COHEN and WOLF P.C.
ATTORNEYS AT LAW

**JULIE D. KOHLER**

Please Reply To: Bridgeport
Writer's Direct Dial: (203) 337-4157
E-Mail: jkohler@cohenandwolf.com

April 2, 2015

Attorney Melanie Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06501

**Re: Notice of Exempt Modification**
**Lin Television Corporation d/b/a/ WTNH TV/T-Mobile equipment upgrade**
**Site ID: CT11474A**
**101 Talmadge Road, Hamden, CT**

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, the Lin Television Corporation d/b/a/ WTNH TV owns the existing guyed G-12 telecommunications tower and related facility at 101 Talmadge Road, Hamden, Connecticut (latitude 41.422871/longitude -72.951149). T-Mobile intends to replace three (3) antennas and add three (3) antennas and related equipment at this existing telecommunications facility in Hamden ("Hamden Facility"). Please accept this letter as notification, pursuant to R.C.S.A. §16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R. C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor Scott Jackson, and the property owner, Lin Television Corporation.

The existing Hamden Facility consists of a 907-foot guyed G-12 tower.[1] T-Mobile plans to replace three (3) antennas, and add three (3) antennas mounted to the existing pipe mast at a centerline of 315 feet. T-Mobile will also replace the existing S8000 cabinet on a concrete slab with a 6201 cabinet and install a second 6201 cabinet; install three remote radio units (RRUs) and six (6) TMAs (tower mounted amplifiers) on a proposed H-frame; and reuse and install coax cables. (See the plans revised to March 27, 2015 attached hereto as **Exhibit A**). Assuming the modifications indicated in the structural analysis are completed, the existing Hamden Facility is structurally capable of

[1] While the online docket for the Connecticut Siting Council does not provide a docket or petition number for approval of this structure, it does reference this structure in connection with a recent notice of intent captioned EM-T-MOBILE-062-150203.

supporting T-Mobile's proposed modifications. (See the Structural Analysis dated March 10, 2015 and stamped March 13, 2015, attached hereto as **Exhibit B**.)

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

1. The proposed modification will not increase the height of the tower. T-Mobile's existing antennas are at a centerline of 315 feet; the replacement and additional antennas will be installed at the same 315-foot level. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension on the site boundaries or lease area, as depicted on Sheet A-1 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

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

4. The operation of the additional antennas and equipment will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated March 25, 2015, T-Mobile's operations would add 1.48% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 3.95% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as **Exhibit C.**

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

Sincerely,

Julie D. K

Julie D. Kohler

cc: Mayor Scott Jackson, Town of Hamden
Lin Television Corporation d/b/a WTNH TV
Lin Television Corporation
Sheldon Freincle, Northeast Site Solutions

# EXHIBIT A

# T-MOBILE NORTHEAST LLC

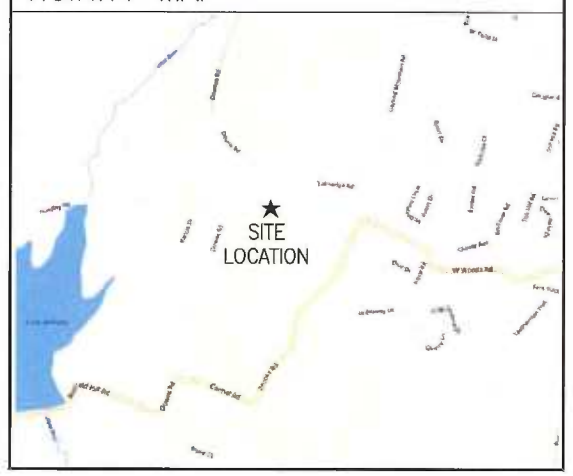
## SITE #: CT11474A

## SITE NAME: WTNH HAMDEN

SITE ADDRESS:
101 TALMADGE ROAD
HAMDEN, CT, 06518

WIRELESS BROADBAND FACILITY
CONSTRUCTION DRAWINGS
(704E CONFIGURATION)

### VICINITY MAP




### DO NOT SCALE DRAWINGS

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

CALL BEFORE YOU DIG:
WWW.CBYD.COM
**CALL 800 922 4455, OR 811**
CALL THREE WORKING DAYS PRIOR TO DIGGING

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

COLOR CODE FOR UTILITY LOCATIONS

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

### GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES. RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE T–MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS, AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFETY REGULATIONS.
14. THE CONTRACTOR SHALL NOTIFY THE T–MOBILE REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE T–MOBILE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
16. THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.
17. ATLANTIS GROUP, INC. HAS NOT CONDUCTED A STRUCTURAL ANALYSIS FOR THIS PROJECT AND DOES NOT ASSUME ANY LIABILITY FOR THE ADEQUACY OF THE STRUCTURE AND COMPONENTS.
18. REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT" PREPARED BY STAINLESS LLC. "T–MOBILE SITE ID CT11474", DATED MARCH 10, 2014.

### SITE INFORMATION

| | |
|---|---|
| SITE NUMBER: | CT11474A |
| SITE NAME: | WTNH HAMDEN |
| SITE ADDRESS: | 101 TALMADGE ROAD<br>HAMDEN, CT, 06518 |
| JURISDICTION: | TOWN OF HAMDEN, CT |
| PROPERTY OWNER: | LIN TELEVISION CORPORATION |

### 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 SUMMERY

T–MOBILE PROPOSES TO MODIFY THE EXISTING WIRELESS TELECOMMUNICATIONS FACILITY AS FOLLOWS:

(3) NEW RFS DUAL POLE ANTENNAS ON EXISTING PIPE MAST MOUNTED TO LATTICE TOWER.
(3) NEW COMMSCOPE DUAL POLE ANTENNAS ON (3) NEW PIPE MASTS MOUNTED TO LATTICE TOWER.
(2) NEW ERICSSON RBS 6201 CABINET TO REPLACE EXISTING S8000 CABINET AT BASE OF TOWER.
(6) 7/8" COAX CABLES ROUTED FROM NEW EQUIPMENT TO NEW ANTENNAS.
(6) NEW d B2/B4 TMAs AND (3) NEW RRUs ON PROPOSED H–FRAME .
(3) EXISTING ddB2 TMAs TO BE REMOVED .

### PROJECT SUB–CONTRACTORS

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

### SHEET INDEX



| SHEET | DESCRIPTION | REVISION |
|---|---|---|
| T–1 | TITLE SHEET | 1 |
| N–1 | GENERAL AND ELECTRICAL NOTES | 1 |
| A–1 | SITE PLAN AND ELEVATION | 1 |
| A–2 | ANTENNA PLAN AND DETAILS | 1 |
| A–3 | EQUIPMENT PLAN AND DETAILS | 1 |
| E–1 | GROUNDING AND COAX/FIBER DIAGRAM | 1 |
| E–2 | GROUNDING DETAILS | 1 |
| END OF CD | REINFORCEMENT DESIGN BY STAINLESS LLS | 1 |




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

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


SUBMITTALS

| DATE | DESCRIPTION | REVISION |
|---|---|---|
| 01/22/15 | ISSUED FOR REVIEW | A |
| 02/03/15 | REVISION | 0 |
| 03/20/15 | REVISION | 1 |
| 03/27/15 | FINAL CD | 2 |

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

| | |
|---|---|
| PROJECT NO: | CT11474A |
| DRAWN BY: | FG |
| CHECKED BY: | SM |

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

PROFESSIONAL SEAL



SITE NUMBER
CT11474A
SITE NAME
WTNH HAMDEN
SITE ADDRESS
101 TALMADGE ROAD
HAMDEN, CT, 06518

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

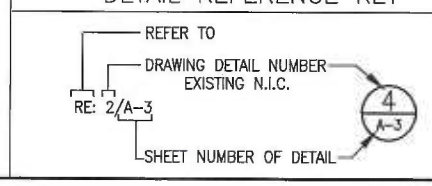
1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT 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


## 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
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Newton Center, MA 02459
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Fax: 617-213-5056


SUBMITTALS

| DATE | DESCRIPTION | REVISION |
|---|---|---|
| 01/22/15 | ISSUED FOR REVIEW | A |
| 02/03/15 | REVISION | 0 |
| 03/20/15 | REVISION | 1 |
| 03/27/15 | FINAL CD | 2 |

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

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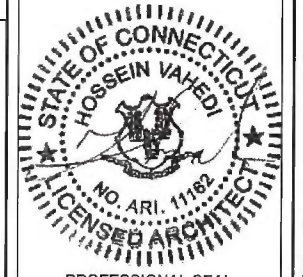
|---|---|
| PROJECT NO: | CT11474A |
| DRAWN BY: | FG |
| CHECKED BY: | SM |




PROFESSIONAL SEAL



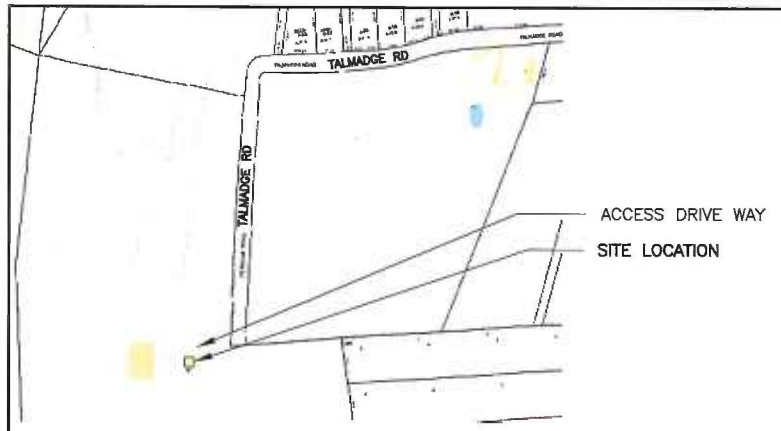
SITE NUMBER
CT11474A

SITE NAME
WTNH HAMDEN

SITE ADDRESS
101 TALMADGE ROAD
HAMDEN, CT, 06518

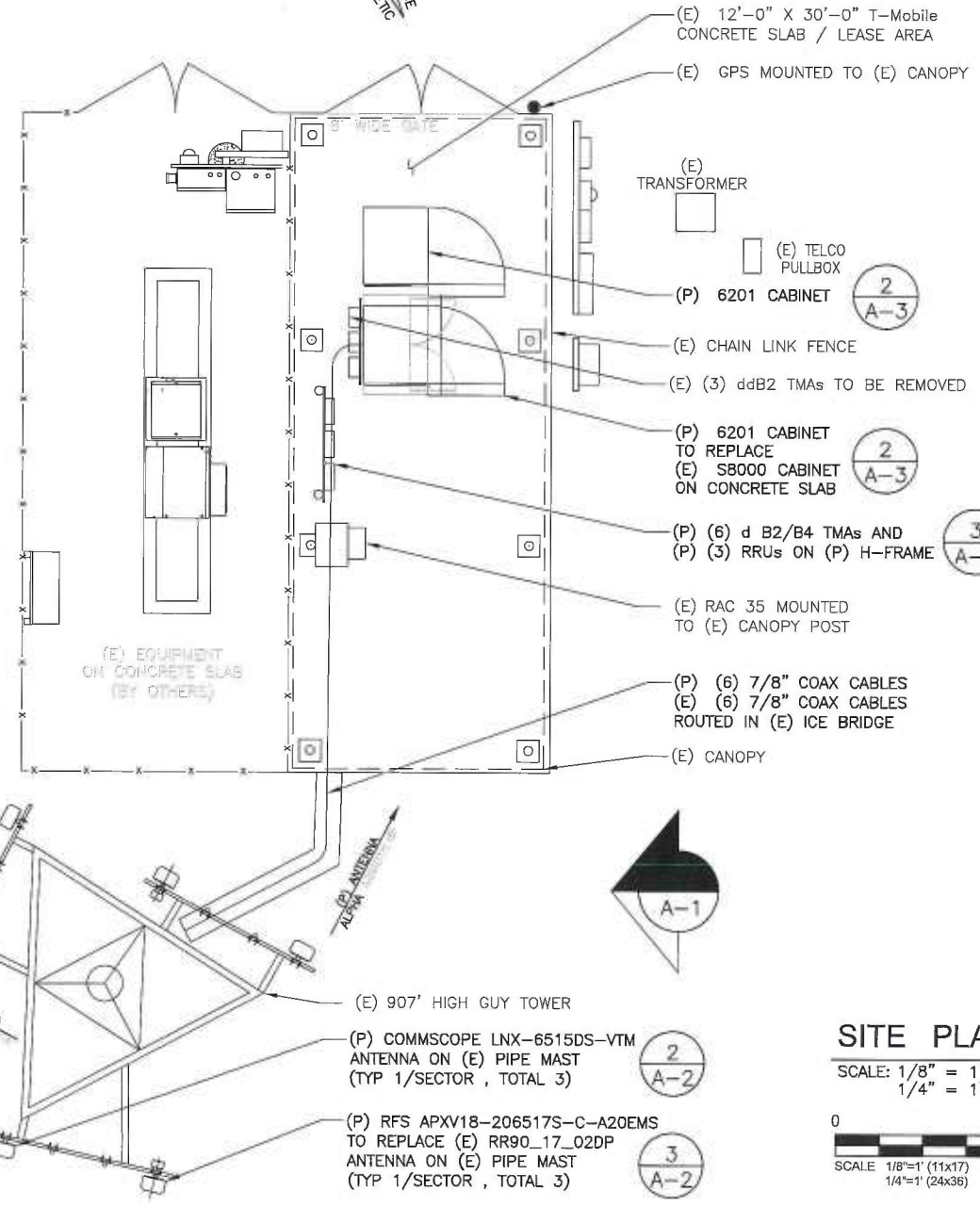
SHEET TITLE
GENERAL AND ELECTRICAL NOTES

SHEET NUMBER
N-1



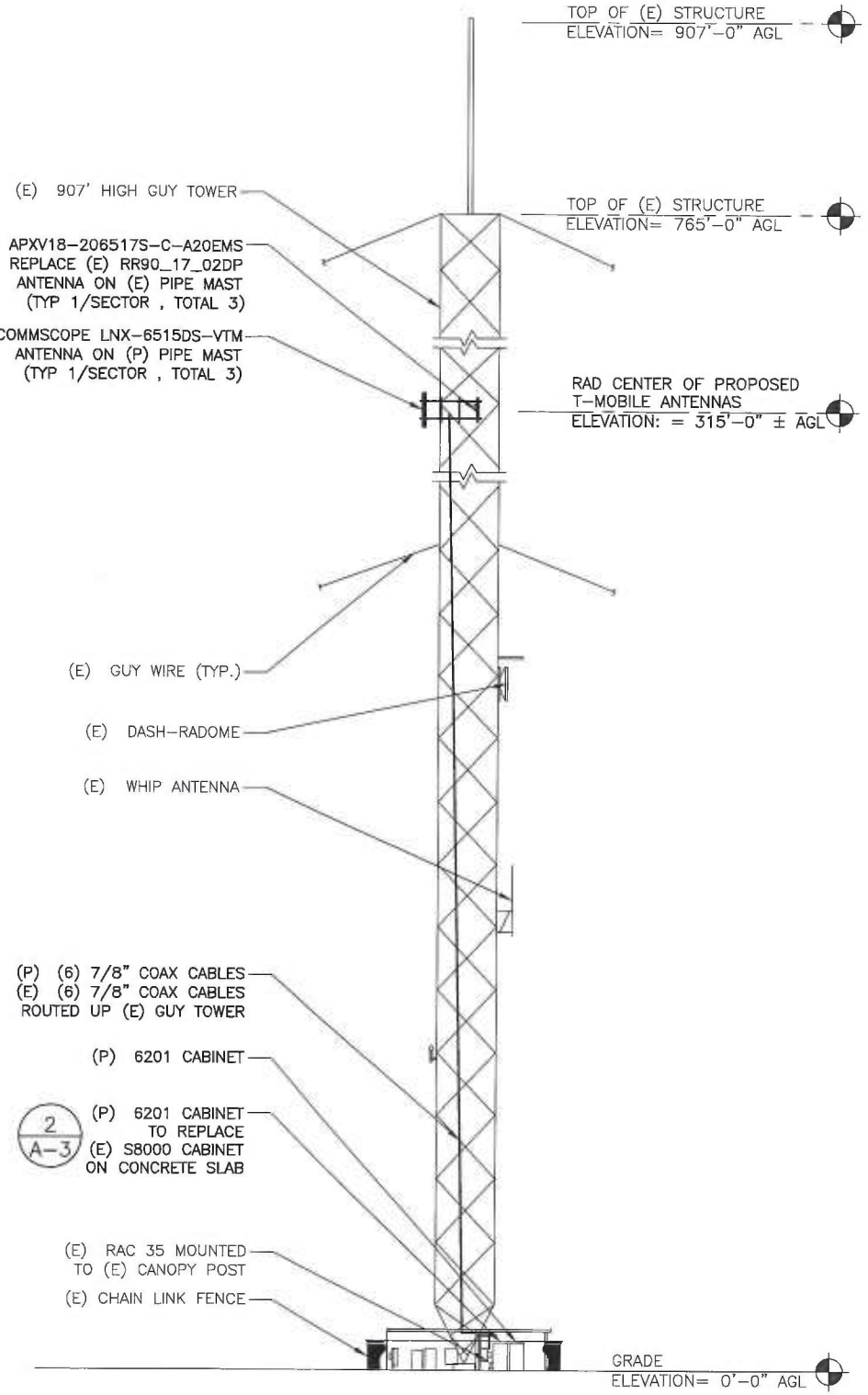

KEY PLAN (1/A-1)
SCALE: N.T.S.


(E) GRAVEL ACCESS DRIVE




SITE PLAN (2/A-1)
SCALE: 1/8" = 1'-0" (11x17)
1/4" = 1'-0" (24x36)

0 8 16 24
SCALE 1/8"=1' (11x17)
1/4"=1' (24x36)




ELEVATION (3/A-1)
SCALE: 1" = 40'-0" (11x17)
1" = 20'-0" (24x36)

0 40 80 120
SCALE 1"=40' (11x17)
1"=20' (24x36)

## STRUCTURAL REFERENCE

REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT" PREPARED BY STAINLESS LLC. "T-MOBILE SITE ID CT11474", DATED MARCH 10, 2014.

## GENERAL SITE NOTES

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

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

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

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

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

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

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

## SITE LEGEND

| | |
|---|---|
| | SITE PROPERTY LINE |
| | STREET OR ROAD |
| -x-x-x- | 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

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| RFE | | | |
| RF MAN. | | | |
| ZONING | | | |
| OPS | | | |
| CONSTR. | | | |
| SITE AC. | | | |

| | |
|---|---|
| PROJECT NO: | CT11474A |
| DRAWN BY: | FG |
| CHECKED BY: | SM |

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

PROFESSIONAL SEAL



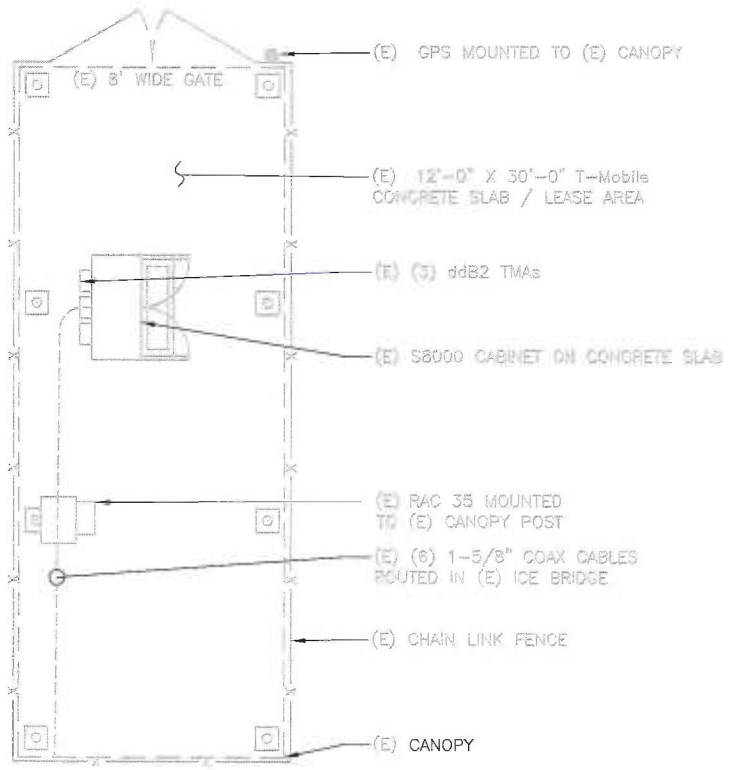
SITE NUMBER
CT11474A

SITE NAME
WTNH HAMDEN

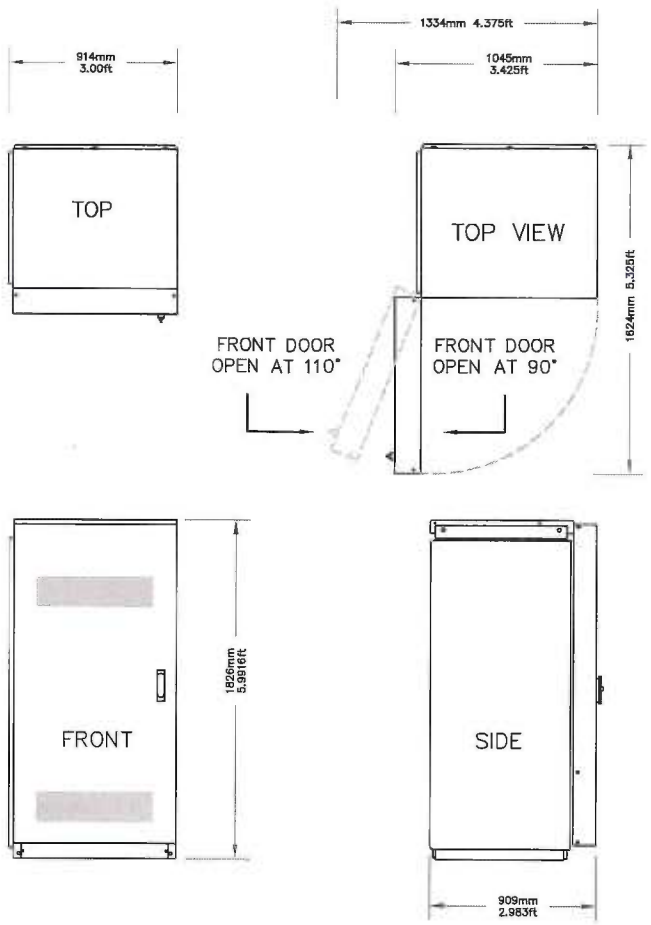
SITE ADDRESS
101 TALMADGE ROAD
HAMDEN, CT, 06518

SHEET TITLE
SITE PLAN AND ELEVATION

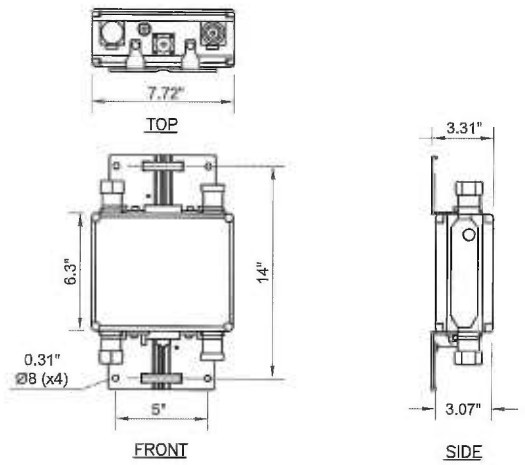
SHEET NUMBER
A-1




EXISTING EQUIPMENT PLAN

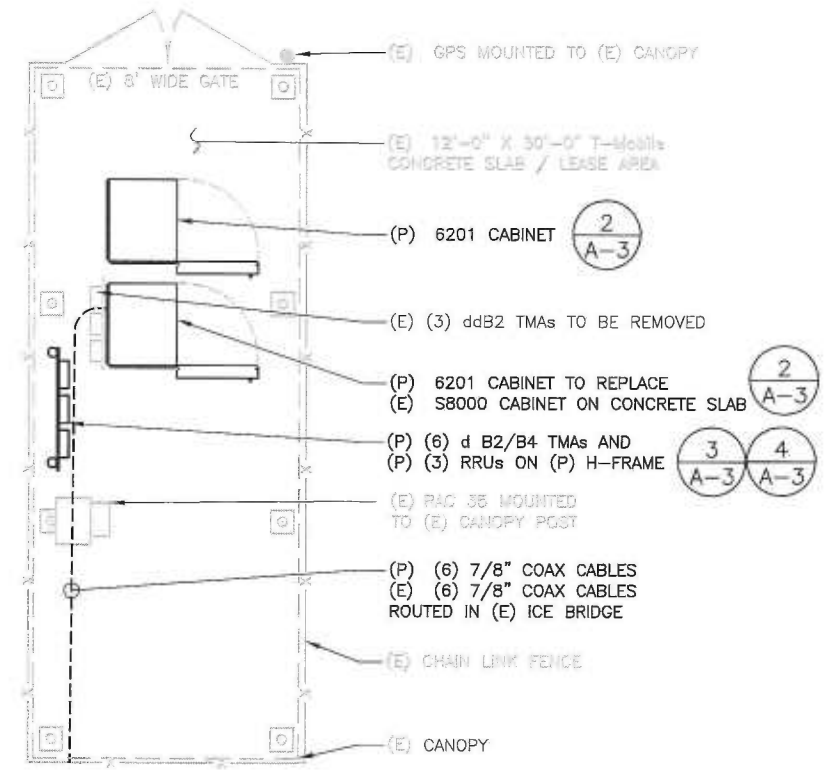



ERICSSON RBS 6201 CABINET (2 / A-3)
SCALE: N.T.S




d B2/B4 TMA

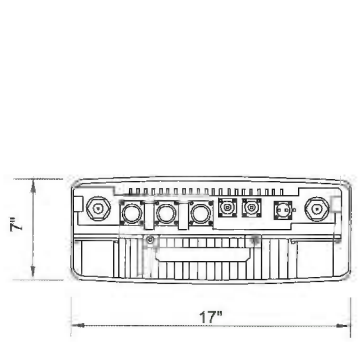
TMA DETAILS (3 / A-3)
SCALE: N.T.S

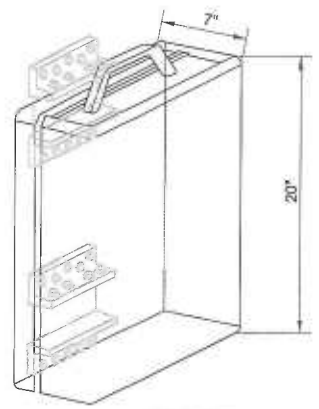



PROPOSING EQUIPMENT PLAN

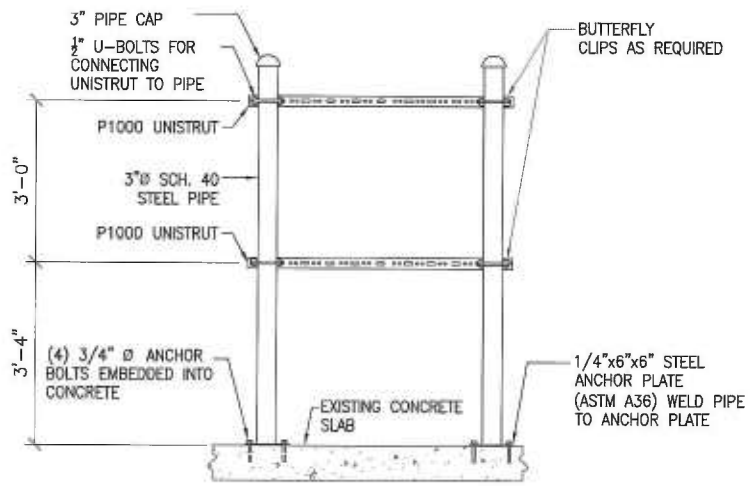
EQUIPMENT PLAN (3 / A-3)
SCALE: 1/8" = 1'-0" (11x17)
1/4" = 1'-0" (24x36)

0 8 16 24
SCALE 1/8"=1' (11x17)
1/4"=1' (24x36)




RRUS 11 B12 DETAILS (4 / A-3)
SCALE: N.T.S




H-FRAME DETAILS (5 / A-3)
SCALE: N.T.S

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|---|---|---|---|
| RFE. | | | |
| RF MAN. | | | |
| ZONING | | | |
| OPS | | | |
| CONSTR. | | | |
| SITE AC. | | | |

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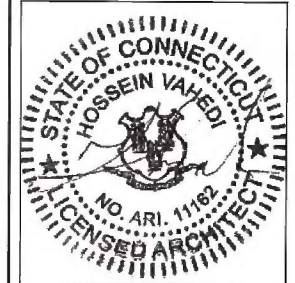
|---|---|
| PROJECT NO: | CT11474A |
| DRAWN BY: | FG |
| CHECKED BY: | SM |



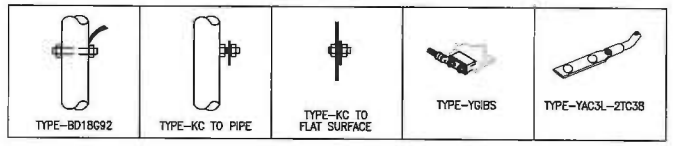

PROFESSIONAL SEAL



SITE NUMBER
CT11474A
SITE NAME
WTNH HAMDEN
SITE ADDRESS
101 TALMADGE ROAD
HAMDEN, CT, 06518

SHEET TITLE
EQUIPMENT PLAN AND DETAILS

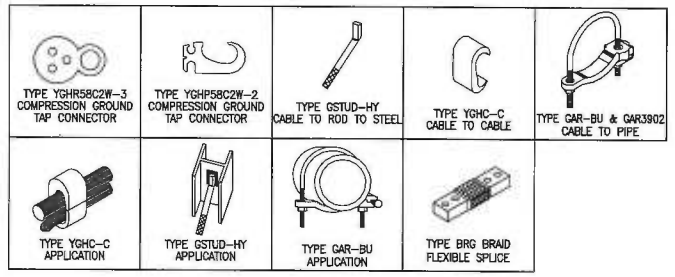
SHEET NUMBER
A-3




## BURNDY GROUNDING DETAILS

1 E-2

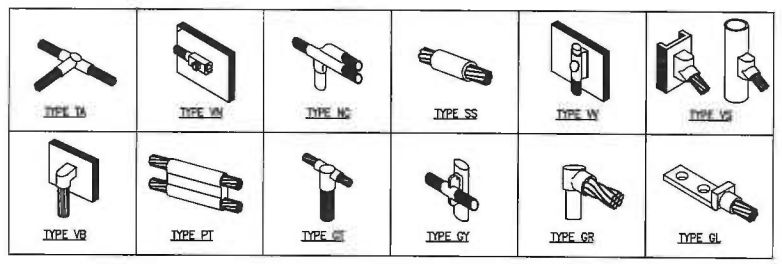
*SCALE: N.T.S.*




## BURNDY GROUNDING PRODUCTS

2 E-2

*SCALE: N.T.S.*




## CADWELD GROUNDING CONNECTION PRODUCTS

3 E-2

*SCALE: N.T.S.*

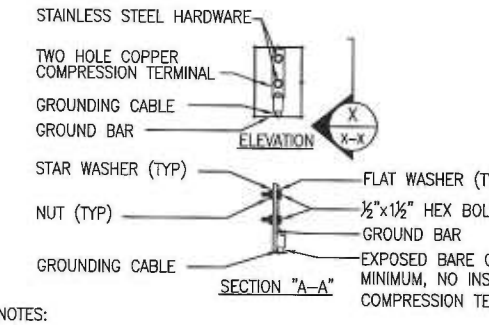
TERMINATION TYPES:
A. MECHANICAL COMPRESSION LUG
B. DOUBLE BARRELL COMPRESSION CONNECTOR
C. EXOTHERMIC TERMINATION
D. BEAM CLAMP

| | 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 |

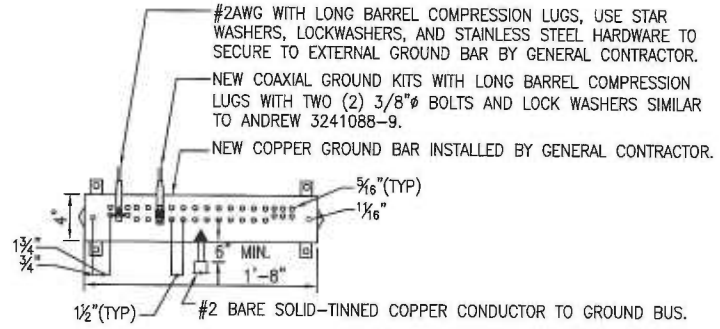
## GROUNDING TERMINATION MARTIX

4 E-2

*SCALE: N.T.S.*




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

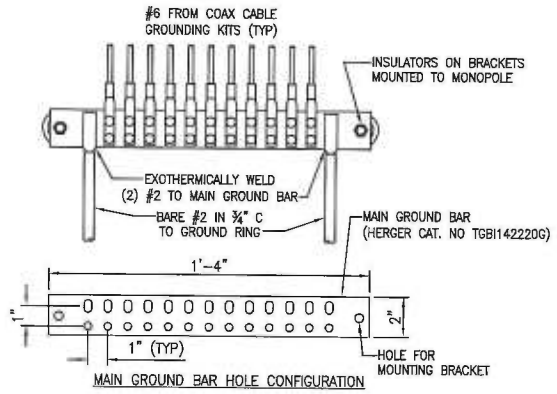



NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

## TYPICAL GROUND BAR CONNECTIONS DETAIL

5 E-2

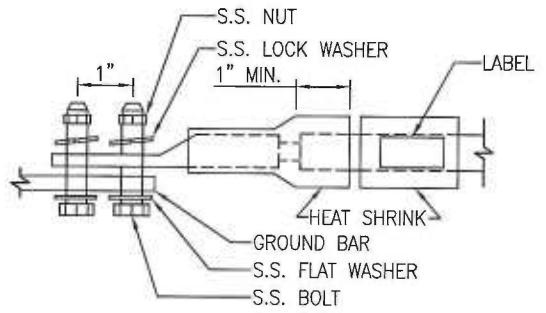
*SCALE: N.T.S.*




## 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
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1340 Centre Street, Suite 212
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| SUBMITTALS | | |
|---|---|---|
| DATE | DESCRIPTION | REVISION |
| 01/22/15 | ISSUED FOR REVIEW | A |
| 02/03/15 | REVISION | 0 |
| 03/20/15 | REVISION | 1 |
| 03/27/15 | FINAL CD | 2 |

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

| | |
|---|---|
| PROJECT NO: | CT11474A |
| DRAWN BY: | FG |
| CHECKED BY: | SM |

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

PROFESSIONAL SEAL



SITE NUMBER
CT11474A
SITE NAME
WTNH HAMDEN

SITE ADDRESS
101 TALMADGE ROAD
HAMDEN, CT, 06518

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-2

# EXHIBIT B

Stainless LLC

# REPORT 362016

Site ID: CT11474A

Address: 101 Talmadge Road, Hamden, CT

DATE: 3/10/2015

STRUCTURAL ANALYSIS

FOR A 907' G-12 GUYED TOWER

HAMDEN, CONNECTICUT

PREPARED BY: AP

APPROVED: AP 3/13/15

CHECKED BY: PCL

PROFESSIONAL ENGINEER
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of CONNECTICUT
Print Name: Gregg M Fehrman
Signature:
Date 3/13/15 License # 27523

STATE OF CONNECTICUT
GREGG A. FEHRMAN
No. 27523
LICENSED
PROFESSIONAL ENGINEER
3/13/15

| Date | Pages | Remarks |
|---|---|---|

| Rev. | Date | Description |
|---|---|---|
| | | |

SECTION PAGE

A. AUTHORIZATION/PURPOSE ..... 1

B. TOWER HISTORY ..... 1

C. CONDITIONS INVESTIGATED ..... 2

D. LOADS AND STRESSES ..... 4

E. METHOD OF ANALYSIS ..... 4

F. RESULTS ..... 4

G. CONCLUSIONS AND RECOMMENDATIONS ..... 5

H. PROVISIONS OF ANALYSIS ..... 6

APPENDIX

GENERAL ARRANGEMENT ..... A-1

LINEAR APPURTENANCES ..... A-2

PROFESSIONAL ENGINEER
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of CONNECTICUT
Print Name: Gregg A Fehrman
Signature:
Date 3/13/15 License # 27523

STATE OF CONNECTICUT
GREGG A. FEHRMAN
No. 27523
LICENSED
PROFESSIONAL ENGINEER

3/13/15

| Rev. | Date | Description |
|---|---|---|
| | | |

## A. AUTHORIZATION/PURPOSE

As authorized by Sheldon Freincle of Northeast Site Solutions, a structural analysis was performed to investigate the adequacy of a 907' guyed G-12 tower located at 101 Talmadge Road in Hamden, Connecticut to support specified equipment.

## B. TOWER HISTORY

The tower was originally designed and furnished in 1995 by Stainless, Inc. It was designed in accordance with TIA/EIA-222-E for a wind speed of 85 mph and 73.6 mph with 1/2" ice while supporting the following equipment:

1. One (1) top mounted Dielectric TCL-12A8(S) antenna, fed by two (2) 6-1/8" rigid lines.
2. One (1) top mounted HDTV antenna, fed by one (1) WR1150 waveguide (future).
3. One (1) Dielectric TFU-28JSM Ch. 59 antenna, at the 730' level, fed by one (1) WR1150 waveguide.
4. One (1) Dielectric TFU-28JSM HDTV Ch. 14 antenna, at the 670' level, fed by one (1) WR1150 waveguide (future).
5. Two (2) ENG Super Quad antennas at the 760' level, fed by one (1) 1-5/8" line and one (1) 1/2" control cable (one future).
6. One (1) ERI 6-bay panel type FM antenna at the 610' level, fed by one (1) 6-1/8" rigid line (future).
7. Two (2) Andrew MMDS wireless cable antennas at the 565' level, fed by one (1) EW20 waveguide (future).
8. One (1) ERI SHPX-3AE FM antenna at the 545' level, fed by one (1) 3" line.
9. One (1) ERI SHPX-3AE FM antenna at the 520' level, fed by one (1) 3" line.
10. Three (3) whip antennas at the 750' level, fed by one (1) 1-5/8" line to each.
11. Three (3) whip antennas at the 500' level, fed by one (1) 1-5/8" line to each.
12. Three (3) whip antennas at the 400' level, fed by one (1) 1-5/8" line to each.
13. Three (3) whip antennas at the 350' level, fed by one (1) 1-5/8" line to each (future).
14. Three (3) whip antennas at the 325' level, fed by one (1) 1-5/8" line to each (future).
15. Three (3) whip antennas at the 300' level, fed by one (1) 1-5/8" line to each (future).
16. One (1) Scala PR-450U antenna at the 339' level, fed by one (1) 7/8" line.
17. One (1) Scala PR-450U antenna at the 247' level, fed by one (1) 7/8" line.
18. One (1) 6' grid dish at the 400' level, fed by one (1) 1-5/8" line.
19. Two (2) 6' grid dishes at the 325' level, fed by one (1) 1-5/8" line to each (future).
20. Two (2) 6' grid dishes at the 225' level, fed by one (1) 1-5/8" line to each (future).
21. Two (2) 8' dishes with radomes at the 325' level, fed by one (1) EW63 waveguide to each (one future).

| Rev. | Date | Description |
|---|---|---|
| | | |

22. One (1) 8' dish with radome at the 166' level, fed by one (1) EW63 waveguide (future).
23. One (1) 8' dish with radome at the 150' level, fed by one (1) EW63 waveguide (future).
24. One (1) inside climbing ladder with cable type safety device for the full height of the tower.
25. One (1) single car elevator with guide rails, cables, motor and elevator equipment.
26. Ice shields for all side mounted antennas, except the whip antennas.
27. One (1) red lighting system with circuits in rigid conduit for the full height of the tower.

In 1998, the bottom stack Dielectric THP-O-2-1 antenna of the top mounted stack system was installed per Stainless, Inc. Report 362006. The guy wires of all the four levels were also re-tensioned.

The tower was analyzed per Stainless LLC Report 362013, dated 09/25/2014. The proposed antennas are assumed to have been installed, and the tower top plate and top K-bracing members strengthened to remove the reported overstresses for the purpose of this analysis.

## C. CONDITIONS INVESTIGATED

The analysis was performed for the tower supporting the following equipment based upon the following sources:

- Stainless LLC Proposal P15_3620_003 dated 2/19/2015.
- Stainless LLC Report 362014 dated 1/23/2015.
- Email from Sheldon Freincle, dated 2/18/2015, with details of proposed equipment RFDS_CT11474_700_V5_20150217-1.

1. One (1) top mounted stacked antenna system consisting of one (1) top Dielectric TCL-12A8(S) antenna, Ch. 8, fed by one (1) 6-1/8" rigid coax, on top of one (1) bottom Dielectric THP-O-2-1 antenna, Ch. 10 DTV, fed by one (1) 3-1/8" rigid coax. (NB: The remaining one of the two (2) 6-1/8" coaxes that originally fed the top stacked TCL antenna is now used to feed the Shively 6810-2R antenna, see below)
2. One (1) 10' whip antenna at the 758' level, fed by one (1) 1-5/8" heliax shared with Items 4 and 5.
3. One (1) 5' omni antenna at the 750' level, fed by one (1) 7/8" heliax.
4. One (1) ENG Super Quad antenna at the 744' level, fed by one (1) 1-5/8" line shared with Items 2 and 5 and by one (1) 1/2" control cable.
5. One (1) Allen Telcom DB408 antenna at the 742' level, fed by one (1) 1-5/8" line shared with Items 2 and 4.
6. One (1) Dielectric TFU-31E/V-R(S) antenna, Ch. 59, at the 715' level, fed by one (1) WR1150 waveguide.

| Rev. | Date | Description |
|---|---|---|
| | | |

7. One (1) ice shield at the 681' level.
8. One (1) Andrew PL6-65 6' diameter dish antenna with radome at the 678' level, fed by one (1) EW63 and one (1) 1/2" control cable.
9. One (1) Dielectric TFU 16DSB-B(C) antenna, Ch. 39 DTV, at the 652' level, fed by one (1) 4-1/16" rigid coax.
10. One (1) Andrew PL6-65 6' diameter dish antenna with radome at the 630' level, fed by one (1) EW63 and one (1) 1/2" control cable.
11. One (1) Shively 6015-2/3R FM antenna at the 591' level, fed by one (1) 4-1/16" line.
12. Two (2) Allen Telcom DB408 antennas at the 529' level, fed by one (1) 7/8" line to each.
13. One (1) Allen Telcom DB408 antenna at the 510' level, fed by one (1) 7/8" line.
14. One (1) Shively 6810-2R 2-bay FM antenna at the 458' level, fed by one (1) existing 6-1/8" rigid coax. (NB: This coax was cut at the 440' – 480' level and a 20' length of 3" heliax was used to connect the 6-1/8" rigid coax to the antenna. The remaining length of the 6-1/8" coax from 480' to the top of tower was left in place)
15. One (1) unused 15' whip antenna at the 420' level, fed by one (1) 1/2" line.
16. One (1) unused 10' whip antenna at the 420' level, fed by one (1) 1-5/8" line.
17. One (1) 5' omni antenna at the 348' level, fed by one (1) 7/8" heliax.
18. One (1) ice shield at the 346' level.
19. One (1) 6' grid dish at the 339' level, fed by one (1) 7/8" line.
20. Three (3) **proposed** RFS APXV18-206517S-C-A20 and three **proposed** (3) LNX-6515DS-VTM antennas on three (3) **proposed** sector mounts at the 315' level, fed by six (6) existing 7/8" lines and six (6) **proposed** 7/8" lines.. (NB: The three existing EMS RR90-17-02DP panel antenna are replaced by the proposed antennas)
21. Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) RFS APXVTM14-C-120 panel antennas, three (3) TD-RRH8x20 RRU units and six (6) RRHs on three (3) sector mounts at the 200' level, fed by three (3) 1-1/4" Hybriflex cables and one (1) fiber cable.
22. One (1) ice shield at the 166' level.
23. One (1) Andrew 8' dish with radome at the 160' level, fed by two (2) EW63 waveguides.
24. One (1) unused 15' whip antenna at the 102' level, fed by one (1) 1/2" line.
25. One (1) unused ASPG952 antenna at the 100' level, fed by one (1) 2-1/4" line.
26. One (1) GPS antenna at the 75' level, fed by one (1) 1/2" line.
27. One (1) 1-1/2" support conduit each to the 348', 2 x 420', 529', 758' levels, and to top of tower.
28. One (1) 1-1/4" support conduits to the 315' level **(proposed extended from the 200' level)** and one (1) 1-1/4" conduit to 200'.
29. One (1) inside climbing ladder with cable type safety device for the full height of the tower.
30. One (1) single car elevator with guide rails, cables, motor and elevator equipment.
31. One (1) red lighting system with circuits within one (1) 1" conduit to the 45' level, and one (1) 1-1/2" conduit for the full height of the tower.

| Rev. | Date | Description |
|---|---|---|
| | | |

The locations of the transmission lines have been based upon the cross section from Stainless Report 362014 Rev C dated 1/23/2015 and shown on Page A-2 of this Report. Proposed transmission lines have been located to minimize the wind load on the tower. Deviating from the line arrangement as shown may invalidate the results of this analysis.

## D. LOADS AND STRESSES

The basic design wind speed for the tower per ANSI/TIA/EIA Standard 222-F is 85 mph with no ice. However the 222-F Code does not provide specific ice thicknesses but recommends a minimum of 1/2" uniform radial ice concurrent with 75% of the no ice design wind load which is equivalent to 73.6 mph.

Research however has shown that tower icing is associated with lower wind speeds, and the thickness also increases with height of the tower. These findings are reflected in the latest Revision 222-G of the Code which also now provides specific design ice thicknesses to be used depending on the tower location. Therefore for this analysis, Revision 222-G has been used to determine the ice case loading condition for the tower. The basic design wind speed for the ice case is 39 mph with 3/4" of uniform ice thickness. Due to escalation of ice thickness with height, a uniform ice thickness of 1" was used in the analysis.

The tower was analyzed for a basic wind speed of 85 mph with no ice, and 39 mph with 1" uniform ice per ANSI/TIA/EIA Standard 222-F. Allowable unit stresses and minimum safety factors used to evaluate the adequacy of the structure were in accordance with ANSI/EIA/TIA Standard 222-F.

## E. METHOD OF ANALYSIS

The analysis was performed using Stainless, Inc's Beam-Column Analysis Program, a computer operation which idealizes the tower as a continuous beam-column on non-linear, elastic supports (guys) subject to simultaneous transverse (wind) and axial (dead, ice and vertical components of guy tensions) loads.

## F. RESULTS

The results of the analysis show the following overstresses:

| LOCATION | TOWER COMPONENT | % RATING (Before Modifications) | % RATING (After Modifications) |
|---|---|---|---|
| Span 4 (Top) | Vertical Members | **103.8** | 90.6 |
| | Diagonal Members | **101.0** | 76.8 |

| Rev. | Date | Description |
|---|---|---|
| | | |

| LOCATION | TOWER COMPONENT | % RATING (Before Modifications) | % RATING (After Modifications) |
|---|---|---|---|
| | Horizontal Members | 64.0 | 64.0 |
| | Guy Wires | 87.8 | 87.8 |
| Span 3 | Vertical Members | 94.2 | 94.8 |
| | Diagonal Members | 76.1 | 78.9 |
| | Horizontal Members | 66.1 | 66.1 |
| | Guy Wires | 83.1 | 83.4 |
| Span 2 | Vertical Members | 80.0 | 80.1 |
| | Diagonal Members | 57.3 | 57.2 |
| | Horizontal Members | 45.8 | 47.1 |
| | Guy Wires | 77.8 | 77.9 |
| Span 1 | Vertical Members | 80.8 | 81.0 |
| | Diagonal Members | 73.2 | 73.3 |
| | Horizontal Members | 52.0 | 51.9 |
| | Guy Wires | 77.1 | 77.1 |
| | Foundations | 81.4 | 81.6 |

Ratings are not to exceed 100% after modifications as requested by Northeast Site Solutions.

## G. CONCLUSIONS AND RECOMMENDATIONS

Based on the preceding results, the following conclusions may be drawn:

1. The tower supporting equipment as specified in Section C of this Report is not adequate to achieve a basic wind speed rating of 85 mph with no ice and 39 mph with 1" uniform ice in accordance with ANSI/EIA/TIA Standard 222-F.
2. In order to achieve a basic wind speed of 85 mph with no ice and 39 mph with 1" uniform ice in accordance with ANSI/EIA/TIA Standard 222-F, the following modifications are required:
   a. Install additional horizontal sub-braces at the midpoint of the following bay:

| Location | No. of bays |
|---|---|
| 583.8' – 591.3' | 1 |

   b. Replace existing diagonal bracing members with new, higher capacity diagonal bracing members at the following bay:

| Location | No. of bays |
|---|---|
| 613.8' – 621.3' | 1 |

| Rev. | Date | Description |
|---|---|---|
| | | |

## H. PROVISIONS OF ANALYSIS

The analysis performed and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

1. Proper alignment and plumbness.
2. Correct guy tensions.
3. Correct bolt tightness.
4. No significant deterioration or damage to any component.

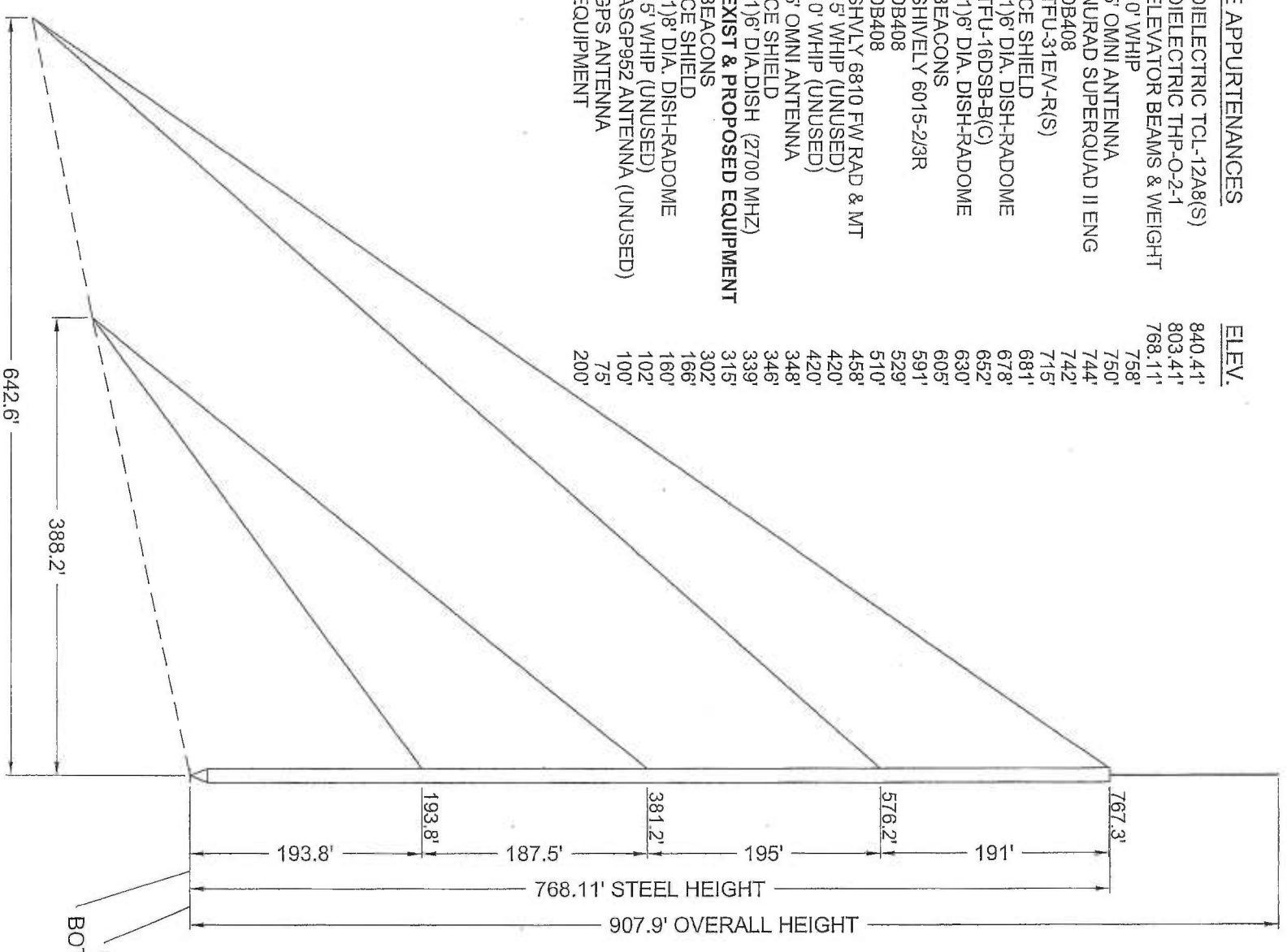
Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-arts" engineering and analysis procedures and formulae, and Stainless LLC assumes no obligations to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will Stainless LLC have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of Stainless LLC, if any, pursuant to this Report shall be limited to the total funds actually received by Stainless LLC for preparation of this Report.

Customer has requested Stainless LLC to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested Stainless LLC to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of Stainless LLC, Customer has informed Stainless LLC that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by Stainless LLC and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice.

Customer hereby agrees and acknowledges that Stainless LLC shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than Stainless LLC in connection with the implementation of any structural changes or modifications recommended by Stainless LLC including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that Stainless LLC shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor.

## DISCRETE APPURTENANCES

| | | | ELEV. |
|---|---|---|---|
| 1. | 1 | DIELECTRIC TCL-12A8(S) | 840.41' |
| 2. | 1 | DIELECTRIC THP-O-2-1 | 803.41' |
| 3. | 1 | ELEVATOR BEAMS & WEIGHT | 768.11' |
| 4. | 1 | 10' WHIP | 758' |
| 5. | 1 | 5' OMNI ANTENNA | 750' |
| 6. | 1 | NURAD SUPERQUAD II ENG | 744' |
| 7. | 1 | DB408 | 742' |
| 8. | 1 | TFU-31E/V-R(S) | 715' |
| 9. | 1 | ICE SHIELD | 681' |
| 10. | 1 | (1)6' DIA. DISH-RADOME | 678' |
| 11. | 1 | TFU-16DSB-B(C) | 652' |
| 12. | 1 | (1)6' DIA. DISH-RADOME | 630' |
| 13. | 2 | BEACONS | 605' |
| 14. | 1 | SHIVELY 6015-2/3R | 591' |
| 15. | 2 | DB408 | 529' |
| 16. | 1 | DB408 | 510' |
| 17. | 1 | SHVLY 6810 FW RAD & MT | 458' |
| 18. | 1 | 15' WHIP (UNUSED) | 420' |
| 19. | 1 | 10' WHIP (UNUSED) | 420' |
| 20. | 1 | 5' OMNI ANTENNA | 348' |
| 21. | 1 | ICE SHIELD | 346' |
| 22. | 1 | (1)6' DIA.DISH (2700 MHZ) | 339' |
| 23. | 1 | **EXIST & PROPOSED EQUIPMENT** | 315' |
| 24. | 2 | BEACONS | 302' |
| 25. | 1 | ICE SHIELD | 166' |
| 26. | 1 | (1)8' DIA. DISH-RADOME | 160' |
| 27. | 1 | 15' WHIP (UNUSED) | 102' |
| 28. | 1 | ASGP952 ANTENNA (UNUSED) | 100' |
| 29. | 1 | GPS ANTENNA | 75' |
| 30. | 1 | EQUIPMENT | 200' |




TOWER TYPE: G-12
STD: EIA/TIA-222-F
LOAD CASE(S)
85 MPH BASIC WIND SPEED WITH NO ICE
39 MPH BASIC WIND SPEED WITH 1" BASIC RADIAL ICE THICKNESS

## LINEAR APPURTENANCES

(1) ELEV.RAILS,CABLES,COND.
(1) 16-3/4"LADDER-3/4"VERTICAL
(1) CABLE TYPE SAFETY DEVICE
(1) 1-1/2 CONDUIT
(1) 7/8" AIR HELIAX
(2) 7/8" AIR HELIAX
(1) 1-1/2 CONDUIT
(1) 6-1/8 COAX
(1) 1-1/2 CONDUIT
(1) 1" CONDUIT
(1) WR1150
(2) 1-1/2 CONDUIT
(1) 1-5/8" AIR HELIAX
(1) 4-1/16" COAX
(1) 7/8" AIR HELIAX
(1) 3-1/8 COAX
(1) 1-5/8" AIR HELIAX
(1) 1/2" AIR HELIAX
(1) 1-1/2 CONDUIT
(1) 1/2" AIR HELIAX
(1) 1/2" AIR HELIAX
(1) 1-1/2 CONDUIT
(2) EW63
(1) 7/8" AIR HELIAX
(2) 1-1/4 CONDUIT
(1) 4-1/16" COAX
(1) EW63
(1) EW63
(1) 1/2" CONTROL CABLE
(1) 1/2" CONTROL CABLE
(1) 7/8" AIR HELIAX
(1) 2-1/4" AIR HELIAX
(1) 1/2" AIR HELIAX
(1) 1" CONDUIT
(3) 1-1/4" HYBRIFLEX
(1) FIBER CABLE
(6)7/8" AIR HELIAX
(6) 7/8" AIR HELIAX (PROPOSED)


Stainless LLC
100 West Main Street, Suite 400
Lansdale, PA 19446


GENERAL ARRANGEMENT

HAMDEN, CT



| REV | BY | DATE | REVISION DESCRIPTION | D.CK | DATE | E.CK | DATE |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |
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| PREPARED BY | AP | 3/10/2015 |
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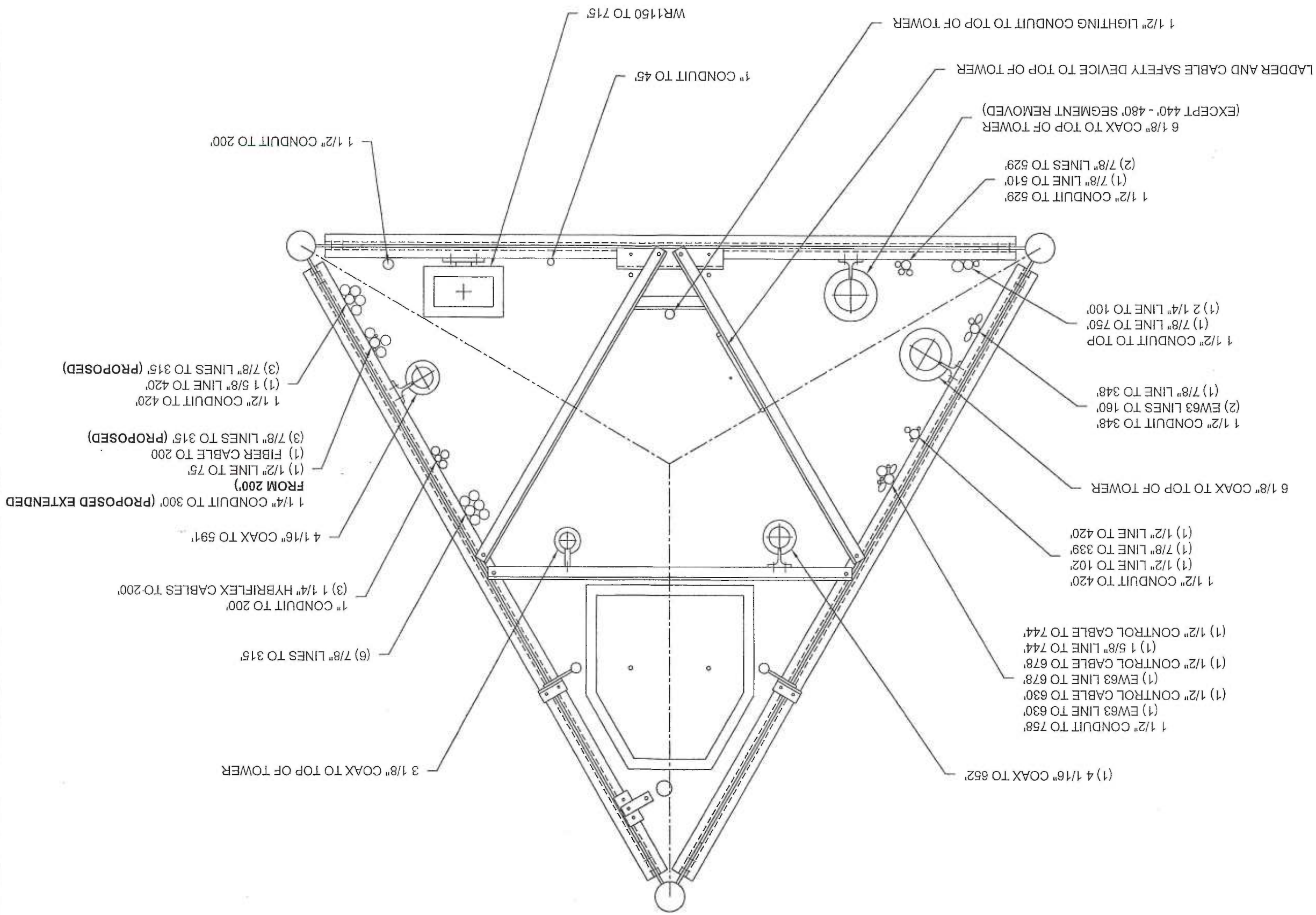
| ENGINEER REVIEW | | |
| PROJECT NUMBER | 362016 | |
| DRAWING NUMBER | A-1 | |

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Lansdale, PA 19446

LINEAR APPURTENANCES
HAMDEN, CT



| REV | BY | DATE | REVISION DESCRIPTION | D.CK | DATE | E.CK | DATE |
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| DRAWING NUMBER | A-2 |
| PROJECT NUMBER | 362016 |
| ENGINEER REVIEW | |
| CHECKED BY | |
| PREPARED BY | AP |
| | 3/10/2015 |

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100 West Main Street, Suite 400
Lansdale, PA 19446

# DESIGN DRAWINGS
## 101 TALMADGE ROAD, HAMDEN, CT

## INDEX


| DESCRIPTION | DWG | REV | DATE |
|---|---|---|---|
| GENERAL ARRANGEMENT | D01.00 | A | 1/26/2015 |
| GENERAL NOTES | D01.01 | A | 1/26/2015 |
| GENERAL NOTES | D01.02 | A | 1/26/2015 |
| TOWER PROFILE | D04.00 | A | 1/26/2015 |
| LINEAR APPURTENANCES | D05.00 | A | 1/26/2015 |
| DIAGONAL REPLACEMENT | D05.01 | A | 1/26/2015 |
| SUB-BRACING DETAILS | D05.02 | A | 1/26/2015 |


| Rev | Description | Drawn by | Date | Checked by | Date | Reviewed by | Date | Approved by | Date |
|---|---|---|---|---|---|---|---|---|---|
| A | Rev.D01.00-D01.02,D04.00,D05.00-D05.02. | GH | 1/26/2015 | AG | 1/26/15 | GH | 1/26/15 | AP | 1/26/15 |
| -- | Initial Release | GH | 12/19/2014 | RE | 12/22/2014 | GH | 12/22/2014 | AP | 12/29/2014 |

Project No.: 362015

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1. The tower is a guyed, triangular, non-insulated, open face structure.

2. The tower was analyzed per Stainless LLC Report 362014, Revision B, dated 12/17/2014. It was analyzed in accordance with ANSI/EIA/TIA 222-F for the following parameters to support equipment as listed below:

   - 85 mph basic wind speed with no ice
   - 39 mph basic wind speed with 1" uniform ice thickness

   a. One (1) top mounted stacked antenna system consisting of one (1) top Dielectric TCL-12A8(S) antenna, Ch. 8, fed by one (1) 6-1/8" rigid coax, on top of one (1) bottom Dielectric THP-O-2-1 antenna, Ch. 10 DTV, fed by one (1) 3-1/8" rigid coax. (NB: The remaining one of the two (2) 6-1/8" coaxes that originally fed the top stacked TCL antenna is now used to feed the Shively 6810-2R antenna, see below)
   b. One (1) 10' whip antenna at the 758' level, fed by one (1) 1-5/8" heliax shared with items d and e.
   c. One (1) 5' omni antenna at the 750' level, fed by one (1) 7/8" heliax.
   d. One (1) ENG Super Quad antenna at the 744' level, fed by one (1) 1-5/8" line shared with items b and e and by one (1) 1/2" control cable.
   e. One (1) Allen Telcom DB408 antenna at the 742' level, fed by one (1) 1-5/8" line shared with items b and d.
   f. One (1) Dielectric TFU-31E/V-R(S) antenna, Ch. 59, at the 715' level, fed by one (1) WR1150 waveguide.
   g. One (1) ice shield at the 681' level.
   h. One (1) Andrew PL6-65 6' diameter dish antenna with radome at the 678' level, fed by one (1) EW63 and one (1) 1/2" control cable.
   i. One (1) Dielectric TFU 16DSB-B(C) antenna, Ch. 39 DTV, at the 652' level, fed by one (1) 4-1/16" rigid coax.
   j. One (1) Andrew PL6-65 6' diameter dish antenna with radome at the 630' level, fed by one (1) EW63 and one (1) 1/2" control cable.
   k. One (1) Shively 6015-2/3R FM antenna at the 591' level, fed by one (1) 4-1/16" line.
   l. Two (2) Allen Telcom DB408 antennas at the 529' level, fed by one (1) 7/8" line to each.
   m. One (1) Allen Telcom DB408 antenna at the 510' level, fed by one (1) 7/8" line.
   n. One (1) Shively 6810-2R 2-bay FM antenna at the 458' level, fed by one (1) existing 6-1/8" rigid coax. (NB: This coax was cut at the 440' – 480' level and a 20' length of 3" heliax was used to connect the 6-1/8" rigid coax to the antenna. The remaining length of the 6-1/8" coax from 480' to the top of tower was left in place)
   o. One (1) unused 15' whip antenna at the 420' level, fed by one (1) 1/2" line.
   p. One (1) unused 10' whip antenna at the 420' level, fed by one (1) 1-5/8" line.
   q. One (1) 5' omni antenna at the 348' level, fed by one (1) 7/8" heliax.
   r. One (1) ice shield at the 346' level.
   s. One (1) 6' grid dish at the 339' level, fed by one (1) 7/8" line.
   t. Three (3) EMS FR90-17-02-DP antennas, three (3) proposed LNX-6515DS-VTM antennas and three (3) DDB2 TMA units on sector mounts at the 315' level, fed by six (6) 7/8" lines and six (6) 7/8" proposed lines.
   u. Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) RFS APXVTM14-C-120 panel antennas, three (3) TD-RRH8x20 RRU units and six (6) RRHs on three (3) sector mounts at the 200' level, fed by three (3) 1-1/4" Hybriflex cables and one (1) fiber cable.
   v. One (1) ice shield at the 166' level.
   w. One (1) Andrew 8' dish with radome at the 160' level, fed by two (2) EW63 waveguides.
   x. One (1) unused 15' whip antenna at the 102' level, fed by one (1) 1/2" line.
   y. One (1) unused ASPG952 antenna at the 100' level, fed by one (1) 2-1/4" line.
   z. One (1) GPS antenna at the 75' level, fed by one (1) 1/2" line.
   aa. One (1) 1-1/2" support conduit each to the 348', 2 x 420', 529', 758' levels, and to top of tower.
   bb. One (1) 1-1/4" support conduits to the 315' level (proposed extended from the 200' level) and one (1) 1-1/4" conduit to 200'.
   cc. One (1) inside climbing ladder with cable type safety device for the full height of the tower.
   dd. One (1) single car elevator with guide rails, cables, motor and elevator equipment.
   ee. One (1) red lighting system with circuits within one (1) 1" conduit to the 45' level, and one (1) 1-1/2" conduit for the full height of the tower.

3. In order for the tower to achieve a basic wind speed of 85 mph with no ice and 39 mph with 1" uniform ice thickness in accordance with ANSI/EIA/TIA 222-F, the following modifications are required:
   a. Install additional horizontal sub-bracing at the midpoints of the following bays:

| Location | No. of bays |
|---|---|
| 583.8' – 591.3' | 1 |

   b. Replace existing diagonal braces with new, higher capacity members at the following bays:

| Location | No. of bays |
|---|---|
| 613.8' – 621.3' | 1 |

4. The design of the tower modifications above has been based upon Stainless LLC Report 362014 Revision B dated 12/17/2014. The details contained within this design drawing package are included for information and are not intended to be used as shop or final fabrication drawings. The Contractor shall field verify all dimensions, elevations and existing site conditions and notify Stainless LLC immediately of any site discrepancies or variances. Contractor shall not scale dimensions from the design drawings. It shall be the responsibility of the Contractor to ensure proper fit-up of the tower modification materials.

5. All work shown on this design drawing package shall be performed by qualified contractor (s) with a minimum of 5 years experience in tower and foundation construction.

6. All fabricated elements shall be in accordance with the notes, specifications and drawings. All deviations and substitutions must be approved by a registered Professional Engineer in the state where the work is being done and submitted to Stainless LLC for approval prior to installation. The Contractor shall furnish satisfactory evidence as to the kind and quality of the materials and equipment being substituted. Contractor shall also be responsible for obtaining all necessary permits, licenses and any other requirements for the construction. Submit all necessary calculations for substitutions.

7. Contractor shall observe safe construction practices and shall be responsible for all methods of construction, including proper and adequate bracing to the tower and excavation work during the installation process. Adequately designed temporary support shall be installed before any tower member is removed and replaced. All means and methods of construction, including construction and soil pressure loads, shall be properly calculated and documented by the Contractor.

8. If the construction activities require a rigging plan per the requirements of ANSI/TIA-1019-A, a rigging plan shall be developed by a qualified engineer, submitted to the Owner for review and implemented by a competent rigger. A properly detailed rigging plan shall include, as a minimum, a review of the following:

   - Operational and non-operational construction loads.
   - Equipment used, and Supporting Structure
   - Construction sequence and durations

| | | |
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| PREPARED BY | GH | 12/19/14 |
| CHECKED BY | RE | 12/22/14 |
| ENGINEER REVIEW | AP | 12/29/14 |
| PROJECT NUMBER | 362015 | |
| DRAWING NUMBER | D01.01 | |

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GENERAL NOTES

HAMDEN, CT

9. Stainless LLC assumes no responsibility for the structural adequacy of the tower if non-conforming modification materials are supplied and/or installed by others, and shall have no liability whatsoever to owner or to others for any work performed by any persons other than Stainless LLC in connection with the implementation of any structural changes or modifications not specifically addressed within this design drawing package. Owner acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by owner shall be solely responsible to owner and to others for the quality of work performed by them and that Stainless LLC shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by such rigger, erector or subcontractor.

10. The modification drawings contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

    a. Proper alignment and plumbness.
    b. Correct guy tensions and bolt tightness.
    c. No significant deterioration or damage to any component.

## APPLICABLE CODES AND STANDARDS

Use latest editions of the following Codes and Standards unless noted otherwise.

1. ANSI/TIA-222-G Structural Standards for Antenna Supporting Structures and Antennas including Addenda 1 & 2.
2. ANSI/TIA-1019-A Standard for Installation, Alteration and Maintenance of Antenna Supporting Structures and Antennas.
3. AISC Manual of Steel Construction.
4. RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts.
5. ASTM A36 Standard Specification for Carbon Structural Steel.
6. ASTM A572 Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
7. ASTM A586 Standard Specification for Zinc-Coated Parallel and Helical Wire Structural Strand.
8. ASTM A325 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
9. ASTM A194 Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both.
10. ASTM F436 Standard Specification for Hardened Steel Washers.
11. ASTM A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and products.
12. ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
13. ASTM A780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

## STRUCTURAL STEEL

1. The fabrication and erection of structural steel shall conform to the AISC Manual of Steel Construction.
2. Connections are not fully detailed on these plans and shall be detailed by the steel fabricator in accordance with the AISC Manual of Steel Construction. Connections and connecting elements shall develop the strength capacities as indicated on the design drawings.
3. Hot-dip galvanize all items unless otherwise noted, after fabrication in accordance with ASTM A123 and/or ASTM A153.
4. Repair all damaged or uncoated areas of galvanized coatings in accordance with ASTM A780.
5. Locking ANCO style nuts shall be installed on all bolts unless noted otherwise.
6. ASTM A325 bolts shall not be reused.
7. All A325 high strength bolts shall be tightened by the "snug tightening" method as specified in the RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts unless noted otherwise on the design drawings.
8. Material grades shall be as follows:
    a. Plates and angles – A36
    b. Diagonal tension rods – A572 Grade 50
    c. Bolts – A325X

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| PREPARED BY | GH 12/19/14 |
| CHECKED BY | RE 12/22/14 |
| ENGINEER REVIEW | AP 12/29/14 |
| PROJECT NUMBER | 362015 |
| DRAWING NUMBER | D01.02 |

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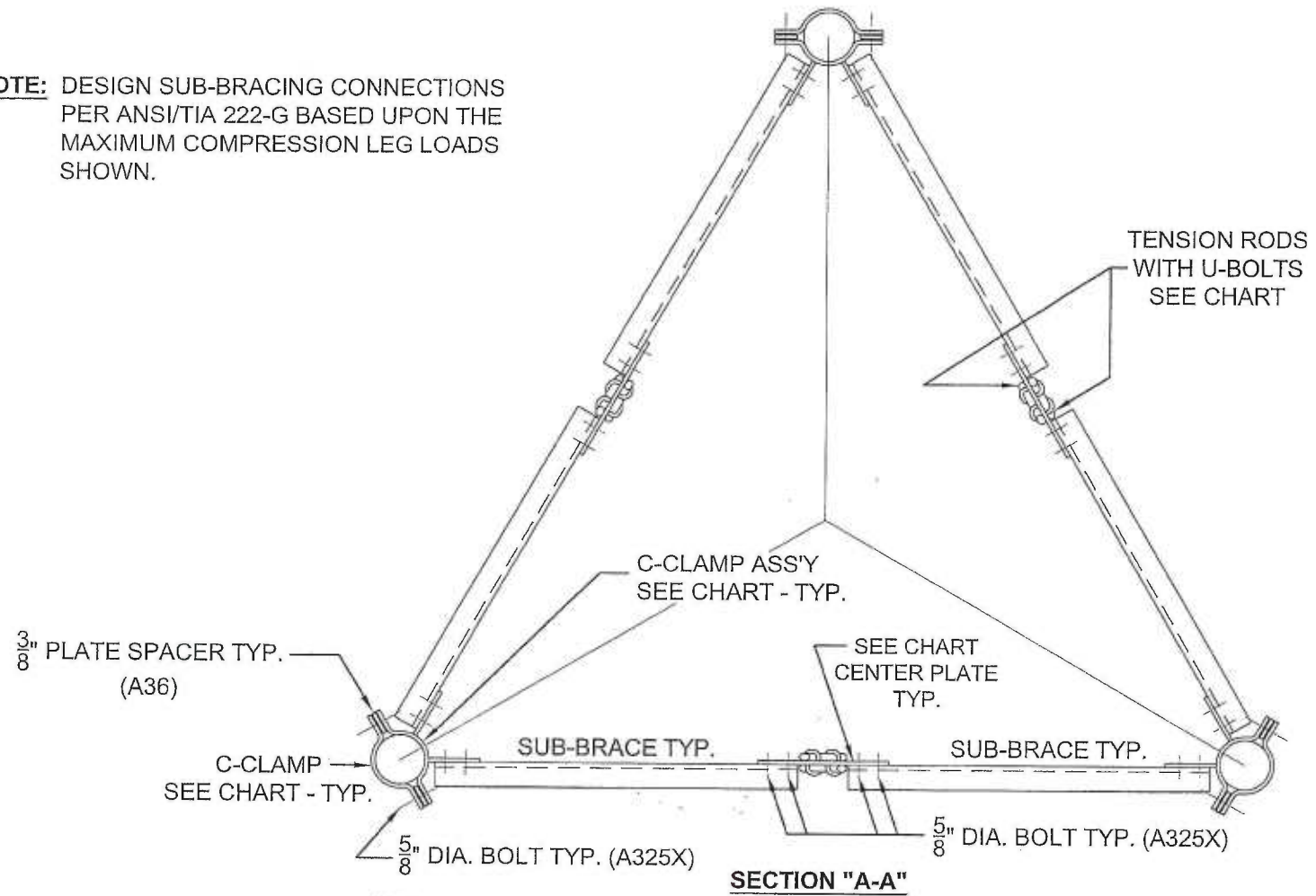
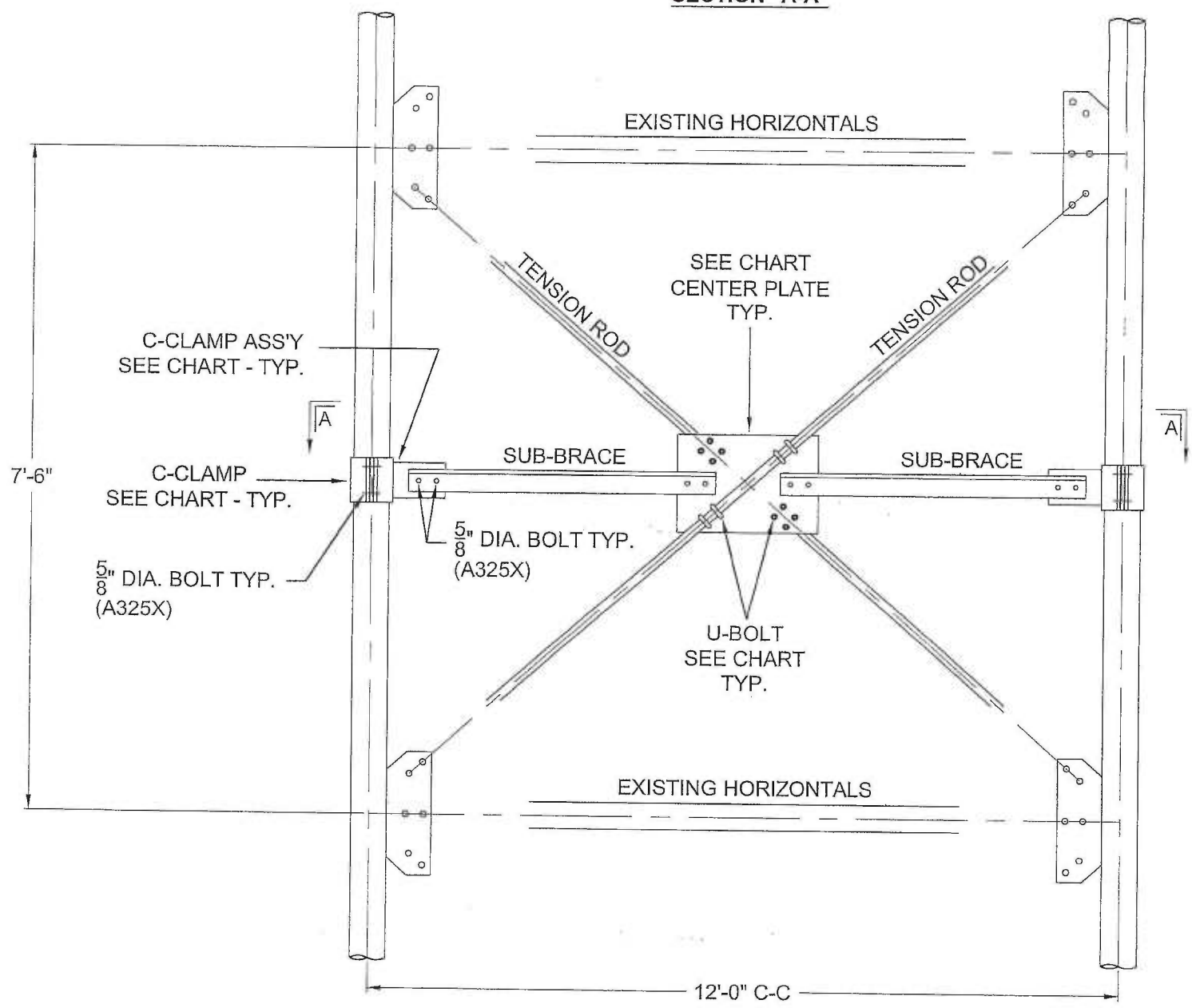
GENERAL NOTES
HAMDEN, CT

| ELEVATIONS | # BAYS | LEG Ø | C-CLAMP ASS'Y | C-CLAMP | CENTER PLATE | U-BOLT | SUB-BRACE SIZE | MAX. FACTORED COMPRESSION LEG LOADS |
|---|---|---|---|---|---|---|---|---|
| 583.8' - 591.3' | 1 | 4" | $\frac{3}{8}$" PLATE (A36) | $\frac{3}{8}$" PLATE (A36) | $\frac{3}{8}$" PLATE (A36) | $\frac{3}{8}$" DIA. (A307) | L 3 x 3 x 1/4 (A36) | 263.0 KIPS |

**NOTE:** DESIGN SUB-BRACING CONNECTIONS PER ANSI/TIA 222-G BASED UPON THE MAXIMUM COMPRESSION LEG LOADS SHOWN.




**SECTION "A-A"**




**ELEVATION**

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SUB-BRACING DETAILS
HAMDEN, CT



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| PREPARED BY | GH | 12/19/14 |
| CHECKED BY | RE | 12/22/14 |
| ENGINEER REVIEW | AP | 12/29/14 |
| PROJECT NUMBER | 362015 | |
| DRAWING NUMBER | D05.02 | |

# EXHIBIT C

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: CT11474A

WTNH Hamden
101 Talmadge Road
Hamden, CT 06518

**March 25, 2015**

**EBI Project Number: 6215001745**

| Site Compliance Summary | |
|---|---|
| Compliance Status: | COMPLIANT |
| Site total MPE% of FCC general public allowable limit: | 3.95 % |

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March 25, 2015

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

Emissions Analysis for Site: **CT11474A – WTNH Hamden**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **101 Talmadge Road, Hamden, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **101 Talmadge Road, Hamden, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

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

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

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

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

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

7) The antennas used in this modeling are the **RFS APXV18-206517S-C-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APXV18-206517S-C-A20** has a maximum gain of **16.7 dBd** at its main lobe. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **315 feet** above ground level (AGL).

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

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

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## T-Mobile Site Inventory and Power Data

| Sector: | A | Sector: | B | Sector: | C |
|---|---|---|---|---|---|
| Antenna #: | 1 | Antenna #: | 1 | Antenna #: | 1 |
| Make / Model: | RFS APXV18-206517S-C-A20 | Make / Model: | RFS APXV18-206517S-C-A20 | Make / Model: | RFS APXV18-206517S-C-A20 |
| Gain: | 16.7 dBd | Gain: | 16.7 dBd | Gain: | 16.7 dBd |
| Height (AGL): | 315 | Height (AGL): | 315 | Height (AGL): | 315 |
| Frequency Bands | 1900 MHz(PCS) / 2100 MHz (AWS) | Frequency Bands | 1900 MHz(PCS) / 2100 MHz (AWS) | Frequency Bands | 1900 MHz(PCS) / 2100 MHz (AWS) |
| Channel Count | 6 | Channel Count | 6 | # PCS Channels: | 6 |
| Total TX Power: | 240 | Total TX Power: | 240 | # AWS Channels: | 240 |
| ERP (W): | 11,225.64 | ERP (W): | 11,225.64 | ERP (W): | 11,225.64 |
| Antenna A1 MPE% | 0.42 | Antenna B1 MPE% | 0.42 | Antenna C1 MPE% | 0.42 |
| Antenna #: | 2 | Antenna #: | 2 | Antenna #: | 2 |
| Make / Model: | Commscope LNX-6515DS-VTM | Make / Model: | Commscope LNX-6515DS-VTM | Make / Model: | Commscope LNX-6515DS-VTM |
| Gain: | 14.6 dBd | Gain: | 14.6 dBd | Gain: | 14.6 dBd |
| Height (AGL): | 315 | Height (AGL): | 315 | Height (AGL): | 315 |
| Frequency Bands | 700 MHz | Frequency Bands | 700 MHz | Frequency Bands | 700 MHz |
| Channel Count | 1 | Channel Count | 1 | Channel Count | 1 |
| Total TX Power: | 30 | Total TX Power: | 30 | Total TX Power: | 30 |
| ERP (W): | 865.21 | ERP (W): | 865.21 | ERP (W): | 865.21 |
| Antenna A2 MPE% | 0.07 | Antenna B2 MPE% | 0.07 | Antenna C2 MPE% | 0.07 |

| Site Composite MPE% | |
|---|---|
| **Carrier** | **MPE%** |
| T-Mobile | **1.48** |
| Sprint | 2.47 % |
| **Site Total MPE %:** | **3.95 %** |

| | |
|---|---|
| T-Mobile Sector 1 Total: | 0.49 % |
| T-Mobile Sector 2 Total: | 0.49 % |
| T-Mobile Sector 3 Total: | 0.49 % |
| | |
| Site Total: | 3.95 % |

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## Summary

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

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

| T-Mobile Sector | Power Density Value (%) |
|---|---|
| Sector 1: | 0.49 % |
| Sector 2: | 0.49 % |
| Sector 3 : | 0.49 % |
| T-Mobile Total: | 1.48 % |
| | |
| Site Total: | 3.95 % |
| | |
| Site Compliance Status: | **COMPLIANT** |

The anticipated composite MPE value for this site assuming all carriers present is **3.95%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

**EBI Consulting**
21 B Street
Burlington, MA 01803