NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

June 8, 2016

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
305 West Service Road, Hartford CT 06120
Latitude: 41.799539
Longitude: -72.656697
T-Mobile Site#: CT11491B_L1900

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 125-foot level of the existing 150-foot monopole at 305 West Service Road, Hartford CT 06120. The tower is owned by American Tower Corporation. The property is owned by 305 West Service Rd LLC. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 1900 MHz antenna. The antenna would be installed at the 125-foot level of the tower.

This facility was approved by the City of Hartford PZC. The city file is no longer available – See attached letter from the City Planner.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Luke Bronin, Elected Official for the City of Hartford, as well as the property owner and the tower owner.

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments

cc: Luke Bronin- Mayor - as elected official
American Tower Corporation - as tower owner
305 West Service Rd LLC - as property owner

Exhibit A

LUKE BRONIN
MAYOR

CITY OF HARTFORD

DEPARTMENT OF DEVELOPMENT SERVICES
Planning and Economic Development Division
250 Constitution Plaza, 4th Floor
Hartford, Connecticut 06103

Telephone: (860) 757- 9025
Fax: (860) 722-6402
www.hartford.gov

JAMIE BRÄTT
DIRECTOR

June 7, 2016

Denise Sabo
Northeast Site Solutions
54 Main Street Unit 3
Sturbridge MA 01566

RE: 305 West Service Road

Dear Ms. Sabo:

In response to your inquiry regarding cell towers at 305 West Service Road, the Planning Division did not find any original zoning approvals. A Certificate of Occupancy was found for the use of cell towers. Building permits also indicate that the use of cell towers currently exists.

Please feel free to contact me at 860-757-9055, should you have any questions.

Sincerely,

Lynda Crespo,
Administrative Assistant

Exhibit B

Card 1 of 1

Location 0305 WEST SERVICE RD HARTFORD	Parcel ID 304-074-014

Current Property Mailing Address

Owner 305 W SERVICE RD ASSOC LLC	City BROAD BROOK
	State CT
Address 79 RYE ST	Zip 06016-9555
	Zoning ID-1

Current Property Sales Information

Sale Date 5/29/1998	Legal Reference 03960 0282
Sale Price 280,000	Grantor(Seller)

Two Year Prior Assessment History

Fiscal Year 2013	Fiscal Year 2014
Property Use 242	Property Use 242
Total Value 472,500	Total Value 472,500

Current Property Assessment

Fiscal Year 2015	Building Value 184,170
Land Area 1.970 acres	Land Value 284,900
	Total Value 472,500

2011 Grand List Revaluation Fair Market Value

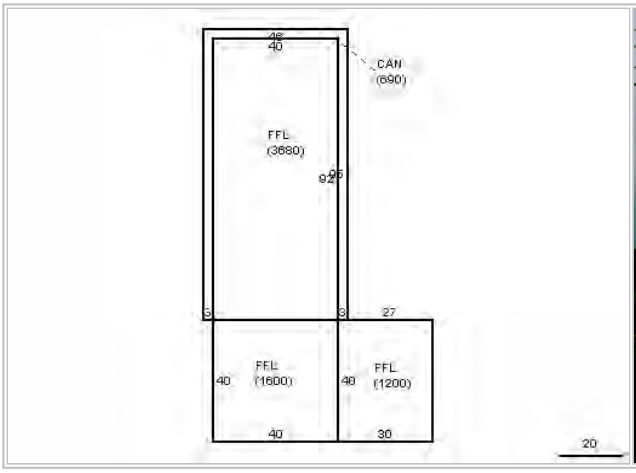
675,000

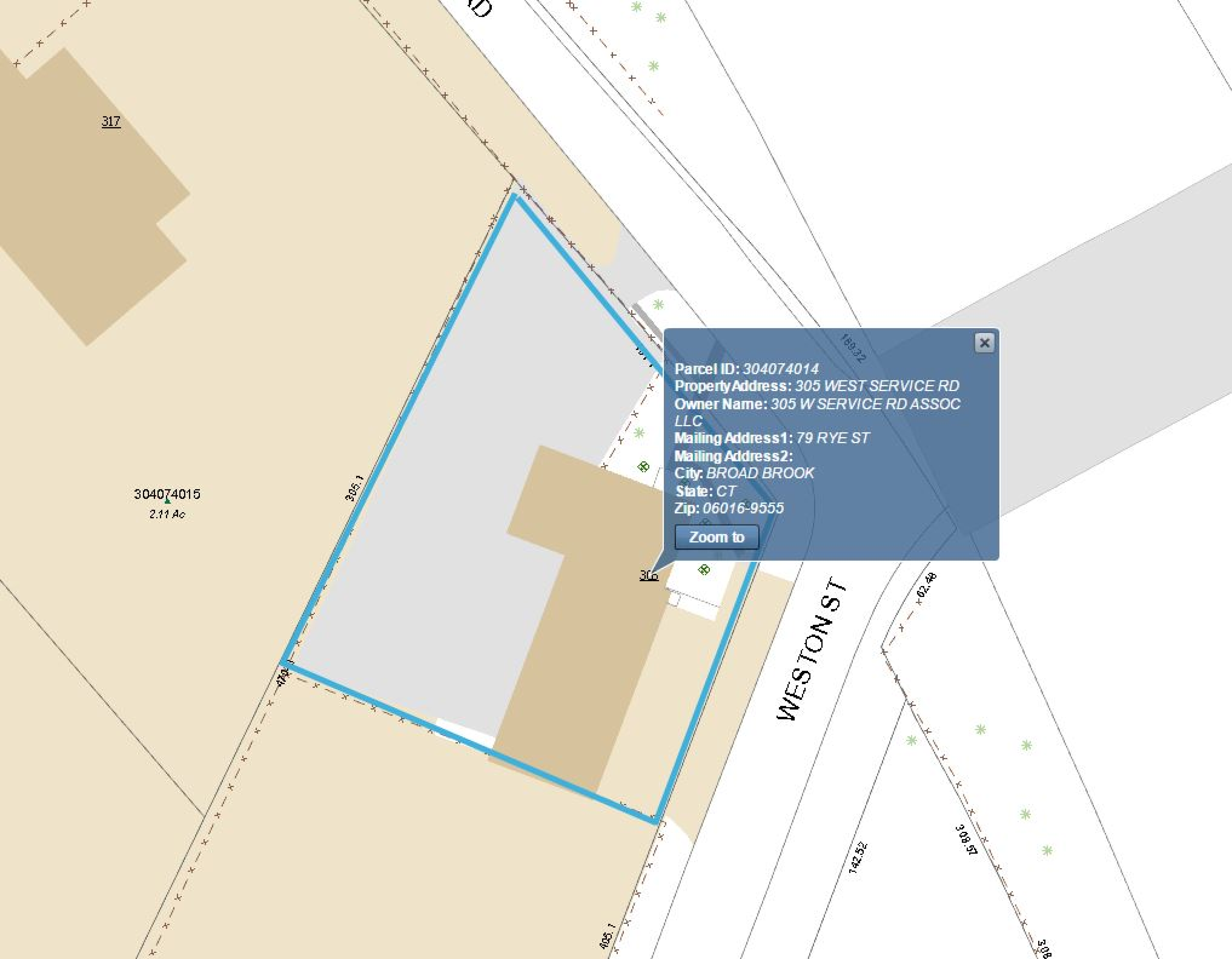
Narrative Description

This property contains 1.970 acres of land mainly classified as AUTO REPAIR with a(n) AU SERVICE style building, built about 1960 , having Conc Block exterior and Membrane roc cover, with 0 unit(s), 0 total room(s), 0 total bedroom(s), 0 total bath(s), 0 total half bath(s) total 3/4 bath(s).

Legal Description

Click Property Images to Enlarge





317
304074015
2.11 Ac
305.1
Parcel ID: 304074014
Property Address: 305 WEST SERVICE RD
Owner Name: 305 W SERVICE RD ASSOC LLC
Mailing Address1: 79 RYE ST
Mailing Address2:
City: BROAD BROOK
State: CT
Zip: 06016-9555
Zoom to
305
WESTON ST
189.22
142.52
308.57

Exhibit C

T-MOBILE NORTHEAST LLC

SITE #: CT11491B

SITE NAME: SSITE HARTFORD_MP1

SITE ADDRESS:
305 WEST SERVICE ROAD
HARTFORD, CT 06120
WIRELESS BROADBAND FACILITY
CONSTRUCTION DRAWINGS
(792DB CONFIGURATION)

VICINITY MAP

DO NOT SCALE DRAWINGS

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

CALL BEFORE YOU DIG:

WWW.CBYD.COM

CALL 800 922 4455, OR 811

CALL THREE WORKING DAYS PRIOR TO DIGGING

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

COLOR CODE FOR UTILITY LOCATIONS

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

GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES. RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE T–MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS, AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFETY REGULATIONS.
14. THE CONTRACTOR SHALL NOTIFY THE T–MOBILE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE T–MOBILE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
16. THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.
17. ATLANTIS GROUP, INC. HAS NOT CONDUCTED A STRUCTURAL ANALYSIS FOR THIS PROJECT AND DOES NOT ASSUME ANY LIABILITY FOR THE ADEQUACY OF THE STRUCTURE AND COMPONENTS.
18. REFER TO STRUCTURAL DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT" PREPARED BY AMERICAN TOWER CORPORATION "T–MOBILE SITE ID CT11491B", DATED APRIL 21, 2016.

SITE INFORMATION

SITE NUMBER:	CT11491B
SITE NAME:	SSITE HARTFORD_MP1
SITE ADDRESS:	305 WEST SERVICE ROAD HARTFORD, CT 06120
LAT./LONG.:	N 41.7998 / W –72.6569
JURISDICTION:	CITY OF HARTFORD , CT
PROPERTY OWNER:	BRIAN L. MUCK PROJECT MANAGER NETWORK DEVELOPMENT AMERICAN TOWER CORPORATION (717) 496–3169 OFFICE BRIAN.MUCK@AMERICANTOWER.COM

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
A&E:	ATLANTIS DESIGN GROUP INC. 54 JACQUELINE ROAD, SUITE #7 WALTHAM, MA 02452 (617)–852–3611

SHEET INDEX

SHEET	DESCRIPTION
T–1	TITLE SHEET
N–1	GENERAL AND ELECTRICAL NOTES
A–1	KEY PLAN AND COMPOUND PLAN
A–2	ELEVATION
A–3	ANTENNA PLAN AND DETAILS
E–1	GROUNDING AND POWER ONE LINE DIAGRAM
E–2	GROUNDING DETAILS

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

DRAWN BY: MB
CHECKED BY: SM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT

PROFESSIONAL SEAL

SITE NAME
CT11491B
SITE NAME
SSITE HARTFORD_MP1
SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

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.

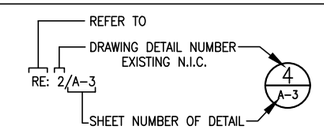
INSURANCE AND BONDS

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

DRAWN BY: MB
CHECKED BY: SM

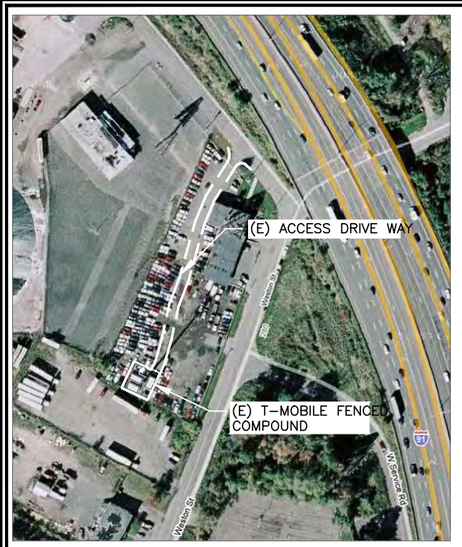
STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 17162
LICENSED ARCHITECT

PROFESSIONAL SEAL

SITE NAME
CT11491B
SITE NAME
SSITE HARTFORD_MP1
SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

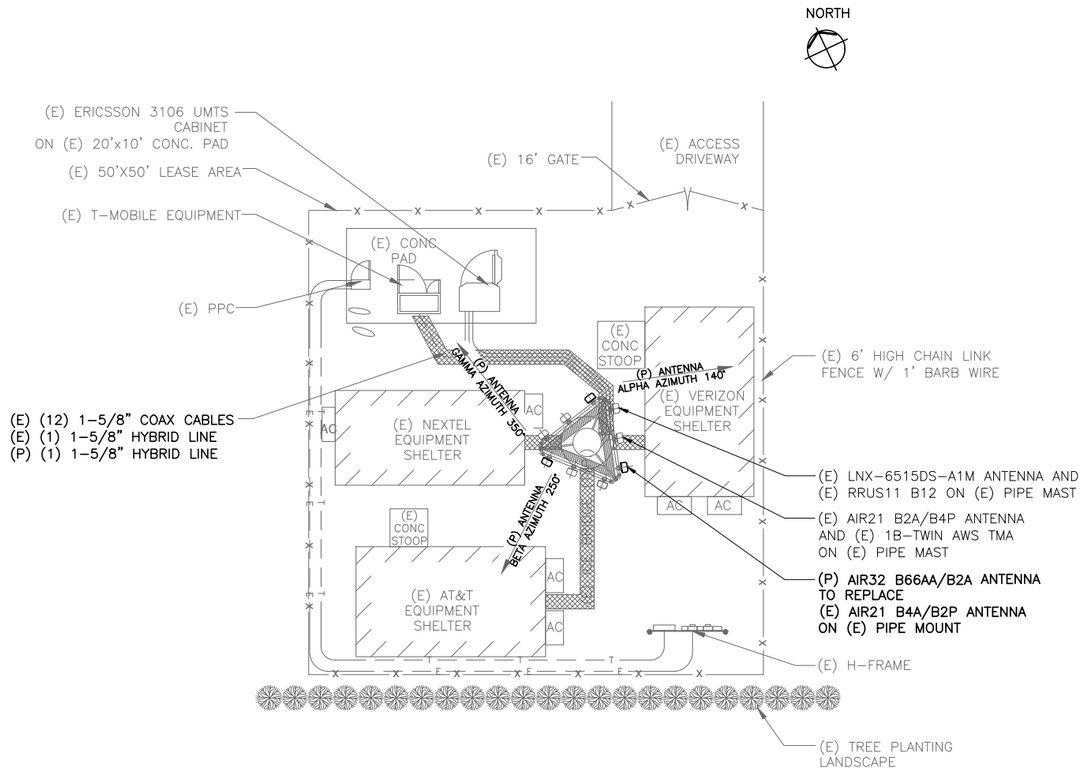
SHEET TITLE
GENERAL AND ELECTRICAL NOTES

SHEET NUMBER
N-1



KEY PLAN — 1 / A-1

SCALE: N.T.S.



COMPOUND PLAN — 2 / A-1

SCALE: 1/16" = 1'-0" (11x17)
1/8" = 1'-0" (24x36)

0 16 32 48

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

GENERAL SITE NOTES:

1. SITE INFORMATION WAS OBTAINED FROM A FIELD INVESTIGATION PERFORMED BY ATLANTIS DESIGN 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

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

DRAWN BY: MB
CHECKED BY: SM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT

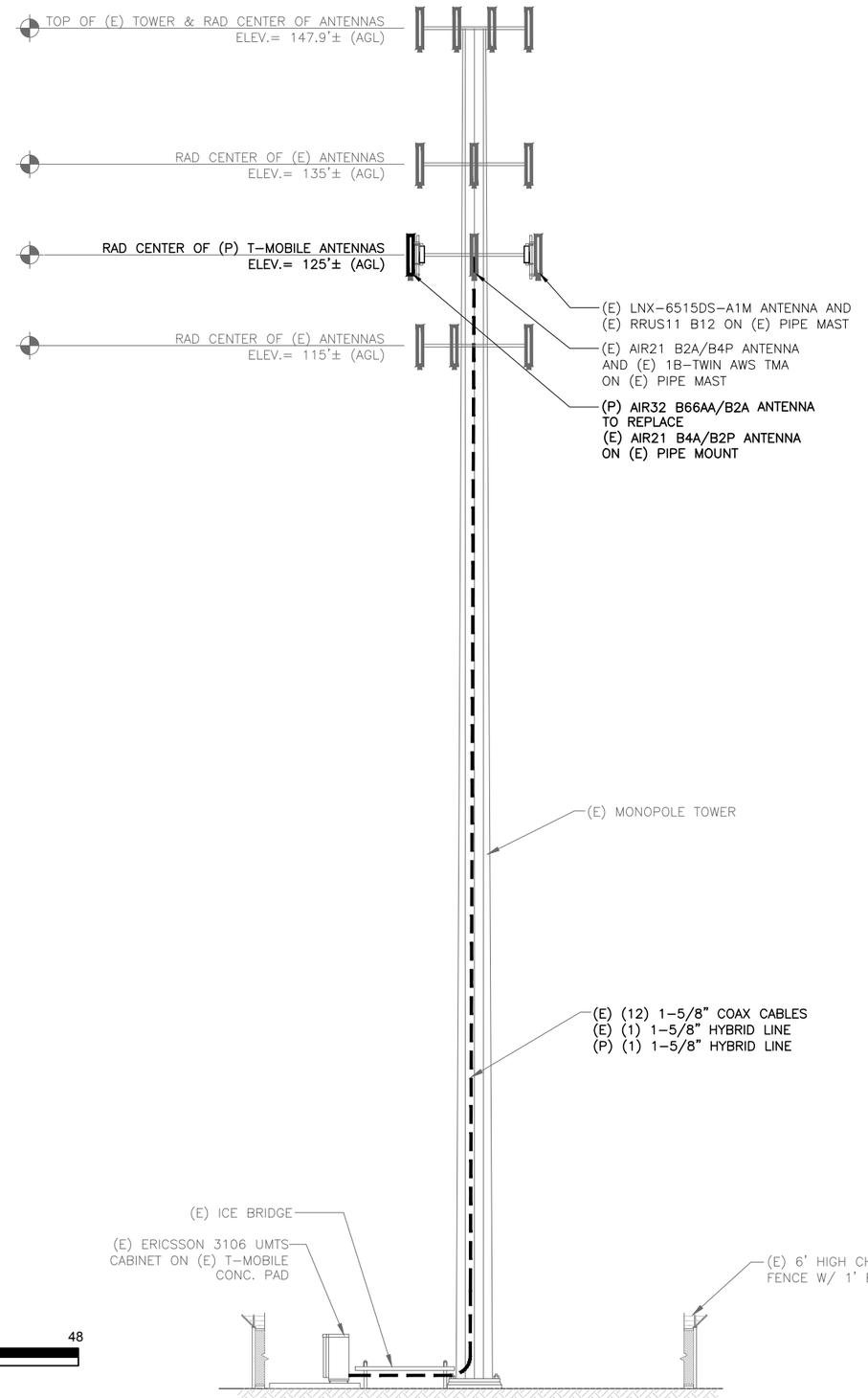
PROFESSIONAL SEAL

SITE NAME
CT11491B
SITE NAME
SSITE HARTFORD_MP1

SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

SHEET TITLE
COMPOUND PLAN AND ELEVATION

SHEET NUMBER
A-1



ELEVATION VIEW

1 / A-2

SCALE: 1/16"=1'-0" (11x17)
1/8"=1'-0" (24x36)

0 16 32 48

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

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS		
DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

DRAWN BY:	MB
CHECKED BY:	SM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT

PROFESSIONAL SEAL

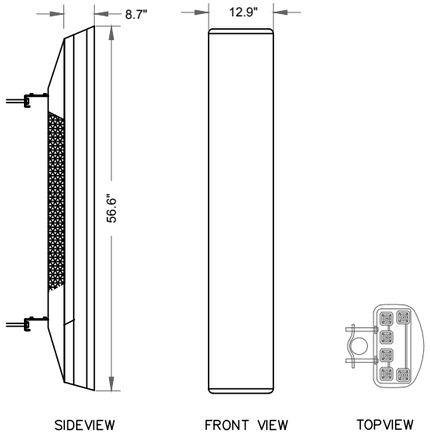
SITE NAME
CT11491B

SITE NAME
SSITE HARTFORD_MP1

SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

SHEET TITLE
ELEVATION

SHEET NUMBER
A-2



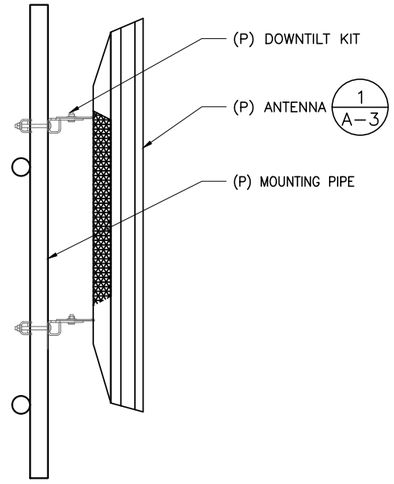
SIDEVIEW FRONT VIEW TOPVIEW

MANUFACTURER: ERICSSON
MODEL NO.:ERICSSON AIR32 AIR32 B66Aa/B2a
DIMENSIONS – HxWxD, (IN) 56.6"x12.9"x8.7"

ERICSSON AIR32 B66Aa/B2a ANTENNA DETAILS

1 / A–3

SCALE: N.T.S



ANTENNA MOUNT DETAILS

2 / A–3

SCALE: N.T.S

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS		
DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

DRAWN BY:	MB
CHECKED BY:	SM

STATE OF CONNECTICUT · HOSSEIN VAHEDI · NO. ARI. 11162 · LICENSED ARCHITECT

PROFESSIONAL SEAL

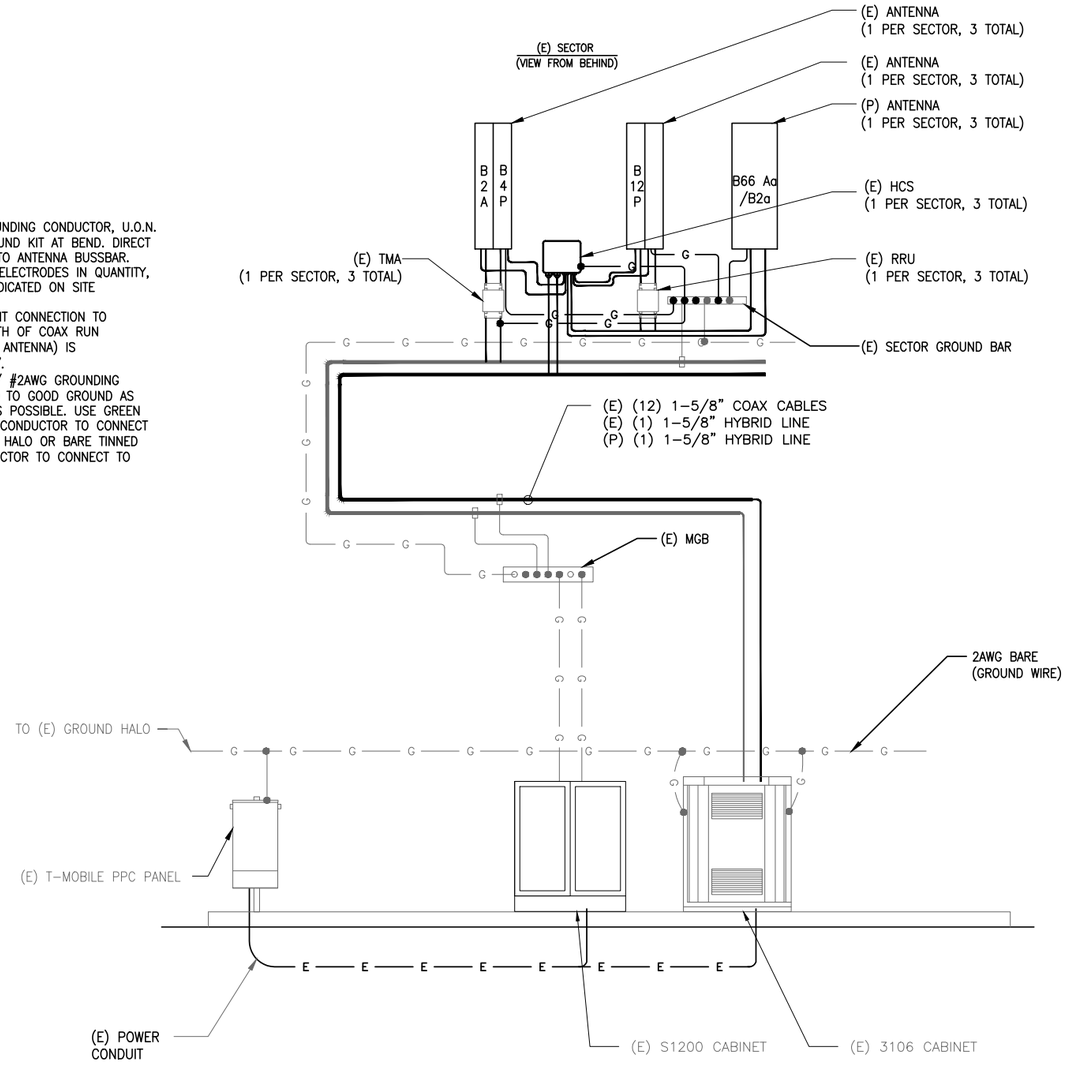
SITE NAME
CT11491B
SITE NAME
SSITE HARTFORD_MP1

SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

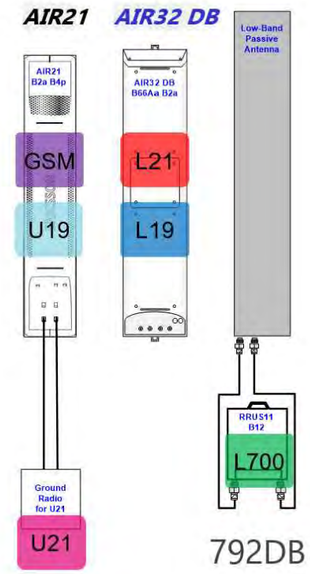
SHEET TITLE
ANTENNA PLAN
AND
DETAILS

SHEET NUMBER
A-3

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



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



TRUNK FIBER NOTES:
1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO 7/8" 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 3/4" (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 3/8" 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 3/4" (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

792DB CONFIGURATION
COAX/FIBER PLUMBING DIAGRAM

SCALE: N.T.S 2 / E-1

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

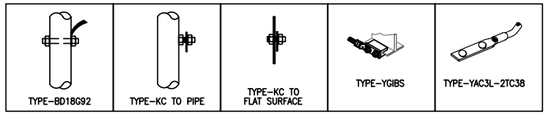
DRAWN BY: MB
CHECKED BY: SM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT
PROFESSIONAL SEAL

SITE NAME
CT11491B
SITE NAME
SSITE HARTFORD_MP1
SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

SHEET TITLE
GROUNDING AND POWER ONE LINE DIAGRAM

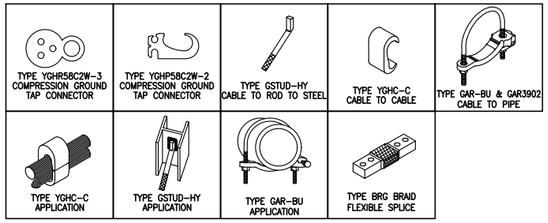
SHEET NUMBER
E-1



BURNDY GROUNDING DETAILS

1 E-2

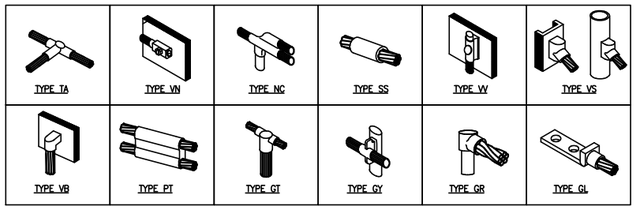
SCALE: N.T.S.



BURNDY GROUNDING PRODUCTS

2 E-2

SCALE: N.T.S.



CADWELD GROUNDING CONNECTION PRODUCTS

3 E-2

SCALE: N.T.S.

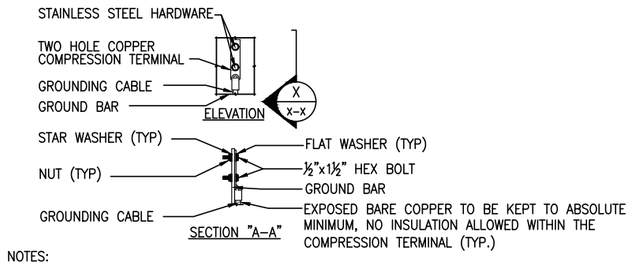
TERMINATION TYPES:
A. MECHANICAL COMPRESSION LUG
B. DOUBLE BARRELL COMPRESSION CONNECTOR
C. EXOTHERMIC TERMINATION
D. BEAM CLAMP

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

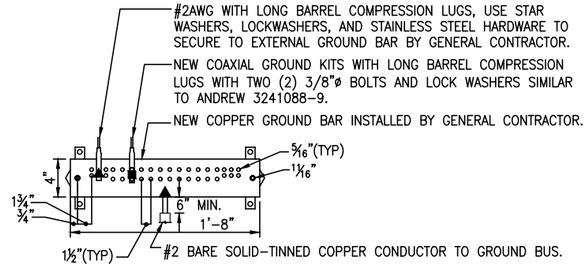
GROUNDING TERMINATION MARTIX

4 E-2

SCALE: N.T.S.



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

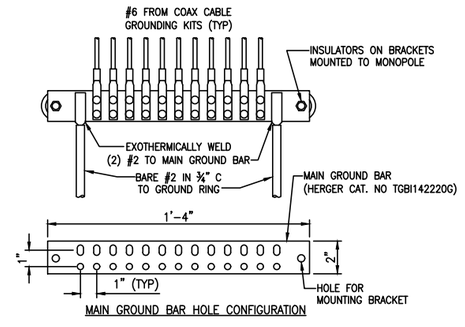


NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

TYPICAL GROUND BAR CONNECTIONS DETAIL

5 E-2

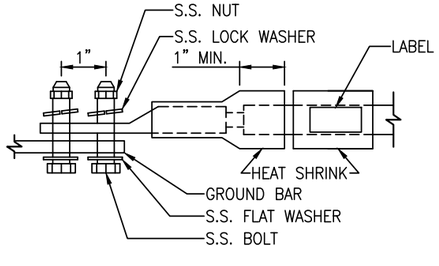
SCALE: N.T.S.



GROUND BAR DETAIL

6 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

7 E-2

SCALE: N.T.S.

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

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

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS		
DATE	DESCRIPTION	REVISION
05/11/16	ISSUED FOR REVIEW	A
06/09/16	FINAL CD	0

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

DRAWN BY:	MB
CHECKED BY:	SM

PROFESSIONAL SEAL

SITE NAME
CT11491B
SITE NAME
SSITE HARTFORD_MP1
SITE ADDRESS
305 WEST SERVICE ROAD
HARTFORD, CT 06120

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-2

Exhibit D

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**147.9 ft Monopole**
ATC Site Name	:	**West Service Road, CT**
ATC Site Number	:	**302466**
Engineering Number	:	**66270921**
Proposed Carrier	:	**T-Mobile**
Carrier Site Name	:	**CT491/SSite Hartford_MP1**
Carrier Site Number	:	**CT11491B**
Site Location	:	**305 W. Service Rd.** **Hartford, CT 06120-0001** **41.7998,-72.6569 :**
County		**Hartford**
Date	:	**April 21, 2016**
Max Usage	:	**77%**
Result	:	**Pass**

Reviewed by:
William Garrett, PE
Chief Engineer

Prepared By:
April Du

Apr 21 2016 4:44 PM

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 147.9 ft monopole to reflect the change in loading by T-Mobile.

Supporting Documents

Tower Drawings	FWT Job #18053, dated September 10, 1998
Foundation Drawing	FWT Job #18054, dated September 10, 1998
Geotechnical Report	Gibble Norden Champion Project #98134.09, dated September 8, 1998

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	95 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2003 IBC w/ 2005 CT Supplement & 2009 CT Amendment
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.18, S_1 = 0.06
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
148.0	148.0	8	Andrew DB844H90E-XY	Platform w/ Handrails	(12) 1 5/8" Coax	Sprint Nextel
		4	Andrew 844G65VTZASX			
135.0	135.0	9	48" x 4" Panel	Low Profile Platform	(9) 1 5/8" Coax	AT&T Mobility
125.0	125.0	3	Ericsson KRY 112 144/1	T-Arms	(12) 1-5/8" Coax (1) 1-5/8" Hybrid line	T-Mobile
		3	Ericsson RRUS 11 B12			
		3	Ericsson AIR 21, 1.3 M, B2A B4P			
		3	Andrew LNX-6515DS-VTM			
115.0	115.0	3	Alcatel-Lucent RRH2X60-1900	Low Profile Platform	(18) 1 5/8" Coax (2) 1 5/8" Fiber	Verizon
		3	Alcatel-Lucent RRH2X60-AWS			
		3	Alcatel-Lucent RRH2x60 700			
		2	RFS DB-T1-6Z-8AB-0Z			
		6	Antel BXA-70063-6CF-EDIN-X			
		6	Commscope SBNHH-1D65B			
105.0	105.0	1	Antel BCD-87010 ___ 25	Stand-Off	(1) 7/8" Coax	Sensus USA
90.0	90.0	2	Horizon Compact	Flush	(6) 5/16" Coax	Clearwire
88.0	88.0	3	NextNet BTS-2500	Side Arms	(2) 1/2" Coax (2) 2" Conduit	
		3	Argus LLPX310R			
		2	DragonWave A-ANT-18G-2-C			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
125.0	125.0	3	Ericsson AIR 21, 1.3M, B4A B2P	-	-	T-Mobile

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
125.0	125.0	3	Ericsson AIR-32 B2A/B66Aa	T-Arms	(1) 1-5/8" hybrid line	T-Mobile

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax outside the pole shaft. Stacking coax is not allowed.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	62%	Pass
Shaft	64%	Pass
Base Plate	54%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	3,969.0	5,358.2	3,185.9	59%
Shear (Kips)	29.4	39.7	30.6	77%

*** The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1**

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
125.0	Ericsson AIR-32 B2A/B66Aa	T-Mobile	1.079	0.887
88.0	DragonWave A-ANT-18G-2-C	Clearwire	0.557	0.703

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-G**

AMERICAN TOWER®
CORPORATION

Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

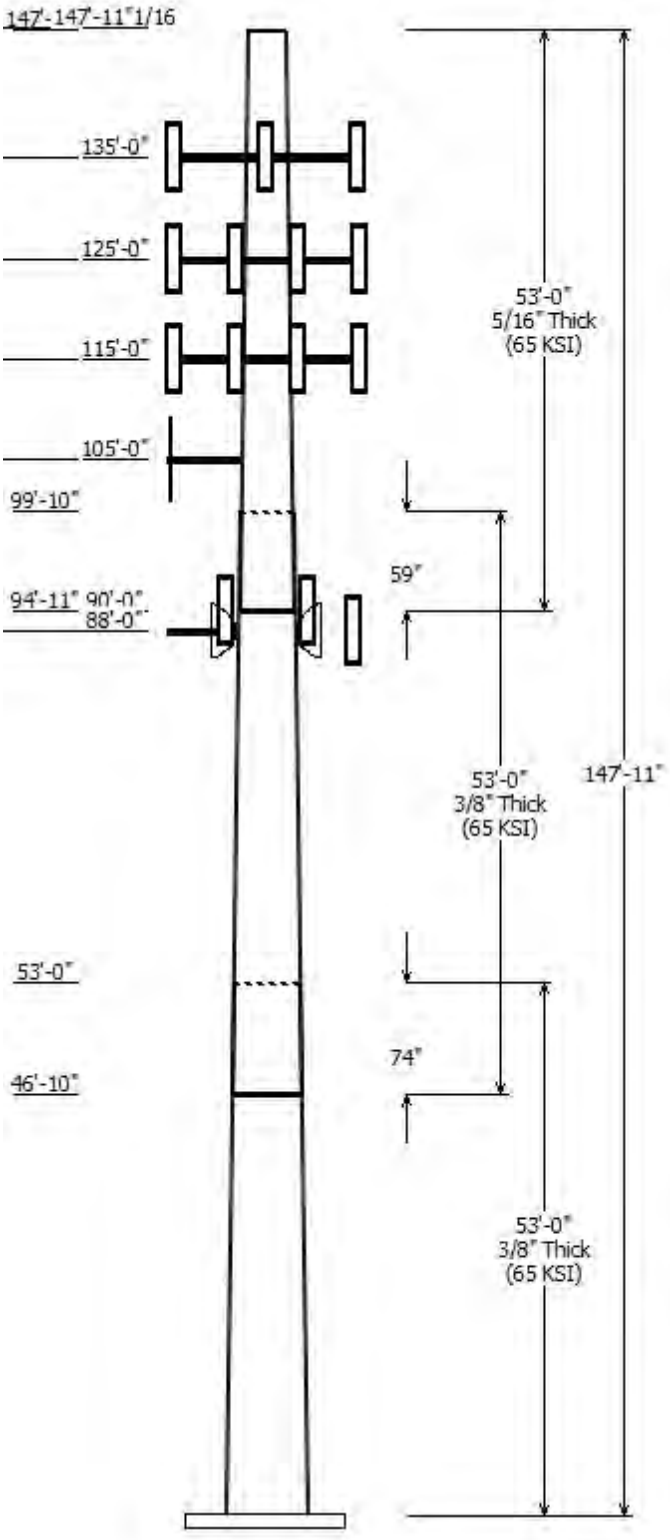
-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.



Job Information

Pole :	302466	Code:	ANSI/TIA-222-G
Description :	148 ft FWT Monopole		
Client :	T- Mobile	Struct Class :	II
Location :	West Service Road, CT		
Shape :	18 Sides	Exposure :	C
Height :	147.92 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.21456 (in/ft)		

Sections Properties

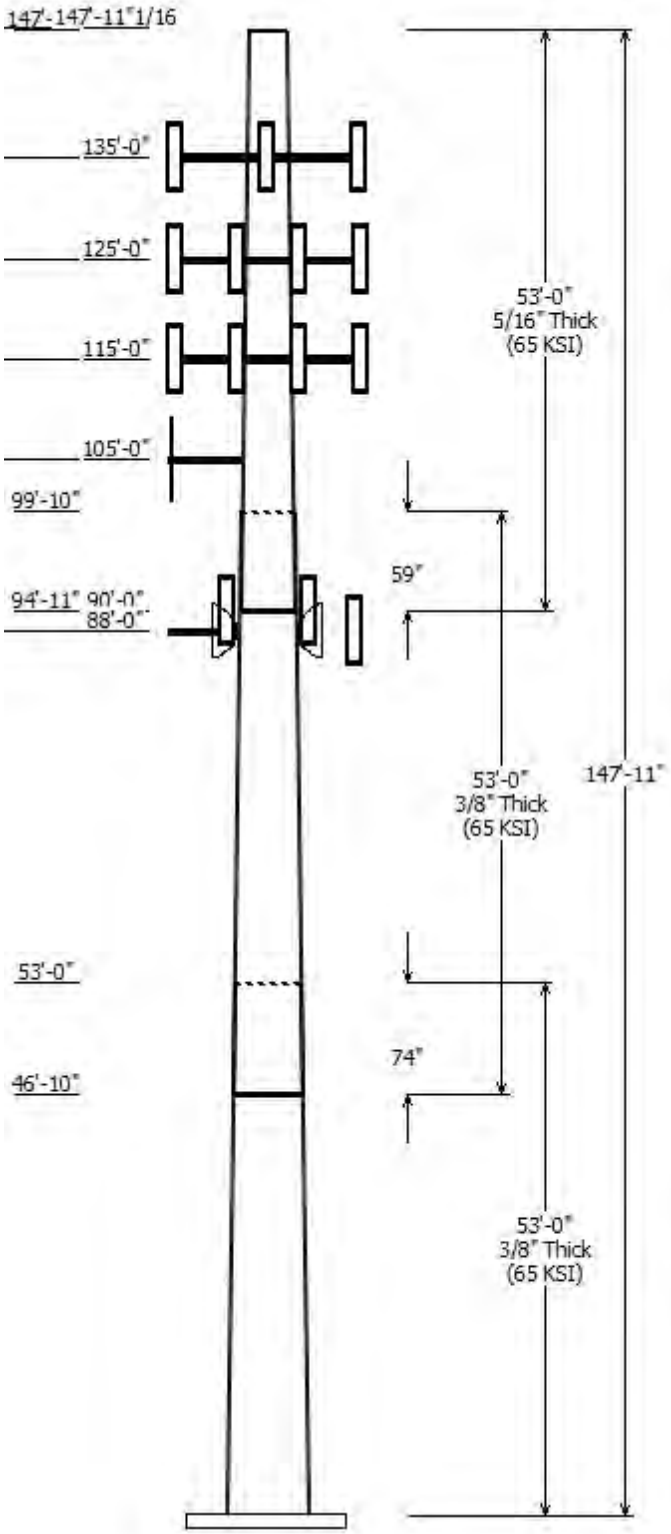
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	53.000	45.20	56.58	0.375		0.000	0.214600	65
2	53.000	35.90	47.28	0.375	Slip Joint	74.000	0.214600	65
3	53.000	26.21	37.58	0.313	Slip Joint	59.000	0.214600	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
147.920	148.000	1	Flat Platform w/ Handrails
147.920	148.000	4	Andrew 844G65VTZASX
147.920	148.000	8	Andrew DB844H90E-XY
135.000	135.000	1	Flat Low Profile Platform
135.000	135.000	9	48" x 4" Panel
125.000	125.000	3	Andrew LNX-6515DS-VTM
125.000	125.000	3	Ericsson AIR-32 B2A/B66Aa
125.000	125.000	3	Ericsson RRUS 11 B12
125.000	125.000	3	Ericsson AIR 21, 1.3 M, B2A B4
125.000	125.000	3	Ericsson KRY 112 144/1
125.000	125.000	3	Round T-Arm
115.000	115.000	6	Commscope SBNHH-1D65B
115.000	115.000	2	RFS DB-T1-6Z-8AB-0Z
115.000	115.000	3	Alcatel-Lucent RRH2x60 700
115.000	115.000	3	Alcatel-Lucent RRH2X60-AWS
115.000	115.000	3	Alcatel-Lucent RRH2X60-1900
115.000	115.000	6	Amphenol Antel BXA-70063-
115.000	115.000	1	Flat Low Profile Platform
105.000	105.000	1	Antel BCD-87010 ___ 25
105.000	105.000	1	Stand-Off
90.000	90.000	2	Horizon Compact
88.000	88.000	1	Side Arms
88.000	88.000	2	DragonWave A-ANT-18G-2-C
88.000	88.000	3	Argus LLPX310R
88.000	88.000	3	NextNet BTS-2500

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	88.000	1/2" Coax	Yes
0.000	88.000	2" Conduit	Yes
0.000	90.000	5/16" Coax	No
0.000	105.0	7/8" Coax	Yes
0.000	115.0	1 5/8" Coax	Yes
0.000	115.0	1 5/8" Coax	Yes
0.000	115.0	1 5/8" Fiber	Yes
0.000	125.0	1 5/8" Coax	Yes
0.000	125.0	1 5/8" Coax	No
0.000	125.0	1 5/8" Coax	Yes
0.000	125.0	1 5/8" Hybriflex	Yes
0.000	125.0	1.58" Fiber	No



0.000	125.0	1.58" Fiber	Yes
0.000	135.0	1 5/8" Coax	No
0.000	148.0	1 5/8" Coax	No

Load Cases

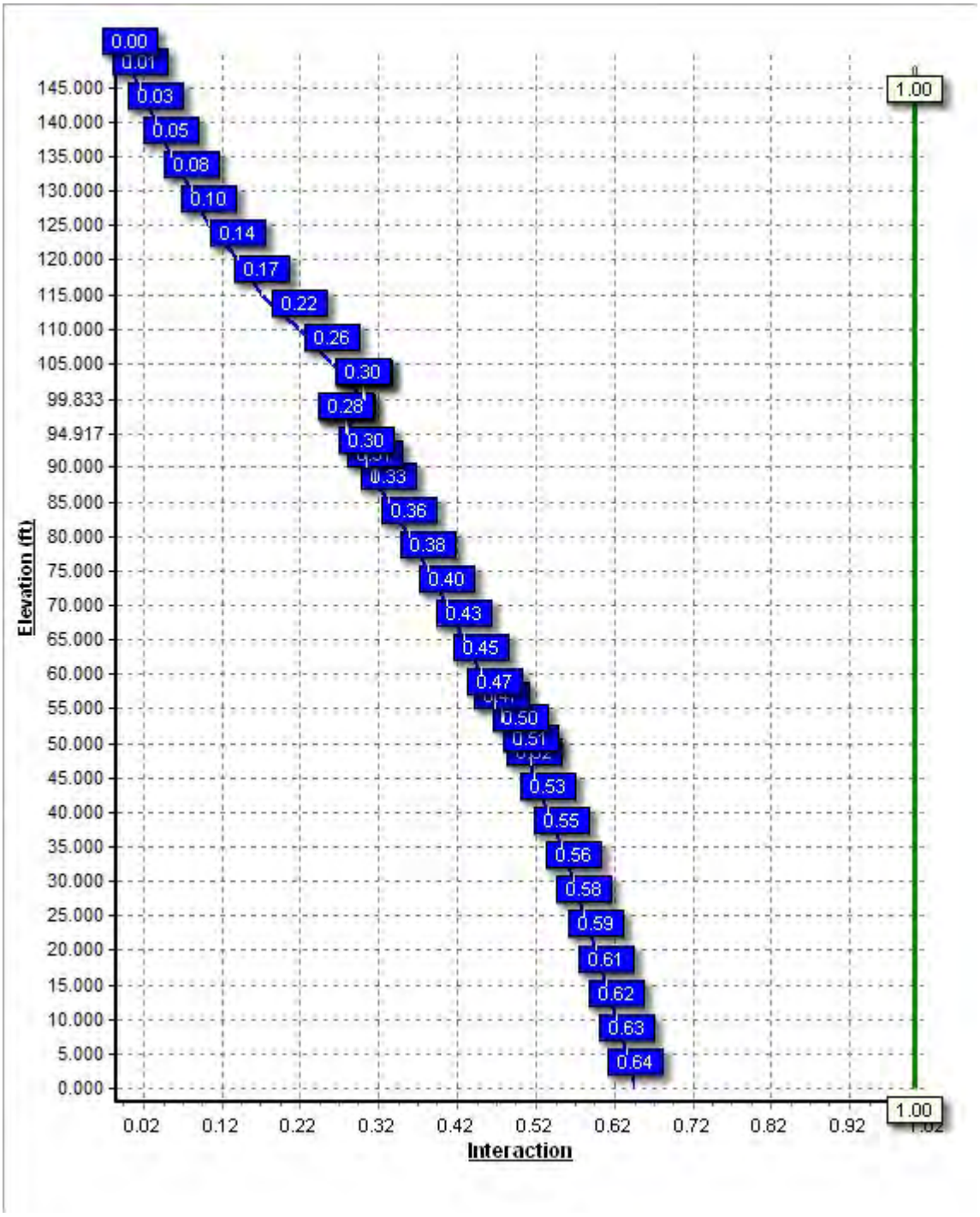
1.2D + 1.6W	95 mph with No Ice
0.9D + 1.6W	95 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	3185.90	30.62	50.29
0.9D + 1.6W	3139.40	30.44	37.70
1.2D + 1.0Di + 1.0Wi	977.04	9.32	103.11
(1.2 + 0.2Sds) * DL + E ELFM	208.74	1.82	50.16
(1.2 + 0.2Sds) * DL + E EMAM	245.91	2.16	50.16
(0.9 - 0.2Sds) * DL + E ELFM	206.44	1.82	34.90
(0.9 - 0.2Sds) * DL + E EMAM	243.01	2.16	34.90
1.0D + 1.0W	785.56	7.59	41.94

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	88.00	6.684	0.703


0.00
0.01
0.03
0.05
0.08
0.10
0.14
0.17
0.22
0.26
0.30
0.28
0.30
0.33
0.36
0.38
0.40
0.43
0.45
0.47
0.50
0.51
0.53
0.55
0.56
0.58
0.59
0.61
0.62
0.63
0.64
1.00
1.00
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
99.833
94.917
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number:	**302466**	**Code: ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number: 66270921**	**4/21/2016 4:06:42 PM**
Customer:	**T- Mobile**		

Analysis Parameters

Location:	**Hartford County, CT**		
Code:	**ANSI/TIA-222-G**	**Height (ft):**	**147.**
Shape:	**18 Sides**	**Base Diameter (in):**	**56.58**
Pole Type:	**Taper**	**Top Diameter (in):**	**26.22**
Pole Manfacturer:	**FWT Inc**	**Taper (in/ft) :**	**0.215**

Ice & Wind Parameters

Structure Class:	**II**	**Design Wind Speed Without Ice:**	**95 mph**
Exposure Category:	**C**	**Design Wind Speed With Ice:**	**50 mph**
Topographic Category:	**1**	**Operational Wind Speed:**	**60 mph**
Crest Height:	**0.0 ft**	**Design Ice Thickness:**	**1.00 in**

Seismic Parameters

Analysis Method:	**Equivalent Modal Analysis & Equivalent Lateral Force Methods**				
Site Class:	**D - Stiff Soil**				
Period Based on Rayleigh Method (sec):	**2.04**				
T_L (sec):	**6**	**p:**	**1.3**	**C_s:**	**0.033**
S_s:	**0.180**	**S_1:**	**0.064**	**C_s Max:**	**0.033**
F_a:	**1.600**	**F_v:**	**2.400**	**C_s Min:**	**0.030**
S_{ds}:	**0.192**	**S_{d1}:**	**0.102**		

Load Cases

1.2D + 1.6W	**95 mph with No Ice**
0.9D + 1.6W	**95 mph with No Ice (Reduced DL)**
1.2D + 1.0Di + 1.0Wi	**50 mph with 1.00 in Radial Ice**
(1.2 + 0.2Sds) * DL + E ELFM	**Seismic Equivalent Lateral Forces Method**
(1.2 + 0.2Sds) * DL + E EMAM	**Seismic Equivalent Modal Analysis Method**
(0.9 - 0.2Sds) * DL + E ELFM	**Seismic (Reduced DL) Equivalent Lateral Forces Method**
(0.9 - 0.2Sds) * DL + E EMAM	**Seismic (Reduced DL) Equivalent Modal Analysis Method**
1.0D + 1.0W	**Serviceability 60 mph**

Site Number:	**302466**	**Code:**	**ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number:**	**66270921**	**4/21/2016 4:06:42 PM**
Customer:	**T- Mobile**			

Shaft Section Properties

							Bottom						Top						
Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Slip Joint Type	Slip Joint Len (in)	Weight (lb)	Dia (in)	Elev (ft)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	53.000	0.3750	65		0.00	10,844	56.58	0.00	66.90	26698.9	24.84	150.88	45.20	53.00	53.36	13550.7	19.49	120.55	0.214565
2-18	53.000	0.3750	65	Slip	74.00	8,848	47.28	46.83	55.83	15518.8	20.47	126.08	35.90	99.83	42.29	6746.9	15.12	95.76	0.214565
3-18	53.000	0.3125	65	Slip	59.00	5,651	37.58	94.92	36.97	6490.8	19.45	120.28	26.21	147.92	25.69	2178.3	13.03	83.89	0.214565
				Shaft Weight		25,343													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
147.92	Andrew 844G65VTZASX	4	16.00	5.310	0.86	236.95	6.671	0.86	0.000	0.080
147.92	Andrew DB844H90E-XY	8	14.00	3.610	0.92	173.45	4.838	0.92	0.000	0.080
147.92	Flat Platform w/ Handrails	1	2000.00	42.400	1.00	3,894.24	70.353	1.00	0.000	0.080
135.00	48" x 4" Panel	9	20.00	2.090	0.81	104.21	3.224	0.81	0.000	0.000
135.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,354.95	51.294	1.00	0.000	0.000
125.00	Andrew LNX-6515DS-VTM	3	51.30	11.430	0.84	415.00	13.620	0.84	0.000	0.000
125.00	Ericsson AIR 21, 1.3 M, B2A	3	83.00	6.050	0.86	317.17	7.513	0.86	0.000	0.000
125.00	Ericsson AIR-32 B2A/B66Aa	3	132.20	6.510	0.86	385.42	8.011	0.86	0.000	0.000
125.00	Ericsson KRY 112 144/1	3	11.00	0.410	0.50	36.18	0.744	0.50	0.000	0.000
125.00	Ericsson RRUS 11 B12	3	50.70	2.790	0.67	171.83	3.702	0.67	0.000	0.000
125.00	Round T-Arm	3	250.00	9.700	0.67	523.64	20.494	0.67	0.000	0.000
115.00	Alcatel-Lucent RRH2x60 700	3	56.70	2.150	0.67	169.78	2.983	0.67	0.000	0.000
115.00	Alcatel-Lucent RRH2X60-	3	43.00	1.880	0.50	137.73	2.670	0.50	0.000	0.000
115.00	Alcatel-Lucent RRH2X60-	3	44.00	1.880	0.50	140.83	2.670	0.50	0.000	0.000
115.00	Amphenol Antel BXA-70063-	6	17.00	7.570	0.77	257.21	9.243	0.77	0.000	0.000
115.00	Commscope SBNHH-1D65B	6	50.70	8.170	0.83	329.33	9.896	0.83	0.000	0.000
115.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	2,341.08	50.885	1.00	0.000	0.000
115.00	RFS DB-T1-6Z-8AB-0Z	2	44.00	4.800	0.67	240.18	5.955	0.67	0.000	0.000
105.00	Antel BCD-87010 ___ 25	1	26.50	2.900	1.00	222.10	7.347	1.00	0.000	0.000
105.00	Stand-Off	1	75.00	2.500	1.00	122.04	3.754	1.00	0.000	0.000
90.00	Horizon Compact	2	10.60	0.430	1.00	52.96	0.758	1.00	0.000	0.000
88.00	Argus LLPX310R	3	28.60	4.290	0.73	173.33	5.446	0.73	0.000	0.000
88.00	DragonWave A-ANT-18G-2-C	2	27.10	4.690	1.00	150.60	6.301	1.00	0.000	0.000
88.00	NextNet BTS-2500	3	35.00	1.820	0.50	113.68	2.569	0.50	0.000	0.000
88.00	Side Arms	1	560.00	8.500	1.00	1,151.98	17.486	1.00	0.000	0.000
	Totals	78	8943.60			25,520.14			Number of Loadings :	25

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	148.00	12	1 5/8" Coax	1.98	0.82	N	0.00	N	Sprint Nextel
0.00	135.00	9	1 5/8" Coax	1.98	0.82	N	0.00	N	AT&T Mobility
0.00	125.00	6	1 5/8" Coax	1.98	0.82	N	1.98	Y	T-Mobile
0.00	125.00	6	1 5/8" Coax	1.98	0.82	N	0.00	N	T-Mobile
0.00	125.00	6	1 5/8" Coax	1.98	0.82	N	1.98	Y	T-Mobile
0.00	125.00	1	1 5/8" Hybriflex	1.98	1.30	N	0.00	Y	T-Mobile
0.00	125.00	1	1.58" Fiber	1.63	1.61	N	0.00	N	T-Mobile
0.00	125.00	1	1.58" Fiber	1.63	1.61	N	0.00	Y	T-Mobile
0.00	115.00	12	1 5/8" Coax	1.98	0.82	N	0.00	Y	Verizon
0.00	115.00	6	1 5/8" Coax	1.98	0.82	N	0.00	Y	Verizon
0.00	115.00	2	1 5/8" Fiber	1.63	1.61	N	0.00	Y	Verizon

0.00	105.00	1	7/8" Coax	1.09	0.33	N	0.00	Y	Sensus USA
0.00	90.00	6	5/16" Coax	0.31	0.05	N	0.00	N	Clearwire
0.00	88.00	2	1/2" Coax	0.63	0.15	N	0.00	Y	Clearwire
0.00	88.00	2	2" Conduit	2.38	3.65	N	0.40	Y	Clearwire

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.3750	56.580	66.895	26,698.9	24.84	150.88	72.2	929.4	0.0	0.0
5.00		0.3750	55.507	65.618	25,199.0	24.34	148.02	72.8	894.2	0.0	1,127.3
10.00		0.3750	54.434	64.341	23,756.4	23.83	145.16	73.4	859.6	0.0	1,105.6
15.00		0.3750	53.361	63.065	22,369.9	23.33	142.30	74.0	825.7	0.0	1,083.8
20.00		0.3750	52.288	61.788	21,038.5	22.82	139.44	74.6	792.5	0.0	1,062.1
25.00		0.3750	51.216	60.511	19,760.9	22.32	136.57	75.2	760.0	0.0	1,040.4
30.00		0.3750	50.143	59.234	18,536.2	21.81	133.71	75.7	728.1	0.0	1,018.7
35.00		0.3750	49.070	57.957	17,363.1	21.31	130.85	76.3	696.9	0.0	996.9
40.00		0.3750	47.997	56.680	16,240.6	20.81	127.99	76.9	666.5	0.0	975.2
45.00		0.3750	46.924	55.403	15,167.5	20.30	125.13	77.5	636.6	0.0	953.5
46.83	Bot - Section 2	0.3750	46.531	54.935	14,786.2	20.12	124.08	77.7	625.9	0.0	344.2
50.00		0.3750	45.851	54.126	14,142.8	19.80	122.27	78.1	607.5	0.0	1,184.8
53.00	Top - Section 1	0.3750	45.958	54.253	14,242.2	19.85	122.55	78.1	610.4	0.0	1,106.4
55.00		0.3750	45.529	53.742	13,843.7	19.64	121.41	78.3	598.9	0.0	367.5
60.00		0.3750	44.456	52.465	12,880.2	19.14	118.55	78.9	570.7	0.0	903.5
65.00		0.3750	43.383	51.188	11,962.5	18.64	115.69	79.5	543.1	0.0	881.8
70.00		0.3750	42.310	49.912	11,089.5	18.13	112.83	80.1	516.2	0.0	860.1
75.00		0.3750	41.237	48.635	10,259.9	17.63	109.97	80.7	490.0	0.0	838.3
80.00		0.3750	40.165	47.358	9,472.9	17.12	107.11	81.3	464.5	0.0	816.6
85.00		0.3750	39.092	46.081	8,727.1	16.62	104.24	81.9	439.7	0.0	794.9
88.00		0.3750	38.448	45.315	8,299.0	16.32	102.53	82.2	425.1	0.0	466.5
90.00		0.3750	38.019	44.804	8,021.5	16.11	101.38	82.4	415.6	0.0	306.7
94.92	Bot - Section 3	0.3750	36.964	43.548	7,365.9	15.62	98.57	82.6	392.5	0.0	739.1
95.00		0.3750	36.946	43.527	7,355.1	15.61	98.52	82.6	392.1	0.0	22.8
99.83	Top - Section 2	0.3125	36.534	35.926	5,955.1	18.85	116.91	79.2	321.1	0.0	1,305.1
100.0		0.3125	36.498	35.890	5,937.5	18.83	116.79	79.3	320.4	0.0	20.4
105.0		0.3125	35.425	34.826	5,424.9	18.23	113.36	80.0	301.6	0.0	601.6
110.0		0.3125	34.353	33.762	4,942.7	17.62	109.93	80.7	283.4	0.0	583.5
115.0		0.3125	33.280	32.698	4,490.0	17.01	106.50	81.4	265.7	0.0	565.4
120.0		0.3125	32.207	31.634	4,065.7	16.41	103.06	82.1	248.6	0.0	547.3
125.0		0.3125	31.134	30.570	3,669.1	15.80	99.63	82.6	232.1	0.0	529.2
130.0		0.3125	30.061	29.506	3,299.1	15.20	96.20	82.6	216.2	0.0	511.1
135.0		0.3125	28.988	28.442	2,954.9	14.59	92.76	82.6	200.8	0.0	493.0
140.0		0.3125	27.916	27.378	2,635.5	13.99	89.33	82.6	186.0	0.0	474.9
145.0		0.3125	26.843	26.314	2,340.0	13.38	85.90	82.6	171.7	0.0	456.8
147.9		0.3125	26.217	25.693	2,178.3	13.03	83.89	82.6	163.6	0.0	258.1
											25,342.5

Site Number:	**302466**	**Code: ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number: 66270921**	**4/21/2016 4:06:42 PM**
Customer:	**T- Mobile**		

Load Case: **1.2D + 1.6W** — **95 mph with No Ice** — **22 Iterations**

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.60

Wind Importance Factor : 1.00

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf		Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	18.656	20.52	419.33	0.650		0.000	0.00	0.000	0.00	253.0	0.0	0.0
5.00		1.00	0.85	18.656	20.52	415.35	0.650		0.000	5.00	23.712	15.41	501.2	0.0	1,352.7
10.00		1.00	0.85	18.656	20.52	407.40	0.650		0.000	5.00	23.258	15.12	491.5	0.0	1,326.7
15.00		1.00	0.85	18.656	20.52	399.45	0.650		0.000	5.00	22.804	14.82	489.4	0.0	1,300.6
20.00		1.00	0.87	19.247	21.17	397.64	0.650		0.000	5.00	22.350	14.53	500.2	0.0	1,274.5
25.00		1.00	0.92	20.292	22.32	400.01	0.650		0.000	5.00	21.896	14.23	513.8	0.0	1,248.5
30.00		1.00	0.96	21.168	23.28	400.08	0.650		0.000	5.00	21.442	13.94	522.8	0.0	1,222.4
35.00		1.00	0.99	21.926	24.11	398.56	0.650		0.000	5.00	20.988	13.64	528.6	0.0	1,196.3
40.00		1.00	1.02	22.596	24.85	395.86	0.650		0.000	5.00	20.534	13.35	531.9	0.0	1,170.3
45.00		1.00	1.05	23.200	25.52	392.24	0.650		0.000	5.00	20.080	13.05	364.2	0.0	1,144.2
46.83	Bot - Section 2	1.00	1.07	23.580	25.93	389.34	0.650		0.000	1.83	7.249	4.71	269.3	0.0	413.0
50.00		1.00	1.08	23.845	26.22	387.02	0.650		0.000	3.17	12.578	8.18	333.9	0.0	1,421.8
53.00	Top - Section 1	1.00	1.10	24.157	26.57	383.97	0.650		0.000	3.00	11.748	7.64	270.4	0.0	1,327.6
55.00		1.00	1.11	24.399	26.83	387.70	0.650		0.000	2.00	7.741	5.03	377.3	0.0	441.0
60.00		1.00	1.12	24.724	27.19	383.86	0.650		0.000	5.00	19.036	12.37	536.7	0.0	1,084.2
65.00		1.00	1.14	25.162	27.67	378.01	0.650		0.000	5.00	18.582	12.08	532.8	0.0	1,058.1
70.00		1.00	1.16	25.573	28.13	371.78	0.650	*	0.000	5.00	18.128	11.79	530.0	0.0	1,032.1
75.00		1.00	1.18	25.960	28.55	365.21	0.655	*	0.000	5.00	17.674	11.58	528.2	0.0	1,006.0
80.00		1.00	1.19	26.327	28.96	358.33	0.661	*	0.000	5.00	17.220	11.38	525.8	0.0	979.9
85.00		1.00	1.21	26.676	29.34	351.19	0.666	*	0.000	5.00	16.766	11.17	418.8	0.0	953.9
88.00	Appertunance(s)	1.00	1.22	26.943	29.63	345.30	0.671	*	0.000	3.00	9.842	6.60	257.5	0.0	559.8
90.00	Appertunance(s)	1.00	1.23	27.106	29.81	341.55	0.654	*	0.000	2.00	6.471	4.23	347.7	0.0	368.0
94.92	Bot - Section 3	1.00	1.24	27.324	30.05	336.27	0.658	*	0.000	4.92	15.598	10.26	251.0	0.0	886.9
95.00		1.00	1.25	27.478	30.22	332.39	0.661	*	0.000	0.08	0.265	0.18	248.8	0.0	27.4
99.83	Top - Section 2	1.00	1.25	27.626	30.38	328.53	0.664	*	0.000	4.83	15.154	10.06	252.9	0.0	1,566.1
100.0		1.00	1.26	27.774	30.55	330.20	0.663	*	0.000	0.17	0.515	0.34	257.5	0.0	24.4
105.0	Appertunance(s)	1.00	1.27	27.924	30.71	326.07	0.666	*	0.000	5.00	15.215	10.14	495.7	0.0	721.9
110.0		1.00	1.28	28.205	31.02	317.93	0.673	*	0.000	5.00	14.761	9.93	490.3	0.0	700.2
115.0	Appertunance(s)	1.00	1.29	28.476	31.32	309.63	0.680	*	0.000	5.00	14.307	9.73	484.5	0.0	678.5
120.0		1.00	1.30	28.738	31.61	301.18	0.687	*	0.000	5.00	13.854	9.52	478.4	0.0	656.7
125.0	Appertunance(s)	1.00	1.32	28.991	31.89	292.60	0.695	*	0.000	5.00	13.400	9.31	454.1	0.0	635.0
130.0		1.00	1.33	29.237	32.16	283.88	0.650		0.000	5.00	12.946	8.41	427.1	0.0	613.3
135.0	Appertunance(s)	1.00	1.34	29.474	32.42	275.03	0.650		0.000	5.00	12.492	8.12	415.1	0.0	591.6
140.0		1.00	1.35	29.705	32.67	266.08	0.650		0.000	5.00	12.038	7.82	402.9	0.0	569.8
145.0		1.00	1.36	29.929	32.92	257.01	0.650		0.000	5.00	11.584	7.53	311.1	0.0	548.1
147.9	Appertunance(s)	1.00	1.37	30.102	33.11	249.75	0.650		0.000	2.92	6.548	4.26	112.8	0.0	309.7
Totals:										**147.92**			**14,707.3**	**0.0**	**30,411.0**

*** = Cf Adjusted By Linear Load Ra Effect**

Site Number:	**302466**	**Code: ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number: 66270921**	**4/21/2016 4:06:43 PM**
Customer:	**T- Mobile**		

Load Case: **1.2D + 1.6W** **95 mph with No Ice** **22 Iterations**

Gust Response Factor : 1.10
Dead Load Factor : 1.20
Wind Load Factor : 1.60

Wind Importance Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-50.29	-30.62	0.00	-3,185.90	0.00	3,185.90	4,345.86	2,172.93	10,048.4	5,031.69	0.00	0.00	0.645
5.00	-48.47	-30.26	0.00	-3,032.81	0.00	3,032.81	4,297.95	2,148.97	9,746.71	4,880.60	0.09	-0.17	0.633
10.00	-46.68	-29.89	0.00	-2,881.54	0.00	2,881.54	4,248.67	2,124.33	9,446.21	4,730.12	0.35	-0.33	0.620
15.00	-44.92	-29.52	0.00	-2,732.08	0.00	2,732.08	4,198.03	2,099.01	9,147.11	4,580.35	0.79	-0.50	0.607
20.00	-43.19	-29.13	0.00	-2,584.46	0.00	2,584.46	4,146.02	2,073.01	8,849.60	4,431.38	1.41	-0.67	0.594
25.00	-41.49	-28.72	0.00	-2,438.80	0.00	2,438.80	4,092.65	2,046.33	8,553.86	4,283.29	2.20	-0.84	0.580
30.00	-39.81	-28.29	0.00	-2,295.19	0.00	2,295.19	4,037.92	2,018.96	8,260.07	4,136.18	3.17	-1.01	0.565
35.00	-38.17	-27.85	0.00	-2,153.73	0.00	2,153.73	3,981.82	1,990.91	7,968.42	3,990.13	4.32	-1.18	0.550
40.00	-36.55	-27.39	0.00	-2,014.49	0.00	2,014.49	3,924.36	1,962.18	7,679.09	3,845.25	5.65	-1.35	0.533
45.00	-34.99	-27.06	0.00	-1,877.54	0.00	1,877.54	3,865.54	1,932.77	7,392.25	3,701.62	7.16	-1.52	0.516
46.83	-34.41	-26.83	0.00	-1,827.93	0.00	1,827.93	3,843.63	1,921.82	7,287.74	3,649.29	7.75	-1.59	0.510
50.00	-32.71	-26.51	0.00	-1,742.98	0.00	1,742.98	3,805.35	1,902.68	7,108.10	3,559.33	8.84	-1.69	0.498
53.00	-31.12	-26.24	0.00	-1,663.46	0.00	1,663.46	3,811.38	1,905.69	7,136.13	3,573.37	9.94	-1.80	0.474
55.00	-30.49	-25.90	0.00	-1,610.99	0.00	1,610.99	3,786.98	1,893.49	7,023.14	3,516.79	10.71	-1.87	0.466
60.00	-28.98	-25.39	0.00	-1,481.49	0.00	1,481.49	3,725.01	1,862.51	6,742.74	3,376.38	12.75	-2.02	0.447
65.00	-27.50	-24.88	0.00	-1,354.52	0.00	1,354.52	3,661.69	1,830.84	6,465.44	3,237.53	14.95	-2.18	0.426
70.00	-26.05	-24.37	0.00	-1,230.11	0.00	1,230.11	3,597.00	1,798.50	6,191.43	3,100.31	17.32	-2.34	0.404
75.00	-24.63	-23.85	0.00	-1,108.27	0.00	1,108.27	3,530.95	1,765.47	5,920.87	2,964.83	19.85	-2.49	0.381
80.00	-23.24	-23.32	0.00	-989.05	0.00	989.05	3,463.53	1,731.77	5,653.95	2,831.18	22.53	-2.63	0.356
85.00	-21.89	-22.88	0.00	-872.46	0.00	872.46	3,394.75	1,697.38	5,390.86	2,699.44	25.36	-2.77	0.330
88.00	-20.19	-21.34	0.00	-803.83	0.00	803.83	3,352.83	1,676.42	5,234.92	2,621.35	27.13	-2.85	0.313
90.00	-19.65	-20.96	0.00	-761.15	0.00	761.15	3,324.61	1,662.30	5,131.78	2,569.70	28.33	-2.91	0.302
94.92	-18.43	-20.67	0.00	-658.09	0.00	658.09	3,235.43	1,617.71	4,852.78	2,430.00	31.39	-3.03	0.277
95.00	-18.39	-20.44	0.00	-656.37	0.00	656.37	3,233.85	1,616.92	4,848.02	2,427.61	31.44	-3.03	0.276
99.83	-16.50	-20.10	0.00	-557.59	0.00	557.59	2,561.72	1,280.86	3,809.83	1,907.74	34.57	-3.15	0.299
100.00	-16.46	-19.86	0.00	-554.24	0.00	554.24	2,559.96	1,279.98	3,803.41	1,904.53	34.68	-3.15	0.298
105.00	-15.29	-19.06	0.00	-454.95	0.00	454.95	2,506.38	1,253.19	3,612.46	1,808.91	38.05	-3.27	0.258
110.00	-14.26	-18.54	0.00	-359.64	0.00	359.64	2,451.43	1,225.72	3,424.36	1,714.72	41.53	-3.38	0.216
115.00	-10.67	-12.82	0.00	-266.95	0.00	266.95	2,395.12	1,197.56	3,239.30	1,622.06	45.11	-3.47	0.169
120.00	-9.81	-12.30	0.00	-202.84	0.00	202.84	2,337.45	1,168.73	3,057.46	1,531.00	48.78	-3.54	0.137
125.00	-7.12	-8.17	0.00	-141.33	0.00	141.33	2,271.20	1,135.60	2,869.91	1,437.09	52.53	-3.60	0.102
130.00	-6.42	-7.70	0.00	-100.50	0.00	100.50	2,192.15	1,096.07	2,672.63	1,338.30	56.32	-3.65	0.078
135.00	-3.87	-5.12	0.00	-62.00	0.00	62.00	2,113.09	1,056.55	2,482.37	1,243.03	60.16	-3.68	0.052
140.00	-3.27	-4.68	0.00	-36.38	0.00	36.38	2,034.04	1,017.02	2,299.14	1,151.28	64.03	-3.71	0.033
145.00	-2.68	-4.33	0.00	-12.97	0.00	12.97	1,954.98	977.49	2,122.94	1,063.05	67.92	-3.72	0.014
147.92	0.00	-4.15	0.00	-0.34	0.00	0.34	1,908.86	954.43	2,023.38	1,013.20	70.19	-3.72	0.000

Site Number:	**302466**	**Code: ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number: 66270921**	**4/21/2016 4:06:44 PM**
Customer:	**T- Mobile**		

Load Case: **0.9D + 1.6W** — **95 mph with No Ice (Reduced DL)** — **22 Iterations**

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.60
Wind Importance Factor : 1.00

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf		Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	18.656	20.52	419.33	0.650		0.000	0.00	0.000	0.00	253.0	0.0	0.0
5.00		1.00	0.85	18.656	20.52	415.35	0.650		0.000	5.00	23.712	15.41	501.2	0.0	1,014.6
10.00		1.00	0.85	18.656	20.52	407.40	0.650		0.000	5.00	23.258	15.12	491.5	0.0	995.0
15.00		1.00	0.85	18.656	20.52	399.45	0.650		0.000	5.00	22.804	14.82	489.4	0.0	975.5
20.00		1.00	0.87	19.247	21.17	397.64	0.650		0.000	5.00	22.350	14.53	500.2	0.0	955.9
25.00		1.00	0.92	20.292	22.32	400.01	0.650		0.000	5.00	21.896	14.23	513.8	0.0	936.3
30.00		1.00	0.96	21.168	23.28	400.08	0.650		0.000	5.00	21.442	13.94	522.8	0.0	916.8
35.00		1.00	0.99	21.926	24.11	398.56	0.650		0.000	5.00	20.988	13.64	528.6	0.0	897.2
40.00		1.00	1.02	22.596	24.85	395.86	0.650		0.000	5.00	20.534	13.35	531.9	0.0	877.7
45.00		1.00	1.05	23.200	25.52	392.24	0.650		0.000	5.00	20.080	13.05	364.2	0.0	858.1
46.83	Bot - Section 2	1.00	1.07	23.580	25.93	389.34	0.650		0.000	1.83	7.249	4.71	269.3	0.0	309.8
50.00		1.00	1.08	23.845	26.22	387.02	0.650		0.000	3.17	12.578	8.18	333.9	0.0	1,066.3
53.00	Top - Section 1	1.00	1.10	24.157	26.57	383.97	0.650		0.000	3.00	11.748	7.64	270.4	0.0	995.7
55.00		1.00	1.11	24.399	26.83	387.70	0.650		0.000	2.00	7.741	5.03	377.3	0.0	330.7
60.00		1.00	1.12	24.724	27.19	383.86	0.650		0.000	5.00	19.036	12.37	536.7	0.0	813.2
65.00		1.00	1.14	25.162	27.67	378.01	0.650		0.000	5.00	18.582	12.08	532.6	0.0	793.6
70.00		1.00	1.16	25.573	28.13	371.78	0.650	*	0.000	5.00	18.128	11.78	527.6	0.0	774.0
75.00		1.00	1.18	25.960	28.55	365.21	0.650	*	0.000	5.00	17.674	11.49	521.8	0.0	754.5
80.00		1.00	1.19	26.327	28.96	358.33	0.650	*	0.000	5.00	17.220	11.19	515.2	0.0	734.9
85.00		1.00	1.21	26.676	29.34	351.19	0.650	*	0.000	5.00	16.766	10.90	407.5	0.0	715.4
88.00	Appertunance(s)	1.00	1.22	26.943	29.63	345.30	0.650	*	0.000	3.00	9.842	6.40	252.0	0.0	419.8
90.00	Appertunance(s)	1.00	1.23	27.106	29.81	341.55	0.650	*	0.000	2.00	6.471	4.21	344.1	0.0	276.0
94.92	Bot - Section 3	1.00	1.24	27.324	30.05	336.27	0.650	*	0.000	4.92	15.598	10.14	248.0	0.0	665.2
95.00		1.00	1.25	27.478	30.22	332.39	0.650	*	0.000	0.08	0.265	0.17	243.6	0.0	20.5
99.83	Top - Section 2	1.00	1.25	27.626	30.38	328.53	0.650	*	0.000	4.83	15.154	9.85	247.6	0.0	1,174.5
100.0		1.00	1.26	27.774	30.55	330.20	0.650	*	0.000	0.17	0.515	0.33	251.2	0.0	18.3
105.0	Appertunance(s)	1.00	1.27	27.924	30.71	326.07	0.650	*	0.000	5.00	15.215	9.89	481.2	0.0	541.4
110.0		1.00	1.28	28.205	31.02	317.93	0.650	*	0.000	5.00	14.761	9.59	471.2	0.0	525.1
115.0	Appertunance(s)	1.00	1.29	28.476	31.32	309.63	0.650	*	0.000	5.00	14.307	9.30	460.8	0.0	508.8
120.0		1.00	1.30	28.738	31.61	301.18	0.650	*	0.000	5.00	13.854	9.00	449.9	0.0	492.5
125.0	Appertunance(s)	1.00	1.32	28.991	31.89	292.60	0.650	*	0.000	5.00	13.400	8.71	438.7	0.0	476.3
130.0		1.00	1.33	29.237	32.16	283.88	0.650		0.000	5.00	12.946	8.41	427.1	0.0	460.0
135.0	Appertunance(s)	1.00	1.34	29.474	32.42	275.03	0.650		0.000	5.00	12.492	8.12	415.1	0.0	443.7
140.0		1.00	1.35	29.705	32.67	266.08	0.650		0.000	5.00	12.038	7.82	402.9	0.0	427.4
145.0		1.00	1.36	29.929	32.92	257.01	0.650		0.000	5.00	11.584	7.53	311.1	0.0	411.1
147.9	Appertunance(s)	1.00	1.37	30.102	33.11	249.75	0.650		0.000	2.92	6.548	4.26	112.8	0.0	232.3
Totals:										147.92			14,546.2	0.0	22,808.3

*** = Cf Adjusted By Linear Load Ra Effect**

Site Number: 302466 Code: ANSI/TIA-222-G

Site Name: West Service Road, CT Engineering Number: 66270921 4/21/2016 4:06:45 PM

Customer: T- Mobile

Load Case: 0.9D + 1.6W — 95 mph with No Ice (Reduced DL) — 22 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 0.90
Wind Load Factor : 1.60

Wind Importance Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-37.70	-30.44	0.00	-3,139.40	0.00	3,139.40	4,345.86	2,172.93	10,048.4	5,031.69	0.00	0.00	0.633
5.00	-36.32	-30.04	0.00	-2,987.21	0.00	2,987.21	4,297.95	2,148.97	9,746.71	4,880.60	0.09	-0.16	0.621
10.00	-34.96	-29.64	0.00	-2,837.03	0.00	2,837.03	4,248.67	2,124.33	9,446.21	4,730.12	0.35	-0.33	0.608
15.00	-33.62	-29.24	0.00	-2,688.82	0.00	2,688.82	4,198.03	2,099.01	9,147.11	4,580.35	0.78	-0.49	0.595
20.00	-32.31	-28.82	0.00	-2,542.61	0.00	2,542.61	4,146.02	2,073.01	8,849.60	4,431.38	1.39	-0.66	0.582
25.00	-31.01	-28.38	0.00	-2,398.50	0.00	2,398.50	4,092.65	2,046.33	8,553.86	4,283.29	2.17	-0.83	0.568
30.00	-29.74	-27.93	0.00	-2,256.59	0.00	2,256.59	4,037.92	2,018.96	8,260.07	4,136.18	3.12	-0.99	0.553
35.00	-28.49	-27.46	0.00	-2,116.94	0.00	2,116.94	3,981.82	1,990.91	7,968.42	3,990.13	4.25	-1.16	0.538
40.00	-27.26	-26.98	0.00	-1,979.64	0.00	1,979.64	3,924.36	1,962.18	7,679.09	3,845.25	5.56	-1.33	0.522
45.00	-26.08	-26.64	0.00	-1,844.71	0.00	1,844.71	3,865.54	1,932.77	7,392.25	3,701.62	7.04	-1.50	0.505
46.83	-25.64	-26.40	0.00	-1,795.87	0.00	1,795.87	3,843.63	1,921.82	7,287.74	3,649.29	7.63	-1.56	0.499
50.00	-24.35	-26.08	0.00	-1,712.26	0.00	1,712.26	3,805.35	1,902.68	7,108.10	3,559.33	8.70	-1.67	0.488
53.00	-23.16	-25.81	0.00	-1,634.03	0.00	1,634.03	3,811.38	1,905.69	7,136.13	3,573.37	9.78	-1.77	0.464
55.00	-22.68	-25.46	0.00	-1,582.42	0.00	1,582.42	3,786.98	1,893.49	7,023.14	3,516.79	10.54	-1.84	0.456
60.00	-21.53	-24.95	0.00	-1,455.12	0.00	1,455.12	3,725.01	1,862.51	6,742.74	3,376.38	12.54	-1.99	0.437
65.00	-20.41	-24.43	0.00	-1,330.39	0.00	1,330.39	3,661.69	1,830.84	6,465.44	3,237.53	14.71	-2.14	0.417
70.00	-19.32	-23.91	0.00	-1,208.25	0.00	1,208.25	3,597.00	1,798.50	6,191.43	3,100.31	17.04	-2.30	0.395
75.00	-18.24	-23.39	0.00	-1,088.70	0.00	1,088.70	3,530.95	1,765.47	5,920.87	2,964.83	19.53	-2.44	0.373
80.00	-17.19	-22.88	0.00	-971.73	0.00	971.73	3,463.53	1,731.77	5,653.95	2,831.18	22.16	-2.59	0.348
85.00	-16.17	-22.45	0.00	-857.35	0.00	857.35	3,394.75	1,697.38	5,390.86	2,699.44	24.94	-2.72	0.323
88.00	-14.91	-20.93	0.00	-790.00	0.00	790.00	3,352.83	1,676.42	5,234.92	2,621.35	26.68	-2.80	0.306
90.00	-14.50	-20.56	0.00	-748.13	0.00	748.13	3,324.61	1,662.30	5,131.78	2,569.70	27.87	-2.86	0.296
94.92	-13.59	-20.28	0.00	-647.04	0.00	647.04	3,235.43	1,617.71	4,852.78	2,430.00	30.87	-2.98	0.271
95.00	-13.55	-20.05	0.00	-645.35	0.00	645.35	3,233.85	1,616.92	4,848.02	2,427.61	30.92	-2.98	0.270
99.83	-12.14	-19.74	0.00	-548.45	0.00	548.45	2,561.72	1,280.86	3,809.83	1,907.74	34.00	-3.09	0.292
100.00	-12.10	-19.50	0.00	-545.16	0.00	545.16	2,559.96	1,279.98	3,803.41	1,904.53	34.11	-3.10	0.291
105.00	-11.23	-18.73	0.00	-447.66	0.00	447.66	2,506.38	1,253.19	3,612.46	1,808.91	37.42	-3.21	0.252
110.00	-10.46	-18.23	0.00	-354.02	0.00	354.02	2,451.43	1,225.72	3,424.36	1,714.72	40.84	-3.32	0.211
115.00	-7.83	-12.60	0.00	-262.87	0.00	262.87	2,395.12	1,197.56	3,239.30	1,622.06	44.36	-3.41	0.165
120.00	-7.19	-12.12	0.00	-199.90	0.00	199.90	2,337.45	1,168.73	3,057.46	1,531.00	47.97	-3.48	0.134
125.00	-5.22	-8.04	0.00	-139.32	0.00	139.32	2,271.20	1,135.60	2,869.91	1,437.09	51.65	-3.54	0.099
130.00	-4.71	-7.58	0.00	-99.12	0.00	99.12	2,192.15	1,096.07	2,672.63	1,338.30	55.38	-3.59	0.076
135.00	-2.83	-5.05	0.00	-61.20	0.00	61.20	2,113.09	1,056.55	2,482.37	1,243.03	59.16	-3.62	0.051
140.00	-2.38	-4.62	0.00	-35.94	0.00	35.94	2,034.04	1,017.02	2,299.14	1,151.28	62.96	-3.65	0.032
145.00	-1.95	-4.28	0.00	-12.83	0.00	12.83	1,954.98	977.49	2,122.94	1,063.05	66.79	-3.66	0.013
147.92	0.00	-4.15	0.00	-0.34	0.00	0.34	1,908.86	954.43	2,023.38	1,013.20	69.02	-3.66	0.000

Site Number:	**302466**	**Code: ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number: 66270921**	**4/21/2016 4:06:45 PM**
Customer:	**T- Mobile**		

Load Case: **1.2D + 1.0Di + 1.0Wi** **50 mph with 1.00 in Radial Ice** **21 Iterations**

Gust Response Factor : 1.10 **Ice Dead Load Factor : 1.00** **Wind Importance Factor : 1.00**
Dead Load Factor : 1.20 **Ice Importance Factor : 1.00**
Wind Load Factor : 1.00

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C	Cf		Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	5.168	5.685	0.000	1.200		0.000	0.00	0.000	0.00	85.3	0.0	0.0
5.00		1.00	0.85	5.168	5.685	0.000	1.200		1.545	5.00	24.999	30.00	169.5	552.2	1,904.9
10.00		1.00	0.85	5.168	5.685	0.000	1.200		1.725	5.00	24.695	29.63	167.2	606.6	1,933.3
15.00		1.00	0.85	5.168	5.685	0.000	1.200		1.815	5.00	24.316	29.18	167.1	627.2	1,927.9
20.00		1.00	0.87	5.331	5.865	0.000	1.200		1.877	5.00	23.914	28.70	171.3	636.8	1,911.3
25.00		1.00	0.92	5.621	6.183	0.000	1.200		1.925	5.00	23.500	28.20	176.5	640.6	1,889.1
30.00		1.00	0.96	5.864	6.450	0.000	1.200		1.964	5.00	23.079	27.69	180.1	640.9	1,863.3
35.00		1.00	0.99	6.074	6.681	0.000	1.200		1.997	5.00	22.652	27.18	182.6	638.7	1,835.0
40.00		1.00	1.02	6.259	6.885	0.000	1.200		2.026	5.00	22.222	26.67	184.2	634.6	1,804.9
45.00		1.00	1.05	6.426	7.069	0.000	1.200		2.051	5.00	21.790	26.15	126.4	629.2	1,773.3
46.83	Bot - Section 2	1.00	1.07	6.532	7.185	0.000	1.200		2.067	1.83	7.881	9.46	93.6	230.7	643.7
50.00		1.00	1.08	6.605	7.266	0.000	1.200		2.078	3.17	13.675	16.41	116.1	401.2	1,823.0
53.00	Top - Section 1	1.00	1.10	6.692	7.361	0.000	1.200		2.091	3.00	12.794	15.35	94.2	377.5	1,705.2
55.00		1.00	1.11	6.759	7.435	0.000	1.200		2.101	2.00	8.442	10.13	131.7	250.7	691.6
60.00		1.00	1.12	6.849	7.534	0.000	1.200		2.114	5.00	20.798	24.96	187.7	616.6	1,700.8
65.00		1.00	1.14	6.970	7.667	0.000	1.200		2.132	5.00	20.359	24.43	186.8	607.6	1,665.8
70.00		1.00	1.16	7.084	7.792	0.000	1.200	*	2.148	5.00	19.918	23.90	185.6	598.1	1,630.2
75.00		1.00	1.18	7.191	7.910	0.000	1.200	*	2.164	5.00	19.477	23.37	184.1	588.1	1,594.0
80.00		1.00	1.19	7.293	8.022	0.000	1.200	*	2.178	5.00	19.036	22.84	182.3	577.5	1,557.5
85.00		1.00	1.21	7.390	8.129	0.000	1.200	*	2.192	5.00	18.593	22.31	144.6	566.6	1,520.5
88.00	Appertunance(s)	1.00	1.22	7.464	8.210	0.000	1.200	*	2.202	3.00	10.943	13.13	89.6	336.3	896.1
90.00	Appertunance(s)	1.00	1.23	7.508	8.259	0.000	1.200	*	2.209	2.00	7.207	8.65	122.7	222.5	590.5
94.92	Bot - Section 3	1.00	1.24	7.569	8.326	0.000	1.200	*	2.217	4.92	17.415	20.90	88.5	534.8	1,421.7
95.00		1.00	1.25	7.612	8.373	0.000	1.200	*	2.223	0.08	0.296	0.36	87.1	9.2	36.6
99.83	Top - Section 2	1.00	1.25	7.653	8.418	0.000	1.200	*	2.229	4.83	16.949	20.34	88.5	522.9	2,088.9
100.0		1.00	1.26	7.694	8.463	0.000	1.200	*	2.234	0.17	0.577	0.69	90.1	18.1	42.5
105.0	Appertunance(s)	1.00	1.27	7.735	8.509	0.000	1.200	*	2.240	5.00	17.082	20.50	173.0	528.2	1,250.1
110.0		1.00	1.28	7.813	8.594	0.000	1.200	*	2.251	5.00	16.637	19.96	170.1	515.8	1,216.0
115.0	Appertunance(s)	1.00	1.29	7.888	8.677	0.000	1.200	*	2.261	5.00	16.192	19.43	167.0	503.1	1,181.5
120.0		1.00	1.30	7.961	8.757	0.000	1.200	*	2.271	5.00	15.746	18.90	163.8	490.1	1,146.9
125.0	Appertunance(s)	1.00	1.32	8.031	8.834	0.000	1.200	*	2.280	5.00	15.300	18.36	160.5	477.0	1,112.0
130.0		1.00	1.33	8.099	8.909	0.000	1.200		2.289	5.00	14.854	17.82	157.0	463.6	1,076.9
135.0	Appertunance(s)	1.00	1.34	8.165	8.981	0.000	1.200		2.298	5.00	14.407	17.29	153.5	450.1	1,041.7
140.0		1.00	1.35	8.229	9.051	0.000	1.200		2.307	5.00	13.960	16.75	149.8	436.4	1,006.2
145.0		1.00	1.36	8.291	9.120	0.000	1.200		2.315	5.00	13.513	16.22	116.2	422.5	970.6
147.9	Appertunance(s)	1.00	1.37	8.339	9.172	0.000	1.200		2.321	2.92	7.677	9.21	42.3	241.9	551.6
* = Cf Adjusted By Linear Load Ra Effect								Totals:		147.92			5,136.4	16,594.2	47,005.2

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 1.00 in Radial Ice — 21 Iterations

Gust Response Factor : 1.10 | Ice Dead Load Factor : 1.00 | Wind Importance Factor : 1.00
Dead Load Factor : 1.20 | Ice Importance Factor : 1.00
Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-103.11	-9.32	0.00	-977.04	0.00	977.04	4,345.86	2,172.93	10,048.4	5,031.69	0.00	0.00	0.218
5.00	-100.17	-9.24	0.00	-930.46	0.00	930.46	4,297.95	2,148.97	9,746.71	4,880.60	0.03	-0.05	0.214
10.00	-97.12	-9.15	0.00	-884.28	0.00	884.28	4,248.67	2,124.33	9,446.21	4,730.12	0.11	-0.10	0.210
15.00	-94.03	-9.06	0.00	-838.53	0.00	838.53	4,198.03	2,099.01	9,147.11	4,580.35	0.24	-0.15	0.205
20.00	-90.93	-8.96	0.00	-793.22	0.00	793.22	4,146.02	2,073.01	8,849.60	4,431.38	0.43	-0.21	0.201
25.00	-87.82	-8.85	0.00	-748.40	0.00	748.40	4,092.65	2,046.33	8,553.86	4,283.29	0.68	-0.26	0.196
30.00	-84.72	-8.74	0.00	-704.13	0.00	704.13	4,037.92	2,018.96	8,260.07	4,136.18	0.97	-0.31	0.191
35.00	-81.62	-8.61	0.00	-660.45	0.00	660.45	3,981.82	1,990.91	7,968.42	3,990.13	1.33	-0.36	0.186
40.00	-78.55	-8.48	0.00	-617.40	0.00	617.40	3,924.36	1,962.18	7,679.09	3,845.25	1.73	-0.41	0.181
45.00	-75.49	-8.37	0.00	-575.01	0.00	575.01	3,865.54	1,932.77	7,392.25	3,701.62	2.20	-0.47	0.175
46.83	-74.38	-8.31	0.00	-559.66	0.00	559.66	3,843.63	1,921.82	7,287.74	3,649.29	2.38	-0.49	0.173
50.00	-71.73	-8.21	0.00	-533.36	0.00	533.36	3,805.35	1,902.68	7,108.10	3,559.33	2.71	-0.52	0.169
53.00	-69.24	-8.12	0.00	-508.74	0.00	508.74	3,811.38	1,905.69	7,136.13	3,573.37	3.05	-0.55	0.161
55.00	-68.03	-8.02	0.00	-492.50	0.00	492.50	3,786.98	1,893.49	7,023.14	3,516.79	3.29	-0.57	0.158
60.00	-65.01	-7.85	0.00	-452.40	0.00	452.40	3,725.01	1,862.51	6,742.74	3,376.38	3.91	-0.62	0.151
65.00	-62.02	-7.69	0.00	-413.13	0.00	413.13	3,661.69	1,830.84	6,465.44	3,237.53	4.59	-0.67	0.145
70.00	-59.05	-7.51	0.00	-374.70	0.00	374.70	3,597.00	1,798.50	6,191.43	3,100.31	5.31	-0.72	0.137
75.00	-56.12	-7.33	0.00	-337.14	0.00	337.14	3,530.95	1,765.47	5,920.87	2,964.83	6.09	-0.76	0.130
80.00	-53.21	-7.15	0.00	-300.47	0.00	300.47	3,463.53	1,731.77	5,653.95	2,831.18	6.91	-0.81	0.122
85.00	-50.33	-7.00	0.00	-264.71	0.00	264.71	3,394.75	1,697.38	5,390.86	2,699.44	7.77	-0.85	0.113
88.00	-46.32	-6.53	0.00	-243.73	0.00	243.73	3,352.83	1,676.42	5,234.92	2,621.35	8.31	-0.87	0.107
90.00	-45.14	-6.40	0.00	-230.67	0.00	230.67	3,324.61	1,662.30	5,131.78	2,569.70	8.68	-0.89	0.103
94.92	-42.54	-6.29	0.00	-199.19	0.00	199.19	3,235.43	1,617.71	4,852.78	2,430.00	9.62	-0.93	0.095
95.00	-42.48	-6.21	0.00	-198.67	0.00	198.67	3,233.85	1,616.92	4,848.02	2,427.61	9.64	-0.93	0.095
99.83	-39.22	-6.08	0.00	-168.65	0.00	168.65	2,561.72	1,280.86	3,809.83	1,907.74	10.59	-0.96	0.104
100.00	-39.14	-6.00	0.00	-167.63	0.00	167.63	2,559.96	1,279.98	3,803.41	1,904.53	10.63	-0.96	0.103
105.00	-36.46	-5.71	0.00	-137.62	0.00	137.62	2,506.38	1,253.19	3,612.46	1,808.91	11.65	-1.00	0.091
110.00	-34.07	-5.52	0.00	-109.07	0.00	109.07	2,451.43	1,225.72	3,424.36	1,714.72	12.72	-1.03	0.078
115.00	-23.76	-3.93	0.00	-81.49	0.00	81.49	2,395.12	1,197.56	3,239.30	1,622.06	13.81	-1.06	0.060
120.00	-22.01	-3.74	0.00	-61.82	0.00	61.82	2,337.45	1,168.73	3,057.46	1,531.00	14.93	-1.08	0.050
125.00	-14.60	-2.58	0.00	-43.10	0.00	43.10	2,271.20	1,135.60	2,869.91	1,437.09	16.08	-1.10	0.036
130.00	-13.43	-2.41	0.00	-30.19	0.00	30.19	2,192.15	1,096.07	2,672.63	1,338.30	17.24	-1.11	0.029
135.00	-8.87	-1.53	0.00	-18.15	0.00	18.15	2,113.09	1,056.55	2,482.37	1,243.03	18.41	-1.12	0.019
140.00	-7.81	-1.36	0.00	-10.48	0.00	10.48	2,034.04	1,017.02	2,299.14	1,151.28	19.59	-1.13	0.013
145.00	-6.78	-1.23	0.00	-3.67	0.00	3.67	1,954.98	977.49	2,122.94	1,063.05	20.78	-1.14	0.007
147.92	0.00	-1.09	0.00	-0.09	0.00	0.09	1,908.86	954.43	2,023.38	1,013.20	21.47	-1.14	0.000

Site Number:	**302466**	**Code: ANSI/TIA-222-G**	
Site Name:	**West Service Road, CT**	**Engineering Number: 66270921**	**4/21/2016 4:06:47 PM**
Customer:	**T- Mobile**		

Load Case: **1.0D + 1.0W** **Serviceability 60 mph** **21 Iterations**

Gust Response Factor : 1.10 **Wind Importance Factor : 1.00**
Dead Load Factor : 1.00
Wind Load Factor : 1.00

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf		Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.186	264.84	0.650		0.000	0.00	0.000	0.00	63.1	0.0	0.0
5.00		1.00	0.85	7.442	8.186	262.33	0.650		0.000	5.00	23.712	15.41	125.0	0.0	1,127.3
10.00		1.00	0.85	7.442	8.186	257.31	0.650		0.000	5.00	23.258	15.12	122.5	0.0	1,105.6
15.00		1.00	0.85	7.442	8.186	252.28	0.650		0.000	5.00	22.804	14.82	122.0	0.0	1,083.8
20.00		1.00	0.87	7.677	8.445	251.14	0.650		0.000	5.00	22.350	14.53	124.7	0.0	1,062.1
25.00		1.00	0.92	8.094	8.904	252.64	0.650		0.000	5.00	21.896	14.23	128.1	0.0	1,040.4
30.00		1.00	0.96	8.444	9.288	252.68	0.650		0.000	5.00	21.442	13.94	130.3	0.0	1,018.7
35.00		1.00	0.99	8.746	9.621	251.72	0.650		0.000	5.00	20.988	13.64	131.8	0.0	996.9
40.00		1.00	1.02	9.013	9.915	250.01	0.650		0.000	5.00	20.534	13.35	132.6	0.0	975.2
45.00		1.00	1.05	9.254	10.18	247.73	0.650		0.000	5.00	20.080	13.05	90.8	0.0	953.5
46.83	Bot - Section 2	1.00	1.07	9.406	10.34	245.90	0.650		0.000	1.83	7.249	4.71	67.1	0.0	344.2
50.00		1.00	1.08	9.512	10.46	244.43	0.650		0.000	3.17	12.578	8.18	83.2	0.0	1,184.8
53.00	Top - Section 1	1.00	1.10	9.636	10.60	242.50	0.650		0.000	3.00	11.748	7.64	67.4	0.0	1,106.4
55.00		1.00	1.11	9.733	10.70	244.86	0.650		0.000	2.00	7.741	5.03	94.1	0.0	367.5
60.00		1.00	1.12	9.862	10.84	242.44	0.650		0.000	5.00	19.036	12.37	133.8	0.0	903.5
65.00		1.00	1.14	10.037	11.04	238.74	0.650		0.000	5.00	18.582	12.08	132.8	0.0	881.8
70.00		1.00	1.16	10.201	11.22	234.81	0.650	*	0.000	5.00	18.128	11.78	131.5	0.0	860.1
75.00		1.00	1.18	10.355	11.39	230.66	0.650	*	0.000	5.00	17.674	11.49	130.1	0.0	838.3
80.00		1.00	1.19	10.502	11.55	226.31	0.650	*	0.000	5.00	17.220	11.19	128.4	0.0	816.6
85.00		1.00	1.21	10.641	11.70	221.80	0.650	*	0.000	5.00	16.766	10.90	101.6	0.0	794.9
88.00	Appertunance(s)	1.00	1.22	10.748	11.82	218.08	0.650	*	0.000	3.00	9.842	6.40	62.8	0.0	466.5
90.00	Appertunance(s)	1.00	1.23	10.812	11.89	215.71	0.650	*	0.000	2.00	6.471	4.21	85.8	0.0	306.7
94.92	Bot - Section 3	1.00	1.24	10.899	11.98	212.38	0.650	*	0.000	4.92	15.598	10.14	61.8	0.0	739.1
95.00		1.00	1.25	10.961	12.05	209.93	0.650	*	0.000	0.08	0.265	0.17	60.7	0.0	22.8
99.83	Top - Section 2	1.00	1.25	11.020	12.12	207.49	0.650	*	0.000	4.83	15.154	9.85	61.7	0.0	1,305.1
100.0		1.00	1.26	11.079	12.18	208.55	0.650	*	0.000	0.17	0.515	0.33	62.6	0.0	20.4
105.0	Appertunance(s)	1.00	1.27	11.138	12.25	205.94	0.650	*	0.000	5.00	15.215	9.89	120.0	0.0	601.6
110.0		1.00	1.28	11.251	12.37	200.80	0.650	*	0.000	5.00	14.761	9.59	117.5	0.0	583.5
115.0	Appertunance(s)	1.00	1.29	11.359	12.49	195.55	0.650	*	0.000	5.00	14.307	9.30	114.9	0.0	565.4
120.0		1.00	1.30	11.463	12.61	190.22	0.650	*	0.000	5.00	13.854	9.00	112.2	0.0	547.3
125.0	Appertunance(s)	1.00	1.32	11.564	12.72	184.80	0.650	*	0.000	5.00	13.400	8.71	109.4	0.0	529.2
130.0		1.00	1.33	11.662	12.82	179.29	0.650		0.000	5.00	12.946	8.41	106.5	0.0	511.1
135.0	Appertunance(s)	1.00	1.34	11.757	12.93	173.70	0.650		0.000	5.00	12.492	8.12	103.5	0.0	493.0
140.0		1.00	1.35	11.849	13.03	168.05	0.650		0.000	5.00	12.038	7.82	100.4	0.0	474.9
145.0		1.00	1.36	11.939	13.13	162.32	0.650		0.000	5.00	11.584	7.53	77.6	0.0	456.8
147.9	Appertunance(s)	1.00	1.37	12.008	13.20	157.74	0.650		0.000	2.92	6.548	4.26	28.1	0.0	258.1
Totals:										**147.92**			**3,626.5**	**0.0**	**25,342.5**

*** = Cf Adjusted By Linear Load Ra Effect**

Load Case: 1.0D + 1.0W Serviceability 60 mph 21 Iterations

Gust Response Factor : 1.10
Dead Load Factor : 1.00
Wind Load Factor : 1.00
Wind Importance Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-41.94	-7.59	0.00	-785.56	0.00	785.56	4,345.86	2,172.93	10,048.4	5,031.69	0.00	0.00	0.166
5.00	-40.49	-7.49	0.00	-747.62	0.00	747.62	4,297.95	2,148.97	9,746.71	4,880.60	0.02	-0.04	0.163
10.00	-39.07	-7.40	0.00	-710.15	0.00	710.15	4,248.67	2,124.33	9,446.21	4,730.12	0.09	-0.08	0.159
15.00	-37.67	-7.30	0.00	-673.17	0.00	673.17	4,198.03	2,099.01	9,147.11	4,580.35	0.20	-0.12	0.156
20.00	-36.29	-7.20	0.00	-636.67	0.00	636.67	4,146.02	2,073.01	8,849.60	4,431.38	0.35	-0.17	0.152
25.00	-34.93	-7.09	0.00	-600.68	0.00	600.68	4,092.65	2,046.33	8,553.86	4,283.29	0.54	-0.21	0.149
30.00	-33.59	-6.98	0.00	-565.22	0.00	565.22	4,037.92	2,018.96	8,260.07	4,136.18	0.78	-0.25	0.145
35.00	-32.28	-6.87	0.00	-530.32	0.00	530.32	3,981.82	1,990.91	7,968.42	3,990.13	1.07	-0.29	0.141
40.00	-30.98	-6.75	0.00	-495.99	0.00	495.99	3,924.36	1,962.18	7,679.09	3,845.25	1.39	-0.33	0.137
45.00	-29.71	-6.67	0.00	-462.25	0.00	462.25	3,865.54	1,932.77	7,392.25	3,701.62	1.76	-0.37	0.133
46.83	-29.25	-6.61	0.00	-450.03	0.00	450.03	3,843.63	1,921.82	7,287.74	3,649.29	1.91	-0.39	0.131
50.00	-27.87	-6.53	0.00	-429.11	0.00	429.11	3,805.35	1,902.68	7,108.10	3,559.33	2.18	-0.42	0.128
53.00	-26.57	-6.46	0.00	-409.53	0.00	409.53	3,811.38	1,905.69	7,136.13	3,573.37	2.45	-0.44	0.122
55.00	-26.08	-6.37	0.00	-396.62	0.00	396.62	3,786.98	1,893.49	7,023.14	3,516.79	2.64	-0.46	0.120
60.00	-24.86	-6.25	0.00	-364.75	0.00	364.75	3,725.01	1,862.51	6,742.74	3,376.38	3.14	-0.50	0.115
65.00	-23.66	-6.12	0.00	-333.52	0.00	333.52	3,661.69	1,830.84	6,465.44	3,237.53	3.68	-0.54	0.109
70.00	-22.48	-5.99	0.00	-302.93	0.00	302.93	3,597.00	1,798.50	6,191.43	3,100.31	4.27	-0.58	0.104
75.00	-21.33	-5.86	0.00	-272.98	0.00	272.98	3,530.95	1,765.47	5,920.87	2,964.83	4.89	-0.61	0.098
80.00	-20.20	-5.73	0.00	-243.67	0.00	243.67	3,463.53	1,731.77	5,653.95	2,831.18	5.55	-0.65	0.092
85.00	-19.09	-5.63	0.00	-215.01	0.00	215.01	3,394.75	1,697.38	5,390.86	2,699.44	6.25	-0.68	0.085
88.00	-17.63	-5.25	0.00	-198.13	0.00	198.13	3,352.83	1,676.42	5,234.92	2,621.35	6.68	-0.70	0.081
90.00	-17.19	-5.15	0.00	-187.63	0.00	187.63	3,324.61	1,662.30	5,131.78	2,569.70	6.98	-0.72	0.078
94.92	-16.18	-5.08	0.00	-162.29	0.00	162.29	3,235.43	1,617.71	4,852.78	2,430.00	7.73	-0.75	0.072
95.00	-16.16	-5.03	0.00	-161.87	0.00	161.87	3,233.85	1,616.92	4,848.02	2,427.61	7.75	-0.75	0.072
99.83	-14.58	-4.95	0.00	-137.57	0.00	137.57	2,561.72	1,280.86	3,809.83	1,907.74	8.52	-0.77	0.078
100.00	-14.55	-4.89	0.00	-136.74	0.00	136.74	2,559.96	1,279.98	3,803.41	1,904.53	8.55	-0.78	0.077
105.00	-13.58	-4.70	0.00	-112.30	0.00	112.30	2,506.38	1,253.19	3,612.46	1,808.91	9.37	-0.81	0.068
110.00	-12.72	-4.57	0.00	-88.82	0.00	88.82	2,451.43	1,225.72	3,424.36	1,714.72	10.23	-0.83	0.057
115.00	-9.48	-3.16	0.00	-65.96	0.00	65.96	2,395.12	1,197.56	3,239.30	1,622.06	11.12	-0.85	0.045
120.00	-8.75	-3.04	0.00	-50.16	0.00	50.16	2,337.45	1,168.73	3,057.46	1,531.00	12.02	-0.87	0.037
125.00	-6.32	-2.02	0.00	-34.96	0.00	34.96	2,271.20	1,135.60	2,869.91	1,437.09	12.94	-0.89	0.027
130.00	-5.72	-1.90	0.00	-24.87	0.00	24.87	2,192.15	1,096.07	2,672.63	1,338.30	13.88	-0.90	0.021
135.00	-3.47	-1.27	0.00	-15.35	0.00	15.35	2,113.09	1,056.55	2,482.37	1,243.03	14.83	-0.91	0.014
140.00	-2.95	-1.16	0.00	-9.01	0.00	9.01	2,034.04	1,017.02	2,299.14	1,151.28	15.78	-0.91	0.009
145.00	-2.45	-1.07	0.00	-3.22	0.00	3.22	1,954.98	977.49	2,122.94	1,063.05	16.74	-0.92	0.004
147.92	0.00	-1.03	0.00	-0.08	0.00	0.08	1,908.86	954.43	2,023.38	1,013.20	17.30	-0.92	0.000

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.18	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06	
Long-Period Transition Period (T_L):	6	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.60	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.19	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10	
Seismic Response Coefficient (C_s):	0.03	
Upper Limit C_s	0.03	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	2.04	
Redundancy Factor (p):	1.30	
Seismic Force Distribution Exponent (k):	1.77	
Total Unfactored Dead Load:	41.94	k
Seismic Base Shear (E):	1.82	k

Equivalent Modal Forces Analysis

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.18
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.06
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.19
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.10
Period Based on Rayleigh Method (sec):	2.04
Redundancy Factor (p):	1.30

Load Case (1.2 + 0.2Sds) * DL + E ELFM **Seismic Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
35	146.46	287	1.853	1.790	1.071	0.345	86	247
34	142.50	506	1.754	1.338	0.900	0.284	125	436
33	137.50	524	1.633	0.885	0.716	0.216	98	452
32	132.50	579	1.517	0.543	0.563	0.156	78	499
31	127.50	597	1.404	0.292	0.436	0.105	54	515
30	122.50	712	1.296	0.115	0.333	0.062	38	613
29	117.50	730	1.193	-0.002	0.249	0.027	17	629
28	112.50	838	1.093	-0.074	0.183	0.000	0	722
27	107.50	856	0.998	-0.110	0.130	-0.018	-14	737
26	102.50	876	0.908	-0.122	0.090	-0.029	-22	754
25	99.92	29	0.862	-0.120	0.074	-0.031	-1	25
24	97.42	1,570	0.820	-0.115	0.060	-0.032	-43	1,353
23	94.96	27	0.779	-0.108	0.048	-0.031	-1	24
22	92.46	1,009	0.738	-0.098	0.038	-0.028	-25	869
21	89.00	417	0.684	-0.082	0.027	-0.022	-8	359
20	86.50	655	0.646	-0.069	0.021	-0.016	-9	564
19	82.50	1,108	0.588	-0.049	0.013	-0.006	-6	955
18	77.50	1,130	0.519	-0.023	0.008	0.009	8	974
17	72.50	1,152	0.454	0.000	0.006	0.022	22	992
16	67.50	1,173	0.394	0.020	0.007	0.033	33	1,011
15	62.50	1,195	0.337	0.036	0.009	0.041	42	1,030
14	57.50	1,217	0.286	0.048	0.014	0.046	48	1,048
13	54.00	493	0.252	0.055	0.017	0.047	20	425
12	51.50	1,294	0.229	0.059	0.020	0.048	54	1,115
11	48.42	1,383	0.202	0.062	0.023	0.049	58	1,192
10	45.92	459	0.182	0.065	0.026	0.048	19	396
9	42.50	1,267	0.156	0.067	0.029	0.048	53	1,092
8	37.50	1,289	0.121	0.070	0.034	0.047	52	1,110
7	32.50	1,310	0.091	0.071	0.038	0.046	52	1,129
6	27.50	1,332	0.065	0.072	0.041	0.044	51	1,148
5	22.50	1,354	0.044	0.071	0.042	0.043	50	1,166
4	17.50	1,375	0.026	0.067	0.040	0.040	48	1,185
3	12.50	1,397	0.013	0.059	0.035	0.036	44	1,204
2	7.50	1,419	0.005	0.044	0.025	0.028	34	1,223

1	2.50	1,441	0.001	0.018	0.010	0.013	16	1,241
Andrew DB844H90E-XY	147.92	112	1.890	1.980	1.140	0.368	36	96
Andrew 844G65VTZASX	147.92	64	1.890	1.980	1.140	0.368	20	55
Flat Platform w/ Han	147.92	2,000	1.890	1.980	1.140	0.368	639	1,723
48" x 4" Panel	135.00	180	1.574	0.701	0.636	0.185	29	155
Flat Low Profile Pla	135.00	1,500	1.574	0.701	0.636	0.185	240	1,292
Ericsson KRY 112 144	125.00	33	1.350	0.195	0.382	0.082	2	28
Ericsson RRUS 11 B12	125.00	152	1.350	0.195	0.382	0.082	11	131
Ericsson AIR 21, 1.3	125.00	249	1.350	0.195	0.382	0.082	18	215
Ericsson AIR-32 B2A/	125.00	397	1.350	0.195	0.382	0.082	28	342
Round T-Arm	125.00	750	1.350	0.195	0.382	0.082	53	646
Andrew LNX-6515DS-VT	125.00	154	1.350	0.195	0.382	0.082	11	133
Alcatel-Lucent RRH2X	115.00	129	1.142	-0.043	0.214	0.013	1	111
Alcatel-Lucent RRH2X	115.00	132	1.142	-0.043	0.214	0.013	1	114
Alcatel-Lucent RRH2x	115.00	170	1.142	-0.043	0.214	0.013	2	147
RFS DB-T1-6Z-8AB-0Z	115.00	88	1.142	-0.043	0.214	0.013	1	76
Amphenol Antel BXA-7	115.00	102	1.142	-0.043	0.214	0.013	1	88
Commscope SBNHH-	115.00	304	1.142	-0.043	0.214	0.013	3	262
Flat Low Profile Pla	115.00	1,500	1.142	-0.043	0.214	0.013	16	1,292
Stand-Off	105.00	75	0.952	-0.119	0.109	-0.025	-2	65
Antel BCD-87010 ___	105.00	26	0.952	-0.119	0.109	-0.025	-1	23
Horizon Compact	90.00	21	0.700	-0.087	0.030	-0.024	0	18
NextNet BTS-2500	88.00	105	0.669	-0.077	0.024	-0.020	-2	90
Argus LLPX310R	88.00	86	0.669	-0.077	0.024	-0.020	-1	74
DragonWave A-ANT-18G	88.00	54	0.669	-0.077	0.024	-0.020	-1	47
Side Arms	88.00	560	0.669	-0.077	0.024	-0.020	-10	482
		41,943	52.340	12.460	14.200	3.572	2,172	36,138

Load Case (1.2 + 0.2Sds) * DL + E EMAM **Seismic Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
35	146.46	287	1.853	1.790	1.071	0.345	86	247
34	142.50	506	1.754	1.338	0.900	0.284	125	436
33	137.50	524	1.633	0.885	0.716	0.216	98	452
32	132.50	579	1.517	0.543	0.563	0.156	78	499
31	127.50	597	1.404	0.292	0.436	0.105	54	515
30	122.50	712	1.296	0.115	0.333	0.062	38	613
29	117.50	730	1.193	-0.002	0.249	0.027	17	629
28	112.50	838	1.093	-0.074	0.183	0.000	0	722
27	107.50	856	0.998	-0.110	0.130	-0.018	-14	737
26	102.50	876	0.908	-0.122	0.090	-0.029	-22	754
25	99.92	29	0.862	-0.120	0.074	-0.031	-1	25
24	97.42	1,570	0.820	-0.115	0.060	-0.032	-43	1,353
23	94.96	27	0.779	-0.108	0.048	-0.031	-1	24
22	92.46	1,009	0.738	-0.098	0.038	-0.028	-25	869
21	89.00	417	0.684	-0.082	0.027	-0.022	-8	359
20	86.50	655	0.646	-0.069	0.021	-0.016	-9	564
19	82.50	1,108	0.588	-0.049	0.013	-0.006	-6	955
18	77.50	1,130	0.519	-0.023	0.008	0.009	8	974
17	72.50	1,152	0.454	0.000	0.006	0.022	22	992
16	67.50	1,173	0.394	0.020	0.007	0.033	33	1,011
15	62.50	1,195	0.337	0.036	0.009	0.041	42	1,030
14	57.50	1,217	0.286	0.048	0.014	0.046	48	1,048
13	54.00	493	0.252	0.055	0.017	0.047	20	425
12	51.50	1,294	0.229	0.059	0.020	0.048	54	1,115
11	48.42	1,383	0.202	0.062	0.023	0.049	58	1,192
10	45.92	459	0.182	0.065	0.026	0.048	19	396
9	42.50	1,267	0.156	0.067	0.029	0.048	53	1,092
8	37.50	1,289	0.121	0.070	0.034	0.047	52	1,110

7	32.50	1,310	0.091	0.071	0.038	0.046	52	1,129
6	27.50	1,332	0.065	0.072	0.041	0.044	51	1,148
5	22.50	1,354	0.044	0.071	0.042	0.043	50	1,166
4	17.50	1,375	0.026	0.067	0.040	0.040	48	1,185
3	12.50	1,397	0.013	0.059	0.035	0.036	44	1,204
2	7.50	1,419	0.005	0.044	0.025	0.028	34	1,223
1	2.50	1,441	0.001	0.018	0.010	0.013	16	1,241
Andrew DB844H90E-XY	147.92	112	1.890	1.980	1.140	0.368	36	96
Andrew 844G65VTZASX	147.92	64	1.890	1.980	1.140	0.368	20	55
Flat Platform w/ Han	147.92	2,000	1.890	1.980	1.140	0.368	639	1,723
48" x 4" Panel	135.00	180	1.574	0.701	0.636	0.185	29	155
Flat Low Profile Pla	135.00	1,500	1.574	0.701	0.636	0.185	240	1,292
Ericsson KRY 112 144	125.00	33	1.350	0.195	0.382	0.082	2	28
Ericsson RRUS 11 B12	125.00	152	1.350	0.195	0.382	0.082	11	131
Ericsson AIR 21, 1.3	125.00	249	1.350	0.195	0.382	0.082	18	215
Ericsson AIR-32 B2A/	125.00	397	1.350	0.195	0.382	0.082	28	342
Round T-Arm	125.00	750	1.350	0.195	0.382	0.082	53	646
Andrew LNX-6515DS-VT	125.00	154	1.350	0.195	0.382	0.082	11	133
Alcatel-Lucent RRH2X	115.00	129	1.142	-0.043	0.214	0.013	1	111
Alcatel-Lucent RRH2X	115.00	132	1.142	-0.043	0.214	0.013	1	114
Alcatel-Lucent RRH2x	115.00	170	1.142	-0.043	0.214	0.013	2	147
RFS DB-T1-6Z-8AB-0Z	115.00	88	1.142	-0.043	0.214	0.013	1	76
Amphenol Antel BXA-7	115.00	102	1.142	-0.043	0.214	0.013	1	88
Commscope SBNHH-	115.00	304	1.142	-0.043	0.214	0.013	3	262
Flat Low Profile Pla	115.00	1,500	1.142	-0.043	0.214	0.013	16	1,292
Stand-Off	105.00	75	0.952	-0.119	0.109	-0.025	-2	65
Antel BCD-87010 ___	105.00	26	0.952	-0.119	0.109	-0.025	-1	23
Horizon Compact	90.00	21	0.700	-0.087	0.030	-0.024	0	18
NextNet BTS-2500	88.00	105	0.669	-0.077	0.024	-0.020	-2	90
Argus LLPX310R	88.00	86	0.669	-0.077	0.024	-0.020	-1	74
DragonWave A-ANT-18G	88.00	54	0.669	-0.077	0.024	-0.020	-1	47
Side Arms	88.00	560	0.669	-0.077	0.024	-0.020	-10	482
		41,943	52.340	12.460	14.200	3.572	2,172	36,138

Load Case (0.9 - 0.2Sds) * DL + E ELFM **Seismic (Reduced DL) Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
35	146.46	287	1.853	1.790	1.071	0.345	86	247
34	142.50	506	1.754	1.338	0.900	0.284	125	436
33	137.50	524	1.633	0.885	0.716	0.216	98	452
32	132.50	579	1.517	0.543	0.563	0.156	78	499
31	127.50	597	1.404	0.292	0.436	0.105	54	515
30	122.50	712	1.296	0.115	0.333	0.062	38	613
29	117.50	730	1.193	-0.002	0.249	0.027	17	629
28	112.50	838	1.093	-0.074	0.183	0.000	0	722
27	107.50	856	0.998	-0.110	0.130	-0.018	-14	737
26	102.50	876	0.908	-0.122	0.090	-0.029	-22	754
25	99.92	29	0.862	-0.120	0.074	-0.031	-1	25
24	97.42	1,570	0.820	-0.115	0.060	-0.032	-43	1,353
23	94.96	27	0.779	-0.108	0.048	-0.031	-1	24
22	92.46	1,009	0.738	-0.098	0.038	-0.028	-25	869
21	89.00	417	0.684	-0.082	0.027	-0.022	-8	359
20	86.50	655	0.646	-0.069	0.021	-0.016	-9	564
19	82.50	1,108	0.588	-0.049	0.013	-0.006	-6	955
18	77.50	1,130	0.519	-0.023	0.008	0.009	8	974
17	72.50	1,152	0.454	0.000	0.006	0.022	22	992
16	67.50	1,173	0.394	0.020	0.007	0.033	33	1,011
15	62.50	1,195	0.337	0.036	0.009	0.041	42	1,030
14	57.50	1,217	0.286	0.048	0.014	0.046	48	1,048

13	54.00	493	0.252	0.055	0.017	0.047	20	425
12	51.50	1,294	0.229	0.059	0.020	0.048	54	1,115
11	48.42	1,383	0.202	0.062	0.023	0.049	58	1,192
10	45.92	459	0.182	0.065	0.026	0.048	19	396
9	42.50	1,267	0.156	0.067	0.029	0.048	53	1,092
8	37.50	1,289	0.121	0.070	0.034	0.047	52	1,110
7	32.50	1,310	0.091	0.071	0.038	0.046	52	1,129
6	27.50	1,332	0.065	0.072	0.041	0.044	51	1,148
5	22.50	1,354	0.044	0.071	0.042	0.043	50	1,166
4	17.50	1,375	0.026	0.067	0.040	0.040	48	1,185
3	12.50	1,397	0.013	0.059	0.035	0.036	44	1,204
2	7.50	1,419	0.005	0.044	0.025	0.028	34	1,223
1	2.50	1,441	0.001	0.018	0.010	0.013	16	1,241
Andrew DB844H90E-XY	147.92	112	1.890	1.980	1.140	0.368	36	96
Andrew 844G65VTZASX	147.92	64	1.890	1.980	1.140	0.368	20	55
Flat Platform w/ Han	147.92	2,000	1.890	1.980	1.140	0.368	639	1,723
48" x 4" Panel	135.00	180	1.574	0.701	0.636	0.185	29	155
Flat Low Profile Pla	135.00	1,500	1.574	0.701	0.636	0.185	240	1,292
Ericsson KRY 112 144	125.00	33	1.350	0.195	0.382	0.082	2	28
Ericsson RRUS 11 B12	125.00	152	1.350	0.195	0.382	0.082	11	131
Ericsson AIR 21, 1.3	125.00	249	1.350	0.195	0.382	0.082	18	215
Ericsson AIR-32 B2A/	125.00	397	1.350	0.195	0.382	0.082	28	342
Round T-Arm	125.00	750	1.350	0.195	0.382	0.082	53	646
Andrew LNX-6515DS-VT	125.00	154	1.350	0.195	0.382	0.082	11	133
Alcatel-Lucent RRH2X	115.00	129	1.142	-0.043	0.214	0.013	1	111
Alcatel-Lucent RRH2X	115.00	132	1.142	-0.043	0.214	0.013	1	114
Alcatel-Lucent RRH2x	115.00	170	1.142	-0.043	0.214	0.013	2	147
RFS DB-T1-6Z-8AB-0Z	115.00	88	1.142	-0.043	0.214	0.013	1	76
Amphenol Antel BXA-7	115.00	102	1.142	-0.043	0.214	0.013	1	88
Commscope SBNHH-	115.00	304	1.142	-0.043	0.214	0.013	3	262
Flat Low Profile Pla	115.00	1,500	1.142	-0.043	0.214	0.013	16	1,292
Stand-Off	105.00	75	0.952	-0.119	0.109	-0.025	-2	65
Antel BCD-87010 ___	105.00	26	0.952	-0.119	0.109	-0.025	-1	23
Horizon Compact	90.00	21	0.700	-0.087	0.030	-0.024	0	18
NextNet BTS-2500	88.00	105	0.669	-0.077	0.024	-0.020	-2	90
Argus LLPX310R	88.00	86	0.669	-0.077	0.024	-0.020	-1	74
DragonWave A-ANT-18G	88.00	54	0.669	-0.077	0.024	-0.020	-1	47
Side Arms	88.00	560	0.669	-0.077	0.024	-0.020	-10	482
		41,943	52.340	12.460	14.200	3.572	2,172	36,138

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
35	146.46	287	1.853	1.790	1.071	0.345	86	247
34	142.50	506	1.754	1.338	0.900	0.284	125	436
33	137.50	524	1.633	0.885	0.716	0.216	98	452
32	132.50	579	1.517	0.543	0.563	0.156	78	499
31	127.50	597	1.404	0.292	0.436	0.105	54	515
30	122.50	712	1.296	0.115	0.333	0.062	38	613
29	117.50	730	1.193	-0.002	0.249	0.027	17	629
28	112.50	838	1.093	-0.074	0.183	0.000	0	722
27	107.50	856	0.998	-0.110	0.130	-0.018	-14	737
26	102.50	876	0.908	-0.122	0.090	-0.029	-22	754
25	99.92	29	0.862	-0.120	0.074	-0.031	-1	25
24	97.42	1,570	0.820	-0.115	0.060	-0.032	-43	1,353
23	94.96	27	0.779	-0.108	0.048	-0.031	-1	24
22	92.46	1,009	0.738	-0.098	0.038	-0.028	-25	869
21	89.00	417	0.684	-0.082	0.027	-0.022	-8	359
20	86.50	655	0.646	-0.069	0.021	-0.016	-9	564

19	82.50	1,108	0.588	-0.049	0.013	-0.006	-6	955
18	77.50	1,130	0.519	-0.023	0.008	0.009	8	974
17	72.50	1,152	0.454	0.000	0.006	0.022	22	992
16	67.50	1,173	0.394	0.020	0.007	0.033	33	1,011
15	62.50	1,195	0.337	0.036	0.009	0.041	42	1,030
14	57.50	1,217	0.286	0.048	0.014	0.046	48	1,048
13	54.00	493	0.252	0.055	0.017	0.047	20	425
12	51.50	1,294	0.229	0.059	0.020	0.048	54	1,115
11	48.42	1,383	0.202	0.062	0.023	0.049	58	1,192
10	45.92	459	0.182	0.065	0.026	0.048	19	396
9	42.50	1,267	0.156	0.067	0.029	0.048	53	1,092
8	37.50	1,289	0.121	0.070	0.034	0.047	52	1,110
7	32.50	1,310	0.091	0.071	0.038	0.046	52	1,129
6	27.50	1,332	0.065	0.072	0.041	0.044	51	1,148
5	22.50	1,354	0.044	0.071	0.042	0.043	50	1,166
4	17.50	1,375	0.026	0.067	0.040	0.040	48	1,185
3	12.50	1,397	0.013	0.059	0.035	0.036	44	1,204
2	7.50	1,419	0.005	0.044	0.025	0.028	34	1,223
1	2.50	1,441	0.001	0.018	0.010	0.013	16	1,241
Andrew DB844H90E-XY	147.92	112	1.890	1.980	1.140	0.368	36	96
Andrew 844G65VTZASX	147.92	64	1.890	1.980	1.140	0.368	20	55
Flat Platform w/ Han	147.92	2,000	1.890	1.980	1.140	0.368	639	1,723
48" x 4" Panel	135.00	180	1.574	0.701	0.636	0.185	29	155
Flat Low Profile Pla	135.00	1,500	1.574	0.701	0.636	0.185	240	1,292
Ericsson KRY 112 144	125.00	33	1.350	0.195	0.382	0.082	2	28
Ericsson RRUS 11 B12	125.00	152	1.350	0.195	0.382	0.082	11	131
Ericsson AIR 21, 1.3	125.00	249	1.350	0.195	0.382	0.082	18	215
Ericsson AIR-32 B2A/	125.00	397	1.350	0.195	0.382	0.082	28	342
Round T-Arm	125.00	750	1.350	0.195	0.382	0.082	53	646
Andrew LNX-6515DS-VT	125.00	154	1.350	0.195	0.382	0.082	11	133
Alcatel-Lucent RRH2X	115.00	129	1.142	-0.043	0.214	0.013	1	111
Alcatel-Lucent RRH2X	115.00	132	1.142	-0.043	0.214	0.013	1	114
Alcatel-Lucent RRH2x	115.00	170	1.142	-0.043	0.214	0.013	2	147
RFS DB-T1-6Z-8AB-0Z	115.00	88	1.142	-0.043	0.214	0.013	1	76
Amphenol Antel BXA-7	115.00	102	1.142	-0.043	0.214	0.013	1	88
Commscope SBNHH-	115.00	304	1.142	-0.043	0.214	0.013	3	262
Flat Low Profile Pla	115.00	1,500	1.142	-0.043	0.214	0.013	16	1,292
Stand-Off	105.00	75	0.952	-0.119	0.109	-0.025	-2	65
Antel BCD-87010 ___	105.00	26	0.952	-0.119	0.109	-0.025	-1	23
Horizon Compact	90.00	21	0.700	-0.087	0.030	-0.024	0	18
NextNet BTS-2500	88.00	105	0.669	-0.077	0.024	-0.020	-2	90
Argus LLPX310R	88.00	86	0.669	-0.077	0.024	-0.020	-1	74
DragonWave A-ANT-18G	88.00	54	0.669	-0.077	0.024	-0.020	-1	47
Side Arms	88.00	560	0.669	-0.077	0.024	-0.020	-10	482
		41,943	52.340	12.460	14.200	3.572	2,172	36,138

Analysis Summary

Load Case	Reactions Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Max Usage Elev (ft)	Interaction Ratio
1.2D + 1.6W	30.62	0.00	50.29	0.00	0.00	3185.90	0.00	0.64
0.9D + 1.6W	30.44	0.00	37.70	0.00	0.00	3139.40	0.00	0.63
1.2D + 1.0Di + 1.0Wi	9.32	0.00	103.11	0.00	0.00	977.04	0.00	0.22
(1.2 + 0.2Sds) * DL + E ELFM	1.82	0.00	50.16	0.00	0.00	208.74	0.00	0.05
(1.2 + 0.2Sds) * DL + E EMAM	2.16	0.00	50.16	0.00	0.00	245.91	0.00	0.06
(0.9 - 0.2Sds) * DL + E ELFM	1.82	0.00	34.90	0.00	0.00	206.44	0.00	0.05
(0.9 - 0.2Sds) * DL + E EMAM	2.16	0.00	34.90	0.00	0.00	243.01	0.00	0.06
1.0D + 1.0W	7.59	0.00	41.94	0.00	0.00	785.56	0.00	0.17

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
3,969.00	39.50	29.40	3,185.90	103.11	30.62	59.46

Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
60.0	2.500	69.000	Round	0	0.00	11.224	507.70	946.99	0.54

Anchor Bolts

								Start	Compression			Tension		
Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Angle (deg)	Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
63.00	16	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	158.15	260.00	0.62	145.27	260.00	0.57

Exhibit E

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11491B

Site Hartford_MP1
305 West Service Road
Hartford, CT 06120

May 16, 2016

EBI Project Number: 6216002354

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	10.63 %

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

EBI Consulting
environmental | engineering | due diligence

May 16, 2016

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

Emissions Analysis for Site: **CT11491B – Site Hartford_MP1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **305 West Service Road, Hartford, 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 approximately 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 **305 West Service Road, Hartford, 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 / UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

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 AIR32 B2A/B66A & AIR 21 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 AIR32 B2A/B66A & AIR 21 B4A/B2P** have a maximum gain of **15.9 dBd** at their main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **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.

EBI Consulting
environmental | engineering | due diligence

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B2A/B66A	Make / Model:	Ericsson AIR32 B2A/B66A	Make / Model:	Ericsson AIR32 B2A/B66A
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(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	2.37	Antenna B1 MPE%	2.37	Antenna C1 MPE%	2.37
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	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(W):	30	Total TX Power(W):	30	Total TX Power(W):	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 (Per Sector Max)	**4.03 %**
Northcoast	0.20 %
Nextel	0.28 %
Clearwire	0.26 %
Sensus (CL&P)	0.14 %
Verizon Wireless	5.72 %
Site Total MPE %:	**10.63 %**

T-Mobile Sector 1 Total:	4.03 %
T-Mobile Sector 2 Total:	4.03 %
T-Mobile Sector 3 Total:	4.03 %
Site Total:	10.63 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**125**	**11.85**	**2100**	**1000**	**1.19 %**
T-Mobile 1900 MHz (PCS) LTE	**2**	**1167.14**	**125**	**11.85**	**1900**	**1000**	**1.19 %**
T-Mobile 1900 MHz (PCS) GSM/UMTS	**2**	**1167.14**	**125**	**5.93**	**1900**	**1000**	**0.59 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**125**	**5.93**	**2100**	**1000**	**0.59 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**125**	**2.20**	**700**	**467**	**0.47 %**
						Total:	**4.03%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector 1:	4.03 %
Sector 2:	4.03 %
Sector 3 :	4.03 %
T-Mobile Per Sector Maximum:	4.03 %
Site Total:	10.63 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.63%** 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.