

January 7, 2015

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

**RE: Sprint PCS-Exempt Modification – Crown Site BU: 876379**  
**Sprint PCS Site ID: CT33XC518**  
**Located at: 1440 Main Street North, Woodbury, CT 06798**

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of Sprint PCS (Sprint). Sprint is making modifications to certain existing sites in its Connecticut system in order to implement their 2.5GHz LTE technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies (“R.C.S.A.”), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mr. William J. Butterly, Jr., First Selectman for the Town of Woodbury, and Mr. Tikva Wolff, Property Owner.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **1440 Main Street North, Woodbury, CT 06798**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint’s operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes (“C.G.S.”) § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint’s additional antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

Melanie A. Bachman

January 7, 2015

Page 2

4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.
5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

For the foregoing reasons, Sprint respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Donna Neal.

Sincerely,



Susan Vale  
Real Estate Specialist

Enclosures

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. William J. Butterly, Jr., First Selectman  
Town of Woodbury  
281 Main Street South  
Woodbury, CT 06798

Mr. Tikva Wolff  
1514 Main Street North  
Woodbury, CT 06798



# 2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:  
CT33XC518

SITE NAME:

N. WOODBURY/WOLFF PARCEL

SITE ADDRESS:

1440 MAIN STREET NORTH  
WOODBURY, CT 06798

CROWN ID#: 876379

CROWN SITE NAME: N. WOODBURY/WOLFF PARCEL



2.5 EQUIPMENT DEPLOYMENT  
SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251



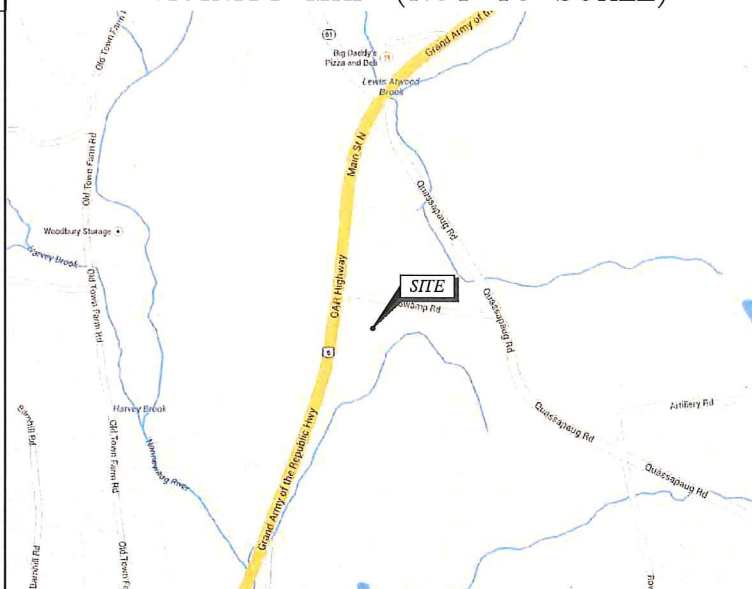
**TECTONIC** Engineering & Surveying  
Consultants P.C.  
1279 Route 300  
Newburgh, NY 12550  
Phone: (845) 567-6656  
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## SHEET INFORMATION

SITE NUMBER:	CT33XC518	LANDLORD:	CROWN CASTLE USA 2000 CORPORATE DRIVE CANONSBURG, PA
SITE NAME:	N. WOODBURY/WOLFF PARCEL	LOCAL POWER COMPANY:	CONNECTICUT LIGHT AND POWER CONTACT CUSTOMER SERVICE (800) 286-2000
SITE ADDRESS:	1440 MAIN STREET NORTH WOODBURY, CT 06798	APPLICANT:	SPRINT 8580 SPRINT PARKWAY OVERLAND PARK, KANSAS 66251
COUNTY:	LITCHFIELD	ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 jquicksell@tectonicengineering.com
COORDINATES: (NAD 83)	41° 35' 23.81" N 73° 10' 11.52" W	SPRINT CM:	PETER CULBERT (603) 203-6646 Peter.Culbert@sprint.com
GROUND ELEV:	487'± AMSL	CROWN CM:	JASON D'AMICO (860) 209-0104 jason.damico@crowncastle.com
STRUCTURE TYPE:	MONOPOLE	AAV:	CHARTER
STRUCTURE HEIGHT:	160'-0"± AGL		
STRUCTURE RAD CENTER:	158'-0"± AGL		
ZONING CLASSIFICATION:	OS60		
MAP-BLOCK-LOT:	012-054		

## VICINITY MAP (NOT TO SCALE)



## SHEET INDEX

SHT. NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
SP-1	GENERAL NOTES
SP-2	GENERAL NOTES
A-1	SITE PLAN
A-2	ELEVATION
A-3	ENLARGED EQUIPMENT LAYOUT PLANS
A-4	ANTENNA LAYOUT PLANS
A-5	RAN WIRING DIAGRAM
A-6	CABLE DETAILS
S-1	EQUIPMENT DETAILS
S-2	EQUIPMENT SCHEMATIC DETAILS
E-1	ELECTRICAL & GROUNDING PLANS
E-2	GROUNDING DETAILS & NOTES

## SUBMITTALS

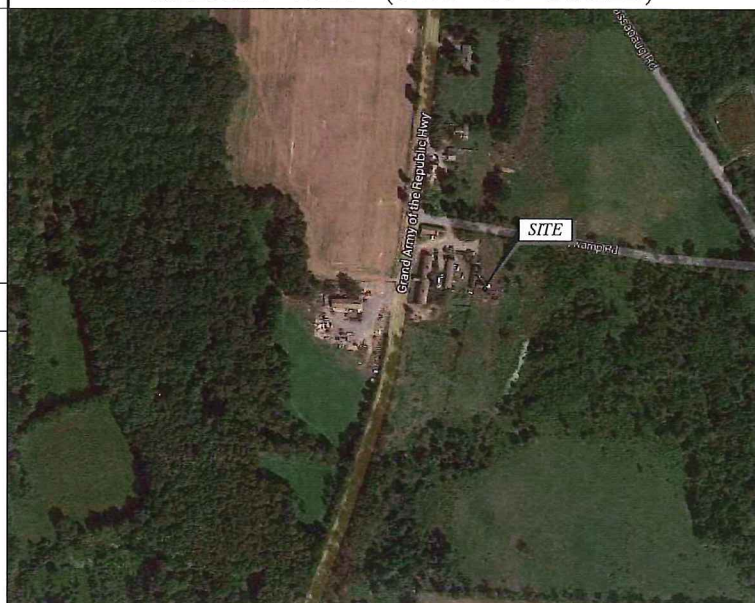
NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	MP
1	01/05/15	FOR CONSTRUCTION	DC

DATE	REVIEWED BY
1/5/15	JMR

## GENERAL NOTES

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED. FACILITY HAS NO PLUMBING OR REFRIGERANTS. THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATOR REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
- DEVELOPMENT AND USE OF THIS SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
  - 2005 STATE OF CONNECTICUT BUILDING CODE.
  - ANSI/TIA/EIA-222-F-1996.
  - NATIONAL ELECTRICAL CODE, LATEST EDITION.

## AERIAL VIEW (NOT TO SCALE)



## APPROVALS

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

CONSTRUCTION: \_\_\_\_\_ DATE: \_\_\_\_\_

LEASING/  
SITE ACQUISITION: \_\_\_\_\_ DATE: \_\_\_\_\_

LANDLORD/  
PROPERTY OWNER: \_\_\_\_\_ DATE: \_\_\_\_\_

R.F. ENGINEER: \_\_\_\_\_ DATE: \_\_\_\_\_



## PROJECT DESCRIPTION

- (1) NEW 2.5 EQUIPMENT RACK INSIDE EXIST MMBTS CABINET.
- (3) NEW RFS APXVTM14-C-120 ANTENNAS.
- (3) NEW TD-RRH8x20-25 RRH.
- (1) NEW 1-1/4" HYBRID CABLE.



SITE NUMBER:  
CT33XC518

SITE NAME:  
N. WOODBURY/WOLFF PARCEL

SITE ADDRESS:  
1440 MAIN STREET NORTH  
WOODBURY, CT 06798

SHEET TITLE:  
TITLE SHEET

SHEET NO:  
T-1

**DIVISION 01000--GENERAL NOTES**

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE PROJECT OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. 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 THE ARCHITECT/ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. THE CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, D) TRENCHING AND EXCAVATION OF 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 THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK SUBJECT TO THE APPROVAL OF THE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
16. THE CONTRACTOR SHALL NOTIFY THE THE RF ENGINEER FOR ANTENNA AZIMUTH VERIFICATION (DURING ANTENNA INSTALLATION) PRIOR TO CONDUCTING SWEEP TESTS.
17. THE CONTRACTOR SHALL SUBMIT AT THE END OF THE PROJECT A COMPLETE SET OF AS-BUILT DRAWINGS TO THE CLIENT REPRESENTATIVE.

18. REFER TO: CONSTRUCTION STANDARDS--SPRINT DOCUMENT EXHIBIT A--STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV. 4.0-- 02.15.2011.DOCM.
19. REFER TO: WEATHER PROOFING SPECS: EXCERPT EXH A--WIHRPRF--STD CONSTR SPECS...157201110421855492.DOCM.
20. REFER TO: COLOR CODING--SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF
21. REFER TO LATEST DOCUMENTATION REVISION.

**DIVISION 03000--CONCRETE**

- 1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)
  - A. ACI-301 -- SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
  - B. ACI-347 GUIDE TO FORM WORK FOR CONCRETE.
  - C. ASTM C33-- CONCRETE AGGREGATE
  - D. ASTM C94 -- READY MIXED CONCRETE e. ASTM C150 -- PORTLAND CEMENT.
  - E. ASTM C260 -- AIR--ENTRAINING ADMIXTURES FOR CONCRETE
  - F. ASTM C309-- LIQUID MEMBRANE FORMING COMPOUNDS FOR CURING CONCRETE.
  - H. ASTM C494 -- CHEMICAL ADMIXTURES FOR CONCRETE
  - I. ASTM A615-- DEFORMED AND PLAIN BILLET--STEEL BARS FOR CONCRETE REINFORCEMENT
  - J. ASTM A185-- STEEL WELDED WIRE FABRIC (PLAIN) FOR CONCRETE REINFORCEMENT
- 1.04 QUALITY ASSURANCE
 

CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ARCHITECT/ENGINEER AS DIRECTED BY THE CLIENT'S REPRESENTATIVE.
- 3.04 SURFACE FINISHES
  - A. SURFACES AGAINST WHICH BACKFILL OR CONCRETE SHALL BE PLACED REQUIRE NO TREATMENT EXCEPT REPAIR OF DEFECTIVE AREAS.
  - B. SURFACES THAT WILL BE PERMANENTLY EXPOSED SHALL PRESENT A UNIFORM FINISH PROVIDED BY THE REMOVAL OF FINS AND THE FILLING HOLES AND OTHER IRREGULARITIES WITH DRY PACK GROUT, OR BY SACKING WITH UTILITY OR ORDINARY GROUT.
  - C. SURFACES THAT WOULD NORMALLY BE LEVEL AND WHICH WILL BE PERMANENTLY EXPOSED TO THE WEATHER SHALL BE SLOPED FOR DRAINAGE. UNLESS ENGINEER'S DESIGN DRAWING SPECIFIES A HORIZONTAL SURFACE OR SURFACES SUCH AS STAIR TREADS, WALLS, CURBS, AND PARAPETS SHALL BE SLOPED APPROXIMATELY 1/4" PER FOOT.
  - D. SURFACES THAT WILL BE COVERED BY BACKFILL OR CONCRETE SHALL BE SMOOTH SCREENED.
  - E. EXPOSED SLAB SURFACES SHALL BE CONSOLIDATED, SCREENED, FLOATED, AND STEEL TROWELED. HAND OR POWER--DRIVEN EQUIPMENT MAY BE USED FOR FLOATING. FLOATING SHALL BE STARTED AS SOON AS THE SCREENED SURFACE HAS ATTAINED A STIFFNESS TO PERMIT FINISHING OPERATIONS. OPERATIONS. ALL EDGES MUST HAVE A 3/4" CHAMFER.
- 1.04 QUALITY ASSURANCE CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER.
- 3.05 PATCHING
 

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON REMOVAL OF THE FORMS TO OBSERVE CONCRETE SURFACE CONDITIONS. IMPERFECTIONS SHALL BE PATCHED ACCORDING TO THE ENGINEER'S DIRECTION.
- 3.06 DEFECTIVE CONCRETE
 

THE CONTRACTOR SHALL NOTIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LEVELS AND LINES, DETAILS, AND ELEVATIONS AS SPECIFIED IN ACI 301.
- 3.07 PROTECTION
  - A. IMMEDIATELY AFTER PLACEMENT. THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.
  - B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.
  - C. ALL CONCRETE SHALL BE WATER CURED PER ACCEPTABLE PRACTICES SPECIFIED BY ACI CODE (LATEST EDITION)

**DIVISION 05000 -- METALS**

- PART 1 -- GENERAL
- 1.01 WORK INCLUDED
    - A. THE WORK CONSISTS OF THE FABRICATION AND INSTALLATION OF ALL MATERIALS TO BE FURNISHED, AND WITHOUT LIMITING THE GENERALITY THEREOF, INCLUDING ALL EQUIPMENT, LABOR AND SERVICES REQUIRED FOR ALL STRUCTURAL STEEL WORK AND ALL ITEMS INCIDENTAL AS SPECIFIED AND AS SHOWN ON THE DRAWINGS:
      1. STEEL FRAMING INCLUDING BEAMS, ANGLES, CHANNELS AND PLATES.
      2. WELDING AND BOLTING OF ATTACHMENTS.
  - 1.02 REFERENCE STANDARDS
    - A. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:
      1. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS IN BUILDING CODES" OR LATEST EDITION.
      2. AWS: AMERICAN WELDING SOCIETY CODE OR LATEST EDITION.
      3. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).
- PART 2 -- PRODUCTS
- 2.01 MATERIALS
    - A. STRUCTURAL STEEL: SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A36 AND A992 FOR STRUCTURAL STEEL.
- ALL PROPOSED STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC CODE AND ASTM SPECIFICATIONS (LATEST EDITION) ALL NEW STEEL SHALL CONFORM TO THE FOLLOWING.
1. STRUCTURAL WIDE FLANGE: ASTM A992 Fy=50KSI.
  2. MISCELLANEOUS STEEL (PLATES), CHANNELS, ANGLES, ETC): ASTM A36 (Fy=36KSI).
  3. STRUCTURAL TUBING: ASTM A500 Gr. B (Fy=48KSI).
  4. STEEL PIPE: ASTM A53 Gr B (Fy=35KSI).
- 2.02 WELDING
    - A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.
    - B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM 1-233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN THE SUBMERGED ARC PROCESS SHALL CONFORM TO AISC SPECIFICATIONS.
    - C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE.
    - D. STUD WELDING SHALL BE ACCOMPLISHED BY CAPACITOR DISCHARGE (CD) WELDING TECHNIQUE USING CAPACITOR DISCHARGE STUD WELDER.
    - E. PROVIDE STUD FASTENERS OF MATERIALS AND SIZES SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE MANUFACTURER FOR STRUCTURAL LOADINGS REQUIRED.
    - F. FOLLOW MANUFACTURERS SPECIFICATIONS AND INSTRUCTIONS TO PROPERLY SELECT AND INSTALL STUD WELDS.
  - 2.03 BOLTING
    - A. BOLTS SHALL BE CONFORMING TO ASTM A35 HIGH STRENGTH HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.
    - B. BOLTS SHALL BE 3/4" (MINIMUM) CONFORMING TO ASTM A325, HOT DIP GALVANIZED, ASTM A153 NUTS SHALL BE HEAVY HEX TYPE.
    - C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.
    - D. EXCEPT WHERE SHOWN, ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS TO BE DOUBLE ANGLED CONNECTIONS WITH HIGH STRENGTH BOLTS (THREADS EXCLUDED FROM SHEAR PLANE) AND HARDENED WASHERS.
    - E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.
    - F. SNUG--TIGHT STRENGTH BEARING BOLTS MAY BE USED IN STANDARD HOLES CONFORMING TO ACIS, USING THE TURN OF THE NUT METHOD.
    - H. FULLY--TENSIONED HIGH STRENGTH (SLIP CRITICAL) SHALL BE USED IN OVERSIZED SLOT HOLES (RESPECTIVE OF SLOT ORIENTATION).
    - I. ALL BRACED CONNECTION, MOMENT CONNECTION AND CONNECTIONS NOTED AS "SLIP CRITICAL" SHALL BE BE SLIP CRITICAL JOINTS WITH CLASS A SURFACE CONDITIONS, UNLESS OTHERWISE NOTED.
    - J. EPOXY ANCHOR ASSEMBLIES SHALL BE AS MANUFACTURED BY HILTI OR ENGINEER APPROVED EQUAL, AS FOLLOWS:
 

<u>BASE MATERIAL</u>	<u>ANCHOR SYSTEM</u>
CONCRETE	HILTI HIT--HY 200
HOLLOW & GROUTED CMU OR BRICK	HILTI HIT--HY 70
  - 2.04 FABRICATION
    - A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS

- 2.05 FINISH
    - A. STRUCTURAL STEEL EXPOSED TO WEATHER SHALL BE HOT--DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. (LATEST EDITION) UNLESS OTHERWISE NOTED.
  - 2.06 PROTECTION
    - A. UPON COMPLETION OF ERECTION, INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS OR GALVANIZED BREAKS WITH (2) COATS OF ZINC--RICH COLD GALVANIZING PAINT.
- PART 3 -- ERECTION
- A. PROVIDE ALL ERECTION, EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION, BUT ARE NECESSARY FOR ITS PROPER ERECTION.
  - B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING
  - C. TEMPORARY BRACING, GUYING, AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SET AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.



**TECTONIC** ENGINEERING & SURVEYING CONSULTANTS P.C.

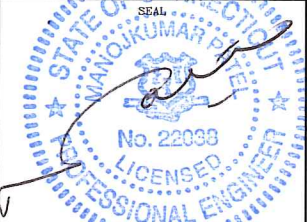
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**SUBMITTALS**

PROJECT NO: 7225.CT33XC518			
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DATE	REVIEWED BY
7/15/15	JMO



SITE NUMBER:  
**CT33XC518**

SITE NAME:  
**N. WOODBURY/WOLFF PARCEL**

SITE ADDRESS:  
**1440 MAIN STREET NORTH  
WOODBURY, CT 06798**

SHEET TITLE:  
**GENERAL NOTES**

SHEET NO:  
**SP-1**

DIVISION 13000—SPECIAL CONSTRUCTION ANTENNA INSTALLATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. ANTENNAS AND HYBRIFLEX CABLES ARE FURNISHED BY CLIENT'S REPRESENTATIVE UNDER SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPERTY.

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT RESULT

F. INSTALL HYBRIFLEX CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

G. ANTENNA AND HYBRIFLEX CABLE GROUNDING:

1. ALL EXTERIOR #6 GREEN GROUND WIRE DAISY CHAIN CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPICE WEATHERPROOFING KIT TYPE 3221213 OR EQUIVALENT.

2. ALL HYBRIFLEX CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF HYBRIFLEX CABLE (NOT WITHIN BENDS). 1.02 RELATED WORK FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH QOTHER TRADES PRIOR TO BID:

1. FLASHING OF OPENING INTO OUTSIDE WALLS.
2. SEALING AND CAULKING ALL OPENINGS.
3. PAINTING.
4. CUTTING AND PATCHING.

1.03 REQUIREMENTS OF REGULATOR AGENCIES

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. EIA - ELECTRONIC INDUSTRIES ASSOCIATION RS-22. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

2. FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7480-1H, CONSTRUCTION MARKING AND LIGHTING.

3. FCC - FEDERAL COMMUNICATION COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES

4. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION FOR STRUCTURAL JOINTS USING ASTM 1325 OR A490 BOLTS.

5. NEC - NATIONAL ELECTRIC CODE - ON TOWER LIGHTING KITS.

6. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

7. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

8. LIFE SAFETY CODE NFPA, LATEST EDITION.

DIVISION 13000—EARTHWORK

PART 1 GENERAL

1.01 WORK INCLUDED: REFER TO SURVEY AND SITE PLAN FOR WORK INCLUDED.

1.02 RELATED WORK

A. CONSTRUCTION OF EQUIPMENT FOUNDATIONS  
B. INSTALLATION OF ANTENNA SYSTEM

PART 2 PRODUCTS

2.01 MATERIALS

A. ROAD AND SITE MATERIALS; FILL MATERIAL SHALL BE ACCEPTABLE, SELECT FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF HIGHWAY AND PUBLIC TRANSPORTATION STANDARD SPECIFICATIONS.

B. SOIL STERILIZER SHALL BE EPA REGISTERED OF LIQUID COMPOSITION AND OF PRE-EMERGENCE DESIGN.

C. SOIL STABILIZER FABRIC SHALL BE MIRAFI OR EQUAL - 600X AT ACCESS ROAD AND COMPOUND.

D. GRAVEL FILL; WELL GRADED, HARD, DURABLE, NATURAL SAND AND GRAVEL, FREE FROM ICE AND SNOW, ROOTS, SOD RUBBISH, AND OTHER DELETERIOUS OR ORGANIC MATTER.

MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS:

GRAVEL FILL TO BE PLACED IN LIFTS OF 9" MAXIMUM THICKNESS AND 90 % DENSITY. COMPACTED TO 95

E. NO FILL OR EMBANKMENT MATERIALS SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OF EMBANKMENT

2.02 EQUIPMENT

A. COMPACTION SHALL BE ACCOMPLISHED BY MECHANICAL MEANS. LARGER AREAS SHALL BE COMPACTED BY SHEEPS FOOT, VIBRATORY OR RUBBER TIED ROLLERS WEIGHING AT LEAST FIVE TONS. SMALLER AREAS SHALL BE COMPACTED BY POWER-DRIVER, HAND HELD TAMPERS.

B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS GRUB ORGANIC MATERIAL TO A MINIMUM OF 6" BELOW ORIGINAL GROUND LEVEL.

C. UNLESS OTHERWISE INSTRUCTED BY CLIENT'S REPRESENTATIVE, REMOVE TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED DISPOSAL LOCATION.

D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, ROLL THE SOIL.

E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE GRUBBED AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

3.03 INSTALLATION

A. THE SITE AND TURNAROUND AREAS SHALL BE AT THE SUB-BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE OR FILL THE SITE AND ACCESS ROAD AS REQUIRED TO PRODUCE EVEN DISTRIBUTION OF SPOILS RESULTING FROM FOUNDATION EXCAVATIONS. THE RESULTING GRADE SHALL CORRESPOND WITH SAID SUB-BASE COURSE, ELEVATIONS ARE TO BE CALCULATED FORM FINISHED GRADES OR SLOPES INDICATED.

B. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION.

C. DO NOT CREATE DEPRESSIONS WHERE WATER MAY POND.

D. THE CONTRACT INCLUDES ALL NECESSARY GRADING, BANKING, DITCHING AND COMPLETE SURFACE COURSE FOR ACCESS ROAD. ALL ROADS OR ROUTES UTILIZED FOR ACCESS TO PUBLIC THROUGHFARE IS INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE INDICATED.

E. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATTER AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.

F. PLACE FILL OR STONE IN 3" MAXIMUM LIFTS AND COMPACT BEFORE PLACING NEXT LIFT.

G. THE FINISH GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF 12" BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.

H. RIPRAP SHALL BE APPLIED TO THE SIDE SLOPES OF ALL FENCED AREAS, PARKING AREAS AND TO ALL OTHER SLOPES GREATER THAN 2:1.

I. RIPRAP SHALL BE APPLIED TO THE SIDES OF DITCHES OR DRAINAGE SWALES AS INDICATED ON PLANS.

J. RIPRAP ENTIRE DITCH FOR 6'-0" IN ALL DIRECTIONS AT CULVERT OPENINGS.

K. SEED, FERTILIZER AND STRAW COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES, NOT OTHERWISE RIP-RAPPED.

L. UNDER NO CIRCUMSTANCES SHALL DITCHES, SWALES OR CULVERTS BE PLACED SO THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SITE. IF OWNER DESIGNS OR IF DESIGN ELEVATIONS CONFLICT WITH THIS GUIDANCE ADVISE THE OWNER IMMEDIATELY.

M. IF A DITCH LIES WITH SLOPE GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALL IN THE DITCH AT CULVERT ENTRANCES. RIP-RAP THE UPSTREAM SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR 6'-0" ABOVE THE CULVERT.

N. IF A DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH FOR 6'-0" ABOVE THE CULVERT ENTRANCE.

O. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND TO LOOSEN THE SOIL.

P. SOW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMENDED BY THE SEED PRODUCER.

Q. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

3.04 FIELD QUALITY CONTROL

A. COMPACTION SHALL BE D-1557 FOR SITE WORK AND 95 % MAXIMUM DENSITY UNDER SLAB AREAS. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTOR'S EXPENSE. REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. THE COMPACTION TEST RESULTS SHALL BE AVAILABLE PRIOR TO THE CONCRETE POUR.

3.05 PROTECTION

A. PROTECT SEEDED AREAS FORM EROSION BY SPREADING STRAW TO A UNIFORM LOOSE DEPTH OF 1"-2". STAKE AND TIE DOWN AS REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT SHALL BE WRAPPED, TIED WITH HOSE PROTECTED WIRE AND SECURED TO STAKES EXTENDING 2'-0" INTO THE GROUND ON FOUR SIDES OF THE TREE.

C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION. STRAW BALES SHALL BE PLACED AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS. REFER TO DETAILS ON DRAWINGS

SYMBOLS	ABBREVIATIONS
— — — — G — — — — G —	GROUND WIRE
— — — — E — — — — E —	ELECTRIC
— — — — T — — — — T —	TELEPHONE
— — — — — — — — — — — — — —	OVERHEAD WIRE
— — — — — — — — — — — — — —	PROPERTY LINE
— X — — — — X — — — — X — — — —	CHAIN LINK FENCE
A-1	ANTENNA MARK
(E)	EXISTING
(P)	PROPOSED DETAIL
	REFERENCE
	SURFACE ELEVATION



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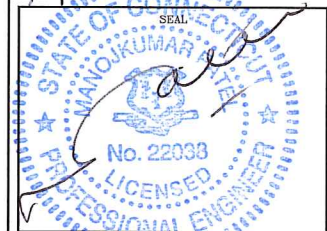
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SUBMITTALS

PROJECT NO: 7225.CT33XC518

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	MP
1	01/05/15	FOR CONSTRUCTION	DC

DATE	REVIEWED BY
1/5/15	DMQ



SITE NUMBER:  
CT33XC518

SITE NAME:  
N. WOODBURY/WOLFF PARCEL

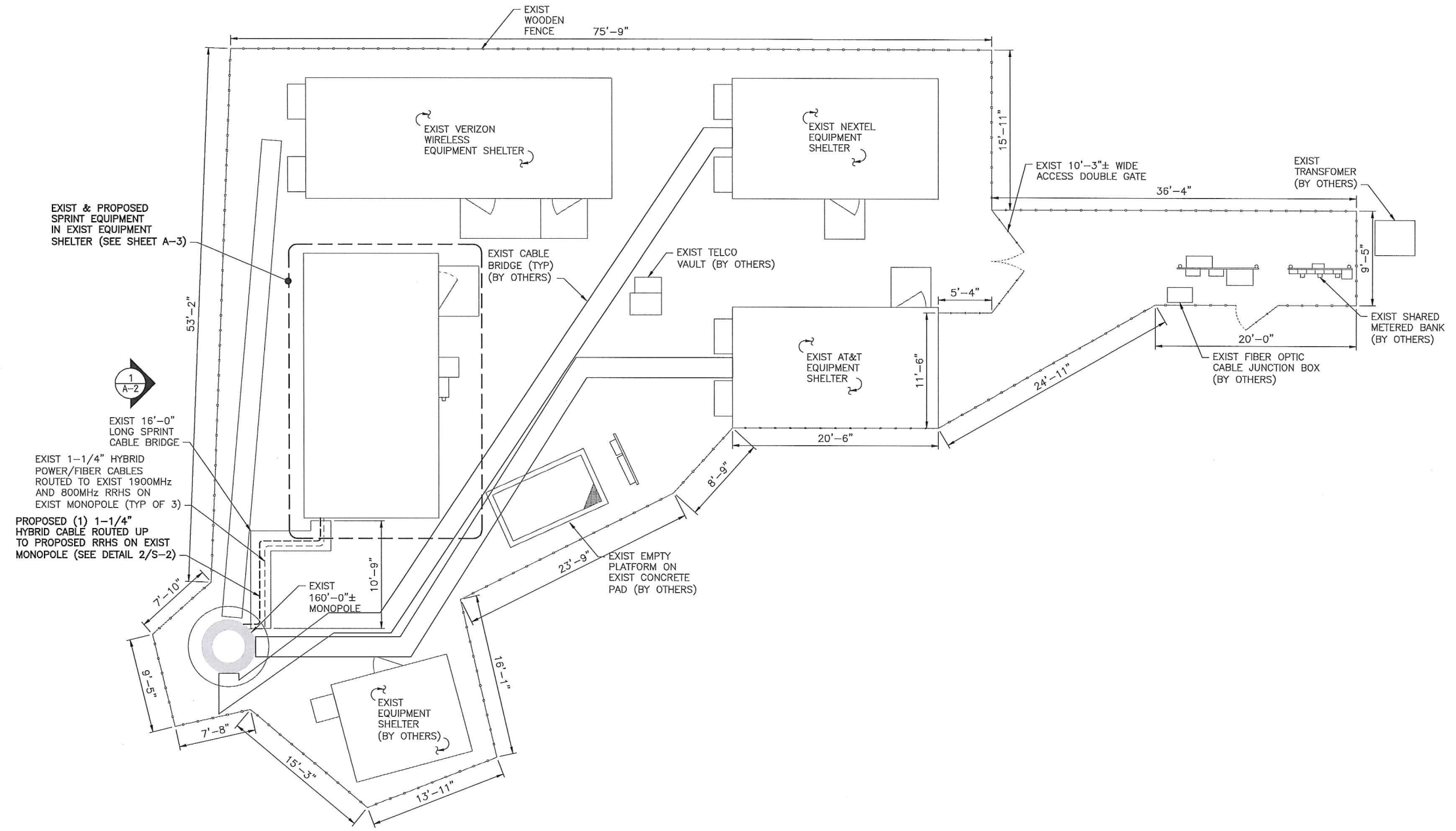
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1440 MAIN STREET NORTH  
WOODBURY, CT 06798

SHEET TITLE:  
GENERAL NOTES

SHEET NO:  
SP-2



**NORTH NOTE:**  
 NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.



**1 SITE PLAN**  
 A-1 SCALE: 3/16" = 1'-0"

**Sprint**  
 2.5 EQUIPMENT DEPLOYMENT  
 SPRINT PARKWAY  
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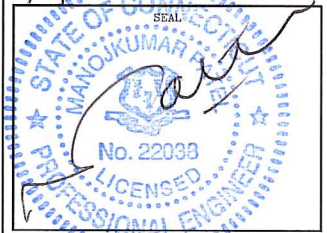
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1	01/05/15	FOR CONSTRUCTION	DC

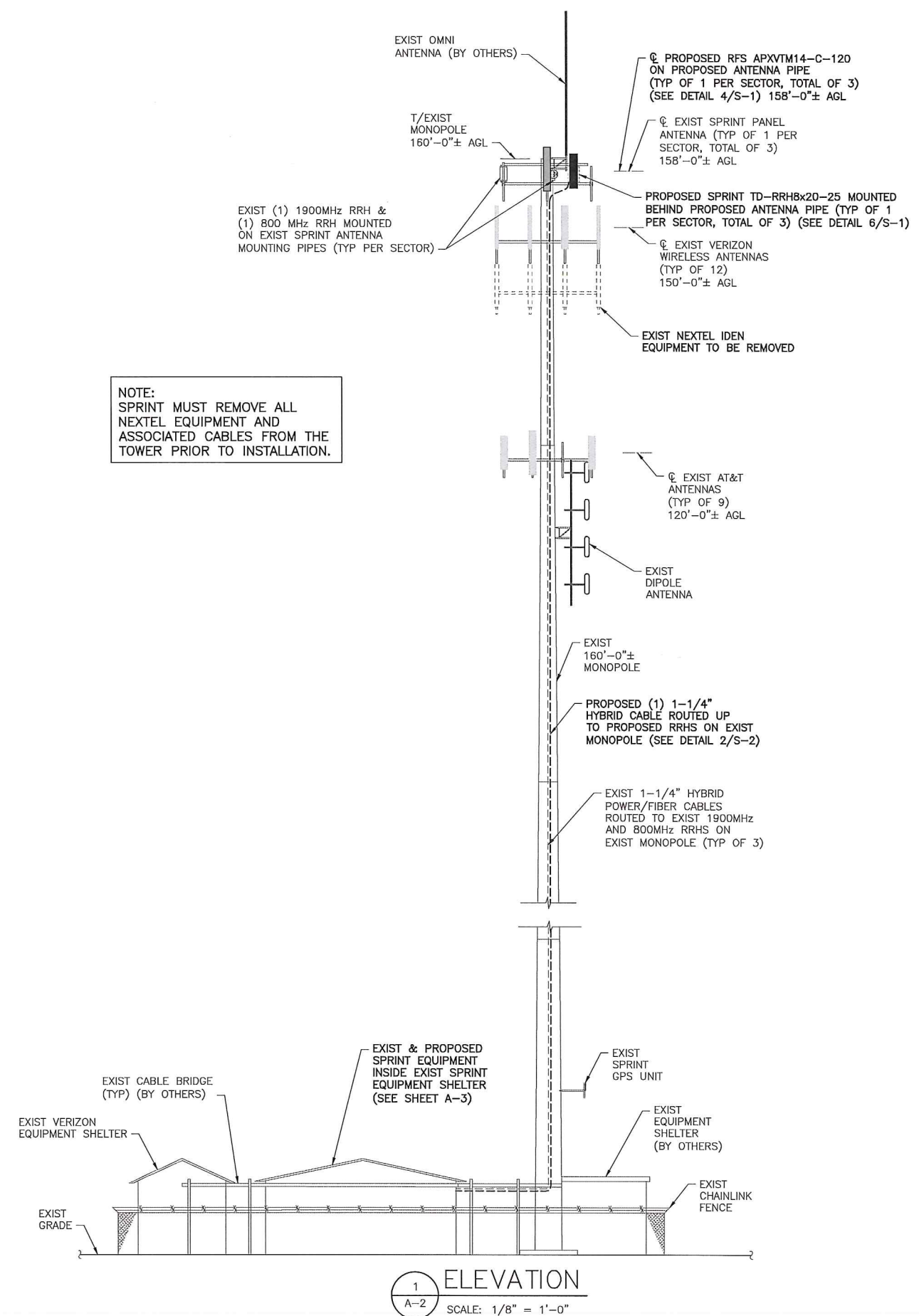
DATE	REVIEWED BY
1/5/15	SMQ



SITE NUMBER:  
 CT33XC518  
 SITE NAME:  
 N. WOODBURY/WOLFF PARCEL  
 SITE ADDRESS:  
 1440 MAIN STREET NORTH  
 WOODBURY, CT 06798

SHEET TITLE:  
 SITE PLAN

SHEET NO:  
 A-1



NOTE:  
SPRINT MUST REMOVE ALL  
NEXTEL EQUIPMENT AND  
ASSOCIATED CABLES FROM THE  
TOWER PRIOR TO INSTALLATION.

1 ELEVATION  
A-2 SCALE: 1/8" = 1'-0"

THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

THE EXISTING MOUNT HAS BEEN ANALYZED BY TECTONIC ENGINEERING AND FOUND TO BE ADEQUATE TO SUPPORT THE PROPOSED SPRINT UPGRADE AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 01/05/15.



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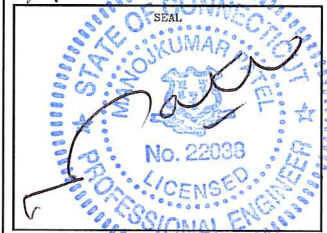
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DATE: 1/5/15  
REVIEWED BY: JMO



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CT33XC518

SITE NAME:  
N. WOODBURY/WOLFF PARCEL

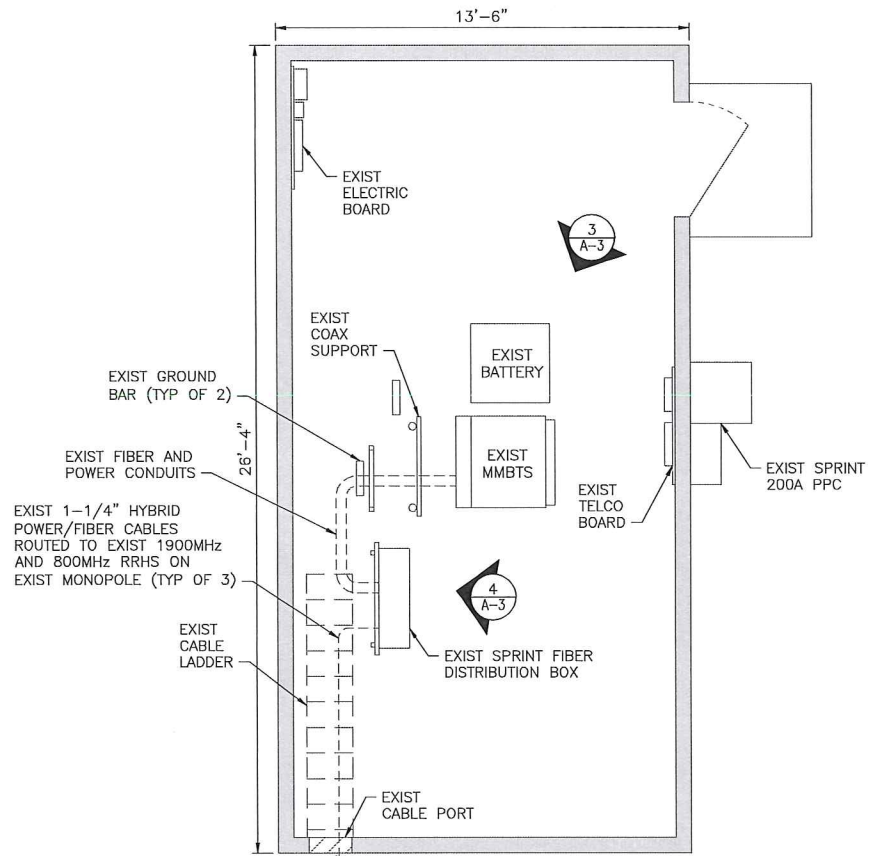
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1440 MAIN STREET NORTH  
WOODBURY, CT 06798

SHEET TITLE:  
ELEVATION

SHEET NO:  
A-2



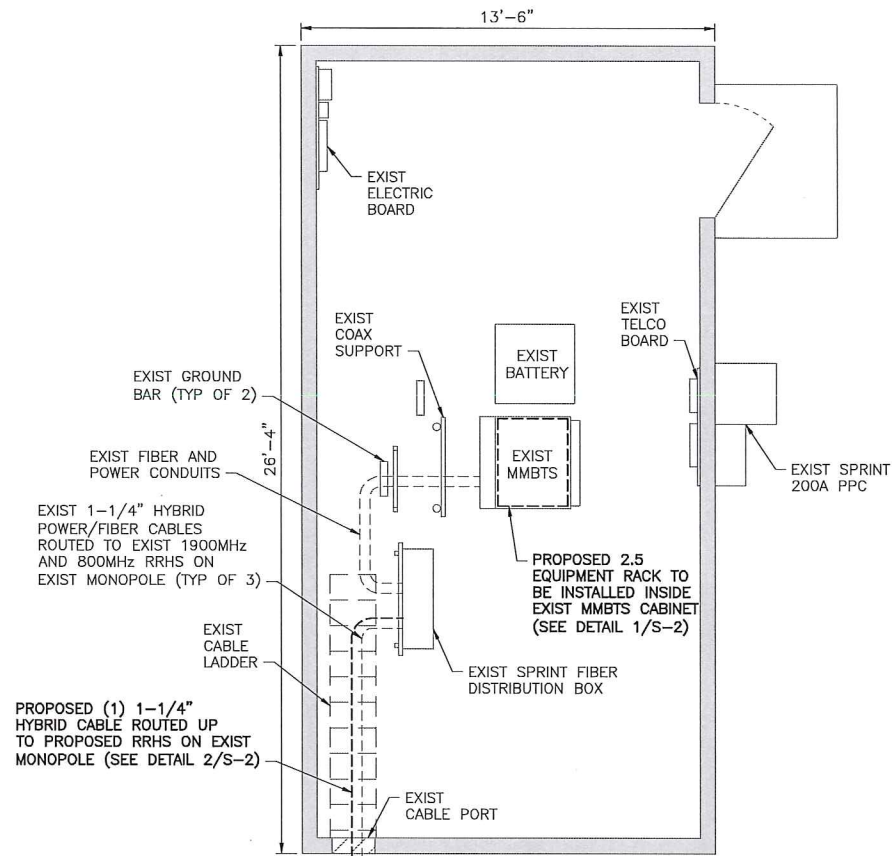
**NORTH NOTE:**  
 NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.



**1** ENLARGED EQUIPMENT LAYOUT PLAN (EXIST)  
 A-3 SCALE: 3/8" = 1'-0"



**3** EXIST EQUIPMENT ROOM  
 A-3 SCALE: NTS



**2** ENLARGED EQUIPMENT LAYOUT PLAN (FINAL)  
 A-3 SCALE: 3/8" = 1'-0"



**4** EXIST FIBER DISTRIBUTION BOX  
 A-3 SCALE: NTS

**Sprint**  
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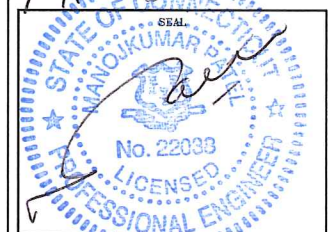
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1	01/05/15	FOR CONSTRUCTION	DC

DATE: 1/5/15 REVIEWED BY: JMG

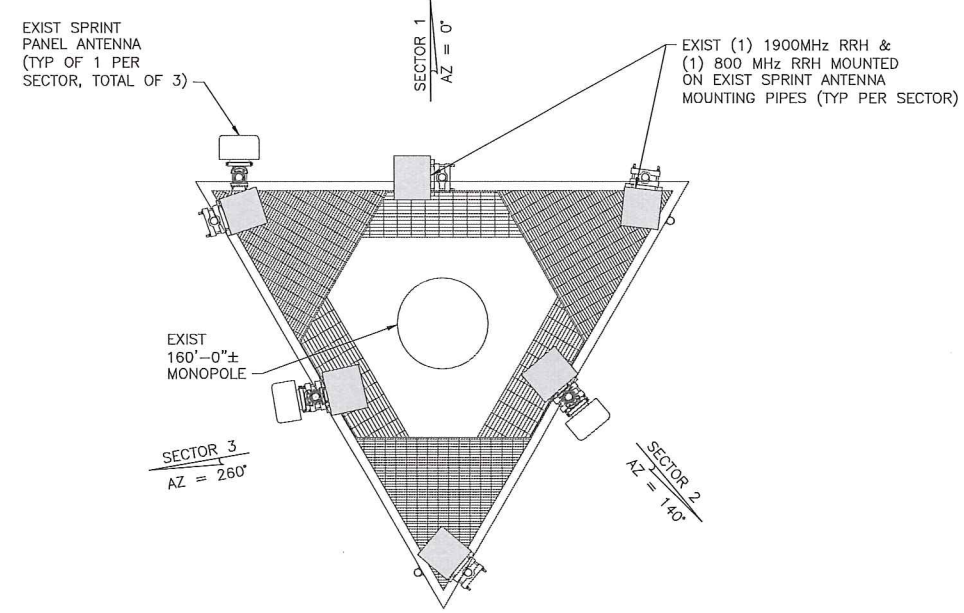


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 SITE NAME:  
 N. WOODBURY/WOLFF PARCEL  
 SITE ADDRESS:  
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 WOODBURY, CT 06798

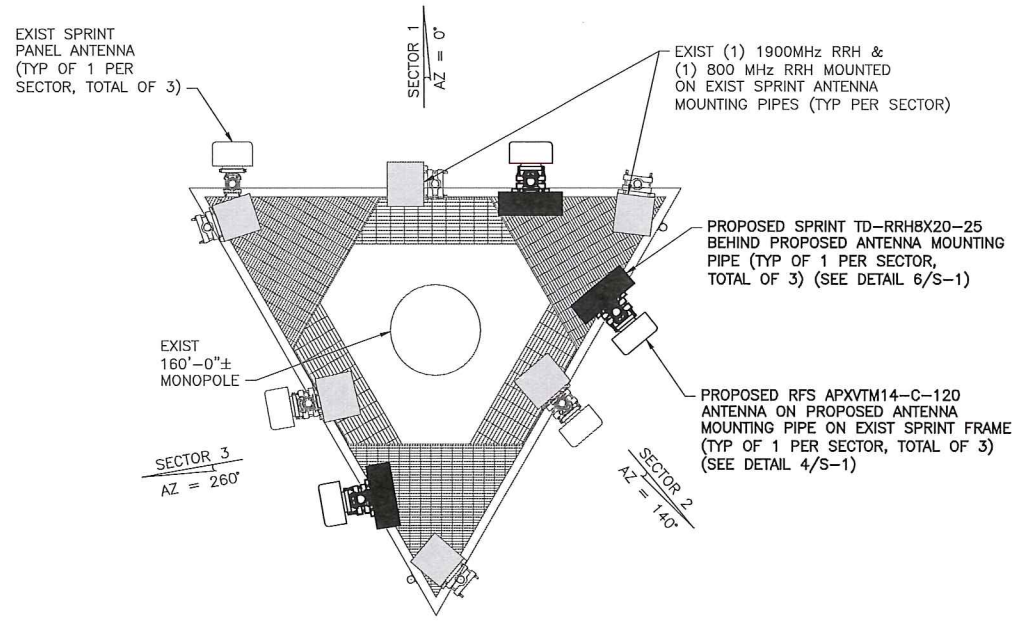
SHEET TITLE:  
 ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:  
 A-3





1 ANTENNA LAYOUT PLAN (EXIST)  
A-4 SCALE: 1/2" = 1'-0"



2 ANTENNA LAYOUT PLAN (FINAL)  
A-4 SCALE: 1/2" = 1'-0"

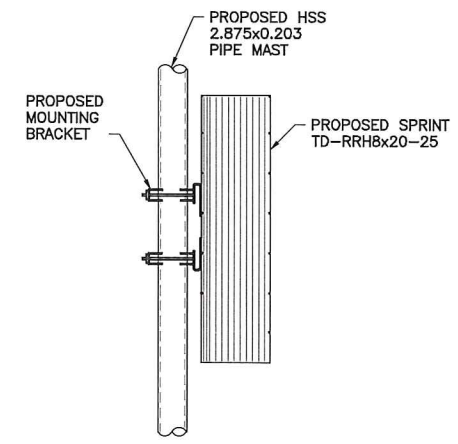
EXIST (1) 1900MHz RRH AND (1) 800MHz RRH MOUNTED ON EXIST SPRINT ANTENNA MOUNTING PIPES (TYP PER SECTOR)



EXIST SPRINT PANEL ANTENNA (TYP OF 1 PER SECTOR, TOTAL OF 3)

THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

THE EXISTING MOUNT HAS BEEN ANALYZED BY TECTONIC ENGINEERING AND FOUND TO BE ADEQUATE TO SUPPORT THE PROPOSED SPRINT UPGRADE AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 01/05/15.



3 RRH MOUNTING DETAIL  
A-4 SCALE: 1 1/2" = 1'-0"

ANTENNA DATA

Status	Exist	Proposed
Antenna Manufacturer	RFS-CEL WAVE	RFS-CEL WAVE
Antenna Model Number	APXVSP18C-A20	APXVTM14-C-120
Number of Antennas	3	3
Antenna RAD Center	158'	158'
Antenna Azimuth	0/140/260	0/140/260
Antenna RRH Model Number	1900MHz/800MHz RRHS	TD-RRH8x20-25
Number of RRH	6	3

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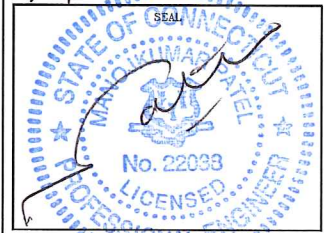
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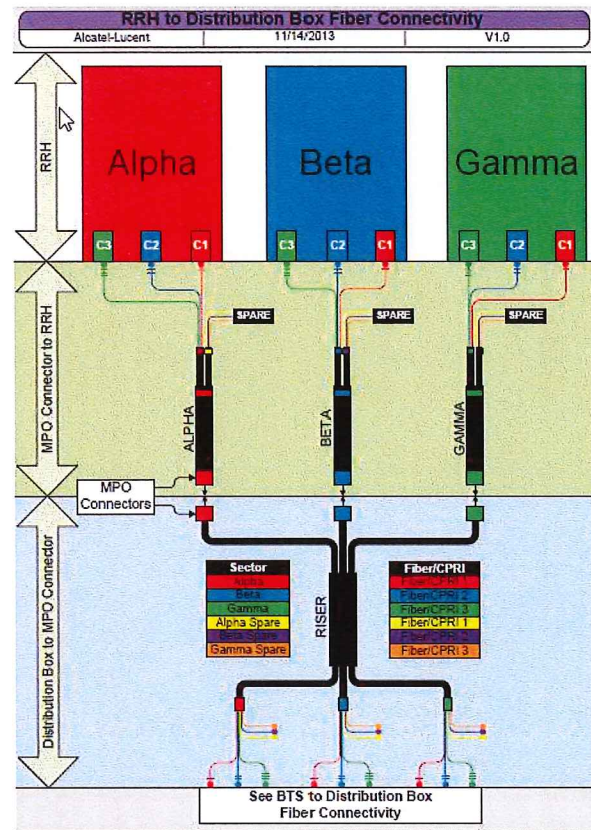
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REVIEWED BY: SMQ



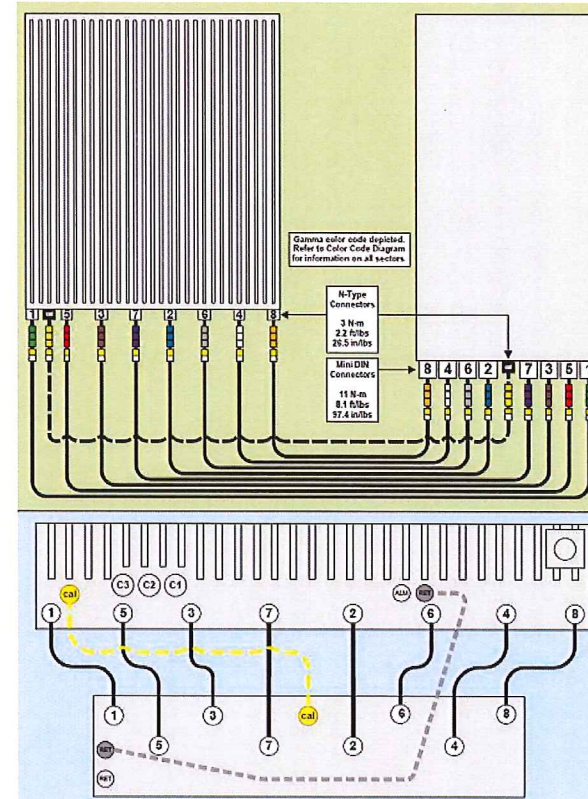
SITE NUMBER: CT33XC518  
SITE NAME: N. WOODBURY/WOLFF PARCEL  
SITE ADDRESS: 1440 MAIN STREET NORTH WOODBURY, CT 06798

SHEET TITLE: ANTENNA LAYOUT PLANS

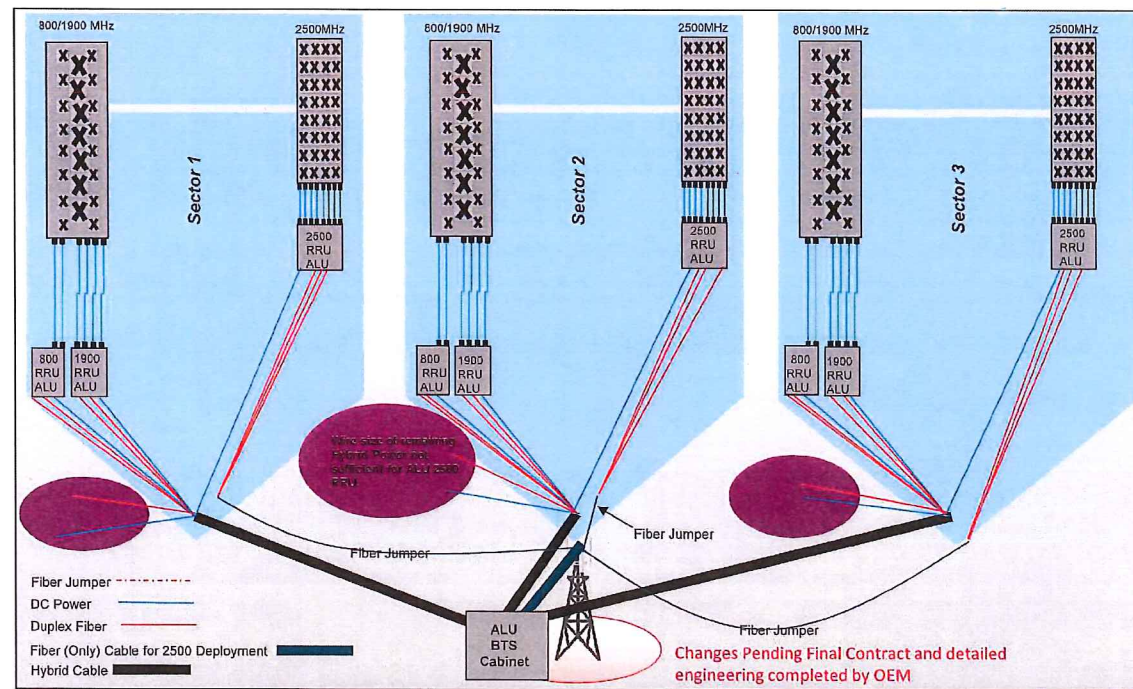
SHEET NO: A-4



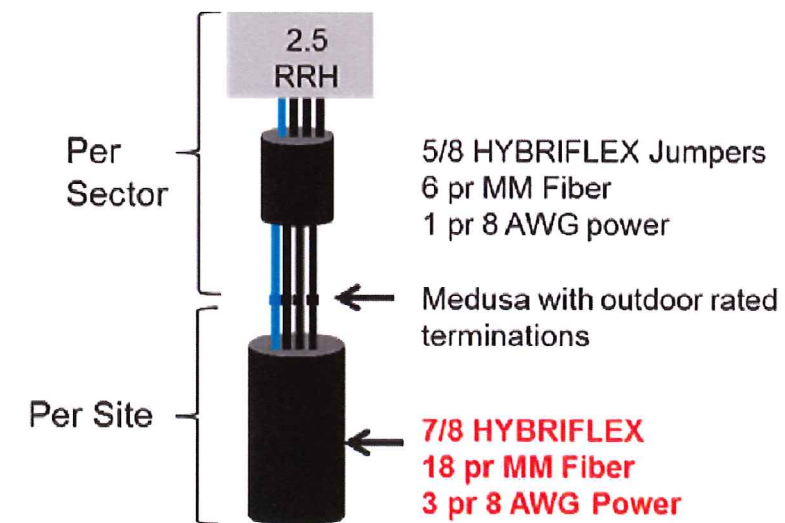
1 2.5 CABLE COLOR CODING  
A-5 SCALE: N.T.S.



2 RRH CONNECTIVITY  
A-5 SCALE: N.T.S.



3 RAN WIRING  
A-5 SCALE: N.T.S.



4 CABLE SCENARIO  
A-5 SCALE: N.T.S.

**Sprint**  
2.5 EQUIPMENT DEPLOYMENT  
SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251

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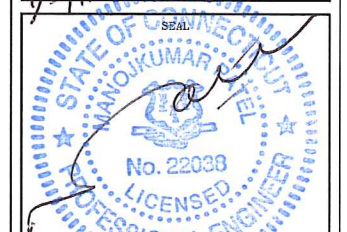
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1	01/05/15	FOR CONSTRUCTION	DC

DATE	REVIEWED BY
1/5/15	SMG



SITE NUMBER:  
CT33XC518

SITE NAME:  
N. WOODBURY/WOLFF PARCEL

SITE ADDRESS:  
1440 MAIN STREET NORTH  
WOODBURY, CT 06796

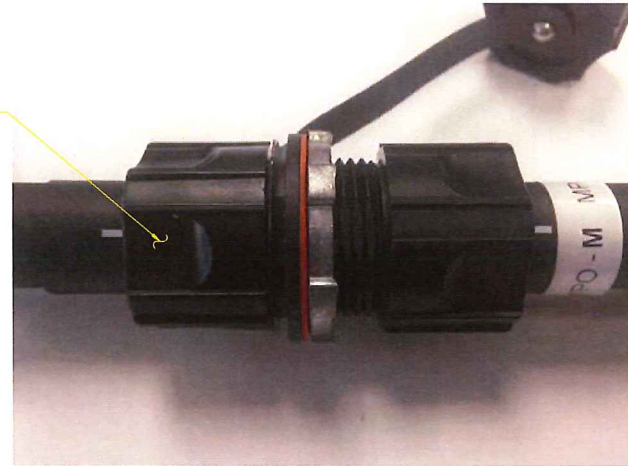
SHEET TITLE:  
RAN WIRING DIAGRAM

SHEET NO:  
A-5

IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION

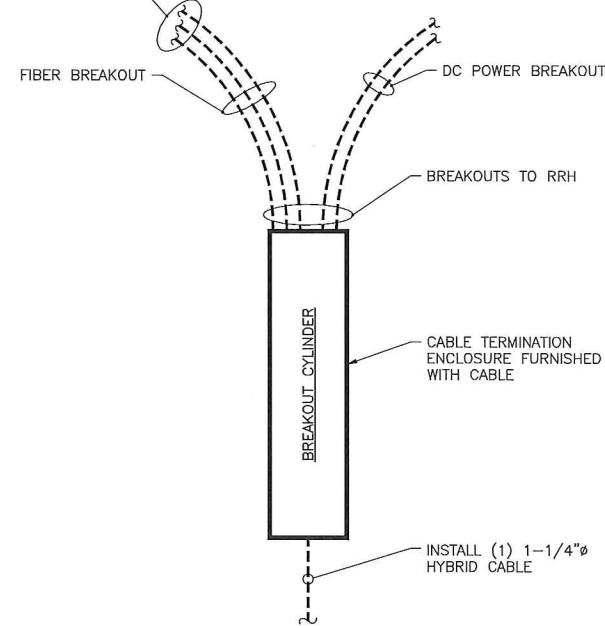


IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

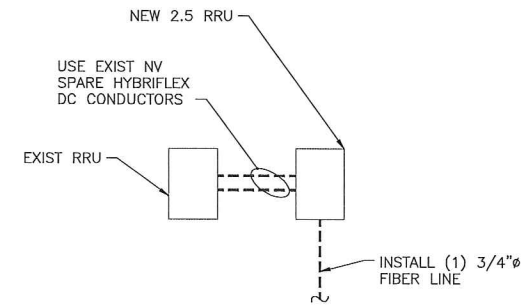


1 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS  
A-6 SCALE: N.T.S.

TRUNK-LINE TO JUMPER CONNECTION (MPO) TO BE INSTALLED PER MANUFACTURER REQUIREMENTS. SEE DETAIL.



2.5 HYBRID CABLE W/FIBER & DC FEEDERS



FIBER ONLY TRUNK LINES

2 TRUNK LINE DETAILS (TYPICAL)  
A-6 SCALE: N.T.S.

**SPECIAL NOTES: CABLE MARKINGS AT RAD CENTER AND ALL WALL/BLDG. PENETRATIONS**

- ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) WRAPS OF TAPE.
- ALL COLOR BANDS INSTALLED AT THE TOWER TOP SHALL BE A MINIMUM OF 3" WIDE AND SHALL HAVE A MINIMUM OF 3/4" OF SPACING BETWEEN EACH COLOR.
- ALL COLOR BANDS INSTALLED AT OR NEAR THE GROUND MAY BE ONLY 3/4" WIDE. EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
- EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH 3/4" COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
- ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" BANDS ON EACH END OF THE BOTTOM JUMPER.
- ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
- EACH COLOR BAND SHALL HAVE A MINIMUM OF (3) WRAPS AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT AS TO AVOID UNRAVELING.
- X-POLE ANTENNAS SHOULD USE "XX-1" FOR THE "+45" PORT, "XX-2" FOR THE "-45" PORT.
- COLOR BAND #4 REFERS TO THE FREQUENCY BAND: ORANGE=850, VIOLET=1900. USED ON JUMPERS ONLY.
- RF FEEDLINE SHALL BE IDENTIFIED WITH A METAL TAG (STAINLESS OR BRASS) AND STAMPED WITH THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER.
- ANTENNAS MUST BE IDENTIFIED, USING THE SECTOR LETTER AND ANTENNA NUMBER, WITH A BLACK MARKER PRIOR TO INSTALLATION.

**Sprint**  
2.5 EQUIPMENT DEPLOYMENT  
SPRINT PARKWAY  
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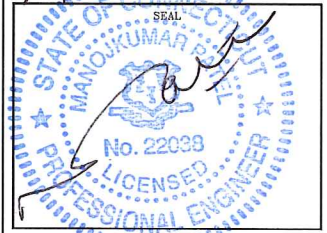
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**SUBMITTALS**

PROJECT NO: 7225.CT33XC518

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	MP
1	01/05/15	FOR CONSTRUCTION	DC

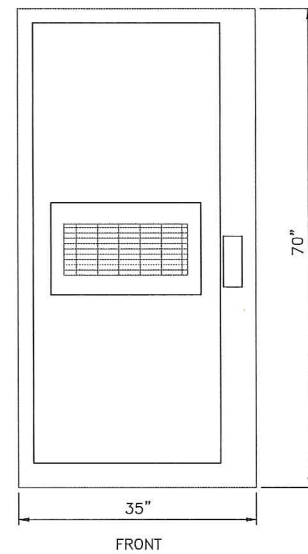
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REVIEWED BY: SMC



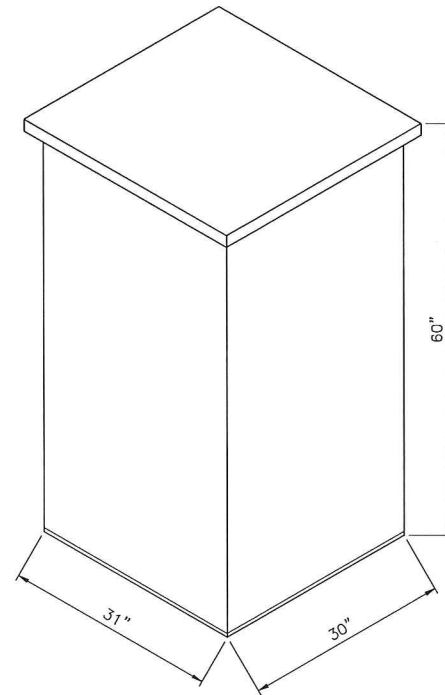
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CT33XC518  
SITE NAME:  
N. WOODBURY/WOLFF PARCEL  
SITE ADDRESS:  
1440 MAIN STREET NORTH  
WOODBURY, CT 06798

SHEET TITLE:  
CABLE DETAILS

SHEET NO:  
A-6



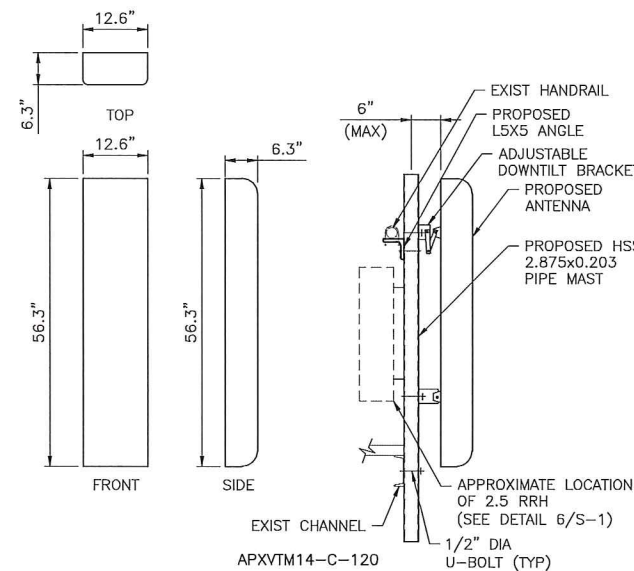
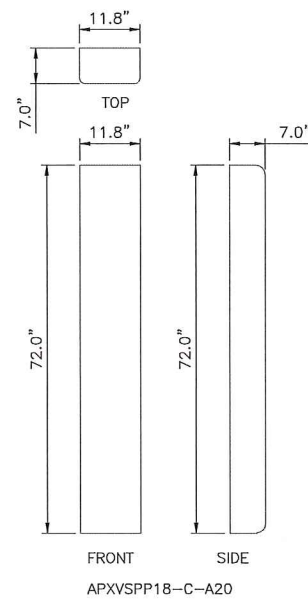
CABINET FRONT  
9928 MMBTS MODULAR CELL  
SPECIFICATIONS:  
HEIGHT: 70"  
WIDTH: 35"  
DEPTH: 37.8"  
WEIGHT: 1090 LBS.



ANDREW 60ECv2  
SPECIFICATIONS:  
HEIGHT: 60"  
WIDTH: 31"  
DEPTH: 30"  
WEIGHT: 2430 LBS.

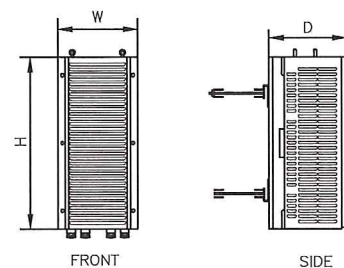
1 (EXIST) MMBTS CABINET  
S-1 SCALE: 1" = 1'-0"

2 (EXIST) BATTERY CABINET  
S-1 SCALE: 1" = 1'-0"

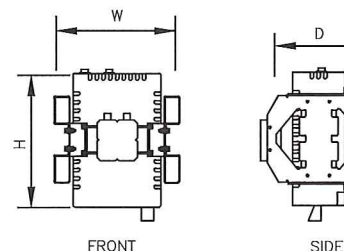


3 (EXIST) ANTENNA DETAIL  
S-1 SCALE: 3/4" = 1'-0"

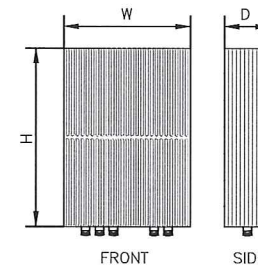
4 (PROPOSED) ANTENNA DETAIL  
S-1 SCALE: 3/4" = 1'-0"



TYPE: 1900 MHz 4x45W  
MODEL #: RRH 1900 4X45 65MHz  
HEIGHT: 25.0"  
WIDTH: 11.1"  
DEPTH: 11.4"  
WEIGHT: ±60 LBS.



TYPE: 800 MHz 2x50W  
MODEL #: FD-RRH-2x50-800  
HEIGHT: 19.7"  
WIDTH: 13"  
DEPTH: 10.8"  
WEIGHT: ±53 LBS.



TYPE: 2.5 RRH  
MODEL #: TD-RRH8x20-25  
HEIGHT: 26.1"  
WIDTH: 18.6"  
DEPTH: 6.7"  
WEIGHT: ±70 LBS.

5 (EXIST) RRH DETAILS  
S-1 SCALE: 1 1/2" = 1'-0"

6 (PROPOSED) RRH DETAIL  
S-1 SCALE: 1" = 1'-0"

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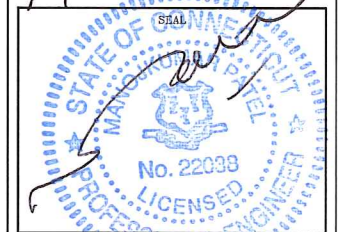
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1	01/05/15	FOR CONSTRUCTION	DC

DATE	REVIEWED BY
1/5/15	SMA



SITE NUMBER:  
CT33XC518  
SITE NAME:  
N. WOODBURY/WOLFF PARCEL  
SITE ADDRESS:  
1440 MAIN STREET NORTH  
WOODBURY, CT 06798

SHEET TITLE:  
EQUIPMENT DETAILS


SHEET NO:  
S-1

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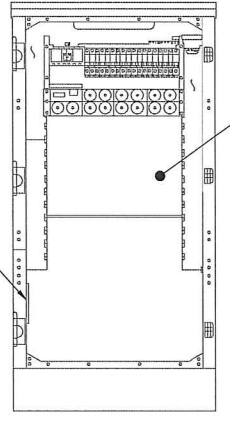
DATE: 1/5/15  
 REVIEWED BY: JMA  


SITE NUMBER:  
 CT33XC518  
 SITE NAME:  
 N. WOODBURY/WOLFF PARCEL  
 SITE ADDRESS:  
 1440 MAIN STREET NORTH  
 WOODBURY, CT 06798

SHEET TITLE:  
 EQUIPMENT  
 SCHEMATIC DETAILS

SHEET NO:  
 S-2

NOTE:  
 LOCATIONS SHOWN FOR  
 INSTALLATION OF NEW  
 EQUIPMENT IN EXISTING  
 CABINET ARE APPROXIMATE.  
 ACTUAL SPACE AVAILABLE  
 TO BE VERIFIED IN FIELD  
 ON A SITE BY SITE BASIS.



EXIST GROUND  
 BAR TO BE UTILIZED

INSTALL NEW 2.5  
 EQUIPMENT IN EXIST MMBTS  
 CABINET INCLUDING BUT  
 NOT LIMITED TO BASE BAND  
 UNIT, CELL SITE ROUTER  
 AND SURGE ARRESTORS.  
 GROUND EQUIPMENT TO  
 EXIST INTERIOR CABINET  
 GROUND BAR

FRONT ELEVATION  
 (CABINET INTERIOR)

1 MMBTS INTERIOR DETAIL  
 S-2 SCALE: N.T.S.

RFS HYBRIFLEX RISER CABLES SCHEDULE

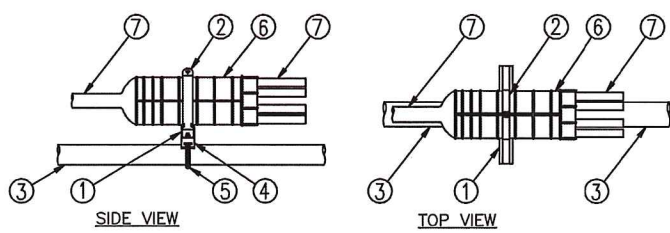
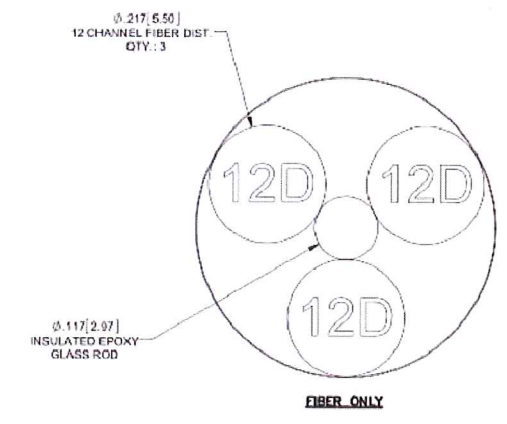
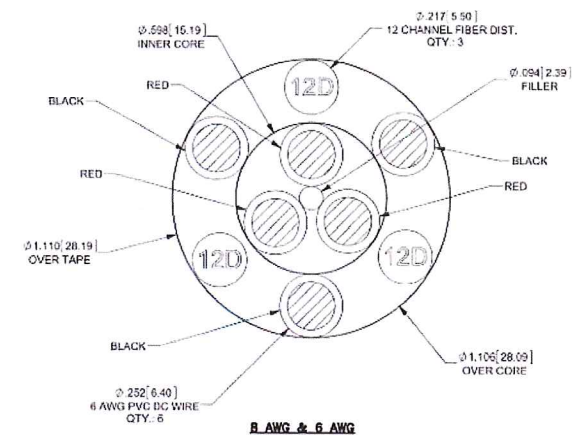
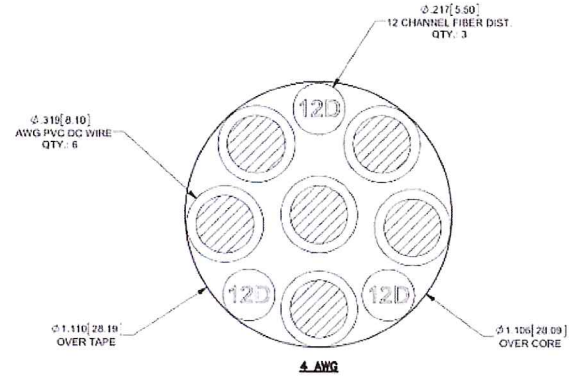
Power	Hybrid cable	Length	
Fiber Only (Existing DC Power)	MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50ft	50 ft	
	MN: HB058-M12-075F	75 ft	
	MN: HB058-M12-100F	100 ft	
	MN: HB058-M12-125F	125 ft	
	MN: HB058-M12-150F	150 ft	
	MN: HB058-M12-175F	175 ft	
8 AWG Power	MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50ft	50 ft	
	MN: HB114-08U3M12-075F	75 ft	
	MN: HB114-08U3M12-100F	100 ft	
	MN: HB114-08U3M12-125F	125 ft	
	MN: HB114-08U3M12-150F	150 ft	
	MN: HB114-08U3M12-175F	175 ft	
6 AWG Power	MN: HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225ft	225 ft	
	MN: HB114-13U3M12-250F	250 ft	
	MN: HB114-13U3M12-275F	275 ft	
	MN: HB114-13U3M12-300F	300 ft	
	4 AWG Power	MN: HB114-21U3M12-225F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225ft	225 ft
		MN: HB114-21U3M12-250F	250 ft
MN: HB114-21U3M12-275F		275 ft	
MN: HB114-21U3M12-300F		300 ft	
8 AWG Power		MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50ft	50 ft
		MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft	
	MN: HB114-08U3M12-125F	125 ft	
	MN: HB114-08U3M12-150F	150 ft	
	MN: HB114-08U3M12-175F	175 ft	
6 AWG Power	MN: HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225ft	225 ft	
	MN: HB114-13U3M12-250F	250 ft	
	MN: HB114-13U3M12-275F	275 ft	
	MN: HB114-13U3M12-300F	300 ft	
	4 AWG Power	MN: HB114-21U3M12-225F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225ft	225 ft
		MN: HB114-21U3M12-250F	250 ft
MN: HB114-21U3M12-275F		275 ft	
MN: HB114-21U3M12-300F		300 ft	

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Power	Hybrid Jumper cable	Length
Fiber Only	MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft
6 AWG Power	MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft
4 AWG Power	MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE

MANUF:	RFS	DC CONDUCTOR	CABLE DIAMETER
CABLE	VARIES	USE NV HYBRIFLEX	7/8"
FIBER ONLY	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



- LEGEND:**
- P1000T-HG UNISTRUT, 12" LONG.
  - 6" PIPE HANGER.
  - EXISTING SUPPORT PIPE.
  - NEW STANDOFF BRACKET, ANDREW PART# 30848-4.
  - NEW ROUND MEMBER ADAPTER SIZED FOR EXISTING PIPE SUPPORT.
  - BREAKOUT UNIT.
  - CABLE.

3 MEDUSA HEAD DETAIL  
 S-2 SCALE: NTS

2 2.5 HYBRID CABLE X-SECTION AND DATA  
 S-2 SCALE: NTS

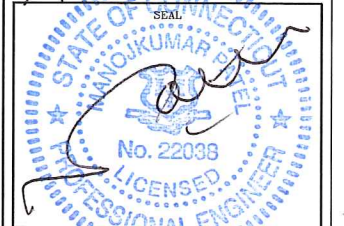
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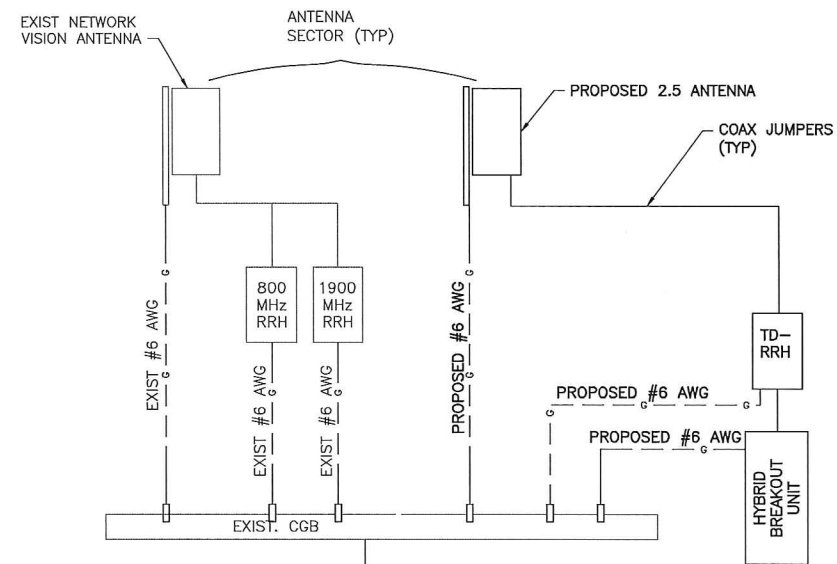
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1/5/15	JMG



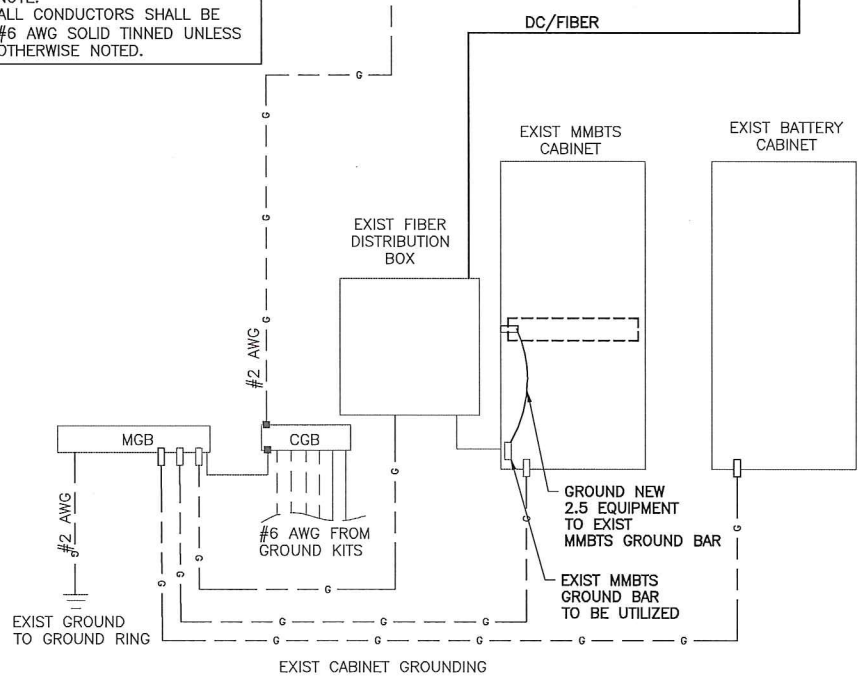
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 CT33XC518  
 SITE NAME:  
 N. WOODBURY/WOLFF PARCEL  
 SITE ADDRESS:  
 1440 MAIN STREET NORTH  
 WOODBURY, CT 06798

SHEET TITLE:  
 ELECTRICAL & GROUNDING  
 PLANS

SHEET NO:  
 E-1

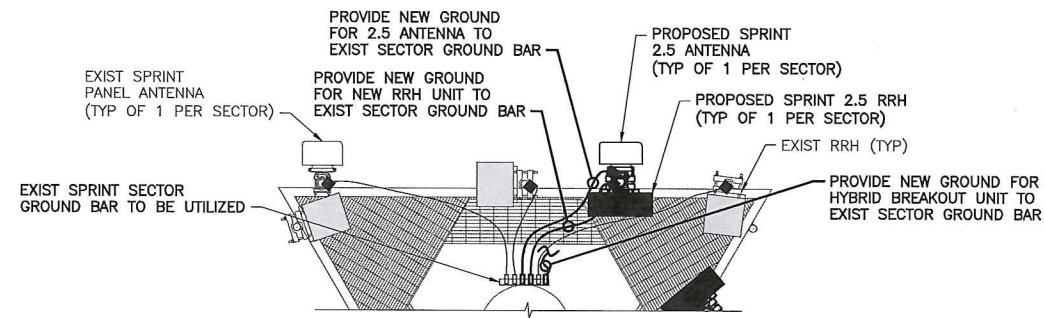


NOTE:  
 ALL CONDUCTORS SHALL BE #6 AWG SOLID TINNED UNLESS OTHERWISE NOTED.

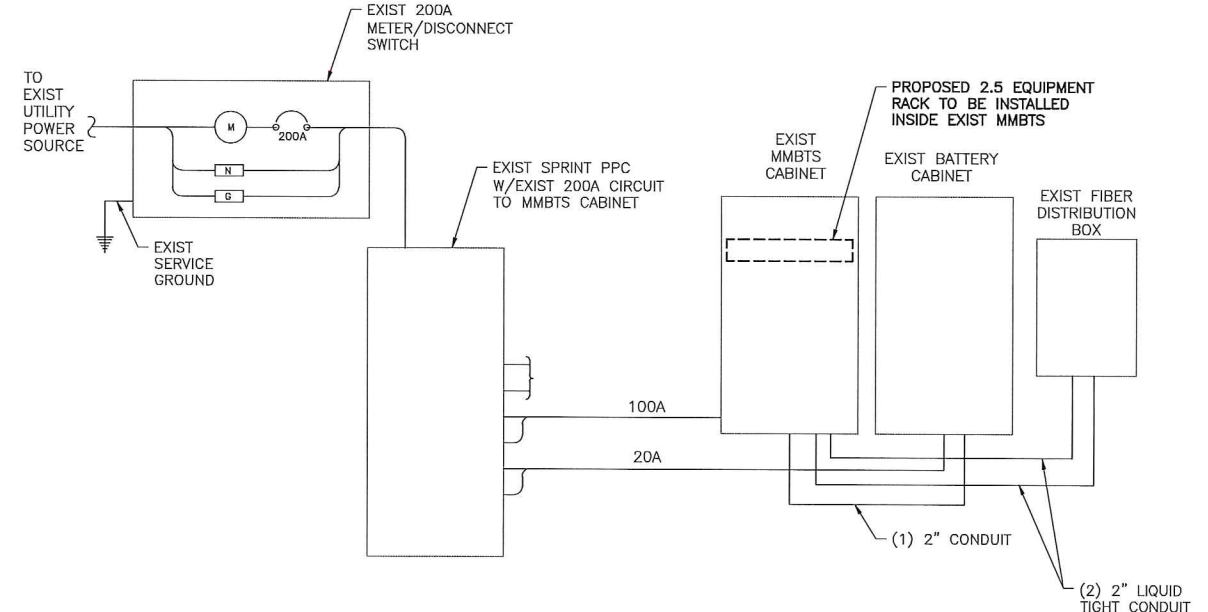


**LEGEND**  
 ■ CADWELD CONNECTION  
 □ MECHANICAL CONNECTION  
 ● COMPRESSION CONNECTION

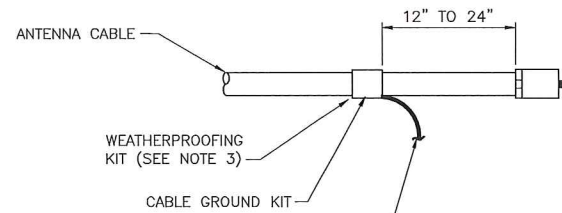
**1** TYPICAL GROUNDING ONE LINE DIAGRAM  
 E-1 SCALE: NTS



**2** TYPICAL ANTENNA GROUNDING PLAN  
 E-1 SCALE: NTS



**3** TYPICAL ELECTRICAL & TELCO PLAN  
 E-1 SCALE: NTS



6 AWG STRANDED Cu WIRE WITH GREEN, 600V, THWN INSULATION OR BLACK, MARKED AS REQUIRED BY THE NEC (GROUNDED TO GROUND BAR) (SEE NOTES 1 & 2)

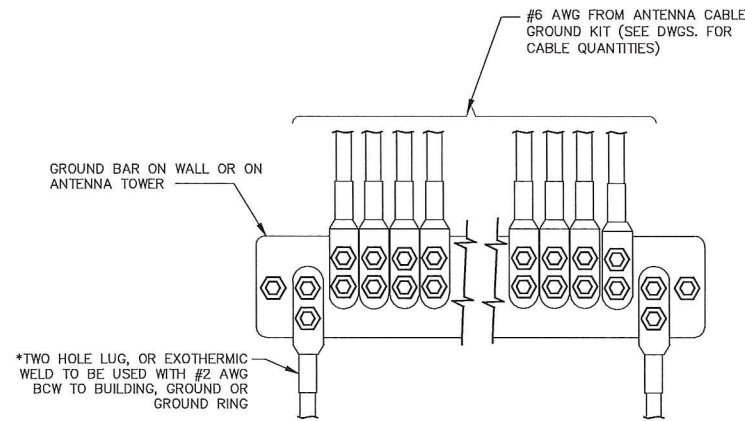
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

**NOTES:**

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

GROUNING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

WEATHER PROOFING SHALL BE (TYPE AND PART NUMBER) AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER AND APPROVED BY CONTRACTOR.



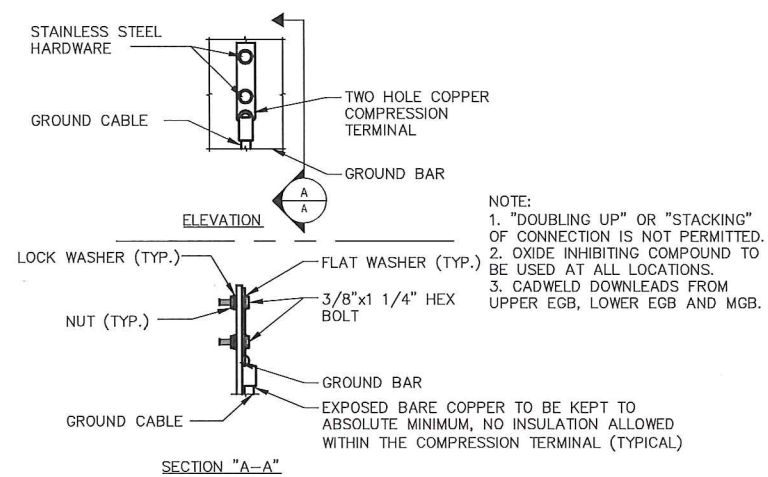
\*TWO HOLE LUG, OR EXOTHERMIC WELD TO BE USED WITH #2 AWG BCW TO BUILDING, GROUND OR GROUND RING

\* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRID GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.

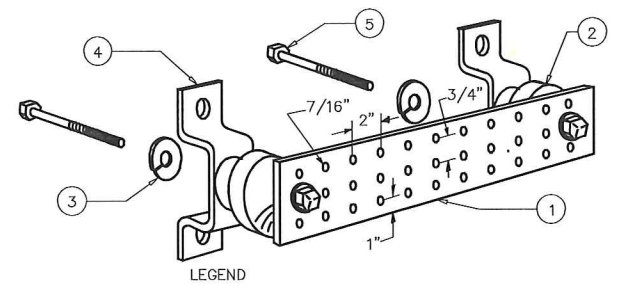
- CONNECT SEQUENCE- BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

1 CABLE GROUNDING KIT DETAIL  
E-2 SCALE: N.T.S.



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

2 GROUNDING BAR CONN. DETAIL  
E-2 SCALE: NTS



- LEGEND
- 1- COPPER TINNED GROUND BAR, 1/4"X 4"X 20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
  - 2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
  - 3- 5/8" LOCKWASHERS OR EQUAL
  - 4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056 OR EQUAL
  - 5- 5/8-11 X 1" H.H.C.S.BOLTS

NOTE:  
ALL BOLTS, NUTS, WASHERS AND LOCK WASHERS SHALL BE 18-8 STAINLESS STEEL.

3 GROUNDING BAR DETAIL  
E-2 SCALE: NTS

4 ANTENNA GROUND BAR DETAIL  
E-2 SCALE: NTS

**GROUNDING NOTES:**

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.
2. ALL GROUND WIRES SHALL BE #2 AWG UNLESS NOTED OTHERWISE.
3. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
4. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
5. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
6. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
7. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
8. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
9. WHEN CABLE LENGTH IS OVER 20' THE MANUFACTURERS GROUND KIT MUST BE INSTALLED PER THE MANUFACTURERS SPECIFICATIONS.
10. REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUNDING.
11. HOME RUN GROUNDS ARE NOT APPROVED BY CROWN CASTLE CONSTRUCTION STANDARDS AND THAT ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INSULATORS OR DOWN CONDUCTORS.

**PROTECTIVE GROUNDING SYSTEM GENERAL NOTES:**

1. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
2. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
3. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH PROJECT MANAGER.
4. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
5. INSTALL GROUND BUSHING ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.
6. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
7. GROUND HYBRID CABLE SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

**ELECTRICAL AND GROUNDING NOTES**

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
6. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
7. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
10. GROUND HYBRID CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRID CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
11. USE #2 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
12. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #2 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
16. BOND ANTENNA MOUNTING BRACKETS, HYBRID CABLE GROUND KITS, AND RRRs TO EGB PLACED NEAR THE ANTENNA LOCATION.
17. BOND ANTENNA EGB'S AND MGB TO GROUND RING.
18. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
19. CONTRACTOR SHALL CONDUCT ANTENNA, HYBRID CABLES, GPS COAX AND RRR RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
20. CONTRACTOR SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.
21. LOCATION OF ALL OUTLET, BOXES, ETC, AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
22. ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNERS REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT.

**Sprint**  
2.5 EQUIPMENT DEPLOYMENT  
SPRINT PARKWAY  
OVERLAND PARK, KANSAS 66251

**CROWN CASTLE**

**TECTONIC**  
• PLANNING  
• ENGINEERING  
• SURVEYING  
• CONSTRUCTION MANAGEMENT

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**SUBMITTALS**

PROJECT NO: 7225.CT33XC518

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	MP
1	01/05/15	FOR CONSTRUCTION	DC

DATE	REVIEWED BY
7/15/15	JMG

STATE OF CONNECTICUT  
REGISTERED PROFESSIONAL ENGINEER  
No. 22038

SITE NUMBER:  
CT33XC518

SITE NAME:  
N. WOODBURY/WOLFF PARCEL

SITE ADDRESS:  
1440 MAIN STREET NORTH  
WOODBURY, CT 06798

SHEET TITLE:  
GROUNDING DETAILS & NOTES

SHEET NO:  
E-2

Date: June 06, 2014

Veronica Harris  
Crown Castle  
1200 McArthur Blvd  
Mahwah, NJ 07430



Crown Castle  
2000 Corporate Drive  
Canonsburg, PA 15317  
724-416-2000

**Subject: Structural Analysis Report**

<b>Carrier Designation:</b>	<b>Sprint PCS Co-Locate</b>	Scenario 2.5A
	<b>Carrier Site Number:</b>	CT33XC518
<b>Crown Castle Designation:</b>	<b>Crown Castle BU Number:</b>	876379
	<b>Crown Castle Site Name:</b>	N. WOODBURY / WOLFF PARCEL
	<b>Crown Castle JDE Job Number:</b>	288225
	<b>Crown Castle Work Order Number:</b>	773470
	<b>Crown Castle Application Number:</b>	246005 Rev. 0
<b>Engineering Firm Designation:</b>	<b>Crown Castle Project Number:</b>	773470
<b>Site Data:</b>	<b>1440 Main Street North, WOODBURY, Litchfield County, CT</b> <b>Latitude 41° 35' 23.81", Longitude -73° 10' 11.52"</b> <b>163 Foot - Monopole Tower</b>	

Dear Veronica Harris,

Crown Castle is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 773470, in accordance with application 246005, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**  
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 mph fastest mile.

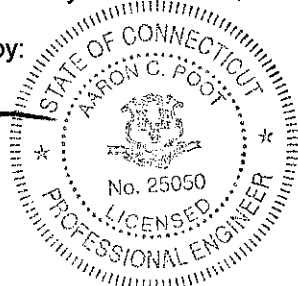
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Crown Castle appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Matt Schmitt, E.I.T./ Truc Lac

Respectfully submitted by:

  
Aaron C. Poot, P.E.  
Manager Engineering





## TABLE OF CONTENTS

### 1) INTRODUCTION

### 2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

### 3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

### 4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 – Tower Components vs. Capacity

4.1) Recommendations

### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

## 1) INTRODUCTION

This tower is a 163 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in September of 1999. The tower was originally designed for a wind speed of 95 mph per TIA/EIA-222-F.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 28.1 mph with 0.75 inch ice thickness and 50 mph under service loads.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
156.0	158.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

**Table 2 - Existing Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	171.0	1	sinclair	SC229-SFXLDF	1	1/2	1
	160.0	1	tower mounts	Side Arm Mount [SO 301-1]			
156.0	156.0	3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		3	alcatel lucent	1900MHz RRH (65MHz)			
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		9	rfs celwave	ACU-A20-N			
		1	tower mounts	Platform Mount [LP 602-1]			
148.0	150.0	3	antel	BXA-171085-12BF-2 w/ Mount Pipe	12	1-5/8	1
		3	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		6	antel	LPA-80080/6CF w/ Mount Pipe			
	148.0	6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 1201-1]			
141.0	142.0	12	decibel	DB846G90A-XY w/ Mount Pipe	12	1-5/8	1
	141.0	1	tower mounts	Platform Mount [LP 304-1]			
120.0	121.0	6	ericsson	TME-RRUS-11	-	-	1
	120.0	1	tower mounts	Side Arm Mount [SO 201-3]			

118.0	119.0	3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	12 2 1	1-5/8 7/16 3/8	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
	118.0	6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21901			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 403-1]			
108.0	108.0	1	telewave	ANT150D6-9	1	1/2	1
		1	tower mounts	Side Arm Mount [SO 201-1]			
22.0	21.0	1	lucent	KS24019-L112A	1	1/2	1
	22.0	1	tower mounts	Side Arm Mount [SO 203-1]			

Notes:  
 1) Existing Equipment

**Table 3 - Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
190	190	12	Decibel	DB980H90 Panel Antennas	-	-
175	175	12	Decibel	DB980H90 Panel Antennas	-	-
160	160	12	Decibel	DB980H90 Panel Antennas	-	-
145	145	12	Decibel	DB980H90 Panel Antennas	-	-
130	130	12	Decibel	DB980H90 Panel Antennas	-	-
115	115	12	Decibel	DB980H90 Panel Antennas	-	-

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Wlti Assoc.	1531966	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated	1614612	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated	1613543	CCISITES

#### 3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	163 - 121.58	Pole	TP42.37x34.28x0.3125	1	-11.31	2109.93	21.5	Pass
L2	121.58 - 84.663	Pole	TP48.83x40.6057x0.375	2	-22.50	2918.91	42.4	Pass
L3	84.663 - 42.2	Pole	TP56.25x46.7974x0.4375	3	-35.41	3923.81	53.8	Pass
L4	42.2 - 0	Pole	TP63.5x53.916x0.5	4	-55.41	5197.71	58.8	Pass
							Summary	
						Pole (L4)	58.8	Pass
						Base Plate	98.6	Pass
						Rating =	98.6	Pass

**Table 6 - Tower Component Stresses vs. Capacity – LC5**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	58.3	Pass
1	Base Plate	0	59.7	Pass
1	Base Foundation Soil Interaction	0	58.0	Pass

<b>Structure Rating (max from all components) =</b>	<b>98.6%</b>
-----------------------------------------------------	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

### 4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

**APPENDIX A**  
**TNXTOWER OUTPUT**

## DESIGNED APPURTENANCE LOADING

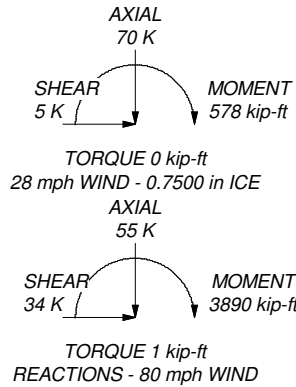
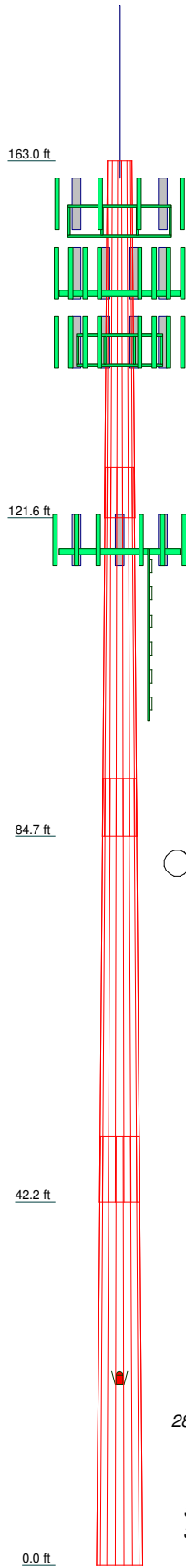
TYPE	ELEVATION	TYPE	ELEVATION
SC229-SFXLDF	160	(2) FD9R6004/2C-3L	148
Side Arm Mount [SO 301-1]	160	(2) FD9R6004/2C-3L	148
APXVSP18-C-A20 w/ Mount Pipe	156	(2) FD9R6004/2C-3L	148
APXVSP18-C-A20 w/ Mount Pipe	156	Platform Mount [LP 1201-1]	148
APXVSP18-C-A20 w/ Mount Pipe	156	(4) DB846G90A-XY w/ Mount Pipe	141
(3) ACU-A20-N	156	(4) DB846G90A-XY w/ Mount Pipe	141
(3) ACU-A20-N	156	(4) DB846G90A-XY w/ Mount Pipe	141
(3) ACU-A20-N	156	Platform Mount [LP 304-1]	141
1900MHz RRH (65MHz)	156	(2) TME-RRUS-11	120
1900MHz RRH (65MHz)	156	(2) TME-RRUS-11	120
1900MHz RRH (65MHz)	156	(2) TME-RRUS-11	120
800MHZ RRH	156	Side Arm Mount [SO 201-3]	120
800MHZ RRH	156	(2) 7770.00 w/ Mount Pipe	118
800MHZ RRH	156	(2) 7770.00 w/ Mount Pipe	118
800 EXTERNAL NOTCH FILTER	156	(2) 7770.00 w/ Mount Pipe	118
800 EXTERNAL NOTCH FILTER	156	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
800 EXTERNAL NOTCH FILTER	156	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
APXVTM14-C-120 w/ Mount Pipe	156	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
APXVTM14-C-120 w/ Mount Pipe	156	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
APXVTM14-C-120 w/ Mount Pipe	156	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
TD-RRH8x20-25	156	(2) LGP21401	118
TD-RRH8x20-25	156	(2) LGP21401	118
TD-RRH8x20-25	156	(2) LGP21401	118
Platform Mount [LP 602-1]	156	(2) LGP21901	118
6' x 2" Mount Pipe	156	(2) LGP21901	118
6' x 2" Mount Pipe	156	(2) LGP21901	118
6' x 2" Mount Pipe	156	(2) LGP21901	118
(2) LPA-80080/6CF w/ Mount Pipe	148	DC6-48-60-18-8F	118
(2) LPA-80080/6CF w/ Mount Pipe	148	Platform Mount [LP 403-1]	118
(2) LPA-80080/6CF w/ Mount Pipe	148	6' x 2" Mount Pipe	118
BXA-171085-12BF-2 w/ Mount Pipe	148	6' x 2" Mount Pipe	118
BXA-171085-12BF-2 w/ Mount Pipe	148	6' x 2" Mount Pipe	118
BXA-171085-12BF-2 w/ Mount Pipe	148	ANT150D6-9	108
BXA-70063-6CF-2 w/ Mount Pipe	148	Side Arm Mount [SO 201-1]	108
BXA-70063-6CF-2 w/ Mount Pipe	148	KS24019-L112A	22
BXA-70063-6CF-2 w/ Mount Pipe	148	Side Arm Mount [SO 203-1]	20
BXA-70063-6CF-2 w/ Mount Pipe	148		

### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.6%



Section	1	2	3	4																
Length (ft)	41.42	42.75	49.13	49.78																
Number of Sides	18	18	18	18																
Thickness (in)	0.3125	0.3750	0.4375	0.5000																
Socket Length (ft)	5.83	6.67	7.58	53.9160																
Top Dia (in)	34.2800	40.6057	46.7974	63.5000																
Bot Dia (in)	42.3700	48.8300	56.2500	63.5000																
Grade			A572-65																	
Weight (K)	5.3	7.7	11.9	15.6																

**Crown Castle**  
 2000 Corporate Drive  
 Canonsburg, PA 15317  
 Phone: 724-416-2000  
 FAX: 724-416-4245

Job: <b>N. Woodbury/Wolff Parcel</b>		
Project: <b>BU # 876340</b>		
Client: Crown Castle	Drawn by: Matt Schmitt	App'd:
Code: TIA/EIA-222-F	Date: 06/05/14	Scale: NTS
Path: X:\ENG Work Area\MSchmitt\Production\876379\876379.er		Dwg No. E-1

## Tower Input Data

There is a pole section.

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

The following design criteria apply:

- 2) Tower is located in Litchfield County, Connecticut.
- 3) Basic wind speed of 80 mph.
- 4) Nominal ice thickness of 0.7500 in.
- 5) Ice density of 56 pcf.
- 6) A wind speed of 28 mph is used in combination with ice.
- 7) Temperature drop of 50 °F.
- 8) Deflections calculated using a wind speed of 50 mph.
- 9) A non-linear (P-delta) analysis was used.
- 10) Pressures are calculated at each section.
- 11) Stress ratio used in pole design is 1.333.
- 12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feedline Torque Include Angle Block Shear Check <div style="background-color: #e0e0e0; text-align: center; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	163.00-121.58	41.42	5.83	18	34.2800	42.3700	0.3125	1.2500	A572-65 (65 ksi)
L2	121.58-84.66	42.75	6.67	18	40.6057	48.8300	0.3750	1.5000	A572-65 (65 ksi)
L3	84.66-42.20	49.13	7.58	18	46.7974	56.2500	0.4375	1.7500	A572-65 (65 ksi)
L4	42.20-0.00	49.78		18	53.9160	63.5000	0.5000	2.0000	A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	34.8088	33.6915	4911.1720	12.0585	17.4142	282.0205	9828.8063	16.8490	5.4833	17.546
	43.0236	41.7158	9322.3361	14.9304	21.5240	433.1144	18656.938	20.8619	6.9071	22.103
L2	42.3716	47.8846	9791.4961	14.2819	20.6277	474.6769	19595.876	23.9469	6.4866	17.298
	49.5833	57.6736	17107.692	17.2015	24.8056	689.6695	34237.895	28.8423	7.9341	21.158
L3	48.8218	64.3765	17480.337	16.4578	23.7731	735.2997	34983.676	32.1944	7.4663	17.066
	57.1177	77.5026	30501.195	19.8134	28.5750	1067.4084	61042.524	38.7587	9.1300	20.869
L4	56.2301	84.7712	30558.304	18.9627	27.3893	1115.7005	61156.817	42.3937	8.6092	17.218
	64.4796	99.9810	50134.423	22.3650	32.2580	1554.1702	100334.81	50.0000	10.2960	20.592

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L1 163.00- 121.58				1	1	1		
L2 121.58- 84.66				1	1	1		
L3 84.66- 42.20				1	1	1		
L4 42.20-0.00				1	1	1		

### Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	22
Embedment length	60.0000 in
f <sub>c</sub>	4 ksi
Grout space	3.0000 in
Base plate grade	A572-60
Base plate thickness	2.5000 in
Bolt circle diameter	73.0000 in
Outer diameter	79.0000 in
Inner diameter	63.5000 in
Base plate type	Plain Plate

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter r in	Perimete r in	Weight plf
*										



### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub>		Weight
						No Ice	ft <sup>2</sup> /ft	plf
LDF4-50A(1/2")	B	No	Inside Pole	160.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
*								
HB114-1-0813U4-M5J(1 1/4")	A	No	Inside Pole	156.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.20 1.20 1.20
HB114-21U3M12-XXXF(1-1/4")	A	No	CaAa (Out Of Face)	156.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.15 0.25 0.35	1.22 2.47 4.32
*								
LDF7-50A(1-5/8")	A	No	Inside Pole	148.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
*								
LDF7-50A(1-5/8")	B	No	Inside Pole	143.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.82 0.82 0.82
*								
LCF158-50A(1-5/8")	C	No	Inside Pole	118.00 - 0.00	12	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.80 0.80 0.80
FB-L98B-002-75000(3/8")	C	No	Inside Pole	118.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.06 0.06 0.06
WR-VG122ST-BRDA(7/16)	C	No	Inside Pole	118.00 - 0.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.14 0.14 0.14
*								
LDF4-50A(1/2")	B	No	Inside Pole	108.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.15 0.15 0.15
*								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	22.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.06 0.16 0.26	0.15 0.84 2.14
*								

### Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	163.00-121.58	A	0.000	0.000	0.000	5.301	0.43
		B	0.000	0.000	0.000	0.000	0.22
		C	0.000	0.000	0.000	0.000	0.00
L2	121.58-84.66	A	0.000	0.000	0.000	5.685	0.54
		B	0.000	0.000	0.000	0.000	0.37
		C	0.000	0.000	0.000	0.000	0.33
L3	84.66-42.20	A	0.000	0.000	0.000	6.539	0.62
		B	0.000	0.000	0.000	0.000	0.43
		C	0.000	0.000	0.000	0.000	0.42
L4	42.20-0.00	A	0.000	0.000	0.000	6.499	0.62
		B	0.000	0.000	0.000	0.000	0.43
		C	0.000	0.000	0.000	1.386	0.42

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	163.00-121.58	A	0.750	0.000	0.000	0.000	10.464	0.50
		B		0.000	0.000	0.000	0.000	0.22
		C		0.000	0.000	0.000	0.000	0.00
L2	121.58-84.66	A	0.750	0.000	0.000	0.000	11.223	0.62
		B		0.000	0.000	0.000	0.000	0.37
		C		0.000	0.000	0.000	0.000	0.33
L3	84.66-42.20	A	0.750	0.000	0.000	0.000	12.909	0.71
		B		0.000	0.000	0.000	0.000	0.43
		C		0.000	0.000	0.000	0.000	0.42
L4	42.20-0.00	A	0.750	0.000	0.000	0.000	12.829	0.71
		B		0.000	0.000	0.000	0.000	0.43
		C		0.000	0.000	0.000	4.686	0.45

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	163.00-121.58	0.0000	-0.1879	0.0000	-0.3449
L2	121.58-84.66	0.0000	-0.2219	0.0000	-0.4095
L3	84.66-42.20	0.0000	-0.2231	0.0000	-0.4150
L4	42.20-0.00	-0.0425	-0.1981	-0.1343	-0.3336

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	$C_{AA}$ Front ft <sup>2</sup>	$C_{AA}$ Side ft <sup>2</sup>	Weight K	
SC229-SFXLDF	A	From Leg	2.00	0.0000	160.00	No Ice	5.95	5.95	0.03
			0.00			1/2"	7.97	7.97	0.07
			11.00			Ice	10.00	10.00	0.13
						1" Ice			
Side Arm Mount [SO 301-1]	A	From Leg	2.00	0.0000	160.00	No Ice	1.00	0.90	0.02
			0.00			1/2"	1.39	1.42	0.03
			0.00			Ice	1.78	1.94	0.04
						1" Ice			
*** APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	156.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			2.00			Ice	9.77	9.02	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	156.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			2.00			Ice	9.77	9.02	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	156.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			2.00			Ice	9.77	9.02	0.23
						1" Ice			
(3) ACU-A20-N	A	From Leg	4.00	0.0000	156.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			0.00			Ice	0.17	0.25	0.00
						1" Ice			
(3) ACU-A20-N	B	From Leg	4.00	0.0000	156.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			0.00			Ice	0.17	0.25	0.00
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>Front</sub>	C <sub>A</sub> A <sub>Side</sub>	Weight
			Horz Lateral	Vert					
(3) ACU-A20-N	C	From Leg	4.00	0.0000	156.00	No Ice	0.08	0.14	0.00
			0.00			1/2"	0.12	0.19	0.00
			0.00			Ice	0.17	0.25	0.00
1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	156.00	1" Ice	2.70	2.77	0.06
			0.00			No Ice	2.94	3.01	0.08
			0.00			1/2"	3.18	3.26	0.11
1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	156.00	1" Ice	2.70	2.77	0.06
			0.00			No Ice	2.94	3.01	0.08
			0.00			1/2"	3.18	3.26	0.11
1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	156.00	1" Ice	2.70	2.77	0.06
			0.00			No Ice	2.94	3.01	0.08
			0.00			1/2"	3.18	3.26	0.11
800MHZ RRH	A	From Leg	4.00	0.0000	156.00	1" Ice	2.49	2.07	0.05
			0.00			No Ice	2.71	2.27	0.07
			0.00			1/2"	2.93	2.48	0.10
800MHZ RRH	B	From Leg	4.00	0.0000	156.00	1" Ice	2.49	2.07	0.05
			0.00			No Ice	2.71	2.27	0.07
			0.00			1/2"	2.93	2.48	0.10
800MHZ RRH	C	From Leg	4.00	0.0000	156.00	1" Ice	2.49	2.07	0.05
			0.00			No Ice	2.71	2.27	0.07
			0.00			1/2"	2.93	2.48	0.10
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	156.00	1" Ice	0.77	0.37	0.01
			0.00			No Ice	0.89	0.46	0.02
			0.00			1/2"	1.02	0.56	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	156.00	1" Ice	0.77	0.37	0.01
			0.00			No Ice	0.89	0.46	0.02
			0.00			1/2"	1.02	0.56	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	156.00	1" Ice	0.77	0.37	0.01
			0.00			No Ice	0.89	0.46	0.02
			0.00			1/2"	1.02	0.56	0.02
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	156.00	1" Ice	7.13	4.96	0.07
			0.00			No Ice	7.66	5.75	0.13
			2.00			Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	156.00	1" Ice	7.13	4.96	0.07
			0.00			No Ice	7.66	5.75	0.13
			2.00			Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.0000	156.00	1" Ice	7.13	4.96	0.07
			0.00			No Ice	7.66	5.75	0.13
			2.00			Ice	8.18	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00	0.0000	156.00	1" Ice	4.72	1.70	0.07
			0.00			No Ice	5.01	1.92	0.10
			2.00			Ice	5.32	2.15	0.13
TD-RRH8x20-25	B	From Leg	4.00	0.0000	156.00	1" Ice	4.72	1.70	0.07
			0.00			No Ice	5.01	1.92	0.10
			2.00			Ice	5.32	2.15	0.13
TD-RRH8x20-25	C	From Leg	4.00	0.0000	156.00	1" Ice	4.72	1.70	0.07
			0.00			No Ice	5.01	1.92	0.10
			2.00			Ice	5.32	2.15	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K
Platform Mount [LP 602-1]	C	None		0.0000	156.00	No Ice	32.03	32.03	1.34
						1/2"	38.71	38.71	1.80
						Ice	45.39	45.39	2.26
						1" Ice			
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	156.00	No Ice	1.43	1.43	0.02
						1/2"	1.92	1.92	0.03
						Ice	2.29	2.29	0.05
						1" Ice			
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	156.00	No Ice	1.43	1.43	0.02
						1/2"	1.92	1.92	0.03
						Ice	2.29	2.29	0.05
						1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	156.00	No Ice	1.43	1.43	0.02
						1/2"	1.92	1.92	0.03
						Ice	2.29	2.29	0.05
						1" Ice			
***									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	4.56	10.73	0.05
						1/2"	5.11	11.99	0.11
						Ice	5.61	12.97	0.19
						1" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	4.56	10.73	0.05
						1/2"	5.11	11.99	0.11
						Ice	5.61	12.97	0.19
						1" Ice			
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	4.56	10.73	0.05
						1/2"	5.11	11.99	0.11
						Ice	5.61	12.97	0.19
						1" Ice			
BXA-171085-12BF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	4.97	5.23	0.04
						1/2"	5.52	6.39	0.09
						Ice	6.04	7.26	0.14
						1" Ice			
BXA-171085-12BF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	4.97	5.23	0.04
						1/2"	5.52	6.39	0.09
						Ice	6.04	7.26	0.14
						1" Ice			
BXA-171085-12BF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	4.97	5.23	0.04
						1/2"	5.52	6.39	0.09
						Ice	6.04	7.26	0.14
						1" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	7.97	5.80	0.04
						1/2"	8.61	6.95	0.10
						Ice	9.22	7.82	0.17
						1" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	7.97	5.80	0.04
						1/2"	8.61	6.95	0.10
						Ice	9.22	7.82	0.17
						1" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice	7.97	5.80	0.04
						1/2"	8.61	6.95	0.10
						Ice	9.22	7.82	0.17
						1" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice	0.37	0.08	0.00
						1/2"	0.45	0.14	0.01
						Ice	0.54	0.20	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice	0.37	0.08	0.00
						1/2"	0.45	0.14	0.01
						Ice	0.54	0.20	0.01
						1" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.0000	148.00	No Ice	0.37	0.08	0.00
						1/2"	0.45	0.14	0.01
						Ice	0.54	0.20	0.01
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			Horz Lateral	Vert					
Platform Mount [LP 1201-1]	C	None			0.0000	148.00	No Ice 23.10 1/2" 26.80 Ice 30.50 1" Ice	23.10 26.80 30.50	2.10 2.50 2.90
**									
(4) DB846G90A-XY w/ Mount Pipe	A	From Leg	4.00 0.00 1.00		0.0000	141.00	No Ice 5.23 1/2" 5.78 Ice 6.30 1" Ice	7.53 8.72 9.62	0.04 0.10 0.16
(4) DB846G90A-XY w/ Mount Pipe	B	From Leg	4.00 0.00 1.00		0.0000	141.00	No Ice 5.23 1/2" 5.78 Ice 6.30 1" Ice	7.53 8.72 9.62	0.04 0.10 0.16
(4) DB846G90A-XY w/ Mount Pipe	C	From Leg	4.00 0.00 1.00		0.0000	141.00	No Ice 5.23 1/2" 5.78 Ice 6.30 1" Ice	7.53 8.72 9.62	0.04 0.10 0.16
Platform Mount [LP 304-1]	C	None			0.0000	141.00	No Ice 17.46 1/2" 22.44 Ice 27.42 1" Ice	17.46 22.44 27.42	1.35 1.62 1.90
**									
(2) TME-RRUS-11	A	From Leg	2.00 0.00 1.00		0.0000	120.00	No Ice 3.42 1/2" 3.72 Ice 4.04 1" Ice	1.85 2.19 2.55	0.06 0.08 0.12
(2) TME-RRUS-11	B	From Leg	2.00 0.00 1.00		0.0000	120.00	No Ice 3.42 1/2" 3.72 Ice 4.04 1" Ice	1.85 2.19 2.55	0.06 0.08 0.12
(2) TME-RRUS-11	C	From Leg	2.00 0.00 1.00		0.0000	120.00	No Ice 3.42 1/2" 3.72 Ice 4.04 1" Ice	1.85 2.19 2.55	0.06 0.08 0.12
Side Arm Mount [SO 201-3]	C	None			0.0000	120.00	No Ice 5.71 1/2" 7.91 Ice 10.11 1" Ice	5.71 7.91 10.11	0.29 0.35 0.41
**									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00		0.0000	118.00	No Ice 6.12 1/2" 6.63 Ice 7.13 1" Ice	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00		0.0000	118.00	No Ice 6.12 1/2" 6.63 Ice 7.13 1" Ice	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00		0.0000	118.00	No Ice 6.12 1/2" 6.63 Ice 7.13 1" Ice	4.25 5.01 5.71	0.06 0.10 0.16
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 1.00		0.0000	118.00	No Ice 8.50 1/2" 9.15 Ice 9.77 1" Ice	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 1.00		0.0000	118.00	No Ice 8.50 1/2" 9.15 Ice 9.77 1" Ice	6.30 7.48 8.37	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 1.00		0.0000	118.00	No Ice 8.50 1/2" 9.15 Ice 9.77 1" Ice	6.30 7.48 8.37	0.07 0.14 0.21

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
(2) LGP21401	A	From Leg	4.00	0.0000	118.00	No Ice	1.29	0.23	0.01
			0.00			1/2"	1.45	0.31	0.02
			0.00			Ice	1.61	0.40	0.03
(2) LGP21401	B	From Leg	4.00	0.0000	118.00	1" Ice	1.29	0.23	0.01
			0.00			No Ice	1.29	0.23	0.01
			0.00			1/2"	1.45	0.31	0.02
(2) LGP21401	C	From Leg	4.00	0.0000	118.00	Ice	1.61	0.40	0.03
			0.00			1" Ice	1.29	0.23	0.01
			0.00			No Ice	1.29	0.23	0.01
(2) LGP21901	A	From Leg	4.00	0.0000	118.00	1/2"	1.45	0.31	0.02
			0.00			Ice	1.61	0.40	0.03
			0.00			1" Ice	1.29	0.23	0.01
(2) LGP21901	B	From Leg	4.00	0.0000	118.00	No Ice	0.27	0.18	0.01
			0.00			1/2"	0.34	0.25	0.01
			0.00			Ice	0.43	0.32	0.01
(2) LGP21901	C	From Leg	4.00	0.0000	118.00	1" Ice	0.27	0.18	0.01
			0.00			No Ice	0.27	0.18	0.01
			0.00			1/2"	0.34	0.25	0.01
DC6-48-60-18-8F	B	From Leg	4.00	0.0000	118.00	Ice	0.43	0.32	0.01
			0.00			1" Ice	0.27	0.18	0.01
			0.00			No Ice	0.27	0.18	0.01
Platform Mount [LP 403-1]	C	None		0.0000	118.00	1/2"	0.34	0.25	0.01
						Ice	0.43	0.32	0.01
						1" Ice	0.27	0.18	0.01
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	1.27	1.27	0.02
			0.00			1/2"	1.46	1.46	0.04
			0.00			Ice	1.66	1.66	0.05
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	118.00	1" Ice	1.27	1.27	0.02
			0.00			No Ice	18.85	18.85	1.50
			0.00			1/2"	24.30	24.30	1.80
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	118.00	Ice	29.75	29.75	2.09
			0.00			1" Ice	1.27	1.27	0.02
			0.00			No Ice	1.43	1.43	0.02
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	118.00	1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
			0.00			1" Ice	1.43	1.43	0.02
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	118.00	1" Ice	1.43	1.43	0.02
			0.00			No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
** ANT150D6-9	B	From Leg	2.00	0.0000	108.00	Ice	2.29	2.29	0.05
			0.00			No Ice	3.84	3.84	0.00
			0.00			1/2"	6.42	6.42	0.00
Side Arm Mount [SO 201-1]	B	None		0.0000	108.00	1" Ice	9.00	9.00	0.00
						No Ice	2.96	2.11	0.10
						1/2"	4.10	2.93	0.12
** KS24019-L112A	A	From Leg	3.00	0.0000	22.00	Ice	5.24	3.75	0.14
			0.00			No Ice	0.10	0.10	0.01
			-1.00			1/2"	0.18	0.18	0.01
Side Arm Mount [SO 203-1]	A	None		0.0000	20.00	1" Ice	0.26	0.26	0.01
						No Ice	2.96	3.36	0.13
						1/2"	4.10	4.68	0.15
*						Ice	5.24	6.00	0.18
						1" Ice			

### Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	163 - 121.58	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	14	-18.41	0.00	0.65
			Max. Mx	5	-11.31	-370.86	0.21
			Max. My	2	-11.31	-0.01	371.25
			Max. Vy	5	17.07	-370.86	0.21
			Max. Vx	2	-17.08	-0.01	371.25
			Max. Torque	11			-1.09
L2	121.58 - 84.663	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.04	-0.22	0.74
			Max. Mx	5	-22.51	-1178.57	0.26
			Max. My	2	-22.50	-0.09	1179.04
			Max. Vy	5	25.36	-1178.57	0.26
			Max. Vx	2	-25.37	-0.09	1179.04
			Max. Torque	11			-1.11

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	84.663 - 42.2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.73	-0.22	1.04
			Max. Mx	5	-35.41	-2318.54	0.38
			Max. My	2	-35.41	-0.10	2319.31
			Max. Vy	5	29.39	-2318.54	0.38
			Max. Vx	2	-29.40	-0.10	2319.31
L4	42.2 - 0	Pole	Max. Torque	6			1.07
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-70.15	-0.15	1.45
			Max. Mx	5	-55.41	-3888.52	0.55
			Max. My	2	-55.41	-0.09	3889.70
			Max. Vy	5	33.60	-3888.52	0.55
			Max. Vx	2	-33.60	-0.09	3889.70
			Max. Torque	6			1.14

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	70.15	0.00	0.00
	Max. H <sub>x</sub>	11	55.42	33.57	0.00
	Max. H <sub>z</sub>	2	55.42	-0.00	33.58
	Max. M <sub>x</sub>	2	3889.70	-0.00	33.58
	Max. M <sub>z</sub>	5	3888.52	-33.57	0.00
	Max. Torsion	6	1.14	-29.08	-16.79
	Min. Vert	1	55.42	0.00	0.00
	Min. H <sub>x</sub>	5	55.42	-33.57	0.00
	Min. H <sub>z</sub>	8	55.42	-0.00	-33.58
	Min. M <sub>x</sub>	8	-3888.58	-0.00	-33.58
	Min. M <sub>z</sub>	11	-3888.33	33.57	0.00
	Min. Torsion	12	-1.14	29.08	16.79

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	55.42	0.00	0.00	-0.54	-0.09	0.00
Dead+Wind 0 deg - No Ice	55.42	0.00	-33.58	-3889.70	-0.09	0.73
Dead+Wind 30 deg - No Ice	55.42	16.79	-29.08	-3368.65	-1944.31	0.19
Dead+Wind 60 deg - No Ice	55.42	29.08	-16.79	-1945.13	-3367.57	-0.41
Dead+Wind 90 deg - No Ice	55.42	33.57	-0.00	-0.55	-3888.52	-0.89
Dead+Wind 120 deg - No Ice	55.42	29.08	16.79	1944.02	-3367.57	-1.14
Dead+Wind 150 deg - No Ice	55.42	16.79	29.08	3367.54	-1944.31	-1.08
Dead+Wind 180 deg - No Ice	55.42	0.00	33.58	3888.58	-0.09	-0.73
Dead+Wind 210 deg - No Ice	55.42	-16.79	29.08	3367.54	1944.12	-0.19
Dead+Wind 240 deg - No Ice	55.42	-29.08	16.79	1944.02	3367.38	0.41
Dead+Wind 270 deg - No Ice	55.42	-33.57	-0.00	-0.55	3888.33	0.89
Dead+Wind 300 deg - No Ice	55.42	-29.08	-16.79	-1945.13	3367.38	1.14
Dead+Wind 330 deg - No Ice	55.42	-16.79	-29.08	-3368.65	1944.12	1.08
Dead+Ice+Temp	70.15	0.00	0.00	-1.45	-0.15	0.00
Dead+Wind 0 deg+Ice+Temp	70.15	0.00	-4.85	-577.97	-0.16	0.16
Dead+Wind 30 deg+Ice+Temp	70.15	2.43	-4.20	-500.74	-288.43	0.05
Dead+Wind 60 deg+Ice+Temp	70.15	4.20	-2.43	-289.74	-499.46	-0.07
Dead+Wind 90 deg+Ice+Temp	70.15	4.85	-0.00	-1.51	-576.71	-0.18



Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 120 deg+Ice+Temp	70.15	4.20	2.43	286.72	-499.46	-0.23
Dead+Wind 150 deg+Ice+Temp	70.15	2.43	4.20	497.72	-288.43	-0.22
Dead+Wind 180 deg+Ice+Temp	70.15	0.00	4.85	574.96	-0.16	-0.16
Dead+Wind 210 deg+Ice+Temp	70.15	-2.43	4.20	497.72	288.12	-0.05
Dead+Wind 240 deg+Ice+Temp	70.15	-4.20	2.43	286.72	499.15	0.07
Dead+Wind 270 deg+Ice+Temp	70.15	-4.85	-0.00	-1.51	576.39	0.18
Dead+Wind 300 deg+Ice+Temp	70.15	-4.20	-2.43	-289.74	499.15	0.23
Dead+Wind 330 deg+Ice+Temp	70.15	-2.43	-4.20	-500.74	288.12	0.22
Dead+Wind 0 deg - Service	55.42	0.00	-13.12	-1520.23	-0.10	0.29
Dead+Wind 30 deg - Service	55.42	6.56	-11.36	-1316.63	-759.79	0.07
Dead+Wind 60 deg - Service	55.42	11.36	-6.56	-760.39	-1315.93	-0.16
Dead+Wind 90 deg - Service	55.42	13.11	0.00	-0.56	-1519.49	-0.35
Dead+Wind 120 deg - Service	55.42	11.36	6.56	759.28	-1315.93	-0.45
Dead+Wind 150 deg - Service	55.42	6.56	11.36	1315.52	-759.79	-0.42
Dead+Wind 180 deg - Service	55.42	0.00	13.12	1519.11	-0.10	-0.29
Dead+Wind 210 deg - Service	55.42	-6.56	11.36	1315.52	759.60	-0.07
Dead+Wind 240 deg - Service	55.42	-11.36	6.56	759.28	1315.73	0.16
Dead+Wind 270 deg - Service	55.42	-13.11	0.00	-0.56	1519.29	0.35
Dead+Wind 300 deg - Service	55.42	-11.36	-6.56	-760.39	1315.73	0.45
Dead+Wind 330 deg - Service	55.42	-6.56	-11.36	-1316.63	759.60	0.42

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-55.42	0.00	0.00	55.42	0.00	0.000%
2	0.00	-55.42	-33.58	-0.00	55.42	33.58	0.000%
3	16.79	-55.42	-29.08	-16.79	55.42	29.08	0.000%
4	29.08	-55.42	-16.79	-29.08	55.42	16.79	0.000%
5	33.57	-55.42	0.00	-33.57	55.42	0.00	0.000%
6	29.08	-55.42	16.79	-29.08	55.42	-16.79	0.000%
7	16.79	-55.42	29.08	-16.79	55.42	-29.08	0.000%
8	0.00	-55.42	33.58	-0.00	55.42	-33.58	0.000%
9	-16.79	-55.42	29.08	16.79	55.42	-29.08	0.000%
10	-29.08	-55.42	16.79	29.08	55.42	-16.79	0.000%
11	-33.57	-55.42	0.00	33.57	55.42	0.00	0.000%
12	-29.08	-55.42	-16.79	29.08	55.42	16.79	0.000%
13	-16.79	-55.42	-29.08	16.79	55.42	29.08	0.000%
14	0.00	-70.15	0.00	0.00	70.15	0.00	0.000%
15	0.00	-70.15	-4.85	-0.00	70.15	4.85	0.000%
16	2.43	-70.15	-4.20	-2.43	70.15	4.20	0.000%
17	4.20	-70.15	-2.43	-4.20	70.15	2.43	0.000%
18	4.85	-70.15	0.00	-4.85	70.15	0.00	0.000%
19	4.20	-70.15	2.43	-4.20	70.15	-2.43	0.000%
20	2.43	-70.15	4.20	-2.43	70.15	-4.20	0.000%
21	0.00	-70.15	4.85	-0.00	70.15	-4.85	0.000%
22	-2.43	-70.15	4.20	2.43	70.15	-4.20	0.000%
23	-4.20	-70.15	2.43	4.20	70.15	-2.43	0.000%
24	-4.85	-70.15	0.00	4.85	70.15	0.00	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
25	-4.20	-70.15	-2.43	4.20	70.15	2.43	0.000%
26	-2.43	-70.15	-4.20	2.43	70.15	4.20	0.000%
27	0.00	-55.42	-13.12	0.00	55.42	13.12	0.000%
28	6.56	-55.42	-11.36	-6.56	55.42	11.36	0.000%
29	11.36	-55.42	-6.56	-11.36	55.42	6.56	0.000%
30	13.11	-55.42	0.00	-13.11	55.42	0.00	0.000%
31	11.36	-55.42	6.56	-11.36	55.42	-6.56	0.000%
32	6.56	-55.42	11.36	-6.56	55.42	-11.36	0.000%
33	0.00	-55.42	13.12	0.00	55.42	-13.12	0.000%
34	-6.56	-55.42	11.36	6.56	55.42	-11.36	0.000%
35	-11.36	-55.42	6.56	11.36	55.42	-6.56	0.000%
36	-13.11	-55.42	0.00	13.11	55.42	0.00	0.000%
37	-11.36	-55.42	-6.56	11.36	55.42	6.56	0.000%
38	-6.56	-55.42	-11.36	6.56	55.42	11.36	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00010235
3	Yes	5	0.00000001	0.00007490
4	Yes	5	0.00000001	0.00007548
5	Yes	4	0.00000001	0.00013185
6	Yes	5	0.00000001	0.00007282
7	Yes	5	0.00000001	0.00007645
8	Yes	4	0.00000001	0.00010232
9	Yes	5	0.00000001	0.00007442
10	Yes	5	0.00000001	0.00007386
11	Yes	4	0.00000001	0.00013184
12	Yes	5	0.00000001	0.00007664
13	Yes	5	0.00000001	0.00007300
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00054081
16	Yes	4	0.00000001	0.00055603
17	Yes	4	0.00000001	0.00055565
18	Yes	4	0.00000001	0.00053943
19	Yes	4	0.00000001	0.00055328
20	Yes	4	0.00000001	0.00055281
21	Yes	4	0.00000001	0.00053709
22	Yes	4	0.00000001	0.00055216
23	Yes	4	0.00000001	0.00055265
24	Yes	4	0.00000001	0.00053870
25	Yes	4	0.00000001	0.00055513
26	Yes	4	0.00000001	0.00055548
27	Yes	4	0.00000001	0.00003435
28	Yes	4	0.00000001	0.00024127
29	Yes	4	0.00000001	0.00024515
30	Yes	4	0.00000001	0.00003794
31	Yes	4	0.00000001	0.00022841
32	Yes	4	0.00000001	0.00025170
33	Yes	4	0.00000001	0.00003432
34	Yes	4	0.00000001	0.00023804
35	Yes	4	0.00000001	0.00023454
36	Yes	4	0.00000001	0.00003793
37	Yes	4	0.00000001	0.00025322
38	Yes	4	0.00000001	0.00022954

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163 - 121.58	21.132	27	1.0140	0.0015
L2	127.413 - 84.663	13.709	27	0.9464	0.0008
L3	91.33 - 42.2	7.252	27	0.7268	0.0004
L4	49.783 - 0	2.220	27	0.3981	0.0002

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	SC229-SFXLDF	27	20.491	1.0112	0.0014	97549
156.00	APXVSP18-C-A20 w/ Mount Pipe	27	19.637	1.0074	0.0013	69678
148.00	(2) LPA-80080/6CF w/ Mount Pipe	27	17.940	0.9977	0.0012	32516
141.00	(4) DB846G90A-XY w/ Mount Pipe	27	16.473	0.9857	0.0010	22170
120.00	(2) TME-RRUS-11	27	12.265	0.9133	0.0007	12086
118.00	(2) 7770.00 w/ Mount Pipe	27	11.885	0.9030	0.0007	11713
108.00	ANT150D6-9	27	10.046	0.8442	0.0006	10146
22.00	KS24019-L112A	27	0.660	0.1752	0.0001	12428
20.00	Side Arm Mount [SO 203-1]	27	0.588	0.1593	0.0001	13671

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163 - 121.58	54.046	2	2.5932	0.0037
L2	127.413 - 84.663	35.066	2	2.4208	0.0021
L3	91.33 - 42.2	18.552	2	1.8592	0.0011
L4	49.783 - 0	5.679	2	1.0185	0.0005

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	SC229-SFXLDF	2	52.406	2.5862	0.0036	38319
156.00	APXVSP18-C-A20 w/ Mount Pipe	2	50.223	2.5763	0.0034	27370
148.00	(2) LPA-80080/6CF w/ Mount Pipe	2	45.882	2.5518	0.0030	12772
141.00	(4) DB846G90A-XY w/ Mount Pipe	2	42.132	2.5211	0.0026	8707
120.00	(2) TME-RRUS-11	2	31.373	2.3362	0.0018	4743
118.00	(2) 7770.00 w/ Mount Pipe	2	30.400	2.3099	0.0017	4596
108.00	ANT150D6-9	2	25.698	2.1594	0.0015	3979
22.00	KS24019-L112A	2	1.689	0.4483	0.0002	4859
20.00	Side Arm Mount [SO 203-1]	2	1.504	0.4075	0.0002	5345

### Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Bolt Compression K	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
in		in						
2.5000	22	2.2500	112.55 131.21 0.86	117.59 217.81 0.54	59.134 45.000 1.31		Plate	1.31 ✓

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P/P <sub>a</sub>
L1	163 - 121.58 (1)	TP42.37x34.28x0.3125	41.42	0.00	0.0	39.000	40.5858	-11.31	1582.84	0.007
L2	121.58 - 84.663 (2)	TP48.83x40.6057x0.375	42.75	0.00	0.0	39.000	56.1469	-22.50	2189.73	0.010
L3	84.663 - 42.2 (3)	TP56.25x46.7974x0.4375	49.13	0.00	0.0	39.000	75.4767	-35.41	2943.59	0.012
L4	42.2 - 0 (4)	TP63.5x53.916x0.5	49.78	0.00	0.0	39.000	99.9810	-55.41	3899.26	0.014

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> /F <sub>by</sub>
L1	163 - 121.58 (1)	TP42.37x34.28x0.3125	371.25	10.869	39.000	0.279	0.00	0.000	39.000	0.000
L2	121.58 - 84.663 (2)	TP48.83x40.6057x0.375	1179.04	21.650	39.000	0.555	0.00	0.000	39.000	0.000
L3	84.663 - 42.2 (3)	TP56.25x46.7974x0.4375	2319.31	27.498	39.000	0.705	0.00	0.000	39.000	0.000
L4	42.2 - 0 (4)	TP63.5x53.916x0.5	3889.70	30.033	39.000	0.770	0.00	0.000	39.000	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f <sub>v</sub> ksi	Allow. F <sub>v</sub> ksi	Ratio f <sub>v</sub> /F <sub>v</sub>	Actual T kip-ft	Actual f <sub>vt</sub> ksi	Allow. F <sub>vt</sub> ksi	Ratio f <sub>vt</sub> /F <sub>vt</sub>
L1	163 - 121.58 (1)	TP42.37x34.28x0.3125	17.08	0.421	26.000	0.032	0.00	0.000	26.000	0.000
L2	121.58 - 84.663 (2)	TP48.83x40.6057x0.375	25.37	0.452	26.000	0.035	0.75	0.007	26.000	0.000
L3	84.663 - 42.2 (3)	TP56.25x46.7974x0.4375	29.40	0.389	26.000	0.030	0.75	0.004	26.000	0.000
L4	42.2 - 0 (4)	TP63.5x53.916x0.5	33.60	0.336	26.000	0.026	0.74	0.003	26.000	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P$	Ratio $f_{bx}$	Ratio $f_{by}$	Ratio $f_v$	Ratio $f_{vt}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_a$	$F_{bx}$	$F_{by}$	$F_v$	$F_{vt}$			
L1	163 - 121.58 (1)	0.007	0.279	0.000	0.032	0.000	0.286 ✓	1.333	H1-3+VT ✓
L2	121.58 - 84.663 (2)	0.010	0.555	0.000	0.035	0.000	0.566 ✓	1.333	H1-3+VT ✓
L3	84.663 - 42.2 (3)	0.012	0.705	0.000	0.030	0.000	0.717 ✓	1.333	H1-3+VT ✓
L4	42.2 - 0 (4)	0.014	0.770	0.000	0.026	0.000	0.784 ✓	1.333	H1-3+VT ✓

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	$P$ $K$	$SF \cdot P_{allow}$ $K$	% Capacity	Pass Fail
L1	163 - 121.58	Pole	TP42.37x34.28x0.3125	1	-11.31	2109.93	21.5	Pass
L2	121.58 - 84.663	Pole	TP48.83x40.6057x0.375	2	-22.50	2918.91	42.4	Pass
L3	84.663 - 42.2	Pole	TP56.25x46.7974x0.4375	3	-35.41	3923.81	53.8	Pass
L4	42.2 - 0	Pole	TP63.5x53.916x0.5	4	-55.41	5197.71	58.8	Pass
Summary								
Pole (L4)							58.8	Pass
Base Plate							98.6	Pass
<b>RATING =</b>							<b>98.6</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



(INSTALLED)  
(1) 1/2" TO 22 FT LEVEL

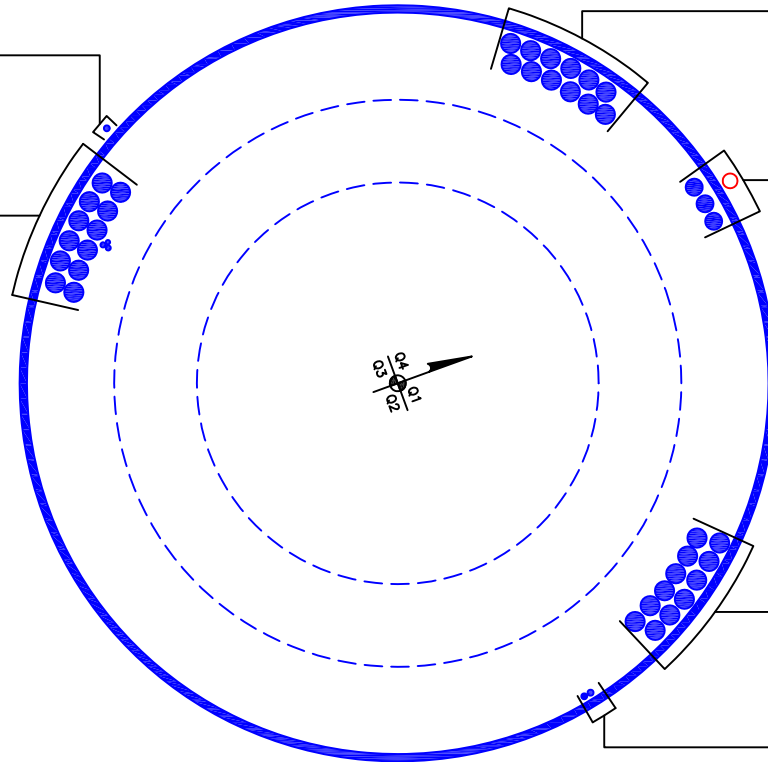
(INSTALLED)  
(12) 1-5/8" TO 118 FT LEVEL  
(1) 3/8" TO 118 FT LEVEL  
(2) 7/16" TO 118 FT LEVEL

(INSTALLED)  
(12) 1-5/8" TO 148 FT LEVEL

(PROPOSED)  
(1) 1-1/4" TO 156 FT LEVEL  
(INSTALLED)  
(3) 1-1/4" TO 156 FT LEVEL

(INSTALLED)  
(12) 1-5/8" TO 143 FT LEVEL

(INSTALLED)  
(1) 1/2" TO 108 FT LEVEL  
(1) 1/2" TO 160 FT LEVEL



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**



# Stiffened or Unstiffened, UngROUTED, Circular Base Plate - Any Rod Material

## TIA Rev F

### Site Data

BU#: 876379
Site Name: N. WOODBURY / WOLFF F
App #: 246005 Rev 0
Pole Manufacturer: <i>Other</i>

### Reactions

Moment:	3890	ft-kips
Axial:	55	kips
Shear:	34	kips

### Anchor Rod Data

Qty:	22	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	73	in

If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

### Anchor Rod Results

Maximum Rod Tension:	113.7 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	58.3% <b>Pass</b>

Rigid
Service, ASD
Fty*ASIF

### Plate Data

Diam:	79	in
Thick:	2.5	in
Grade:	60	ksi
Single-Rod B-eff:	9.16	in

### Base Plate Results

Base Plate Stress:	35.8 ksi	Flexural Check
Allowable Plate Stress:	60.0 ksi	
Base Plate Stress Ratio:	59.7% <b>Pass</b>	

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
36.01

### Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

### Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

### Pole Results

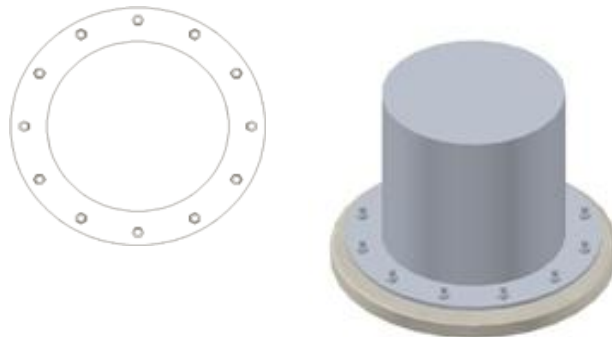
Pole Punching Shear Check:	n/a
----------------------------	-----

### Pole Data

Diam:	63.5	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

### Stress Increase Factor

ASIF:	1.333
-------	-------



\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

\*\* Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

BU: 876379  
 Site Name: N. WOODBURY / WOLFF PARCEL  
 App Number: 246005 Rev 0  
 Work Order: 773470



**Monopole Drilled Pier**

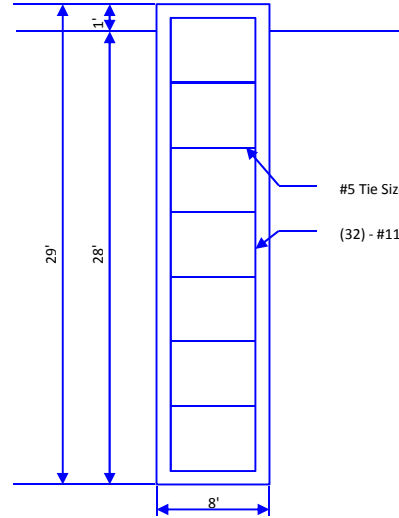
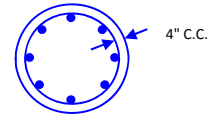
**Input**

**Criteria**  
 TIA Revision: F  
 ACI 318 Revision: 2002  
 Seismic Category: B

**Forces**  
 Compression: 55 kips  
 Shear: 34 kips  
 Moment: 3890 k-ft  
 Swelling Force: 0 kips

**Foundation Dimensions**  
 Pier Diameter: 8 ft  
 Ext. above grade: 1 ft  
 Depth below grade: 28 ft

**Material Properties**  
 Number of Rebar: 32  
 Rebar Size: 11  
 Tie Size: 5  
 Rebar tensile strength: 60 ksi  
 Concrete Strength: 4000 psi  
 Ultimate Concrete Strain: 0.003 in/in  
 Clear Cover to Ties: 4 in



Soil Profile: 1

Layer	Thickness (ft)	From (ft)	To (ft)	Unit Weight (pcf)	Cohesion (psf)	Friction Angle (deg)	Ultimate Uplift Skin Friction (ksf)	Ultimate Comp. Skin Friction (ksf)	Ultimate Bearing Capacity (ksf)	SPT 'N' Counts
1	4	0	4	135	0		0	0	0	
2	1	4	5	135	0	38	0	0	0	
3	9.5	5	14.5	135	0	38	0.8	0.8	0	
4	0.5	14.5	15	75	0	38	0.8	0.8	0	
5	13	15	28	75	0	38	1.6	1.6	32	

**Analysis Results**

**Soil Lateral Capacity**  
 Depth to Zero Shear: 6.38 ft  
 Max Moment, Mu: 4092.26 k-ft  
 Soil Safety Factor: 5.50  
 Safety Factor Req'd: 2  
**RATING: 36.4%**

**Soil Axial Capacity**  
 Skin Friction (k): 361.91 kips  
 End Bearing (k): 804.25 kips  
 Comp. Capacity (k), φCn: 1166.16 kips  
 Comp. (k), Cu: 55.00 kips  
**RATING: 4.7%**

**Concrete/Steel Check**

Mu (from soil analysis) 5319.93 k-ft  
 φMn 9166.72 k-ft  
**RATING: 58.0%**

rho provided 0.69  
 rho required 0.33 OK

Rebar Spacing 6.97  
 Spacing required 22.56 OK

Dev. Length required 21.29  
 Dev. Length provided 53.51 OK

**Overall Foundation Rating: 58.0%**

RADIO FREQUENCY FCC REGULATORY COMPLIANCE  
MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT33XC518

N. Woodbury / Wolff Parcel

1440 Main Street North  
Woodbury, CT 06798

**September 6, 2014**

**EBI Project Number: 62144514**

September 6, 2014

Sprint  
Attn: RF Engineering Manager  
1 International Boulevard, Suite 800  
Mahwah, NJ 07495

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:  
**CT33XC518 - N. Woodbury / Wolff Parcel**

**Site Total: 44.49% - MPE% in full compliance**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at **1440 Main Street North, Woodbury, CT**, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades 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 limit for the cellular band (850 MHz Band) is approximately  $567 \mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the 1900 MHz and 2500 MHz 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 upgrades to the existing Sprint Wireless antenna facility located at **1440 Main Street North, Woodbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. 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 emissions were calculated using the following assumptions:

- 1) 2 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
- 2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation.
- 3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
- 4) 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.

- 5) 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.
- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. 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.
- 7) The antenna mounting height centerline for the proposed antennas is **158 feet** above ground level (AGL).
- 8) 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 calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT33XC518 - N. Woodbury / Wolff Parcel
Site Address	1440 Main Street North, Woodbury, CT, 06798
Site Type	Monopole

**Sector 1**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	158	152	1/2 "	0.5	0	138.69	0.22%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	158	152	1/2 "	0.5	0	39.00	0.11%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	158	152	1/2 "	0.5	0	138.69	0.38%
Sector total Power Density Value:																0.70%

**Sector 2**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	158	152	1/2 "	0.5	0	138.69	0.22%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	158	152	1/2 "	0.5	0	39.00	0.11%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	158	152	1/2 "	0.5	0	138.69	0.38%
Sector total Power Density Value:																0.70%

**Sector 3**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	158	152	1/2 "	0.5	0	138.69	0.22%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	158	152	1/2 "	0.5	0	39.00	0.11%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	158	152	1/2 "	0.5	0	138.69	0.38%
Sector total Power Density Value:																0.70%

Site Composite MPE %	
Carrier	MPE %
Sprint	2.11%
Nextel	2.91%
Verizon Wireless	16.77%
AT&T	22.70%
<b>Total Site MPE %</b>	<b>44.49%</b>

## Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **2.11% (0.70% from sector 1, 0.70% from sector 2 and 0.70% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **44.49%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE 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.



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