



Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

August 15, 2017

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

RE: Notice of Exempt Modification for Sprint/ Crown Site BU: 876379
Sprint Site ID: CT33XC518
1440 Main Street North, Woodbury, CT 06798
Latitude: 41° 351' 23.81"/ Longitude: -73° 10' 11.52"

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 158-foot level of the existing 163-foot monopole tower at 1440 Main Street North in Woodbury, CT. The tower is owned by Crown Castle. The property is owned by Tikva Wolff. Sprint intends to install (3) antennas and (3) RRUs with (1) hybrid cable.

This facility was approved by the by the Town of Woodbury Zoning Commission on August 10, 1999, with the following conditions:

1. A final site development plan, annotated with all conditions herein, shall be filed with the Town Planner prior to commencement of construction;
2. An itemized estimate of costs for soil erosion and sedimentation control, screening landscaping, and tower removal and site restoration must be provided to the Woodbury Town Planner (Town Planner) for determination of an appropriate bond and such bond shall be posted in a form and amount determined by the Town Planner, prior to commencement of construction;
3. The Town Planner shall be notified 48 hours prior to commencement of construction to permit inspection of soil erosion and sedimentation control devices;
4. The tower and enclosure area shall be designed to accommodate up to six providers of telecommunications services, with all ground equipment enclosed in a single building and the enclosure secured and screened in manner that is architecturally compatible with surrounding farm;
5. All electric and telephone service to the tower and building shall be installed below ground.

6. The galvanized steel tower shall not exceed 160 feet above grade in height, shall have no lights above the height of the building, screening, or fence, and shall not be painted. Any future extension of the tower to accommodate additional antennas or addition of any facilities other than shown on the approved site plan shall require an amendment to this Special Permit as provided in Section 10.6 of the Woodbury Zoning Regulations, however, an extension of the tower from 160 feet to 190 feet shall be deemed to be of a minor nature;
7. The tower shall be located no closer than 190 feet from any property line along Main Street North and Swamp Road.
8. Sprint shall use best efforts to make the tower available to other telecommunications carriers and promote co-location on this tower on a commercially reasonable basis;
9. In the event the wireless telecommunications facility ceases to be used by Sprint PCS or any bona fide tenant providers of telecommunication services for a period of a year, the tower and all associated equipment and structures shall be removed by Sprint PCS within 90 days;
10. Construction shall not commence until all applicable appeal periods have terminated and this permit will expire if construction is not completed by August 10, 2001; and
11. An A2, as-built survey shall be filed with the Town Planner upon completion of construction.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. William J. Butterly, Jr., First Selectman, Town of Woodbury, Town Planner Maryellen Edwards, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

Melanie A. Bachman

August 15, 2017

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6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Sprint respectfully submits that 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: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

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

Maryellen Edwards, Town Planner
Town of Woodbury
281 Main Street South
Woodbury, CT 06798

Tikva Wolff
1514 Main Street North
Woodbury, CT 06798

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2013.

Town of Woodbury

First Deed from the Indians 1659



Information on the Property Records for the Municipality of Woodbury was last updated on 8/12/2017.

Property Summary Information

Parcel Data And Values

Outbuildings

Sales

Permits

Google Map

Parcel Information

Location:	1440 MAIN ST NORTH	Property Use:	Farms/Barns	Primary Use:	Barn
Unique ID:	390800	Map Block Lot:	012-054	Acres:	38.62
490 Acres:	38.62	Zone:	OS60	Volume / Page:	0384/1171
Developers Map / Lot:		Census:	3621		

Value Information

	Appraised Value	70% Assessed Value
Land	3,476	2,440
Buildings	0	0
Detached Outbuildings	118,904	83,230
Total	122,380	85,670

Owner's Information

Owner's Data

WOLFF TIKVA
1514 MAIN ST NORTH
WOODBURY CT 06798-1812

[Back To Search \(JavaScript>window.history.back\(1\);\)](#)

[Print View \(PrintPage.aspx?towncode=168&uniqueid=390800\)](#)

Information Published With Permission From The Assessor



Zoning Commission

P.O. Box 369

Town of Woodbury - Woodbury, Connecticut 06798-0369

First land deed from the Indians

April 12th 1659

Telephone: (203) 263-3467

Fax: (203) 263-5076

VOICES

Middle Quarter Mall
Main Street South
Woodbury, CT 06798

Kindly publish the following legal notice in VOICES on Sunday, August 22, 1999. The invoice should be sent to the Accounting Office, 281 Main Street S. Box #369, Woodbury, CT 06798 with a tear-sheet copy for the Town Planner's Office.

LEGAL NOTICE

At its regular meeting held on Tuesday, August 10, 1999, the Woodbury Zoning Commission took the following actions:

X APPROVED: With conditions, Application #969 submitted by Sprint Spectrum, LP, d/b/a Sprint PCS to construct a radio tower/wireless telecommunications facility at 1440 Main St. N., Richard Wolff, property owner. (Map 12/Lot 54)

APPROVED: With conditions, Application #973 submitted by Watertown Fire District for an Earth Materials Permit for gravel excavation from Nonnewaug River, Hart Farm Wellfield on Rte. 61. (Map 14/Lots 10, 32, 32A -B, 33)

DENIED: To deny without prejudice Application #971 for lack of information submitted by Woodbury Fire Dept. for Earth Materials Permit for a fire pond at 274 Grassy Hill Rd., Richard Wolff, property owner. (Map 64/Lot 12).

APPROVED: With conditions, Application #976 submitted by Flanders Nature Center, Inc. for a Special Permit to hold a fall festival at the Van Vleck Farm Sanctuary on Flanders Rd and Church Hill Rd on October 3, 1999. (Map 96/Lots 21, 22, 23)

Dated this 20th day of August, 1999.


Sue Bartlett, Admin. Asst.

A letter of 8/10/99 from Ken Faroni of O & G was submitted granting a 65-day extension.

(Tietz unseated, Alt. Leach seated)

#969/Sprint Spectrum/Wolff/1440 Main St. N/Wireless TeleComm. Facility

MOTION:

WHEREAS, the WOODBURY ZONING COMMISSION has received Application #969 submitted by Sprint Spectrum, L.P., d/b/a Sprint PCS for a Special Permit pursuant to Section 5.2.4 of the Woodbury Zoning Regulations to construct a radio tower/wireless telecommunications facility and associated radio equipment on property owned by Richard Wolff at 1440 Main Street North (Tax Assessor's Map 12/Lot 54); and

WHEREAS, members of the Commission inspected the site at a duly noticed special meeting on July 6, 1999; and

WHEREAS, a duly called public hearing was held June 22, 1999 and July 13, 1999 to consider the application and to receive public comments; and

WHEREAS, the Commission has carefully considered all the information and testimony received during the duly called public hearing; and

WHEREAS, the Commission has determined that the proposed radio tower/telecommunications facility and associated radio equipment are in conformance with Section 5.2.4 of the Woodbury Zoning Regulations after conditions 6 and 7 below, are met;

NOW THEREFORE BE IT RESOLVED that the WOODBURY ZONING COMMISSION approves Application #969 submitted by Sprint Spectrum, L.P., d/b/a Sprint PCS for a Special Permit pursuant to Section 5.2.4 of the Woodbury Zoning Regulations to construct a radio tower/telecommunications facility and associated radio equipment on property owned by Richard Wolff at 1440 Main Street North (Tax Assessor's Map 12/Lot 54) as depicted on the site plans and accompanying materials dated June 17, 1999, with the following conditions:

1. A final site development plan, annotated with all conditions herein, shall be filed with the Town Planner prior to commencement of construction;
2. An itemized estimate of costs for soil erosion and sedimentation control, screening, landscaping, and tower removal and site restoration must be provided to the Woodbury Town Planner (Town Planner) for determination of an appropriate bond and such bond shall be posted in a form and amount determined by the Town Planner, prior to commencement of construction;
3. The Town Planner shall be notified 48 hours prior to commencement of construction to permit inspection of soil erosion and sedimentation control devices;

4. The tower and enclosure area shall be designed to accommodate up to six providers of telecommunications services, with all ground equipment enclosed in a single building and the enclosure secured and screened in manner that is architecturally compatible with surrounding farm;
5. All electric and telephone service to the tower and building shall be installed below ground.
6. The galvanized steel tower shall not exceed 160 feet above grade in height, shall have no lights above the height of the building, screening, or fence, and shall not be painted. Any future extension of the tower to accommodate additional antennas or addition of any facilities other than shown on the approved site plan shall require an amendment to this Special Permit as provided in Section 10.6 of the Woodbury Zoning Regulations, however, an extension of the tower from 160 feet to 190 feet shall be deemed to be of a minor nature;
7. The tower shall be located no closer than 190 feet from any property line along Main Street North and Swamp Road.
8. Sprint shall use best efforts to make the tower available to other telecommunications carriers and promote co-location on this tower on a commercially reasonable basis;
9. In the event the wireless telecommunications facility ceases to be used by Sprint PCS or any bona fide tenant providers of telecommunication services for a period of a year, the tower and all associated equipment and structures shall be removed by Sprint PCS within 90 days.;
10. Construction shall not commence until all applicable appeal periods have terminated and this permit will expire if construction is not completed by August 10, 2001; and
11. An A2, as-built survey shall be filed with the Town Planner upon completion of construction.

Made by Kelly, seconded by Alt. Leach.
Vote 5-0 in favor.

(Tietz unseated, Alt. Leach seated)

#973/Watertown Fire District/Hart Farm Wellfield/Rte 61/EM Permit

MOTION:

WHEREAS, the WOODBURY ZONING COMMISSION has received Application #973 submitted by the Watertown Fire District for an Earth Materials Permit pursuant to Section 15.3 of the Woodbury Zoning Regulations to excavate up to 4500 cubic yards of gravel from the Nonnewaug River (Tax Assessor's Map 14/Lots 10, 32, 32A, 32B, 33); and

WHEREAS, the Woodbury Inland Wetlands Agency approved the regulated activity on August 9, 1999; and

WHEREAS, a duly called public hearing was held July 27, 1999 and August 10, 1999 to consider the application and to receive public comments; and



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

APPROVED

By Jason D'Amico at 9:35 am, Jul 06, 2017

APPROVED

By Susan Vale at 10:46 am, Jan 06, 2015



2.5 EQUIPMENT DEPLOYMENT
SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251



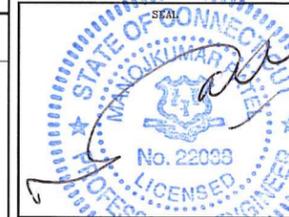
Tectonic Engineering & Surveying
Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703
www.tectonicengineering.com

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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	JMR



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

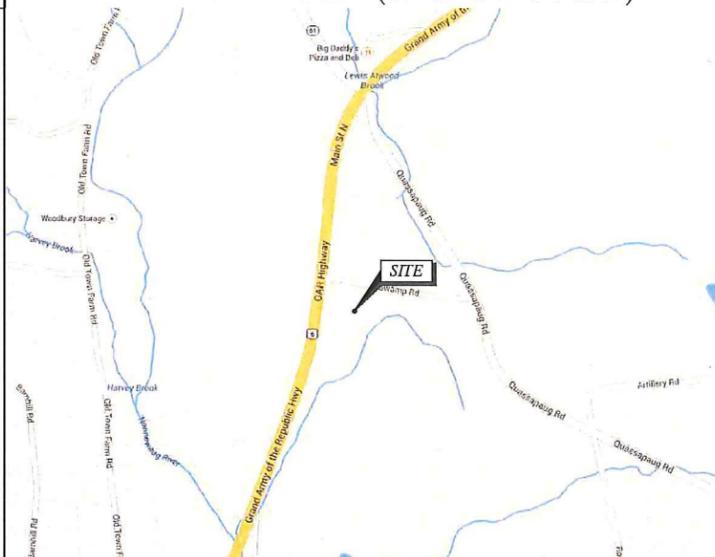
SHEET TITLE:
TITLE SHEET

SHEET NO:
T-1

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.d.amico@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)



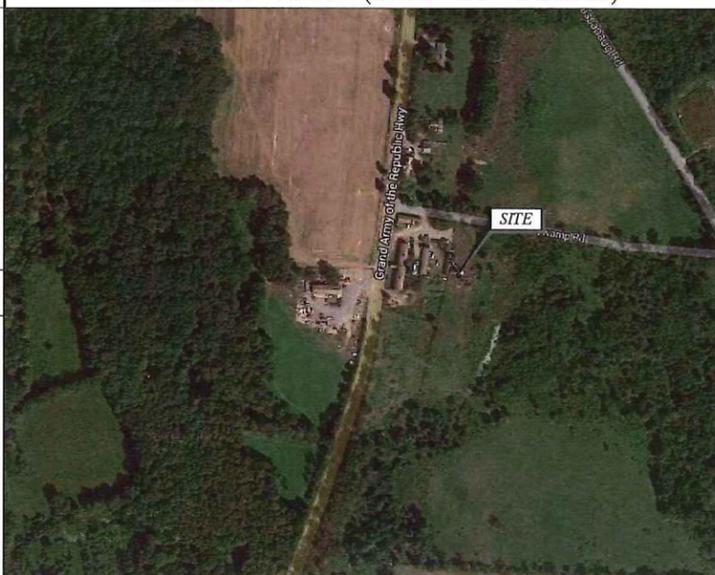
SHEET INDEX

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

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.

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=46KSI).
 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.



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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	JMCO



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
— — — — O — — — — O —	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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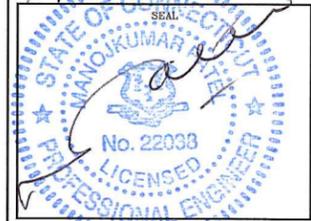
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SUBMITTALS

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

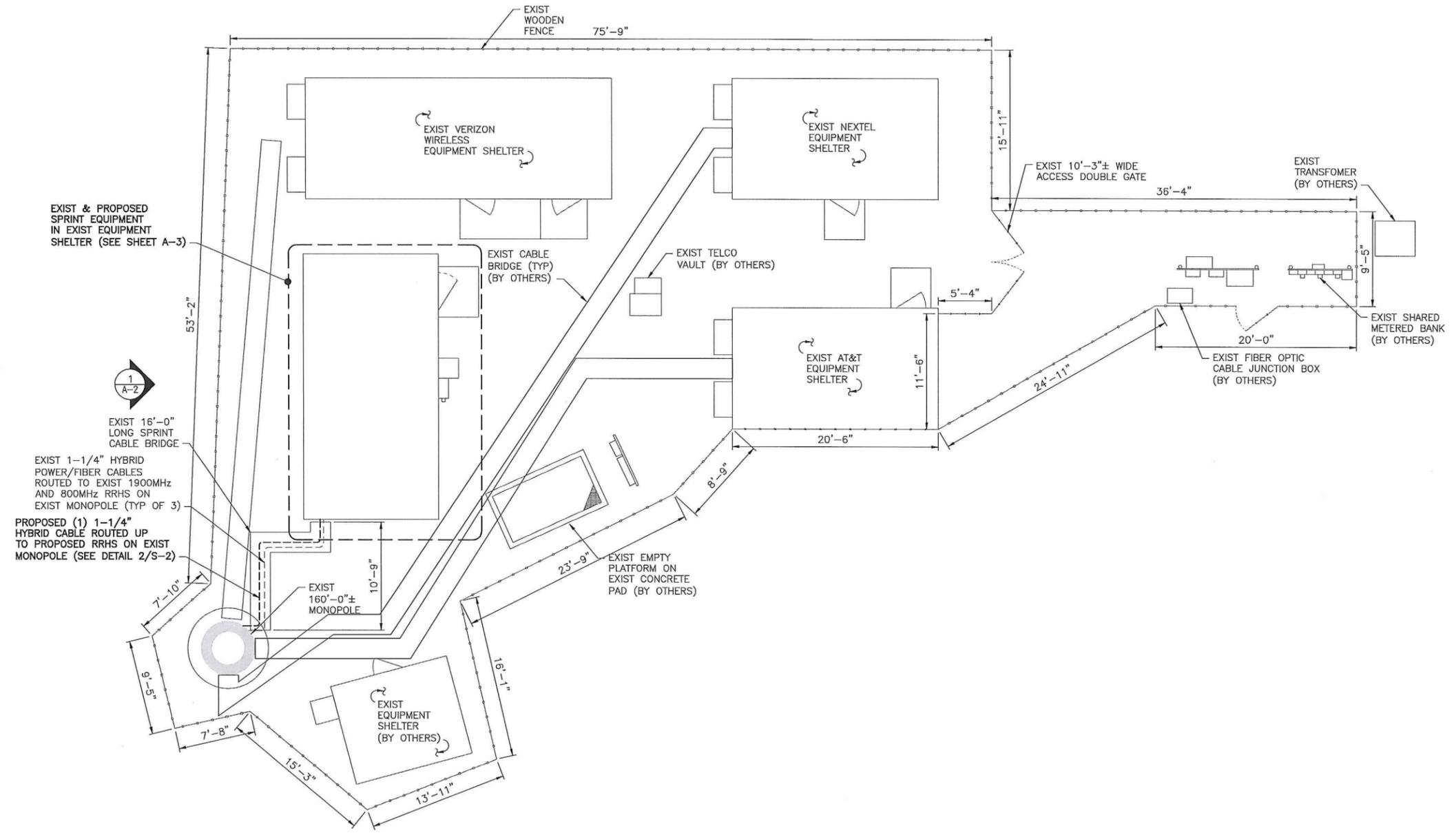
SITE ADDRESS:
1440 MAIN STREET NORTH
WOODBURY, CT 06798

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
 OVERLAND PARK, KANSAS 66251

CROWN CASTLE

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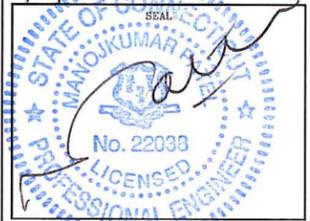
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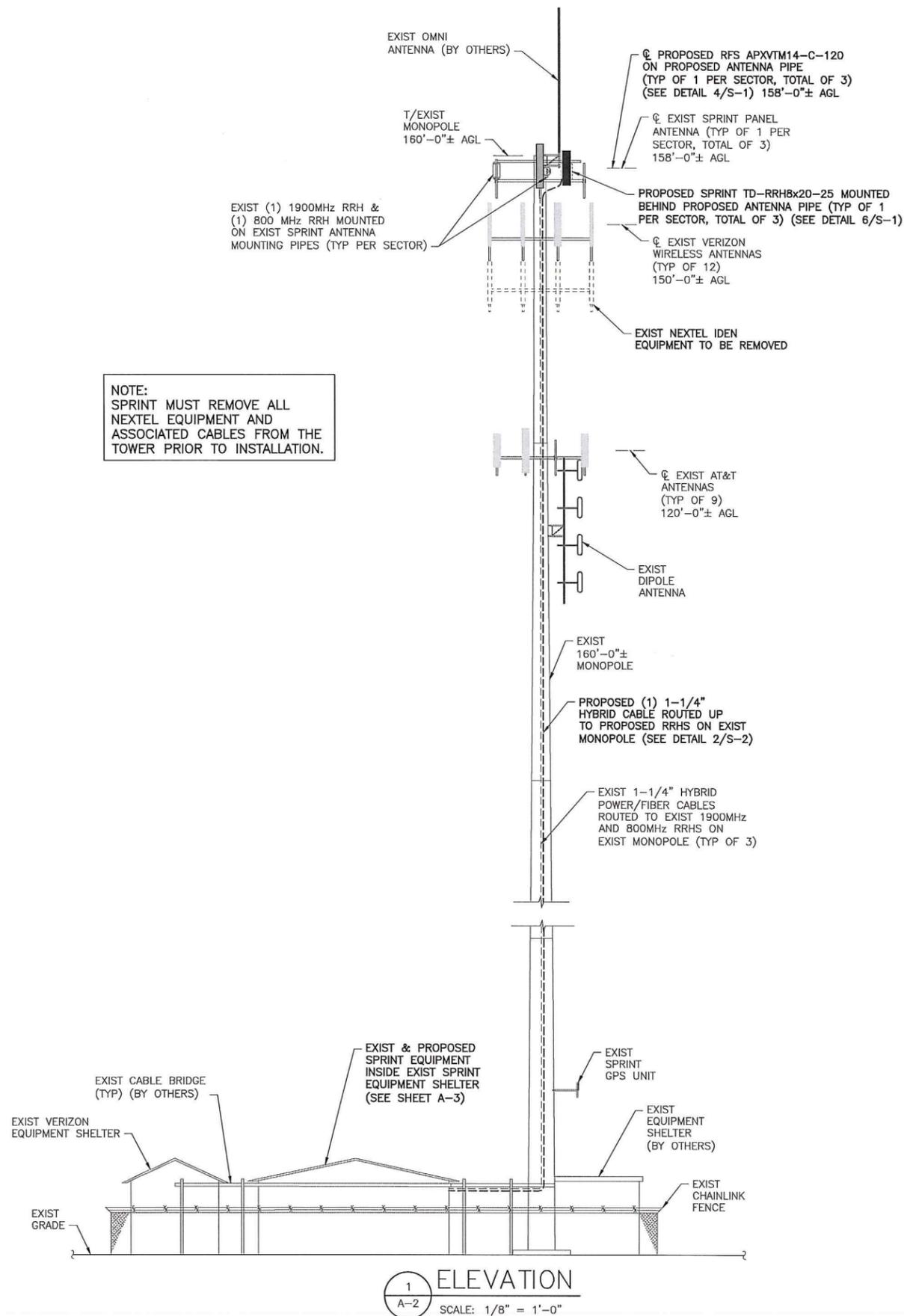
DATE	REVIEWED BY
1/5/15	SMQ



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.



Sprint
2.5 EQUIPMENT DEPLOYMENT
SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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REVIEWED BY: JMO



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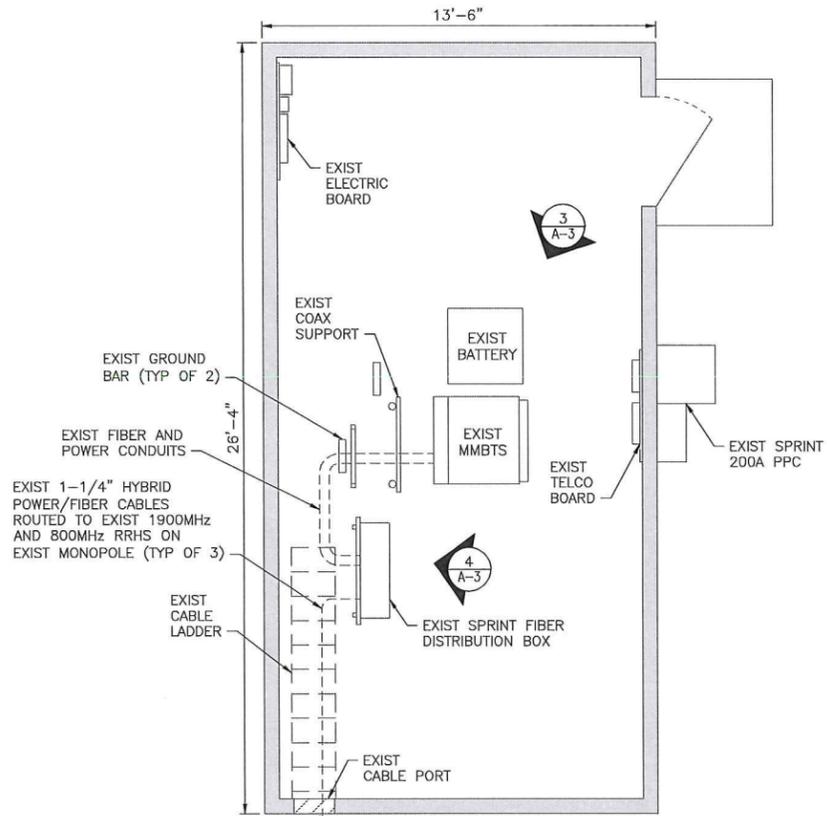
SITE ADDRESS:
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE:
ELEVATION

SHEET NO:
A-2



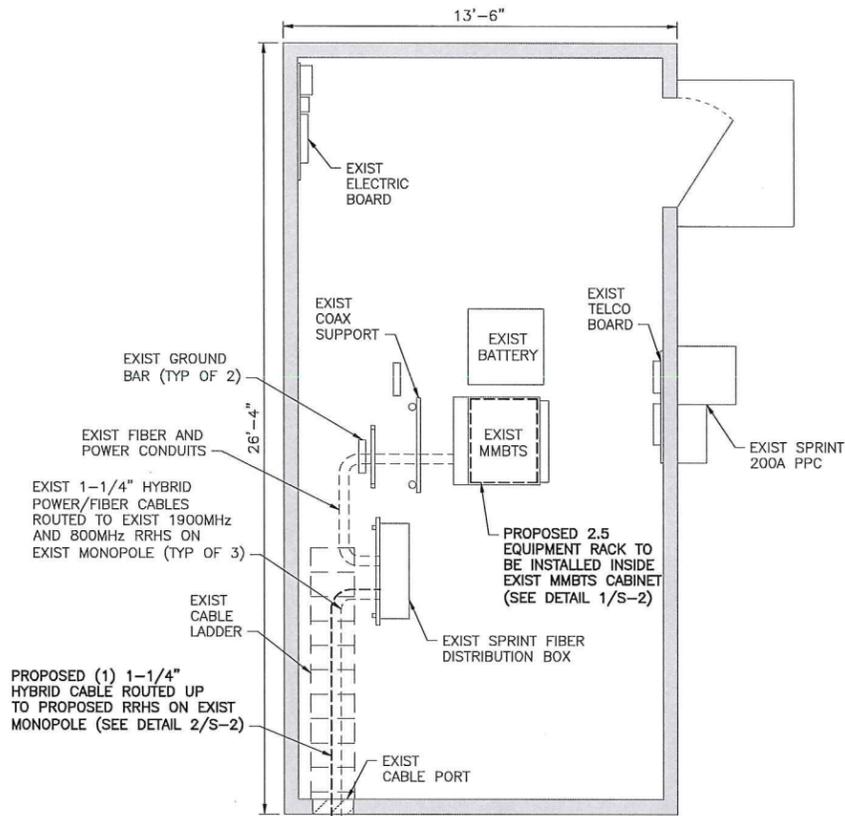
NORTH NOTE:
 NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.



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
 2.5 EQUIPMENT DEPLOYMENT
 SPRINT PARKWAY
 OVERLAND PARK, KANSAS 66251

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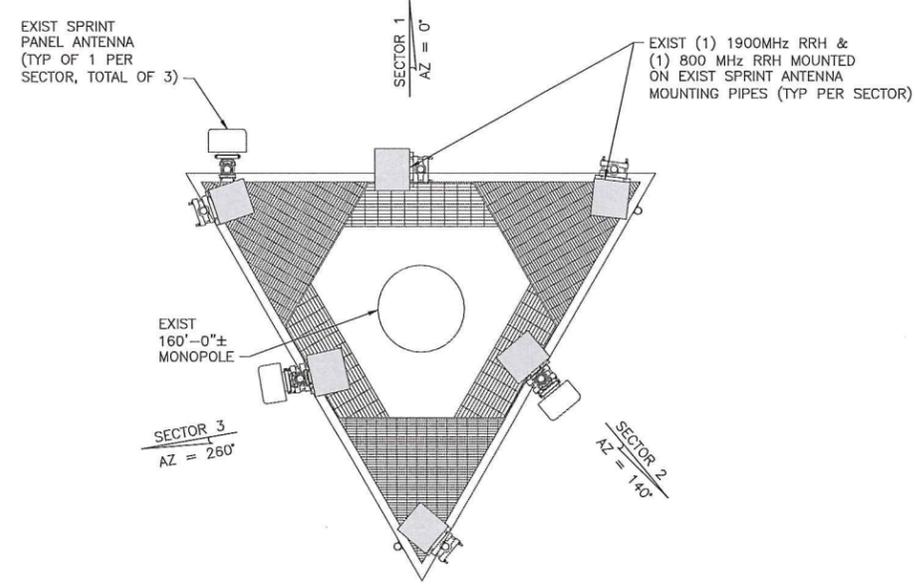
DATE: 1/5/15 REVIEWED BY: JMG



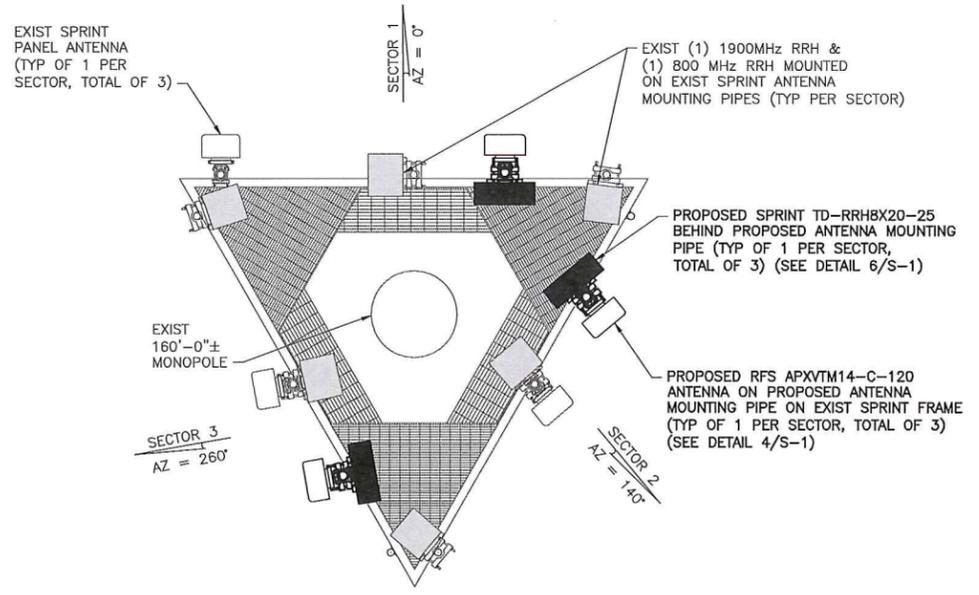
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 N. WOODBURY/WOLFF PARCEL
 SITE ADDRESS:
 1440 MAIN STREET NORTH
 WOODBURY, CT 06798

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"

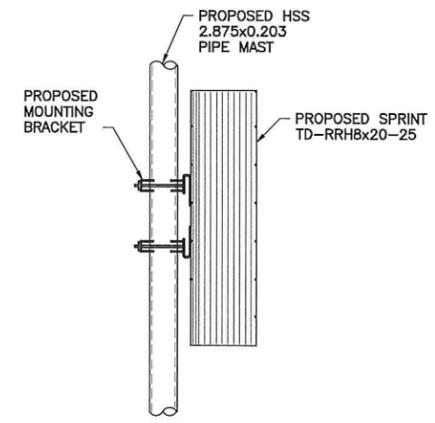
EXIST (1) 1900MHz RRH AND (1) 800MHz RRH MOUNTED ON EXIST SPRINT ANTENNA MOUNTING PIPES (TYP PER SECTOR)



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

Sprint
2.5 EQUIPMENT DEPLOYMENT
SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

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TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703
www.tectonicengineering.com

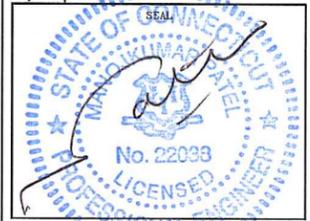
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SUBMITTALS

PROJECT NO: 7225.CT33XC518

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

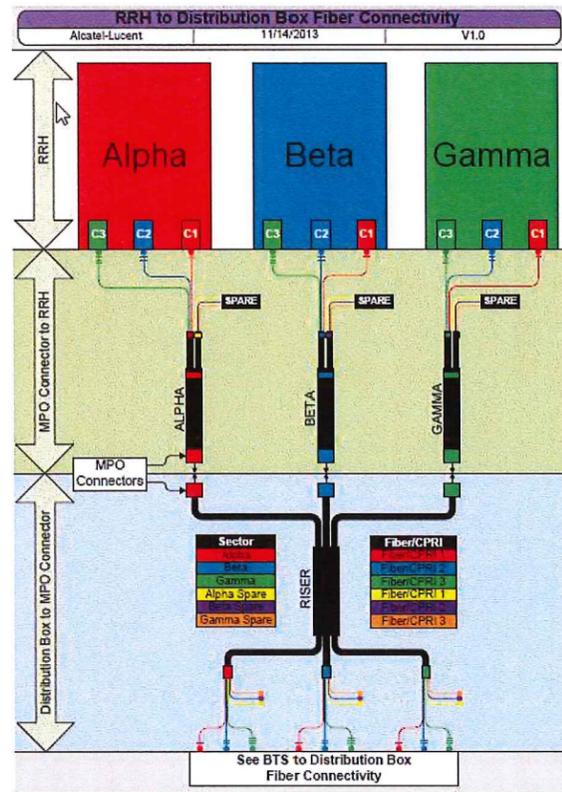
DATE: 1/5/15
REVIEWED BY: SMQ



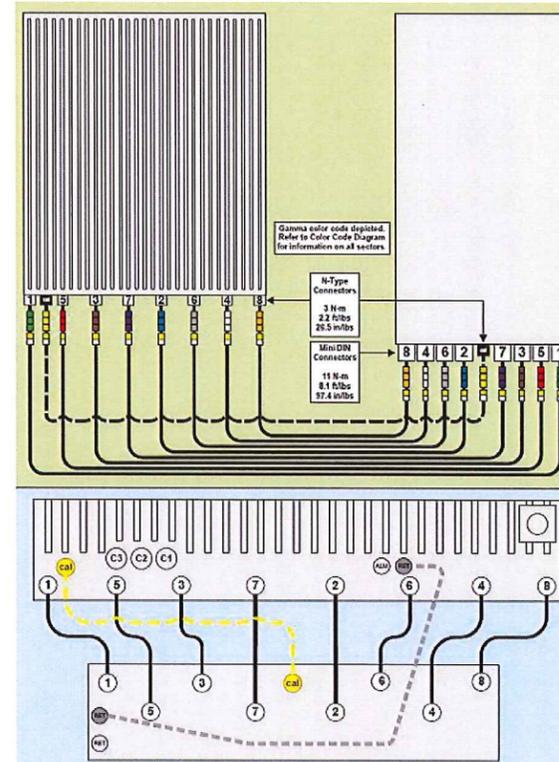
SITE NUMBER: CT33XC518
SITE NAME: N. WOODBURY/WOLFF PARCEL
SITE ADDRESS: 1440 MAIN STREET NORTH WOODBURY, CT 06798

SHEET TITLE: ANTENNA LAYOUT PLANS

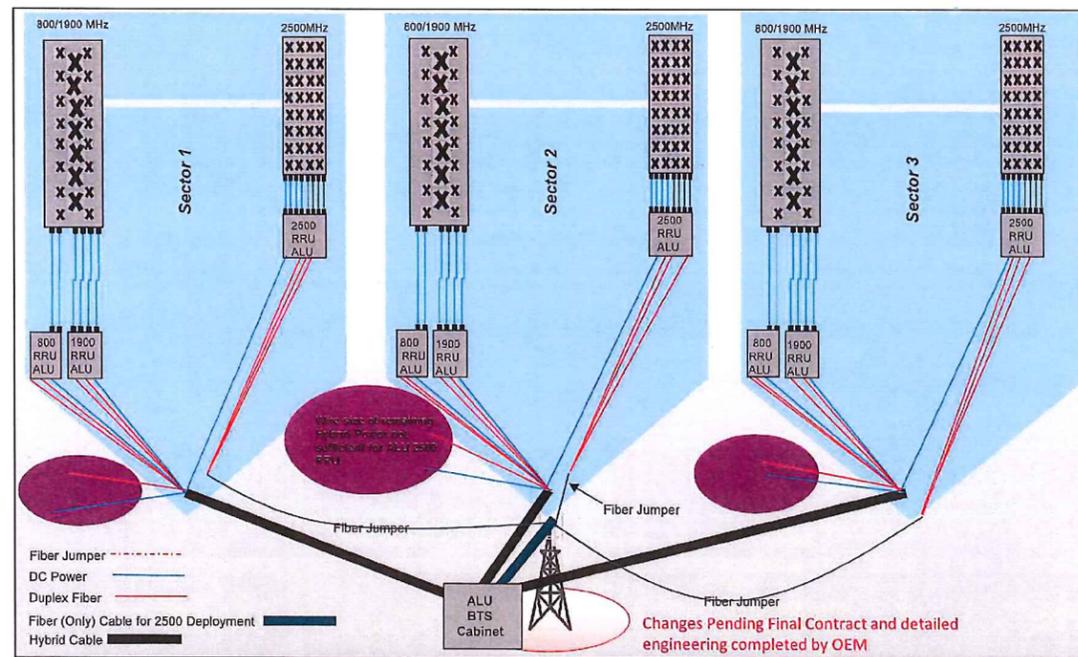
SHEET NO: A-4



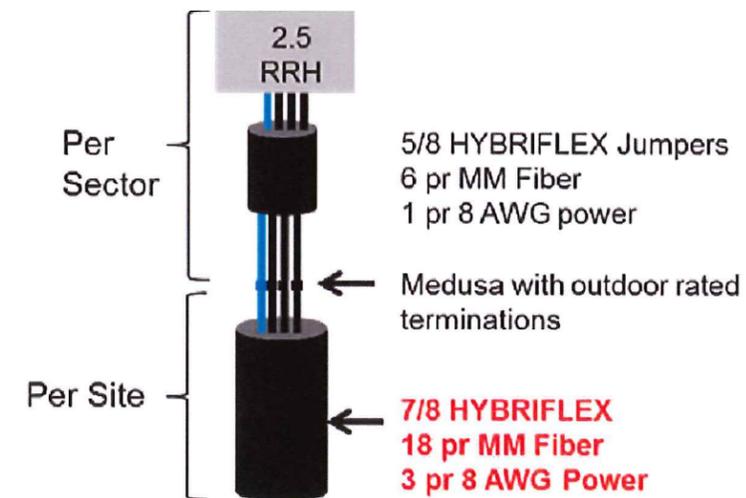
1 2.5 CABLE COLOR CODING
A-5 SCALE: N.T.S.



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.

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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

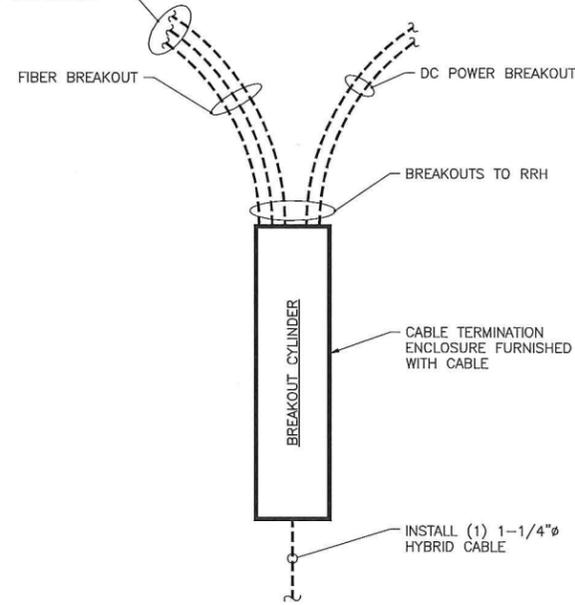


IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

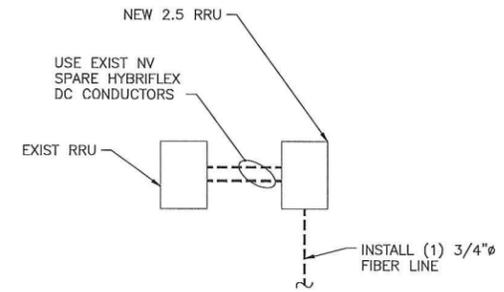


1 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS
A-6 SCALE: N.T.S.

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.

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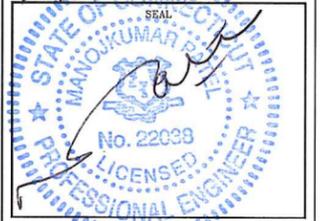
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PROJECT NO: 7225.CT33XC518

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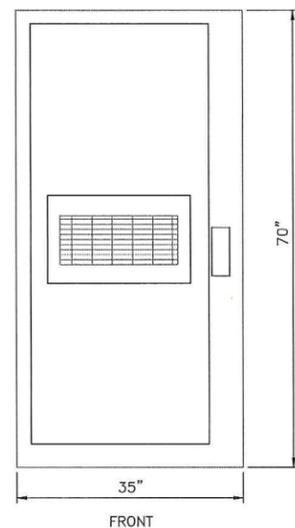
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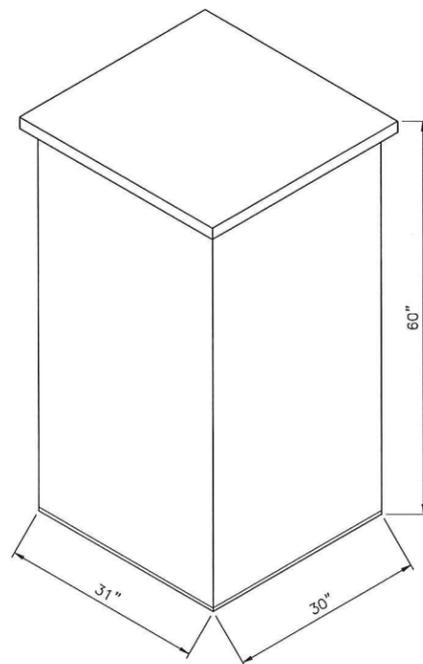
SITE NUMBER:
CT33XC518
SITE NAME:
N. WOODBURY/WOLFF PARCEL
SITE ADDRESS:
1440 MAIN STREET NORTH
WOODBURY, CT 06798

SHEET TITLE:
CABLE DETAILS

SHEET NO:
A-6



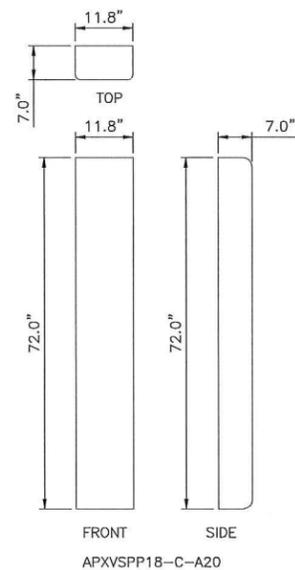
CABINET FRONT
9928 MMBTS MODULAR CELL
SPECIFICATIONS:
HEIGHT: 70"
WIDTH: 35"
DEPTH: 37.8"
WEIGHT: 1090 LBS.



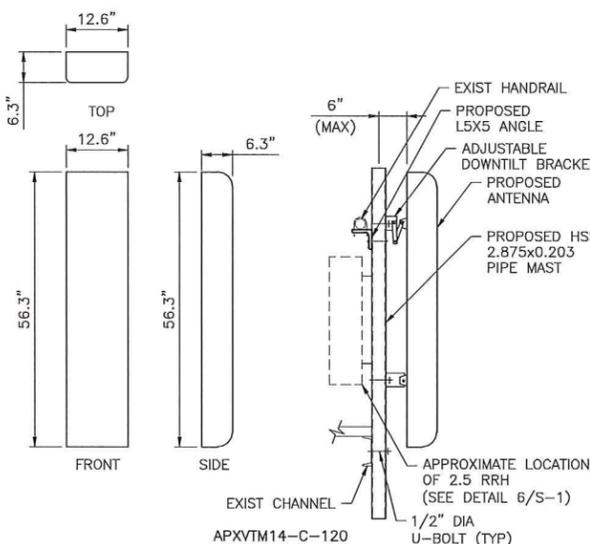
ANDREW 60ECv2
SPECIFICATIONS:
HEIGHT: 60"
WIDTH: 31"
DEPTH: 30"
WEIGHT: 2430 LBS.

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

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

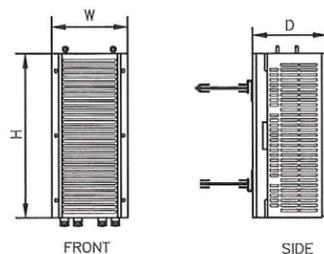


APXVSP18-C-A20

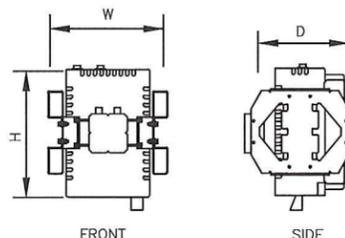


3 (EXIST) ANTENNA DETAIL
S-1 SCALE: 3/4" = 1'-0"

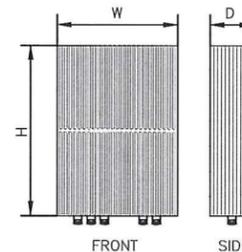
4 (PROPOSED) ANTENNA DETAIL
S-1 SCALE: 3/4" = 1'-0"



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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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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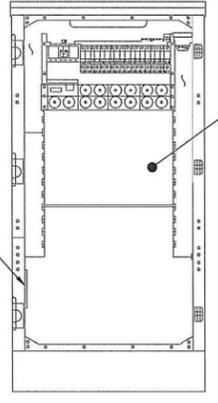
DATE: 1/5/15
 REVIEWED BY: JMA
 STATE OF CONNECTICUT
 PROFESSIONAL ENGINEER
 No. 22038

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

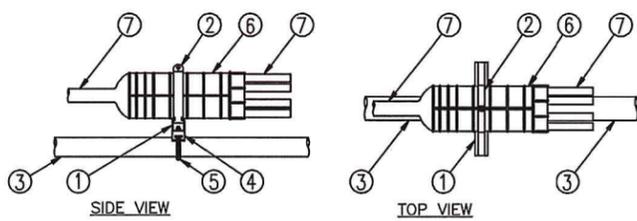
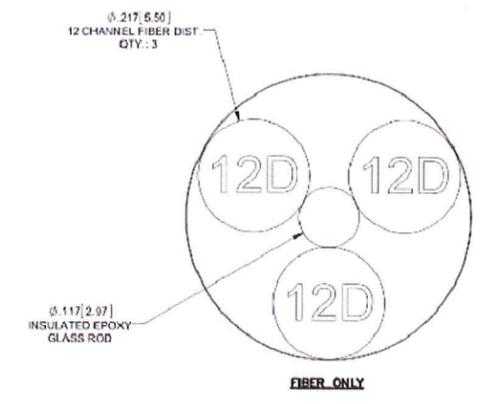
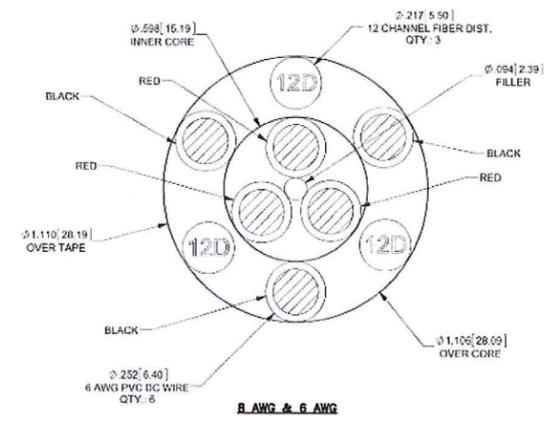
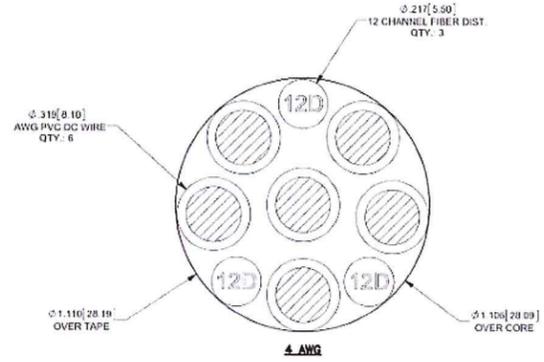
Power	Hybrid cable	Length	
Fiber Only (Existing DC Power)	MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50ft	50 ft	
	MN: HB058-M12-075F	75 ft	
	MN: HB058-M12-100F	100 ft	
	MN: HB058-M12-125F	125 ft	
	MN: HB058-M12-150F	150 ft	
	MN: 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

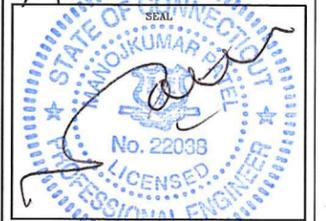
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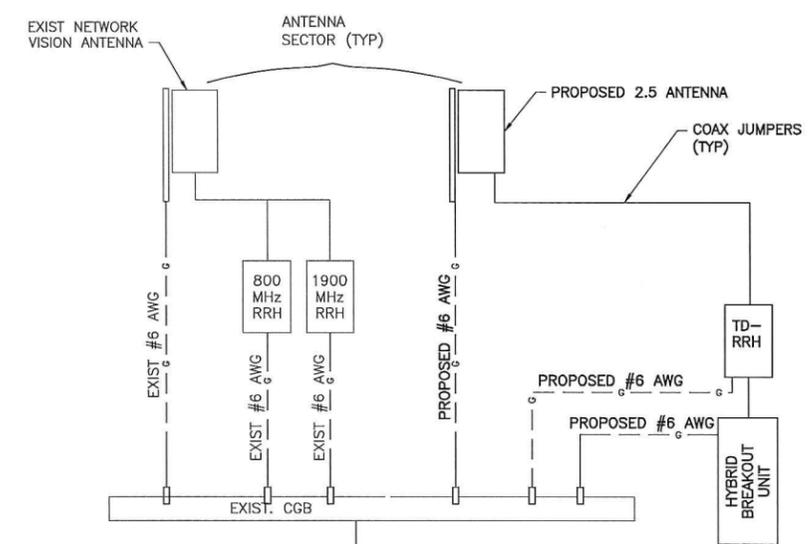
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1/5/15	JMG



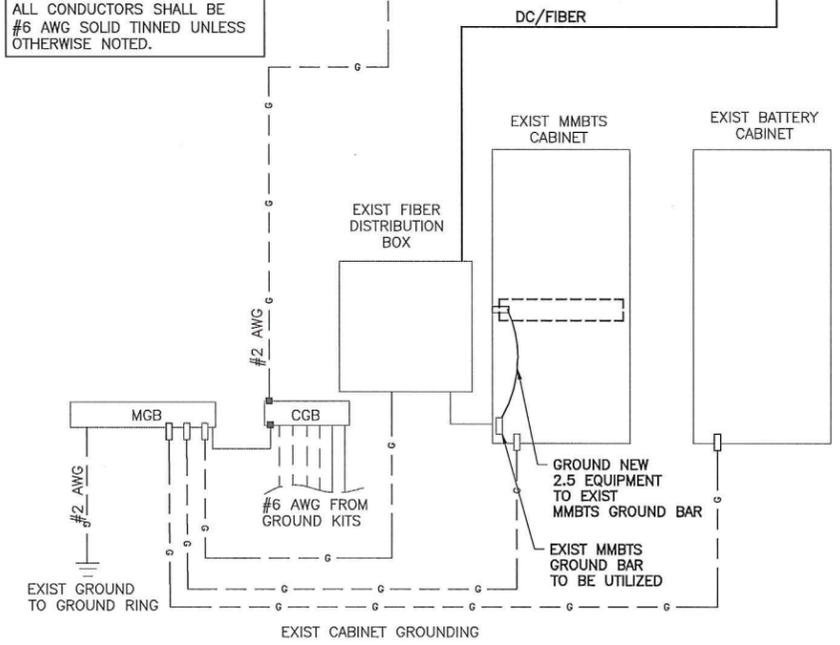
SITE NUMBER:
 CT33XC518
 SITE NAME:
 N. WOODBURY/WOLFF PARCEL
 SITE ADDRESS:
 1440 MAIN STREET NORTH
 WOODBURY, CT 06798

SHEET TITLE:
 ELECTRICAL & GROUNDING
 PLANS

SHEET NO:
 E-1



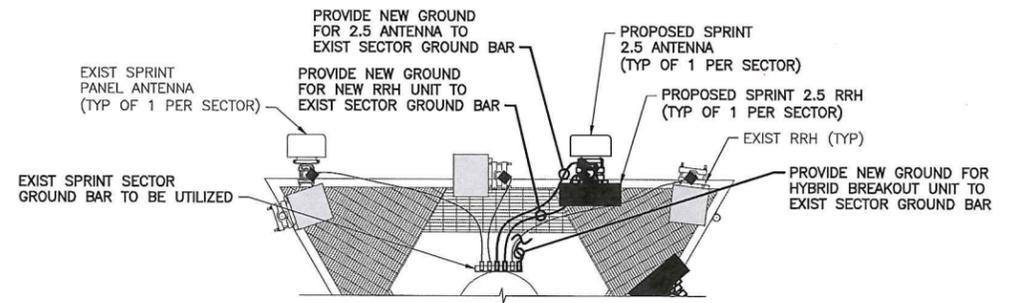
NOTE:
 ALL CONDUCTORS SHALL BE #6 AWG SOLID TINNED UNLESS OTHERWISE NOTED.



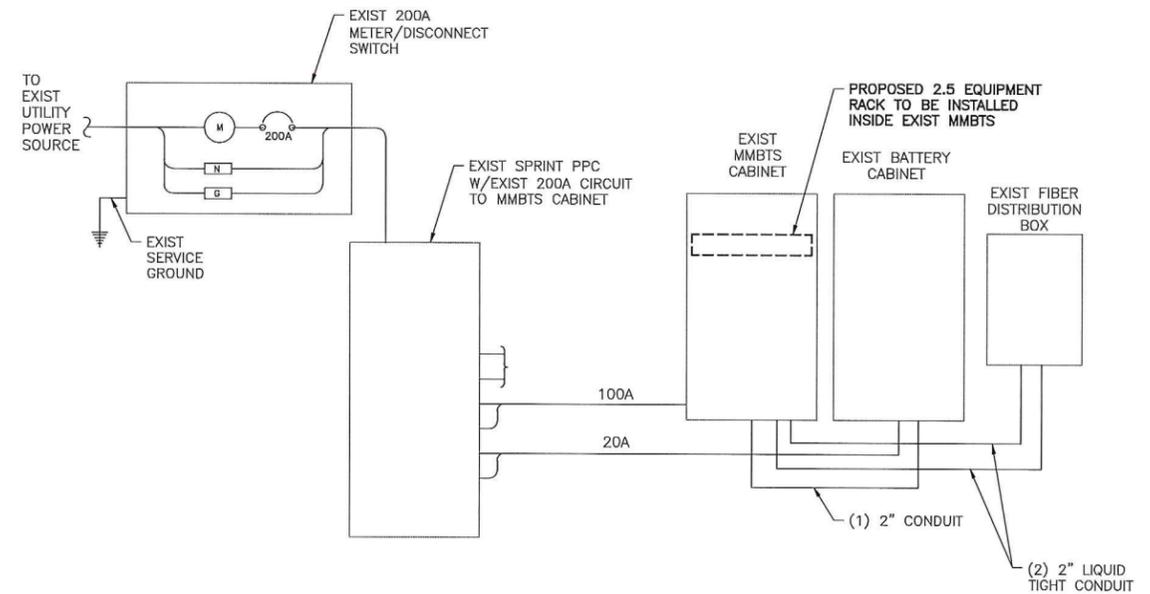
LEGEND

- CADWELD CONNECTION
- MECHANICAL CONNECTION
- COMPRESSION CONNECTION

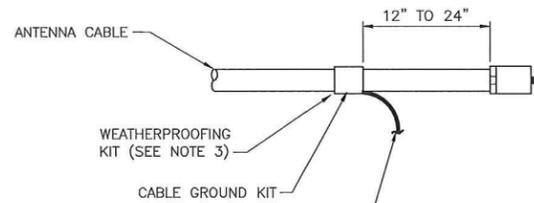
1 TYPICAL GROUNDING ONE LINE DIAGRAM
 E-1 SCALE: NTS



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)

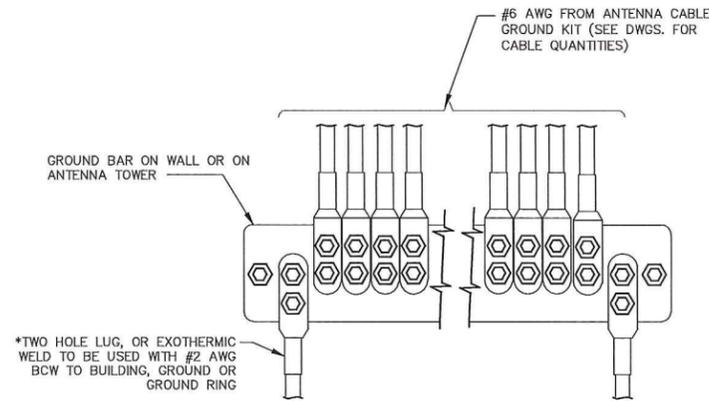
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

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.



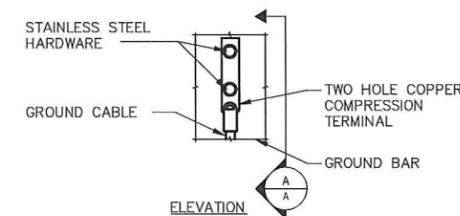
*TWO HOLE LUG, OR EXOTHERMIC WELD TO BE USED WITH #2 AWG BCW TO BUILDING, GROUND OR GROUND RING

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

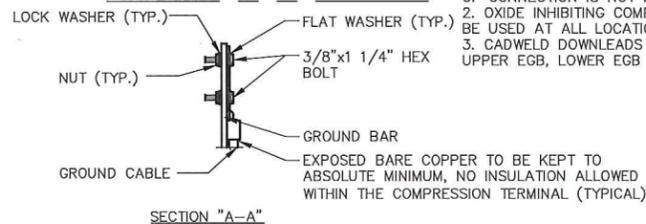
- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRID GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.

- 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.

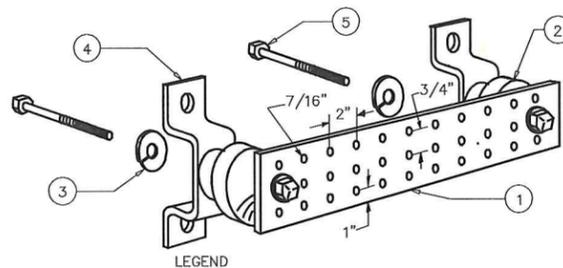


NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.



SECTION "A-A"

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

GROUNING NOTES:

1. GROUNING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNING AND BONDING.
2. ALL GROUND WIRES SHALL BE #2 AWG UNLESS NOTED OTHERWISE.
3. ALL GROUNING 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 GROUNING 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 GROUNING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUNING.
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 GROUNING SYSTEM GENERAL NOTES:

1. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNING. 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 GROUNING 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 GROUNING CONDUCTOR.
3. ALL GROUNING 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 GROUNING 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 GROUNING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNING.
7. GROUND HYBRID CABLE SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

ELECTRICAL AND GROUNING 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. GROUNING SHALL COMPLY WITH NEC ART. 250.
10. GROUND HYBRID CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRID CABLE GROUNING KITS SUPPLIED BY PROJECT OWNER.
11. USE #2 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNING 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 GROUNING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNING 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 GROUNING 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

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• ENGINEERING
• SURVEYING
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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



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

SHEET TITLE:
GROUNING DETAILS & NOTES

SHEET NO:
E-2



Date: June 14, 2017

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

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

Subject: Structural Analysis Report

Carrier Designation: *Sprint PCS Co-Locate*
Carrier Site Number: CT33XC518

Crown Castle Designation:
Crown Castle BU Number: 876379
Crown Castle Site Name: N. WOODBURY / WOLFF PARCEL
Crown Castle JDE Job Number: 442170
Crown Castle Work Order Number: 1416893
Crown Castle Application Number: 393602 Rev. 0

Engineering Firm Designation: **Crown Castle Project Number:** 1416893

Site Data: **1440 Main Street North, WOODBURY, Litchfield County, CT**
Latitude 41° 35' 23.81", Longitude -73° 10' 11.52"
163 Foot - Monopole Tower

Dear Charles McGuirt,

Crown Castle Inc. 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 1416893, in accordance with application 393602, 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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

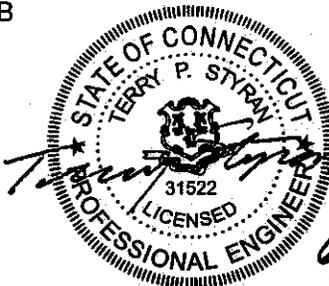
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Crown Castle Inc. 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: Bernadette Rossmiller/ KB

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer



6/15/2017

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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-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 40 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C.

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-RRH-4x20-2500	1	1-1/4	-
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			

Table 2 - Existing and Reserved 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				
148.0	150.0	3	alcatel lucent	RRH2X60-AWS	2	1-5/8	2	
		3	alcatel lucent	RRH2X60-PCS				
		3	alcatel lucent	RRH2x60-700				
	148.0	148.0	6	andrew	SBNHH-1D65B w/ Mount Pipe	12	1-5/8	1
			6	antel	LPA-80080/6CF w/ Mount Pipe			
			3	rfs celwave	FD9R6004/2C-3L			
141.0	142.0	12	decibel	DB846G90A-XY w/ Mount Pipe	12	1-5/8	1	
	141.0	1	tower mounts	Platform Mount [LP 303-1]				
120.0	121.0	6	ericsson	TME-RRUS-11			1	
	120.0	1	tower mounts	Side Arm Mount [SO 104-3]				
118.0	119.0	3	ericsson	RRUS 11 B12	12	1-5/8	1	
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe				
		6	powerwave technologies	7770.00 w/ Mount Pipe				

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21901			
		1	raycap	DC6-48-60-18-8F			
	118.0	1	tower mounts	Platform Mount [LP 401-1]			
108.0	110.0	1	telewave	ANT150D6-9	1	1/2	1
22.0	24.0	1	lucent	KS24019-L112A	1	1/2	1
	22.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved 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 Endeavor Incorporated	1614612	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated	1613543	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle Inc. 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	-14.00	2781.86	18.3	Pass
L2	121.58 - 84.663	Pole	TP48.83x40.6057x0.375	2	-27.91	3902.28	35.5	Pass
L3	84.663 - 42.2	Pole	TP56.25x46.7974x0.4375	3	-43.58	5267.61	45.0	Pass
L4	42.2 - 0	Pole	TP63.5x53.916x0.5	4	-67.77	6944.95	49.8	Pass
							Summary	
						Pole (L4)	49.8	Pass
						Rating =	49.8	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	53.0	Pass
1	Base Plate	0	41.3	Pass
1	Base Foundation (Structure)	0	50.5	Pass
1	Base Foundation (Soil Interaction)	0	27.8	Pass

Structure Rating (max from all components) =	53.0%
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Notes:

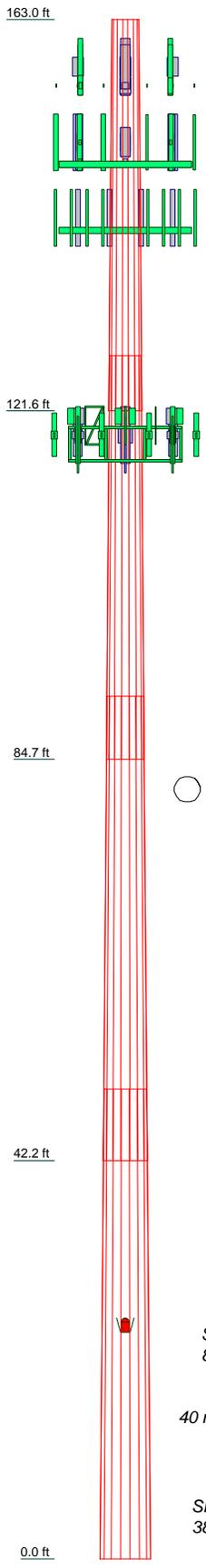
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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

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



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
SC229-SFXLDF	160	FD9R6004/2C-3L	148
Side Arm Mount [SO 301-1]	160	FD9R6004/2C-3L	148
1900MHz RRH (65MHz)	156	FD9R6004/2C-3L	148
1900MHz RRH (65MHz)	156	FD9R6004/2C-3L	148
1900MHz RRH (65MHz)	156	Platform Mount [LP 401-1]	148
800 EXTERNAL NOTCH FILTER	156	(4) DB846G90A-XY w/ Mount Pipe	141
800 EXTERNAL NOTCH FILTER	156	(4) DB846G90A-XY w/ Mount Pipe	141
800 EXTERNAL NOTCH FILTER	156	(4) DB846G90A-XY w/ Mount Pipe	141
800MHz RRH	156	Platform Mount [LP 303-1]	141
800MHz RRH	156	(2) TME-RRUS-11	120
800MHz RRH	156	(2) TME-RRUS-11	120
(3) ACU-A20-N	156	(2) TME-RRUS-11	120
(3) ACU-A20-N	156	Side Arm Mount [SO 104-3]	120
(3) ACU-A20-N	156	4' x 2" Pipe Mount	120
(3) TD-RRH-4x20-2500	156	4' x 2" Pipe Mount	120
APXVTM14-ALU-I20 w/ Mount Pipe	156	4' x 2" Pipe Mount	120
APXVTM14-ALU-I20 w/ Mount Pipe	156	(2) 7770.00 w/ Mount Pipe	118
APXVTM14-ALU-I20 w/ Mount Pipe	156	(2) 7770.00 w/ Mount Pipe	118
APXVSP18-C-A20 w/ Mount Pipe	156	(2) 7770.00 w/ Mount Pipe	118
APXVSP18-C-A20 w/ Mount Pipe	156	(2) LGP21401	118
APXVSP18-C-A20 w/ Mount Pipe	156	(2) LGP21901	118
6' x 2" Mount Pipe	156	(2) LGP21401	118
6' x 2" Mount Pipe	156	(2) LGP21901	118
6' x 2" Mount Pipe	156	(2) LGP21401	118
Platform Mount [LP 602-1]	156	(2) LGP21901	118
(2) LPA-80080/6CF w/ Mount Pipe	148	RRUS 11 B12	118
(3) LPA-80080/6CF w/ Mount Pipe	148	RRUS 11 B12	118
LPA-80080/6CF w/ Mount Pipe	148	RRUS 11 B12	118
RRH2x60-700	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
RRH2x60-700	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
RRH2x60-700	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
RRH2X60-AWS	148	AM-X-CD-16-65-00T-RET w/ Mount Pipe	118
RRH2X60-AWS	148	DC6-48-60-18-8F	118
RRH2X60-AWS	148	6' x 2" Mount Pipe	118
RRH2X60-PCS	148	6' x 2" Mount Pipe	118
RRH2X60-PCS	148	6' x 2" Mount Pipe	118
(2) SBNHH-1D65B w/ Mount Pipe	148	Platform Mount [LP 401-1]	118
SBNHH-1D65B w/ Mount Pipe	148	ANT150D6-9	108
(3) SBNHH-1D65B w/ Mount Pipe	148	KS24019-L112A	22
FD9R6004/2C-3L	148	Side Arm Mount [SO 701-1]	22
FD9R6004/2C-3L	148		

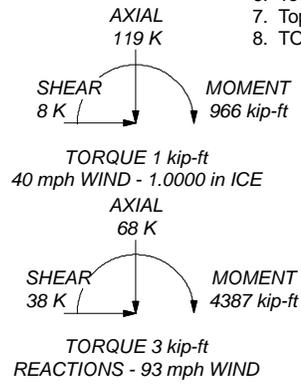
MATERIAL STRENGTH

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 Exposure C to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 49.8%

ALL REACTIONS ARE FACTORED



Crown Castle
 2000 Corporate Drive
 Canonsburg, PA 15317
 Phone: (724) 416-2000
 FAX: (724) 416-2254

Job: BU 876379	Project: 1416893		
Client: Crown Castle	Drawn by: Kibreab Gebremariam	App'd:	
Code: TIA-222-G	Date: 06/14/17	Scale: NTS	
Path: C:\Users\kibremariam\Desktop\ELC7\876379 - WO_1416893 - LG7.dwg			

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- 1) Tower is located in Litchfield County, Connecticut.
- 2) Basic wind speed of 93 mph.
- 3) Structure Class II.
- 4) Exposure Category C.
- 5) Topographic Category 1.
- 6) Crest Height 0.00 ft.
- 7) Nominal ice thickness of 1.0000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56 pcf.
- 10) A wind speed of 40 mph is used in combination with ice.
- 11) Temperature drop of 50 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) 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) SR Members Have Cut Ends SR Members Are Concentric	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 Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line 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 Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	---

Tapered Pole Section Geometry

Section	Elevation <small>ft</small>	Section Length <small>ft</small>	Splice Length <small>ft</small>	Number of Sides	Top Diameter <small>in</small>	Bottom Diameter <small>in</small>	Wall Thickness <small>in</small>	Bend Radius <small>in</small>	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 ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	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 _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					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			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter	Perimeter	Weight
			ft				in	in	plf
22** LDF4-50A(1/2) *	A	Surface Ar (CaAa)	22.00 - 0.00	1	1	-0.500 -0.480	0.6300		0.15

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	plf
***160** LDF4-50A(1/2)	B	No	Inside Pole	160.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.15 0.15 0.15
** 156** HB114-1-0813U4-M5J(1-1/4)	A	No	Inside Pole	156.00 - 0.00	3	No Ice 1/2" Ice 1" Ice	1.20 1.20 1.20
HB114-21U3M12-XXXF(1-1/4)	A	No	Inside Pole	156.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	1.22 1.22 1.22
***148** LDF7-50A(1-5/8)	A	No	Inside Pole	148.00 - 0.00	12	No Ice	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA}		Weight
						ft ² /ft	plf	
HB158-1-08U8-S8J18(1-5/8) **141**	A	No	Inside Pole	148.00 - 0.00	2	1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
LDF7-50A(1-5/8) **118**	C	No	Inside Pole	141.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LCF158-50A(1-5/8)	C	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	0.80
						1/2" Ice	0.00	0.80
						1" Ice	0.00	0.80
						No Ice	0.00	0.06
FB-L98B-002-75000(3/8)	C	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						No Ice	0.00	0.68
WR-VG86ST-BRDA(7/8) **108**	C	No	Inside Pole	118.00 - 0.00	2	No Ice	0.00	0.68
						1/2" Ice	0.00	0.68
						1" Ice	0.00	0.68
LDF4-50A(1/2) ****	B	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section n	Tower Elevation ft	Face	A _R	A _F	C _{AA} In Face	C _{AA} Out Face	Weight K
			ft ²	ft ²	ft ²	ft ²	
L1	163.00-121.58	A	0.000	0.000	0.000	0.000	0.49
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.19
L2	121.58-84.66	A	0.000	0.000	0.000	0.000	0.64
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.73
L3	84.66-42.20	A	0.000	0.000	0.000	0.000	0.73
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.89
L4	42.20-0.00	A	0.000	0.000	1.386	0.000	0.73
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.88

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R	A _F	C _{AA} In Face	C _{AA} Out Face	Weight K
				ft ²	ft ²	ft ²	ft ²	
L1	163.00-121.58	A	2.314	0.000	0.000	0.000	0.000	0.49
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.19
L2	121.58-84.66	A	2.241	0.000	0.000	0.000	0.000	0.64
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.73
L3	84.66-42.20	A	2.134	0.000	0.000	0.000	0.000	0.73
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.89
L4	42.20-0.00	A	1.916	0.000	0.000	10.778	0.000	0.89
		B		0.000	0.000	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.88

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L1	163.00-121.58	0.0000	0.0000	0.0000	0.0000
L2	121.58-84.66	0.0000	0.0000	0.0000	0.0000
L3	84.66-42.20	0.0000	0.0000	0.0000	0.0000
L4	42.20-0.00	-0.0441	0.0242	-0.3076	0.1691

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L3	18	LDF4-50A(1/2)	42.20 - 22.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Vert					
160									
SC229-SFXLDF	A	From Leg	4.00	0.0000	160.00	No Ice	5.95	5.95	0.03
			0.00	0.0000		1/2"	7.97	7.97	0.07
			11.00	0.0000		Ice	10.00	10.00	0.13
Side Arm Mount [SO 301-1]	A	From Leg	1.00	0.0000	160.00	No Ice	1.00	0.90	0.02
			0.00	0.0000		1/2"	1.39	1.42	0.03
			0.00	0.0000		Ice	1.78	1.94	0.04
156ft									
1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	156.00	No Ice	2.31	2.38	0.06
			0.00	0.0000		1/2"	2.52	2.58	0.08
			0.00	0.0000		Ice	2.73	2.79	0.11
1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	156.00	No Ice	2.31	2.38	0.06
			0.00	0.0000		1/2"	2.52	2.58	0.08
			0.00	0.0000		Ice	2.73	2.79	0.11
1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	156.00	No Ice	2.31	2.38	0.06
			0.00	0.0000		1/2"	2.52	2.58	0.08
			0.00	0.0000		Ice	2.73	2.79	0.11
800 EXTERNAL NOTCH FILTER	A	From Leg	4.00	0.0000	156.00	No Ice	0.66	0.32	0.01
			0.00	0.0000		1/2"	0.76	0.40	0.02
			0.00	0.0000		Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	156.00	No Ice	0.66	0.32	0.01
			0.00	0.0000		1/2"	0.76	0.40	0.02
			0.00	0.0000		Ice	0.87	0.48	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	156.00	No Ice	0.66	0.32	0.01
			0.00	0.0000		1/2"	0.76	0.40	0.02
			0.00	0.0000		Ice	0.87	0.48	0.02
800MHZ RRH	A	From Leg	4.00	0.0000	156.00	No Ice	2.13	1.77	0.05
			0.00	0.0000		1/2"	2.32	1.95	0.07

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft ²	ft ²	K	
			0.00				Ice	2.51	2.13	0.10	
800MHZ RRH	B	From Leg	4.00			0.0000	156.00	1" Ice			
			0.00					No Ice	2.13	1.77	0.05
			0.00					1/2"	2.32	1.95	0.07
800MHZ RRH	C	From Leg	4.00			0.0000	156.00	Ice	2.51	2.13	0.10
			0.00					1" Ice			
			0.00					No Ice	2.13	1.77	0.05
(3) ACU-A20-N	A	From Leg	4.00			0.0000	156.00	1/2"	0.10	0.16	0.00
			0.00					Ice	0.15	0.21	0.00
			0.00					1" Ice			
(3) ACU-A20-N	B	From Leg	4.00			0.0000	156.00	No Ice	0.07	0.12	0.00
			0.00					1/2"	0.10	0.16	0.00
			0.00					Ice	0.15	0.21	0.00
(3) ACU-A20-N	C	From Leg	4.00			0.0000	156.00	1" Ice			
			0.00					No Ice	0.07	0.12	0.00
			0.00					1/2"	0.10	0.16	0.00
(3) TD-RRH-4x20-2500	A	From Leg	4.00			0.0000	156.00	Ice	0.15	0.21	0.00
			0.00					1" Ice			
			2.00					No Ice	2.76	1.14	0.10
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00			0.0000	156.00	1/2"	2.97	1.30	0.12
			0.00					Ice	3.19	1.47	0.14
			2.00					1" Ice			
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00			0.0000	156.00	No Ice	6.58	4.96	0.08
			0.00					1/2"	7.03	5.75	0.13
			2.00					Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00			0.0000	156.00	1" Ice			
			0.00					No Ice	6.58	4.96	0.08
			2.00					1/2"	7.03	5.75	0.13
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00			0.0000	156.00	Ice	7.47	6.47	0.19
			0.00					1" Ice			
			2.00					No Ice	6.58	4.96	0.08
APX/SPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00			0.0000	156.00	1/2"	8.82	8.13	0.15
			0.00					Ice	9.35	9.02	0.23
			2.00					1" Ice			
APX/SPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00			0.0000	156.00	No Ice	8.26	6.95	0.08
			0.00					1/2"	8.82	8.13	0.15
			2.00					Ice	9.35	9.02	0.23
APX/SPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00			0.0000	156.00	1" Ice			
			0.00					No Ice	8.26	6.95	0.08
			2.00					1/2"	8.82	8.13	0.15
6' x 2" Mount Pipe	A	From Leg	4.00			0.0000	156.00	Ice	9.35	9.02	0.23
			0.00					1" Ice			
			0.00					No Ice	1.43	1.43	0.02
6' x 2" Mount Pipe	B	From Leg	4.00			0.0000	156.00	1/2"	1.92	1.92	0.03
			0.00					Ice	2.29	2.29	0.05
			0.00					1" Ice			
6' x 2" Mount Pipe	C	From Leg	4.00			0.0000	156.00	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
Platform Mount [LP 602-1]	A	None				0.0000	156.00	1" Ice			
								No Ice	32.03	32.03	1.34
								1/2"	38.71	38.71	1.80
							Ice	45.39	45.39	2.26	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
						1" Ice			
148									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	148.00	No Ice 1/2" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
(3) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	4.56 5.11 5.61	10.26 11.43 12.31	0.05 0.11 0.19
RRH2x60-700	A	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2x60-700	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2x60-700	C	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	A	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-PCS	A	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
RRH2X60-PCS	C	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	2.20 2.39 2.59	1.72 1.90 2.09	0.06 0.08 0.10
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	8.39 8.95 9.48	7.08 8.28 9.19	0.08 0.15 0.22
FD9R6004/2C-3L	B	From Leg	4.00 0.00 2.00	0.0000	148.00	1" Ice No Ice 1/2" Ice	0.31 0.39 0.47	0.08 0.12 0.17	0.00 0.01 0.01

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
FD9R6004/2C-3L	C	From Leg	4.00	0.0000	148.00	1" Ice				
			0.00			No Ice	0.31	0.08	0.00	
			2.00			1/2"	0.39	0.12	0.01	
FD9R6004/2C-3L	A	From Leg	4.00	0.0000	148.00	1" Ice				
			0.00			No Ice	0.31	0.08	0.00	
			2.00			1/2"	0.39	0.12	0.01	
FD9R6004/2C-3L	B	From Leg	4.00	0.0000	148.00	1" Ice				
			0.00			No Ice	0.31	0.08	0.00	
			0.00			1/2"	0.39	0.12	0.01	
FD9R6004/2C-3L	C	From Leg	4.00	0.0000	148.00	1" Ice				
			0.00			No Ice	0.31	0.08	0.00	
			0.00			1/2"	0.39	0.12	0.01	
FD9R6004/2C-3L	A	From Leg	4.00	0.0000	148.00	1" Ice				
			0.00			No Ice	0.31	0.08	0.00	
			0.00			1/2"	0.39	0.12	0.01	
Platform Mount [LP 401-1]	B	None		0.0000	148.00	1" Ice				
						No Ice	24.33	24.33	1.65	
						1/2"	30.22	30.22	2.03	
141 (4) DB846G90A-XY w/ Mount Pipe	A	From Leg	4.00	0.0000	141.00	1" Ice				
			0.00			No Ice	5.23	7.53	0.04	
			1.00			1/2"	5.78	8.72	0.10	
(4) DB846G90A-XY w/ Mount Pipe	B	From Leg	4.00	0.0000	141.00	1" Ice				
			0.00			No Ice	5.23	7.53	0.04	
			1.00			1/2"	5.78	8.72	0.10	
(4) DB846G90A-XY w/ Mount Pipe	C	From Leg	4.00	0.0000	141.00	1" Ice				
			0.00			No Ice	5.23	7.53	0.04	
			1.00			1/2"	5.78	8.72	0.10	
Platform Mount [LP 303-1]	A	None		0.0000	141.00	1" Ice				
						No Ice	14.66	14.66	1.25	
						1/2"	18.87	18.87	1.48	
120 (2) TME-RRUS-11	A	From Leg	2.00	0.0000	120.00	1" Ice				
			0.00			No Ice	2.96	1.67	0.06	
			1.00			1/2"	3.23	1.98	0.08	
(2) TME-RRUS-11	B	From Leg	2.00	0.0000	120.00	1" Ice				
			0.00			No Ice	2.96	1.67	0.06	
			1.00			1/2"	3.23	1.98	0.08	
(2) TME-RRUS-11	C	From Leg	2.00	0.0000	120.00	1" Ice				
			0.00			No Ice	2.96	1.67	0.06	
			1.00			1/2"	3.23	1.98	0.08	
Side Arm Mount [SO 104-3]	C	From Leg	2.00	0.0000	120.00	1" Ice				
			0.00			No Ice	3.30	3.30	0.29	
			0.00			1/2"	4.13	4.13	0.32	
4' x 2" Pipe Mount	A	From Leg	2.00	0.0000	120.00	1" Ice				
			0.00			No Ice	0.79	0.79	0.03	
			0.00			1/2"	1.03	1.03	0.04	
4' x 2" Pipe Mount	B	From Leg	2.00	0.0000	120.00	1" Ice				
			0.00			No Ice	0.79	0.79	0.03	
			0.00			1/2"	1.03	1.03	0.04	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral	Vert						ft
			0.00								
4' x 2" Pipe Mount	C	None					Ice	1.28	1.28	0.04	
							1" Ice				
						0.0000	120.00	No Ice	0.79	0.79	0.03
								1/2"	1.03	1.03	0.04
						Ice	1.28	1.28	0.04		
						1" Ice					
118ft											
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00		0.0000	118.00	No Ice	5.75	4.25	0.06	
			0.00				1/2"	6.18	5.01	0.10	
			1.00				Ice	6.61	5.71	0.16	
						1" Ice					
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00		0.0000	118.00	No Ice	5.75	4.25	0.06	
			0.00				1/2"	6.18	5.01	0.10	
			1.00				Ice	6.61	5.71	0.16	
						1" Ice					
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00		0.0000	118.00	No Ice	5.75	4.25	0.06	
			0.00				1/2"	6.18	5.01	0.10	
			1.00				Ice	6.61	5.71	0.16	
						1" Ice					
(2) LGP21401	A	From Leg	4.00		0.0000	118.00	No Ice	1.10	0.21	0.01	
			0.00				1/2"	1.24	0.27	0.02	
			1.00				Ice	1.38	0.35	0.03	
						1" Ice					
(2) LGP21901	A	From Leg	4.00		0.0000	118.00	No Ice	0.23	0.16	0.01	
			0.00				1/2"	0.29	0.21	0.01	
			1.00				Ice	0.36	0.28	0.01	
						1" Ice					
(2) LGP21401	B	From Leg	4.00		0.0000	118.00	No Ice	1.10	0.21	0.01	
			0.00				1/2"	1.24	0.27	0.02	
			1.00				Ice	1.38	0.35	0.03	
						1" Ice					
(2) LGP21901	B	From Leg	4.00		0.0000	118.00	No Ice	0.23	0.16	0.01	
			0.00				1/2"	0.29	0.21	0.01	
			1.00				Ice	0.36	0.28	0.01	
						1" Ice					
(2) LGP21401	C	From Leg	4.00		0.0000	118.00	No Ice	1.10	0.21	0.01	
			0.00				1/2"	1.24	0.27	0.02	
			1.00				Ice	1.38	0.35	0.03	
						1" Ice					
(2) LGP21901	C	From Leg	4.00		0.0000	118.00	No Ice	0.23	0.16	0.01	
			0.00				1/2"	0.29	0.21	0.01	
			1.00				Ice	0.36	0.28	0.01	
						1" Ice					
RRUS 11 B12	A	From Leg	4.00		0.0000	118.00	No Ice	2.83	1.18	0.05	
			0.00				1/2"	3.04	1.33	0.07	
			1.00				Ice	3.26	1.48	0.10	
						1" Ice					
RRUS 11 B12	B	From Leg	4.00		0.0000	118.00	No Ice	2.83	1.18	0.05	
			0.00				1/2"	3.04	1.33	0.07	
			1.00				Ice	3.26	1.48	0.10	
						1" Ice					
RRUS 11 B12	C	From Leg	4.00		0.0000	118.00	No Ice	2.83	1.18	0.05	
			0.00				1/2"	3.04	1.33	0.07	
			1.00				Ice	3.26	1.48	0.10	
						1" Ice					
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00		0.0000	118.00	No Ice	8.26	6.30	0.07	
			0.00				1/2"	8.82	7.48	0.14	
			1.00				Ice	9.35	8.37	0.21	
						1" Ice					
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00		0.0000	118.00	No Ice	8.26	6.30	0.07	
			0.00				1/2"	8.82	7.48	0.14	
			1.00				Ice	9.35	8.37	0.21	
						1" Ice					
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00		0.0000	118.00	No Ice	8.26	6.30	0.07	
			0.00				1/2"	8.82	7.48	0.14	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
			1.00			Ice 9.35	8.37	0.21
DC6-48-60-18-8F	B	From Leg	4.00 0.00 1.00	0.0000	118.00	1" Ice No Ice 0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	118.00	1" Ice No Ice 1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	118.00	1" Ice No Ice 1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	118.00	1" Ice No Ice 1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
Platform Mount [LP 401-1]	C	None		0.0000	118.00	1" Ice No Ice 24.33 30.22 36.11	24.33 30.22 36.11	1.65 2.03 2.41
108ft ANT150D6-9	A	From Leg	2.00 0.00 2.00	0.0000	108.00	1" Ice No Ice 3.84 6.42 9.00	3.84 6.42 9.00	0.00 0.00 0.00
***** KS24019-L112A	A	From Leg	1.00 0.00 2.00	0.0000	22.00	1" Ice No Ice 0.10 0.18 0.26	0.10 0.18 0.26	0.01 0.01 0.01
Side Arm Mount [SO 701-1]	A	None		0.0000	22.00	1" Ice No Ice 0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice

Comb. No.	Description
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	163 - 121.58	Pole	Max Tension	14	0.00	0.00	0.00
			Max. Compression	26	-38.70	-1.61	6.21
			Max. Mx	8	-14.03	-404.85	6.53
			Max. My	2	-14.01	-4.63	413.19
			Max. Vy	20	-18.73	404.16	-2.18
			Max. Vx	2	-18.95	-4.63	413.19
			Max. Torque	11			3.22
L2	121.58 - 84.663	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-65.23	-0.95	5.28
			Max. Mx	20	-27.94	1296.22	-9.80
			Max. My	2	-27.92	-10.82	1311.47
			Max. Vy	20	-28.07	1296.22	-9.80
			Max. Vx	2	-28.28	-10.82	1311.47
			Max. Torque	11			3.39
L3	84.663 - 42.2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.37	-0.95	5.28
			Max. Mx	20	-43.60	2566.52	-17.86
			Max. My	2	-43.59	-18.95	2590.69
			Max. Vy	20	-32.96	2566.52	-17.86
			Max. Vx	2	-33.17	-18.95	2590.69
			Max. Torque	11			3.38
L4	42.2 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-119.43	-0.58	5.12
			Max. Mx	20	-67.77	4336.34	-27.38
			Max. My	2	-67.77	-28.48	4371.00
			Max. Vy	20	-37.80	4336.34	-27.38

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-38.01	-28.48	4371.00
			Max. Torque	11			3.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	28	119.43	-4.11	7.13
	Max. H _x	20	67.79	37.77	-0.19
	Max. H _z	2	67.79	-0.19	37.97
	Max. M _x	2	4371.00	-0.19	37.97
	Max. M _z	8	4335.20	-37.77	0.19
	Max. Torsion	11	3.39	-32.61	-18.82
	Min. Vert	11	50.84	-32.61	-18.82
	Min. H _x	8	67.79	-37.77	0.19
	Min. H _z	14	67.79	0.19	-37.97
	Min. M _x	14	-4367.63	0.19	-37.97
	Min. M _z	20	-4336.34	37.77	-0.19
	Min. Torsion	23	-3.37	32.61	18.82

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	56.49	0.00	0.00	-1.34	0.45	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	67.79	0.19	-37.97	-4371.00	-28.48	1.69
0.9 Dead+1.6 Wind 0 deg - No Ice	50.84	0.19	-37.97	-4339.43	-28.40	1.69
1.2 Dead+1.6 Wind 30 deg - No Ice	67.79	19.05	-32.98	-3800.14	-2192.46	-0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	50.84	19.05	-32.98	-3772.62	-2176.97	-0.01
1.2 Dead+1.6 Wind 60 deg - No Ice	67.79	32.80	-19.15	-2211.51	-3768.82	-1.70
0.9 Dead+1.6 Wind 60 deg - No Ice	50.84	32.80	-19.15	-2195.30	-3742.12	-1.71
1.2 Dead+1.6 Wind 90 deg - No Ice	67.79	37.77	-0.19	-30.74	-4335.20	-2.94
0.9 Dead+1.6 Wind 90 deg - No Ice	50.84	37.77	-0.19	-30.07	-4304.49	-2.95
1.2 Dead+1.6 Wind 120 deg - No Ice	67.79	32.61	18.82	2157.84	-3739.81	-3.38
0.9 Dead+1.6 Wind 120 deg - No Ice	50.84	32.61	18.82	2142.91	-3713.34	-3.39
1.2 Dead+1.6 Wind 150 deg - No Ice	67.79	18.72	32.79	3767.76	-2142.15	-2.91
0.9 Dead+1.6 Wind 150 deg - No Ice	50.84	18.72	32.79	3741.35	-2127.06	-2.91
1.2 Dead+1.6 Wind 180 deg - No Ice	67.79	-0.19	37.97	4367.63	29.63	-1.66
0.9 Dead+1.6 Wind 180 deg - No Ice	50.84	-0.19	37.97	4336.93	29.25	-1.66
1.2 Dead+1.6 Wind 210 deg - No Ice	67.79	-19.05	32.98	3796.77	2193.60	0.02
0.9 Dead+1.6 Wind 210 deg - No Ice	50.84	-19.05	32.98	3770.12	2177.82	0.03
1.2 Dead+1.6 Wind 240 deg - No Ice	67.79	-32.80	19.15	2208.14	3769.96	1.69

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 240 deg - No Ice	50.84	-32.80	19.15	2192.81	3742.97	1.70
1.2 Dead+1.6 Wind 270 deg - No Ice	67.79	-37.77	0.19	27.38	4336.34	2.91
0.9 Dead+1.6 Wind 270 deg - No Ice	50.84	-37.77	0.19	27.58	4305.33	2.92
1.2 Dead+1.6 Wind 300 deg - No Ice	67.79	-32.61	-18.82	-2161.20	3740.95	3.36
0.9 Dead+1.6 Wind 300 deg - No Ice	50.84	-32.61	-18.82	-2145.39	3714.19	3.37
1.2 Dead+1.6 Wind 330 deg - No Ice	67.79	-18.72	-32.79	-3771.13	2143.30	2.92
0.9 Dead+1.6 Wind 330 deg - No Ice	50.84	-18.72	-32.79	-3743.83	2127.92	2.92
1.2 Dead+1.0 Ice+1.0 Temp	119.43	0.00	-0.00	-5.12	-0.58	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	119.43	0.02	-8.22	-964.69	-4.06	0.25
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	119.43	4.11	-7.13	-837.89	-481.21	-0.26
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	119.43	7.11	-4.13	-488.04	-829.58	-0.70
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	119.43	8.19	-0.02	-8.88	-955.84	-0.95
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	119.43	7.08	4.09	471.20	-826.15	-0.95
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	119.43	4.08	7.11	823.56	-475.27	-0.70
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	119.43	-0.02	8.22	953.79	2.80	-0.25
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	119.43	-4.11	7.13	826.99	479.94	0.26
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	119.43	-7.11	4.13	477.14	828.32	0.70
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	119.43	-8.19	0.02	-2.02	954.58	0.95
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	119.43	-7.08	-4.09	-482.10	824.89	0.95
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	119.43	-4.08	-7.11	-834.46	474.00	0.70
Dead+Wind 0 deg - Service	56.49	0.04	-8.84	-1013.99	-6.26	0.39
Dead+Wind 30 deg - Service	56.49	4.43	-7.68	-881.70	-507.77	-0.00
Dead+Wind 60 deg - Service	56.49	7.64	-4.46	-513.52	-873.09	-0.40
Dead+Wind 90 deg - Service	56.49	8.79	-0.04	-8.13	-1004.35	-0.69
Dead+Wind 120 deg - Service	56.49	7.59	4.38	499.07	-866.36	-0.79
Dead+Wind 150 deg - Service	56.49	4.36	7.63	872.17	-496.11	-0.68
Dead+Wind 180 deg - Service	56.49	-0.04	8.84	1011.20	7.20	-0.39
Dead+Wind 210 deg - Service	56.49	-4.43	7.68	878.90	508.71	0.00
Dead+Wind 240 deg - Service	56.49	-7.64	4.46	510.73	874.03	0.40
Dead+Wind 270 deg - Service	56.49	-8.79	0.04	5.33	1005.29	0.68
Dead+Wind 300 deg - Service	56.49	-7.59	-4.38	-501.87	867.30	0.79
Dead+Wind 330 deg - Service	56.49	-4.36	-7.63	-874.96	497.05	0.68

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	-56.49	0.00	0.00	56.49	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	
2	0.19	-67.79	-37.97	-0.19	67.79	37.97	0.000%
3	0.19	-50.84	-37.97	-0.19	50.84	37.97	0.000%
4	19.05	-67.79	-32.98	-19.05	67.79	32.98	0.000%
5	19.05	-50.84	-32.98	-19.05	50.84	32.98	0.000%
6	32.80	-67.79	-19.15	-32.80	67.79	19.15	0.000%
7	32.80	-50.84	-19.15	-32.80	50.84	19.15	0.000%
8	37.77	-67.79	-0.19	-37.77	67.79	0.19	0.000%
9	37.77	-50.84	-0.19	-37.77	50.84	0.19	0.000%
10	32.61	-67.79	18.82	-32.61	67.79	-18.82	0.000%
11	32.61	-50.84	18.82	-32.61	50.84	-18.82	0.000%
12	18.72	-67.79	32.79	-18.72	67.79	-32.79	0.000%
13	18.72	-50.84	32.79	-18.72	50.84	-32.79	0.000%
14	-0.19	-67.79	37.97	0.19	67.79	-37.97	0.000%
15	-0.19	-50.84	37.97	0.19	50.84	-37.97	0.000%
16	-19.05	-67.79	32.98	19.05	67.79	-32.98	0.000%
17	-19.05	-50.84	32.98	19.05	50.84	-32.98	0.000%
18	-32.80	-67.79	19.15	32.80	67.79	-19.15	0.000%
19	-32.80	-50.84	19.15	32.80	50.84	-19.15	0.000%
20	-37.77	-67.79	0.19	37.77	67.79	-0.19	0.000%
21	-37.77	-50.84	0.19	37.77	50.84	-0.19	0.000%
22	-32.61	-67.79	-18.82	32.61	67.79	18.82	0.000%
23	-32.61	-50.84	-18.82	32.61	50.84	18.82	0.000%
24	-18.72	-67.79	-32.79	18.72	67.79	32.79	0.000%
25	-18.72	-50.84	-32.79	18.72	50.84	32.79	0.000%
26	0.00	-119.43	0.00	-0.00	119.43	0.00	0.000%
27	0.02	-119.43	-8.22	-0.02	119.43	8.22	0.000%
28	4.11	-119.43	-7.13	-4.11	119.43	7.13	0.000%
29	7.11	-119.43	-4.13	-7.11	119.43	4.13	0.000%
30	8.19	-119.43	-0.02	-8.19	119.43	0.02	0.000%
31	7.08	-119.43	4.09	-7.08	119.43	-4.09	0.000%
32	4.08	-119.43	7.11	-4.08	119.43	-7.11	0.000%
33	-0.02	-119.43	8.22	0.02	119.43	-8.22	0.000%
34	-4.11	-119.43	7.13	4.11	119.43	-7.13	0.000%
35	-7.11	-119.43	4.13	7.11	119.43	-4.13	0.000%
36	-8.19	-119.43	0.02	8.19	119.43	-0.02	0.000%
37	-7.08	-119.43	-4.09	7.08	119.43	4.09	0.000%
38	-4.08	-119.43	-7.11	4.08	119.43	7.11	0.000%
39	0.04	-56.49	-8.84	-0.04	56.49	8.84	0.000%
40	4.43	-56.49	-7.68	-4.43	56.49	7.68	0.000%
41	7.64	-56.49	-4.46	-7.64	56.49	4.46	0.000%
42	8.79	-56.49	-0.04	-8.79	56.49	0.04	0.000%
43	7.59	-56.49	4.38	-7.59	56.49	-4.38	0.000%
44	4.36	-56.49	7.63	-4.36	56.49	-7.63	0.000%
45	-0.04	-56.49	8.84	0.04	56.49	-8.84	0.000%
46	-4.43	-56.49	7.68	4.43	56.49	-7.68	0.000%
47	-7.64	-56.49	4.46	7.64	56.49	-4.46	0.000%
48	-8.79	-56.49	0.04	8.79	56.49	-0.04	0.000%
49	-7.59	-56.49	-4.38	7.59	56.49	4.38	0.000%
50	-4.36	-56.49	-7.63	4.36	56.49	7.63	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	0.00042862
3	Yes	4	0.00000001	0.00027921
4	Yes	5	0.00000001	0.00016731
5	Yes	5	0.00000001	0.00007895
6	Yes	5	0.00000001	0.00017188
7	Yes	5	0.00000001	0.00008132
8	Yes	4	0.00000001	0.00064951
9	Yes	4	0.00000001	0.00042682
10	Yes	5	0.00000001	0.00015005
11	Yes	5	0.00000001	0.00007090

12	Yes	5	0.00000001	0.00017038
13	Yes	5	0.00000001	0.00008102
14	Yes	4	0.00000001	0.00026146
15	Yes	4	0.00000001	0.00016793
16	Yes	5	0.00000001	0.00016663
17	Yes	5	0.00000001	0.00007869
18	Yes	5	0.00000001	0.00016134
19	Yes	5	0.00000001	0.00007611
20	Yes	4	0.00000001	0.00047889
21	Yes	4	0.00000001	0.00031478
22	Yes	5	0.00000001	0.00017179
23	Yes	5	0.00000001	0.00008169
24	Yes	5	0.00000001	0.00015206
25	Yes	5	0.00000001	0.00007174
26	Yes	4	0.00000001	0.00002007
27	Yes	5	0.00000001	0.00015117
28	Yes	5	0.00000001	0.00016277
29	Yes	5	0.00000001	0.00016265
30	Yes	5	0.00000001	0.00014929
31	Yes	5	0.00000001	0.00015793
32	Yes	5	0.00000001	0.00015837
33	Yes	5	0.00000001	0.00014757
34	Yes	5	0.00000001	0.00015895
35	Yes	5	0.00000001	0.00015867
36	Yes	5	0.00000001	0.00014861
37	Yes	5	0.00000001	0.00016085
38	Yes	5	0.00000001	0.00016082
39	Yes	4	0.00000001	0.00003001
40	Yes	4	0.00000001	0.00008622
41	Yes	4	0.00000001	0.00009411
42	Yes	4	0.00000001	0.00003960
43	Yes	4	0.00000001	0.00007474
44	Yes	4	0.00000001	0.00009881
45	Yes	4	0.00000001	0.00002835
46	Yes	4	0.00000001	0.00008517
47	Yes	4	0.00000001	0.00007970
48	Yes	4	0.00000001	0.00003777
49	Yes	4	0.00000001	0.00010241
50	Yes	4	0.00000001	0.00007565

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	163 - 121.58	14.076	40	0.6757	0.0026
L2	127.413 - 84.663	9.132	40	0.6296	0.0015
L3	91.33 - 42.2	4.836	40	0.4838	0.0008
L4	49.783 - 0	1.483	40	0.2657	0.0003

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	40	13.648	0.6738	0.0025	144890
156.00	1900MHz RRH (65MHz)	40	13.080	0.6710	0.0024	103493
148.00	(2) LPA-80080/6CF w/ Mount Pipe	40	11.949	0.6643	0.0021	48296
141.00	(4) DB846G90A-XY w/ Mount Pipe	40	10.972	0.6561	0.0019	32929
120.00	(2) TME-RRUS-11	40	8.171	0.6076	0.0014	18051
118.00	(2) 7770.00 w/ Mount Pipe	40	7.918	0.6007	0.0013	17516
108.00	ANT150D6-9	40	6.695	0.5616	0.0011	15255

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
22.00	KS24019-L112A	40	0.442	0.1171	0.0001	18660

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	163 - 121.58	60.650	4	2.9070	0.0113
L2	127.413 - 84.663	39.379	4	2.7145	0.0065
L3	91.33 - 42.2	20.859	4	2.0873	0.0035
L4	49.783 - 0	6.396	4	1.1462	0.0014

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
160.00	SC229-SFXLDF	4	58.812	2.8992	0.0110	34339
156.00	1900MHz RRH (65MHz)	4	56.366	2.8882	0.0104	24528
148.00	(2) LPA-80080/6CF w/ Mount Pipe	4	51.501	2.8608	0.0092	11445
141.00	(4) DB846G90A-XY w/ Mount Pipe	4	47.299	2.8265	0.0083	7803
120.00	(2) TME-RRUS-11	4	35.239	2.6200	0.0058	4252
118.00	(2) 7770.00 w/ Mount Pipe	4	34.148	2.5906	0.0056	4121
108.00	ANT150D6-9	4	28.876	2.4226	0.0048	3569
22.00	KS24019-L112A	4	1.904	0.5051	0.0006	4327

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	KI/r	A	P _u	φP _n	Ratio P _u /φP _n
	ft		ft	ft		in ²	K	K	
L1	163 - 121.58 (1)	TP42.37x34.28x0.3125	41.42	0.00	0.0	40.5858	-14.00	2781.86	0.005
L2	121.58 - 84.663 (2)	TP48.83x40.6057x0.375	42.75	0.00	0.0	56.1469	-27.91	3902.28	0.007
L3	84.663 - 42.2 (3)	TP56.25x46.7974x0.4375	49.13	0.00	0.0	75.4767	-43.58	5267.61	0.008
L4	42.2 - 0 (4)	TP63.5x53.916x0.5	49.78	0.00	0.0	99.9810	-67.77	6944.95	0.010

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	φM _{nx}	Ratio M _{ux} /φM _{nx}	M _{uy}	φM _{ny}	Ratio M _{uy} /φM _{ny}
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	163 - 121.58	TP42.37x34.28x0.3125	415.22	2341.21	0.177	0.00	2341.21	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L2	(1) 121.58 - 84.663	TP48.83x40.6057x0.375	1317.29	3784.95	0.348	0.00	3784.95	0.000
L3	(2) 84.663 - 42.2	TP56.25x46.7974x0.4375	2601.30	5886.43	0.442	0.00	5886.43	0.000
L4	(3) 42.2 - 0	TP63.5x53.916x0.5	4387.25	8996.42	0.488	0.00	8996.42	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	163 - 121.58 (1)	TP42.37x34.28x0.3125	19.06	1390.93	0.014	0.44	4688.14	0.000
L2	121.58 - 84.663 (2)	TP48.83x40.6057x0.375	28.40	1951.14	0.015	0.00	7579.16	0.000
L3	84.663 - 42.2 (3)	TP56.25x46.7974x0.4375	33.29	2633.80	0.013	0.00	11787.25	0.000
L4	42.2 - 0 (4)	TP63.5x53.916x0.5	38.12	3472.48	0.011	0.00	18014.83	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	163 - 121.58 (1)	0.005	0.177	0.000	0.014	0.000	0.183	1.000	4.8.2 ✓
L2	121.58 - 84.663 (2)	0.007	0.348	0.000	0.015	0.000	0.355	1.000	4.8.2 ✓
L3	84.663 - 42.2 (3)	0.008	0.442	0.000	0.013	0.000	0.450	1.000	4.8.2 ✓
L4	42.2 - 0 (4)	0.010	0.488	0.000	0.011	0.000	0.498	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	163 - 121.58	Pole	TP42.37x34.28x0.3125	1	-14.00	2781.86	18.3	Pass
L2	121.58 - 84.663	Pole	TP48.83x40.6057x0.375	2	-27.91	3902.28	35.5	Pass
L3	84.663 - 42.2	Pole	TP56.25x46.7974x0.4375	3	-43.58	5267.61	45.0	Pass
L4	42.2 - 0	Pole	TP63.5x53.916x0.5	4	-67.77	6944.95	49.8	Pass
Summary								
Pole (L4)							49.8	Pass
RATING =							49.8	Pass

APPENDIX B
BASE LEVEL DRAWING



(RESERVED)
(2) 1-5/8" TO 148 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 148 FT LEVEL

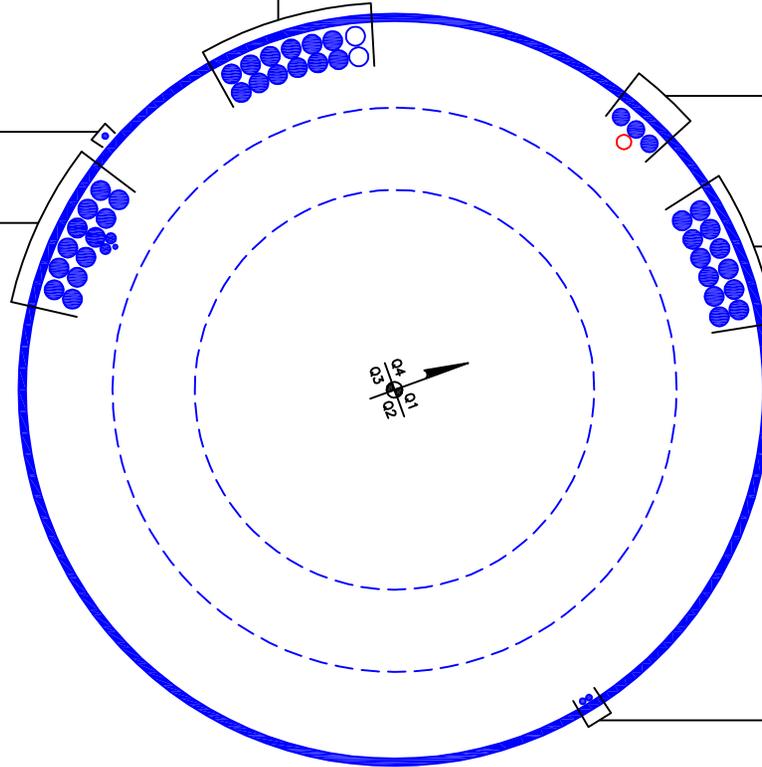
(INSTALLED)
(1) 1/2" TO 22 FT LEVEL

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

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

(ABANDONED)
(12) 1-5/8" TO 141 FT LEVEL

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



BUSINESS UNIT: 876379 TOWER ID: C_BASELEVEL

APPENDIX C
ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: 876379
Site Name: N. WOODBURY / WOLFF PARCEL
App #: 393602 Rev# 0
Pole Manufacturer: Other

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

Plate Data

Diam:	79	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	9.16	in

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

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

Reactions

Mu:	4387	ft-kips
Axial, Pu:	68	kips
Shear, Vu:	38	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

Max Rod (Cu+ Vu/η): 137.7 Kips
 Allowable Axial, $\Phi \cdot Fu \cdot Anet$: 260.0 Kips
 Anchor Rod Stress Ratio: 53.0% **Pass**

Rigid
AISC LRFD
$\phi \cdot Tn$

Base Plate Results

Base Plate Stress: 22.3 ksi
 Allowable Plate Stress: 54.0 ksi
 Base Plate Stress Ratio: 41.3% **Pass**

Flexural Check

Rigid
AISC LRFD
$\phi \cdot Fy$
Y.L. Length:
36.01

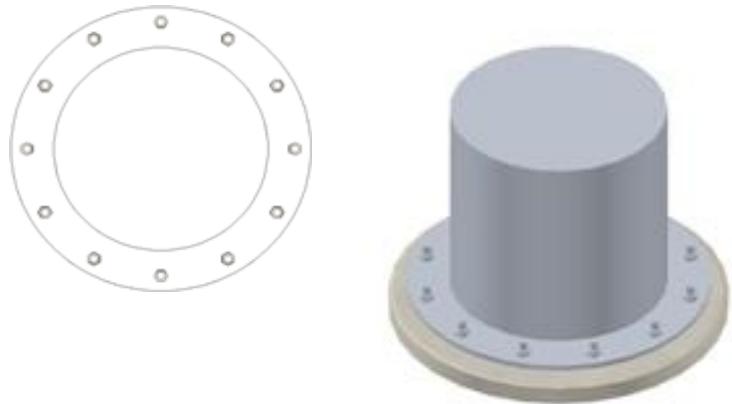
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: n/a
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 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

Drilled Pier Foundation



BU #: 876379
 Site Name: N. Woodbury / Wolff P.
 App. Number: 393602 rev# 0

TIA-222 Revison: G
 Tower Type: Monopole

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	4387	
Axial Force (kips)	68	
Shear Force (kips)	38	

Material Properties		
Concrete Strength, f'c:	4	ksi
Rebar Strength, Fy:	60	ksi

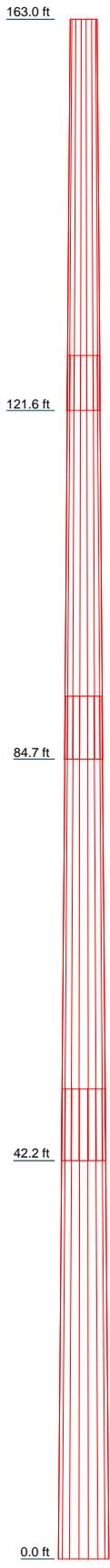
Pier Design Data		
Depth	28	ft
Ext. Above Grade	1	ft
Pier Section 1		
<i>From 1' above grade to 28' below grade</i>		
Pier Diameter	8	ft
Rebar Quantity	32	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results		
Soil Lateral Capacity		
	Compression	Uplift
D _{v=0} (ft from TOC)	7.53	-
Soil Safety Factor	4.79	-
Max Moment (kip-ft)	4670.26	-
Rating	27.8%	-
Soil Vertical Capacity		
	Compression	Uplift
Skin Friction (kips)	557.95	-
End Bearing (kips)	1206.37	-
Weight of Concrete (kips)	211.57	-
Total Capacity (kips)	1764.32	-
Axial (kips)	279.57	-
Rating	15.8%	-
Reinforced Concrete Capacity		
	Compression	Uplift
Critical Depth (ft from TOC)	7.21	-
Critical Moment (kip-ft)	4669.33	-
Critical Moment Capacity	9254.46	-
Rating	50.5%	-
Soil Interaction Rating		27.8%
Structural Foundation Rating		50.5%

Soil Profile			
Groundwater Depth	14.5	ft	# of Layers
			4

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ultimate Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	135	150	0	0	0.000	0.000	0.00	0.00	0		Cohesionless
2	4	14.5	10.5	135	150	0	38	0.000	0.000	0.80	0.80			Cohesionless
3	14.5	15	0.5	75	87.6	0	38	0.000	0.000	0.80	0.80			Cohesionless
4	15	28	13	75	87.6	0	38	0.000	0.000	1.60	1.60	32		Cohesionless

Section	1	2	3	4	Grade	Weight (K)
Length (ft)	41.42	42.75	49.13	49.78	A572-65	40.5
Number of Sides	18	18	18	18		15.6
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			
		7.7	11.9			



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Seismic Discrete Force 1	171	Seismic Linear Force 10	105
Seismic Discrete Force 2	160	Seismic Linear Force 11	104
Seismic Discrete Force 3	158	Seismic Section Force 8	102.413
Seismic Section Force 1	158	Seismic Linear Force 12	95
Seismic Discrete Force 4	156	Seismic Section Force 9	92.413
Seismic Linear Force 1	155	Seismic Section Force 11	86.33
Seismic Linear Force 2	153	Seismic Section Force 10	86.038
Seismic Discrete Force 5	150	Seismic Linear Force 13	85
Seismic Discrete Force 6	148	Seismic Section Force 12	76.33
Seismic Section Force 2	148	Seismic Linear Force 14	75
Seismic Linear Force 3	145	Seismic Section Force 13	66.33
Seismic Linear Force 4	144	Seismic Linear Force 15	65
Seismic Discrete Force 7	142	Seismic Section Force 14	56.33
Seismic Discrete Force 8	141	Seismic Linear Force 16	55
Seismic Linear Force 5	140.5	Seismic Section Force 15	46.765
Seismic Section Force 3	138	Seismic Linear Force 17	45
Seismic Linear Force 6	135	Seismic Section Force 16	44.783
Seismic Section Force 4	128	Seismic Linear Force 18	35
Seismic Linear Force 7	125	Seismic Section Force 17	34.783
Seismic Section Force 6	122.413	Seismic Linear Force 19	25
Seismic Section Force 5	122.29	Seismic Section Force 18	24.783
Seismic Discrete Force 9	121	Seismic Discrete Force 14	24
Seismic Discrete Force 10	120	Seismic Discrete Force 15	22
Seismic Discrete Force 11	119	Seismic Linear Force 20	21
Seismic Discrete Force 12	118	Seismic Linear Force 21	15
Seismic Linear Force 8	115	Seismic Section Force 19	14.783
Seismic Linear Force 9	114	Seismic Linear Force 22	5
Seismic Section Force 7	112.413	Seismic Section Force 20	4.8915
Seismic Discrete Force 13	110		

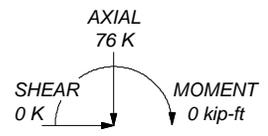
MATERIAL STRENGTH

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

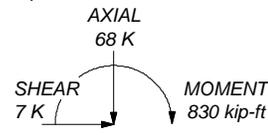
TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 40 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Seismic Do Not Control
9. TOWER RATING: 10.2%

ALL REACTIONS ARE FACTORED



40 mph WIND - 1.0000 in ICE



REACTIONS - 93 mph WIND

<p>CROWN CASTLE The Foundation for a wireless World</p>	<p>Crown Castle 2000 Corporate Drive Canonsburg, PA 15317 Phone: (724) 416-2000 FAX: (724) 416-2254</p>	<p>Job: BU 876379 Project: 1416893 Client: Crown Castle Drawn by: Kibreab Gebremariam App'd: Code: TIA-222-G Date: 06/14/17 Scale: NTS Path: C:\Users\kgebremariam\Desktop\E\LC7\Seismic\876379_Seismic.eri Dwg No. E-1</p>
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CCISeismic

Monopole Analysis
per TIA-222-G

Site BU: 876379
Work Order: 1416893
Application: 393602 Rev. 0



From TNX:	Axial, $W_t =$	68.0	kips
	Shear, $V_w =$	38.0	kips

	degrees	minutes	seconds	
Site Latitude =	41	35	23.81	41.5899 degrees
Site Longitude =	-73	10	11.52	-73.1699 degrees
Mass or Stiffness Irregularities =	No			(Table 2-9)
Ground Supported Structure =	Yes			
Structure Class =	II			(Table 2-1)
Site Class =	D - Stiff Soil			(Table 2-11)
Spectral response acceleration short periods, $S_s =$	0.937			USGS Seismic Tool
Spectral response acceleration 1 s period, $S_1 =$	0.398			
Tower Height (AGL), $H_t =$	163.0			ft
Importance Factor, $I =$	1.0			(Table 2-3)
Acceleration-based site coefficient, $F_a =$	1.1			(Table 2-12)
Velocity-based site coefficient, $F_v =$	1.6			(Table 2-13)
Design spectral response acceleration short period, $S_{DS} =$	0.703			(2.7.6)
Design spectral response acceleration 1 s period, $S_{D1} =$	0.426			(2.7.6)
Calculated $C_s =$	0.469			(2.7.7.1)
Base Seismic Shear, $V_s =$	26.6			kips

Appurtenance Weight (top 1/3 of structure), $W_u =$	11.7	kips
Average Moment of Inertia, $I_{avg} =$	21826.2	in ⁴
Fundamental Frequency, $F_f =$	0.334	(2.7.11.2)
F_f related variable, $S_A =$	0.142	(2.7.8.1)

Calculated $C_s =$	0.095	(2.7.7.1)
Minimum $C_s =$	0.031	(2.7.7.1)
Minimum C_s when $S_1 \geq 0.75 =$	0.000	(2.7.7.1)
Final $C_s =$	0.095	
Alternative Base Seismic Shear, $V_s =$	5.4	kips
Response Modification Factor, $R =$	1.5	

S_s is less than or equal to 1, no seismic analysis is required per section 2.7.3 of TIA-222-G.

Linear Increment
10

Top 1/3 Weight
11.68941468

Discrete							
Ht	Wt (kips)	a	b	c	S _{az}	Seismic Shear, F _{sz} (kips)	Seismic Induced Moment (kip-ft)
171	0.03	1.890	1.980	1.140	1.331	0.027	4.55
160	0.023	1.821	1.636	1.014	1.170	0.018	2.87
158	0.78	1.776	1.431	0.936	1.069	0.556	87.83
156	1.77266	1.731	1.244	0.863	0.972	1.148	179.14
150	1.3293	1.601	0.780	0.671	0.704	0.624	93.65
148	1.6543	1.558	0.655	0.615	0.624	0.688	101.77
142	0.48	1.434	0.352	0.468	0.405	0.129	18.38
141	1.25	1.414	0.311	0.447	0.372	0.310	43.66
121	0.36	1.041	-0.097	0.153	-0.087	-0.021	-2.53
120	0.377	1.024	-0.103	0.144	-0.100	-0.025	-3.02
119	0.833	1.007	-0.108	0.135	-0.112	-0.062	-7.41
118	1.705	0.990	-0.112	0.127	-0.123	-0.140	-16.53
110	2.6E-05	0.861	-0.120	0.073	-0.177	0.000	0.00
24	0.005	0.041	0.070	0.042	0.176	0.001	0.01
22	0.065	0.034	0.069	0.041	0.173	0.008	0.17

Linear							
Mid Ht	Wt (kips)	a	b	c	S _{az}	Seismic Shear, F _{sz} (kips)	Seismic Induced Moment (kip-ft)
155	0.0015	1.709	1.157	0.828	0.925	0.001	0.14
153	0.02892	1.665	0.995	0.762	0.833	0.016	2.46
145	0.0497	1.496	0.490	0.538	0.510	0.017	2.45
144	0.09952	1.475	0.442	0.514	0.474	0.031	4.52
140.5	0.00984	1.404	0.292	0.436	0.355	0.002	0.33
135	0.2725	1.296	0.116	0.333	0.194	0.035	4.75
125	0.2725	1.111	-0.063	0.194	-0.026	-0.005	-0.59
115	0.2725	0.941	-0.120	0.104	-0.151	-0.027	-3.15
114	0.08815	0.924	-0.121	0.097	-0.158	-0.009	-1.06
105	0.38269	0.784	-0.109	0.049	-0.180	-0.046	-4.82
104	0.0012	0.769	-0.106	0.045	-0.178	0.000	-0.01
95	0.38419	0.642	-0.068	0.020	-0.119	-0.030	-2.89
85	0.38419	0.514	-0.021	0.008	-0.001	0.000	-0.02
75	0.38419	0.400	0.018	0.007	0.111	0.028	2.13
65	0.38419	0.301	0.045	0.012	0.175	0.045	2.92
55	0.38419	0.215	0.061	0.021	0.196	0.050	2.76
45	0.38419	0.144	0.068	0.031	0.195	0.050	2.24
35	0.38419	0.087	0.071	0.039	0.187	0.048	1.67
25	0.38419	0.044	0.071	0.042	0.177	0.045	1.14
21	0.0003	0.031	0.068	0.041	0.172	0.000	0.00
15	0.38569	0.016	0.061	0.036	0.157	0.040	0.61
5	0.38569	0.002	0.031	0.017	0.090	0.023	0.12

Section Increment
10

Average Moment of Inertia (in ⁴)
21826.17

Monopole Section Data															
Height Above Base (ft)	Mid-Height, Z (ft)	Section Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Volume (ft ³)	Weight (kips)	Average Moment of Inertia (in ⁴)	a	b	c	S _{az}	Seismic Shear, F _{sz} (kips)	Seismic Induced Moment (kip-ft)
163	158	10	18	34.28	36.23316	0.3125	2.406869	1.179366	5357.979	1.776	1.431	0.936	1.069	0.841	132.80
153	148	10	18	36.23316	38.18633	0.3125	2.541398	1.245285	6305.996	1.558	0.655	0.615	0.624	0.518	76.61
143	138	10	18	38.18633	40.13949	0.3125	2.675928	1.311205	7359.805	1.355	0.204	0.387	0.278	0.243	33.57
133	128	10	18	40.13949	42.09265	0.3125	2.810457	1.377124	8525.005	1.165	-0.025	0.230	0.030	0.028	3.52
123	122.29	1.42	18	42.09265	42.37	0.3125	0.409993	0.200896	9227.728	1.064	-0.088	0.165	-0.069	-0.009	-1.13
127.413	122.413	10	18	40.60572	42.52953	0.375	3.404705	1.668306	10524.82	1.066	-0.087	0.167	-0.067	-0.075	-9.17
117.413	112.413	10	18	42.52953	44.45334	0.375	3.563714	1.74622	12067.56	0.899	-0.122	0.087	-0.167	-0.195	-21.90
107.413	102.413	10	18	44.45334	46.37714	0.375	3.722723	1.824134	13754.23	0.746	-0.100	0.040	-0.172	-0.209	-21.43
97.413	92.413	10	18	46.37714	48.30095	0.375	3.881732	1.902049	15591.24	0.608	-0.056	0.015	-0.092	-0.116	-10.73
87.413	86.038	2.75	18	48.30095	48.83	0.375	1.095353	0.536723	16825.17	0.527	-0.026	0.008	-0.014	-0.005	-0.43
91.33	86.33	10	18	46.7974	48.7214	0.4375	4.563194	2.235965	18608.81	0.530	-0.027	0.009	-0.018	-0.026	-2.27
81.33	76.33	10	18	48.7214	50.64539	0.4375	4.748723	2.326874	20969.99	0.414	0.013	0.006	0.099	0.153	11.67
71.33	66.33	10	18	50.64539	52.56939	0.4375	4.934252	2.417784	23522.99	0.313	0.042	0.011	0.170	0.274	18.14
61.33	56.33	10	18	52.56939	54.49339	0.4375	5.119781	2.508693	26275.3	0.226	0.059	0.020	0.195	0.327	18.39
51.33	46.765	9.13	18	54.49339	56.25	0.4375	4.83638	2.369826	29096.84	0.156	0.067	0.029	0.196	0.309	14.47
49.783	44.783	10	18	53.91603	55.84118	0.5	5.99276	2.936452	32261.01	0.143	0.068	0.031	0.195	0.381	17.06
39.783	34.783	10	18	55.84118	57.76633	0.5	6.204919	3.040411	35807.66	0.086	0.071	0.039	0.187	0.378	13.16
29.783	24.783	10	18	57.76633	59.69148	0.5	6.417079	3.144369	39605.25	0.044	0.071	0.042	0.177	0.371	9.20
19.783	14.783	10	18	59.69148	61.61663	0.5	6.629239	3.248327	43662.36	0.016	0.061	0.036	0.156	0.339	5.01
9.783	4.8915	9.783	18	61.61663	63.5	0.5	6.690689	3.278437	47937.68	0.002	0.030	0.016	0.088	0.193	0.94

CCISeismic - Design Category

Per 2012/2015 IBC

Site BU: 876379
 Work Order: 1416893
 Application: 393602 Rev. 0



	Degrees	Minutes	Seconds		
Site Latitude =	41	35	23.80	41.5899	degrees
Site Longitude =	-73	10	11.52	-73.1699	degrees
Ground Supported Structure =	Yes				
Structure Class =	II				(Table 2-1)
Site Class =	D - Stiff Soil				(Table 2-11)
Spectral response acceleration short periods, S_s =	0.937				USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.398				
Importance Factor, I =	1.0				(Table 2-3)
Acceleration-based site coefficient, F_a =	1.1				(Table 2-12)
Velocity-based site coefficient, F_v =	1.604				(Table 2-13)
Design spectral response acceleration short period, S_{DS} =	0.703				(2.7.6)
Design spectral response acceleration 1 s period, S_{D1} =	0.426				(2.7.6)
Seismic Design Category - Short Period Response =	D				ASCE 7-05 Table 11.6-1
Seismic Design Category - 1s Period Response =	D				ASCE 7-05 Table 11.6-2
Worst Case Seismic Design Category =	D				ASCE 7-05 Tables 11.6-1 and 6-2

USGS Design Maps Summary Report

User-Specified Input

Report Title 876379

Tue June 13, 2017 12:52:26 UTC

Building Code Reference Document 2012/2015 International Building Code
(which utilizes USGS hazard data available in 2008)

Site Coordinates 45.43546°N, 122.52438°W

Site Soil Classification Site Class D – “Stiff Soil”

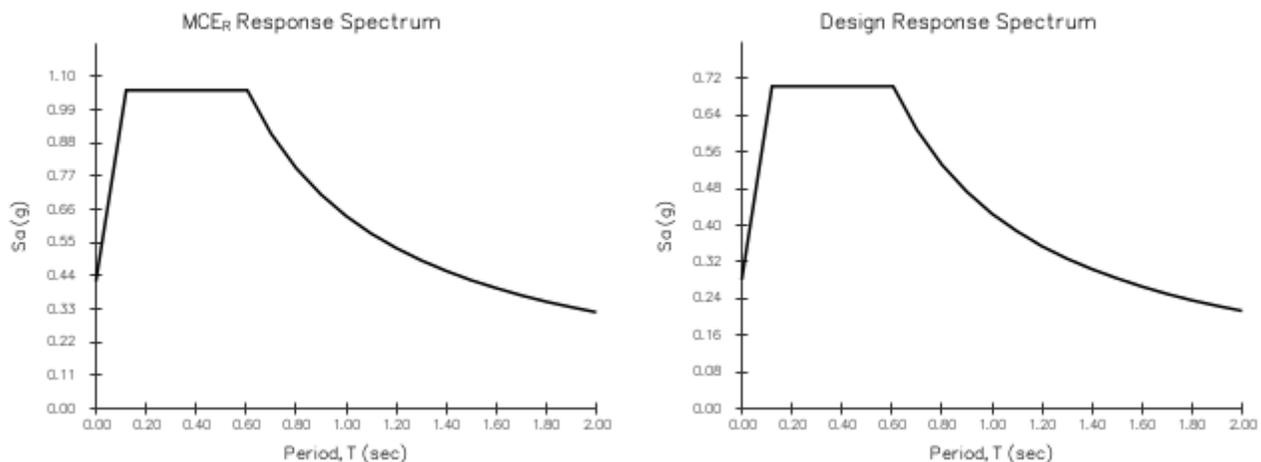
Risk Category I/II/III



USGS-Provided Output

$S_s = 0.937 \text{ g}$	$S_{MS} = 1.055 \text{ g}$	$S_{DS} = 0.703 \text{ g}$
$S_1 = 0.398 \text{ g}$	$S_{M1} = 0.638 \text{ g}$	$S_{D1} = 0.425 \text{ g}$

For information on how the S_s and S_1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the “2009 NEHRP” building code reference document.





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

SPRINT Existing Facility

Site ID: CT33XC518

N. Woodbury/Wolff Parcel
1440 Main Street North
Woodbury, CT 06798

July 24, 2017

EBI Project Number: 6217003214

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.69 %



July 24, 2017

SPRINT

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

Emissions Analysis for Site: **CT33XC518 – N. Woodbury/Wolff Parcel**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **1440 Main Street North, Woodbury, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 850 MHz Band is approximately $567 \mu\text{W}/\text{cm}^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) 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 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. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.



- 6) 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.
- 7) For the following calculations, the sample point was the top of a 6-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.
- 8) The antennas used in this modeling are the **RFS APXVSP18-C-A20** and **RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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.
- 9) The antenna mounting height centerlines of the proposed antennas are **158 feet** above ground level (AGL) for **Sector A**, **158 feet** above ground level (AGL) for **Sector B** and **158 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPPI18-C-A20	Make / Model:	RFS APXVSPPI18-C-A20	Make / Model:	RFS APXVSPPI18-C-A20
Gain:	13.4/15.9 dBd	Gain:	13.4/15.9 dBd	Gain:	13.4/15.9 dBd
Height (AGL):	158 feet	Height (AGL):	158 feet	Height (AGL):	158 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	1.33 %	Antenna B1 MPE%	1.33 %	Antenna C1 MPE%	1.33 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	158 feet	Height (AGL):	158 feet	Height (AGL):	158 feet
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	0.97 %	Antenna B2 MPE%	0.97 %	Antenna C2 MPE%	0.97 %

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	2.30 %
Verizon Wireless	2.87 %
AT&T	2.52 %
Site Total MPE %:	7.69 %

SPRINT Sector A Total:	2.30 %
SPRINT Sector B Total:	2.30 %
SPRINT Sector C Total:	2.30 %
Site Total:	7.69 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	158	0.68	850 MHz	567	0.12%
Sprint 850 MHz LTE	2	437.55	158	1.36	850 MHz	567	0.24%
Sprint 1900 MHz (PCS) CDMA	5	622.47	158	4.84	1900 MHz (PCS)	1000	0.48%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	158	4.84	1900 MHz (PCS)	1000	0.48%
Sprint 2500 MHz (BRS) LTE	8	778.09	158	9.69	2500 MHz (BRS)	1000	0.97%
						Total:	2.30%



Summary

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

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	2.30 %
Sector B:	2.30 %
Sector C:	2.30 %
SPRINT Maximum Total (per sector):	2.30 %
Site Total:	7.69 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **7.69 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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