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

August 10, 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: 881541**
Sprint Site ID: CT23XC313
700 Grassy Hill Road, Orange, CT 06477
Latitude: 41° 17' 7.75"/ Longitude: -73° 2' 33.27"

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 130-foot level of the existing 139.5-foot monopole tower at 700 Grassy Hill Road in Orange, CT. The tower is owned by Crown Castle. The property is owned by the Town of Orange. Sprint intends to install (3) antennas and (3) RRUs with (1) hybrid cable.

This facility was approved by the by the Connecticut Siting Council in Docket No. 262 on January 12, 2004. This approval included the conditions that:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 140 feet above ground level, with a total overall height of 143 feet above ground level including appurtenances. Antennas to be install on towers hall be on a T-bar antenna platform or flush mounted.

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. James Zeoli, First-Selectman, Town of Orange, as the municipality as well as the property owner, and the Zoning Administrator & Enforcement Officer**,** Paul Dinice**.** 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.
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: Mr. James Zeoli, First-Selectman
Town of Orange
617 Orange Center Road
Orange, CT 06477

Paul Dinice, Zoning Administrator & Enforcement Officer
617 Orange Center Road
Orange, CT 06477
Westbrook, CT 06498

700 GRASSY HILL RD

Location	700 GRASSY HILL RD	**Assessment**	$115,500
Mblu	60/ 6/ 1A/ /	**Appraisal**	$164,900
Acct#	00182505	**PID**	5703
Owner	TOWN OF ORANGE	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$13,500	$151,400	$164,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$9,500	$106,000	$115,500

Owner of Record

Owner	TOWN OF ORANGE	**Sale Price**	$25,000
Co-Owner		**Certificate**	
Address	617 ORANGE CENTER ROAD ORANGE, CT 06477	**Book & Page**	520/ 156
		Sale Date	05/28/2004
		Instrument	00

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
TOWN OF ORANGE	$25,000		520/ 156	00	05/28/2004
SCHEN JULIA ROGERS & SAYLOR ELLEN &					

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Stories	
Exterior Wall 1	
Exterior Wall 2	

Building Photo

Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Floor 1	
Interior Floor 2	
Heat Fuel	
Heat Type	
AC Type	
Bedrooms	
Full Baths	
Half Baths	
Extra Fixtures	
Total Rooms	
Stacks	
Fireplace(s)	
Gas Fireplace(s)	
Attic	
Frame	
Traffic	
Bsmt Gar(s)	
SF FBM	
Basement	
Bsmt Floor	

(http://images.vgsi.com/photos/OrangeCTPhotos//default.jpg)

Building Layout

Building Layout

Building Sub-Areas	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	510E
Description	Exempt Vac
Zone	RES
Neighborhood	010
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.62
Frontage	
Depth	
Assessed Value	$106,000
Appraised Value	$151,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD7	Cell Shed			240 UNITS	$13,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$13,500	$151,400	$164,900
2012	$13,500	$151,400	$164,900
2011	$0	$31,000	$31,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$9,500	$106,000	$115,500
2012	$9,500	$106,000	$115,500
2011	$0	$21,700	$21,700

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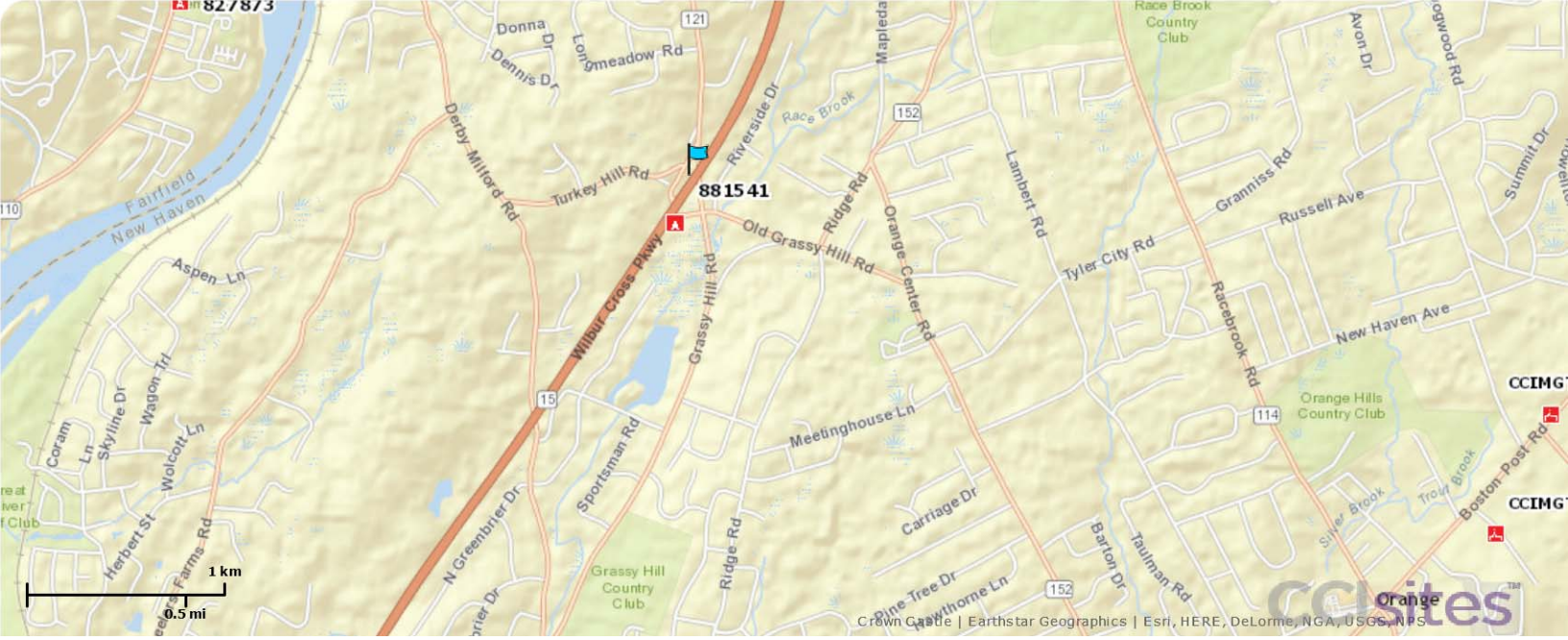

827873
881541
Donna Dr
Dennis Dr
Longmeadow Rd
121
Derby Milford Rd
Turkey Hill Rd
Riverside Dr
Race Brook
152
Mapleda
Race Brook Country Club
Avon Dr
Ridge Rd
Orange Center Rd
Lambert Rd
Granniss Rd
Russell Ave
Summit Dr
Old Grassy Hill Rd
Tyler City Rd
Racebrook Rd
New Haven Ave
Fairfield
New Haven
110
Aspen Ln
Wilbur Cross Pkwy
Grassy Hill Rd
15
Coram Ln
Skyline Dr
Wagon Trl
Wolcott Ln
Herbert St
Meetinghouse Ln
Orange Hills Country Club
114
CCIMG
Boston Post Rd
Sportsman Rd
N Greenbrier Dr
Carriage Dr
Trout Brook
Silver Brook
Barton Dr
Taulman Rd
Ridge Rd
Grassy Hill Country Club
Pine Tree Dr
Hawthorne Ln
152
Orange
1 km
0.5 mi
Crown Castle | Earthstar Geographics | Esri, HERE, DeLorme, NGA, USGS, NPS
ccisites

Connecticut Siting Council
Decisions

DOCKET NO. 262 - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at 707 Cranberry Lane or off of Grassy Hill Road, Orange, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	January 12, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a wireless telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Sprint Spectrum, L.P. d/b/a Sprint PCS (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at Site C off of Grassy Hill Road, Orange, Connecticut. The Council denies certification of Site A located at 707 Cranberry Lane and Site B located off of Grassy Hill Road, Orange, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 140 feet above ground level, with a total overall height of 143 feet above ground level including appurtenances. Antennas to be installed on the tower shall be on a T-bar antenna platform or flush mounted.

2. The Certificate Holder shall prepare a D&M Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:
   a) a final site plan(s) of site development to include specifications for the tower, tower location, tower foundation, antennas, equipment building, access road, provisions for underground utilities, utility line, and landscaping; and
   b) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities'

antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antenna becomes obsolete and ceases to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The New Haven Register, the Amity Observer and The Bulletin (Orange).

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Sprint Spectrum, L.P. d/b/a Sprint PCS	Thomas J. Regan, Esquire Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq. Cuddy & Feder LLP 90 Maple Avenue White Plains, NY 10601

Intervenor	**Its Representative**
Cellco Partnership d/b/a Verison Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103-3597

Content Last Modified on 1/15/2004 8:25:11 AM

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:
CT23XC313
SITE NAME:
ORANGE/ROGERS PROPERTY
SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

CROWN ID#: 881541

CROWN SITE NAME: ROGERS PROPERTY

APPROVED
By Jason D'Amico at 11:00 am, Jul 06, 2017

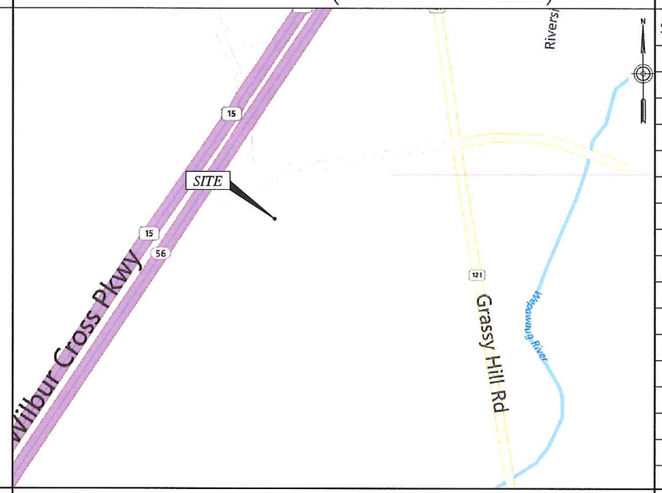
APPROVED
By Jeff Barbadora at 8:21 am, Aug 18, 2014

SHEET INFORMATION

SITE NUMBER:	CT23XC313
SITE NAME:	ORANGE/ROGERS PROPERTY
SITE ADDRESS:	700 GRASSY HILL ROAD ORANGE, CT 06477
COUNTY:	NEW HAVEN
COORDINATES: (NAD 83)	41° 17' 07.75"N 73° 02' 33.27"W
GROUND ELEV:	100'± AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	139'-6"± AGL
STRUCTURE RAD CENTER:	130'-0"± AGL
ZONING CLASSIFICATION:	R-1
PARCEL ID:	60-6-1

LANDLORD:	CROWN CASTLE USA 2000 CORPORATE DRIVE CANONSBURG, PA
LOCAL POWER COMPANY:	CONNECTICUT LIGHT AND POWER CONTACT CUSTOMER SERVICE (800) 286-2000
APPLICANT:	SPRINT 6580 SPRINT PARKWAY OVERLAND PARK, KANSAS 66251
ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 JQuicksell@tectonicengineering.com
SPRINT CM:	GARY WOOD (860) 940-9168 gary.wood@sprint.com
CROWN CM:	JASON D'AMICO (860) 209-0104 jason.d'amico@crowncastle.com
AAV:	AT&T

VICINITY MAP (NOT TO SCALE)



SHEET INDEX

SHT. NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
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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
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S-2	EQUIPMENT SCHEMATIC DETAILS
E-1	ELECTRICAL & GROUNDING PLANS
E-2	GROUNDING DETAILS & NOTES

GENERAL NOTES

1. 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.
2. 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.
3. DEVELOPMENT AND USE OF THIS SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
   - BUILDING CODE OF CONNETICUT, LATEST EDITION.
   - ANSI/TIA/EIA-222-F-1996.
   - NATIONAL ELECTRICAL CODE, LATEST EDITION.

PROJECT DESCRIPTION

1. (1) NEW ALU 9929 EXPANSION CABINET.
2. (3) NEW RFS APXVTM14-C-120 ANTENNAS.
3. (3) NEW TD-RRH8x20-25 RRH.
4. (1) NEW 1-1/4" HYBRID CABLE.

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: _____

Sprint
2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC · PLANNING · ENGINEERING · SURVEYING · CONSTRUCTION MANAGEMENT
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.CT23XC313

NO	DATE	DESCRIPTION	BY
0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL
STATE OF CONNECTICUT
JAMES M. QUICKSELL
No. 22003
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT23XC313
SITE NAME:
ORANGE/ROGERS PROPERTY
SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
TITLE SHEET

SHEET NO:
T-1

DIVISION 01000–GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE PROJECT OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED TO 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. AC1-301 – 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 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:

BASE MATERIAL	ANCHOR SYSTEM
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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2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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SUBMITTALS

PROJECT NO: 7225.CT23XC313

NO	DATE	DESCRIPTION	BY
0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMG

SEAL

STATE OF CONNECTICUT
No. 22003
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

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/SPLICE 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–IH, 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 THOROUGHFARE 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
OHW OHW OHW OHW OHW	OVERHEAD WIRE
——— — — ———	PROPERTY LINE
—X———X———X———	CHAIN LINK FENCE
A–1	ANTENNA MARK
(E)	EXISTING
(P)	PROPOSED DETAIL
DET # / SHT #	REFERENCE
	SURFACE ELEVATION

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SUBMITTALS

PROJECT NO: 7225.CT23XC313

NO	DATE	DESCRIPTION	BY
0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT · JAMES M. QUINN · No. 22003 · LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

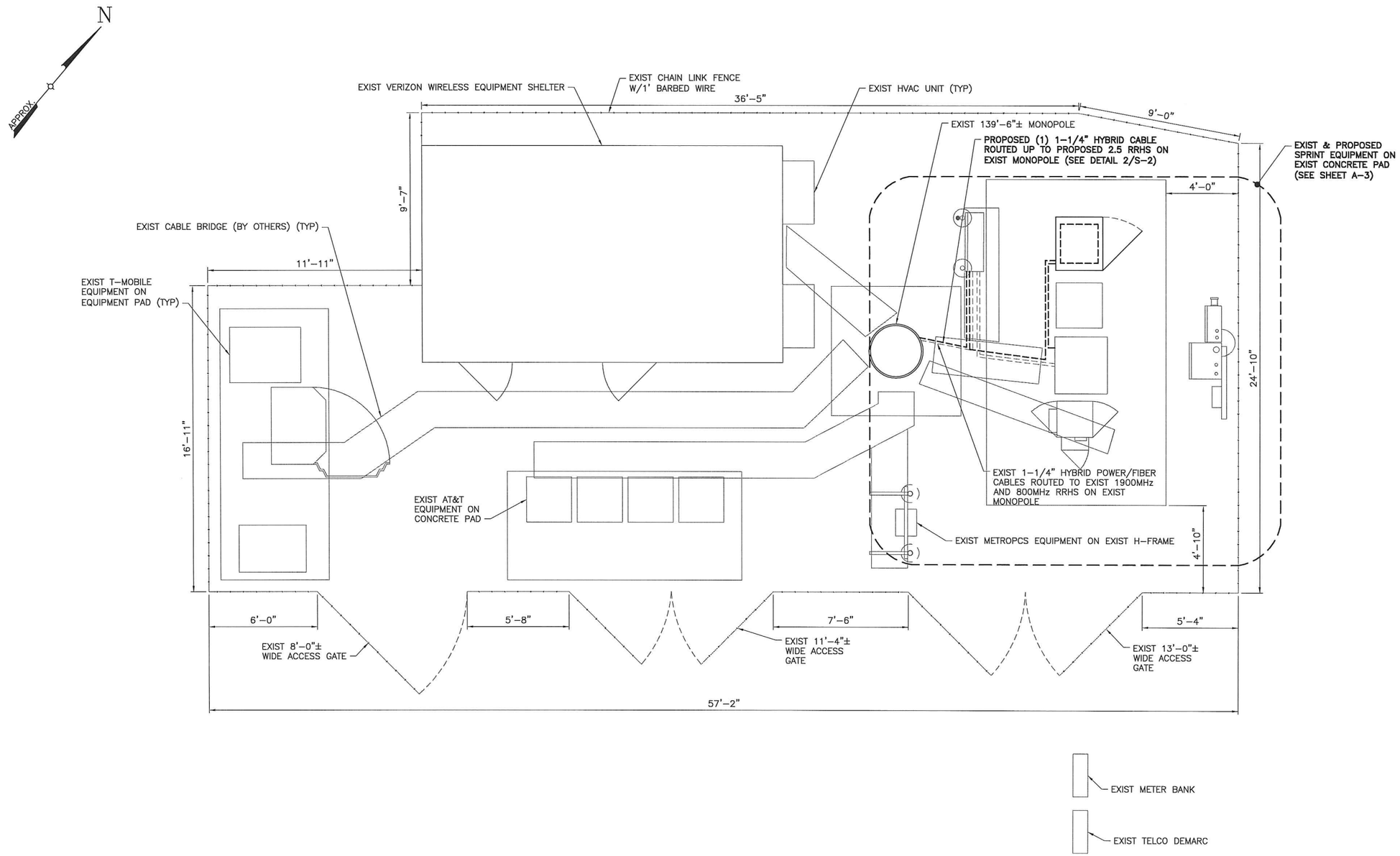
SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

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 / A-1 SITE PLAN

SCALE: 3/8" = 1'-0"

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SUBMITTALS

PROJECT NO: 7225.CT23XC313

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0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT
JOSEPH M. QUINN
No. 22038
LICENSED PROFESSIONAL ENGINEER

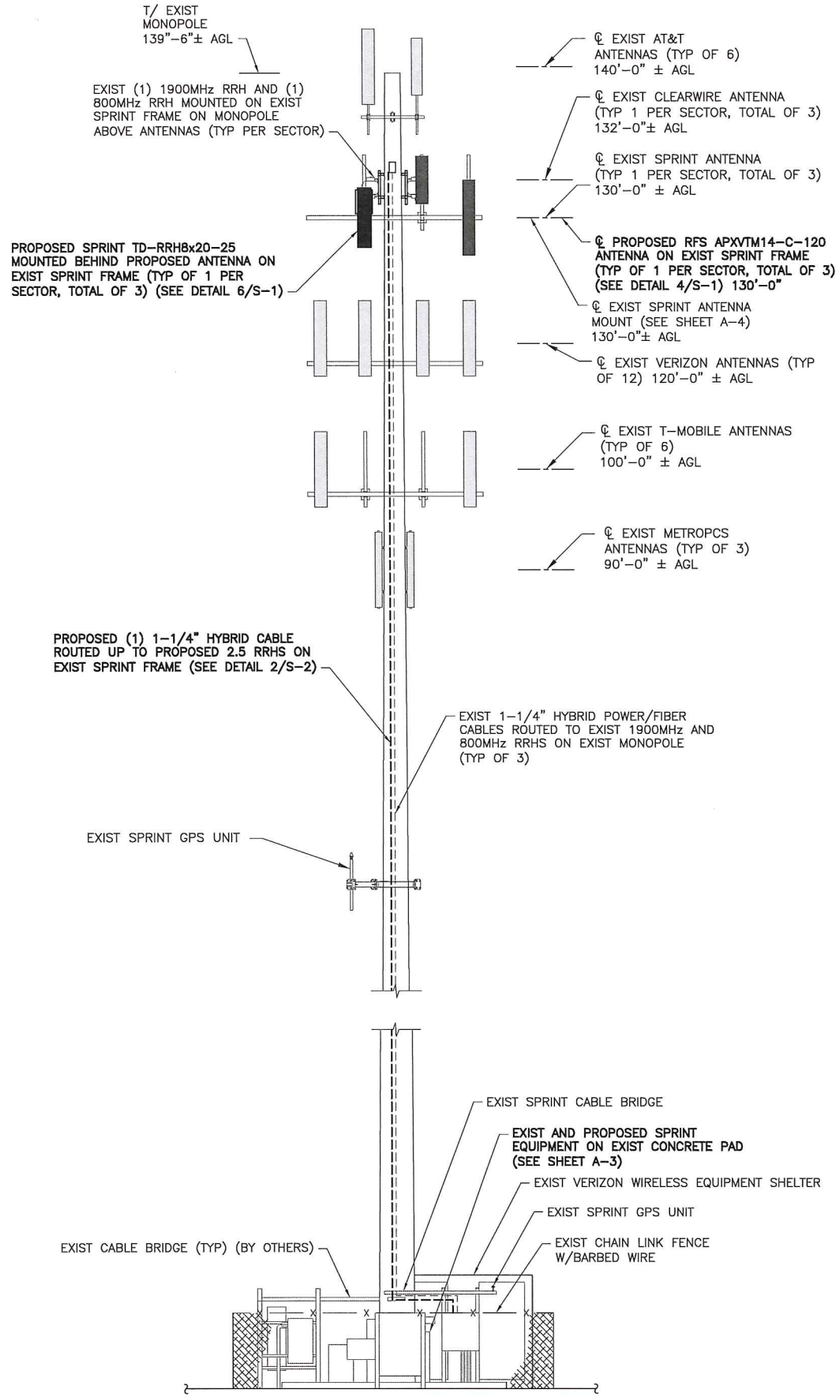
SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
SITE PLAN

SHEET NO:
A-1

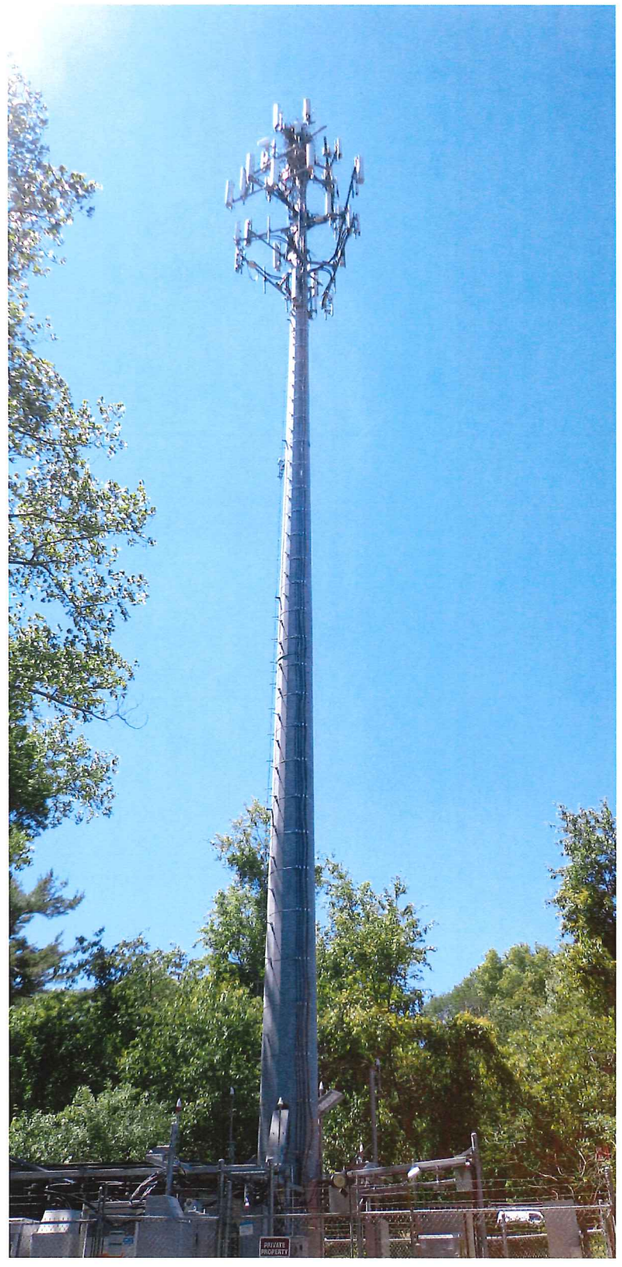


1 / A-2 SITE PLAN

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

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 7/28/14.

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



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DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT
JOSEPH M. QUINN
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

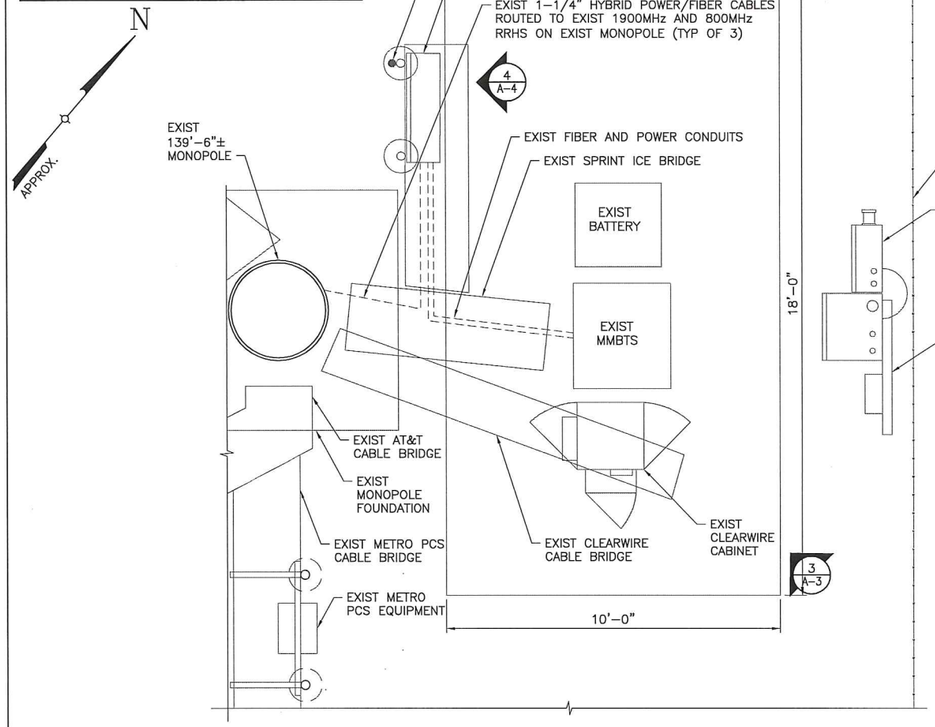
SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
ELEVATION

SHEET NO:
A-2

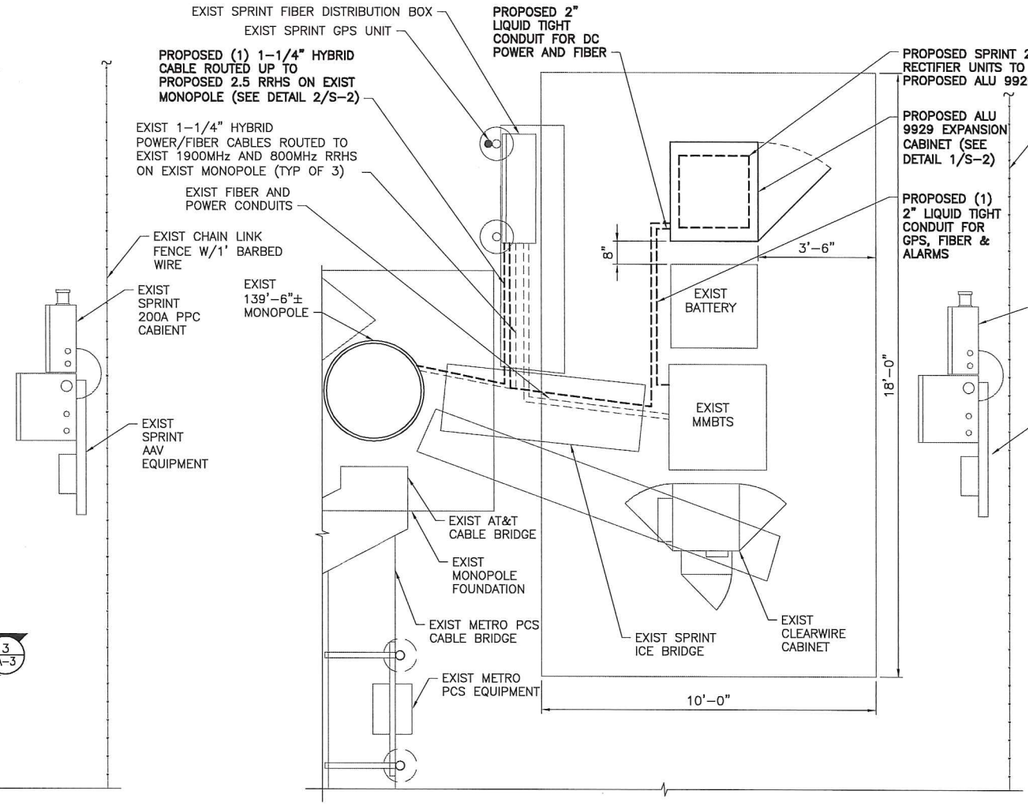
NORTH NOTE:

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 A–3 EQUIPMENT PLAN (EXIST)

SCALE: 1/2" = 1'–0"

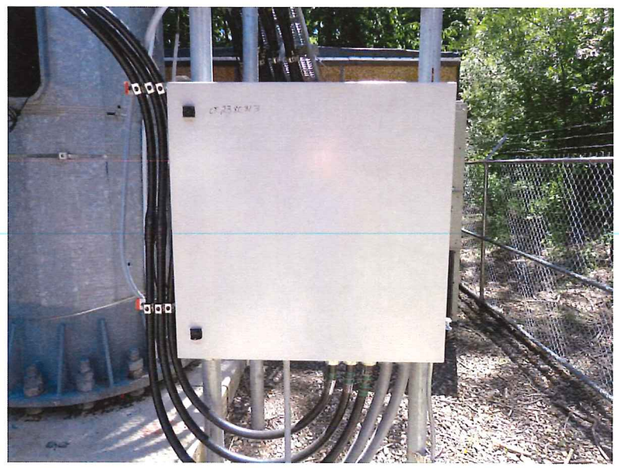


2 A–3 EQUIPMENT PLAN (FINAL)

SCALE: 1/2" = 1'–0"

3 A–3 EXIST EQUIPMENT PAD

SCALE: N.T.S.



4 A–3 EXIST FIBER DISTRIBUTION BOX

SCALE: NTS

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2.5 EQUIPMENT DEPLOYMENT
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SUBMITTALS

PROJECT NO: 7225.CT23XC313

NO	DATE	DESCRIPTION	BY
0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT — JAMES M. QUINN — No. 22008 — LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

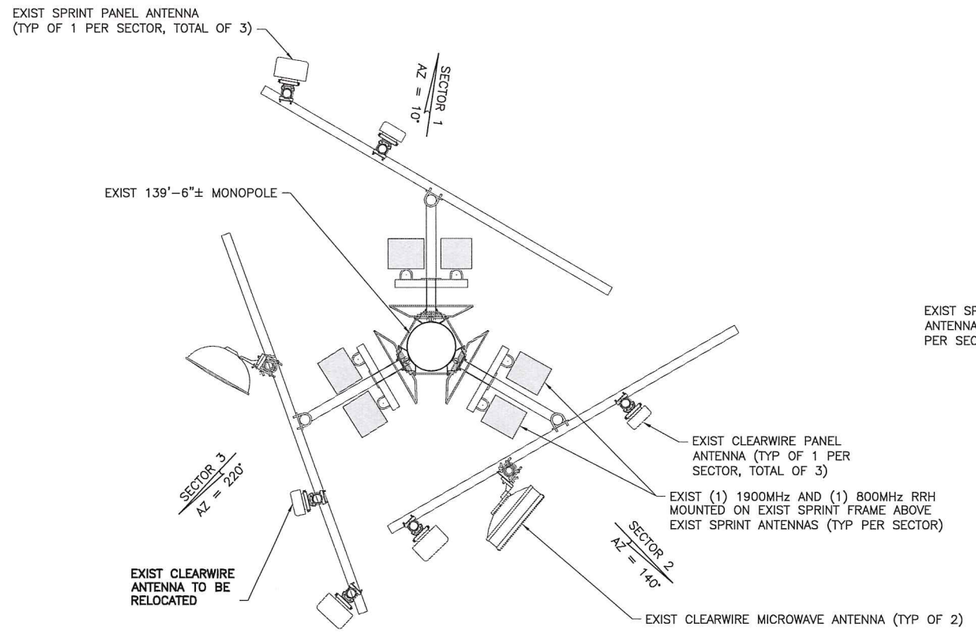
SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
A–3

N

APPROX.

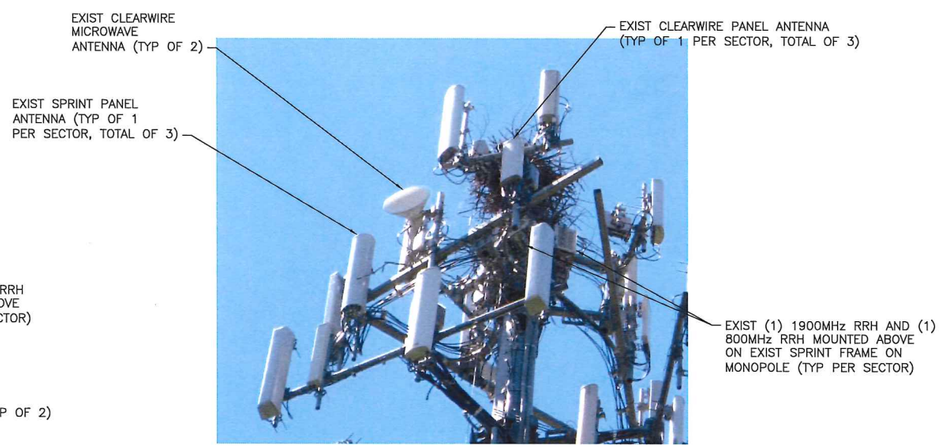


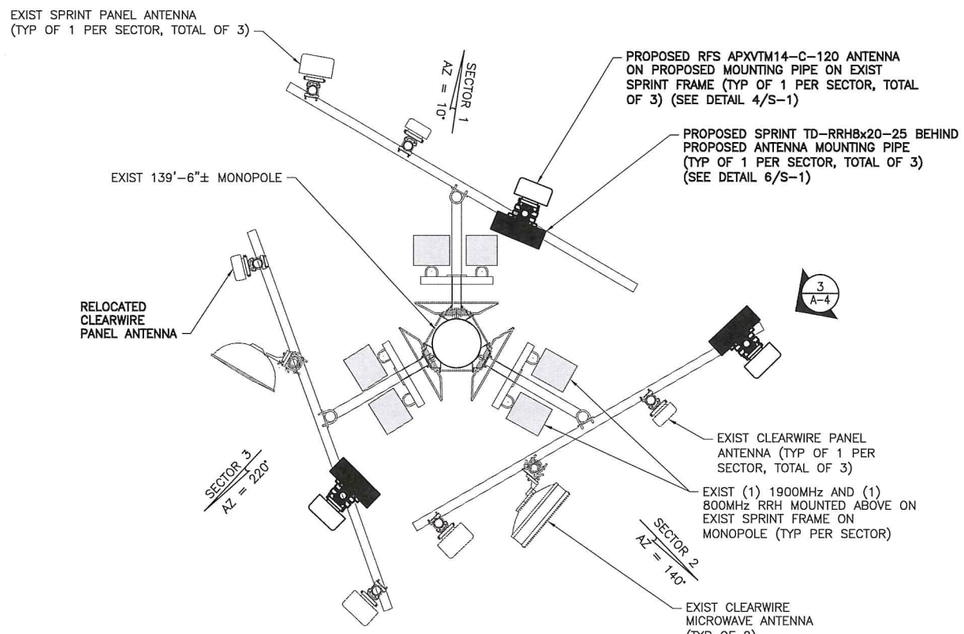
1 / A-4 ANTENNA LAYOUT PLAN (EXIST)

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

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 7/28/14.

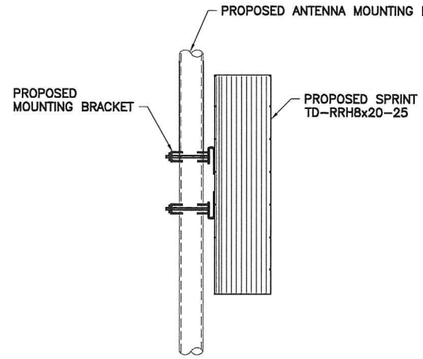
THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNETICUT (TO BE COORDINATED BY OTHERS)





2 / A-4 ANTENNA LAYOUT PLAN (FINAL)

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



3 / A-4 RRH MOUNTING DETAIL

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

ANTENNA DATA

Status	Exist	Proposed
Antenna Manufacturer	RFS-CELWAVE	RFS-CELWAVE
Antenna Model Number	APXVSPP18-C-A20	APXVTM14-C-A20
Number of Antennas	3	3
Antenna RAD Center	130'	130'
Antenna Azimuth	10/140/220	10/140/220
Antenna RRH Model Number	800MHz/1900MHz	TD-RRH8x20-25
Number of RRH	6	3

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2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT
JAMES M. QUINN
No. 22033
LICENSED PROFESSIONAL ENGINEER

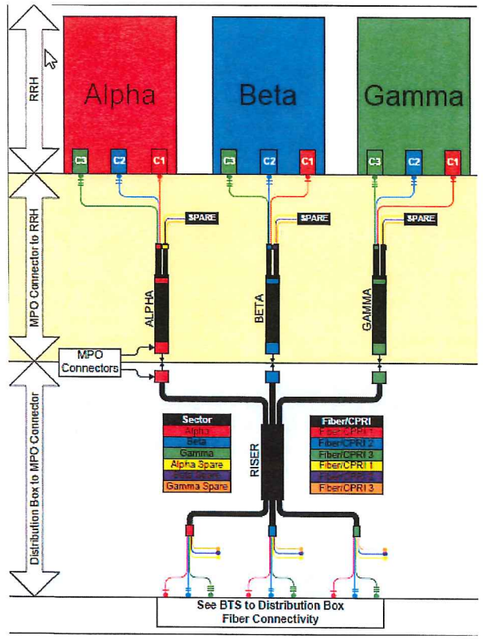
SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

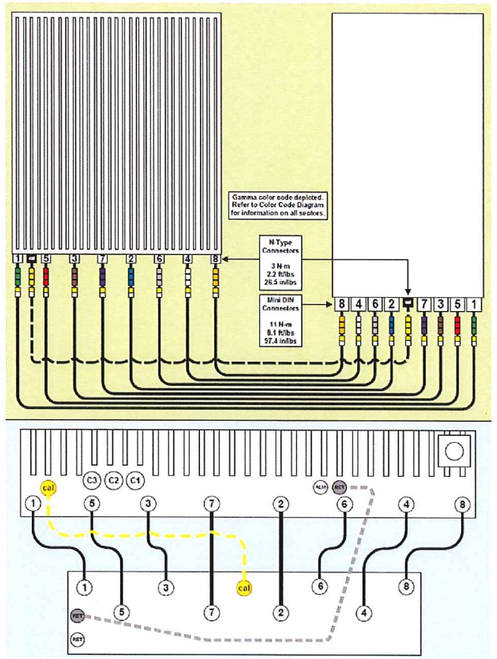
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



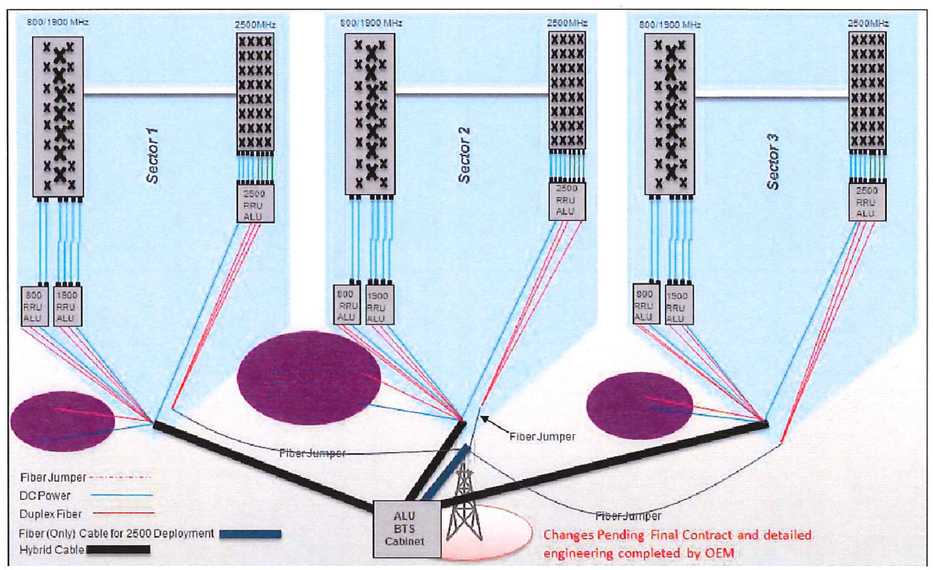
1 A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



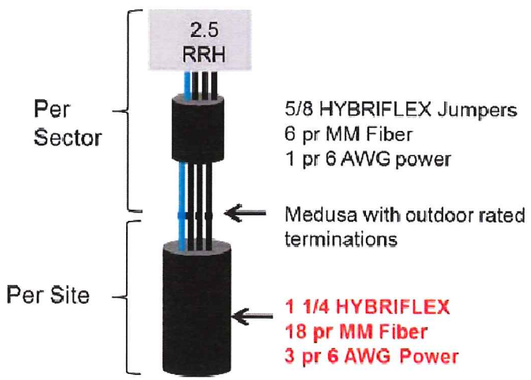
2 A–5 RRH CONNECTIVITY

SCALE: N.T.S.



3 A–5 RAN WIRING

SCALE: N.T.S.



4 A–5 CABLE SCENARIO

SCALE: N.T.S.

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PROJECT NO: 7225.CT23XC313

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1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT
JOSEPH M. QUAGLIA
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
RAN WIRING DIAGRAM

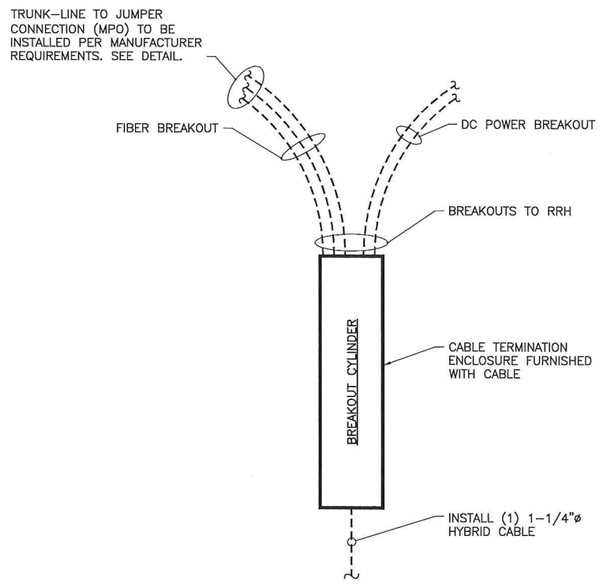
SHEET NO:
A–5

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

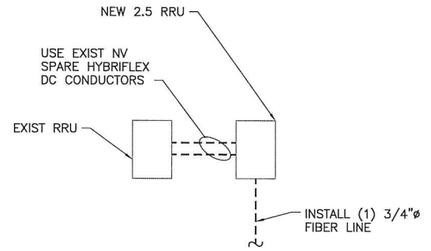
IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

1 / A-6 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS

SCALE: N.T.S.



2.5 HYBRID CABLE W/FIBER & DC FEEDERS



FIBER ONLY TRUNK LINES

2 / A-6 TRUNK LINE DETAILS (TYPICAL)

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 CORDED 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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8/15/14	SMA

SEAL

STATE OF CONNECTICUT
No. 22009
LICENSED PROFESSIONAL ENGINEER

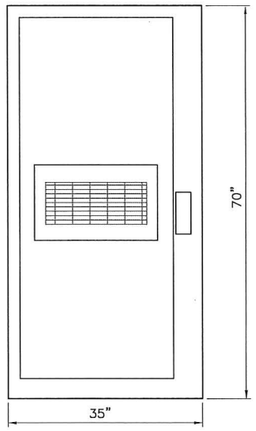
SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
CABLE DETAILS

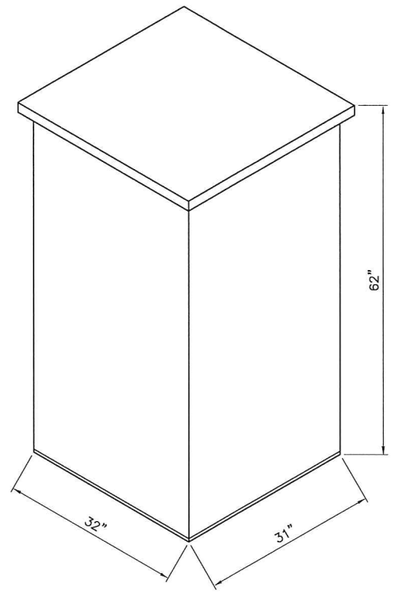
SHEET NO:
A-6



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

1 S-1 (EXIST) MMBTS CABINET

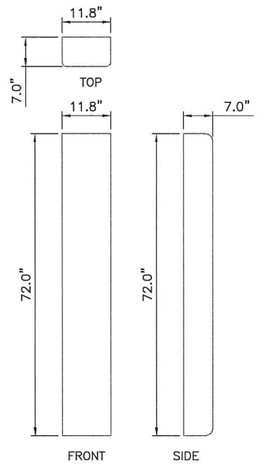
SCALE: 1" = 1'-0"



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

2 S-1 (EXIST) BATTERY CABINET

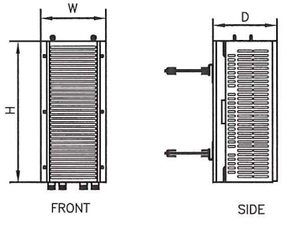
SCALE: 1" = 1'-0"



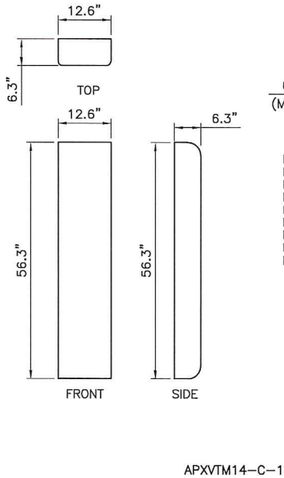
APXVSPP18-C-A20

3 S-1 (EXIST) ANTENNA DETAIL

SCALE: 3/4"=1'-0"



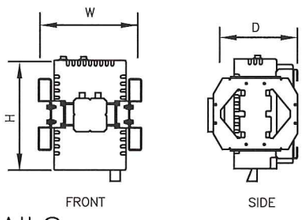
TYPE: 1900 MHz 4x45W MODEL #: RRH 1900 4X45 65MHz HEIGHT: 25.0" WIDTH: 11.1" DEPTH: 11.4" WEIGHT: ±60 LBS.



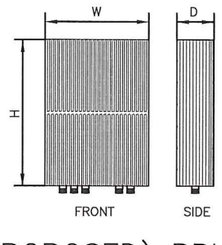
APXVTM14-C-120

4 S-1 (PROPOSED) ANTENNA DETAIL

SCALE: 3/4"=1'-0"



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: 6.71" WEIGHT: ±70 LBS

5 S-1 (EXIST) RRH DETAILS

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

6 S-1 (PROPOSED) RRH DETAIL

SCALE: N.T.S.

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OVERLAND PARK, KANSAS 66251

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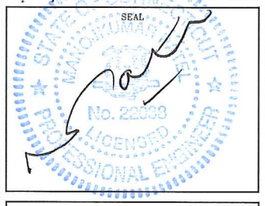
8/15/14	JMQ



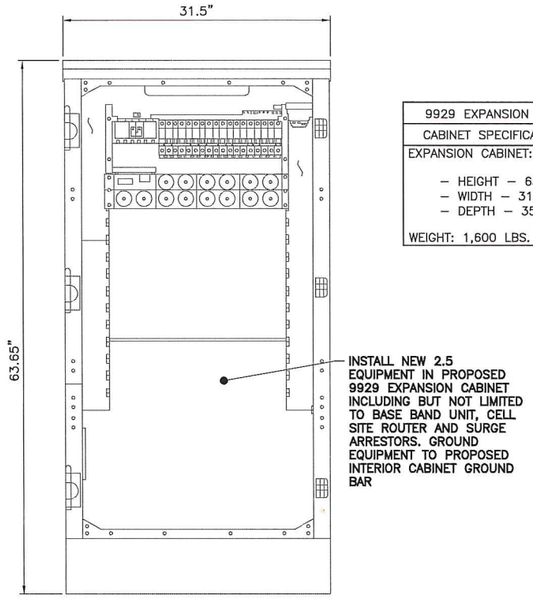
SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NO:
S-1



FRONT ELEVATION
(CABINET INTERIOR)

9929 EXPANSION CABINET
CABINET SPECIFICATIONS
EXPANSION CABINET: – HEIGHT – 63.65" – WIDTH – 31.5" – DEPTH – 35.5" WEIGHT: 1,600 LBS.

1 S–2 9929 INTERIOR DETAIL

SCALE: N.T.S.

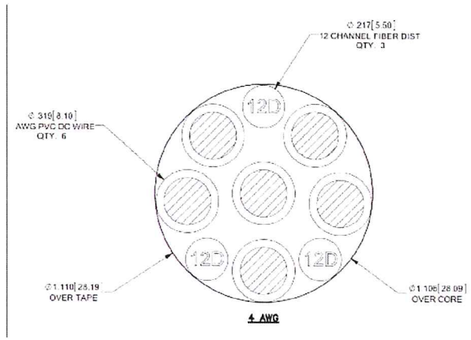
RFS HYBRIFLEX RISER CABLES SCHEDULE

Fiber Only (Existing DC Power)	**Hybrid cable** 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
	MN:HB058-M12-200F	200 ft
8 AWG Power	**Hybrid cable** 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
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	**Hybrid cable** 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	**Hybrid cable** MN: HB114-21U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable,225ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

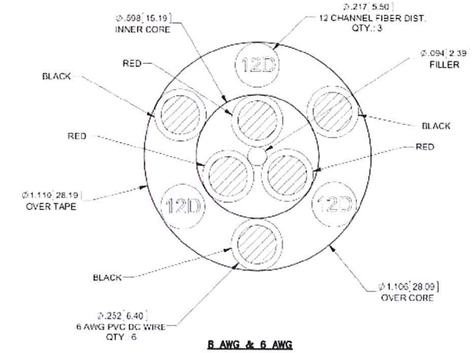
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	**Hybrid Jumper cable** 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	**Hybrid Jumper cable** 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	**Hybrid Jumper cable** 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	**Hybrid Jumper cable** 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

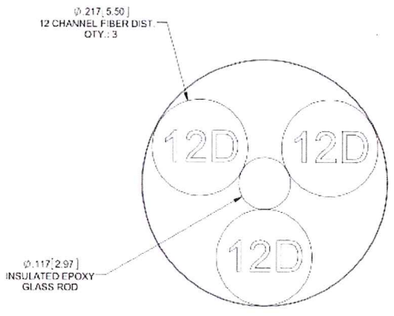
HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG

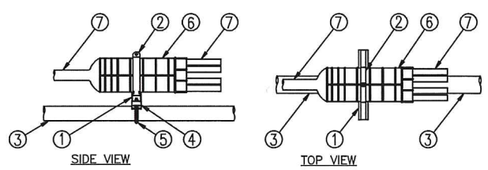


FIBER ONLY

2 S–2 2.5 HYBRID CABLE X–SECTION AND DATA

SCALE: NTS

LEGEND:
1. P1000T–HG UNISTRUT, 12" LONG.
2. 6" PIPE HANGER.
3. EXISTING SUPPORT PIPE.
4. NEW STANDOFF BRACKET, ANDREW PART# 30848–4.
5. NEW ROUND MEMBER ADAPTER SIZED FOR EXISTING PIPE SUPPORT.
6. BREAKOUT UNIT.
7. CABLE.



3 S–2 MEDUSA HEAD DETAIL

SCALE: NTS

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CROWN CASTLE

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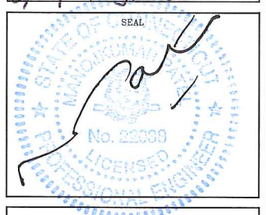
SUBMITTALS

PROJECT NO: 7225.CT23XC313

NO	DATE	DESCRIPTION	BY
0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ



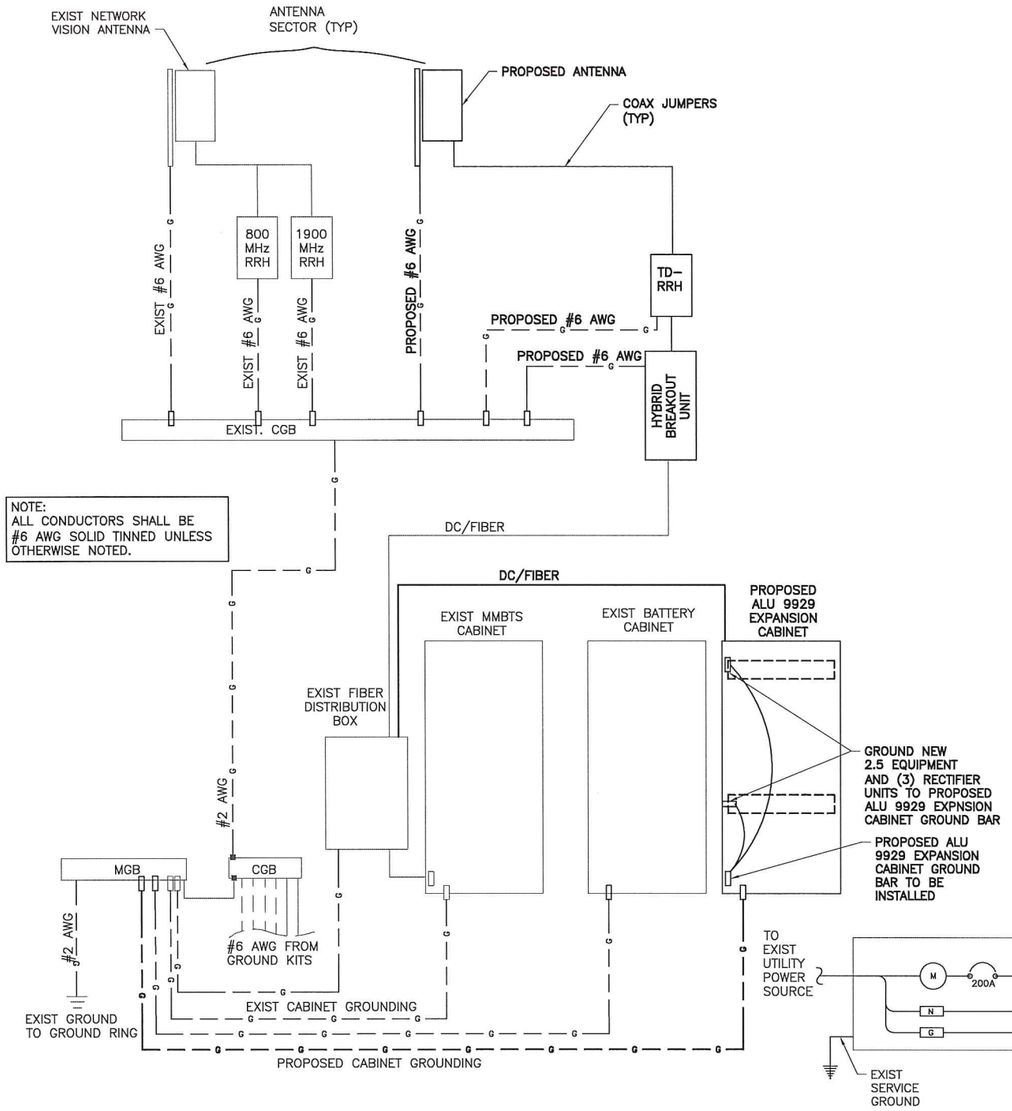
SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

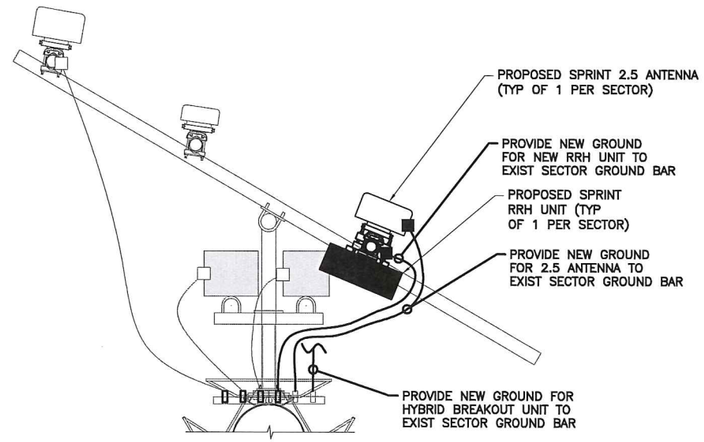
SHEET TITLE:
EQUIPMENT
SCHEMATIC DETAILS

SHEET NO:
S–2



1 / E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 / E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS

NOTE: FINAL ELECTRICAL DESIGN TO BE DETERMINED BY OTHER.

3 / E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

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8/15/14	JMQ

SEAL

STATE OF CONNECTICUT — JOSEPH M. QUINN — No. 22038 — LICENSED PROFESSIONAL ENGINEER

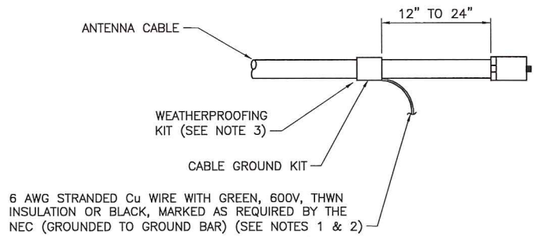
SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

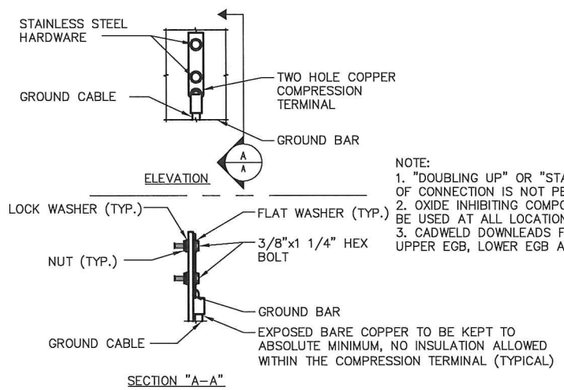
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

GROUNDING 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.

1 E-2 CABLE GROUNDING KIT DETAIL

SCALE: N.T.S.

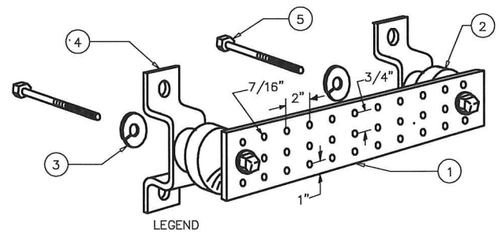


NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

SECTION "A-A"

2 E-2 GROUNDING BAR CONN. DETAIL

SCALE: NTS



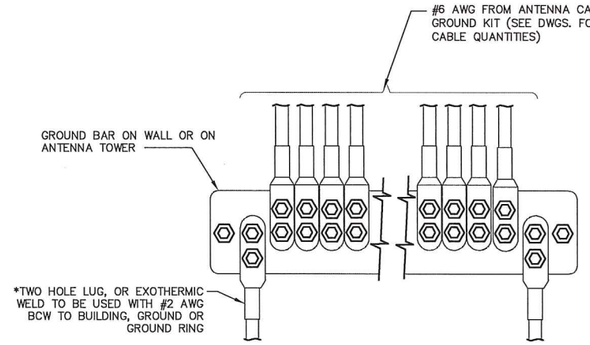
LEGEND

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 E-2 GROUNDING BAR DETAIL

SCALE: NTS



* - 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.

4 E-2 ANTENNA GROUND BAR DETAIL

SCALE: NTS

GROUNDING NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.

2. ALL GROUND WIRES SHALL BE #2 AWG UNLESS NOTED OTHERWISE.

3. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.

4. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.

5. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.

6. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.

7. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.

8. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.

9. WHEN CABLE LENGTH IS OVER 20' THE MANUFACTURERS GROUND KIT MUST BE INSTALLED PER THE MANUFACTURERS SPECIFICATIONS.

10. REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUNDING.

11. HOME RUN GROUNDS ARE NOT APPROVED BY CROWN CASTLE CONSTRUCTION STANDARDS AND THAT ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INSULATORS OR DOWN CONDUCTORS.

PROTECTIVE GROUNDING SYSTEM GENERAL NOTES:

1. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.

2. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.

3. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH PROJECT MANAGER.

4. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.

5. INSTALL GROUND BUSHING ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.

6. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.

7. GROUND HYBRID CABLE SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THNN INSULATION.
6. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
7. WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT. ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
10. GROUND HYBRID CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRID CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
11. USE #2 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
12. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
13. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #2 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
16. BOND ANTENNA MOUNTING BRACKETS, HYBRID CABLE GROUND KITS, AND RRHs 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 RRH 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.

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SUBMITTALS

PROJECT NO: 7225.CT23XC313

NO	DATE	DESCRIPTION	BY
0	6/9/14	FOR COMMENT	BY
1	8/15/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
8/15/14	JMQ

SEAL

STATE OF CONNECTICUT
No. 22033
LICENSED ENGINEER

SITE NUMBER:
CT23XC313

SITE NAME:
ORANGE/ROGERS PROPERTY

SITE ADDRESS:
700 GRASSY HILL ROAD
ORANGE, CT 06477

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E-2

Date: **June 21, 2017**

Rebecca Klein
Crown Castle
3530 Toringdon, Way Suite 300
Charlotte, NC 28277

JACOBS
Jacobs Engineering Group, Inc.
5449 Bells Ferry Road
Acworth, GA 30102
(770)701-2500

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate** **Carrier Site Number:**	 CT23XC313
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	881541 ROGERS PROPERTY 442061 1419636 393564 Rev. 0
Engineering Firm Designation:	**Jacobs Engineering Group, Inc. Project Number:**	1419636
Site Data:	**700 Grassy Hill Road, Orange, New Haven County, CT** **Latitude *41° 17' 7.75"*, Longitude *-73° 2' 33.27"*** **139.5 Foot - Monopole Tower**	

Dear Rebecca Klein,

Jacobs Engineering Group, 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 1048813, in accordance with application 393564, 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 125 mph converted to a nominal 3-second gust wind speed of 97 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 *Jacobs Engineering Group, 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:

Deepjyoti Chakraborty
Structural Engineer

Reviewed by:

Matthew E. Watkins, P.E.
Engineering Project Manager

tnxTower Report - version 7.0.7.0

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Additional Calculations

1) INTRODUCTION

This tower is a 139.5 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in February of 2004. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. The tower has been modified per reinforcement drawings prepared by B+T Group in October of 2013.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1.

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
130.0	130.0	3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe	1	1-1/4	-
		3	alcatel lucent	TD-RRH8x20-25			

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
136.0	140.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	-	-	2
		3	ericsson	RRUS12/RRUS A2			
		3	ericsson	RRUS-11	6 2 1	1-5/8 3/8 5/8	1
		3	kathrein	800 10121 w/ mount pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	136.0	1	tower mounts	T-Arm Mount [TA 702-3]			
132.0	132.0	3	alcatel lucent	1900MHz RRH (65MHz)	-	-	1
		3	alcatel lucent	800MHZ RRH			
		1	tower mounts	Side Arm Mount [SO 102-3]			
130.0	134.0	1	andrew	VHLP2-11	3 3 3	7983A 1-1/4 5/16	1
	132.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		1	dragonwave	A-ANT-23G-2-C (VSI)			
		3	samsung telecommunications	FDD_R6_RRH TMA			
	130.0	3	alcatel lucent	800 External Notch Filter			
		3	celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		9	rfs celwave	ACU-A20-N			
		1	tower mounts	T-Arm Mount [TA 602-3]			
118.0	118.0	6	rfs celwave	FD9R6004/2C-3L	1	1-1/4	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	alcatel lucent	RRH2X40-AWS	12	1-5/8	
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe			
		3	antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe			
		6	decibel	DB846F65ZAXY w/Mount Pipe			
		3	rymsa	MG D3-800Tx w/ Mount Pipe			
		1	tower mounts	T-Arm Mount [TA 602-3]			
108.0	109.0	3	commscope	LNX-6515DS-A1M w/ Mount Pipe	7	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
		3	ericsson	RRUS 11 B12			
	108.0	1	tower mounts	T-Arm Mount [TA 602-3]			
100.0	100.0	3	rfs celwave	APXV18-206517S-C	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
75.0	77.0	1	lucent	KS24019-L112A	1	1/2	1
	75.0	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)
140.0	140.0	12	dapa	48000	-	-
130.0	130.0	12	dapa	48000	-	-
120.0	120.0	12	dapa	48000	-	-
110.0	110.0	12	dapa	48000	-	-
100.0	100.	1	dapa	48000	-	-
75.0	75.0	1	generic	GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	2245154	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineered Endeavors Incorporated	2208511	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors Incorporated	2207700	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T GRP	4024239	CCISITES
4-POST-MODIFICATION INSPECTION	SGS	4432995	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.7.0), 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. Jacobs Engineering Group, 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	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-9.16	1507.75	67.8	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-19.75	3205.49	66.6	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-35.40	3953.98	76.3	Pass
							Summary	
						Pole (L3)	76.3	Pass
						Rating =	76.3	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	61.9	Pass
1	Base Plate	0	67.5	Pass
1	Base Foundation (Structural)	0	44.7	Pass
1	Base Foundation (Soil Interaction)	0	58.8	Pass

Structure Rating (max from all components) =	76.3%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

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 New Haven County, Connecticut.
2) Basic wind speed of 97 mph.
3) Structure Class II.
4) Exposure Category C.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.7500 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 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	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	139.50-93.04	46.46	3.92	18	15.5000	26.9900	0.2500	1.0000	A572-65 (65 ksi)
L2	93.04-46.38	50.58	5.25	18	25.5205	37.9100	0.3750	1.5000	A572-65 (65 ksi)
L3	46.38-0.00	51.63		18	35.8740	48.5000	0.3750	1.5000	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	15.7391	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.2880	9.152
	27.4064	21.2182	1916.7638	9.4927	13.7109	139.7983	3836.0497	10.6111	4.3102	17.241
L2	26.8892	29.9295	2390.8862	8.9267	12.9644	184.4188	4784.9184	14.9676	3.8316	10.218
	38.4948	44.6760	7952.1562	13.3249	19.2583	412.9214	15914.7760	22.3423	6.0122	16.032
L3	37.7311	42.2527	6727.0540	12.6022	18.2240	369.1315	13462.9597	21.1304	5.6538	15.077
	49.2482	57.2808	16760.5346	17.0844	24.6380	680.2717	33543.1232	28.6458	7.8760	21.003

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 139.50-93.04				1	1	1			
L2 93.04-46.38				1	1	1			
L3 46.38-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
7983A(1/2")	A	Surface Ar (CaAa)	130.00 - 0.00	2	2	0.100 0.100	0.5800		0.08
2" Rigid Conduit ** 108 **	A	Surface Ar (CaAa)	130.00 - 0.00	2	2	0.150 0.200	2.0000		2.80
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) ***130***	B	Surface Ar (CaAa)	108.00 - 0.00	1	1	0.080 0.100	1.6250		1.07
HB114-21U3M12-XXXF(1-1/4) **	B	Surface Ar (CaAa)	130.00 - 0.00	1	1	-0.480 -0.480	1.5400		1.22

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
** 136 **								
LDF7-50A(1-5/8")	B	No	Inside Pole	136.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	136.00 - 0.00	2	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG82ST-BRDA(5/8")	B	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
2" Rigid Conduit	B	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
** 130 **								
HB114-1-0813U4-M5J(1 1/4")	B	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
7983A(1/2")	A	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	0.08

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
9207(5/16")	A	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
** 118 **								
561(1-5/8")	A	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35
						1" Ice	0.00	1.35
LDF6-50A(1-1/4")	A	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
** 108 ** *								
LDF7-50A(1-5/8")	B	No	Inside Pole	108.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
** 100 **								
CR 50 1873(1-5/8")	B	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.83
						1/2" Ice	0.00	0.83
						1" Ice	0.00	0.83
*****								
Safety Line 3/8	C	No	CaAa (Out Of Face)	139.50 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
**								
LDF4-50A(1/2)	B	No	Inside Pole	75.00 - 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	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	139.50-93.04	A	0.000	0.000	19.071	0.000	0.70
		B	0.000	0.000	8.123	0.000	0.65
		C	0.000	0.000	0.000	1.742	0.01
L2	93.04-46.38	A	0.000	0.000	24.077	0.000	1.14
		B	0.000	0.000	14.768	0.000	1.12
		C	0.000	0.000	0.000	1.750	0.01
L3	46.38-0.00	A	0.000	0.000	23.932	0.000	1.14
		B	0.000	0.000	14.679	0.000	1.12
		C	0.000	0.000	0.000	1.739	0.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	139.50-93.04	A	1.699	0.000	0.000	55.229	0.000	1.30
		B		0.000	0.000	25.761	0.000	1.00
		C		0.000	0.000	0.000	17.525	0.09
L2	93.04-46.38	A	1.614	0.000	0.000	69.724	0.000	1.90
		B		0.000	0.000	46.470	0.000	1.76
		C		0.000	0.000	0.000	17.601	0.09
L3	46.38-0.00	A	1.448	0.000	0.000	67.349	0.000	1.84
		B		0.000	0.000	44.626	0.000	1.70
		C		0.000	0.000	0.000	16.713	0.09

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	139.50-93.04	-0.2950	-0.5399	-0.5237	-0.6758
L2	93.04-46.38	-0.2459	-0.6805	-0.4888	-0.9441
L3	46.38-0.00	-0.2589	-0.7149	-0.5657	-1.0890

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	8	7983A(1/2")	93.04 - 130.00	1.0000	1.0000
L1	11	2" Rigid Conduit	93.04 - 130.00	1.0000	1.0000
L1	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	93.04 - 108.00	1.0000	1.0000
L1	24	HB114-21U3M12-XXXF(1-1/4)	93.04 - 130.00	1.0000	1.0000
L2	8	7983A(1/2")	46.38 - 93.04	1.0000	1.0000
L2	11	2" Rigid Conduit	46.38 - 93.04	1.0000	1.0000
L2	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	46.38 - 93.04	1.0000	1.0000
L2	24	HB114-21U3M12-XXXF(1-1/4)	46.38 - 93.04	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
** 136 **									
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
800 10121 w/ mount pipe	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
800 10121 w/ mount pipe	B	From Leg	4.00	0.0000	136.00	No Ice	5.39	4.60	0.07
			0.00			1/2"	5.81	5.35	0.11
			4.00			Ice	6.23	6.05	0.17
						1" Ice			
800 10121 w/ mount pipe	C	From Leg	4.00	0.0000	136.00	No Ice	5.39	4.60	0.07
			0.00			1/2"	5.81	5.35	0.11
			4.00			Ice	6.23	6.05	0.17
						1" Ice			
RRUS12/RRUS A2	A	From Leg	4.00	0.0000	136.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			4.00			Ice	3.59	2.20	0.13
						1" Ice			
RRUS12/RRUS A2	B	From Leg	4.00	0.0000	136.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			4.00			Ice	3.59	2.20	0.13
						1" Ice			
RRUS12/RRUS A2	C	From Leg	4.00	0.0000	136.00	No Ice	3.14	1.84	0.07
			0.00			1/2"	3.36	2.01	0.10
			4.00			Ice	3.59	2.20	0.13
						1" Ice			
(2) LGP21401	A	From Leg	4.00	0.0000	136.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			4.00			Ice	1.38	0.35	0.03
						1" Ice			
(2) LGP21401	B	From Leg	4.00	0.0000	136.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			4.00			Ice	1.38	0.35	0.03
						1" Ice			
(2) LGP21401	C	From Leg	4.00	0.0000	136.00	No Ice	1.10	0.21	0.01
			0.00			1/2"	1.24	0.27	0.02
			4.00			Ice	1.38	0.35	0.03
						1" Ice			
RRUS-11	A	From Leg	4.00	0.0000	136.00	No Ice	2.52	1.07	0.06
			0.00			1/2"	2.72	1.21	0.07
			4.00			Ice	2.92	1.36	0.10
						1" Ice			
RRUS-11	B	From Leg	4.00	0.0000	136.00	No Ice	2.52	1.07	0.06
			0.00			1/2"	2.72	1.21	0.07
			4.00			Ice	2.92	1.36	0.10
						1" Ice			
RRUS-11	C	From Leg	4.00	0.0000	136.00	No Ice	2.52	1.07	0.06
			0.00			1/2"	2.72	1.21	0.07
			4.00			Ice	2.92	1.36	0.10
						1" Ice			
DC6-48-60-18-8F	C	From Leg	4.00	0.0000	136.00	No Ice	0.92	0.92	0.03
			0.00			1/2"	1.46	1.46	0.05
			4.00			Ice	1.64	1.64	0.07
						1" Ice			
T-Arm Mount [TA 702-3]	A	None		0.0000	136.00	No Ice	5.64	5.64	0.34
						1/2"	6.55	6.55	0.43
						Ice	7.46	7.46	0.52
						1" Ice			
** 132 **									
TME-1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	132.00	No Ice	2.31	2.38	0.06
			0.00			1/2"	2.52	2.58	0.08
			0.00			Ice	2.73	2.79	0.11
						1" Ice			
TME-1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	132.00	No Ice	2.31	2.38	0.06
			0.00			1/2"	2.52	2.58	0.08
			0.00			Ice	2.73	2.79	0.11
						1" Ice			
TME-1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	132.00	No Ice	2.31	2.38	0.06
			0.00			1/2"	2.52	2.58	0.08
			0.00			Ice	2.73	2.79	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
TME-800MHZ RRH	A	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
TME-800MHZ RRH	B	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
TME-800MHZ RRH	C	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
Side Arm Mount [SO 102-3]	C	None		0.0000	132.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
** 130 **									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	8.50 9.15 9.77	6.95 8.13 9.02	0.08 0.15 0.23
LLPX310R w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	4.54 4.89 5.25	2.98 3.53 4.09	0.05 0.08 0.13
LLPX310R w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	4.54 4.89 5.25	2.98 3.53 4.09	0.05 0.08 0.13
LLPX310R w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	4.54 4.89 5.25	2.98 3.53 4.09	0.05 0.08 0.13
800 External Notch Filter	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800 External Notch Filter	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800 External Notch Filter	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
(3) ACU-A20-N	A	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	B	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	C	From Leg	4.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
FDD_R6_RRH TMA	A	From Leg	4.00	0.0000	130.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
FDD_R6_RRH TMA	B	From Leg	4.00	0.0000	130.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
FDD_R6_RRH TMA	C	From Leg	4.00	0.0000	130.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00	0.0000	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	4.00	0.0000	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	4.00	0.0000	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
6'x4" Pipe Mount	C	From Leg	4.00	0.0000	130.00	No Ice	2.25	2.25	0.07
			0.00			1/2" Ice	2.62	2.62	0.08
			0.00			1" Ice	3.00	3.00	0.11
6'x4" Pipe Mount	B	From Leg	4.00	0.0000	130.00	No Ice	2.25	2.25	0.07
			0.00			1/2" Ice	2.62	2.62	0.08
			0.00			1" Ice	3.00	3.00	0.11
T-Arm Mount [TA 602-3]	C	None		0.0000	130.00	No Ice	11.59	11.59	0.77
						1/2" Ice	15.44	15.44	0.99
						1" Ice	19.29	19.29	1.21
** 118 **									
(2) DB846F65ZAXY w/Mount Pipe	A	From Leg	6.00	0.0000	118.00	No Ice	7.27	7.82	0.05
			0.00			1/2" Ice	7.83	9.01	0.11
			0.00			1" Ice	8.35	9.91	0.19
(2) DB846F65ZAXY w/Mount Pipe	B	From Leg	6.00	0.0000	118.00	No Ice	7.27	7.82	0.05
			0.00			1/2" Ice	7.83	9.01	0.11
			0.00			1" Ice	8.35	9.91	0.19
(2) DB846F65ZAXY w/Mount Pipe	C	From Leg	6.00	0.0000	118.00	No Ice	7.27	7.82	0.05
			0.00			1/2" Ice	7.83	9.01	0.11
			0.00			1" Ice	8.35	9.91	0.19
MG D3-800Tx w/ Mount Pipe	A	From Leg	6.00	0.0000	118.00	No Ice	3.71	3.56	0.04
			0.00			1/2" Ice	4.19	4.39	0.07
			0.00				4.63	5.09	0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
MG D3-800Tx w/ Mount Pipe	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.71 4.19 4.63	3.56 4.39 5.09	0.04 0.07 0.11
MG D3-800Tx w/ Mount Pipe	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.71 4.19 4.63	3.56 4.39 5.09	0.04 0.07 0.11
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
(2) FD9R6004/2C-3L	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/2C-3L	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/2C-3L	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.14 0.20	0.00 0.01 0.01
RRH2X40-AWS	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.59 1.80 2.01	0.04 0.06 0.08
RRH2X40-AWS	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.59 1.80 2.01	0.04 0.06 0.08
RRH2X40-AWS	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.59 1.80 2.01	0.04 0.06 0.08
T-Arm Mount [TA 602-3]	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	11.59 15.44 19.29	11.59 15.44 19.29	0.77 0.99 1.21
** 108 **									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.36 10.68 11.71	0.08 0.16 0.25
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.36 10.68 11.71	0.08 0.16 0.25
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.36 10.68 11.71	0.08 0.16 0.25
KRY 112 144/1	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
RRUS 11 B12	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
T-Arm Mount [TA 602-3]	C	None		0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.59 15.44 19.29	11.59 15.44 19.29	0.77 0.99 1.21
** 100 **									
APXV18-206517S-C	A	From Leg	2.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
APXV18-206517S-C	B	From Leg	2.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
APXV18-206517S-C	C	From Leg	2.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
Pipe Mount [PM 601-3]	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28
** 75 **									
Side Arm Mount [SO 701-1]	C	From Leg	2.75 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
KS24019-L112A	C	From Leg	4.25 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.10 0.18 0.26	0.10 0.18 0.26	0.01 0.01 0.01
*****									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-2-C (VSI)	B	Paraboloid w/Shroud (HP)	From Centroid-Face	4.75 2.25 2.00	10.0000		130.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.01 0.03 0.05
VHLP2-11	C	Paraboloid w/o Radome	From Centroid-Face	4.75 2.25 4.00	-20.0000		130.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
***											

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

Comb. No.	Description
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
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	139.5 - 93.04	Pole	Max Tension	14	0.00	-0.00	0.00
			Max. Compression	26	-31.16	0.81	-0.65
			Max. Mx	20	-10.99	538.12	6.65
			Max. My	2	-11.00	2.41	537.59
			Max. Vy	20	-21.02	538.12	6.65
			Max. Vx	2	-21.02	2.41	537.59
			Max. Torque	21			2.12
L2	93.04 - 46.38	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.59	1.93	0.78
			Max. Mx	20	-21.59	1575.55	15.71
			Max. My	2	-21.59	5.85	1575.12
			Max. Vy	20	-24.74	1575.55	15.71
			Max. Vx	2	-24.76	5.85	1575.12
			Max. Torque	21			2.33
L3	46.38 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.01	2.73	3.19
			Max. Mx	20	-37.24	2950.47	26.61
			Max. My	2	-37.24	9.79	2951.30
			Max. Vy	20	-28.29	2950.47	26.61
			Max. Vx	2	-28.31	9.79	2951.30
			Max. Torque	21			2.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	35	66.01	7.49	-4.34
	Max. H_x	21	27.95	28.25	0.19
	Max. H_z	2	37.27	0.07	28.27
	Max. M_x	2	2951.30	0.07	28.27
	Max. M_z	8	2930.79	-28.13	-0.04
	Max. Torsion	21	2.39	28.25	0.19
	Min. Vert	17	27.95	14.15	-24.36
	Min. H_x	9	27.95	-28.13	-0.04
	Min. H_z	14	37.27	0.07	-28.16
	Min. M_x	14	-2935.35	0.07	-28.16
	Min. M_z	20	-2950.47	28.25	0.19
	Min. Torsion	11	-1.82	-24.41	-14.01

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	31.06	0.00	0.00	-0.46	0.93	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	37.27	-0.07	-28.27	-2951.30	9.79	-1.23
0.9 Dead+1.6 Wind 0 deg - No Ice	27.95	-0.07	-28.27	-2917.34	9.38	-1.23
1.2 Dead+1.6 Wind 30 deg - No Ice	37.27	13.96	-24.53	-2563.74	-1450.93	-0.90
0.9 Dead+1.6 Wind 30 deg - No Ice	27.95	13.96	-24.53	-2534.19	-1434.61	-0.90
1.2 Dead+1.6 Wind 60 deg - No Ice	37.27	24.29	-14.16	-1481.00	-2528.47	0.51
0.9 Dead+1.6 Wind 60 deg - No Ice	27.95	24.29	-14.16	-1463.87	-2499.80	0.51
1.2 Dead+1.6 Wind 90 deg - No Ice	37.27	28.13	0.04	3.64	-2930.79	1.67
0.9 Dead+1.6 Wind 90 deg - No Ice	27.95	28.13	0.04	3.73	-2897.49	1.68
1.2 Dead+1.6 Wind 120 deg - No Ice	37.27	24.41	14.01	1457.10	-2544.86	1.82
0.9 Dead+1.6 Wind 120 deg - No Ice	27.95	24.41	14.01	1440.56	-2515.97	1.82
1.2 Dead+1.6 Wind 150 deg - No Ice	37.27	14.12	24.38	2540.12	-1472.51	1.36
0.9 Dead+1.6 Wind 150 deg - No Ice	27.95	14.12	24.38	2511.15	-1455.92	1.36
1.2 Dead+1.6 Wind 180 deg - No Ice	37.27	-0.07	28.16	2935.35	12.29	0.48
0.9 Dead+1.6 Wind 180 deg - No Ice	27.95	-0.07	28.16	2901.85	11.84	0.48
1.2 Dead+1.6 Wind 210 deg - No Ice	37.27	-14.15	24.36	2537.94	1480.33	-0.41
0.9 Dead+1.6 Wind 210 deg - No Ice	27.95	-14.15	24.36	2508.99	1463.05	-0.41
1.2 Dead+1.6 Wind 240 deg - No Ice	37.27	-24.36	14.11	1472.85	2541.32	-0.85
0.9 Dead+1.6 Wind 240 deg - No Ice	27.95	-24.36	14.11	1456.09	2511.91	-0.85
1.2 Dead+1.6 Wind 270 deg - No Ice	37.27	-28.25	-0.19	-26.61	2950.47	-2.38
0.9 Dead+1.6 Wind 270 deg - No Ice	27.95	-28.25	-0.19	-26.13	2916.34	-2.39
1.2 Dead+1.6 Wind 300 deg	37.27	-24.44	-14.22	-1487.25	2551.15	-2.29

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
- No Ice 0.9 Dead+1.6 Wind 300 deg	27.95	-24.44	-14.22	-1470.04	2521.62	-2.29
- No Ice 1.2 Dead+1.6 Wind 330 deg	37.27	-14.11	-24.51	-2558.99	1473.41	-1.64
- No Ice 0.9 Dead+1.6 Wind 330 deg	27.95	-14.11	-24.51	-2529.51	1456.23	-1.65
- No Ice 1.2 Dead+1.0 Ice+1.0 Temp	66.01	-0.00	-0.00	-3.19	2.73	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	66.01	-0.02	-8.25	-867.09	5.10	-0.72
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	66.01	4.28	-7.49	-786.31	-442.60	-0.45
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	66.01	7.48	-4.35	-457.50	-775.98	0.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	66.01	8.35	0.01	-2.09	-872.74	0.64
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	66.01	7.13	4.10	424.79	-742.89	0.86
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	66.01	4.12	7.13	741.52	-428.70	0.83
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	66.01	-0.01	8.23	857.09	5.11	0.56
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	66.01	-4.32	7.46	774.10	454.46	0.17
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	66.01	-7.49	4.34	449.29	784.11	-0.19
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	66.01	-8.37	-0.04	-9.48	882.42	-0.79
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	66.01	-7.13	-4.15	-438.00	749.55	-0.97
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	66.01	-4.12	-7.15	-752.18	434.13	-0.89
Dead+Wind 0 deg - Service	31.06	-0.01	-6.05	-628.47	2.81	-0.21
Dead+Wind 30 deg - Service	31.06	2.99	-5.25	-545.98	-308.08	-0.16
Dead+Wind 60 deg - Service	31.06	5.20	-3.03	-315.53	-537.40	0.11
Dead+Wind 90 deg - Service	31.06	6.02	0.01	0.44	-623.02	0.33
Dead+Wind 120 deg - Service	31.06	5.22	3.00	309.78	-540.88	0.34
Dead+Wind 150 deg - Service	31.06	3.02	5.22	540.27	-312.66	0.23
Dead+Wind 180 deg - Service	31.06	-0.02	6.03	624.39	3.34	0.05
Dead+Wind 210 deg - Service	31.06	-3.03	5.21	539.81	315.78	-0.12
Dead+Wind 240 deg - Service	31.06	-5.21	3.02	313.13	541.58	-0.19
Dead+Wind 270 deg - Service	31.06	-6.04	-0.04	-5.99	628.68	-0.49
Dead+Wind 300 deg - Service	31.06	-5.23	-3.04	-316.87	543.69	-0.44
Dead+Wind 330 deg - Service	31.06	-3.02	-5.24	-544.97	314.31	-0.29

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-31.06	0.00	0.00	31.06	0.00	0.000%
2	-0.07	-37.27	-28.27	0.07	37.27	28.27	0.000%
3	-0.07	-27.95	-28.27	0.07	27.95	28.27	0.000%
4	13.96	-37.27	-24.53	-13.96	37.27	24.53	0.000%
5	13.96	-27.95	-24.53	-13.96	27.95	24.53	0.000%
6	24.29	-37.27	-14.16	-24.29	37.27	14.16	0.000%
7	24.29	-27.95	-14.16	-24.29	27.95	14.16	0.000%
8	28.13	-37.27	0.04	-28.13	37.27	-0.04	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
9	28.13	-27.95	0.04	-28.13	27.95	-0.04	0.000%
10	24.41	-37.27	14.01	-24.41	37.27	-14.01	0.000%
11	24.41	-27.95	14.01	-24.41	27.95	-14.01	0.000%
12	14.12	-37.27	24.38	-14.12	37.27	-24.38	0.000%
13	14.12	-27.95	24.38	-14.12	27.95	-24.38	0.000%
14	-0.07	-37.27	28.16	0.07	37.27	-28.16	0.000%
15	-0.07	-27.95	28.16	0.07	27.95	-28.16	0.000%
16	-14.15	-37.27	24.36	14.15	37.27	-24.36	0.000%
17	-14.15	-27.95	24.36	14.15	27.95	-24.36	0.000%
18	-24.36	-37.27	14.11	24.36	37.27	-14.11	0.000%
19	-24.36	-27.95	14.11	24.36	27.95	-14.11	0.000%
20	-28.25	-37.27	-0.19	28.25	37.27	0.19	0.000%
21	-28.25	-27.95	-0.19	28.25	27.95	0.19	0.000%
22	-24.44	-37.27	-14.22	24.44	37.27	14.22	0.000%
23	-24.44	-27.95	-14.22	24.44	27.95	14.22	0.000%
24	-14.11	-37.27	-24.51	14.11	37.27	24.51	0.000%
25	-14.11	-27.95	-24.51	14.11	27.95	24.51	0.000%
26	0.00	-66.01	0.00	0.00	66.01	0.00	0.000%
27	-0.02	-66.01	-8.25	0.02	66.01	8.25	0.000%
28	4.28	-66.01	-7.49	-4.28	66.01	7.49	0.000%
29	7.48	-66.01	-4.35	-7.48	66.01	4.35	0.000%
30	8.35	-66.01	0.01	-8.35	66.01	-0.01	0.000%
31	7.13	-66.01	4.10	-7.13	66.01	-4.10	0.000%
32	4.12	-66.01	7.13	-4.12	66.01	-7.13	0.000%
33	-0.01	-66.01	8.23	0.01	66.01	-8.23	0.000%
34	-4.32	-66.01	7.46	4.32	66.01	-7.46	0.000%
35	-7.49	-66.01	4.34	7.49	66.01	-4.34	0.000%
36	-8.37	-66.01	-0.04	8.37	66.01	0.04	0.000%
37	-7.13	-66.01	-4.15	7.13	66.01	4.15	0.000%
38	-4.12	-66.01	-7.15	4.12	66.01	7.15	0.000%
39	-0.01	-31.06	-6.05	0.01	31.06	6.05	0.000%
40	2.99	-31.06	-5.25	-2.99	31.06	5.25	0.000%
41	5.20	-31.06	-3.03	-5.20	31.06	3.03	0.000%
42	6.02	-31.06	0.01	-6.02	31.06	-0.01	0.000%
43	5.22	-31.06	3.00	-5.22	31.06	-3.00	0.000%
44	3.02	-31.06	5.22	-3.02	31.06	-5.22	0.000%
45	-0.02	-31.06	6.03	0.02	31.06	-6.03	0.000%
46	-3.03	-31.06	5.21	3.03	31.06	-5.21	0.000%
47	-5.21	-31.06	3.02	5.21	31.06	-3.02	0.000%
48	-6.04	-31.06	-0.04	6.04	31.06	0.04	0.000%
49	-5.23	-31.06	-3.04	5.23	31.06	3.04	0.000%
50	-3.02	-31.06	-5.24	3.02	31.06	5.24	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	0.00097948
3	Yes	4	0.00000001	0.00050407
4	Yes	5	0.00000001	0.00099164
5	Yes	5	0.00000001	0.00039395
6	Yes	5	0.00000001	0.00099883
7	Yes	5	0.00000001	0.00039700
8	Yes	5	0.00000001	0.00005162
9	Yes	4	0.00000001	0.00065433
10	Yes	6	0.00000001	0.00004823
11	Yes	5	0.00000001	0.00041338
12	Yes	5	0.00000001	0.00098894
13	Yes	5	0.00000001	0.00039233
14	Yes	4	0.00000001	0.00068162
15	Yes	4	0.00000001	0.00027502
16	Yes	6	0.00000001	0.00004642
17	Yes	5	0.00000001	0.00039718
18	Yes	6	0.00000001	0.00004774

19	Yes	5	0.00000001	0.00040886
20	Yes	5	0.00000001	0.00004469
21	Yes	4	0.00000001	0.00058434
22	Yes	5	0.00000001	0.00098480
23	Yes	5	0.00000001	0.00038792
24	Yes	6	0.00000001	0.00004844
25	Yes	5	0.00000001	0.00041482
26	Yes	4	0.00000001	0.00001410
27	Yes	5	0.00000001	0.00039890
28	Yes	5	0.00000001	0.00065968
29	Yes	5	0.00000001	0.00066986
30	Yes	5	0.00000001	0.00040181
31	Yes	5	0.00000001	0.00063302
32	Yes	5	0.00000001	0.00061389
33	Yes	5	0.00000001	0.00039500
34	Yes	5	0.00000001	0.00067517
35	Yes	5	0.00000001	0.00068214
36	Yes	5	0.00000001	0.00040847
37	Yes	5	0.00000001	0.00062669
38	Yes	5	0.00000001	0.00064923
39	Yes	4	0.00000001	0.00004984
40	Yes	4	0.00000001	0.00030171
41	Yes	4	0.00000001	0.00030578
42	Yes	4	0.00000001	0.00006783
43	Yes	4	0.00000001	0.00034403
44	Yes	4	0.00000001	0.00030002
45	Yes	4	0.00000001	0.00003390
46	Yes	4	0.00000001	0.00030899
47	Yes	4	0.00000001	0.00033658
48	Yes	4	0.00000001	0.00008852
49	Yes	4	0.00000001	0.00029545
50	Yes	4	0.00000001	0.00034768

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	139.5 - 93.04	25.508	48	1.6736	0.0060
L2	96.96 - 46.38	11.991	49	1.2194	0.0017
L3	51.63 - 0	3.273	49	0.6015	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
136.00	HPA-65R-BUU-H6 w/ Mount Pipe	48	24.310	1.6393	0.0087	29473
134.00	VHLP2-11	48	23.627	1.6196	0.0084	26793
132.00	A-ANT-23G-2-C (VSI)	48	22.945	1.5999	0.0080	19648
130.00	APXVSPP18-C-A20 w/ Mount Pipe	48	22.266	1.5801	0.0076	15512
118.00	(2) DB846F65ZAXY w/Mount Pipe	49	18.283	1.4581	0.0055	6853
108.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	49	15.150	1.3497	0.0040	4677
100.00	APXV18-206517S-C	49	12.824	1.2566	0.0029	3734
75.00	Side Arm Mount [SO 701-1]	49	6.915	0.9249	0.0012	3607

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	119.518	20	7.8482	0.0286
L2	96.96 - 46.38	56.237	22	5.7271	0.0088
L3	51.63 - 0	15.363	22	2.8248	0.0030

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	HPA-65R-BUU-H6 w/ Mount Pipe	20	113.914	7.6883	0.0420	6492
134.00	VHLP2-11	20	110.717	7.5967	0.0402	5902
132.00	A-ANT-23G-2-C (VSI)	20	107.529	7.5048	0.0384	4327
130.00	APXVSPP18-C-A20 w/ Mount Pipe	20	104.353	7.4125	0.0366	3416
118.00	(2) DB846F65ZAXY w/Mount Pipe	20	85.703	6.8436	0.0265	1506
108.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	71.031	6.3375	0.0191	1025
100.00	APXV18-206517S-C	20	60.136	5.9016	0.0142	816
75.00	Side Arm Mount [SO 701-1]	22	32.456	4.3439	0.0060	778

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	46.46	0.00	0.0	20.4489	-10.99	1507.75	0.007
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	50.58	0.00	0.0	43.1454	-21.59	3205.49	0.007
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	51.63	0.00	0.0	57.2808	-37.24	3953.98	0.009

Pole Bending Design Data

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 $\frac{M_{uy}}{\phi M_{ny}}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	538.24	797.54	0.675	0.00	797.54	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	1576.47	2383.49	0.661	0.00	2383.49	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	2953.01	3913.15	0.755	0.00	3913.15	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	139.5 - 93.04 (1)	TP26.99x15.5x0.25	21.03	753.87	0.028	1.80	1597.03	0.001
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	24.77	1602.74	0.015	2.18	4772.81	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	28.32	1976.99	0.014	2.29	7835.87	0.000

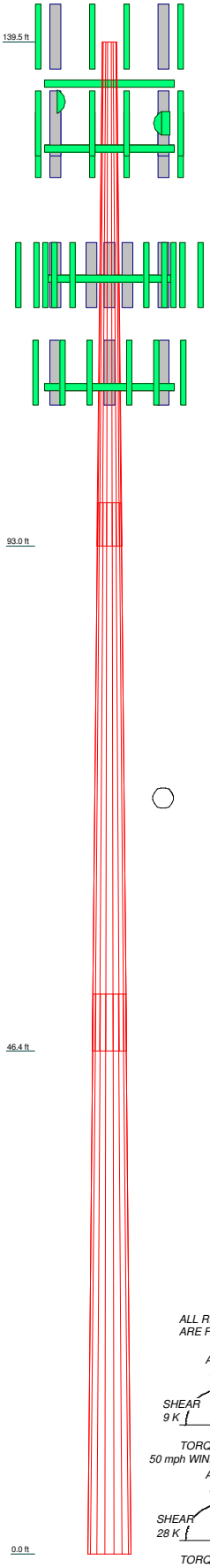
Pole Interaction Design Data

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	139.5 - 93.04 (1)	0.007	0.675	0.000	0.028	0.001	0.683 ✔	1.000	4.8.2 ✔
L2	93.04 - 46.38 (2)	0.007	0.661	0.000	0.015	0.000	0.668 ✔	1.000	4.8.2 ✔
L3	46.38 - 0 (3)	0.009	0.755	0.000	0.014	0.000	0.764 ✔	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	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-10.99	1507.75	68.3	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-21.59	3205.49	66.8	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-37.24	3953.98	76.4	Pass
							Summary	
						Pole (L3)	76.4	Pass
						RATING =	**76.4**	**Pass**

Section	1	2	3
Length (ft)	46.46	50.58	51.63
Number of Sides	18	18	18
Thickness (in)	0.2500	0.3750	0.3750
Socket Length (ft)	3.92	5.25	
Top Dia (in)	15.5000	25.5205	35.8740
Bot Dia (in)	26.9900	37.9100	48.5000
Grade		A572-65	
Weight (K)	2.6	6.4	8.7



ALL REACTIONS ARE FACTORED

AXIAL 63 K

SHEAR 9 K

MOMENT 898 kip-ft

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 35 K

SHEAR 28 K

MOMENT 2950 kip-ft

TORQUE 1 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
HPA-65R-BUU-H6 w/ Mount Pipe	136	T-Arm Mount [TA 602-3]	130
HPA-65R-BUU-H6 w/ Mount Pipe	136	A-ANT-23G-2-C	130
HPA-65R-BUU-H6 w/ Mount Pipe	136	VHLP2-11	130
800 10121 w/ mount pipe	136	(2) DB846F65ZAXY w/Mount Pipe	118
800 10121 w/ mount pipe	136	MG D3-800Tx w/ Mount Pipe	118
800 10121 w/ mount pipe	136	MG D3-800Tx w/ Mount Pipe	118
RRUS12/RRUS A2	136	MG D3-800Tx w/ Mount Pipe	118
RRUS12/RRUS A2	136	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	118
RRUS12/RRUS A2	136	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	118
(2) LGP21401	136	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	118
(2) LGP21401	136	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	118
(2) LGP21401	136	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	118
RRUS-11	136	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	118
RRUS-11	136	(2) FD9R6004/2C-3L	118
RRUS-11	136	(2) FD9R6004/2C-3L	118
DC6-48-60-18-8F	136	(2) FD9R6004/2C-3L	118
T-Arm Mount [TA 702-3]	136	RRH2X40-AWS	118
1900MHz RRH (65MHz)	132	RRH2X40-AWS	118
1900MHz RRH (65MHz)	132	RRH2X40-AWS	118
1900MHz RRH (65MHz)	132	T-Arm Mount [TA 602-3]	118
800MHZ RRH	132	(2) DB846F65ZAXY w/Mount Pipe	118
800MHZ RRH	132	(2) DB846F65ZAXY w/Mount Pipe	118
800MHZ RRH	132	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108
Side Arm Mount [SO 102-3]	132	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108
APXVSPP18-C-A20 w/ Mount Pipe	130	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108
APXVSPP18-C-A20 w/ Mount Pipe	130	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108
APXVSPP18-C-A20 w/ Mount Pipe	130	LNX-6515DS-A1M w/ Mount Pipe	108
LLPX310R w/ Mount Pipe	130	LNX-6515DS-A1M w/ Mount Pipe	108
(2) LLPX310R w/ Mount Pipe	130	LNX-6515DS-A1M w/ Mount Pipe	108
800 External Notch Filter	130	KRY 112 144/1	108
800 External Notch Filter	130	KRY 112 144/1	108
800 External Notch Filter	130	KRY 112 144/1	108
(3) ACU-A20-N	130	RRUS 11 B12	108
(3) ACU-A20-N	130	RRUS 11 B12	108
(3) ACU-A20-N	130	RRUS 11 B12	108
FDD_R6_RRH TMA	130	T-Arm Mount [TA 602-3]	108
(2) FDD_R6_RRH TMA	130	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108
APXVTM14-ALU-I20 w/ Mount Pipe	130	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108
APXVTM14-ALU-I20 w/ Mount Pipe	130	APXV18-206517S-C	100
APXVTM14-ALU-I20 w/ Mount Pipe	130	Pipe Mount [PM 601-3]	100
TD-RRH8x20-25	130	APXV18-206517S-C	100
TD-RRH8x20-25	130	APXV18-206517S-C	100
TD-RRH8x20-25	130	Side Arm Mount [SO 701-1]	75
6'x4" Pipe Mount	130	KS24019-L112A	75
6'x4" Pipe Mount	130		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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: 76.3%

Jacobs Engineering Group, Inc.
JACOBS
5449 Bells Ferry Road
Acworth, GA 30102
Phone: 770-701-2500
FAX: 770-701-2501

Job:	***139.5 Ft MP - Rogers Property***
Project:	***BU881541_WO1419636***
Client: Crown Castle	Drawn by: LinP / App'd:
Code: TIA-222-G	Date: 06/21/17 / Scale: NTS
Path:	Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	139.50-93.04	46.46	3.92	18	15.5000	26.9900	0.2500	1.0000	A572-65 (65 ksi)
L2	93.04-46.38	50.58	5.25	18	25.5205	37.9100	0.3750	1.5000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	46.38-0.00	51.63		18	35.8740	48.5000	0.3750	1.5000	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	15.7391	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.2880	9.152
	27.4064	21.2182	1916.7638	9.4927	13.7109	139.7983	3836.0497	10.6111	4.3102	17.241
L2	26.8892	29.9295	2390.8862	8.9267	12.9644	184.4188	4784.9184	14.9676	3.8316	10.218
	38.4948	44.6760	7952.1562	13.3249	19.2583	412.9214	15914.7760	22.3423	6.0122	16.032
L3	37.7311	42.2527	6727.0540	12.6022	18.2240	369.1315	13462.9597	21.1304	5.6538	15.077
	49.2482	57.2808	16760.5346	17.0844	24.6380	680.2717	33543.1232	28.6458	7.8760	21.003

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 139.50-93.04				1	1	1			
L2 93.04-46.38				1	1	1			
L3 46.38-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
7983A(1/2")	A	Surface Ar (CaAa)	130.00 - 0.00	2	2	0.100 0.100	0.5800		0.08
2" Rigid Conduit ** 108 **	A	Surface Ar (CaAa)	130.00 - 0.00	2	2	0.150 0.200	2.0000		2.80
MLE Hybrid 9Power/18Fiber RL 2(1 5/8) ***130***	B	Surface Ar (CaAa)	108.00 - 0.00	1	1	0.080 0.100	1.6250		1.07
HB114-21U3M12-XXXF(1-1/4) **	B	Surface Ar (CaAa)	130.00 - 0.00	1	1	-0.480 -0.480	1.5400		1.22

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
** 136 **								
LDF7-50A(1-5/8")	B	No	Inside Pole	136.00 - 0.00	6	No Ice 1/2" Ice	0.00 0.00	0.82 0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	136.00 - 0.00	2	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG82ST-BRDA(5/8")	B	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
2" Rigid Conduit	B	No	Inside Pole	136.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
** 130 **								
HB114-1-0813U4-M5J(1 1/4")	B	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	1.20
						1" Ice	0.00	1.20
7983A(1/2")	A	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
9207(5/16")	A	No	Inside Pole	130.00 - 0.00	3	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
** 118 **								
561(1-5/8")	A	No	Inside Pole	118.00 - 0.00	12	No Ice	0.00	1.35
						1/2" Ice	0.00	1.35
						1" Ice	0.00	1.35
LDF6-50A(1-1/4")	A	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
** 108 **								
*								
LDF7-50A(1-5/8")	B	No	Inside Pole	108.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
** 100 **								
CR 50 1873(1-5/8")	B	No	Inside Pole	100.00 - 0.00	6	No Ice	0.00	0.83
						1/2" Ice	0.00	0.83
						1" Ice	0.00	0.83
*****								
Safety Line 3/8	C	No	CaAa (Out Of Face)	139.50 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
**								
LDF4-50A(1/2)	B	No	Inside Pole	75.00 - 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	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	139.50-93.04	A	0.000	0.000	19.071	0.000	0.70
		B	0.000	0.000	8.123	0.000	0.65
		C	0.000	0.000	0.000	1.742	0.01
L2	93.04-46.38	A	0.000	0.000	24.077	0.000	1.14
		B	0.000	0.000	14.768	0.000	1.12
		C	0.000	0.000	0.000	1.750	0.01
L3	46.38-0.00	A	0.000	0.000	23.932	0.000	1.14

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	14.679	0.000	1.12
		C	0.000	0.000	0.000	1.739	0.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	139.50-93.04	A	1.699	0.000	0.000	55.229	0.000	1.30
		B		0.000	0.000	25.761	0.000	1.00
		C		0.000	0.000	0.000	17.525	0.09
L2	93.04-46.38	A	1.614	0.000	0.000	69.724	0.000	1.90
		B		0.000	0.000	46.470	0.000	1.76
		C		0.000	0.000	0.000	17.601	0.09
L3	46.38-0.00	A	1.448	0.000	0.000	67.349	0.000	1.84
		B		0.000	0.000	44.626	0.000	1.70
		C		0.000	0.000	0.000	16.713	0.09

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	139.50-93.04	-0.2950	-0.5399	-0.5237	-0.6758
L2	93.04-46.38	-0.2459	-0.6805	-0.4888	-0.9441
L3	46.38-0.00	-0.2589	-0.7149	-0.5657	-1.0890

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	8	7983A(1/2")	93.04 - 130.00	1.0000	1.0000
L1	11	2" Rigid Conduit	93.04 - 130.00	1.0000	1.0000
L1	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	93.04 - 108.00	1.0000	1.0000
L1	24	HB114-21U3M12-XXXF(1-1/4)	93.04 - 130.00	1.0000	1.0000
L2	8	7983A(1/2")	46.38 - 93.04	1.0000	1.0000
L2	11	2" Rigid Conduit	46.38 - 93.04	1.0000	1.0000
L2	18	MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	46.38 - 93.04	1.0000	1.0000
L2	24	HB114-21U3M12-XXXF(1-1/4)	46.38 - 93.04	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
** 136 **									
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
800 10121 w/ mount pipe	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17
800 10121 w/ mount pipe	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17
800 10121 w/ mount pipe	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	5.39 5.81 6.23	4.60 5.35 6.05	0.07 0.11 0.17
RRUS12/RRUS A2	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	3.14 3.36 3.59	1.84 2.01 2.20	0.07 0.10 0.13
RRUS12/RRUS A2	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	3.14 3.36 3.59	1.84 2.01 2.20	0.07 0.10 0.13
RRUS12/RRUS A2	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	3.14 3.36 3.59	1.84 2.01 2.20	0.07 0.10 0.13
(2) LGP21401	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
RRUS-11	A	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS-11	B	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
RRUS-11	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.52 2.72 2.92	1.07 1.21 1.36	0.06 0.07 0.10
DC6-48-60-18-8F	C	From Leg	4.00 0.00 4.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	0.92 1.46 1.64	0.92 1.46 1.64	0.03 0.05 0.07
T-Arm Mount [TA 702-3]	A	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice	5.64 6.55 7.46	5.64 6.55 7.46	0.34 0.43 0.52

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
** 132 **									
1900MHz RRH (65MHz)	A	From Leg	4.00	0.0000	132.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
1900MHz RRH (65MHz)	B	From Leg	4.00	0.0000	132.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
1900MHz RRH (65MHz)	C	From Leg	4.00	0.0000	132.00	No Ice	2.31	2.38	0.06
			0.00			1/2" Ice	2.52	2.58	0.08
			0.00			1" Ice	2.73	2.79	0.11
800MHZ RRH	A	From Leg	4.00	0.0000	132.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
800MHZ RRH	B	From Leg	4.00	0.0000	132.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
800MHZ RRH	C	From Leg	4.00	0.0000	132.00	No Ice	2.13	1.77	0.05
			0.00			1/2" Ice	2.32	1.95	0.07
			0.00			1" Ice	2.51	2.13	0.10
Side Arm Mount [SO 102-3]	C	None		0.0000	132.00	No Ice	3.00	3.00	0.08
						1/2" Ice	3.48	3.48	0.11
						1" Ice	3.96	3.96	0.14
** 130 **									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	130.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15
			0.00			1" Ice	9.77	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	130.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15
			0.00			1" Ice	9.77	9.02	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	130.00	No Ice	8.50	6.95	0.08
			0.00			1/2" Ice	9.15	8.13	0.15
			0.00			1" Ice	9.77	9.02	0.23
LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	130.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			2.00			1" Ice	5.25	4.09	0.13
(2) LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	130.00	No Ice	4.54	2.98	0.05
			0.00			1/2" Ice	4.89	3.53	0.08
			2.00			1" Ice	5.25	4.09	0.13
800 External Notch Filter	A	From Leg	4.00	0.0000	130.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
800 External Notch Filter	B	From Leg	4.00	0.0000	130.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
800 External Notch Filter	C	From Leg	4.00	0.0000	130.00	No Ice	0.66	0.32	0.01
			0.00			1/2" Ice	0.76	0.40	0.02
			0.00			1" Ice	0.87	0.48	0.02
(3) ACU-A20-N	A	From Leg	4.00	0.0000	130.00	No Ice	0.07	0.12	0.00
			0.00			1/2" Ice	0.10	0.16	0.00
			0.00			1" Ice	0.15	0.21	0.00
(3) ACU-A20-N	B	From Leg	4.00	0.0000	130.00	No Ice	0.07	0.12	0.00
			0.00			1/2" Ice	0.10	0.16	0.00
			0.00			1" Ice	0.15	0.21	0.00
(3) ACU-A20-N	C	From Leg	4.00	0.0000	130.00	No Ice	0.07	0.12	0.00
			0.00			1/2" Ice	0.10	0.16	0.00
			0.00			1" Ice	0.15	0.21	0.00
FDD_R6_RRH TMA	A	From Leg	4.00	0.0000	130.00	No Ice	1.79	0.78	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
(2) FDD_R6_RRH TMA	B	From Leg	4.00	0.0000	130.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00	0.0000	130.00	No Ice	6.58	4.96	0.08
			0.00			1/2" Ice	7.03	5.75	0.13
			0.00			1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00	0.0000	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	B	From Leg	4.00	0.0000	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
TD-RRH8x20-25	C	From Leg	4.00	0.0000	130.00	No Ice	4.05	1.53	0.07
			0.00			1/2" Ice	4.30	1.71	0.10
			0.00			1" Ice	4.56	1.90	0.13
6'x4" Pipe Mount	C	From Leg	4.00	0.0000	130.00	No Ice	2.25	2.25	0.07
			0.00			1/2" Ice	2.62	2.62	0.08
			0.00			1" Ice	3.00	3.00	0.11
6'x4" Pipe Mount	B	From Leg	4.00	0.0000	130.00	No Ice	2.25	2.25	0.07
			0.00			1/2" Ice	2.62	2.62	0.08
			0.00			1" Ice	3.00	3.00	0.11
T-Arm Mount [TA 602-3]	C	None		0.0000	130.00	No Ice	11.59	11.59	0.26
						1/2" Ice	15.44	15.44	0.33
						1" Ice	19.29	19.29	0.42
** 118 **									
(2) DB846F65ZAXY w/Mount Pipe	A	From Leg	6.00	0.0000	118.00	No Ice	7.27	7.82	0.05
			0.00			1/2" Ice	7.83	9.01	0.11
			0.00			1" Ice	8.35	9.91	0.19
(2) DB846F65ZAXY w/Mount Pipe	B	From Leg	6.00	0.0000	118.00	No Ice	7.27	7.82	0.05
			0.00			1/2" Ice	7.83	9.01	0.11
			0.00			1" Ice	8.35	9.91	0.19
(2) DB846F65ZAXY w/Mount Pipe	C	From Leg	6.00	0.0000	118.00	No Ice	7.27	7.82	0.05
			0.00			1/2" Ice	7.83	9.01	0.11
			0.00			1" Ice	8.35	9.91	0.19
MG D3-800Tx w/ Mount Pipe	A	From Leg	6.00	0.0000	118.00	No Ice	3.71	3.56	0.04
			0.00			1/2" Ice	4.19	4.39	0.07
			0.00			1" Ice	4.63	5.09	0.11
MG D3-800Tx w/ Mount Pipe	B	From Leg	6.00	0.0000	118.00	No Ice	3.71	3.56	0.04
			0.00			1/2" Ice	4.19	4.39	0.07
			0.00			1" Ice	4.63	5.09	0.11
MG D3-800Tx w/ Mount Pipe	C	From Leg	6.00	0.0000	118.00	No Ice	3.71	3.56	0.04
			0.00			1/2" Ice	4.19	4.39	0.07
			0.00			1" Ice	4.63	5.09	0.11
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	6.00	0.0000	118.00	No Ice	3.18	3.35	0.03
			0.00			1/2" Ice	3.56	3.97	0.06
			0.00			1" Ice	3.93	4.60	0.10
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	6.00	0.0000	118.00	No Ice	3.18	3.35	0.03
			0.00			1/2" Ice	3.56	3.97	0.06
			0.00			1" Ice	3.93	4.60	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	3.18 3.56 3.93	3.35 3.97 4.60	0.03 0.06 0.10
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	7.81 8.36 8.87	5.80 6.95 7.82	0.04 0.10 0.17
(2) FD9R6004/2C-3L	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/2C-3L	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.14 0.20	0.00 0.01 0.01
(2) FD9R6004/2C-3L	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.08 0.14 0.20	0.00 0.01 0.01
RRH2X40-AWS	A	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.59 1.80 2.01	0.04 0.06 0.08
RRH2X40-AWS	B	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.59 1.80 2.01	0.04 0.06 0.08
RRH2X40-AWS	C	From Leg	6.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.59 1.80 2.01	0.04 0.06 0.08
T-Arm Mount [TA 602-3]	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	11.59 15.44 19.29	11.59 15.44 19.29	0.26 0.33 0.42
** 108 **									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.36 10.68 11.71	0.08 0.16 0.25
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	108.00	No Ice 1/2" Ice	11.45 12.06	9.36 10.68	0.08 0.16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			1" Ice	12.69	11.71	0.25
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.45 12.06 12.69	9.36 10.68 11.71	0.08 0.16 0.25
KRY 112 144/1	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
RRUS 11 B12	A	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 1.00	0.0000	108.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
T-Arm Mount [TA 602-3]	C	None		0.0000	108.00	No Ice 1/2" Ice 1" Ice	11.59 15.44 19.29	11.59 15.44 19.29	0.26 0.33 0.42
** 100 **									
APXV18-206517S-C	A	From Leg	2.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
APXV18-206517S-C	B	From Leg	2.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
APXV18-206517S-C	C	From Leg	2.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.17 5.62 6.08	3.04 3.47 3.91	0.03 0.05 0.09
Pipe Mount [PM 601-3]	C	None		0.0000	100.00	No Ice 1/2" Ice 1" Ice	4.39 5.48 6.57	4.39 5.48 6.57	0.20 0.24 0.28
** 75 **									
Side Arm Mount [SO 701-1]	C	From Leg	2.75 0.00 0.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
KS24019-L112A	C	From Leg	4.25 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	0.10 0.18 0.26	0.10 0.18 0.26	0.01 0.01 0.01
*****									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-2-C	B	Paraboloid w/Shroud (HP)	From Leg	4.00 0.00 2.00	10.0000		130.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
VHLP2-11	C	Paraboloid w/o Radome	From Leg	4.00 0.00 4.00	-20.0000		130.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
***											

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
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

Comb. No.	Description
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 Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	25.401	50	1.6616	0.0052
L2	96.96 - 46.38	11.958	50	1.2149	0.0016
L3	51.63 - 0	3.267	50	0.6001	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	HPA-65R-BUU-H6 w/ Mount Pipe	50	24.211	1.6273	0.0052	29625
134.00	VHLP2-11	50	23.532	1.6081	0.0050	26932
132.00	A-ANT-23G-2-C	50	22.855	1.5888	0.0047	19750
130.00	APXVSPP18-C-A20 w/ Mount Pipe	50	22.180	1.5695	0.0045	15592
118.00	(2) DB846F65ZAXY w/Mount Pipe	50	18.219	1.4500	0.0033	6889
108.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	50	15.102	1.3435	0.0024	4701
100.00	APXV18-206517S-C	50	12.787	1.2517	0.0019	3754
75.00	Side Arm Mount [SO 701-1]	50	6.901	0.9223	0.0008	3634

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	139.5 - 93.04	119.042	24	7.8177	0.0231
L2	96.96 - 46.38	56.090	24	5.7078	0.0067
L3	51.63 - 0	15.334	24	2.8185	0.0019

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136.00	HPA-65R-BUU-H6 w/ Mount Pipe	24	113.469	7.6586	0.0245	6549
134.00	VHLP2-11	24	110.290	7.5675	0.0234	5953

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
132.00	A-ANT-23G-2-C	24	107.120	7.4761	0.0224	4365
130.00	APXVSPP18-C-A20 w/ Mount Pipe	24	103.961	7.3843	0.0214	3445
118.00	(2) DB846F65ZAXY w/Mount Pipe	24	85.411	6.8184	0.0157	1519
108.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	24	70.815	6.3150	0.0115	1034
100.00	APXV18-206517S-C	24	59.972	5.8814	0.0087	823
75.00	Side Arm Mount [SO 701-1]	24	32.383	4.3312	0.0038	783

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	46.46	0.00	0.0	20.4489	-9.16	1507.75	0.006
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	50.58	0.00	0.0	43.1454	-19.75	3205.49	0.006
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	51.63	0.00	0.0	57.2808	-35.40	3953.98	0.009

Pole Bending Design Data

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 $\frac{M_{uy}}{\phi M_{ny}}$
L1	139.5 - 93.04 (1)	TP26.99x15.5x0.25	535.48	797.54	0.671	0.00	797.54	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	1570.97	2383.49	0.659	0.00	2383.49	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	2949.77	3913.15	0.754	0.00	3913.15	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	139.5 - 93.04 (1)	TP26.99x15.5x0.25	20.92	753.87	0.028	0.15	1597.03	0.000
L2	93.04 - 46.38 (2)	TP37.91x25.5205x0.375	24.76	1602.74	0.015	0.31	4772.81	0.000
L3	46.38 - 0 (3)	TP48.5x35.874x0.375	28.40	1976.99	0.014	0.44	7835.87	0.000

Pole Interaction Design Data

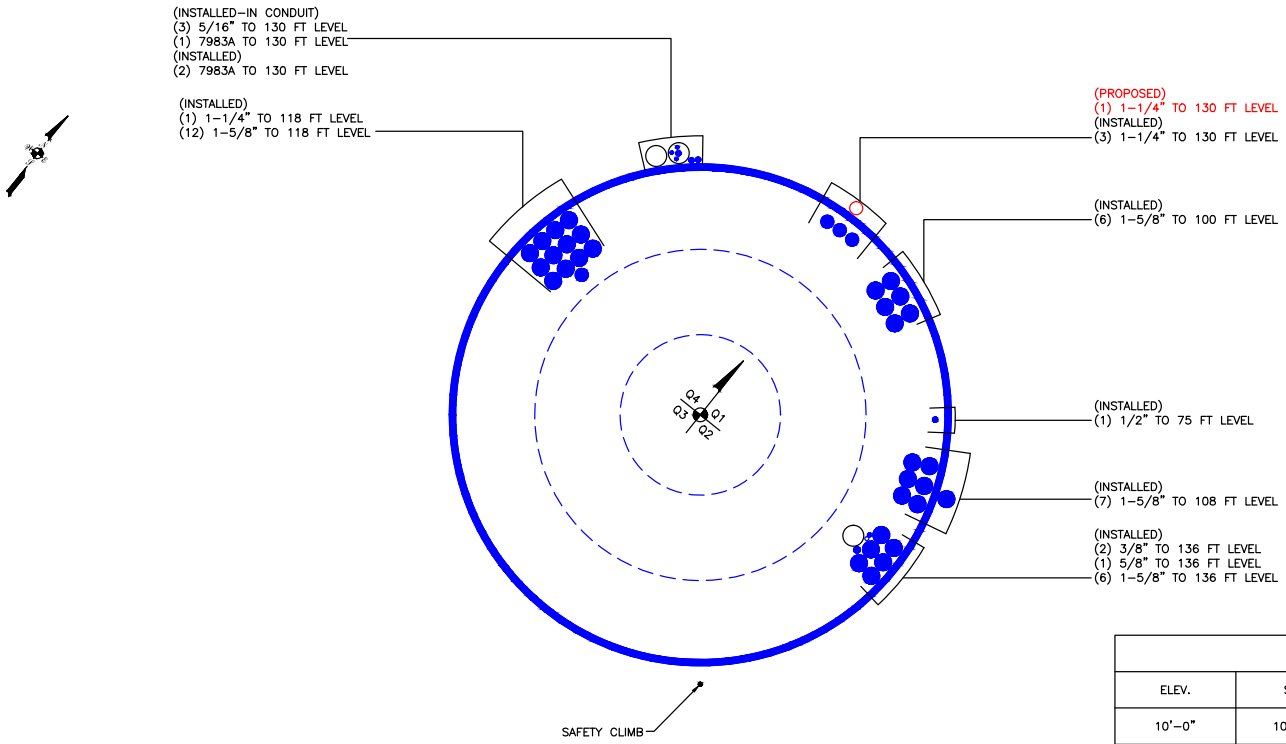
Section No.	Elevation ft	Ratio $P_u / \phi P_n$	Ratio $M_{ux} / \phi M_{nx}$	Ratio $M_{uy} / \phi M_{ny}$	Ratio $V_u / \phi V_n$	Ratio $T_u / \phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	139.5 - 93.04 (1)	0.006	0.671	0.000	0.028	0.000	0.678 ✔	1.000	4.8.2 ✔
L2	93.04 - 46.38 (2)	0.006	0.659	0.000	0.015	0.000	0.666 ✔	1.000	4.8.2 ✔
L3	46.38 - 0 (3)	0.009	0.754	0.000	0.014	0.000	0.763 ✔	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	139.5 - 93.04	Pole	TP26.99x15.5x0.25	1	-9.16	1507.75	67.8	Pass
L2	93.04 - 46.38	Pole	TP37.91x25.5205x0.375	2	-19.75	3205.49	66.6	Pass
L3	46.38 - 0	Pole	TP48.5x35.874x0.375	3	-35.40	3953.98	76.3	Pass
							Summary	
						Pole (L3)	76.3	Pass
						RATING =	**76.3**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881541 TOWER ID: C_BASELEVEL

PORT INFORMATION			
ELEV.	SIZE	LOCATION	STATUS
10'–0"	10"x30"	E & W	.
7'–0"	10"x30"	S	.
3'–3"	10"x30"	E & W	.

09/10/14	UPDATED PER WORK ORDER # 934634	SAT
27/10/2014	UPDATED PER WORK ORDER 917883	CBS
14/7/2015	UPDATED PER WORK ORDER 1082999	ADE
15/9/2015	UPDATED PER WORK ORDER 1120693	SAT
07/06/16	UPDATED PER WORK ORDER 1227481	ALM
15/06/16	UPDATED PER WORK ORDER 1254368	BMH
15/06/17	UPDATED PER WORK ORDER 1419469	JRP
16/06/17	UPDATED PER WORK ORDER 1420040	JRP

DRAWN BY: **VSG**
CHECKED BY: **GPK**
DRAWING DATE: **25/02/08**

SITE NUMBER:
SITE NAME:

SITE NAME

ROGERS PROPERTY

BUSINESS UNIT NUMBER

881541

SITE ADDRESS

NEW HAVEN, CT 06477
NEW HAVEN
UNITED STATES COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING

SCALE: 1" = 1'–0" | 1

PLOT DATE: 7/05/2018 - FILENAME: 881541_BASELEVEL.DWG
R:\TEMPLATES\TYPICAL BLOCKS FOR TEMPLATES\TITLE BLOCK STD-VER 5.1.dwg

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#: *881541*
Site Name: *ROGERS PROPERTY*
App #: *393564 REV.0*

Pole Manufacturer:	*Other*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	57	in

Plate Data		
Diam:	63	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	9.62	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	6	in
Height:	15	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	48.5	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions		
Mu:	2950	ft-kips
Axial, Pu:	35	kips
Shear, Vu:	28	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	161.0 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	61.9% **Pass**	

Base Plate Results Flexural Check

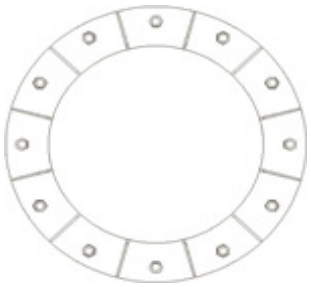
		Stiffened
Base Plate Stress:	27.2 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	50.3% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	60.5% **Pass**
Vertical Weld:	57.1% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	23.6% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	62.9% **Pass**
Plate Comp. (AISC Bracket):	67.5% **Pass**

Pole Results

Pole Punching Shear Check:	16.3% **Pass**



* 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

Project Name:	ROGERS PROPERTY	JACOBS® Jacobs Engineering Group, Inc.	Created On: 8/8/2014
Project Number:	881541		Checked By: JTE
Job Number:	1419636		Revised On:
Date:	6/21/2017		Revision No: 0

Drilled Caisson Foundation with Pad

Analysis Parameters		
Code:	G	
Axial:	35	kip
Shear:	28	kip
Moment:	2950	kip-ft

Soil Parameters		
Unit Weight	125	pcf
Friction Angle	34	degrees
Cohesion	0	psf
Ultimate Bearing Capacity	8	ksf

Foundation Paramaters		
Pad Steel Known?	Yes	
Concrete Density:	150	pcf
Pad Length	16	ft
Pad Thickness	3	ft
Pad Bearing Depth	7	ft
Caisson Diameter	6.5	ft

Foundation Structure		
Concrete Strength (f'_c)	4000	psi
Rebar Strength (f_y)	60	ksi
Rebar Size	8	
Rebar Quantity	31	
Clear Cover	3	in

Reactions in Pad:		
Axial:	35.000	kip
Shear:	28.000	kip
Moment:	932.847	kip-ft
Capacity:	100.0%	Pass

Reactions in Caisson:		
Axial:	0.00	kip
Shear:	0.00	kip
Moment:	2017.15	kip-ft

Pad Structural Capacity:		
Beam Shear:	13.4%	Pass
Flexural:	10.4%	Pass

Drilled Pier Foundation

BU # :	881541
Site Name:	ROGERS PROPERTY
App. Number:	393564 Rev. 0

TIA-222 Revison:	G
Tower Type:	Monopole

Applied Loads	**Comp.**	**Uplift**
Moment (kip-ft)	2017.15	
Axial Force (kips)	1	
Shear Force (kips)	1	

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

Pier Design Data		
Depth	20	ft
Ext. Above Grade	1	ft
Pier Section 1		
From 1' above grade to 20		
Pier Diameter	6.5	ft
Rebar Quantity	22	
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)	4.57	-
Soil Safety Factor	2.26	-
Max Moment (kip-ft)	2205.19	-
Rating	*58.8%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	298.12	-
End Bearing (kips)	199.10	-
Weight of Concrete (kips)	93.13	-
Total Capacity (kips)	497.22	-
Axial (kips)	94.13	-
Rating	*18.9%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	0.00	-
Critical Moment (kip-ft)	2200.66	-
Critical Moment Capacity	4927.53	-
Rating	*44.7%*	-

Soil Interaction Rating	**58.8%**
Structural Foundation Rating	**44.7%**

Soil Profile

Groundwater Depth	7	ft	
# of Layers	3		

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (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 Classification
1	0	3.5	3.5	125	150	0	0	0.000	0.000					Cohesionless
2	3.5	7	3.5	125	150	0	34	0.781	0.781				28	Cohesionless
3	7	20	13	62.6	87.6	0	34	1.287	1.287			8	50	Cohesionless

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

SPRINT Existing Facility

Site ID: CT23XC313

Orange/Rogers Property
700 Grassy Hill Road
Orange, CT 06477

July 23, 2017

EBI Project Number: 6217003217

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	13.32 %

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

EBI Consulting
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July 23, 2017

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

Emissions Analysis for Site: **CT23XC313 – Orange/Rogers Property**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **700 Grassy Hill Road, Orange, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. 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 **700 Grassy Hill Road, Orange, 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 APXVSPP18-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 **130 feet** above ground level (AGL) for **Sector A**, **130 feet** above ground level (AGL) for **Sector B** and **130 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 APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**130 feet**	Height (AGL):	**130 feet**	Height (AGL):	**130 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%	**2.00 %**	Antenna B1 MPE%	**2.00 %**	Antenna C1 MPE%	**2.00 %**
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):	**130 feet**	Height (AGL):	**130 feet**	Height (AGL):	**130 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%	**1.46 %**	Antenna B2 MPE%	**1.46 %**	Antenna C2 MPE%	**1.46 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.45 %**
Verizon Wireless	2.75 %
MetroPCS	0.77 %
Clearwire	0.12 %
AT&T	2.44 %
T-Mobile	3.79 %
Site Total MPE %:	**13.32 %**

SPRINT Sector A Total:	3.45 %
SPRINT Sector B Total:	3.45 %
SPRINT Sector C Total:	3.45 %
Site Total:	13.32 %

SPRINT _ Max Values per Frequency Band / Technology	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density (µW/cm²)**	**Frequency (MHz)**	**Allowable MPE (µW/cm²)**	**Calculated % MPE**
Sprint 850 MHz CDMA	1	437.55	130	1.02	850 MHz	567	0.18%
Sprint 850 MHz LTE	2	437.55	130	2.05	850 MHz	567	0.36%
Sprint 1900 MHz (PCS) CDMA	5	622.47	130	7.28	1900 MHz (PCS)	1000	0.73%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	130	7.28	1900 MHz (PCS)	1000	0.73%
Sprint 2500 MHz (BRS) LTE	8	778.09	130	14.55	2500 MHz (BRS)	1000	1.46%
						Total:	**3.45%**

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:	3.45 %
Sector B:	3.45 %
Sector C:	3.45 %
SPRINT Maximum Total (per sector):	3.45 %
Site Total:	13.32 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.32 %** 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.