



20 Commercial St.  
Branford, CT 06405  
Phone: (203) 208-0806  
Fax: (203) 488-4820

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January 12, 2015

Connecticut Siting Council  
Ten Franklin Square  
New Britain, CT 06051  
Attn: Ms. Melanie Bachman, Executive Director

**Re: 133 Gifford Lane – Bozrah, CT**

Dear Ms. Bachman,

On behalf of New Cingular Wireless PCS, LLC ("AT&T"), enclosed for filing are One (1) original and two (2) copies of AT&T's Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site.

I also enclose herewith a check in the amount of \$625.00 representing the fee for the Notice of Exempt Modification.

If you have any questions, please feel free to contact me.

Thank you,

By: \_\_\_\_\_

Name: Paul F. Sagristano  
Vertical Development LLC  
20 Commercial Street  
Branford, CT 06405  
Phone – 917-841-0247  
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[psagristano@verticaldevelopmentllc.com](mailto:psagristano@verticaldevelopmentllc.com)

CC: Via Fed Ex  
William Ballinger, First Selectman  
1 River Road  
Bozrah, CT 06334  
860-887-6015

John & Betty Orr  
131 Gifford Lane  
Bozrah, CT 06334  
860-889-2689

## **Notice of Exempt Modification**

### **133 Gifford Lane, Bozrah, CT**

New Cingular Wireless PCS, LLC ("AT&T") submits this Notice of Exempt Modification to the Connecticut Siting Council ("Council") pursuant to Sections 16-50j-73 and 16-50j-72(b) of the Regulations of Connecticut State Agencies ("Regulations") in connection with AT&T's planned modification of antennas and associated equipment on an existing 193' Self Supporting Lattice tower located at 133 Gifford Lane, in the Town of Bozrah. More particularly, AT&T plans to upgrade this site by adding additional 4G LTE technology to its facilities. The proposed modifications will not increase the tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six (6) decibels, or add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to Connecticut General Statutes § 22a-162.

To better meet the growing voice and data demands of its wireless customers, AT&T is upgrading their network nationwide to enhance its current 4G technology, which will provide faster service and better overall performance. Pursuant to the LTE upgrade at this site, AT&T will add antennas, install RRHs, and install related equipment to its equipment area within the fenced compound at the base of the tower.

The 193' lattice tower located at 133 Gifford Lane in the Town of Bozrah (lat. 41.552509, long. -72.150713) is owned by SBA Communications Corp. It is within an approx. 4500+ square foot fenced compound. AT&T currently has nine (9) antennas, three (3) per sector, behind which, and mounted to the same pipe as the 3 LTE antennas currently at the site, is one (1) RRH for a total of three (3) at a centerline of 182' installed on the tower and associated transmission lines (one (1) per antenna). AT&T's base station equipment is located adjacent to the base of the tower within the fenced compound. A site plan depicting this is attached.

AT&T plans to remove all existing equipment and install a new Commscope MTC3615 platform mount. Much of the existing equipment will be replaced on the new platform mount, including the 3 existing Powerwave 7770 GSM antennas, which will be relocated on the new tower mount @ a centerline of 182'. Added to the new platform mount will be six (6) OPA-65R-LCUU-H6 LTE antennas, two (2) per sector, each replacing a previously installed antenna, and each with a centerline of 182', and associated transmission lines. Located behind the antennas, and installed on the same pipe mount, will be 3 new RRU's per sector (1 RRU 12, 1 RRU 32, 1 RRU E2 and 1 RRU A2) (which is module attached to the back of the RRU 12). Also AT&T will relocate the three existing RRU 11's. The height of the tower will not need to be increased. AT&T also plans to install new Ericsson RBS 6601 radio equipment within an existing cabinet and a new DC Power plant inside their existing equipment room within the tower compound's fenced border, they also plan to add 2 Fiber Trunks and 2 DC Trunks along the same route as the existing Fiber and DC Trunks on the tower. The compound's boundaries will not need to be extended. Other than brief, construction-related noise, these modifications will not increase noise levels at the tower site boundary by six (6) decibels.

AT&T commissioned SBA Corp to perform a structural analysis of the tower to verify that it can support the proposed loading. The tower "Passes with Proposed modifications at (88.3.% Tower Capacity)" and (81.3% Foundation Capacity) (see page 1 of Structural Analysis Report, January 9, 2015).

The proposed modifications will not add radio frequency sending or receiving capability which increases the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to Connecticut General Statutes § 22a-162. A radio frequency emissions analysis prepared by EBI Consulting indicates that the proposed final configuration (including other carriers on the tower) will emit 18.09% of the allowable FCC established general public limit sampled at the ground level (see the 5th page of Radio Frequency Emissions Analysis Report - Evaluation of Human Exposure Potential to Non-Ionizing Emissions, December 11, 2014). Emission values for the AT&T antennas have been calculated from the sample

point, which is the top of a six foot person standing at the base of the tower. Emissions values for additional carriers were based upon values listed in Connecticut Siting Council active database (see the 3<sup>rd</sup> and 4<sup>th</sup> page of Radio Frequency Emissions Analysis Report - Evaluation of Human Exposure Potential to Non-Ionizing Emissions, December 11, 2014). The information used in the report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1 (see the 2<sup>nd</sup> & 3<sup>rd</sup> page of Radio Frequency Emissions Analysis Report - Evaluation of Human Exposure Potential to Non-Ionizing Emissions, December 11, 2014).

In conclusion, AT&T's proposed modifications do not constitute a modification subject to the Council's review because AT&T will not change the height of the tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards. Therefore, AT&T respectfully requests that the Council acknowledge that this Notice of Exempt Modification meets the Council's exemption criteria.

**PROJECT INFORMATION**

SCOPE OF WORK:

- REMOVE ALL TOWER TOP EQUIPMENT & REPLACE SECTOR FRAMES.
- AT&T ANTENNAS: (2) NEW LTE ANTENNAS PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) NEW LTE ANTENNAS; (3) EXISTING UMTS ANTENNAS & TMAs TO BE RE-USED (1 PER SECTOR)
- AT&T RRUs: (3) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (9) NEW RRUs; (1) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (3) EXISTING RRUs.
- (1) NEW A2 MODULE PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) A2 MODULES.
- (2) NEW AT&T DC6 SURGE SUPPRESSORS; (1) EXISTING DC6 TO BE REUSED.
- NEW LTE RBS-6601 INSTALLED IN EXISTING LTE RACK.
- NEW LTE GPS ANTENNA MOUNTED TO EXISTING EQUIPMENT SHELTER.
- (2) NEW FIBER TRUNKS & (2) NEW DC TRUNKS.
- INSTALL NEW 3-PORT CABLE HATCH PLATE IN EXISTING AT&T EQUIPMENT SHELTER.
- REMOVE (12) EXISTING DIPLEXERS AND REPLACE WITH (6) NEW DIPLEXERS.

SITE ADDRESS: 133 GIFFORD LANE  
BOZRAH, CT 06334

LATITUDE: 41.552509 41° 33' 9.03"N  
LONGITUDE: -72.150713 72° 9' 2.57"W

USID: 65085

TOWER OWNER: SBA TOWERS  
5900 BROKEN SOUND PARKWAY  
BOCA RATON, FL 33487

TYPE OF SITE: SELF SUPPORT TOWER/INDOOR EQUIPMENT

TOWER HEIGHT: 195'-0"±  
RAD CENTER: 182'-0"±

CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY  
PROPOSED USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY



**at&t**  
**MOBILITY**

**FA CODE: 10042309**  
**SITE NUMBER: CT2223**  
**SITE NAME: BOZRAH CT**

**PROJECT TEAM**

**CLIENT REPRESENTATIVE**

COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: DAVID COOPER  
PHONE: 617-639-4908  
EMAIL: dcooper@empiretelecomm.com

**SITE ACQUISITION:**

COMPANY: VERTICAL DEVELOPMENT, LLC  
ADDRESS: 20 COMMERCIAL STREET  
BRANFORD, CT 06405  
CONTACT: DAVID BASS  
PHONE: 203-826-5857  
EMAIL: dbass@verticaldevelopmentllc.com

**ZONING:**

COMPANY: VERTICAL DEVELOPMENT, LLC  
ADDRESS: 20 COMMERCIAL STREET  
BRANFORD, CT 06405  
CONTACT: DAVID BASS  
PHONE: 203-826-5857  
EMAIL: dbass@verticaldevelopmentllc.com

**ENGINEERING:**

COMPANY: COM-EX CONSULTANTS, LLC  
ADDRESS: 4 SECOND AVENUE  
SUITE 204  
DENVER, NJ 07834  
CONTACT: NICHOLAS D. BARILE, P.E.  
PHONE: 862-209-4300  
EMAIL: nbarile@comexconsultants.com

**RF ENGINEER:**

COMPANY: AT&T MOBILITY – NEW ENGLAND  
ADDRESS: 550 COCHITUATE ROAD  
SUITE 550 13 & 14  
FRAMINGHAM, MA 01701  
CONTACT: CAMERON SYME  
PHONE: 508-596-7146  
EMAIL: cs6970@att.com

**CONSTRUCTION MANAGEMENT:**

COMPANY: EMPIRE TELECOM  
ADDRESS: 16 ESQUIRE ROAD  
BILLERICA, MA 01821  
CONTACT: GRZEGORZ "GREG" DORMAN  
PHONE: 484-683-1750  
EMAIL: gdorman@empiretelecomm.com

**DRAWING INDEX**

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**VICINITY MAP**

1. HEAD WEST ON COCHITUATE RD TOWARD BURR ST (0.3 MI). 2. TURN LEFT ONTO SHOPPERS WORLD DR (230 FT). 3. MAKE A U-TURN AT RING RD (138 FT). 4. TAKE THE 1ST RIGHT ONTO COCHITUATE RD (0.3 MI). 5. TAKE THE RAMP TO I-90 E/MASSPIKE W/SPRINGFIELD/BOSTON (0.6 MI). 6. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR INTERSTATE 90 W (0.5 MI). 7. FOLLOW I-90 W, TAKE EXIT 82 FROM I-395 S (79.4 MI). 8. MERGE ONTO I-90 W/MASSACHUSETTS TURNPIKE (26.2 MI). 9. TAKE EXIT 10 TOWARD AUBURN/WORCESTER (0.8 MI). 10. FOLLOW SIGNS FOR US-20 E/I-395 S AND MERGE ONTO I-395 S (52.2 MI). 11. TAKE EXIT 82 TOWARD CT-2 W/CT-32 N/HARDFORD/COLCHESTER (0.2 MI). 12. FOLLOW W TOWN ST TO GIFFORD LN IN BOZRAH (2.8 MI). 13. TURN RIGHT ONTO W TOWN ST (1.1 MI). 14. TURN LEFT ONTO FITCHVILLE RD/NORWICH-COLCHESTER TURNPIKE (0.2 MI). 15. TURN LEFT ONTO GIFFORD LN (479 FT). 16. TURN LEFT TO STAY ON GIFFORD LN (1.4 MI).



**GENERAL NOTES**

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. 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.
- 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.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

**APPROVALS**

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		



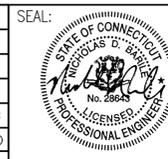
CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811



**SITE NUMBER: CT2223**  
**SITE NAME: BOZRAH CT**  
133 GIFFORD LANE  
BOZRAH, CT 06334  
NEW LONDON COUNTY



NO.	DATE	REVISIONS	BY	CHK	APP'D
A	08/28/14	INITIAL SUBMISSION	CJT	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		01/12/15



<b>AT&amp;T</b>		
DRAWING TITLE: <b>TITLE SHEET</b>		
JOB NUMBER 14020-EMP	DRAWING NUMBER T-1	REV A

**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. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.
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 WITH STAINLESS STEEL HARDWARE 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 AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').
14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE 1/2" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

**GENERAL NOTES:**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
 CONTRACTOR - EMPIRE TELECOM  
 SUBCONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)  
 OWNER - AT&T MOBILITY  
 OEM - ORIGINAL EQUIPMENT MANUFACTURER
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. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
7. 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.
8. 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. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR
9. 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.
10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF 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.
11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
14. 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). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."
16. 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.
17. 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 MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
18. SINCE THE CELL SITE MAY BE 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 REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

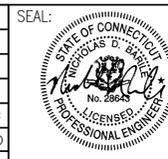
19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
  - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
  - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
  - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS
20. 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, THIRTEENTH EDITION
  - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
  - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
  - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
  - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
  - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
  - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS
21. 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.



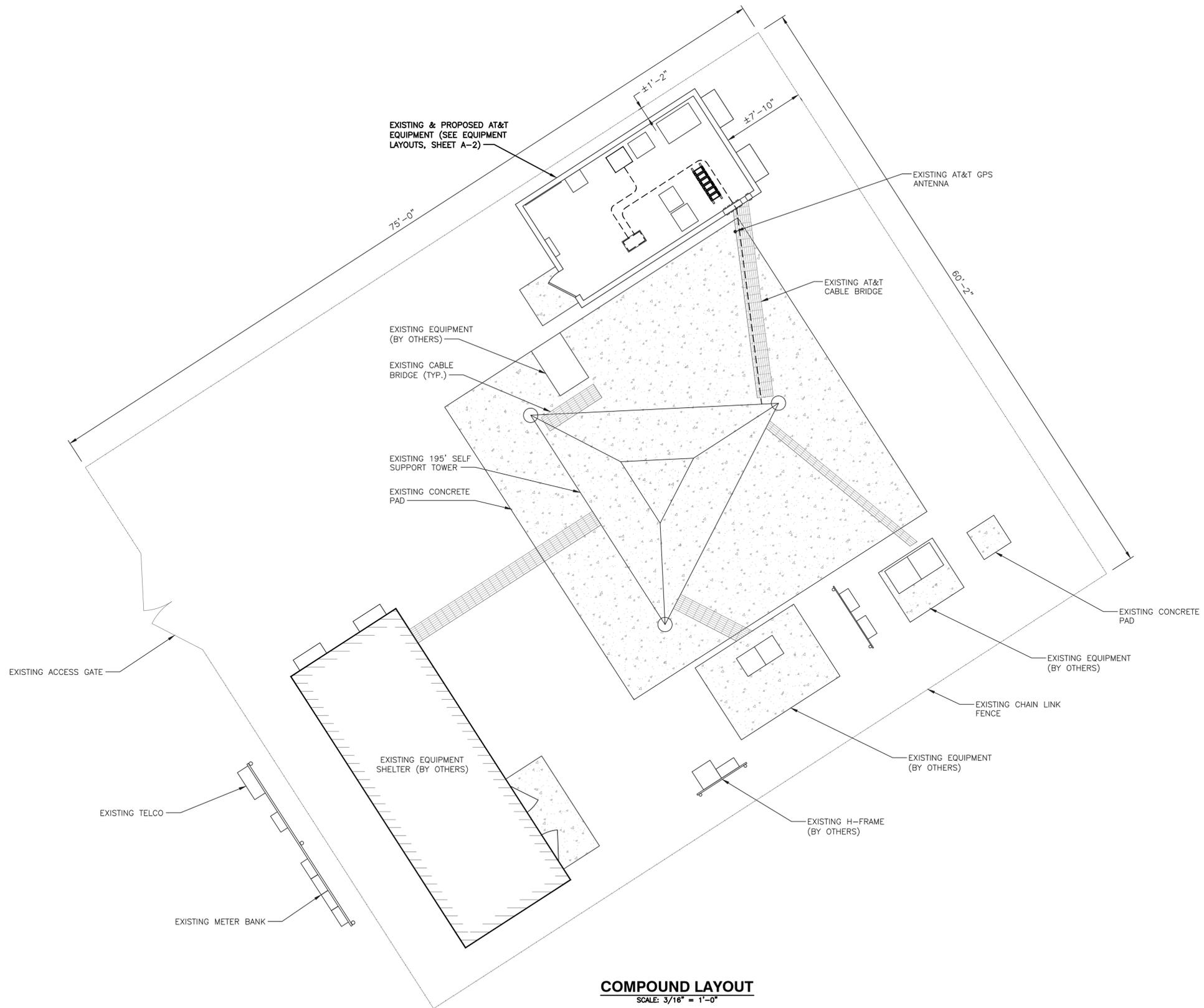
**SITE NUMBER: CT2223**  
**SITE NAME: BOZRAH CT**  
 133 GIFFORD LANE  
 BOZRAH, CT 06334  
 NEW LONDON COUNTY



A	08/28/14	INITIAL SUBMISSION	CJT	NDB	NDB
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		01/12/15



<b>AT&amp;T</b>		
DRAWING TITLE: <b>GROUNDING NOTES &amp; GENERAL NOTES</b>		
JOB NUMBER 14020-EMP	DRAWING NUMBER GN-1	REV A



**COMPOUND LAYOUT**

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

**GRAPHIC SCALE**



( IN FEET )

3/16" = 1 Foot

**COM-EX**  
Consultants  
4 SECOND AVENUE  
SUITE 204  
DENVER, NJ 07834  
PHONE: 862.209.4300  
FAX: 862.209.4301

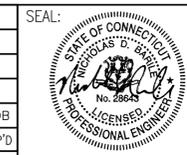
**EMPIRE**  
telecom  
16 ESQUIRE ROAD  
BILLERICA, MA 01821

**SITE NUMBER: CT2223**  
**SITE NAME: BOZRAH CT**

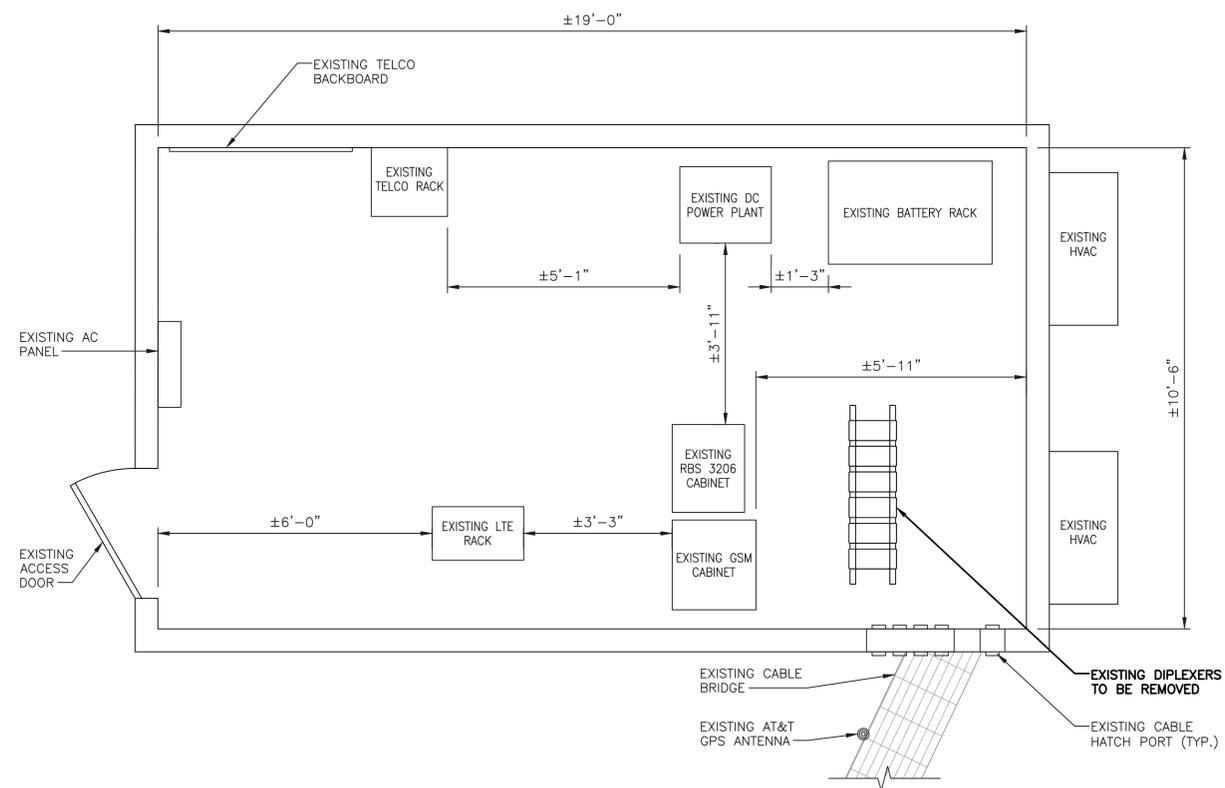
133 GIFFORD LANE  
BOZRAH, CT 06334  
NEW LONDON COUNTY

 **at&t**  
MOBILITY  
550 COCHITUATE ROAD  
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	08/28/14	INITIAL SUBMISSION	CJT	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		01/12/15



<b>AT&amp;T</b>		
DRAWING TITLE: COMPOUND LAYOUT		
JOB NUMBER 14020-EMP	DRAWING NUMBER A-1	REV A



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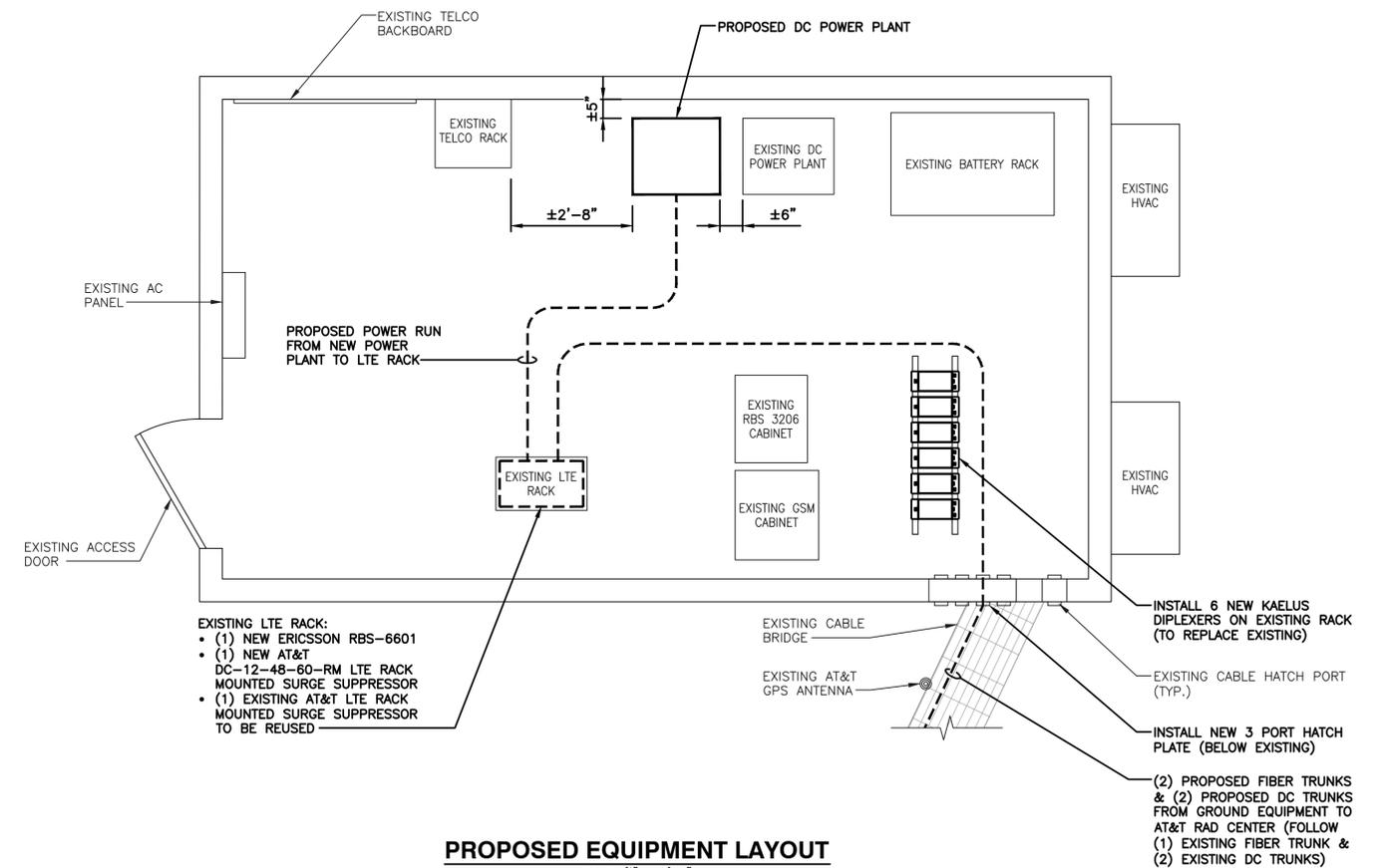
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( IN FEET )  
1/2 Inch = 1 Foot



NORTH



**PROPOSED EQUIPMENT LAYOUT**

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

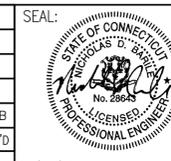


( IN FEET )  
1/2 Inch = 1 Foot

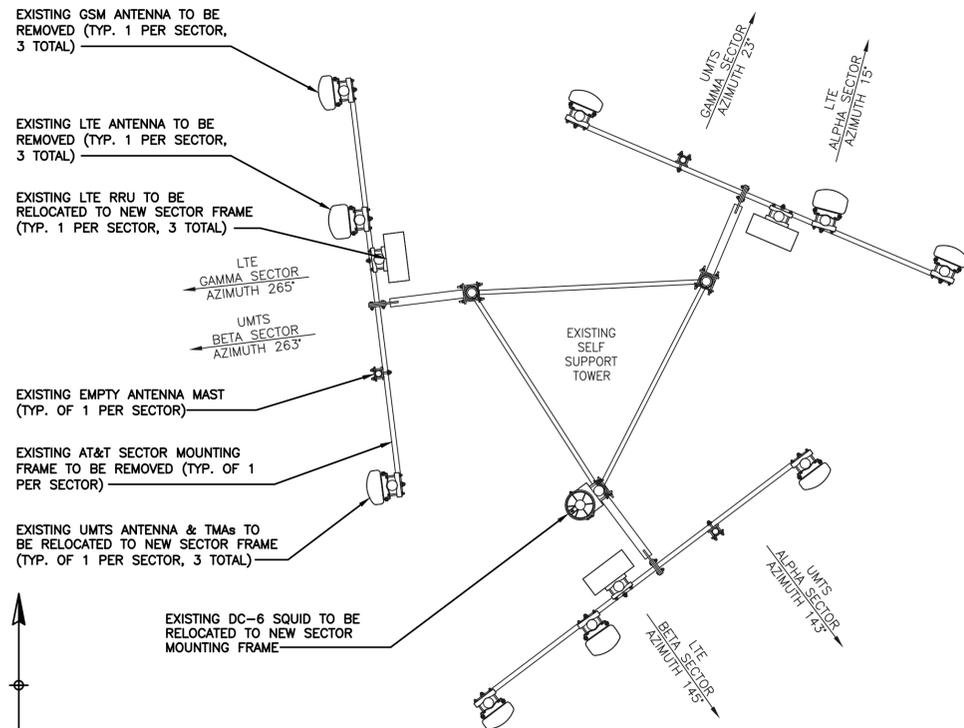


NORTH

NO.	DATE	REVISIONS	BY	CHK	APP'D
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SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		01/12/15



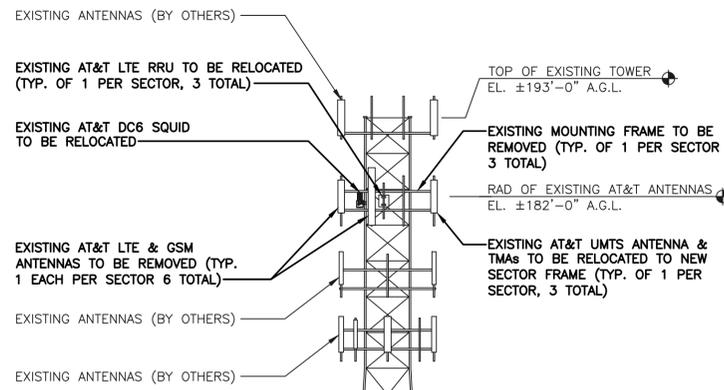
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JOB NUMBER 14020-EMP	DRAWING NUMBER A-2	REV A



**EXISTING ANTENNA LAYOUT**

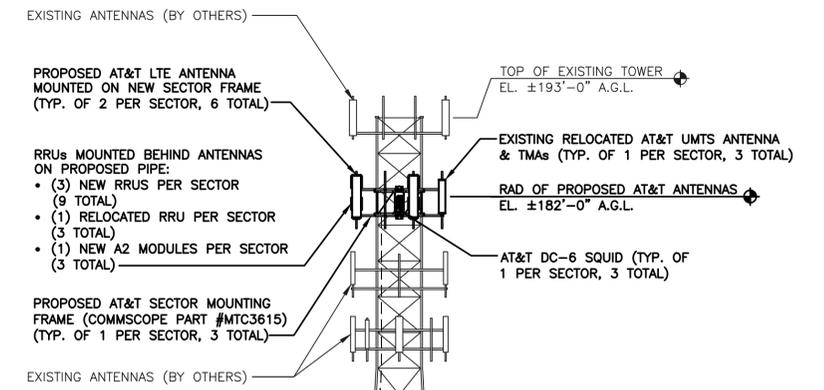
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NORTH



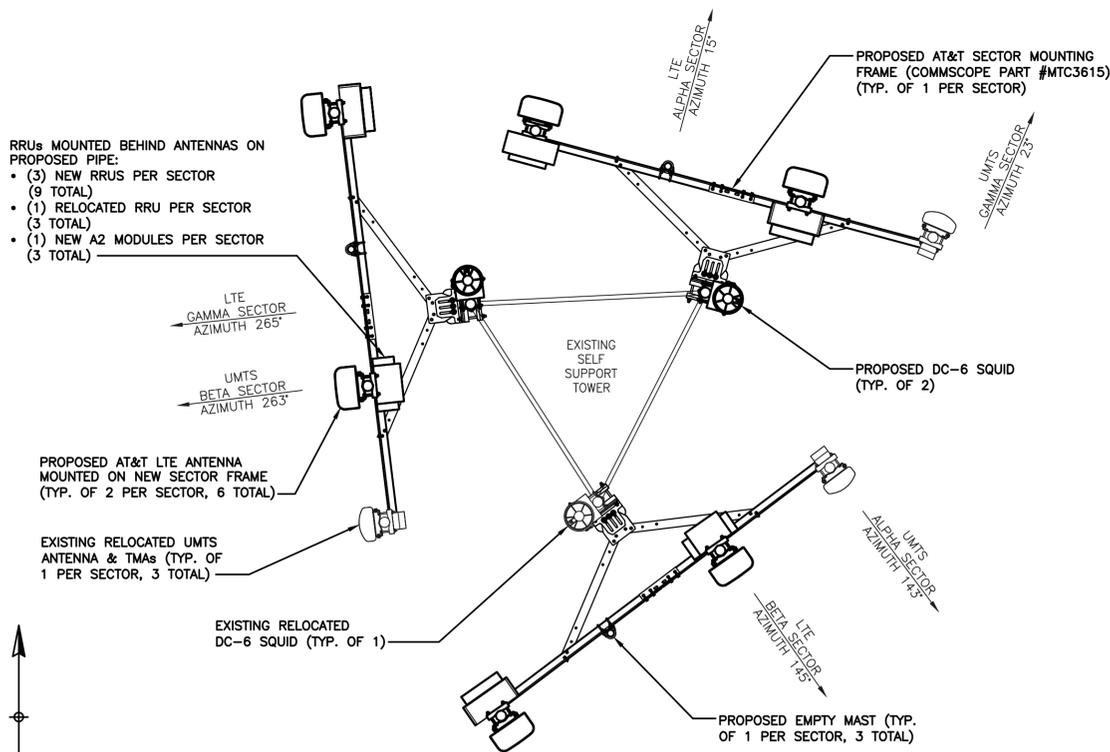
**EXISTING TOWER ELEVATION**

SCALE: NTS



**PROPOSED TOWER ELEVATION**

SCALE: NTS



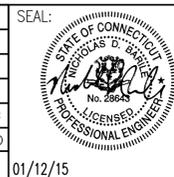
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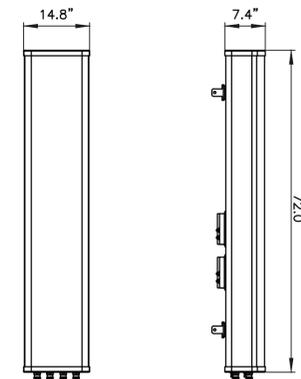
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PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	08/28/14	INITIAL SUBMISSION	CJT	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		01/12/15



<b>AT&amp;T</b>		
DRAWING TITLE: <b>ANTENNA LAYOUTS &amp; ELEVATIONS</b>		
JOB NUMBER 14020-EMP	DRAWING NUMBER A-3	REV A



FRONT VIEW

SIDE VIEW

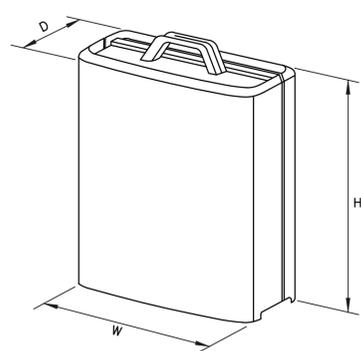


BOTTOM VIEW

MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H4
WEIGHT	73.0 LBS

**LTE ANTENNA DETAIL**

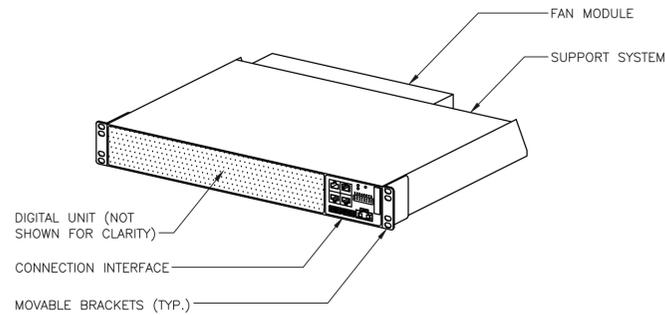
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-12	20.4" x 18.5" x 7.5"	58 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS
RRUS-E2	20.4" x 18.5" x 7.5"	58 LBS
A2 MODULE	16.4" x 15.2" x 3.4"	22 LBS

**RRUS DETAIL**

SCALE: N.T.S.

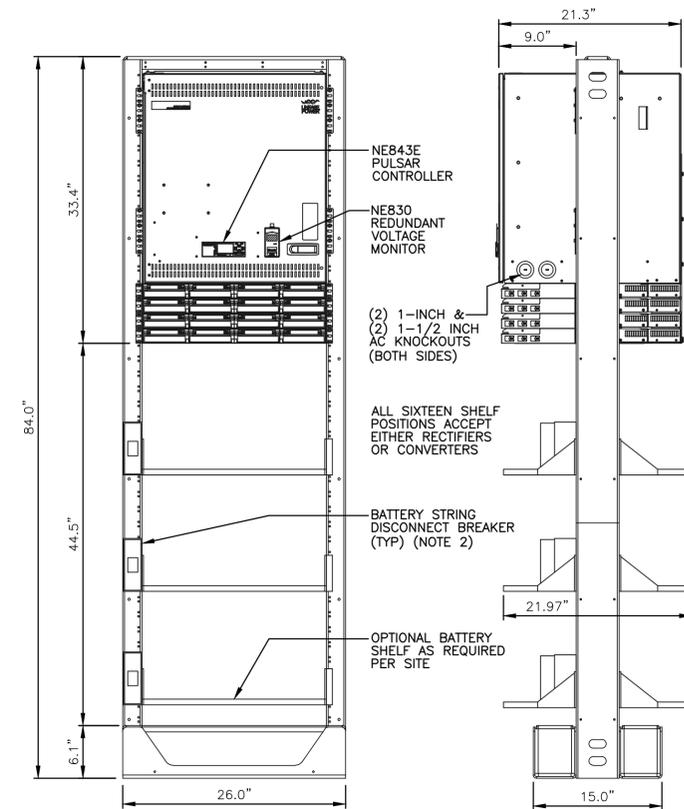


PHYSICAL CHARACTERISTICS	
HEIGHT	2.59" (1.5 U)
WIDTH	19"
DEPTH	13.77"
WEIGHT (FULLY EQUIPPED)	<22 LBS.
COLOR	WHITE

DC POWER SUPPLY	
NOMINAL VOLTAGE	-48VDC
OPERATING VOLTAGE RANGE	-40.0 TO -57.6 VDC
NON-DESTRUCTIVE VOLTAGE RANGE	0 TO -60 VDC

**RBS 6601 DETAIL**

SCALE: N.T.S.



FRONT VIEW

SIDE VIEW

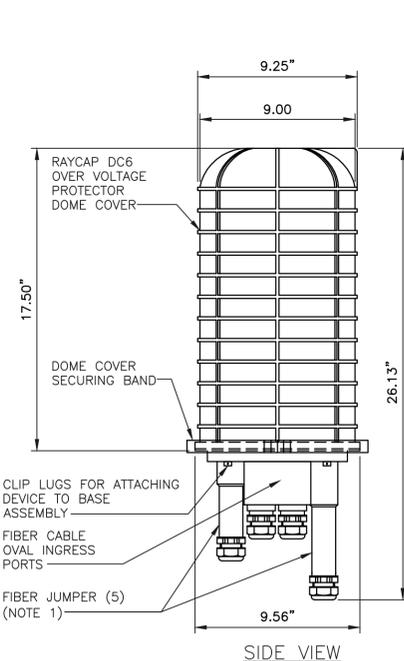
**WEIGHT:**  
FRAME W/DC POWER SYSTEM AND W/O BATTERIES = 435lbs  
**BATTERY SHELF (W/(4) 155AH BATTERIES = APPROXIMATELY 500lbs PER SHELF**  
**CLEARANCE:**  
FRONT = 36"  
REAR = 6"  
SIDES = 2"

**NOTES:**

- GE/LINEAGE FLOOR ANCHOR KIT (847135688) MAY BE USED UNLESS LOCAL REQUIREMENTS GOVERN.
- DISCONNECT MAY BE MOUNTED TO EITHER SIDE OF TRAY OR DIRECTLY TO FRAMEWORK
- PER MANUFACTURER, FRAME IS SEISMIC COMPLIANT UP TO 3 BATTERY SHELVES.

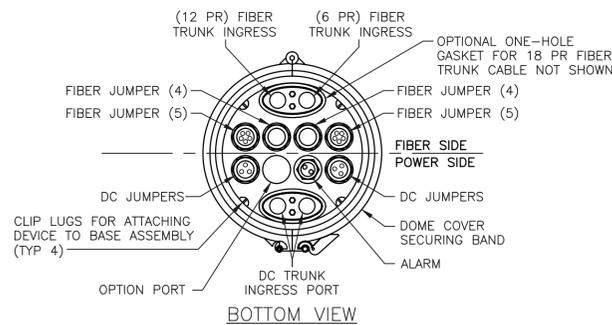
**POWER PLANT DETAIL**

SCALE: N.T.S.

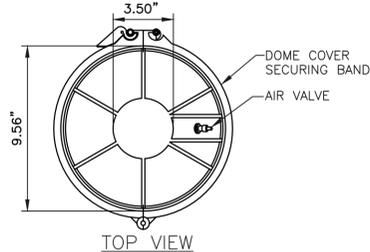


**DC-6 SURGE SUPPRESSOR DETAIL**

SCALE: N.T.S.



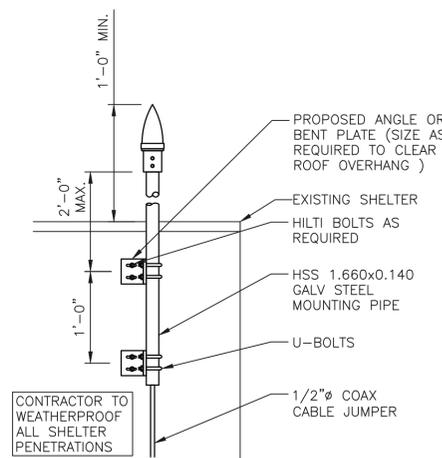
BOTTOM VIEW



TOP VIEW

**NOTES:**

- REMOVE CABLE SEALING GLAND AND INSTALL M32x1.5 METRIC-TO-1" NPT ADAPTER (COOPER CROUSE-HINES P/N CAP 740 994 OR EQUIVALENT MFR) WHEN CONNECTING CONDUIT TO OVP.



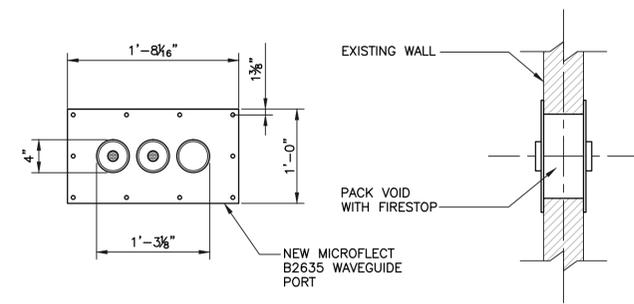
ELEVATION

**NOTES:**

- LOCATION OF ANTENNA MUST HAVE CLEAR VIEW OF SOUTHERN SKY AND CANNOT HAVE ANY BLOCKAGES EXCEEDING 25% OF THE SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.
- ALL GPS ANTENNA LOCATIONS MUST BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF FOUR (4) SATELLITES. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.
- GPS ANTENNA MUST BE MOUNTED A MINIMUM DISTANCE OF TEN FEET (10') FROM ANY EXISTING GPS CONE.

**GPS MOUNTING DETAIL**

SCALE: N.T.S.



**HATCH PLATE DETAIL**

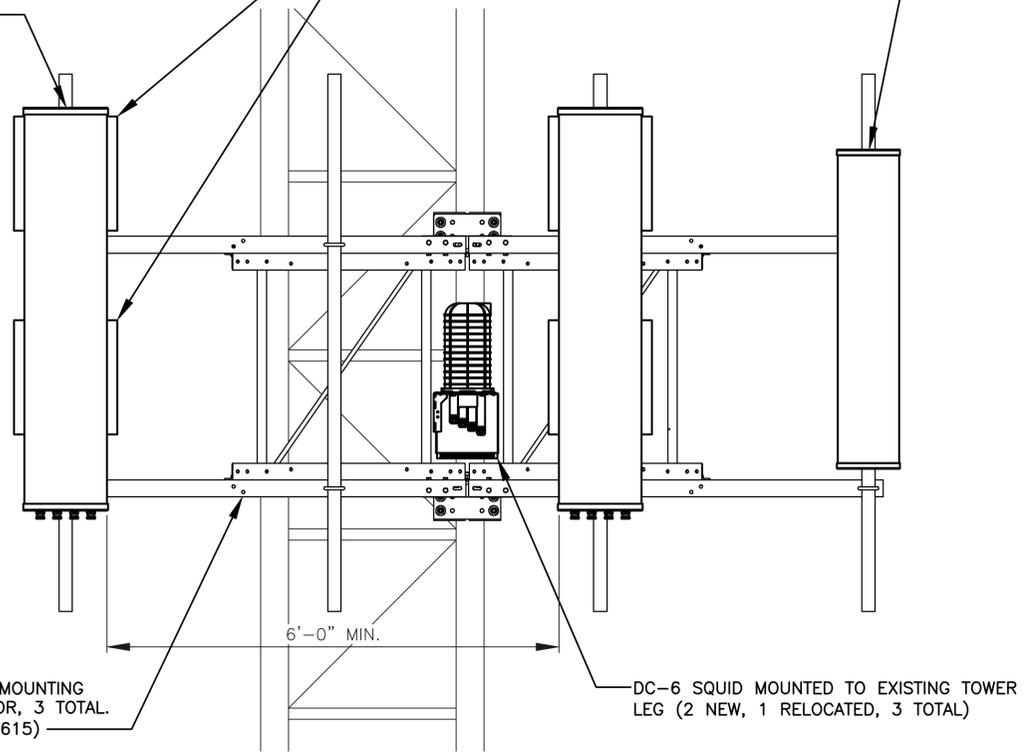
SCALE: N.T.S.

MINIMUM SEPARATION OF 6'-0" TO BE MAINTAINED BETWEEN ALL PROPOSED AT&T LTE ANTENNAS

PROPOSED LTE ANTENNA MOUNTED TO PROPOSED SECTOR FRAME (TYP. FOR 2 PER SECTOR, TOTAL OF 6)

RRUs MOUNTED BEHIND ANTENNAS ON PROPOSED PIPE:  
 • (3) NEW RRUs PER SECTOR (9 TOTAL)  
 • (1) RELOCATED RRU PER SECTOR (3 TOTAL)  
 • (1) NEW A2 MODULE PER SECTOR (3 TOTAL)

EXISTING RELOCATED UMTS ANTENNA & TMAs MOUNTED TO PROPOSED SECTOR FRAME (TYP. FOR 1 PER SECTOR, TOTAL OF 3)



PROPOSED AT&T SECTOR MOUNTING FRAME, TYP. 1 PER SECTOR, 3 TOTAL. (COMMSCOPE PART #MTC3615)

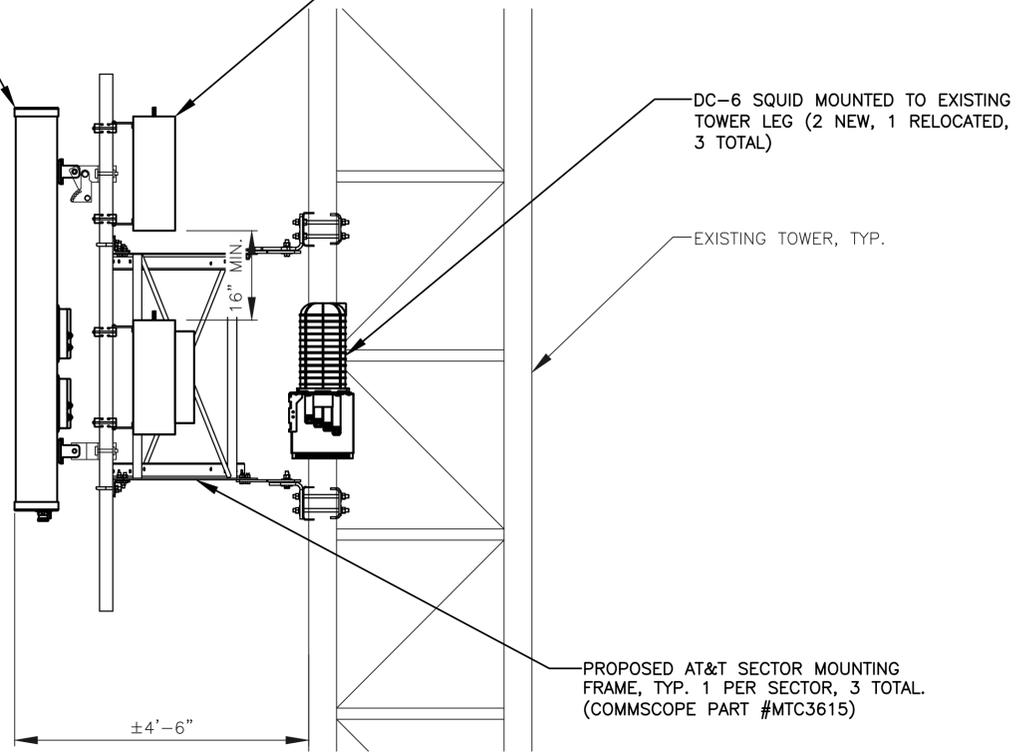
DC-6 SQUID MOUNTED TO EXISTING TOWER LEG (2 NEW, 1 RELOCATED, 3 TOTAL)

**PROPOSED ANTENNA MOUNTING DETAIL (FRONT VIEW)**

SCALE: N.T.S.

AT&T ANTENNA MOUNTED TO PROPOSED SECTOR FRAME (TYP. FOR 3 PER SECTOR, TOTAL OF 9)

RRUs MOUNTED BEHIND ANTENNAS ON PROPOSED PIPE:  
 • (3) NEW RRUs PER SECTOR (9 TOTAL)  
 • (1) RELOCATED RRU PER SECTOR (3 TOTAL)  
 • (1) NEW A2 MODULE PER SECTOR (3 TOTAL)



DC-6 SQUID MOUNTED TO EXISTING TOWER LEG (2 NEW, 1 RELOCATED, 3 TOTAL)

EXISTING TOWER, TYP.

PROPOSED AT&T SECTOR MOUNTING FRAME, TYP. 1 PER SECTOR, 3 TOTAL. (COMMSCOPE PART #MTC3615)

**PROPOSED ANTENNA MOUNTING DETAIL (SIDE VIEW)**

SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	-	-	-
	A3	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	-	-	-
	B3	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	-	-	-
	G3	ANDREW	SBNH-1D6565C	96.4"x11.9"x7.1"
	G4	POWERWAVE	7770	55"x11"x5"

PROPOSED ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	A2	-	-	-
	A3	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	B3	-	-	-
	B4	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"
	G3	-	-	-
	G4	CCI	OPA-65R-LCUU-H6	72"x14.8"x7.4"

PROPOSED RRH SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-32	29.9"x13.3"x9.5"		
	ERICSSON	RRUS-E2	20.4"x18.5"x7.5"		
BETA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-32	29.9"x13.3"x9.5"		
	ERICSSON	RRUS-E2	20.4"x18.5"x7.5"		
GAMMA	ERICSSON	RRUS-12	20.4"x18.5"x7.5"	ERICSSON A2 MODULE	16.4"x15.2"x3.4"
	ERICSSON	RRUS-11 (RELOCATED)	19.7"x16.9"x7.2"		
	ERICSSON	RRUS-32	29.9"x13.3"x9.5"		
	ERICSSON	RRUS-E2	20.4"x18.5"x7.5"		

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

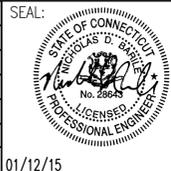
**COM-EX**  
 Consultants  
 4 SECOND AVENUE  
 SUITE 204  
 DENVER, NJ 07834  
 PHONE: 862.209.4300  
 FAX: 862.209.4301

**EMPIRE**  
 telecom  
 16 ESQUIRE ROAD  
 BILLERICA, MA 01821

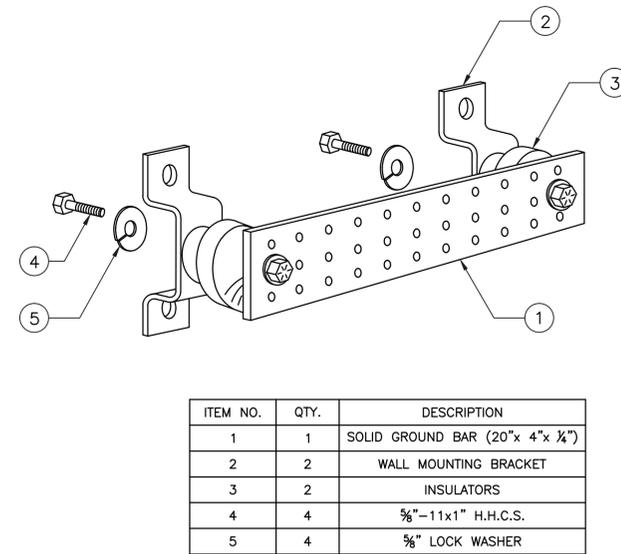
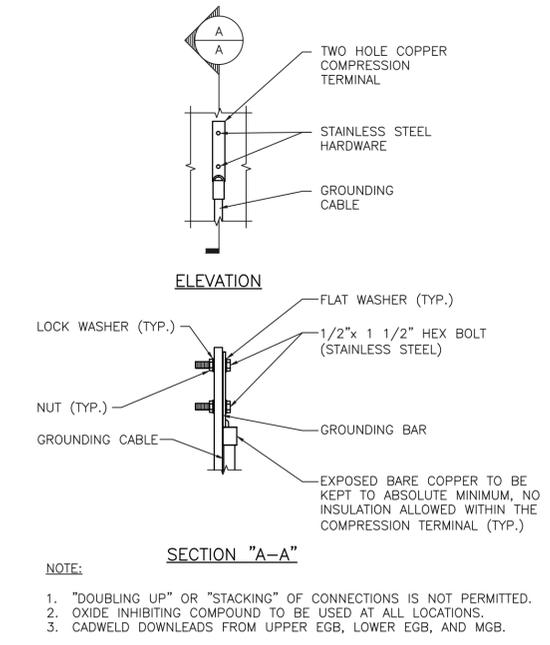
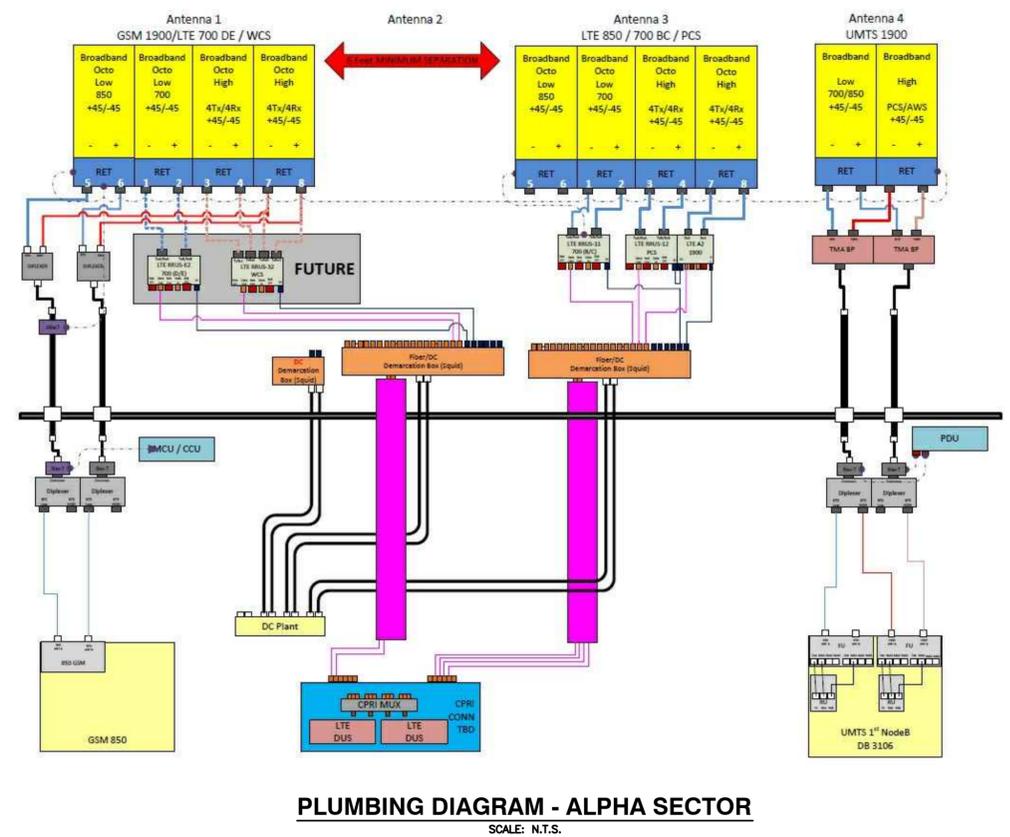
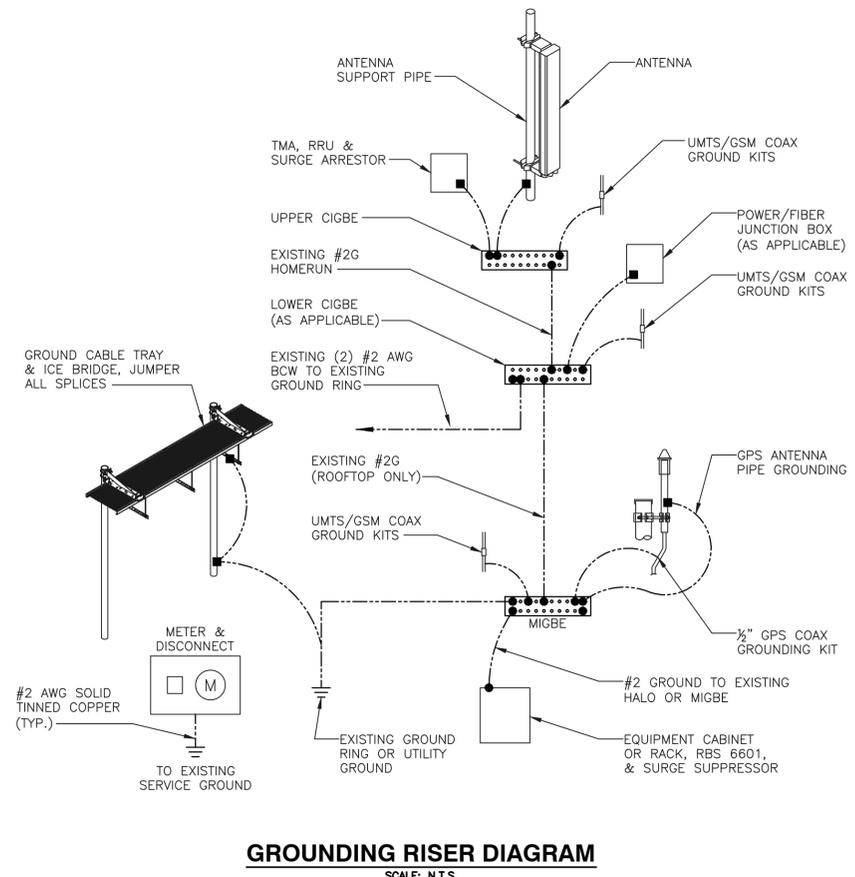
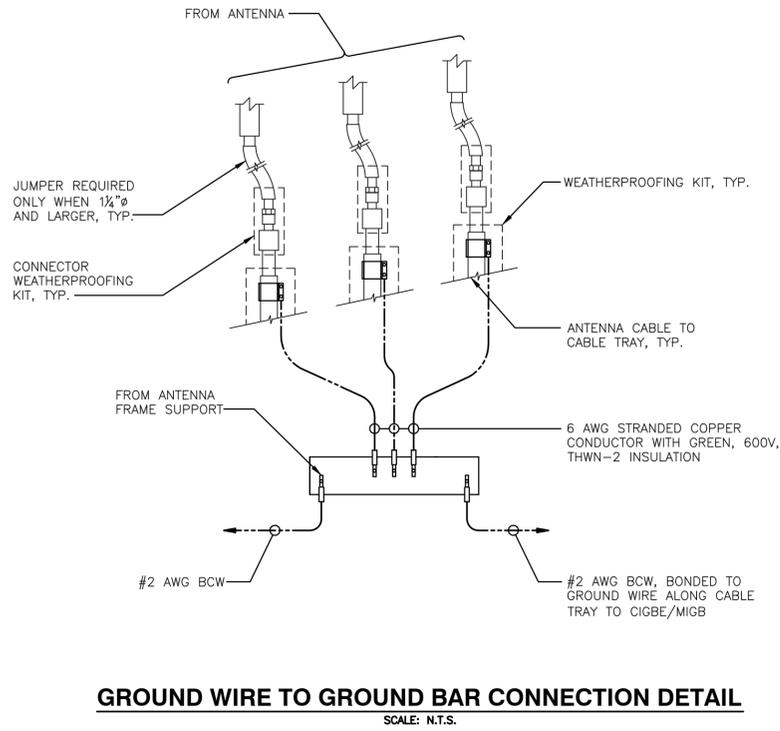
**SITE NUMBER: CT2223**  
**SITE NAME: BOZRAH CT**  
 133 GIFFORD LANE  
 BOZRAH, CT 06334  
 NEW LONDON COUNTY

**at&t**  
 MOBILITY  
 550 COCHITUATE ROAD  
 FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
A	08/28/14	INITIAL SUBMISSION	CJT	NDB	NDB
SCALE: AS SHOWN		DESIGNED BY: JW	DRAWN BY: JW		01/12/15

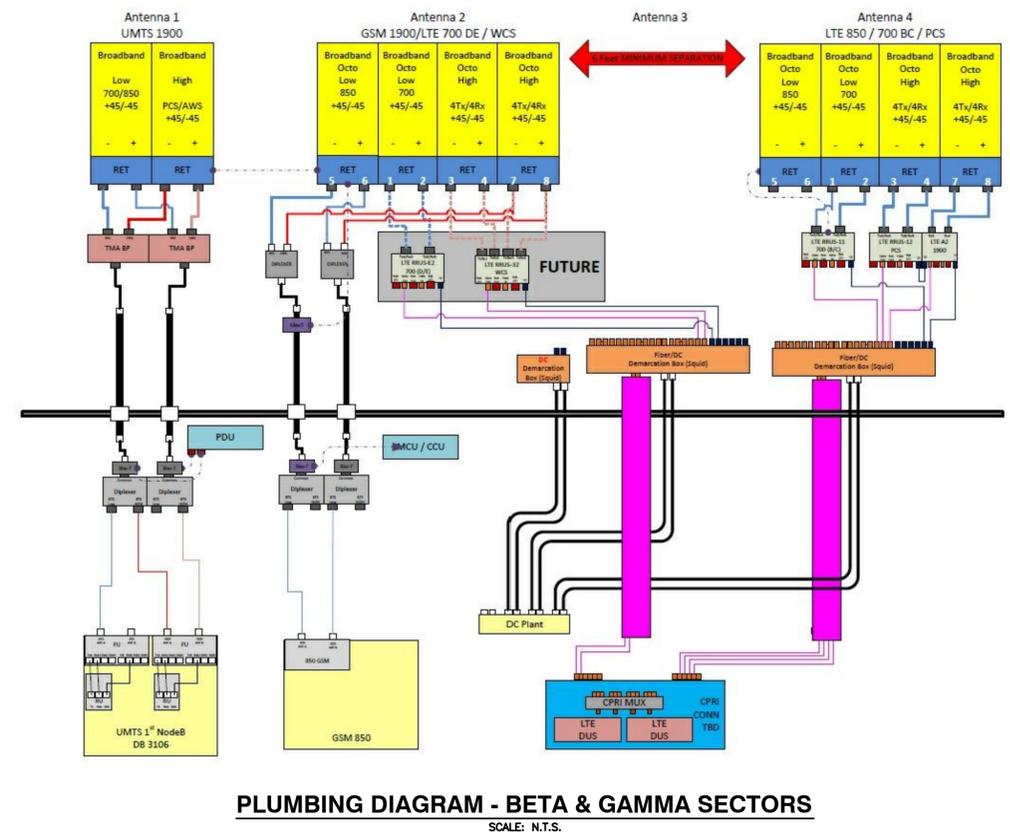


**AT&T**  
 DRAWING TITLE:  
**ANTENNA MOUNTING DETAILS**  
 JOB NUMBER: 14020-EMP  
 DRAWING NUMBER: A-5  
 REV: A



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x 1/4")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	5/8" - 11x1" H.H.C.S.
5	4	5/8" LOCK WASHER

- NOTES:
- EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION
- SECTION "P" - SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
  - GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
  - TELCO GROUND BAR
  - COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
  - +24V POWER SUPPLY RETURN BAR (#2)
  - -48V POWER SUPPLY RETURN BAR (#2)
  - RECTIFIER FRAMES
- SECTION "A" - SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
  - EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
  - METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
  - BUILDING STEEL (IF AVAILABLE) (#2)





FDH Engineering, Inc., 6521 Meriden Drive Raleigh, NC 27616, Ph. 919.755.1012

**Structural Analysis for  
SBA Network Services, Inc.**

**193' Self-Support Tower**

**SBA Site Name: Bozrah  
SBA Site ID: CT01105-S  
New Cingular Site ID: CT2223**

FDH Project Number 15BAJP1400

**Analysis Results**

Tower Components	88.3 %	Sufficient
Foundation	81.3 %	Sufficient

Prepared By:

*Jarel Duncan*

Jarel Duncan, EI  
Project Engineer

Reviewed By:

*Dennis D. Abel*

Dennis D. Abel, PE  
Director of Structural Engineering  
CT PE License No. 23247

**FDH Engineering, Inc.**  
6521 Meriden Drive  
Raleigh, NC 27616  
(919) 755-1012  
info@fdh-inc.com



January 9, 2015

*Prepared pursuant to TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code*

**TABLE OF CONTENTS**

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## EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Engineering, Inc. performed a structural analysis of the existing self-supported tower located in Bozrah, CT to determine whether the tower is structurally adequate to support both the existing and proposed loads pursuant to the *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, TIA/EIA-222-F* and *2005 Connecticut Building Code (CBC)*. Information pertaining to the existing/proposed antenna loading, current tower geometry, the member sizes, soil parameters, and foundation dimensions was obtained from:

- Pirod, Inc. (Eng. File No. A-115466) original design drawings dated April 1, 1999
- Jaworski Geotech, Inc. (Project No. C98492G) Geotechnical Evaluation dated December 14, 1998
- SBA Network Services, Inc.

The *basic design wind speed* per the *TIA/EIA-222-F* standards and *2005 CBC* is 85 mph without ice and 38 mph with 3/4" radial ice. Ice is considered to increase in thickness with height.

## Conclusions

With the existing and proposed antennas from New Cingular in place at 182 ft, the tower meets the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* provided the **Recommendations** listed below are satisfied. Furthermore, provided the foundations were designed and constructed to support the original design reactions (see Pirod, Inc. Eng. File No. A-115466), the foundations should have the necessary capacity to support the existing and proposed loading. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Engineering, Inc. is accurate (i.e., the steel data, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

## Recommendations

To ensure the requirements of the *TIA/EIA-222-F* standards and *2005 CBC* are met with the existing and proposed loading in place, we have the following recommendations:

1. The coax must be installed as shown in **Figure 1**.
2. The existing TMAs and proposed diplexers should be installed directly behind the proposed and existing panel antennas.
3. RRU/RRH Stipulation: The proposed equipment may be installed in any configuration as determined by the client.

**APPURTENANCE LISTING**

The proposed and existing antennas with their corresponding cables/coax lines are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Engineering, Inc. should be contacted to perform a revised analysis.*

**Table 1 - Appurtenance Loading**

**Existing Loading:**

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
195	(9) EMS RR90-17-02DP	(12) 1-5/8"	T-Mobile	193	(1) Low Profile Platform
182	(3) Andrew SBNH-1D6565C (6) Powerwave 7770 (6) Powerwave LGP21401 (6) Powerwave LGP21903 (6) Ericsson RRUS 11 (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (1) 3/8" Fiber (2) 3/4" DC	New Cingular	182	(3) T-Frames
175	(6) 6'x1' panels (assumed)	(6) 1-5/8"	Sprint	175	(3) T-Frames
162	(6) Commscope HBXX-6517DS-A2M (6) Commscope LNX-6514DS-VTM (3) Alcatel Lucent 1900 RRH 2x60W (3) Alcatel Lucent RRH2x60 RRUs (2) RFS DB-T1-6Z-8AB-0Z (6) RFS FD9R6004/2C-3L	(12) 1-5/8" (2) 1-5/8" Fiber	Verizon	162	(3) T-Frames
100	(1) Lucent KS24019-L112A	(1) GPS Line		100	Direct Mount
30	(2) Andrew PC1N0F-0190B-002M E911	(2) 1/2"	T-Mobile	30	Direct Mount

**Proposed Loading – Final Configuration:**

Antenna Elevation (ft)	Description	Coax and Lines	Carrier	Mount Elevation (ft)	Mount Type
182	(3) CCI HPA-65R-BUU-H8 (3) Powerwave 7770 (3) CCI OPA-65R-LCUU-H6 (6) Powerwave LGP21401 (6) Ericsson RRUS 11 (3) Ericsson RRUS 12 (3) Ericsson RRUS A2 (3) Ericsson RRUS 32 (3) Ericsson RRUS E2 (3) Polyphases 1000860 (6) Powerwave LGP21901 (2) Raycap DC6-48-60-18-8F	(3) 1-5/8" (2) 5/8" Fiber (8) 3/4" DC	New Cingular	182	(3) 12.5' T-Frames (Commscope P/N: MTC3615)

## RESULTS

The following yield strength of steel for individual members was used for analysis:

**Table 2 - Material Strength**

Member Type	Yield Strength
Legs	50 ksi
Bracing	50 ksi & 36 ksi

**Table 3** displays the summary of the ratio (as a percentage) of force in the member to their capacities. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 4** displays the maximum foundation reactions.

If the assumptions outlined in this report differ from actual field conditions, FDH Engineering, Inc. should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the existing or proposed appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information

**Table 3 - Summary of Working Percentage of Structural Components**

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
T1	193 - 185	Leg	2	6.6 7.5 (b)	Pass
		Diagonal	1	11.7	Pass
		Horizontal	3/4	7.8	Pass
		Top Girt	1 1/4	4.6	Pass
		Bottom Girt	1 1/4	5.3	Pass
T2	185 - 170	Leg	2	42.6	Pass
		Diagonal	1	44.3	Pass
		Horizontal	3/4	15.7	Pass
		Top Girt	1 1/4	1.5	Pass
		Bottom Girt	1 1/4	6.6	Pass
T3	170 - 160	Leg	Pirod 105244	54.9	Pass
		Diagonal	L2 1/2x2 1/2x3/16	65.8 71.8 (b)	Pass
		Mid Girt	1 1/4	2.1	Pass
T4	160 - 140	Leg	Pirod 105217	55.5	Pass
		Diagonal	L3x3x3/16	56.6 82.7 (b)	Pass
T5	140 - 120	Leg	Pirod 105217	80.0	Pass
		Diagonal	L3x3x3/16	65.2 76.0 (b)	Pass
T6	120 - 100	Leg	Pirod 105218	73.2	Pass
		Diagonal	L3x3x5/16	52.2	Pass
T7	100 - 80	Leg	Pirod 105219	66.3	Pass
		Diagonal	L3x3x5/16	65.8	Pass
T8	80 - 60	Leg	Pirod 105219	76.9	Pass

Section No.	Elevation ft	Component Type	Size	% Capacity*	Pass Fail
		Diagonal	L3 1/2x3 1/2x5/16	53.1	Pass
T9	60 - 40	Leg	Pirod 105220	68.0 79.3 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	65.7	Pass
T10	40 - 20	Leg	Pirod 105220	76.3 88.3 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	79.8	Pass
T11	20 - 0	Leg	Pirod 112738	66.6	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x1	52.6	Pass

\*Capacities include a 1/3 allowable stress increase for wind.

**Table 4 - Maximum Base Reactions**

Load Type	Direction	Current Analysis (TIA/EIA-222-F)	Original Design (TIA/EIA-222-F)
Individual Foundation	Horizontal	43 k	-
	Uplift	332 k	414 k
	Compression	375 k	462 k
Overturing Moment	---	6,788 k-ft	8,348 k-ft

## GENERAL COMMENTS

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Engineering, Inc. should be notified immediately to perform a revised analysis.

## LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Engineering, Inc.

## APPENDIX

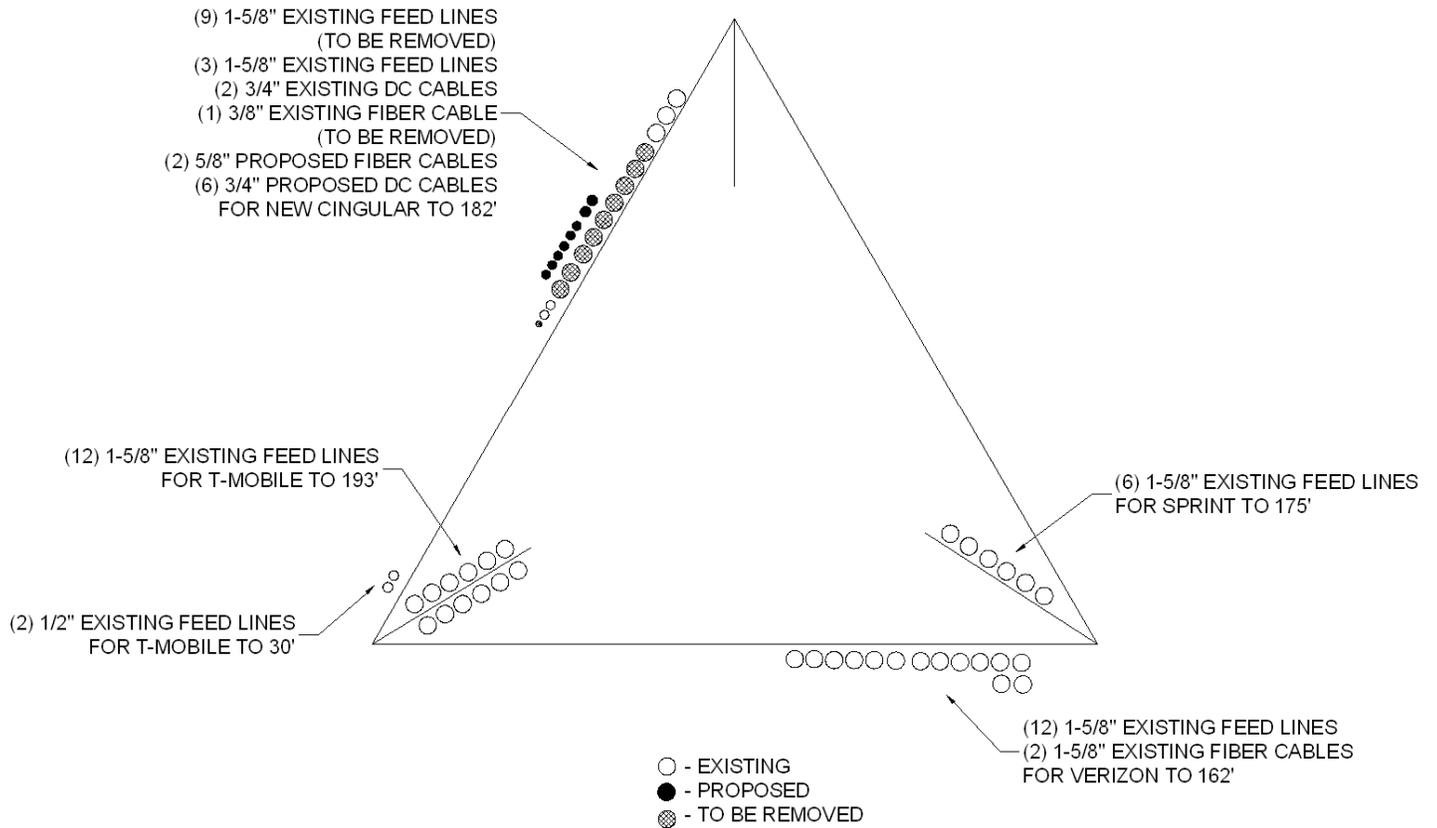
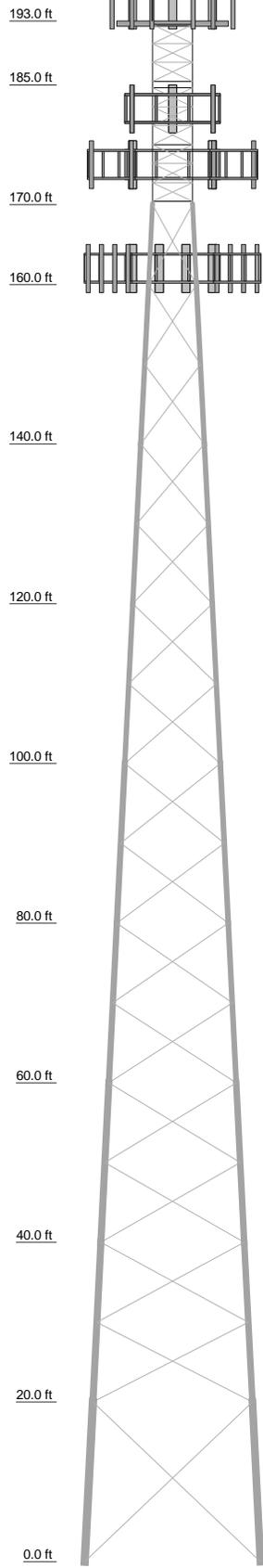


Figure 1 – Coax Layout

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	22	5
Legs		SR 2	A	Pirot 105217		Pirot 105218	Pirot 105219	Pirot 105220		Pirot 105220	Pirot 112738		
Leg Grade		SR 1	B			A572-50	A36						
Diagonals		A572-50		L3x3x3/16		L3x3x5/16		L3 1/2x3 1/2x5/16			2L3 1/2x3 1/2x5/16x1		
Top Girts													
Mid Girts		SR 1 1/4					N.A.						
Bottom Girts		SR 1 1/4					N.A.						
Horizontals		SR 1 1/4					N.A.						
Face Width (ft)		SR 3/4									1 @ 20		
# Panels @ (ft)													
Weight (K)													



**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
(3) RR90-17-02DP w/ Mount Pipe	193	1000860	182
(3) RR90-17-02DP w/ Mount Pipe	193	1000860	182
(3) RR90-17-02DP w/ Mount Pipe	193	DC6-48-60-18-8F	182
(1) Low Profile Platform	193	DC6-48-60-18-8F	182
Lightning Rod	193	(3) 12.5' T-Frames (Commscope P/N: MTC3615)	182
Empty Mount Pipe	193	Powerwave 7770 w/ Mount Pipe	182
Empty Mount Pipe	193	Powerwave 7770 w/ Mount Pipe	182
Empty Mount Pipe	193	Powerwave 7770 w/ Mount Pipe	182
HPA-65R-BUU-H8 w/ Mount Pipe	182	HPA-65R-BUU-H8 w/ Mount Pipe	182
HPA-65R-BUU-H8 w/ Mount Pipe	182	(2) 6' Panel w/ Mount Pipe	175
OPA-65R-LCUU-H6 w/ Mount Pipe	182	(2) 6' Panel w/ Mount Pipe	175
OPA-65R-LCUU-H6 w/ Mount Pipe	182	(2) 6' Panel w/ Mount Pipe	175
OPA-65R-LCUU-H6 w/ Mount Pipe	182	(2) 6' Panel w/ Mount Pipe	175
(2) LGP21401	182	(3) T-Frames	175
(2) LGP21401	182	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
(2) LGP21401	182	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
(2) RRUS 11	182	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
(2) RRUS 11	182	(2) LNX-6514DS-VTM	162
(2) RRUS 11	182	(2) LNX-6514DS-VTM	162
RRUS 12	182	(2) LNX-6514DS-VTM	162
RRUS 12	182	1900 RRH 2x60W	162
RRUS 12	182	1900 RRH 2x60W	162
RRUS A2	182	1900 RRH 2x60W	162
RRUS A2	182	RRH2x60 RRUs	162
RRUS A2	182	RRH2x60 RRUs	162
RRUS-32	182	RRH2x60 RRUs	162
RRUS-32	182	DB-T1-6Z-8AB-0Z	162
RRUS-32	182	DB-T1-6Z-8AB-0Z	162
RRUS-E2	182	(2) FD9R6004/2C-3L	162
RRUS-E2	182	(2) FD9R6004/2C-3L	162
RRUS-E2	182	(2) FD9R6004/2C-3L	162
(2) LGP21901	182	(3) T-Frames	162
(2) LGP21901	182	KS24019-L112A	100
(2) LGP21901	182	PC1N0F-0190B-002M	30
1000860	182	PC1N0F-0190B-002M	30

**SYMBOL LIST**

MARK	SIZE	MARK	SIZE
A	Pirot 105244	B	L2 1/2x2 1/2x3/16

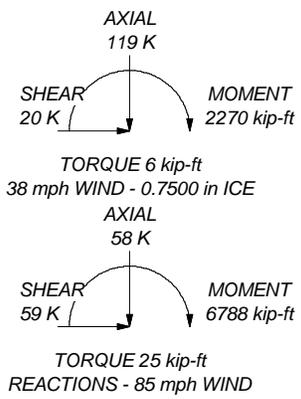
**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. ~~Vertical dimensions are based on a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.~~
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 88.3%

UPLIFT: -332 K  
SHEAR: 38 K



**FDH Engineering, Inc.**  
6521 Meridien Drive  
Raleigh, NC 27616  
Phone: (919) 755-1012  
FAX: (919) 755-1031

Job: **Bozrah, CT01105-S**  
Project: **15BAJP1400**  
Client: SBA Network Services, Inc. Drawn by: Jarel Duncan App'd:  
Code: TIA/EIA-222-F Date: 01/09/15 Scale: NTS  
Path: D:\Projects\15BAJP1400\15BAJP1400.dwg  
Dwg No. E-1

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

AT&T Existing Facility

Site ID: CT2223

Bozrah CT  
133 Gifford Lane  
Bozrah, CT 06334

**December 11, 2014**

**EBI Project Number: 62146233**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>18.09 %</b>

December 11, 2014

AT&T Mobility – New England  
Attn: Cameron Syme  
550 Cochituate Road  
Suite 550 – 13&14  
Framingham, MA 01701

Emissions Analysis for Site: **CT2223 – Bozrah CT**

EBI Consulting was directed to analyze the proposed AT&T facility located at **133 Gifford Lane, Bozrah, CT**, for the purpose of determining whether the emissions from the Proposed AT&T 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 700 MHz and 800 MHz Bands are  $467 \mu\text{W}/\text{cm}^2$  and  $567 \mu\text{W}/\text{cm}^2$  respectively. The general population exposure limit for the PCS and AWS bands is  $1000 \mu\text{W}/\text{cm}^2$ . 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 AT&T Wireless antenna facility located at **133 Gifford Lane, Bozrah, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T 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 (850 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 2 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 7) 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.
- 8) 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.
- 9) The antennas used in this modeling are the **Powerwave 7770** for 850 MHz and 1900 MHz (PCS) channels and the **CCI OPA-65R-LCUU-H8** for 700 MHz, 850 MHz, 1900 MHz and 2300 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Powerwave 7770** has a maximum gain of **11.4 dBd for 850 MHz and 13.4 dBd for 1900 MHz** at its main lobe. The **CCI OPA-65R-LCUU-H8** has a maximum gain of **13.2 dBd for 700 MHz, 14.1 dBd for 850 MHz, 15 dBd for 1900 MHz and 15.6 dBd for 2300 MHz** 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.
- 10) The antenna mounting height centerlines of the proposed antennas are **182 feet** above ground level (AGL).
- 11) 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.

**AT&T Site Inventory and Power Data**

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	13.4 / 11.4 dBd	Gain:	13.4 / 11.4 dBd	Gain:	13.4 / 11.4 dBd
Height (AGL):	182 feet	Height (AGL):	182 feet	Height (AGL):	182 feet
Frequency Bands	1900 MHz(PCS) / 850 MHz	Frequency Bands	1900 MHz(PCS) / 850 MHz	Frequency Bands	1900 MHz(PCS) / 850 MHz
Channel Count	4	Channel Count	4	# PCS Channels:	4
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,395.90	ERP (W):	1,395.90	ERP (W):	1,395.90
Antenna A1 MPE%	0.32	Antenna B1 MPE%	0.32	Antenna C1 MPE%	0.32
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI OPA-65R-LCUU-H8	Make / Model:	CCI OPA-65R-LCUU-H8	Make / Model:	CCI OPA-65R-LCUU-H8
Gain:	13.2/14.1/15.6 dBd	Gain:	13.2/14.1/15.6 dBd	Gain:	13.2/14.1/15.6 dBd
Height (AGL):	182 feet	Height (AGL):	182 feet	Height (AGL):	182 feet
Frequency Bands	700 MHz / 850 MHz / 2300 MHz (WCS)	Frequency Bands	700 MHz / 850 MHz / 2300 MHz (WCS)	Frequency Bands	700 MHz / 850 MHz / 2300 MHz (WCS)
Channel Count	5	Channel Count	5	Channel Count	5
Total TX Power:	240	Total TX Power:	240	Total TX Power:	240
ERP (W):	3,516.62	ERP (W):	3,516.62	ERP (W):	3,516.62
Antenna A2 MPE%	1.13	Antenna B2 MPE%	1.13	Antenna C2 MPE%	1.13
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	CCI OPA-65R-LCUU-H8	Make / Model:	CCI OPA-65R-LCUU-H8	Make / Model:	CCI OPA-65R-LCUU-H8
Gain:	13.2/15 dBd	Gain:	13.2/15 dBd	Gain:	13.2/15 dBd
Height (AGL):	182 feet	Height (AGL):	182 feet	Height (AGL):	182 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power:	180	Total TX Power:	180	Total TX Power:	180
ERP (W):	2,606.98	ERP (W):	2,606.98	ERP (W):	2,606.98
Antenna A3 MPE%	0.75	Antenna B3 MPE%	0.75	Antenna C3 MPE%	0.75

Site Composite MPE%	
Carrier	MPE%
AT&T	6.62 %
T-Mobile	0.73 %
Verizon Wireless	8.55 %
Sprint	2.19%
<b>Site Total MPE %:</b>	<b>18.09 %</b>

AT&T Sector 1 Total:	2.21 %
AT&T Sector 2 Total:	2.21 %
AT&T Sector 3 Total:	2.21 %
<b>Site Total:</b>	<b>18.09 %</b>

## 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 AT&T 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:

AT&T Sector	Power Density Value (%)
Sector 1:	2.21%
Sector 2:	2.21 %
Sector 3 :	2.21 %
AT&T Total:	6.62 %
Site Total:	18.09 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **18.09%** 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

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