



July 23, 2014

Melanie A. Bachman  
Executive Director  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**Re:** **Notice of Exempt Modification**  
**Proposal to Add Three (3) Remote Radio Heads**  
**Property Address:** **83 Windham Street, Willimantic, CT 06226**  
**(the “Property”)**  
**Applicant:** **New Cingular Wireless PCS, LLC (“AT&T”)**

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 175-foot Monopole tower location on the Property, owned by Southwestern Bell Mobile Systems, LLC (the “Tower”). AT&T’s facility consists of nine (9) wireless telecommunication antennas at a height of 138-feet.

The Connecticut Siting Council (the “Council”) approved AT&T’s use of the tower in the following prior decisions; EM-CING-163-080612, EM-AT&T-163-120907 and EM-AT&T-163-121001. In its decision dated October 19, 2012, (the “Decision”), the Council approved AT&T to install six (6) Remote Radio Heads (“RRUs”), but AT&T installed only three (3) RRUs. AT&T now intends to install the remaining RRUs to complete the installation. This exempt modification application is necessary because the Decision is over one year old. Please refer to Tab 1 for further specifications of the RRUs.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that 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 of Willimantic Board of Selectmen. A copy of this letter is also being sent to Southwestern Bell Mobile Systems, LLC

The planned modifications to AT&T’s facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the Tower. AT&T’s new RRUs will be installed at the 138-foot level of the 175-foot Monopole.



2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require an extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A RF emissions calculation for AT&T's modified facility was provided in the application which led to the - Decision. See Tab 2 attached.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The Tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

Adam F. Braillard

cc:

Southwestern Bell Mobile Systems, LLC  
83 Windham Street,  
Willimantic, CT 06226

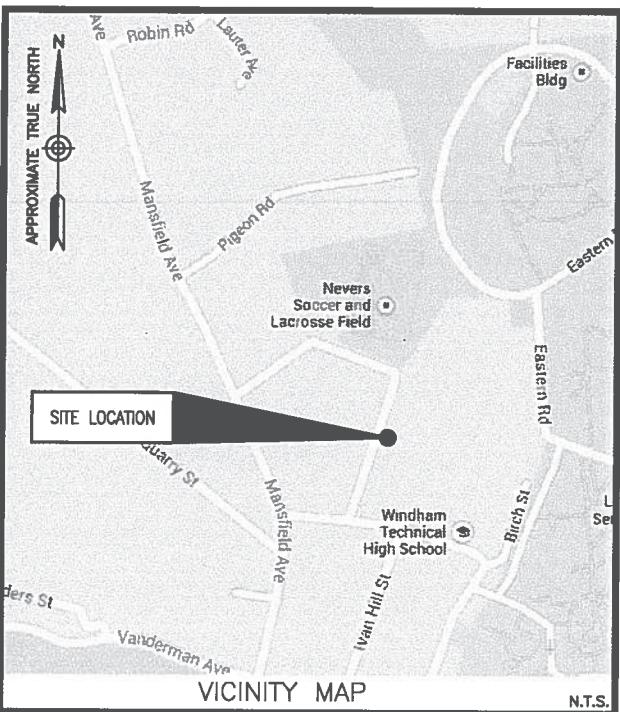
Town of Willimantic  
979 Main Street,  
Willimantic, CT 06226

**TAB 1**



# at&t Mobility

**SITE NAME: WILLIMANTIC T6  
SITE NUMBER: CT1051  
83 WINDHAM STREET,  
WILLIMANTIC, CT 06226**



DIRECTIONS FROM 500 ENTERPRISE DRIVE, ROCKY HILL, CT:

HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD. TURN LEFT ONTO CAPITAL BLVD. TURN LEFT ONTO WEST ST. TAKE RAMP LEFT FOR I-91 N. AT EXIT 29, TAKE RAMP RIGHT FOR US-5 NORTH/CT-15 N TOWARD BOSTON/E HARTFORD. KEEP STRAIGHT ONTO CR-15 N. KEEP STRAIGHT ONTO I-84 E/US-6 E. TAKE RAMP RIGHT FOR I-384 E. ROAD NAME CHANGES TO US-6 E/US-44 E. KEEP STRAIGHT ONTO US-6 E/HOPRIVER RD. KEEP STRAIGHT ONTO US-6 E/WILLIMANTIC RD. TAKE RAMP RIGHT TOWARD STORRS/UNIVERSITY OF CONNECTICUT. TURN RIGHT ONTO HIGH ST. TURN RIGHT ONTO EASTERN RD.

THE SITE WILL BE ON THE RIGHT

SITE COORDINATES:  
LATITUDE: N 41° 43' 14.11"  
LONGITUDE: W 72° 13' 6"  
\*AS PER GOOGLE EARTH

ELEVATION DATA  
GRADE ELEVATION AT TOWER = 379'± A.M.S.L  
\*AS PER GOOGLE EARTH

ANTENNA ELEVATION (TO C.L. OF ANTENNA)  
ALPHA FACE: 138°-0"± A.G.L  
BETA FACE: 138°-0"± A.G.L  
GAMMA FACE: 138°-0"± A.G.L

SITE INFORMATION

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ADD (1) NEW RRUS PER SECTOR FOR A TOTAL OF (3) NEW RRUS.

PROJECT DESCRIPTION

<u>SITE NAME:</u> WILLIMANTIC T6	<u>SITE NUMBER:</u> CT1051
<u>LOCATION:</u> 83 WINDHAM STREET, WILLIMANTIC WINDHAM COUNTY, CT 06226	
<u>APPLICANT/LESSEE:</u> AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CONNECTICUT 06087	
<b>PROJECT INFORMATION</b>	
THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.	
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.	

83 WINDHAM STREET,  
WILLIMANTIC, CT 06226  
WINDHAM COUNTY

**SHEET TITLE**

T-1

**GENERAL NOTES:**

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
PROJECT MANAGEMENT - SMARTLINK  
CONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)  
OWNER - AT&T MOBILITY  
OEM - ORIGINAL EQUIPMENT MANUFACTURER
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR 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 PROJECT MANAGEMENT.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR 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.
- DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTEANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
- CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- CONTRACTOR 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.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- 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.
- CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
- CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH LAND LORD. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- 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.

**SITE WORK GENERAL NOTES:**

- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:  
A) FALL PROTECTION  
B) CONFINED SPACE  
C) ELECTRICAL SAFETY  
D) TRENCHING & EXCAVATION.
- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE AT&T SPECIFICATION FOR SITE SIGNAGE.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUB GRADE SHALL BE COMPAKTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPAKTION NOTES.
- THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
- EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

**CONCRETE AND REINFORCING STEEL NOTES:**

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 338, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
- REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:  
CONCRETE CAST AGAINST EARTH.....3 IN.  
CONCRETE EXPOSED TO EARTH OR WEATHER:  
#8 AND LARGER.....2 IN.  
#8 AND SMALLER & WW.....1 1/2 IN.  
CONCRETE NOT EXPOSED TO EARTH OR WEATHER  
OR NOT CAST AGAINST THE GROUND:  
SLAB AND WALL.....3/4 IN.  
BEAMS AND COLUMNS.....1 1/2 IN.
- A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
- CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.8.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER:  
(A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,  
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.  
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
- AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
- EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

**STRUCTURAL STEEL NOTES:**

- ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
- BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
- NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" Ø DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
- ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

**SOIL COMPACTION NOTES FOR SLAB ON GRADE:**

- EXCAVATE AS REQUIRED TO REMOVE VEGETATION & TOPSOIL EXPOSE UNDISTURBED NATURAL SUBGRADE AND PLACE CRUSHED STONE AS REQUIRED.
- COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
- AS AN ALTERNATIVE TO INSPECTION AND WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPAKTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
- COMPACTED SUBBASE SHALL BE UNIFORM & LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.
- AS AN ALTERNATIVE TO ITEMS 2 AND 3 PROOFROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED AND REPLACED WITH A WELL-GRADED GRANULAR FILL, AND COMPACTED AS STATED ABOVE.

**COMPACTION EQUIPMENT:**

- HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

**CONSTRUCTION NOTES:**

- FIELD VERIFICATION:  
CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, AT&T ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
- COORDINATION OF WORK:  
CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
- CABLE LADDER RACK:  
CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

**ELECTRICAL INSTALLATION NOTES:**

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
- CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
- CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
- EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
- PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 8 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
- NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
- RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND, DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
- CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.



500 ENTERPRISE DRIVE SUITE 3A

ROCKY HILL, CT 06067



1997 ANNAPOLIS EXCHANGE PARKWAY

SUITE 200

ANNAPOLIS, MD 21401

**CT1051**  
**WILLIMANTIC T6**

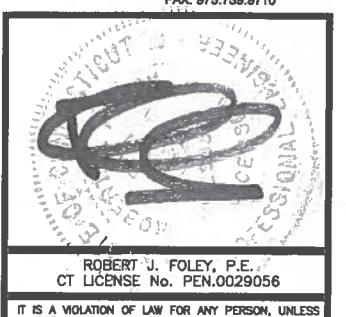
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DRAWN BY: JC

REVIEWED BY: PD

CHECKED BY: GHN

PROJECT NUMBER: 50063024

JOB NUMBER: 50063028

SITE ADDRESS:

83 WINDHAM STREET,  
WILLIMANTIC, CT 06226

WINDHAM COUNTY

SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

G-1

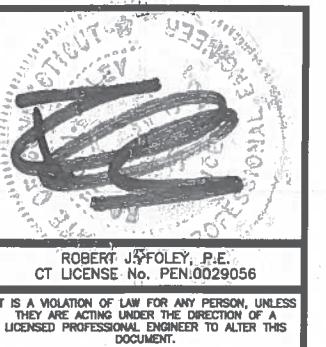
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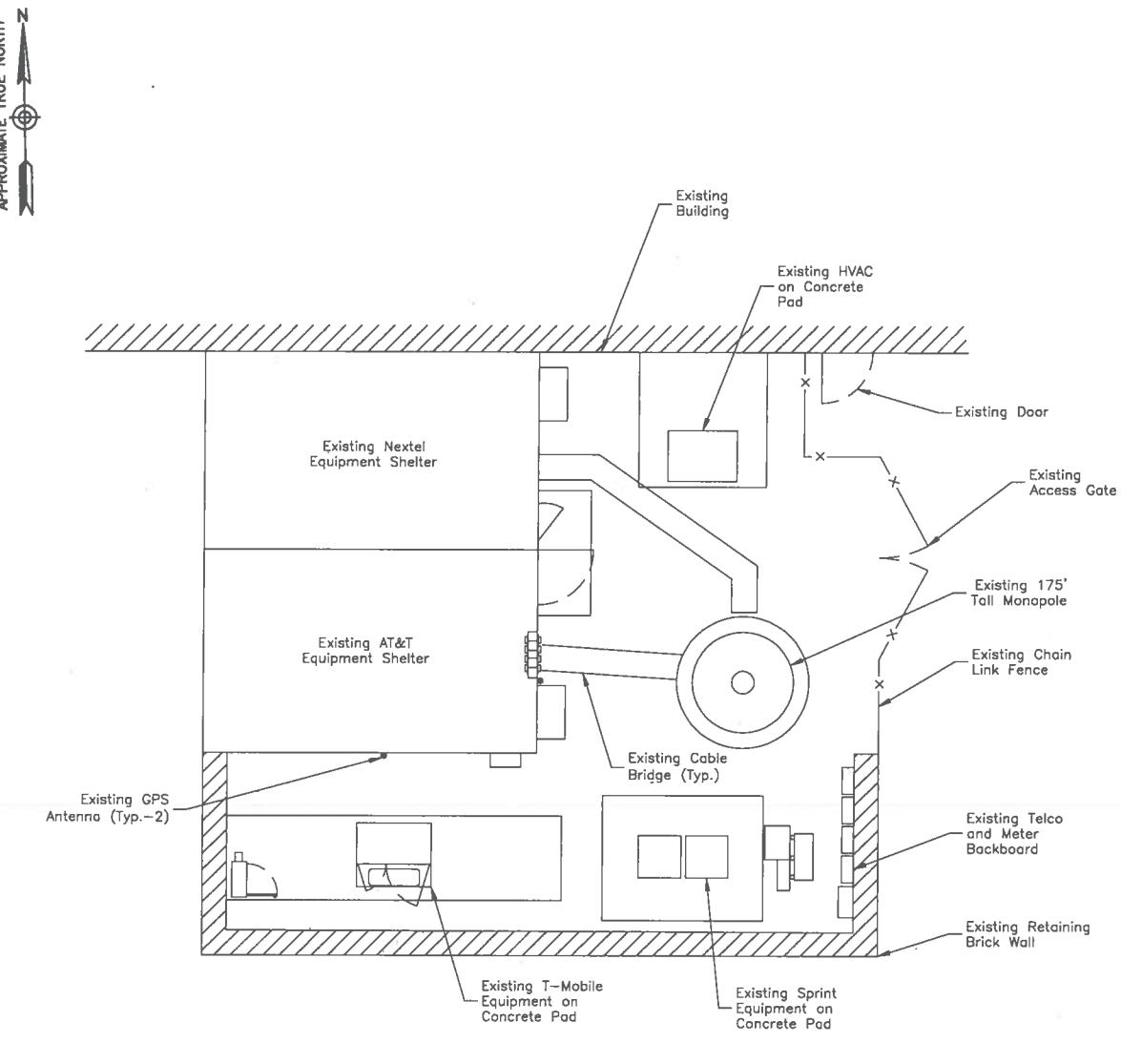
DRAWN BY: JC  
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CHECKED BY: GHN  
PROJECT NUMBER: 50063024  
JOB NUMBER: 50063028  
SITE ADDRESS:

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WINDHAM COUNTY

SHEET TITLE

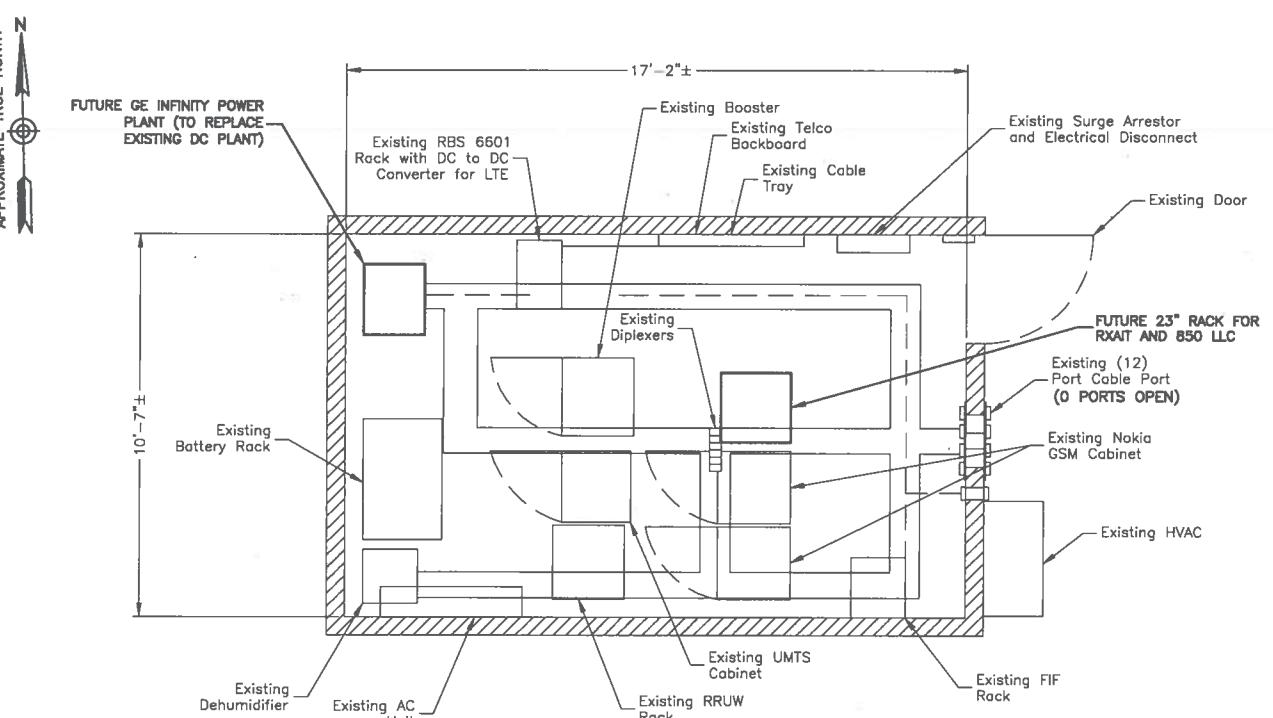
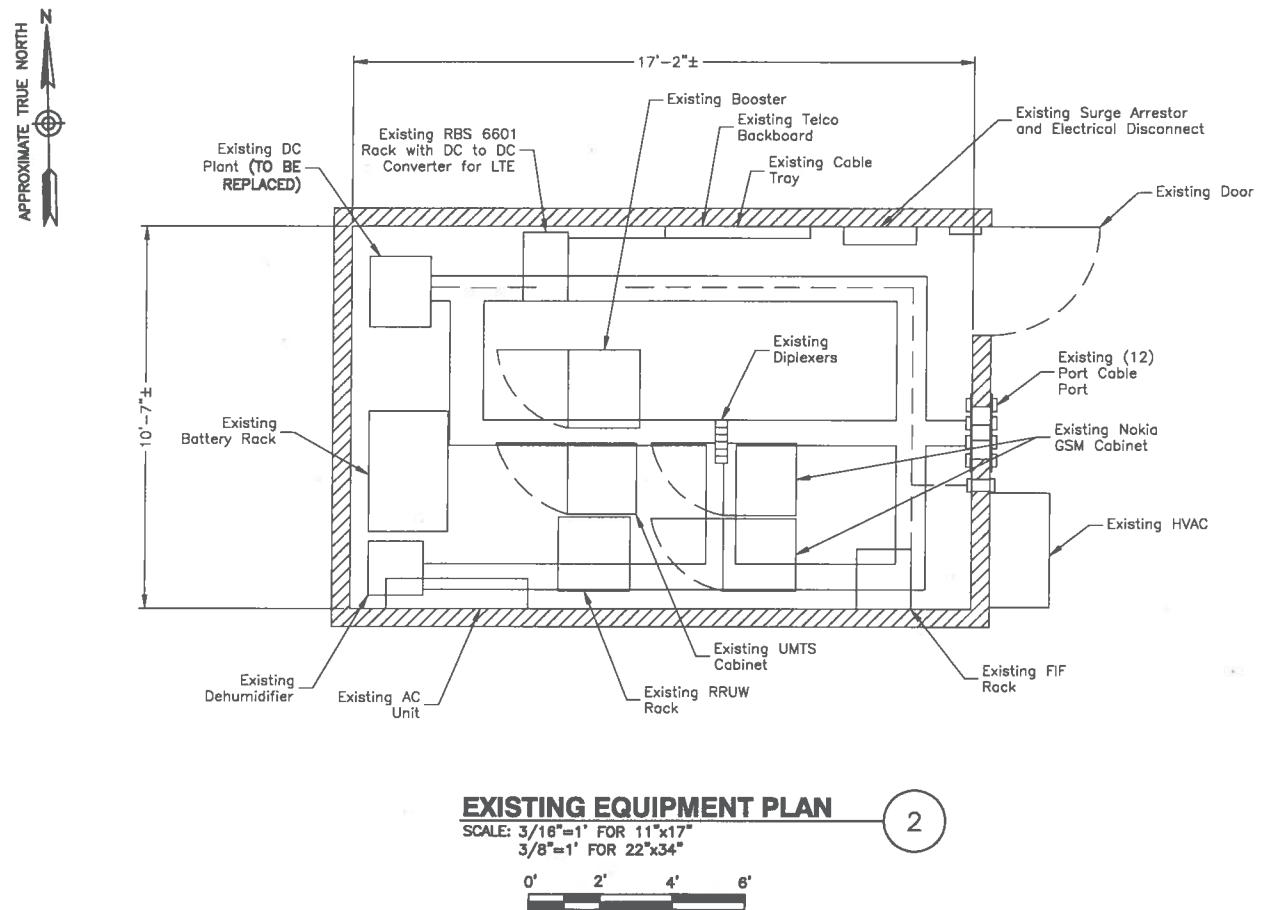
SITE PLAN &  
EQUIPMENT PLANS  
SHEET NUMBER

C-1



**NOTES:**

1. NORTH SHOWN AS APPROXIMATE.
2. MOUNT ALL ANTENNAS, COAX, SURGE ARRESTORS, RRUS, ETC, IN ACCORDANCE WITH STRUCTURAL ANALYSIS.
3. NOT ALL INFORMATION IS SHOWN FOR CLARITY.



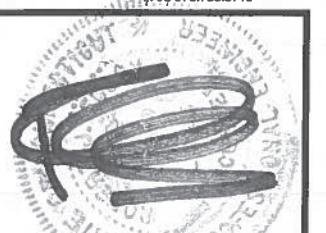
**CT1051**  
**WILLIMANTIC T6**

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ROBERT J. FOLEY, P.E.  
CT LICENSE No. PEN.0029056

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THEY ARE ACTING UNDER THE DIRECTION OF A  
LICENSED PROFESSIONAL ENGINEER TO ALTER THIS  
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DRAWN BY: JC

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PROJECT NUMBER: 50063024

JOB NUMBER: 50063028

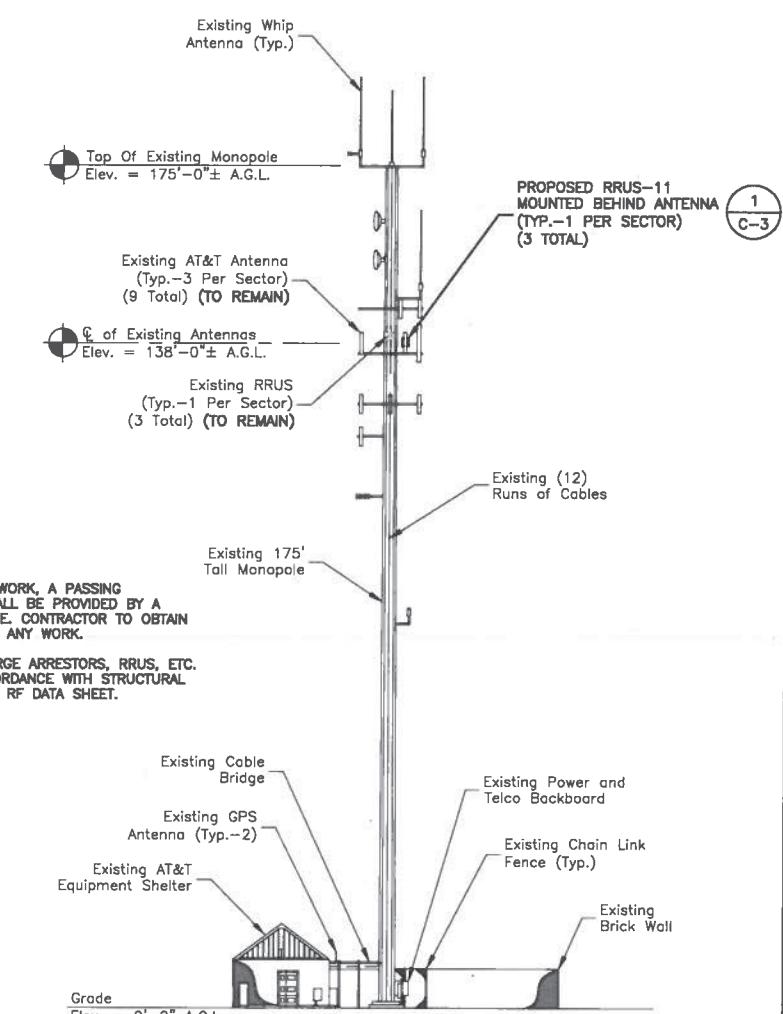
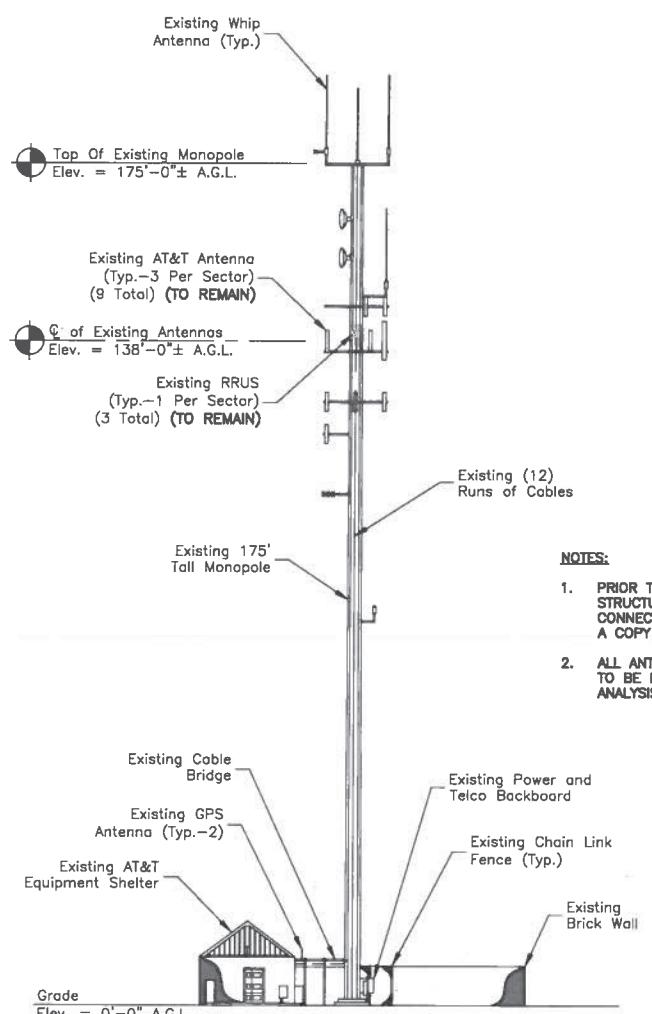
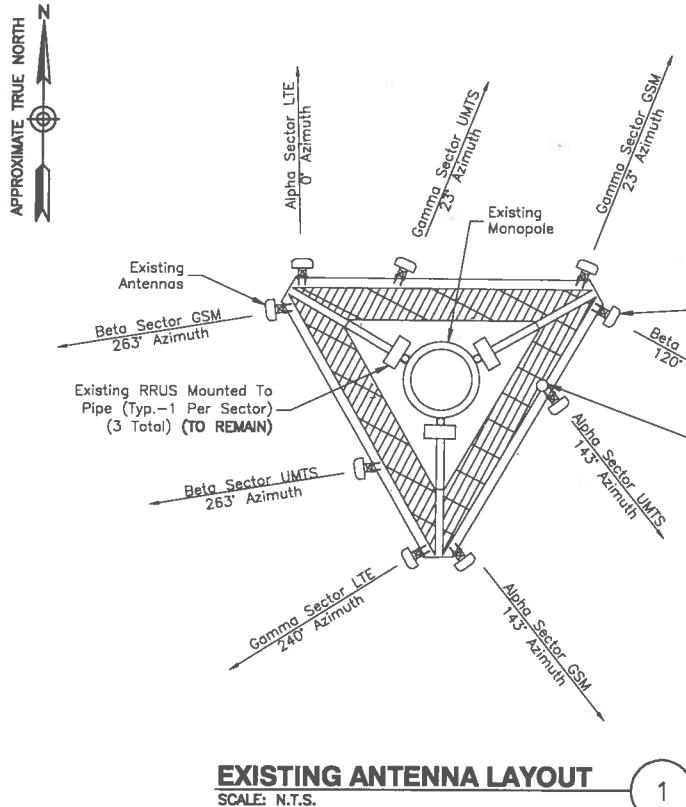
SITE ADDRESS:

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WILLIMANTIC, CT 06226  
WINDHAM COUNTY

SHEET TITLE

ANTENNA LAYOUTS  
& ELEVATIONS

SHEET NUMBER



**PROPOSED ANTENNA LAYOUT**

SCALE: N.T.S.

<b>EXISTING ANTENNA SCHEDULE</b>				
SECTOR	MAKE	MODEL #	SIZE (INCHES)	
ALPHA:	POWERWAVE	7770	55x11x5	
	KMW	AM-X-CD-17-85	96x11.8x5.9	
	CSS	DUO1417-8686-4-0	-	
BETA:	POWERWAVE	7770	55x11x5	
	KMW	AM-X-CD-17-85	96x11.8x5.9	
	CSS	DUO1417-8686-4-0	-	
GAMMA:	POWERWAVE	7770	55x11x5	
	KMW	AM-X-CD-17-85	96x11.8x5.9	
	CSS	DUO1417-8686-4-0	-	

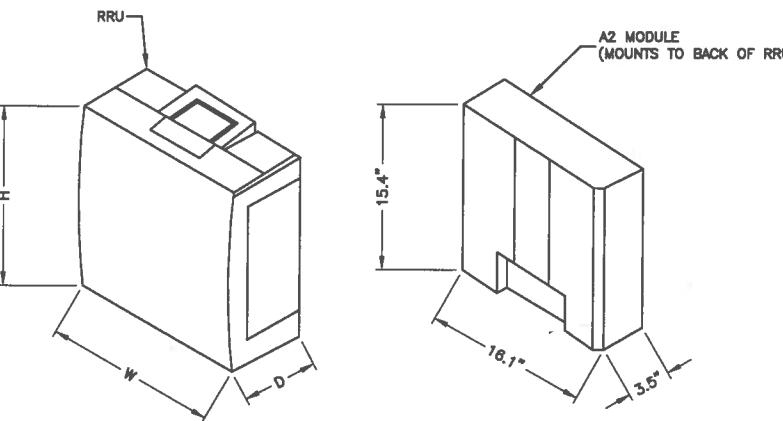
<b>PROPOSED ANTENNA SCHEDULE</b>				
SECTOR	MAKE	MODEL #	SIZE (INCHES)	
ALPHA:	POWERWAVE	7770	55x11x5	
	KMW	AM-X-CD-17-85	96x11.8x5.9	
	CSS	DUO1417-8686-4-0	-	
BETA:	POWERWAVE	7770	55x11x5	
	KMW	AM-X-CD-17-85	96x11.8x5.9	
	CSS	DUO1417-8686-4-0	-	
GAMMA:	POWERWAVE	7770	55x11x5	
	KMW	AM-X-CD-17-85	96x11.8x5.9	
	CSS	DUO1417-8686-4-0	-	

<b>EXISTING RRUS SCHEDULE</b>				
SECTOR	MAKE	MODEL #	SIZE (INCHES)	
ALPHA:	ERICSSON	RRUS-11	19.7x17.0x7.2	
BETA:	ERICSSON	RRUS-11	19.7x17.0x7.2	
GAMMA:	ERICSSON	RRUS-11	19.7x17.0x7.2	

<b>PROPOSED RRUS SCHEDULE</b>				
SECTOR	MAKE	MODEL #	SIZE (INCHES)	
ALPHA:	ERICSSON	RRUS-11	19.7x17.0x7.2	
	ERICSSON	RRUS-11	19.7x17.0x7.2	
BETA:	ERICSSON	RRUS-11	19.7x17.0x7.2	
	ERICSSON	RRUS-11	19.7x17.0x7.2	
GAMMA:	ERICSSON	RRUS-11	19.7x17.0x7.2	
	ERICSSON	RRUS-11	19.7x17.0x7.2	



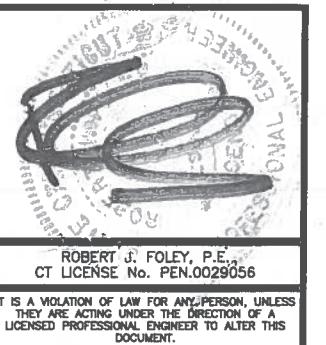
<b>RRU MODEL &amp; DIMENSIONS</b>	
ERICSSON MODEL #	DIMENSIONS (HxWxD)
RRUS-11	19.7" x 17.0" x 7.2"
RRUS-12	20.4" x 18.8" x 7.5"
RRUS-E2	20.4" x 18.8" x 7.5"
RRUS-32	29.9" x 13.3" x 9.5"

**RRU NOTES:**

1. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND AT&T STANDARDS.
2. MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
3. CONFIRM REQUIRED EQUIPMENT WITH LATEST RFDS.

**RRU & A2 MODULE**  
SCALE: N.T.S. 1

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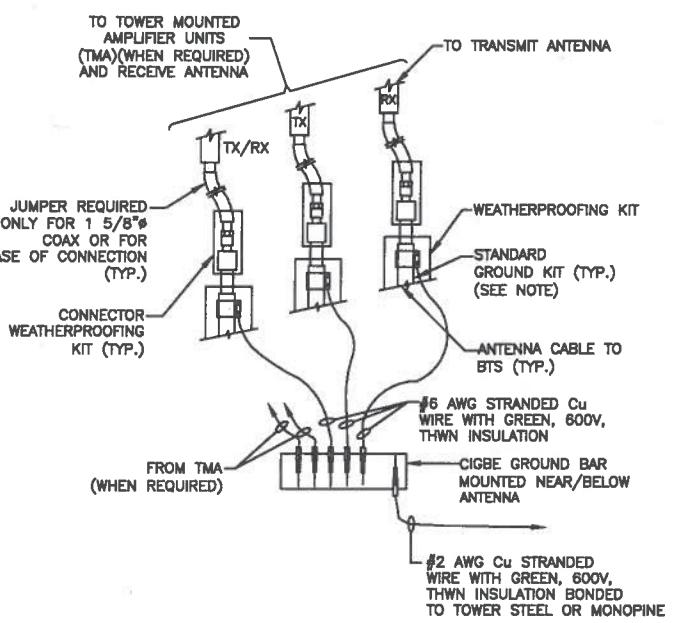
DRAWN BY:	JC
REVIEWED BY:	PD
CHECKED BY:	GHN
PROJECT NUMBER:	50063024
JOB NUMBER:	50063028
SITE ADDRESS:	

83 WINDHAM STREET,  
WILLIMANTIC, CT 06226  
WINDHAM COUNTY

SHEET TITLE
CONSTRUCTION DETAILS & ANTENNA SCHEDULE
SHEET NUMBER

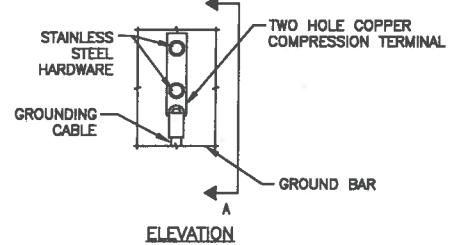
#### GROUNDING NOTES:

- THE CONTRACTOR 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) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER FOR RESOLUTION.
- 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. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY THE ENGINEER IN WRITING.
- THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
- 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 AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- 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 TRANSMISSION EQUIPMENT.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
- EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM SMARTLINK MARKET REPRESENTATIVE.
- EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
- ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
- ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
- COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
- APPROVED ANTIODANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
- 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 WITH LISTED BONDING FITTINGS.



#### CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE)

1



SECTION 'A-A'

#### NOTES:

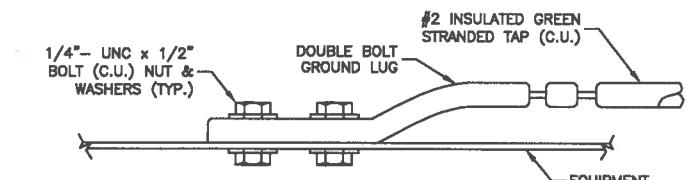
- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

- DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
- OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

#### TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL

2

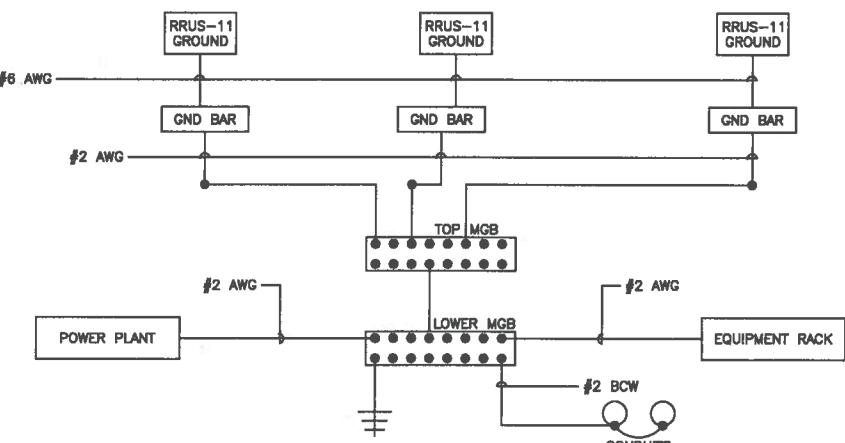
SCALE: N.T.S.



#### CONNECTION TO EQUIPMENT DETAIL

3

SCALE: N.T.S.



#### NOTES:

- BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
- BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE
- SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
- GROUND ALL EQUIPMENT PER MANUFACTURER RECOMMENDATIONS.

#### SCHEMATIC GROUNDING DIAGRAM

4

SCALE: N.T.S.



500 ENTERPRISE DRIVE SUITE 3A  
ROCKY HILL, CT 06067

1997 ANNAPOLIS EXCHANGE PARKWAY  
SUITE 200  
ANNAPOLIS, MD 21401

#### CT1051 WILLIMANTIC T6

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REVIEWED BY: PD  
CHECKED BY: GHN  
PROJECT NUMBER: 50063024  
JOB NUMBER: 50063028  
SITE ADDRESS:

83 WINDHAM STREET,  
WILLIMANTIC, CT 06226  
WINDHAM COUNTY

SHEET TITLE:

GROUNDING NOTES  
& DETAILS

SHEET NUMBER:

E-1

**TAB 2**

**Power Density Calculat**

<b>Control Number</b>	<b>Site</b>	<b>Carrier</b>	<b>#Channels</b>	<b>ERP/Ch</b>
EM-ECSU-163-010522	Willimantic - 83 Windham Road	ECSU		antennas are receive o
EM-AT&T-163-121001	Willimantic - 83 Windham Road/Godda AT&T UMTS		2	565
EM-AT&T-163-121001	Willimantic - 83 Windham Road/Godda AT&T UMTS		2	875
EM-AT&T-163-121001	Willimantic - 83 Windham Road/Godda AT&T GSM		1	283
EM-AT&T-163-121001	Willimantic - 83 Windham Road/Godda AT&T GSM		4	525
EM-AT&T-163-121001	Willimantic - 83 Windham Road/Godda AT&T LTE		1	1615
EM-T-Mobile-163-140318	Willimantic - 83 Windham St/Goddard IT-Mobile LTE		2	24
EM-T-Mobile-163-140318	Willimantic - 83 Windham St/Goddard IT-Mobile GSM/UMTS		2	12
EM-T-Mobile-163-140318	Willimantic - 83 Windham St/Goddard IT-Mobile UMTS		2	16

tions

<u>Ant Ht</u>	<u>Power Den</u>	<u>MHz</u>	<u>S</u>	<u>%MPE</u>	<u>Site Total</u>
nly - no power density generated					
137	0.0216	880	0.5867	3.69%	
137	0.0335	1900	1.0000	3.35%	
137	0.0054	880	0.5867	0.92%	
137	0.0402	1900	1.0000	4.02%	
137	0.0309	734	0.4893	6.32%	
117	0.0013	2100	1.0000	0.13%	
117	0.0006	1950	1.0000	0.06%	
117	0.0008	2100	1.0000	0.08%	<b>18.59%</b>

**TAB 3**



Smartlink, LLC  
6390 Fly Road  
East Syracuse, NY 13057  
(774) 369-3617



Kevin Clements  
520 South Main Street, Suite 2531  
Akron, OH 44311  
(330) 572-3546  
kclements@gpdgroup.com

**GPD# 2014723.21.71313.01**  
May 14, 2014

## STRUCTURAL ANALYSIS REPORT

**AT&T DESIGNATION:** Site USID: **71313**  
Site FA: **10035388**  
Client #: **CT1051**  
Site Name: **WILLIMANTIC ECSU**

**ANALYSIS CRITERIA:** Codes: **TIA/EIA-222-F, 2006 IBC, ASCE 7-05 & 2013 CTBC**  
**85-mph (fastest-mile) with 0" ice**  
**37-mph (fastest-mile) with 1" ice**

**SITE DATA:** **83 Windham St., Willimantic, CT 06226, Windham County**  
**Latitude 41° 43' 14.120" N, Longitude 72° 13' 5.448" W**  
**Market: NEW ENGLAND**  
**175' Modified EEI Monopole**

Mr. Jerry Bruno,

GPD is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

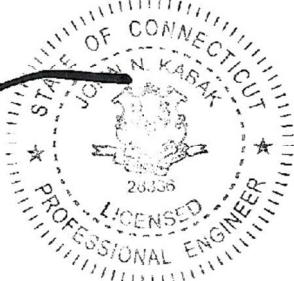
### Analysis Results

Tower Stress Level with Proposed Equipment:	112.2%	Fail
Foundation Ratio with Proposed Equipment:	76.4%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and Smartlink, LLC. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,

  
John N. Kabak, P.E.  
Connecticut #: 28436



## SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing modified structure is capable of carrying the proposed loading configuration as specified by AT&T Mobility to Smartlink, LLC. This report was commissioned by Mr. Jerry Bruno of Smartlink, LLC.

Modifications designed by Hudson Design Group, LLC (dated 9/24/2012) were found to be ineffective and have not been considered in this analysis.

**The proposed coax shall be installed internal to the monopole in order for the results of this analysis to be valid.**

## TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Monopole	84.9%	Pass
Anchor Rods	83.8%	Pass
<b>Base Plate</b>	<b>112.2%</b>	<b>Fail</b>
Foundation	76.4%	Pass

## RECOMMENDATIONS

We recommend adding stiffeners to the base plate. All modifications must be engineered and are beyond the scope of this report.

## ANALYSIS METHOD

tnxTower (Version 6.1.4.1), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live, wind, and ice load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being completed without the benefit of a detailed site visit.

## DOCUMENTS PROVIDED

Document	Remarks	Source
Equipment Modification Form	AT&T Internal Loading Document, uploaded 1/14/2014	Siterra
RF Data Sheet	RF Data Sheet, dated 12/27/2013	Smartlink
Construction Drawings	Smartlink Project #: 50063024 Rev 1, dated 5/2/2014	Smartlink
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Geotechnical Report	Not Provided	N/A
Previous Structural Analysis	Hudson Design Group LLC, dated 9/24/2012	Siterra
Modification Drawings	Hudson Design Group LLC, dated 9/24/2012	Siterra

## ASSUMPTIONS

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower shaft sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to  $\pm 5'$  AGL, antenna size accurate to  $\pm 3.3$  sf, and coax equal to the number of existing antennas without reserve.
11. All existing loading was obtained from the previous structural analysis by Hudson Design Group, LLC (dated 9/24/2012), site photos, the provided RF Data Sheet, the provided construction drawings, and the provided Equipment Modification Form and is assumed to be accurate.
12. The existing AT&T loading has been modeled based on recent site photos.
13. The proposed coax shall be installed internal to the monopole in order for the results of this analysis to be valid.
14. The existing and proposed AT&T loading have been approved by Smartlink and are assumed to be accurate.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

**DISCLAIMER OF WARRANTIES**

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

## APPENDIX A

### Tower Analysis Summary Form

## Tower Analysis Summary Form

<b>General Info</b>	
Site Name	WILLIMANTIC ECSU
Site Number	71313
FA Number	10035388
Date of Analysis	5/14/2014
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	MP	
Tower Height (top of steel AGL)	175'	
Tower Manufacturer	EEI	
Tower Model	n/a	
Tower Design	EEI Job #: 10460-E01	1/24/2002
Foundation Design	EEI Job #: 10460-E01	1/25/2002
Geotech Report	n/a	
Tower Mapping	n/a	
Modification Drawings	Hudson Design Group LLC	9/24/2012
Previous Structural Analysis	Hudson Design Group LLC	9/24/2012

Design Parameters		TIA/EIA-222-F, ASCE 7-05 2006 IBC & 2013 CTBC
Design Code Used		Windham, CT
Location of Tower (County, State)		85 - fastest
Basic Wind Speed (mph)		1
Ice Thickness (in)		
Structure Classification (I, II, III)		
Exposure Category (B, C, D)		
Topographic Category (1 to 5)		

Analysis Results (% Maximum Usage)	
Existing/Reserved + Future + Proposed Condition	
Tower (%)	84.9%
Tower Base (%)	112.2%
Foundation (%)	76.4%
Foundation Adequate?	YES

We recommend adding stiffeners to the base plate. All modifications must be engineered and are beyond the scope of this report.

Steel Yield Strength (ksi)	
Pole	65
Base Plate	60
Anchor Rods	75

### Existing / Reserved Loading

Antenna							Mount			Transmission Line				
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
Unknown	173	178	1	Omni	RFS	BA6312		1	Unknown	13' LP Platform	3	Unknown	7/8"	Internal
Unknown	173	178	1	Dipole	Unknown	10' Dipole				On the same mount				
Unknown	173	176	1	Omni	RFS	PD201				On the same mount				
Unknown	170	170	1	Dish	Andrew	HP6-65	270	1	Unknown	Mount Pipe	1	EW52	Elliptical	Internal
Unknown	163	163	1	Dish	Andrew	GP6F-21A	270	1	Unknown	Mount Pipe	1	Unknown	1-5/8"	Internal
Unknown	158	168	1	Omni	Andrew	ASP 682		1	Unknown	6' Side Arm	2	Unknown	7/8"	Internal
Unknown	158	159	1	Dish	Scala	MF-900B	180			On the same mount				
Unknown	146	147	6	Panel	Decibel	DB978H90T2E-M	30/150/270	1	Unknown	13' LP Platform	12	Unknown	1-5/8"	Internal
AT&T Mobility	140	140	1	DC Unit	Raycap	DC6-48-60-18-8F		1	Unknown	Collar Mount	1	Conduit	2"	Internal
AT&T Mobility	140	140	3	RRU	Ericsson	RRUS 11				On the same mount	2	DC Power	3/8"	Inside Conduit
AT&T Mobility	140									On the same mount	1	Fiber	3/8"	Inside Conduit
AT&T Mobility	135	138	6	Panel	Powerwave	7770.00	23/143/263	1	Unknown	13' LP Platform	12	Unknown	1-5/8"	Internal
AT&T Mobility	135	138	3	Panel	KMW	AM-X-CD-17-65-00T-RET	23/143/263			On the same mount				
AT&T Mobility	135	138	3	Bias T	Powerwave	7060.00				On the same mount				
AT&T Mobility	135	138	6	TMA	Powerwave	LGP 21400				On the same mount				
AT&T Mobility	135	138	6	Diplexer	Powerwave	LGP 21900				On the same mount				
Unknown	125	127	12	Panel	Decibel	DB844H90	0/120/240	1	Unknown	12.5' LP Platform	12	Unknown	1-5/8"	Internal
Unknown	115	117	3	Panel	Andrew	RV90-18-02DP	30/150/270	1	Unknown	12.5' LP Platform	12	Unknown	1-5/8"	Internal
Unknown	98	100	1	Yagi	Unknown	6' Yagi		1	Unknown	13' LP Platform	1	Unknown	7/8"	Internal

Note: All existing TMAs, Diplexers, KMW panels and (3) of the existing Powerwave panels at 138 shall be removed prior to installation of the proposed loading.

### Proposed Loading

Antenna							Mount			Transmission Line				
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T Mobility	135	138	9	Panel	CCI	HPA-65R-BUU-H8	23/143/263			On the existing mount	4	DC Power	3/8"	Internal
AT&T Mobility	135	138	6	TMA	Andrew	E15201P13				On the existing mount				
AT&T Mobility	135	138	3	RRU	Ericsson	RRUS-11				On the existing mount				
AT&T Mobility	135	138	3	RRU	Ericsson	RRUS-E2				On the existing mount				
AT&T Mobility	135	138	3	RRU	Ericsson	RRUS-32				On the existing mount				
AT&T Mobility	135	138	6	RRU	Ericsson	RRUS-12				On the existing mount				
AT&T Mobility	135	138	6	Modul	Ericsson	RRUS-A2				On the existing mount				
AT&T Mobility	135	138	6	Diplexer	Kaelus	DBC2055F1V1-2				On the existing mount				
AT&T Mobility	135	138	2	DC Unit	Raycap	DC6-48-60-0-8F				On the existing mount				

**Note: The proposed loading is in addition to the remaining existing loading at the same elevation.**

Note: The proposed coax shall be installed internal to the monopole in order for the results of this analysis to be valid.

## Future Loading

## APPENDIX B

### tnxTower Output File

<b>tnxTower</b>  <b>GPD Group</b> 520 S. Main Street Akron, OH 44311 Phone: 330.572.2201 FAX:	<b>Job</b> 71313 WILLIMANTIC ECSU	<b>Page</b> 1 of 9
	<b>Project</b> 2014723.21.71313.01	<b>Date</b> 15:52:58 05/14/14
	<b>Client</b> Smartlink	<b>Designed by</b> acourtney

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Windham County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 37 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	$C_{AA}$	Weight
				ft		ft <sup>2</sup> /ft	plf
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	173.00 - 8.00	3	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
EW52	C	No	Inside Pole	170.00 - 8.00	1	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	163.00 - 8.00	1	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	158.00 - 8.00	2	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	147.00 - 8.00	12	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
2" Flex Conduit	C	No	Inside Pole	140.00 - 8.00	1	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
3/8" Fiber Cable	C	No	Inside Pole	140.00 - 8.00	1	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00

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	Client Smartlink						Designed by acourtney	

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C <sub>AA</sub>		Weight
						ft	ft <sup>2</sup> /ft	
3/8" Power Cable	C	No	Inside Pole	138.00 - 8.00	6	No Ice	0.00	0.30
						1/2" Ice	0.00	0.30
						1" Ice	0.00	0.30
						2" Ice	0.00	0.30
						4" Ice	0.00	0.30
3/8" Power Cable	C	No	Inside Pole	140.00 - 138.00	2	No Ice	0.00	0.30
						1/2" Ice	0.00	0.30
						1" Ice	0.00	0.30
						2" Ice	0.00	0.30
						4" Ice	0.00	0.30
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	138.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	127.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	C	No	Inside Pole	117.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF5-50A (7/8 FOAM)	C	No	Inside Pole	100.00 - 8.00	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
Step Pegs	C	No	CaAa (Out Of Face)	175.00 - 8.00	1	No Ice	0.08	2.72
						1/2" Ice	0.18	3.51
						1" Ice	0.28	4.92
						2" Ice	0.48	9.56
						4" Ice	0.88	26.18
Safety Line (3/8")	C	No	CaAa (Out Of Face)	175.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46

Discrete Tower Loads								
Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft	ft	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb
Lightning Rod 6' x 0.75"	A	From Leg	0.00	0.0000	175.00	No Ice	0.45	0.45
			0.00			1/2" Ice	1.06	1.06
			3.00			1" Ice	1.70	1.70
						2" Ice	2.51	2.51
						4" Ice	4.12	4.12
Pirod 13' LP Platform (Mono)	C	None		0.0000	173.00	No Ice	15.70	1300.00
						1/2" Ice	20.10	1765.00
						1" Ice	24.50	2230.00
						2" Ice	33.30	3160.00

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Description	Face or Leg	Offset Type	Offsets: Horz Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
BA6312	A	From Centroid-Leg	4.00 0.00 5.00	0.0000	173.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	50.90 0.44 0.90 1.20 1.77 3.04	50.90 0.44 0.90 1.20 1.77 3.04	5020.00 2.00 6.13 13.21 36.80 126.01
10' Dipole	B	From Centroid-Leg	4.00 0.00 5.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.00 3.02 4.07 5.70 8.26	2.00 3.02 4.07 5.70 8.26	20.00 35.50 57.47 121.40 333.58
PD201	C	From Centroid-Leg	4.00 0.00 3.00	0.0000	173.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.18 2.09 3.02 4.58 6.88	1.18 2.09 3.02 4.58 6.88	4.00 14.05 29.87 79.42 254.42
Mount Pipe	C	From Leg	0.43 0.25 0.00	30.0000	170.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.50 1.57 1.71 1.99	1.43 1.50 1.57 1.71 1.99	20.00 30.00 40.00 60.00 100.00
Mount Pipe	C	From Leg	0.43 0.25 0.00	30.0000	163.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.50 1.57 1.71 1.99	1.43 1.50 1.57 1.71 1.99	20.00 30.00 40.00 60.00 100.00
6' Sidearm - Round (GPD)	B	From Leg	2.60 -1.50 0.00	-30.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.80 1.05 1.30 1.80 2.80	2.80 3.50 4.20 5.60 8.40	61.67 79.33 96.99 132.31 202.95
ASP682	B	From Leg	5.20 -3.00 10.00	-30.0000	158.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.04 4.68 6.34 9.71 15.27	3.04 4.68 6.34 9.71 15.27	9.50 33.21 67.17 166.40 494.47
Pirod 13' LP Platform (Mono)	C	None		0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	15.70 20.10 24.50 33.30 50.90	15.70 20.10 24.50 33.30 50.90	1300.00 1765.00 2230.00 3160.00 5020.00
(2) DB978H90T2E-M w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 3.60 4.02 4.91 6.82	2.89 3.49 4.10 5.38 8.24	25.25 55.50 91.13 181.47 465.53
(2) DB978H90T2E-M w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 3.60 4.02 4.91 6.82	2.89 3.49 4.10 5.38 8.24	25.25 55.50 91.13 181.47 465.53
(2) DB978H90T2E-M w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 1.00	0.0000	146.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.22 3.60 4.02 4.91 6.82	2.89 3.49 4.10 5.38 8.24	25.25 55.50 91.13 181.47 465.53
Collar Mount	C	None		0.0000	140.00	No Ice	1.40	1.40	20.00

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Description	Face or Leg	Offset Type	Offsets: Horz Vert ft ft ft	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
RRUS 11	A	From Leg	0.50 0.00 0.00	0.0000	140.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 3.40 5.40 9.40 3.25 3.49 3.74 4.27 5.43 1.37 1.55 1.74 2.14 3.04	35.00 50.00 80.00 140.00 50.70 71.50 95.33 152.89 312.97 50.70 71.50 95.33 152.89 312.97
RRUS 11	B	From Leg	0.50 0.00 0.00	0.0000	140.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.49 3.49 3.74 4.27 5.43 3.25 3.49 3.74 4.27 5.43 1.55 1.74 2.14 3.04	71.50 95.33 152.89 312.97 50.70 71.50 95.33 152.89 312.97
RRUS 11	C	From Leg	0.50 0.00 0.00	0.0000	140.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.49 3.49 3.74 4.27 5.43 3.25 3.49 3.74 4.27 5.43 1.55 1.74 2.14 3.04	71.50 95.33 152.89 312.97 50.70 71.50 95.33 152.89 312.97
DC6-48-60-18-8F Surge Suppression Unit	A	From Leg	0.50 0.00 0.00	0.0000	140.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.67 1.67 1.88 2.33 3.38 1.47 1.67 1.88 2.33 3.38 1.67 1.88 2.33 3.38	36.62 56.82 105.34 239.02 18.90 36.62 56.82 105.34 239.02
Pirod 13' LP Platform (Mono)	C	None		0.0000	135.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	20.10 20.10 24.50 33.30 33.30 15.70 20.10 24.50 33.30 50.90 20.10 24.50 33.30 50.90	1765.00 2230.00 3160.00 5020.00 1300.00 1765.00 2230.00 3160.00 5020.00
7770.00 w/Mount Pipe	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.31 6.31 6.75 7.66 9.58 5.88 6.31 6.75 7.66 9.58 4.10 4.73 5.37 6.70 9.87	108.55 162.39 289.57 654.40 61.54 108.55 162.39 289.57 654.40
7770.00 w/Mount Pipe	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.31 6.31 6.75 7.66 9.58 5.88 6.31 6.75 7.66 9.58 4.10 4.73 5.37 6.70 9.87	108.55 162.39 289.57 654.40 61.54 108.55 162.39 289.57 654.40
7770.00 w/Mount Pipe	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.31 6.31 6.75 7.66 9.58 5.88 6.31 6.75 7.66 9.58 4.10 4.73 5.37 6.70 9.87	108.55 162.39 289.57 654.40 61.54 108.55 162.39 289.57 654.40
7060.00 Bias T	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.11 0.11 0.16 0.28 0.63 0.07 0.11 0.16 0.28 0.63 0.06 0.09 0.14 0.26 0.60	2.75 4.60 11.35 42.48 1.65 2.75 4.60 11.35 42.48
7060.00 Bias T	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	1/2" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.11 0.11 0.16 0.28 0.63 0.07 0.11 0.16 0.28 0.63 0.06 0.09 0.14 0.26 0.60	2.75 4.60 11.35 42.48 1.65 2.75 4.60 11.35 42.48
7060.00 Bias T	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	1/2" Ice 1/2" Ice 1" Ice No Ice 1/2" Ice 1" Ice	0.11 0.11 0.16 0.07 0.11 0.07 0.11 0.16 0.28 0.63 0.06 0.09 0.14 0.26 0.60	2.75 4.60 11.35 42.48 1.65 2.75 4.60 11.35 42.48

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	Client Smartlink							Designed by acourtney

Description	Face or Leg	Offset Type	Offsets: Horz Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight lb	
(3) HPA-65R-BUU-H8 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	2" Ice 4" Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.28 0.63 13.37 14.10 14.83 16.31 19.37	0.26 0.60 9.42 10.82 12.07 14.24 18.79	11.35 42.48 94.20 189.07 293.65 535.90 1190.28
(3) HPA-65R-BUU-H8 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.37 14.10 14.83 16.31 19.37	9.42 10.82 12.07 14.24 18.79	94.20 189.07 293.65 535.90 1190.28
(3) HPA-65R-BUU-H8 w/ Mount Pipe	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.37 14.10 14.83 16.31 19.37	9.42 10.82 12.07 14.24 18.79	94.20 189.07 293.65 535.90 1190.28
(2) RRUS 12	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	58.00 81.22 107.64 170.88 344.31
(2) RRUS 12	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	58.00 81.22 107.64 170.88 344.31
(2) RRUS 12	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	58.00 81.22 107.64 170.88 344.31
RRUS 11	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	50.70 71.50 95.33 152.89 312.97
RRUS 11	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	50.70 71.50 95.33 152.89 312.97
RRUS 11	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	50.70 71.50 95.33 152.89 312.97
RRUS-32	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	77.00 104.93 136.47 211.15 412.40
RRUS-32	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	77.00 104.93 136.47 211.15 412.40

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Description	Face or Leg	Offset Type	Offsets: Horz Vert ft ft ft	Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight	
RRUS-32	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.87 4.15 4.44 5.06 6.38	2.76 3.02 3.29 3.85 5.08	77.00 104.93 136.47 211.15 412.40
RRUS E2	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	58.00 81.22 107.64 170.88 344.31
RRUS E2	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	58.00 81.22 107.64 170.88 344.31
RRUS E2	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.67 3.93 4.19 4.75 5.96	1.49 1.67 1.87 2.28 3.21	58.00 81.22 107.64 170.88 344.31
(2) RRUS A2 MODULE	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.42 0.53 0.65 0.91 1.54	21.16 31.49 44.03 76.55 176.75
(2) RRUS A2 MODULE	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.42 0.53 0.65 0.91 1.54	21.16 31.49 44.03 76.55 176.75
(2) RRUS A2 MODULE	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.87 2.05 2.24 2.66 3.58	0.42 0.53 0.65 0.91 1.54	21.16 31.49 44.03 76.55 176.75
(2) E15Z01P13	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.95 1.09 1.24 1.56 2.31	0.73 0.86 0.99 1.29 1.99	24.00 31.77 41.43 67.23 150.19
(2) E15Z01P13	B	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.95 1.09 1.24 1.56 2.31	0.73 0.86 0.99 1.29 1.99	24.00 31.77 41.43 67.23 150.19
(2) E15Z01P13	C	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.95 1.09 1.24 1.56 2.31	0.73 0.86 0.99 1.29 1.99	24.00 31.77 41.43 67.23 150.19
(2) DBC2055F1V1-1	A	From Centroid-Leg	4.00 0.00 3.00	23.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.38 0.47 0.56 0.78 1.31	0.14 0.20 0.26 0.42 0.84	7.00 9.78 13.73 25.90 72.79
(2) DBC2055F1V1-1	B	From Centroid-Leg	4.00 0.00	23.0000	135.00	No Ice 1/2" Ice	0.38 0.47	0.14 0.20	7.00 9.78

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	<i>C<sub>AA</sub></i> <sub>Front</sub>	<i>C<sub>AA</sub></i> <sub>Side</sub>	Weight lb	
		g	3.00			1" Ice	0.56	0.26	13.73
						2" Ice	0.78	0.42	25.90
						4" Ice	1.31	0.84	72.79
(2) DBC2055F1V1-1	C	From Centroid-Le	4.00 0.00 g	23.0000	135.00	No Ice	0.38	0.14	7.00
						1/2" Ice	0.47	0.20	9.78
						1" Ice	0.56	0.26	13.73
						2" Ice	0.78	0.42	25.90
						4" Ice	1.31	0.84	72.79
DC6-48-60-18-8F Surge Suppression Unit	B	From Centroid-Le	4.00 0.00 g	23.0000	135.00	No Ice	1.47	1.47	18.90
						1/2" Ice	1.67	1.67	36.62
						1" Ice	1.88	1.88	56.82
						2" Ice	2.33	2.33	105.34
						4" Ice	3.38	3.38	239.02
DC6-48-60-0-8F Surge Suppression Unit	C	From Centroid-Le	4.00 0.00 g	23.0000	135.00	No Ice	1.47	1.47	18.90
						1/2" Ice	1.67	1.67	36.62
						1" Ice	1.88	1.88	56.82
						2" Ice	2.33	2.33	105.34
						4" Ice	3.38	3.38	239.02
MTS 12.5' LP Platform	C	None		0.0000	125.00	No Ice	14.66	14.66	1250.00
						1/2" Ice	18.87	18.87	1481.33
						1" Ice	23.08	23.08	1712.66
						2" Ice	31.50	31.50	2175.32
						4" Ice	48.34	48.34	3100.64
(4) DB844H90 w/ Mount Pipe	A	From Centroid-Le	4.00 0.00 g	0.0000	125.00	No Ice	3.30	4.92	28.25
						1/2" Ice	3.69	5.60	67.83
						1" Ice	4.12	6.28	113.13
						2" Ice	5.01	7.71	223.81
						4" Ice	6.92	10.83	552.61
(4) DB844H90 w/ Mount Pipe	B	From Centroid-Le	4.00 0.00 g	0.0000	125.00	No Ice	3.30	4.92	28.25
						1/2" Ice	3.69	5.60	67.83
						1" Ice	4.12	6.28	113.13
						2" Ice	5.01	7.71	223.81
						4" Ice	6.92	10.83	552.61
(4) DB844H90 w/ Mount Pipe	C	From Centroid-Le	4.00 0.00 g	0.0000	125.00	No Ice	3.30	4.92	28.25
						1/2" Ice	3.69	5.60	67.83
						1" Ice	4.12	6.28	113.13
						2" Ice	5.01	7.71	223.81
						4" Ice	6.92	10.83	552.61
MTS 12.5' Adjustable LP Platform	C	None		0.0000	115.00	No Ice	18.01	18.01	1121.00
						1/2" Ice	23.33	23.33	1352.33
						1" Ice	28.65	28.65	1583.66
						2" Ice	39.29	39.29	2046.32
						4" Ice	60.57	60.57	2971.64
RV90-17-02DP w/ Mount Pipe	A	From Centroid-Le	4.00 0.00 g	0.0000	115.00	No Ice	4.59	3.34	34.18
						1/2" Ice	5.09	4.11	71.72
						1" Ice	5.58	4.81	115.40
						2" Ice	6.59	6.25	224.31
						4" Ice	8.73	9.33	557.78
RV90-17-02DP w/ Mount Pipe	B	From Centroid-Le	4.00 0.00 g	0.0000	115.00	No Ice	4.59	3.34	34.18
						1/2" Ice	5.09	4.11	71.72
						1" Ice	5.58	4.81	115.40
						2" Ice	6.59	6.25	224.31
						4" Ice	8.73	9.33	557.78
RV90-17-02DP w/ Mount Pipe	C	From Centroid-Le	4.00 0.00 g	0.0000	115.00	No Ice	4.59	3.34	34.18
						1/2" Ice	5.09	4.11	71.72
						1" Ice	5.58	4.81	115.40
						2" Ice	6.59	6.25	224.31
						4" Ice	8.73	9.33	557.78

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Description		Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb
Pirod 13' LP Platform (Mono)	C	None		0.0000	98.00	4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.73 15.70 20.10 24.50 33.30 50.90	9.33 15.70 20.10 24.50 33.30 50.90	557.78 1300.00 1765.00 2230.00 3160.00 5020.00
6' Yagi	A	From Centroid-Leg	4.00 0.00 g 2.00	0.0000	98.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.20 1.80 2.17 2.93 4.57	1.20 1.80 2.17 2.93 4.57	30.00 39.39 52.81 92.31 226.29

## Dishes

Description		Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight lb	
HP6-65	C	Paraboloid w/Shroud (HP)	From Leg	0.86 0.50 0.00	30.0000			170.00	6.38	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	31.92 32.76 33.61 35.34 38.94	360.00 580.00 810.77 1298.49 2386.61
GP6F-21A	C	Grid	From Leg	0.86 0.50 0.00	30.0000			163.00	6.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.27 29.07 29.86 31.44 34.60	198.00 347.20 496.40 794.81 1391.61
MF-900B	B	Grid	From Leg	0.86 -0.50 0.00	60.0000			158.00	1.33	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.66 1.58 0.00 0.00 0.00	13.00 21.09 29.17 45.35 77.70

## Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	Lightning Rod 6' x 0.75"	30	37.664	1.7566	0.0110	60171
173.00	Pirod 13' LP Platform (Mono)	30	36.925	1.7533	0.0107	60171
170.00	HP6-65	30	35.817	1.7484	0.0101	60171
163.00	GP6F-21A	30	33.241	1.7352	0.0088	25071
158.00	MF-900B	30	31.415	1.7234	0.0079	17697
146.00	Pirod 13' LP Platform (Mono)	30	27.111	1.6812	0.0059	10373
140.00	Collar Mount	30	25.017	1.6499	0.0051	8594
135.00	Pirod 13' LP Platform (Mono)	30	23.310	1.6170	0.0044	7534
125.00	MTS 12.5' LP Platform	30	20.020	1.5307	0.0034	6339
115.00	MTS 12.5' Adjustable LP Platform	30	16.920	1.4211	0.0027	5530
98.00	Pirod 13' LP Platform (Mono)	30	12.162	1.2014	0.0020	4544

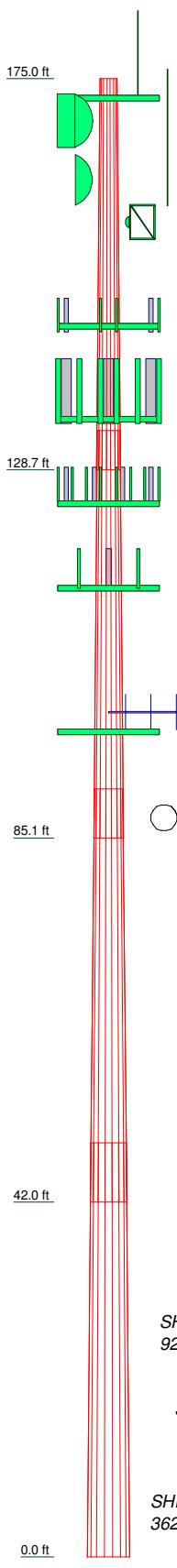
	<b>Job</b> 71313 WILLIMANTIC ECSU	<b>Page</b> 9 of 9
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	<b>Client</b> Smartlink	<b>Designed by</b> acourtney

## Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail
L1	175 - 128.66	Pole	TP33.375x23x0.25	1	-9379.82	1323238.39	33.9	Pass
L2	128.66 - 85.09	Pole	TP42.5625x31.8272x0.3125	2	-20817.80	2111831.82	76.4	Pass
L3	85.09 - 42.03	Pole	TP51.4688x40.6426x0.375	3	-31920.00	3066446.40	84.9	Pass
L4	42.03 - 0	Pole	TP60x49.1817x0.4375	4	-48716.50	4299844.59	82.8	Pass
						Summary	ELC:	Proposed
						Pole (L3)	84.9	Pass
						Rating =	84.9	Pass

## APPENDIX C

### Tower Elevation Drawing



### DESIGNED APPURTEINANCE LOADING

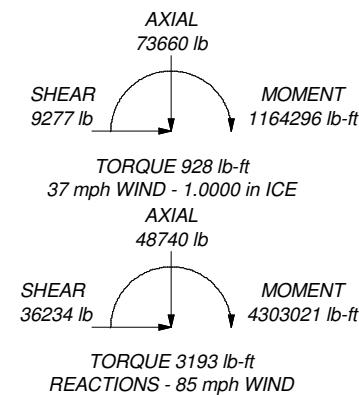
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 6' x 0.75"	175	RRUS 11	135
Pirod 13' LP Platform (Mono)	173	RRUS-32	135
BA6312	173	RRUS-32	135
10' Dipole	173	RRUS-32	135
PD201	173	RRUS E2	135
Mount Pipe	170	RRUS E2	135
HP6-65	170	RRUS E2	135
Mount Pipe	163	(2) RRUS A2 MODULE	135
GP6F-21A	163	(2) RRUS A2 MODULE	135
6' Sidearm - Round (GPD)	158	(2) RRUS A2 MODULE	135
ASP682	158	(2) E15Z01P13	135
MF-900B	158	(2) E15Z01P13	135
(2) DB978H90T2E-M w/ Mount Pipe	146	(2) E15Z01P13	135
Pirod 13' LP Platform (Mono)	146	(2) DBC2055F1V1-1	135
(2) DB978H90T2E-M w/ Mount Pipe	146	(2) DBC2055F1V1-1	135
(2) DB978H90T2E-M w/ Mount Pipe	146	(2) DBC2055F1V1-1	135
RRUS 11	140	DC6-48-60-18-8F Surge Suppression Unit	135
DC6-48-60-18-8F Surge Suppression Unit	140	DC6-48-60-0-8F Surge Suppression Unit	135
Collar Mount	140	Pirod 13' LP Platform (Mono)	135
RRUS 11	140	7770.00 w/ Mount Pipe	135
RRUS 11	140	7770.00 w/ Mount Pipe	135
7770.00 w/ Mount Pipe	135	7770.00 w/ Mount Pipe	135
7060.00 Bias T	135	(4) DB844H90 w/ Mount Pipe	125
7060.00 Bias T	135	MTS 12.5' LP Platform	125
7060.00 Bias T	135	(4) DB844H90 w/ Mount Pipe	125
(3) HPA-65R-BUU-H8 w/ Mount Pipe	135	(4) DB844H90 w/ Mount Pipe	125
(3) HPA-65R-BUU-H8 w/ Mount Pipe	135	RV90-17-02DP w/ Mount Pipe	115
(3) HPA-65R-BUU-H8 w/ Mount Pipe	135	MTS 12.5' Adjustable LP Platform	115
(2) RRUS 12	135	RV90-17-02DP w/ Mount Pipe	115
(2) RRUS 12	135	RV90-17-02DP w/ Mount Pipe	115
(2) RRUS 12	135	6' Yagi	98
RRUS 11	135	Pirod 13' LP Platform (Mono)	98
RRUS 11	135		

### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

### TOWER DESIGN NOTES

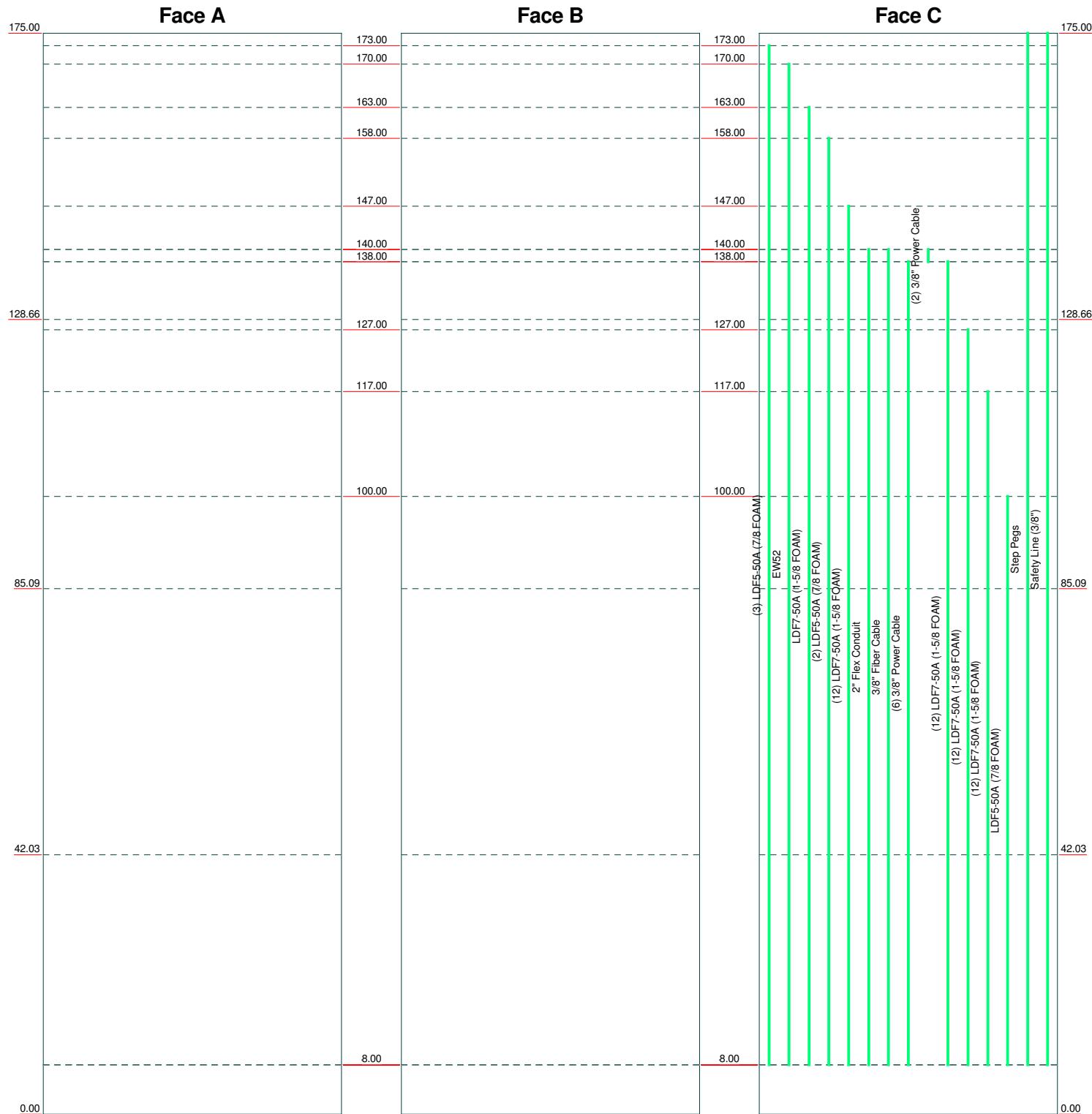
1. Tower is located in Windham County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 84.9%



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
4	48.97	18	0.3750	6.94	40.6426	51.4688		12530.7
3								9043.5
2								6006.3
1								3495.6

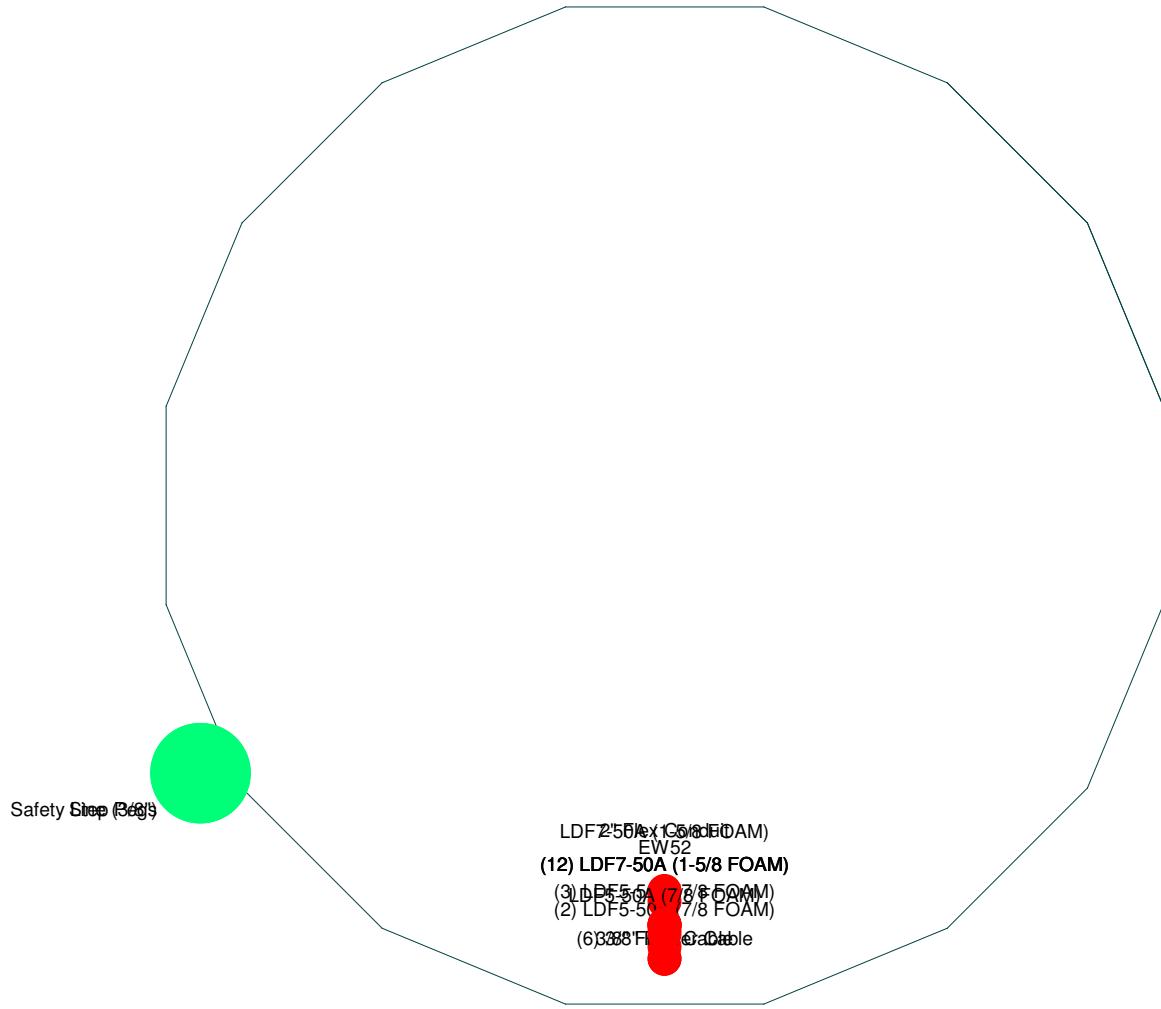
# Feed Line Distribution Chart 0' - 175'

Round  Flat  App In Face  App Out Face  Truss Leg



# Feed Line Plan

Round Flat App In Face App Out Face



## APPENDIX D

### Anchor Rod & Base Plate Analysis



**Anchor Rod and Base Plate Stresses**  
**71313 WILLIMANTIC ECSU**  
**2014723.21.71313.01**

Overturning Moment =	4303.02	k*ft
Axial Force =	48.74	k
Shear Force =	36.23	k

Acceptable Stress Ratio	=	100.0%
-------------------------	---	--------

Anchor Rods		
Number of Rods =	18	
Type =	Upset Rod	
Rod Yield Strength (Fy) =	75	ksi
ASIF =	1.333	
Rod Circle =	69	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in <sup>2</sup>
Max Tension on Rod =	163.50	kips
Max Compression on Rod =	168.92	kips
Allow. Rod Force =	195.00	kips
<b>Anchor Rod Capacity =</b>	<b>83.8%</b>	<b>OK</b>

Base Plate		
Location =	External	
Plate Strength (F <sub>y</sub> ) =	60	ksi
Outside Diameter =	75	in
Plate Thickness =	2	in
w <sub>calc</sub> =	34.07	in
w <sub>max</sub> =	43.60	in
w =	34.07	in
S =	22.72	in <sup>3</sup>
f <sub>b</sub> =	67.31	ksi
F <sub>b</sub> =	60	ksi
<b>BP Capacity =</b>	<b>112.2%</b>	<b>NG</b>

Stiffeners		
Configuration =	None	

Pole		
Pole Diameter =	60	in
Number of Sides =	18	
Thickness =	0.4375	in
Pole Yield Strength =	65	ksi

## APPENDIX E

### Foundation Analysis



**Caisson Analysis**  
**71313 WILLIMANTIC ECSU**  
**2014723.21.71313.01**

General Info	
Code	TIA/EIA-222-F
Concrete Code	ACI 318-05
Seismic Design Category	B
Max Stress Ratio	1.00
Reinforcing Known?	Yes
Modified?	No

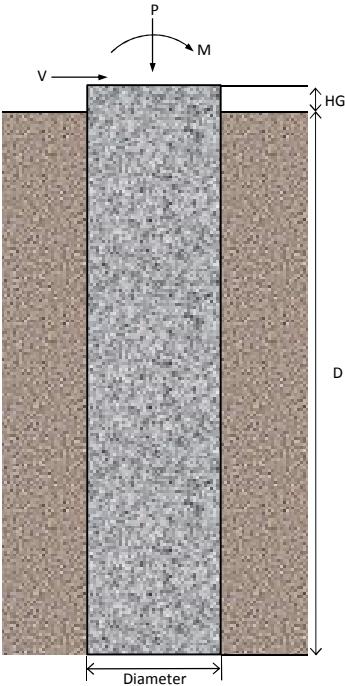
Soil Summary (Req. FS=2.0)	
$M_u$ =	4303.02 k-ft
$M_r$ =	14085.17 k-ft
FS =	3.27
Capacity =	61.1% Pass

General Soil	
Ground Water	14.00 ft
Soil Depth to Neglect	5.00 ft

Reinforcing Summary	
$\phi M_n$ =	7755.49 k-ft
$M_u$ =	5924.83 k-ft
Min $p$ =	0.00333
Provided $p$ =	0.00582 OK
Capacity =	76.4% Pass

Reactions	
Moment, M	4303.02 k-ft
Axial, P	48.74 k
Shear, V	36.23 k

Pier Information		
Pier Diameter	8	ft
Pier Length Below Grade	27	ft
Distance Above Grade	1	ft
Vertical Bar Size	# 11	
Vertical Bar Quantity	27	
Tie Size	# 4	ft
$f'_c$ =	3	ksi
$f_y$ =	60	ksi
Clear Cover =	3	in



Soil Info								
Layer	Soil Type	Thickness	$\gamma$ , pcf	$C_u$ , psf	$\phi$	$K_p$	Top of Layer	Bot. of Layer
Layer 1	Sand	5	100	0	38	4.20	0.00	5.00
Layer 2	Sand	9	110	0	38	4.20	5.00	14.00
Layer 3	Sand	13	115	0	38	4.20	14.00	27.00
Layer 4	Clay					0.00	27.00	27.00
Layer 5	Clay					0.00	27.00	27.00
Layer 6	Sand					1.00	27.00	27.00
Layer 7	Sand					1.00	27.00	27.00
Layer 8	Clay					0.00	27.00	27.00
Layer 9	Sand					1.00	27.00	27.00
Layer 10	Clay					0.00	27.00	27.00