COHEN and WOLF P.C.
ATTORNEYS AT LAW

**RACHEL A. SCHWARTZMAN**

Please Reply To: Bridgeport
Writer's Direct Dial: (203) 337-4110
E-Mail: rschwartzman@cohenandwolf.com

August 29, 2014

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

**Re: Notice of Exempt Modification**
**Siemon Company/T-Mobile co-location**
**T-Mobile Site ID CTNH354A**
**27 Siemon Company Drive, Watertown, 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 Siemon Company owns the existing smokestack telecommunications tower and related facility at 27 Siemon Company Drive, Watertown, CT (-73.11166/41.60338). T-Mobile intends to replace 3 existing antennas with 3 new antennas and related equipment at this existing telecommunications facility in Watertown ("Watertown 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 Town Manager, Charles Frigon, and the property owner, Siemon Company.

The existing Watertown Facility consists of a 135- foot smokestack tower.[1] T-Mobile plans to replace 3 existing antennas on antenna mounts and pipe masts with 3 new antennas on new mounting pipes and new pipe masts[2] at a centerline of 123 feet. (See the plans revised to August 5, 2014 attached hereto as **Exhibit A**). T-Mobile will also install a remote radio unit on a unistrut. The existing Watertown Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated August 11, 2014, and attached hereto as **Exhibit B**.

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

---

[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 notice of intent captioned TS-T-MOBILE-153-060207.

[2] The structural analysis indicates that the pipe mast will be swapped out with new longer pipe masts to accommodate the new larger antennas (Exhibit B, p. 4).

The planned modifications to the Watertown 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 123 feet; the replacement antennas will be installed at the same 123-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 3 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 replacement antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated August 25, 2014. T-Mobile's operations would add 8.66% 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 22.98% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as **Exhibit C.**

For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Watertown 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,

Rachel Schwartzman

Rachel A. Schwartzman, Esq.

cc: Town Manager Charles Frigon, Town of Watertown
Siemon Company
Jamie Ford, EBI Consulting

1115 Broad Street
P.O. Box 1821
Bridgeport, CT 06601-1821
Tel: (203) 368-0211
Fax: (203) 394-9901

158 Deer Hill Avenue
Danbury, CT 06810
Tel: (203) 792-2771
Fax: (203) 791-8149

320 Post Road West
Westport, CT 06880
Tel: (203) 222-1034
Fax: (203) 227-1373

657 Orange Center Road
Orange, CT 06477
Tel: (203) 298-4066
Fax: (203) 298-4068

# EXHIBIT A

# SITE NAME: CTNH354/SIEMON CO DRIVE
# 27 SIEMON COMPANY DRIVE
## WATERTOWN, CT 06795
## LITCHFIELD COUNTY

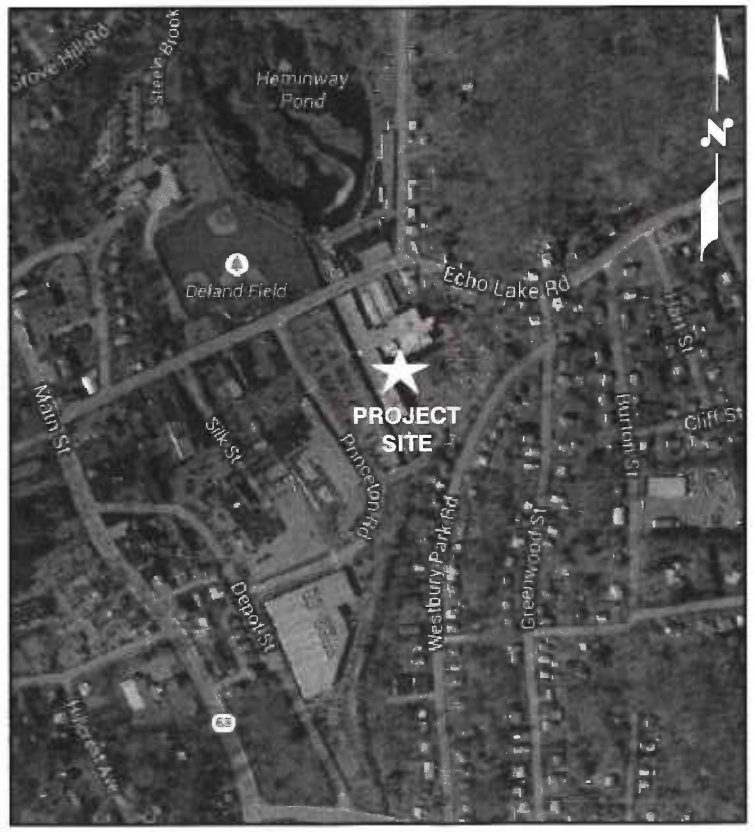
# SITE NUMBER: CTNH354A
# L700 - 704BU CONFIGURATION

## GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

## SPECIAL STRUCTURAL NOTES

1. STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY HUDSON DESIGN ON BEHALF OF T-MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING TOWER PLATFORM, EXISTING ANTENNA MOUNTS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T-MOBILE MODERNIZATION EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.
2. HUDSON DESIGN ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES




## PROJECT INFORMATION

| | |
|---|---|
| SCOPE OF WORK: | UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION |
| ZONING JURISDICTION: | BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW). |
| SITE ADDRESS: | 27 SIEMON COMPANY DRIVE<br>WATERTOWN, CT 06795 |
| LATITUDE: | 41° 36' 12.168" N |
| LONGITUDE: | -73° 6' 41.976" W |
| JURISDICTION: | NATIONAL, STATE & LOCAL CODES OR ORDINANCES |
| CURRENT USE: | TELECOMMUNICATIONS FACILITY |
| PROPOSED USE: | TELECOMMUNICATIONS FACILITY |

## T-MOBILE TECHNICIAN SITE SAFETY NOTES

| LOCATION | SPECIAL RESTRICTIONS |
|---|---|
| SECTOR A: | ACCESS NOT PERMITTED |
| SECTOR B: | ACCESS NOT PERMITTED |
| SECTOR C: | ACCESS NOT PERMITTED |
| GPS/LMU: | UNRESTRICTED |
| RADIO CABINETS: | UNRESTRICTED |
| PPC DISCONNECT: | UNRESTRICTED |
| MAIN CIRCUIT D/C: | UNRESTRICTED |
| NIU/T DEMARC: | UNRESTRICTED |
| OTHER/SPECIAL: | NONE |

CALL
BEFORE YOU DIG
CALL TOLL FREE 800-922-4455
OR CALL 811
UNDERGROUND SERVICE ALERT

## DRAWING INDEX

| | | REV |
|---|---|---|
| T-1 | TITLE SHEET | 0 |
| GN-1 | GENERAL NOTES | 0 |
| A-1 | COMPOUND PLAN & ELEVATION | 0 |
| A-2 | EXISTING & PROPOSED EQUIPMENT PLANS | 0 |
| A-3 | ANTENNA PLANS AND DETAILS | 0 |
| G-1 | GROUNDING DETAILS | 0 |


**T-MOBILE NORTHEAST LLC**
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX: (201) 684-0066

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586


STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED
PROFESSIONAL ENGINEER

**APPROVALS**

| | |
|---|---|
| CONSTRUCTION | DATE |
| RF ENGINEERING | DATE |
| ZONING/SITE ACQ. | DATE |
| OPERATIONS | DATE |
| TOWER OWNER | DATE |
| PROJECT NO: | CTNH354A |
| DRAWN BY: | AS |
| CHECKED BY: | DR |

| | | |
|---|---|---|
| 0 | 08/05/14 | ISSUED FOR REVIEW |

**SITE NUMBER: CTNH354A**
**SITE NAME: CTNH354/ SIEMON CO DRIVE**
27 SIEMON COMPANY DRIVE
WATERTOWN, CT 06795
LITCHFIELD COUNTY

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

## GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

## GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – TRANSCEND WIRELESS
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

   BUILDING CODE: IBC 2003 W/ 2005 CT SUPPLEMENT + 2009 AMENDMENT
   ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
   LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

   AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

   AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

   MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION;

   TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

   ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

## ABBREVIATIONS

| | | | | | |
|---|---|---|---|---|---|
| AGL | ABOVE GRADE LEVEL | G.C. | GENERAL CONTRACTOR | RF | RADIO FREQUENCY |
| AWG | AMERICAN WIRE GAUGE | MGB | MASTER GROUND BUS | | |
| BCW | BARE COPPER WIRE | MIN | MINIMUM | TBD | TO BE DETERMINED |
| BTS | BASE TRANSCEIVER STATION | PROPOSED | NEW | TBR | TO BE REMOVED |
| EXISTING | EXISTING | N.T.S. | NOT TO SCALE | TBRR | TO BE REMOVED AND REPLACED |
| EG | EQUIPMENT GROUND | REF | REFERENCE | TYP | TYPICAL |
| EGR | EQUIPMENT GROUND RING | REQ | REQUIRED | | |


**T-MOBILE NORTHEAST LLC**
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586


STATE OF CONNECTICUT
DEREK J. CREASEY
No. 22561
LICENSED PROFESSIONAL ENGINEER

### APPROVALS

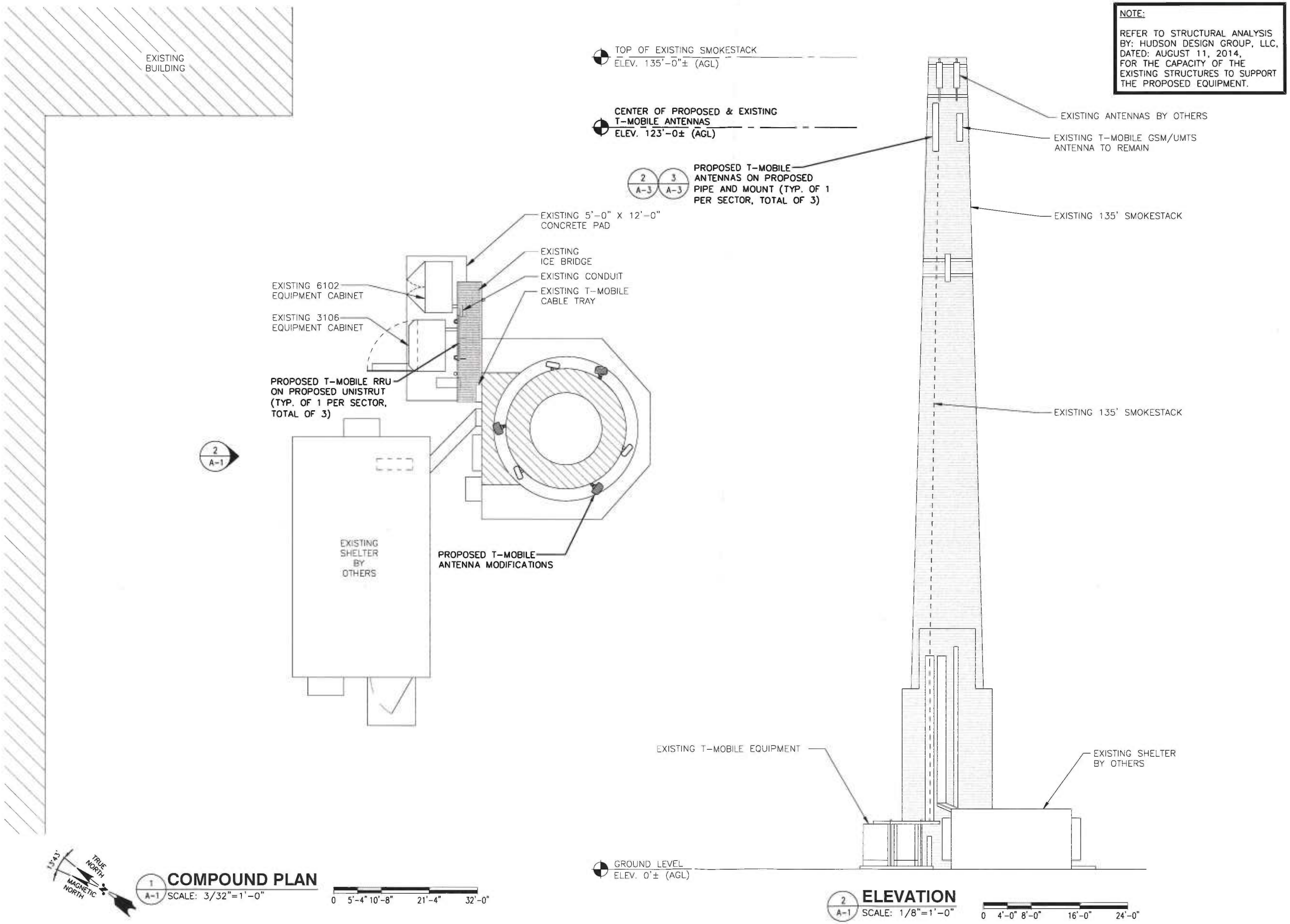
| | |
|---|---|
| CONSTRUCTION | DATE |
| RF ENGINEERING | DATE |
| ZONING/SITE ACQ. | DATE |
| OPERATIONS | DATE |
| TOWER OWNER | DATE |
| PROJECT NO: | CTNH354A |
| DRAWN BY: | AS |
| CHECKED BY: | DR |

| | | |
|---|---|---|
| 0 | 08/05/14 | ISSUED FOR REVIEW |

**SITE NUMBER: CTNH354A**
**SITE NAME: CTNH354/ SIEMON CO DRIVE**
27 SIEMON COMPANY DRIVE
WATERTOWN, CT 06795
LITCHFIELD COUNTY

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1




NOTE:

REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: AUGUST 11, 2014, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

**L700 - 704BU CONFIGURATION**


**T-MOBILE NORTHEAST LLC**

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless

TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Group LLC

1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586


STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

**APPROVALS**

| | |
|---|---|
| CONSTRUCTION | DATE |
| RF ENGINEERING | DATE |
| ZONING/SITE ACQ. | DATE |
| OPERATIONS | DATE |
| TOWER OWNER | DATE |
| PROJECT NO: | CTNH354A |
| DRAWN BY: | AS |
| CHECKED BY: | DR |

| | | |
|---|---|---|
| 0 | 08/05/14 | ISSUED FOR REVIEW |

**SITE NUMBER: CTNH354A**
**SITE NAME: CTNH354/ SIEMON CO DRIVE**

27 SIEMON COMPANY DRIVE
WATERTOWN, CT 06795
LITCHFIELD COUNTY

SHEET TITLE

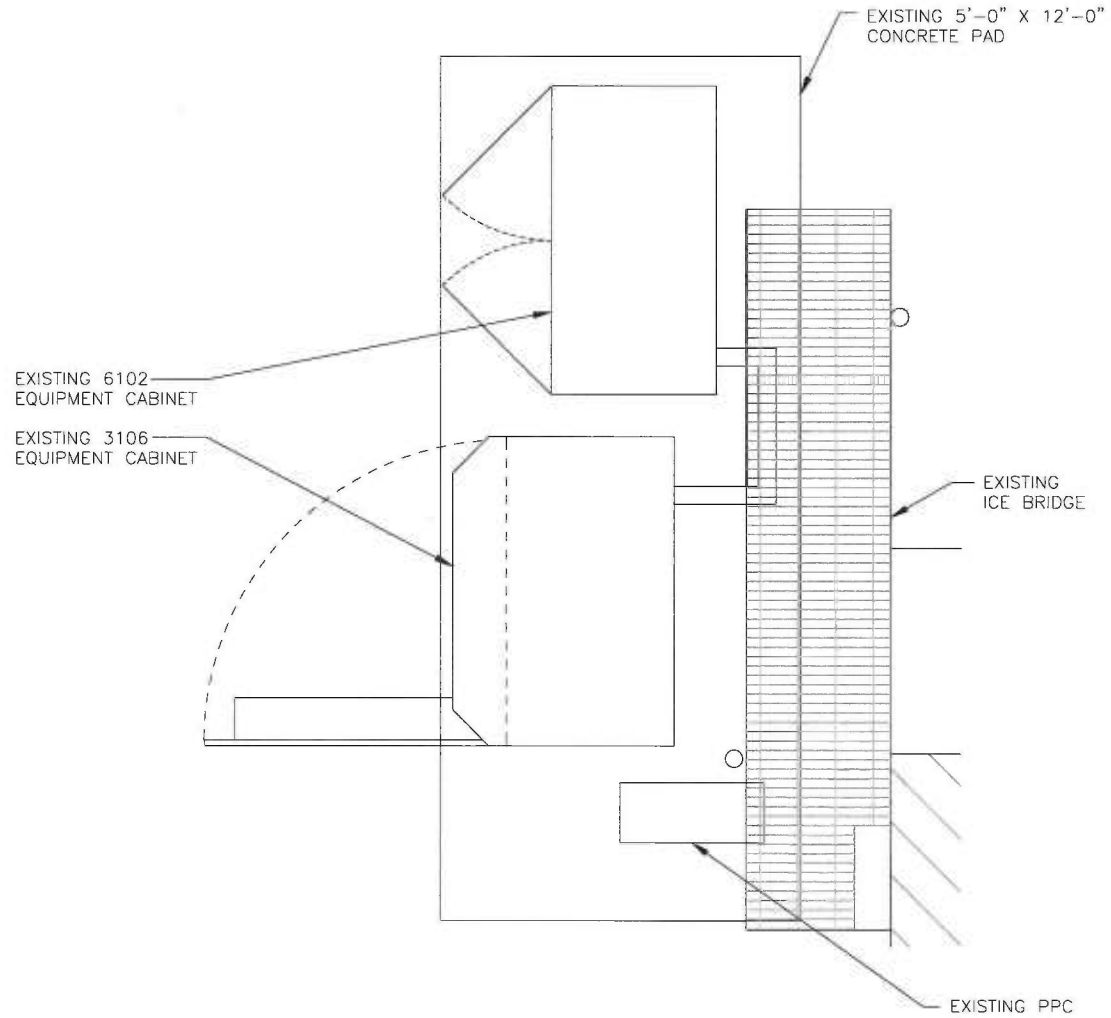
COMPOUND PLAN & ELEVATION

SHEET NUMBER

A-1

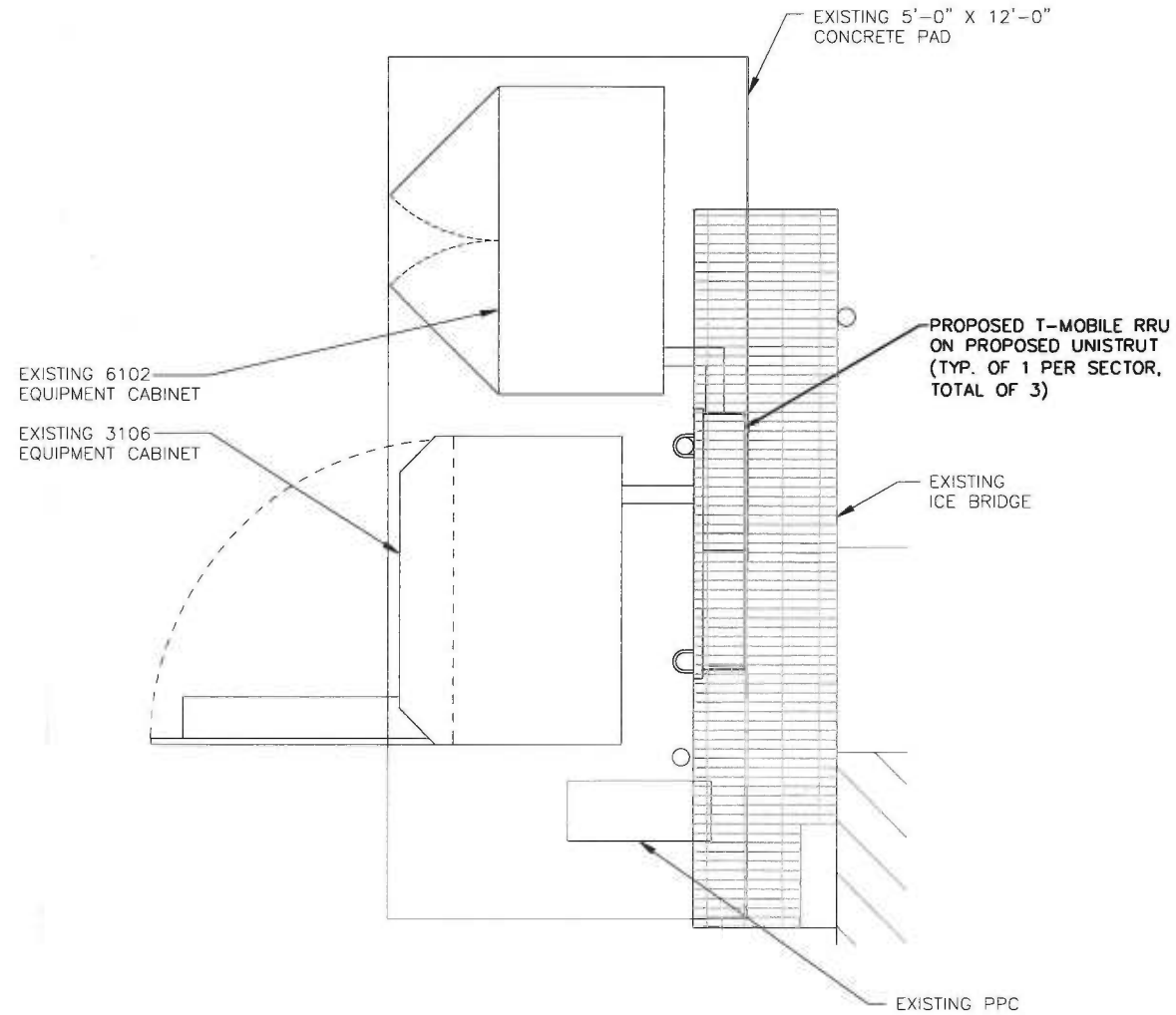
NOTE:

REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: AUGUST 11, 2014, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.




1 A-2 **EXISTING EQUIPMENT PLAN**
SCALE: 3/4"=1'-0"

0 0'-8" 1'-4" 2'-8" 4'-0"




2 A-2 **PROPOSED EQUIPMENT PLAN**
SCALE: 3/4"=1'-0"

0 0'-8" 1'-4" 2'-8" 4'-0"


**T-MOBILE NORTHEAST LLC**

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

*Transcend Wireless*

TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Group LLC

1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586


STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED PROFESSIONAL ENGINEER

**APPROVALS**

| | |
|---|---|
| CONSTRUCTION | DATE |
| RF ENGINEERING | DATE |
| ZONING/SITE ACQ. | DATE |
| OPERATIONS | DATE |
| TOWER OWNER | DATE |
| PROJECT NO: | CTNH354A |
| DRAWN BY: | AS |
| CHECKED BY: | DR |

| | | |
|---|---|---|
| 0 | 08/05/14 | ISSUED FOR REVIEW |

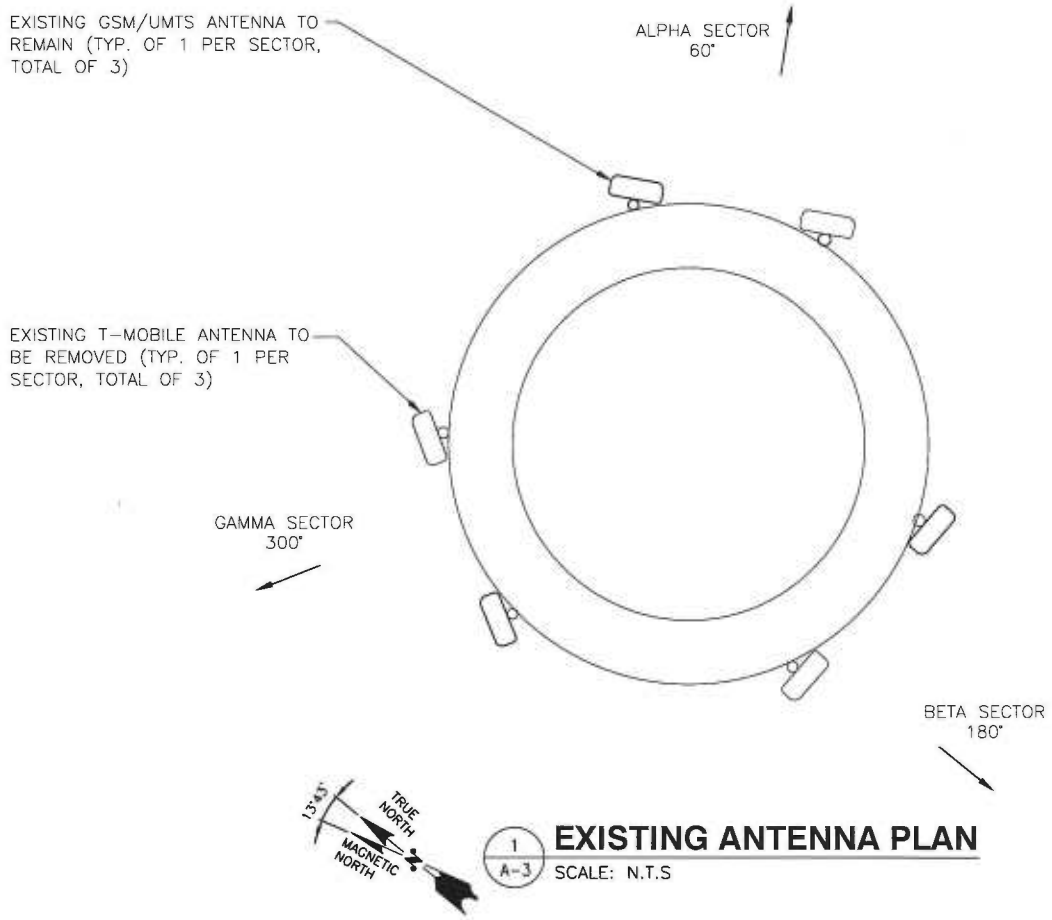
**SITE NUMBER: CTNH354A**
**SITE NAME: CTNH354/ SIEMON CO DRIVE**
27 SIEMON COMPANY DRIVE
WATERTOWN, CT 06795
LITCHFIELD COUNTY

SHEET TITLE

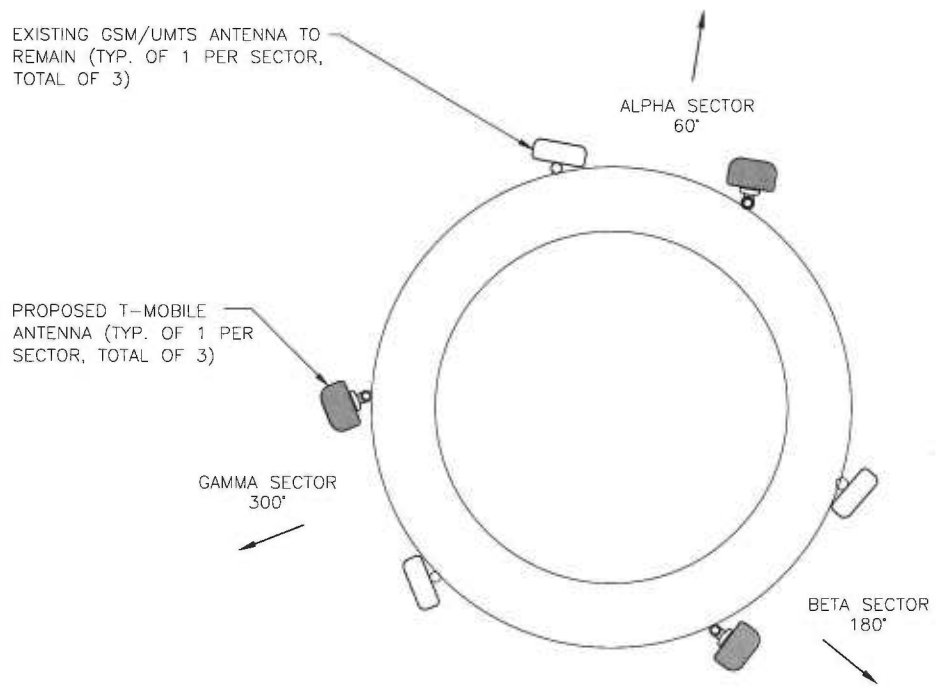
EXISTING & PROPOSED EQUIPMENT PLANS

SHEET NUMBER

A-2




1 A-3 **EXISTING ANTENNA PLAN**
SCALE: N.T.S




2 A-3 **PROPOSED ANTENNA PLAN**
SCALE: N.T.S

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

## EXISTING ANTENNA SCHEDULE (TO BE REMOVED)

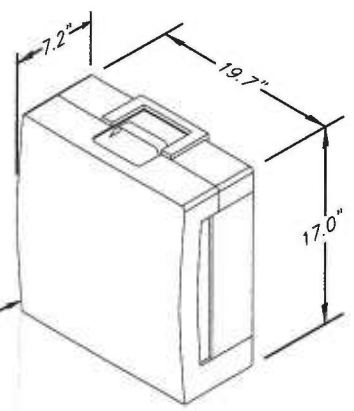
| SECTOR | MAKE | MODEL# | SIZE (INCHES) |
|---|---|---|---|
| ALPHA: | RFS | APX16PV-16PVL | 53x13x5.1 |
| BETA: | RFS | APX16PV-16PVL | 53X13X5.1 |
| GAMMA: | RFS | APX16PV-16PVL | 53X13X5.1 |

## PROPOSED ANTENNA SCHEDULE

| SECTOR | MAKE | MODEL# | SIZE (INCHES) |
|---|---|---|---|
| ALPHA: | COMMSCOPE | LNX-6515DS-VTM | 96.4x11.9x7.1 |
| BETA: | COMMSCOPE | LNX-6515DS-VTM | 96.4X11.9X7.1 |
| GAMMA: | COMMSCOPE | LNX-6515DS-VTM | 96.4X11.9X7.1 |

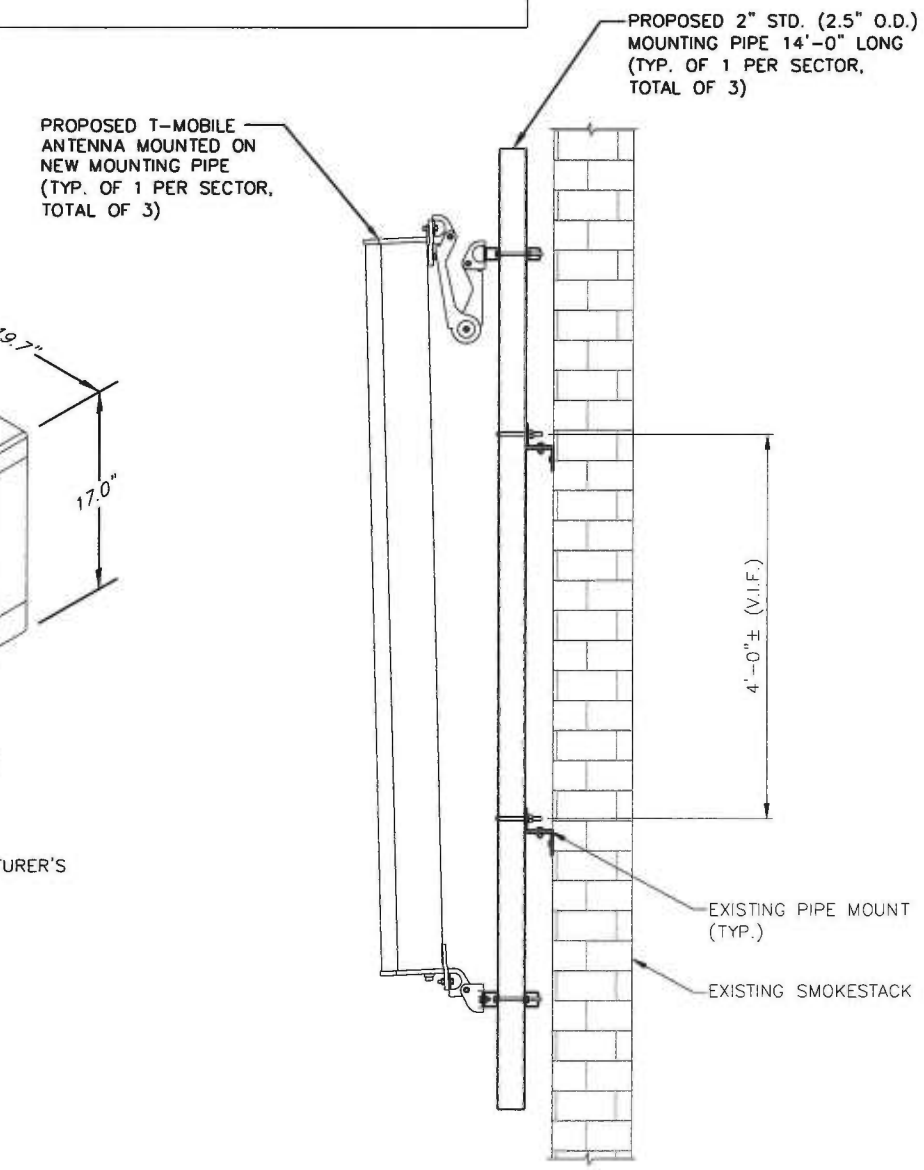
NOTE:

REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: AUGUST 11, 2014, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.




**RRU DETAIL**
SCALE: N.T.S.

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.




3 A-3 **ANTENNA MOUNT (TYP.)**
SCALE: N.T.S.

**T-MOBILE NORTHEAST LLC**
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASEY
No. 28451
LICENSED
PROFESSIONAL ENGINEER

**APPROVALS**

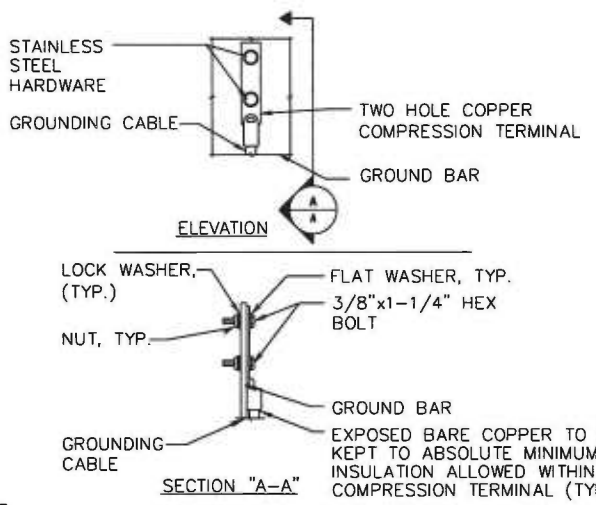
| | |
|---|---|
| CONSTRUCTION | DATE |
| RF ENGINEERING | DATE |
| ZONING/SITE ACQ. | DATE |
| OPERATIONS | DATE |
| TOWER OWNER | DATE |
| PROJECT NO: | CTNH354A |
| DRAWN BY: | AS |
| CHECKED BY: | DR |

| | | |
|---|---|---|
| 0 | 08/05/14 | ISSUED FOR REVIEW |

**SITE NUMBER: CTNH354A**
**SITE NAME: CTNH354/ SIEMON CO DRIVE**
27 SIEMON COMPANY DRIVE
WATERTOWN, CT 06795
LITCHFIELD COUNTY

SHEET TITLE
ANTENNA PLAN & DETAILS

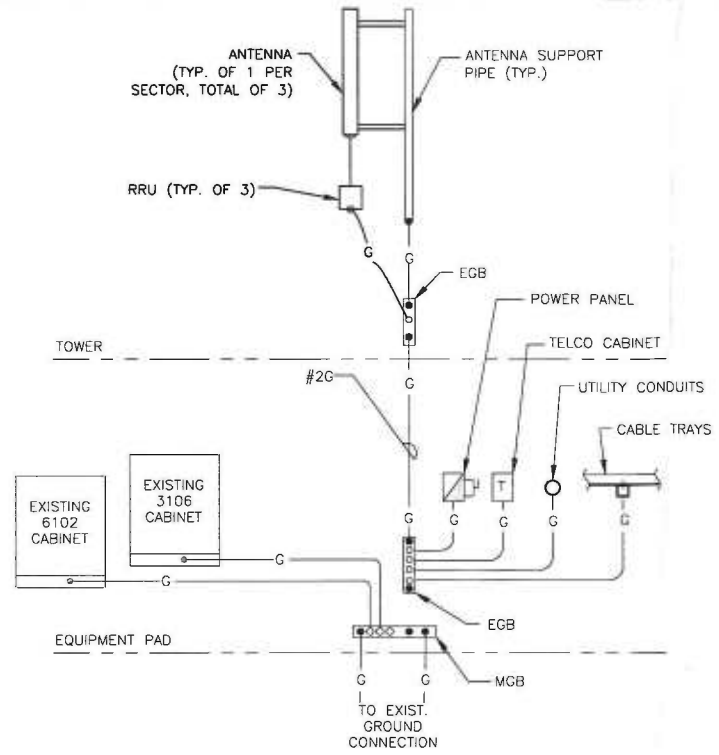
SHEET NUMBER
A-3




NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

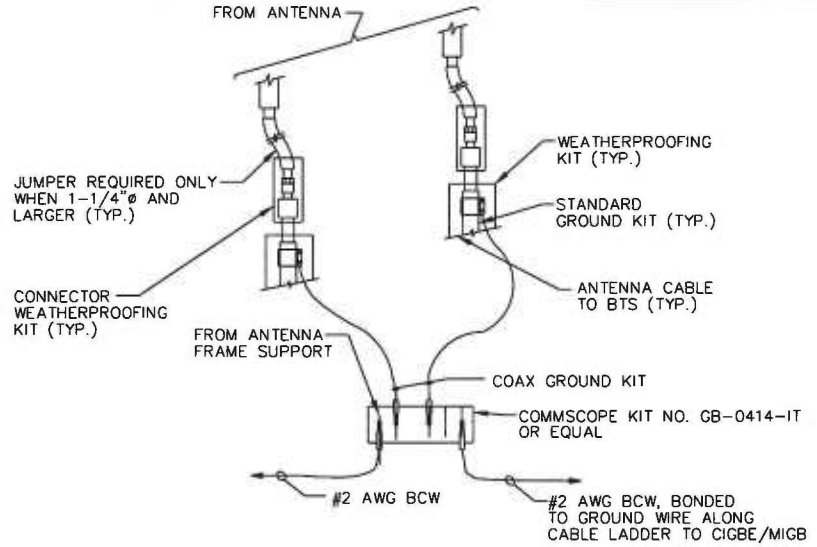
## TYPICAL GROUND BAR CONNECTION DETAIL

1 / G-1 N.T.S.




## GROUNDING RISER DIAGRAM

2 / G-1 N.T.S.




NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

## GROUND WIRE TO GROUND BAR CONNECTION DETAIL

3 / G-1 N.T.S.




NOTE:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

## ANTENNA CABLE GROUNDING

4 / G-1 N.T.S.




## PROPOSED H-FRAME

4 / G-1 N.T.S.


**T-MOBILE NORTHEAST LLC**

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless

TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX: (201) 684-0066

Hudson Design Group LLC

1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586


STATE OF CONNECTICUT — DEREK J. CREASER — No. 20531 — LICENSED PROFESSIONAL ENGINEER

**APPROVALS**

| | |
|---|---|
| CONSTRUCTION | DATE |
| RF ENGINEERING | DATE |
| ZONING/SITE ACQ. | DATE |
| OPERATIONS | DATE |
| TOWER OWNER | DATE |
| PROJECT NO: | CTNH354A |
| DRAWN BY: | AS |
| CHECKED BY: | DR |

| | | |
|---|---|---|
| 0 | 08/05/14 | ISSUED FOR REVIEW |

**SITE NUMBER: CTNH354A**
**SITE NAME: CTNH354/ SIEMON CO DRIVE**
27 SIEMON COMPANY DRIVE
WATERTOWN, CT 06795
LITCHFIELD COUNTY

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-1

# EXHIBIT B

# STRUCTURAL ANALYSIS REPORT

For

## CTNH354A

CTNH354 / SIEMON CO DRIVE

27 Siemon Company Drive
Watertown, CT 06795

## Antennas Mounted on Pipe Masts Secured to Face of Smokestack; Equipment on Concrete Slab on Grade

**Prepared for:**

Transcend Wireless

T-Mobile

**Dated: August 11, 2014**

**Prepared by:**


Hudson Design Group LLC

1600 Osgood Street Building 20 North, Suite 3090
North Andover, MA 01845
Phone: (978) 557-5553
www.hudsondesigngroupllc.com

Hudson Design Group LLC

## SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Transcend Wireless to conduct a structural evaluation of the structure supporting the proposed T-Mobile equipment located in the areas depicted in the latest HDG's construction drawings.

This report represents this office's findings, conclusions and recommendations pertaining to the support of T-Mobile's proposed equipment.

## CONCLUSION SUMMARY:

Smokestack plans were not available and could not be obtained for our use. Construction drawings and a structural analysis report prepared by Bay State Design dated February 2009 were obtained for our reference.

A limited visual survey of the structure was completed in or near the areas of the proposed work. Based on our evaluation, we have determined that the proposed antennas **ARE CAPABLE** of being supported by the smoke stack structure.

## APPURTENANCE/EQUIPMENT CONFIGURATION:

**(3) SBNHH-1D65C Antennas (96"x11.9"x7.1" – Wt. = 50 lbs /each) (One per sector)**

**(3) RRUS-11 RRH's (19.7"x17"x7.2") (Wt. = 50.7 lbs. /each) (One per sector)**

Referenced documents are attached.

Hudson Design Group LLC

**DESIGN CRITERIA:**

1. International Building Code 2003 with 2005 Connecticut Supplement with 2009 Amendments; ASCE 7-05 Minimum Design Loads for Buildings and Other Structures.

   Wind Analysis:

   | | | |
   |---|---|---|
   | Reference Wind Speed: | 95 mph | (includes 3-second gust) |
   | | 78 mph | (fastest mile) |
   | Category: | B | |

   Roof:

   | | | |
   |---|---|---|
   | Ground Snow, Pg: | 35 psf | (Connecticut Supplement) |

2. EIA/TIA -222- F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

   | | |
   |---|---|
   | City/Town: | Watertown |
   | County: | Litchfield |
   | Wind Load: | 80 mph (Basic Wind Speed) |
   | Nominal Ice Thickness: | 3/4 inch |

3. Approximate height above grade to the center of the antennas:

   123'-0"+/-

Hudson Design Group LLC

## ANTENNA SUPPORT RECOMMENDATIONS:

The three new antennas are proposed to be mounted on the existing antenna mounts that will become empty upon the removal of three of the existing antennas. The existing pipe masts will need to be swapped out with new longer pipe masts to accommodate the new larger antennas.

## RRH SUPPORT RECOMMENDATIONS:

The new RRH's are proposed to be mounted on a new H-frame secured to the existing concrete slab on grade with epoxy anchors.

Limitations and assumptions:

1. Reference the latest HDG construction drawings for all the equipment location details.
2. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
3. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements and specifications.
5. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified as soon as possible.
6. The smoke stack has been inspected annually to confirm that its brick components are free from damage at this time.
7. HDG loading is based on the antenna loading/attachment to the smoke stack. In order to complete the analysis on the smoke stack HDG requires the geometry of the smoke stack structure (i.e. as built plans / mapping report).

**EXISTING ANTENNAS:**

**Photo 1:** Sample photo illustrating the existing T-Mobile antennas.

**Photo 2:** Sample photo illustrating the connection of the T-Mobile antennas to the face of the smokestack.

Hudson Design Group LLC

# Calculations

| | | | |
|---|---|---|---|
| **Site Name:** | CTNH354 / Siemon Co Drive | | |
| **Site No.** | CTNH354A | | |
| **Done by:** | GH | **Checked by:** | MSC |
| **Date:** | 8/11/2014 | | |

*References:*

* Structural Standards for Steel Antenna Towers and Antenna Supporting Structures (TIA/EIA-222-F).

*Material Reference Notes:*

### 2.3.1 Wind and Ice Loads

The total design wind load shall include the sum of the horizontal forces applied to the structure in the direction of the wind and the design wind load on guys and discrete appurtenances.

Ice loading, depending on tower height, elevation, and exposure, may be a significant load on the structure in most parts of the United States. If the structure is to be located where ice accumulation is expected, consideration shall be given to an ice load when specifying the requirements for the structure.

### 2.3.2 Horizontal Force Applied to each Section of the Structure

$$F=q_z*G_H\,[C_F*A_E+\sum(C_A*A_A)]$$ (Not to exceed $2*q_z*G_H*A_G$)

where $A_G$ = Gross area of one tower face ($ft^2$)

### 2.3.3 Velocity Pressure ($q_z$) and Exposure Coefficient ($K_Z$)

$q_z=.00256*K_Z*V^2$ V=Basic Wind Speed for the Structure Location (mph)

$K_Z=(z/33)^{2/7}$ z=Ht. above avg. ground level to midpoint of section (ft.)

$1.00 \le K_Z \le 2.58$ $A_E$=effective projected area of structural components in one face

### 2.3.4 Gust Response Factors ($G_H$)

*2.3.4.1* For latticed structures , gust response factor ($G_H$) shall be calculated from the equation:

$G_H=0.65+0.60/(h/33)^{1/7}$ (h in (ft.)) $1.0 < G_H < 1.25$

*2.3.4.2* For Tubular pole structures, the gust response factor ($G_H$) shall be 1.69

*2.3.4.3* One gust response factor shall apply for the entire structure.

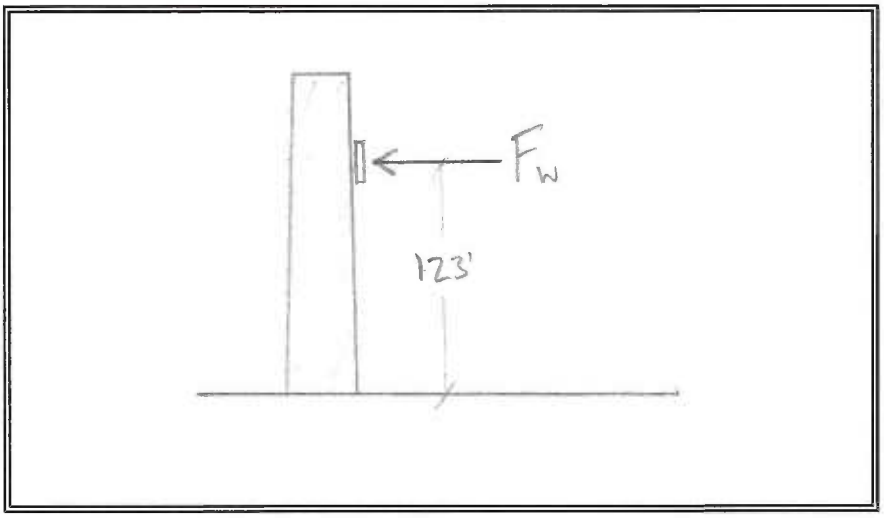
*2.3.4.4* When Cantilevered tubular or latticed pole structures are mounted on latticed structures, the gust response factor the the pole and the latticed structure shall be based on the height of the latticed structure without the pole. The stresses calculated for the pole structures and their connections to latticed structures shall be multiplied by 1.25 to compensate for the greater gust response for the mounted pole structures.

### 2.3.5 Structure Force Coefficients (Reference Table 1)

**Site Name:** CTNH354 / Siemon Co Drive
**Site No.** CTNH354A
**Done by:** GH **Checked by:** MSC
**Date:** 8/11/2014

Hudson Design Group LLC

**Wind Analysis**




V= **80** (mph)
z= **123** (ft)

$K_z$= **1.46**

**Velocity Pressure:** **qz= 23.86 psf** [2.3.3]

Is member analyzing a tube pole structure? If yes, then: Gh= 1.69

If no, then use value below:
Gh= 1.15 [2.3.4.1]

Gh= 1.69

**Determine Cf:**

If lattice structure see manual...

If cantilevered tube pole, then: Use Correct Value from Table 1 Below:

**TABLE 1**
*Coefficients (Cf) for Cantilevered Tubular Pole Structures*

| C (mph ft) | Round | 16 Sided r<0.26 | 16 Sided r≥0.26 | 12 Sides | 8 Sided |
|---|---|---|---|---|---|
| <32 | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| 32 to 64 | $130/C^{1.3}$ | 1.78+1.40r-C/91.5-Cr/22.9 | .72+(64-C)/44.8 | $12.5/C^{.6}$ | 1.2 |
| >64 | 0.59 | 1.08-1.40r | 0.72 | 1.03 | 1.2 |

**Derivation of Structure Coefficient (Cf):**

**Dp** = Avg. Diam. or Avg. Least width of Tubular Pole Structure: 0.25 feet

| | | | |
|---|---|---|---|
| **Site Name:** | CTNH354 / Siemon Co Drive | | |
| **Site No.** | CTNH354A | | |
| **Done by:** | GH | **Checked by:** | MSC |
| **Date:** | 8/11/2014 | | |

Hudson Design Group LLC

**$C = (K_z)^{1/2} * V * Dp$ (for Dp in ft [m]**

C= **24.14**

| C (mph ft) | Round Only Member |
|---|---|
| <32 | 1.2 |
| 32 < 64 | 2.07 |
| > 64 | 0.59 |

(Max Cf= 1.2)
(Min Cf= 0.59)

Cf= 1.2

**Determine Ae:** **[2.3.6]**

If tube structure, then use projected area including ice:
If not a tube structure, then see manual.

Ae= 2.96 sf

**Determine Ca:** **[2.3.7]**

**2.3.7** The force coefficient ($C_A$) applied to the projected area ($ft^2$) [$m^2$] of a linear appurtenance ($A_A$) not considered as a structural component shall be determined from Table 3. The force coefficient for cylindrical members may be applied to the additional projected area of radial ice when specified. (Refer to Figure 1.)

**TABLE 3**

**Appurtenance Force Coefficients**

| Member Type | Aspect Ratio ≤ 7 | Aspect Ratio ≥ 25 |
|---|---|---|
| | $C_A$ | $C_A$ |
| **Flat** | 1.4 | 2 |
| **Cylindrical** | 0.8 | 1.2 |

Aspect Ratio=Overall length/width ratio in plane normal to wind direction.
(Aspect ratio is not a function of the spacing between support points of a linear appurtenance, nor the section length considered to have a uniformly distributed force.)

Note: Linear interpolation may be used to aspect ratios other than shown

**2.3.8** Regardless of location, linear appurtenances not considered as structural components in accordance with 2.3.6.3 shall be included in the term $\Sigma C_A A_A$.

**2.3.9** The horizontal force (F) applied to a section of the structure may be assumed to be uniformly distributed based on the wind pressure at the mid-height of the section.

**Site Name:** CTNH354 / Siemon Co Drive
**Site No.** CTNH354A
**Done by:** GH **Checked by:** MSC
**Date:** 8/11/2014

Hudson Design Group LLC

| | Item #1 | Item #2 | Item #3 | Item #4 | Item #5 |
|---|---|---|---|---|---|
| Member Length (Inches): | 96 | 0 | 0 | 0 | 0 |
| Member Width (Inches): | 11.9 | 0 | 0 | 0 | 0 |
| Calculated Aspect Ratio: | 8 | #DIV/0! | #DIV/0! | #DIV/0! | #DIV/0! |
| From Table 3 Above: | | | | | |
| Ca= | 1.4 | 1.4 | 1.4 | 1.4 | 1.4 |

**Determine Aa: (sf)**

| | | Item #1 | Item #2 | Item #3 | Item #4 | Item #5 |
|---|---|---|---|---|---|---|
| From above: | Aa= | 7.93 | 0.00 | 0.00 | 0.00 | 0.00 |
| Calculated Ca*Aa: | | 11.11 | 0.00 | 0.00 | 0.00 | 0.00 |

**Calculated Sums of Ca*Aa:** 11.11 sf

**Antenna** Item 1 calculated force F: 448 lbs.

## ICE WEIGHT CALCULATIONS

Project: CTNH354A

Thickness of ice: 0.75 in.

**(P) Antenna**

| | | |
|---|---|---|
| Weight of ice based on total radial SF area: | | |
| Depth (in): | 7.1 | |
| height (in): | 96 | |
| Width (in): | 11.9 | |
| Total weight of ice on object: | | 89 pounds ice |
| Weight of object: | 50 pounds | |
| Combined weight of ice and object: | | 139 pounds |

**(P) Pipe**

| | | |
|---|---|---|
| Per foot weight of ice: | | |
| pipe weight per foot: | 3.66 | |
| pipe length (ft): | 8 | |
| diameter (in): | 2.38 | |
| Per foot weight of ice on object: | | 2 pounds ice /ft |
| Total weight of ice on object: | | 17 pounds |
| Total weight of pipe: | | 29 pounds |
| Combined weight of pipe and ice: | | 47 pounds |

*Density of ice used = 56 PCF

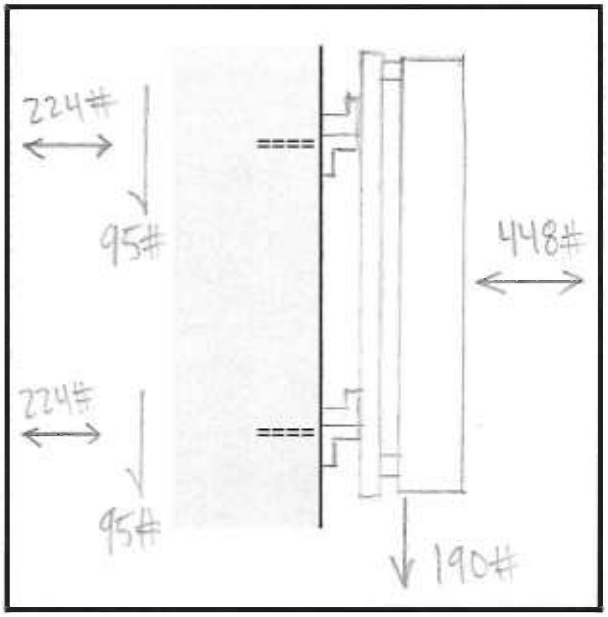
**Site Name:** CTNH354 / Siemon Co Drive
**Site No.** CTNH354A
**Done by:** GH **Checked by:** MSC
**Date:** 8/11/2014

Hudson Design Group LLC

## CHECK CONNECTION CAPACITY

**Reference:** Hilti HIT-HY 150 MAX Adhesive for Masonry

**Epoxy Type =** HIT-HY150
**Anchor Diameter =** 1/2 in.
**Embedment Depth =** 3-3/8 in. (Min.)




**Allowable Tensile Load =**
$F_{Tall}$ = 775 lbs.

**Allowable Shear Load =**
$F_{Vall}$ = 1375 lbs.

## WIND FORCES

**Reaction (Worst Case)** F = 224 lbs.

## GRAVITY LOADS

**Ice and Equipment** 190 lbs.

**No. of Supports =** 2
**No. of Anchors / Support =** 2

**Tension Design Load / Anchor =**
$f_t$ = 112.00 lbs. < 775 lbs. **Therefore, OK !**

**Shear Design Load / Anchor=**
$f_v$ = 47.50 lbs. < 1375 lbs. **Therefore, OK !**

## CHECK COMBINED TENSION AND SHEAR

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $f_t / F_T$ | + | $f_v / F_V$ | ≤ | 1.0 | | | |
| 0.145 | + | 0.035 | = | 0.179 | < | 1.0 | **Therefore, OK !** |

Hudson Design Group LLC

# Referenced Documents

# T··Mobile·

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

## CTNH354A
## SIEMON REALTY COMPANY
### 27 SIEMON COMPANY DRIVE
### (AKA 118 ECHO LAKE ROAD)
### WATERTOWN, CT 06795

**SITE TYPE: SMOKESTACK**

## 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 CONTRACT 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 LESSEE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING 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 ADDENDUMS 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 THE CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY CONSTRUCTION CONTROL SURVEYS, ESTABLISHING AND MAINTAINING ALL LINES AND GRADES REQUIRED TO CONSTRUCT ALL IMPROVEMENTS AS SHOWN HEREIN.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
12. 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.
13. 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 THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
14. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
15. THE CONTRACTOR SHALL NOTIFY THE LESSEE 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 LESSEE REPRESENTATIVE.
16. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
17. ALL UNDERGROUND UTILITY INFORMATION WAS DETERMINED FROM SURFACE INVESTIGATIONS AND EXISTING PLANS OF RECORD. THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES IN THE FIELD PRIOR TO ANY SITE WORK. CALL THE FOLLOWING FOR ALL PRE-CONSTRUCTION NOTIFICATION 72-HOURS PRIOR TO ANY EXCAVATION ACTIVITY: DIG SAFE SYSTEM (MA, ME, NH, RI, VT): 1-888-344-7233 CALL BEFORE YOU DIG (CT): 1-800-922-4455

## VICINITY MAP

N NO SCALE


## DO NOT SCALE DRAWINGS

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

## SHEET INDEX



## PROJECT SUMMARY

| | |
|---|---|
| SITE NUMBER: | CTNH354A |
| SITE NAME: | SIEMON REALTY COMPANY |
| SITE ADDRESS: | 27 SIEMON COMPANY DRIVE (AKA 118 ECHO LAKE ROAD) WATERTOWN, CT 06795 |
| CONSTRUCTION TYPE: | SMOKESTACK |
| PROPERTY OWNER: | 27 SIEMON COMPANY DRIVE (AKA 118 ECHO LAKE ROAD) WATERTOWN, CT 06795 |
| CONTACT NUMBER: | (860) 945-4383 |
| APPLICANT: | T-MOBILE 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 |


T··Mobile·
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 836-6393
Fax: (508) 835-6395

BAY STATE DESIGN
Bay State Design, Inc.
Architects - Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: 781-932-2487
Fax: 781-932-9771

ENGINEER


PROJECT NO: 2898.302
DRAWN BY: MK
CHECKED BY: KLB

SUBMITTALS

| REV | DATE | DESCRIPTION |
|---|---|---|
| REV 1 | 02-24-09 | PER COMMENTS |
| REV 0 | 02-09-09 | CONSTRUCTION |



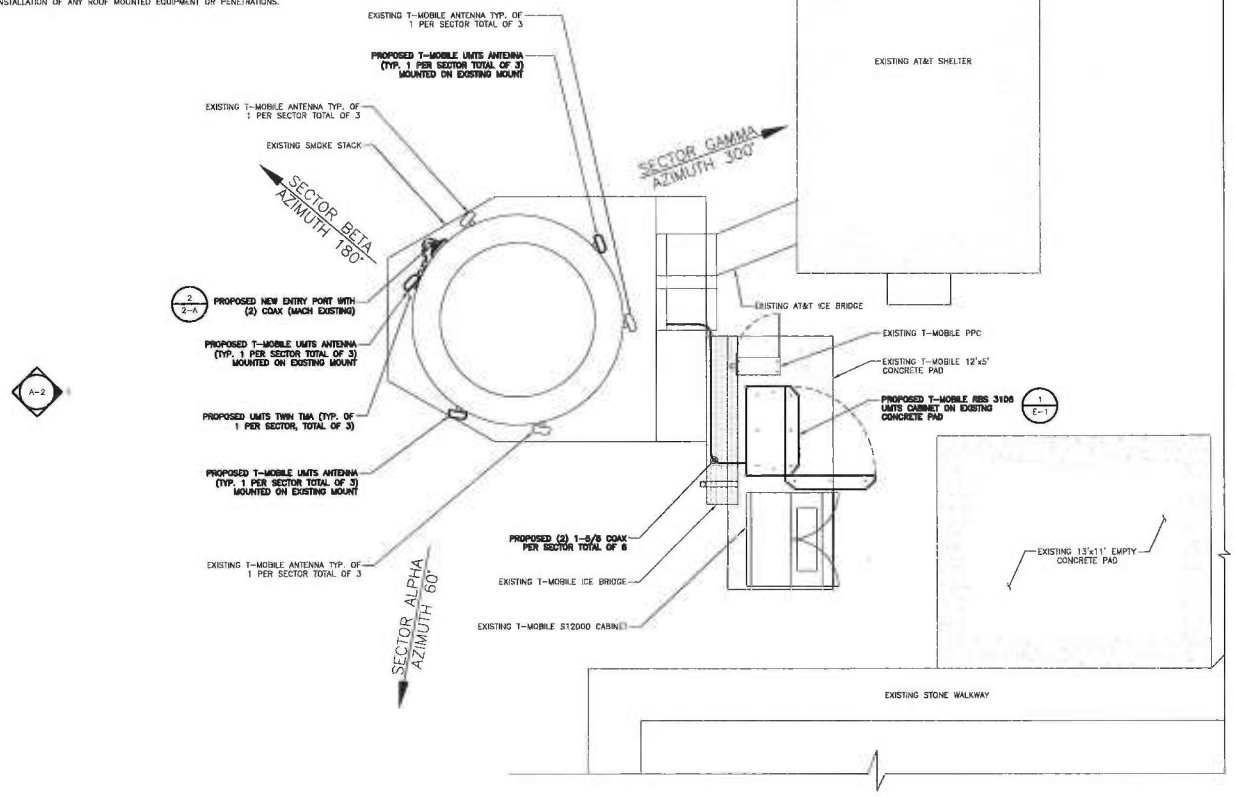
SITE
CTNH354A
SIEMON REALTY COMPANY
27 SIEMON COMPANY DRIVE
(AKA 118 ECHO LAKE ROAD)
WATERTOWN, CT 06795

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

## NOTES

1. ALL DIMENSIONS SHOWN THUS ± ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS WHICH EFFECT THE CONTRACTORS WORK. CONTRACTOR TO VERIFY ALL DIMENSIONS WITH OWNER PRIOR TO CONSTRUCTION.
2. NORTH ARROW SHOWN ON PLANS REFERS TO TRUE NORTH. CONTRACTOR SHALL VERIFY TRUE NORTH AND INFORM CONSTRUCTION MANAGER OF ANY DISCREPANCIES BEFORE STARTING CONSTRUCTION.
3. THE CONTRACTOR AND OR HIS SUB CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTRY OR LOCAL GOVERNMENT AUTHORITY.
4. ANTENNA INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES AND SUPPORT STRUCTURES.
5. COAXIAL CABLE CONNECTORS AND TRANSMITTER EQUIPMENT SHALL BE PROVIDED BY THE OWNER AND IS NOT INCLUDED IN THESE CONSTRUCTION DOCUMENTS. A SCHEDULE OF OWNER SUPPLIED MATERIALS IS ATTACHED TO THE BID DOCUMENTS (SEE ATTACHMENT K). ALL OTHER HARDWARE TO BE PROVIDED BY THE CONTRACTOR. CONNECTION HARDWARE SHALL BE STAINLESS STEEL.
6. ANTENNAS, SUPPORTS AND CABLE MOUNTS SHALL BE PAINTED TO MATCH EXISTING SURFACES TO WHICH IT IS ATTACHED. PAINT SHALL BE SHERWIN WILLIAMS, COROTHANE II, SURFACE PREPARATION AND APPLICATION SHALL BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS AND LESSEE/LICENSEE GUIDELINES.
7. COORDINATION, LAYOUT, AND FURNISHING OF CONDUIT, CABLE AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. PER FCC MANDATE, ENHANCED EMERGENCY (E911) SERVICE IS REQUIRED TO MEET NATIONWIDE STANDARDS FOR WIRELESS COMMUNICATIONS SYSTEMS. LESSEE/LICENSEE'S IMPLEMENTATION REQUIRES DEPLOYMENT OF EQUIPMENT AND ANTENNA GENERALLY DEPICTED ON THIS PLAN, ATTACHED TO OR MOUNTED IN CLOSE PROXIMITY TO THE BTS RADIO CABINETS. LESSEE RESERVES THE RIGHT TO MAKE REASONABLE MODIFICATIONS TO E911 EQUIPMENT AND LOCATION AS TECHNOLOGY EVOLVES TO MEET REQUIRED SPECIFICATIONS.
9. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE BUILDING OWNER'S ROOFING CONTRACTOR WHO WILL COMPLETE ALL WORK ASSOCIATED WITH THE ROOF. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE BUILDING OWNER'S ROOFING CONTRACTOR BEFORE INSTALLATION OF ANY ROOF MOUNTED EQUIPMENT OR PENETRATIONS.




COMPOUND LAYOUT PLAN (1)
SCALE: 3/8"=1'-0"

NORTH

0 1'-4" 2'-8" 5'-4"
SCALE: 3/8" = 1'-0"

**(P) = PROPOSED**
EXISTING = EXISTING

## ABBREVIATIONS

| | | | |
|---|---|---|---|
| ADJ | ADJUSTABLE | NTS | NOT TO SCALE |
| APPROX | APPROXIMATE | OC | ON CENTER |
| BTS | BASE TRANSMISSION STATION | OPP | OPPOSITE |
| C | CONDUIT | (P) | PROPOSED |
| CMU | CONCRETE MASONRY UNIT | SF | SQUARE FOOT |
| CONC | CONCRETE | SHT | SHEET |
| CONT | CONTINUOUS | SIM | SIMILAR |
| CJ | CONSTRUCTION JOINT | STL | STEEL |
| DIA | DIAMETER | TOC | TOP OF CONCRETE |
| DWG | DRAWING | TOM | TOP OF MASONRY |
| EGB | EQUIPMENT GROUND BAR | TYP | TYPICAL |
| EA | EACH | VIF | VERIFY IN FIELD |
| ELEC | ELECTRICAL | UON | UNLESS OTHERWISE NOTED |
| EL. | ELEVATION | WWF | WELDED WIRE FABRIC |
| EQ | EQUAL | W/ | WITH |
| EQUIP | EQUIPMENT | | |
| EXISTING | EXISTING | PCS | PERSONAL COMMUNICATIONS SERVICES |
| EXT | EXTERIOR | | |
| FF | FINISHED FLOOR | A-1 | ANTENNA MARK NO. |
| FG | FINISHED GRADE | | |
| GA | GAUGE | P. | PLATE |
| GALV | GALVANIZED | | |
| GC | GENERAL CONTRACTOR | & | AND |
| GWB | GYPSUM WALLBOARD | @ | AT |
| LG | LONG | | |
| LNA | LOW NOISE AMPLIFIER | | |
| MAX | MAXIMUM | | |
| MECH | MECHANICAL | | |
| MFR | MANUFACTURER | | |
| MGB | MASTER GROUND BAR | | |
| MIN | MINIMUM | | |
| MTL | METAL | | |
| NIC | NOT IN CONTRACT | | |

## SYMBOLS AND MATERIALS

| | | | |
|---|---|---|---|
| | NEW ANTENNA | | GROUT OR PLASTER |
| | EXISTING ANTENNAS | | GWB |
| | ASPHALT | | EXISTINGCONSTRUCTION |
| | NEW ACCESS EASEMENT | | CONCRETE |
| | CONCRETE | | EARTH |
| | ELECTRIC BOX | | GRAVEL |
| | LIGHT POLE | | PLYWOOD |
| | FND. MONUMENT | | SAND |
| | SPOT ELEVATION | | WOOD CONT. |
| | SET POINT | | WOOD BLOCKING |
| | REVISION | | STEEL |
| | GRID REFERENCE | | CENTER LINE |
| DET# SH# | DETAIL REFERENCE | | PROPERTY LINE |
| | | | STEPPED FOOTING |
| SH D | ELEVATION | | MATCH LINE |
| | | | WORK POINT |
| | | G | GROUND WIRE |
| DET# SH# | SECTIONS & DETAILS | | COAXIAL CABLE |
| | | | CHAIN LINK FENCE |
| 1 | WORK ITEM NOTE | | WATER MAIN |

NOTE:
CONTRACTOR TO IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE EXISTING SITE CONDITIONS AND THAT WHICH IS REPRESENTED HERE.


T-Mobile
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 535-5353
Fax: (508) 535-5395

BAY STATE DESIGN
Bay State Design, Inc.
Architects - Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: 781-932-2487
Fax: 781-932-9771

ENGINEER


PROJECT NO: 2898.302
DRAWN BY: MK
CHECKED BY: M.B

### SUBMITTALS

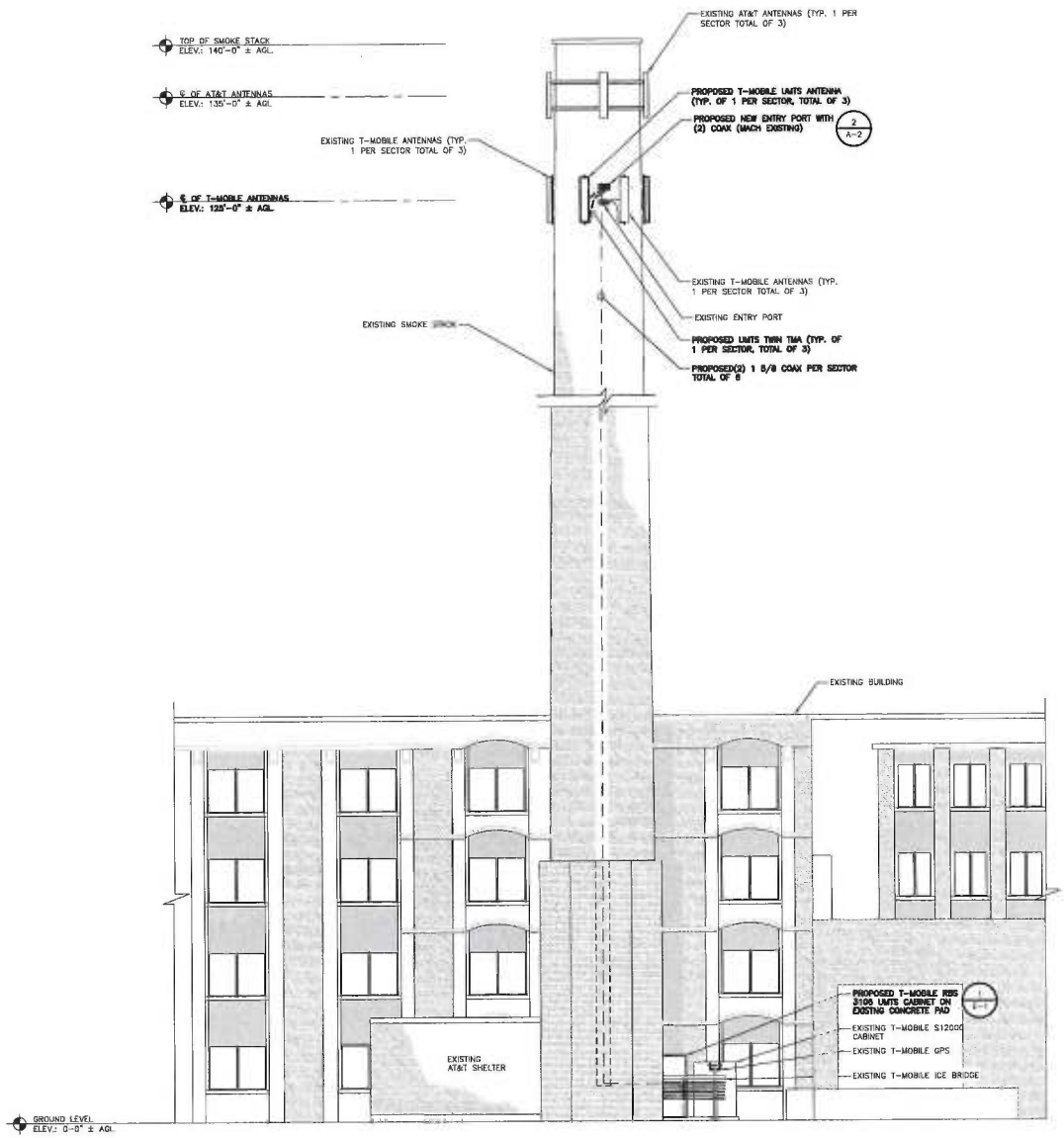
| | | |
|---|---|---|
| REV 1 | 02-24-09 | PER COMMENTS |
| REV 0 | 02-06-09 | CONSTRUCTION |



SITE
CTNH354A
SIEMON REALTY COMPANY
27 SIEMON COMPANY DRIVE
(AKA 118 ECHO LAKE ROAD)
WATERTOWN, CT 06795

SHEET TITLE
COMPOUND LAYOUT PLAN

SHEET NUMBER
A-1



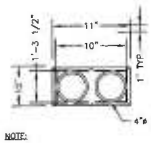

SOUTH EAST ELEVATION 1

SCALE: 3/16"=1'-0"

0 2'-8" 5'-4" 10'-8"

SCALE: 3/16" = 1'-0"

**(P) = PROPOSED**
EXISTING = EXISTING

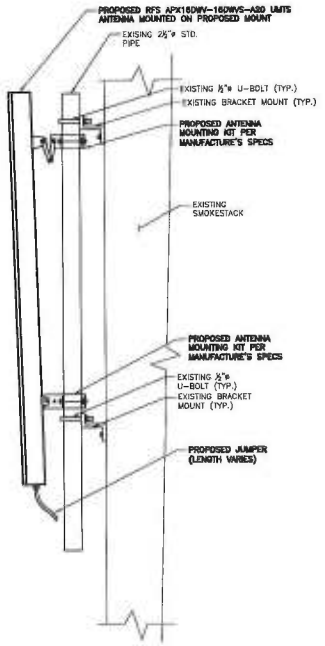



NOTE:

1. 2 HOLE CABLE PORT VALMONT P/N: B550
2. COAX BOOTS (6) VALMONT P/N: B535A

COAX ENTRY PORT DETAIL 2

SCALE: N.T.S.




ANTENNA MOUNTING DETAIL 3

SCALE: 1-1/2"=1'-0"

T··Mobile·
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-6363
Fax: (508) 936-6395

BAY STATE DESIGN
Bay State Design, Inc.
Architects · Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: 781-932-2447
Fax: 781-932-8771

ENGINEER

| | |
|---|---|
| PROJECT NO: | 2898.302 |
| DRAWN BY: | MK |
| CHECKED BY: | K.B |

SUBMITTALS

| | | |
|---|---|---|
| REV 1 | 02-24-09 | PER COMMENTS |
| REV 0 | 02-09-09 | CONSTRUCTION |



SITE
CTNH354A
SIEMON REALTY COMPANY
27 SIEMON COMPANY DRIVE
(AKA 118 ECHO LAKE ROAD)
WATERTOWN, CT 06795

SHEET TITLE
ELEVATION & DETAILS

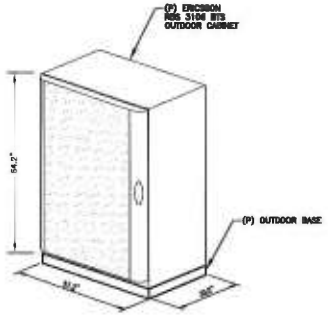
SHEET NUMBER
A-2

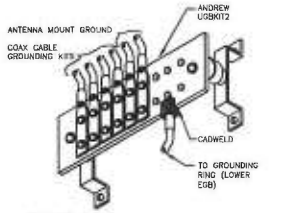
| ERICSSON OUTDOOR DIMENSIONS | |
|---|---|
| CABINET | DEPTH x WIDTH x HEIGHT |
| OUTDOOR RBS 3106 | x30.0"x51.2"x64.2" |
| OUTDOOR BASE | 30.0"x51.2"x3.00" |

| ERICSSON OUTDOOR WEIGHT & FLOOR LOADOUTG | | |
|---|---|---|
| CABINET | APPROX. MAX. WEIGHT | MAX. FLOOR LOADING |
| OUTDOOR RBS 3106 | 1874 LBS | |

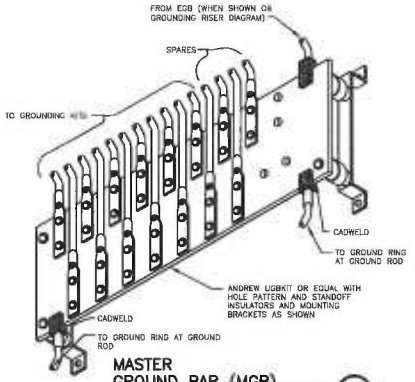
| ERICSSON OUTDOOR MINIMUM CLEARANCES | |
|---|---|
| DIRECTION | MINIMUM CLEARANCE |
| CABINET REAR AND WALL | 0" |
| CABINET SIDE AND WALL | 0" |
| ABOVE THE CABINET | 18" |
| IN FRONT OF THE CABINET | 40" |

EQUIPMENT CABINET (1)
SCALE: N.T.S.

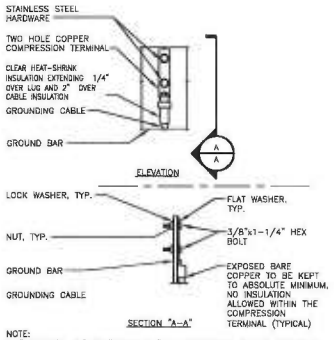



EQUIPMENT GROUND BAR (EGB) (2)
SCALE: N.T.S.



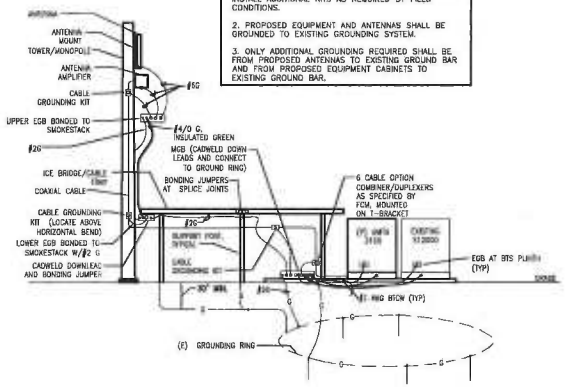

MASTER GROUND BAR (MGB) (3)
SCALE: N.T.S.



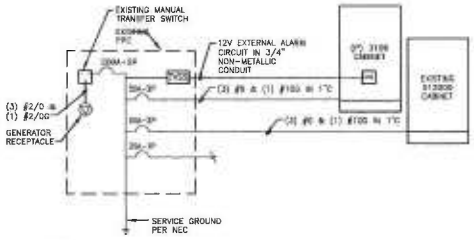

NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTIONS DETAIL (4)
SCALE: N.T.S.

NOTES:
1. MAXIMUM VERTICAL/HORIZONTAL DISTANCE BETWEEN CABLE GROUNDING KITS SHALL NOT EXCEED 100 FEET. INSTALL ADDITIONAL KITS AS REQUIRED BY FIELD CONDITIONS.
2. PROPOSED EQUIPMENT AND ANTENNAS SHALL BE GROUNDED TO EXISTING GROUNDING SYSTEM.
3. ONLY ADDITIONAL GROUNDING REQUIRED SHALL BE FROM PROPOSED ANTENNAS TO EXISTING GROUND BAR AND FROM PROPOSED EQUIPMENT CABINETS TO EXISTING GROUND BAR.




GROUNDING RISER DIAGRAM (5)
SCALE: N.T.S.




NOTE:
1. FIELD TO VERIFY EXISTING PANEL HAS (2) SPACE BREAKER POSITIONS TO INSTALL 50A-2P BREAKER TO SUPPORT PROPOSED 3106 BTS CABINET

ONE LINE DIAGRAM (6)
SCALE: N.T.S.


T··Mobile·
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MIXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-8393
Fax: (508) 936-6385

BAY STATE DESIGN
Bay State Design, Inc.
Architects · Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: 781-932-2497
Fax: 781-933-9771

ENGINEER


PROJECT NO: 2898.302
DRAWN BY: MK
CHECKED BY: K.B

SUBMITTALS

| REV | DATE | DESCRIPTION |
|---|---|---|
| REV 1 | 02-24-09 | PER COMMENTS |
| REV 0 | 02-09-09 | CONSTRUCTION |



SITE
CTNH354A
SIEMON REALTY COMPANY
27 SIEMON COMPANY DRIVE
(AKA 118 ECHO LAKE ROAD)
WATERTOWN, CT 06795

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-1

BAY STATE
DESIGN

February 17, 2009

Mr. Hans Fiedler
UMTS Development Project Manager
T-Mobile, USA
35 Griffin Rd South
Bloomfield, CT 06002

Ref: T-Mobile Site CTNH354A
Siemon Realty Company
27 Siemon Company Dr
Watertown, CT 06795

Dear Mr. Fiedler:

As requested, Bay State Design, Inc. performed the structural analysis of adding three UMTS quad pole antennas, adding three twin TMAs, and adding one proposed RBS 3106 cabinet on the existing concrete pad. Based on the structural analysis, field survey report, and the site file review completed for this site, it is concluded that the structure is adequate to support the additional loads imposed by the proposed changes.

This analysis is based on T-Mobile's RF data sheet Rev 2.0 dated 02/02/09. BSD shall be notified if there any changes.

Please feel free to contact this office if you have any questions.

Sincerely yours,


Trichur Venkataraman
Bay State Design, Inc.

BAY STATE
DESIGN

# Design Calculations

| | |
|---|---|
| SITE NAME: | T-Mobile Siemon Realty Company |
| PROJECT NUMBER: | CTNH354A |
| SITE ADDRESS: | 27 Siemon Company Drive, Watertown, CT 06795 |
| DESCRIPTION: | Antenna Mount, Equipment Pad |
| CALCULATED BY: | Kenny Wang |
| CHECKED BY: | Ram Satyaprasad, P.E |
| DATE: | February 17, 2009 |

BAY STATE DESIGN
Bay State Design, Inc
Architects • Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: (781) 932-2467
Fax: (781) 932-9771

| | | | | | |
|---|---|---|---|---|---|
| Project | CTNH354A | Job No. | 2898.302 | Page | 1 of 6 |
| | WATERTOWN, CT | Computed by | KW | Date | 2/17/09 |
| Detail | | Checked by | | Date | |

**Reference:**
1. 2005 Connecticut Building Code
2. Structural Standard for Antenna Supporting Structures and Antennas (TIA-222-G)
3. Steel Construction Manual by AISC (13th Edition)

**Equipment:**
1. RBS 3106 (64.0"H X 51.2"W X 28.0"D): 1874 lbs
2. Proposed Antenna (APX16DWV-16DWVS): 48.2 lbs (55.9"H X 13.3"W X 3.15"D)
2. Proposed Antenna (APX16PV-16PVL): 40 lbs (53.0"H X 13"W X 3.15"D)

Basic Wind Speed (3 second gust) V : 95 MPH
Structure Classification: Class III
Importance Factor I: 1.15 (wind load without ice)

Exposure Category : C $Z_g$ = 900 ft
$\alpha$ = 9.5
$K_{z(min)}$ = 0.85

Z (height above ground level)= 125.0 ft

$K_z = 2.01(Z/Z_g)^{2/\alpha} = 1.33$

$K_{zt} = 1.0$ (Topographic Category: 1)

Wind Direction Probability Factor $K_d$ : 0.95
(tubular pole structure)

Velocity Pressure $q_z = 0.00256 K_z K_{zt} K_d I v^2$

$q_z$ = 33.5 psf

BAY STATE DESIGN
Bay State Design, Inc.
Architects • Engineers
70 Tower Office Park
Woburn, MA 01801
Phone (781) 932-2467
Fax (781) 932-9771

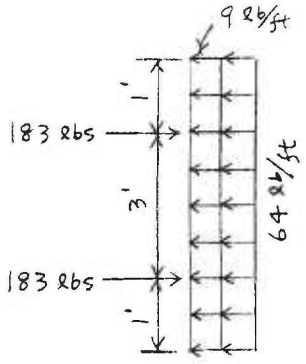
| | | | | | |
|---|---|---|---|---|---|
| Project | CTNH354A WATERTOWN, CT | Job No. | 2898.302 | Page | 2 of 6 |
| | | Computed by | KW | Date | 2/17/09 |
| Detail | | Checked by | | Date | |

WIND LOAD @ ANTENNA

$$F_A = q_z G_h K_a (EPA) = 33.5 \text{ psf} \times 1.35 \times 1.0 \times 6.6/4.66 = 64 \text{ lb/ft}$$

WIND LOAD @ 2"Φ PIPE

$$F_{ST} = q_z G_h C_f A_p = 33.5 \text{ psf} \times 1.1 \times 1.2 \times 2.38/12 = 9 \text{ lb/ft}$$




$V_{max} = 110$ lbs

$M_{max} = 46.4$ ft-lb

PIPE 2" STD. (WT. 3.66 lb/ft $A = 1.0$ in$^2$ $Z = 0.713$ in$^3$) $F_Y = 35.0$ ksi

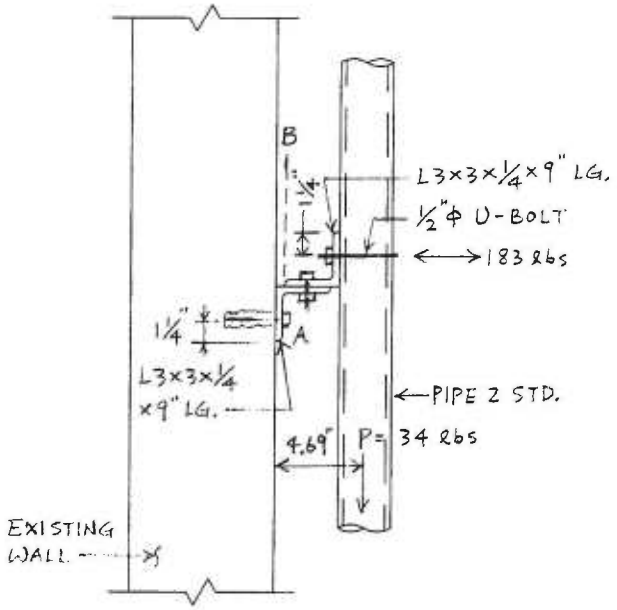
$$V_n/\Omega = 0.6 F_Y A/2\Omega = 0.6 \times 35 \times 1.0/2 \times 1.67 = 6.3 \text{ kips} > 0.11 \quad OK$$

$$M_n/\Omega = 35.0 \times 0.713/1.67 = 14.9 \text{ in-K}$$

$$= 1.25 \text{ ft-K} > 0.046 \quad OK$$

BAY STATE DESIGN
Bay State Design, Inc.
Architects • Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: (781) 932-2467
Fax: (781) 932-9771

| | | | | | |
|---|---|---|---|---|---|
| Project | CTNH354A | Job No. | 2898.302 | Page | 3 of 6 |
| | WATERTOWN, CT | Computed by | KW | Date | 2/17/09 |
| Detail | | Checked by | | Date | |




WT. OF ANTENNA ≈ 50 lbs

PIPE 2 STD.

3.66 × 5 = 18.3 lbs

$P = (50+18)/2 = 34$ lbs

CHECK L3x3x¼x9" LG.

M(@ SEC. B) = 0.034×4.44 + 0.183×1.75 = 0.47 in-k

$Z = 9 \times 0.25^2/4 = 0.14$ in³

$M_n/\Omega = 36.0 \times 0.14/1.67 = 3.0$ in-k > 0.47 OK

FORCE @ A

SHEAR = 34/2 = 17 lbs/BOLT

TENSION = 183/2 + (34×4.69 + 183×4.75)/1.25×2 = 503 lbs

HILTI HIT-HY 150 MAX ADHESIVE ANCHOR (½"ϕ W/3⅜" EMBEDMENT)

ALLOWABLE SHEAR = 1375 lbs

ALLOWABLE TENSION = 775 lbs

$\left(\frac{17}{1375}\right)^{5/3} + \left(\frac{503}{775}\right)^{5/3} = 0.49 < 1.0$ OK

BAY STATE DESIGN
Bay State Design, Inc.
Architects • Engineers
70 Tower Office Park
Woburn, MA 01801
Phone (781) 932-2467
Fax (781) 932-9771

| | | | | | |
|---|---|---|---|---|---|
| Project | CTNH354A | Job No. | 2898,302 | Page | 4 of 6 |
| | WATERTOWN, CT | Computed by | KW | Date | 2/17/09 |
| Detail | | Checked by | | Date | |

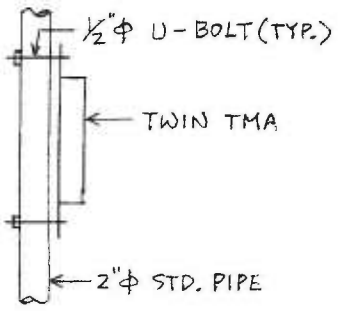
TWIN TMA (ATMPP1412D-1CWA)

13.8" H × 8.7" D × 3.1" W ; WEIGHT = 13 lbs

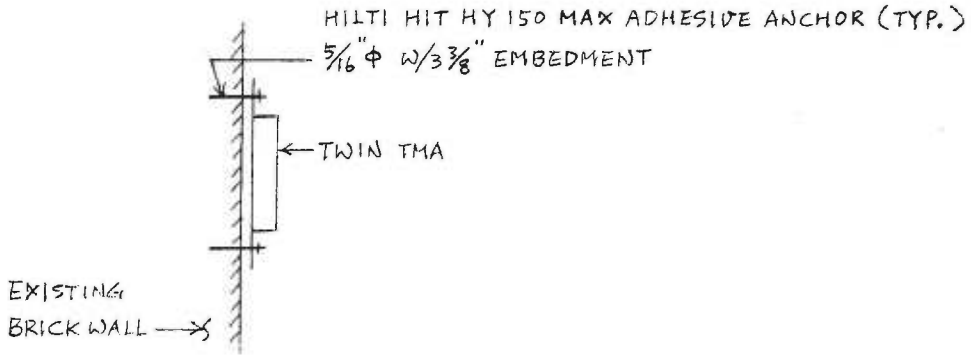
WIND LOAD @ TWIN TMA

$F_A = q_z G_h K_a C_a A = 33.5 \text{ psf} \times 1.35 \times 1.0 \times 1.2 \times 13.8 \times 8.7/144 = 45 \text{ lbs}$

OPTION I (MOUNT ON THE PIPE)




OPTION II (MOUNT ON THE WALL)



BAY STATE DESIGN
Bay State Design, Inc
Architects • Engineers
70 Tower Office Park
Woburn, MA 01801
Phone (781) 932-2467
Fax: (781) 932-9771

| | | | | | |
|---|---|---|---|---|---|
| Project | CTNH354A | Job No. | 2898,302 | Page | 5 of 6 |
| | WATERTOWN, CT | Computed by | KW | Date | 2/17/09 |
| Detail | | Checked by | | Date | |

**Reference:**
1. 2005 Connecticut Building Code
2. Structural Standard for Antenna Supporting Structures and Antennas (TIA-222-G)
3. Steel Construction Manual by AISC (13th Edition)

**Equipment:**
1. RBS 3106 (64.0"H X 51.2"W X 28.0"D): 1874 lbs
2. Proposed Antenna (APX16DWV-16DWVS): 48.2 lbs (55.9"H X 13.3"W X 3.15"D)
2. Proposed Antenna (APX16PV-16PVL): 40 lbs (53.0"H X 13"W X 3.15"D)

Basic Wind Speed (3 second gust) V : 95 MPH
Structure Classification: Class III
Importance Factor I: 1.15 (wind load without ice)

Exposure Category : C $Z_g$ = 900 ft
$\alpha$ = 9.5
$K_{z(min)}$ = 0.85

Z (height above ground level)= 3.0 ft

$K_z = 2.01(Z/Z_g)^{2/\alpha} = 0.60$

$K_{zt}$ = 1.0 (Topographic Category: 1)

Wind Direction Probability Factor $K_d$ : 0.95
(tubular pole structure)

Velocity Pressure $q_z = 0.00256 K_z K_{zt} K_d I v^2$

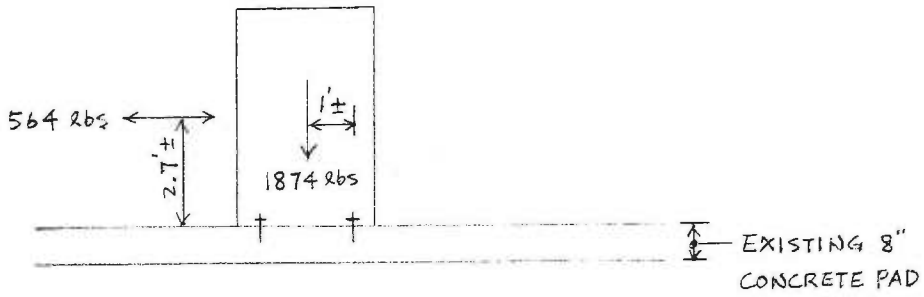
$q_z$ = 15.3 psf

BAY STATE DESIGN
Bay State Design, Inc
Architects • Engineers
70 Tower Office Park
Woburn, MA 01801
Phone: (781) 932-2467
Fax: (781) 932-9771

| | | | | | |
|---|---|---|---|---|---|
| Project | CTNH354A | Job No. | 2898.302 | Page | 6 of 6 |
| | WATERTOWN, CT | Computed by | KW | Date | 2/17/09 |
| Detail | | Checked by | | Date | |

WIND LOAD @ RBS 3106

$F_A = q_z G_h K_a C_a A = 15.3 psf \times 1.35 \times 1.0 \times 1.2 \times 64 \times 51.2/144 = 564$ lbs




SHEAR = 564/4 = 141 lbs/BOLT

TENSION = 0

HILTI HIT HY 150 MAX ADHESIVE ANCHOR
5/8"ϕ HAS ROD W/2 7/8" (MIN.) EMBEDMENT

ALLOWABLE TENSION = 1940 lbs > 0
ALLOWABLE SHEAR = 4095 lbs > 141 lbs OK

PROVIDE (4) - 5/8"ϕ HILTI HIT HY 150 MAX ADHESIVE ANCHORS W/2 7/8" (MIN.) EMBEDMENT

# 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: CTNH354A

Siemon Company Drive
27 Siemon Company Drive
Watertown, CT 06795

**August 25, 2014**

| Site Compliance Summary | |
|---|---|
| Compliance Status: | COMPLIANT |
| Site total MPE% of FCC general public allowable limit: | 22.98 % |

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

EBI Consulting
environmental | engineering | due diligence

August 25, 2014

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

Emissions Analysis for Site: **CTNH354A – Siemon Company Drive**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **27 Siemon Company Drive, Watertown, 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 μW/cm2 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 (μW/cm2). The general population exposure limit for the 700 MHz Band is 567 μW/cm2, and the general population exposure limit for the PCS and AWS bands is 1000 μW/cm2. 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 **27 Siemon Company Drive, Watertown, 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 APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **15.6 dBd** at its main lobe. The **Commscope LNX-6515DS-A1M** has a maximum gain of **15.5 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 **123 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: | RFS APX16DWV-16DWVS-E-A20 | Make / Model: | RFS APX16DWV-16DWVS-E-A20 | Make / Model: | RFS APX16DWV-16DWVS-E-A20 |
| Gain: | 15.6 dBd | Gain: | 15.6 dBd | Gain: | 15.6 dBd |
| Height (AGL): | 123 | Height (AGL): | 123 | Height (AGL): | 123 |
| 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: | 90 | Total TX Power: | 90 | # AWS Channels: | 90 |
| ERP (W): | 3,776.88 | ERP (W): | 3,776.88 | ERP (W): | 3,776.88 |
| Antenna A1 MPE% | 2.29 | Antenna B1 MPE% | 2.29 | Antenna C1 MPE% | 2.29 |
| Antenna #: | 2 | Antenna #: | 2 | Antenna #: | 2 |
| Make / Model: | Commscope LNX-6515DS-A1M | Make / Model: | Commscope LNX-6515DS-A1M | Make / Model: | Commscope LNX-6515DS-A1M |
| Gain: | 15.5 dBd | Gain: | 15.5 dBd | Gain: | 15.5 dBd |
| Height (AGL): | 123 | Height (AGL): | 123 | Height (AGL): | 123 |
| 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): | 470.23 | ERP (W): | 470.23 | ERP (W): | 470.23 |
| Antenna A2 MPE% | 0.60 | Antenna B2 MPE% | 0.60 | Antenna C2 MPE% | 0.60 |

| Site Composite MPE% | |
|---|---|
| **Carrier** | **MPE%** |
| T-Mobile | **8.66** |
| AT&T | 14.32 % |
| **Site Total MPE %:** | **22.98 %** |

| | |
|---|---|
| T-Mobile Sector 1 Total: | 2.89 % |
| T-Mobile Sector 2 Total: | 2.89 % |
| T-Mobile Sector 3 Total: | 2.89 % |
| | |
| Site Total: | 22.98 % |

EBI Consulting
environmental | engineering | due diligence

## Summary

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

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

| T-Mobile Sector | Power Density Value (%) |
|---|---|
| Sector 1: | 2.89 % |
| Sector 2: | 2.89 % |
| Sector 3 : | 2.89 % |
| T-Mobile Total: | 8.66 % |
| | |
| Site Total: | 22.98 % |
| | |
| Site Compliance Status: | COMPLIANT |

The anticipated composite MPE value for this site assuming all carriers present is **22.98%** 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