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: 806384**
Sprint Site ID: CT03XC110
93 Roxbury Road, Niantic (East Lyme) New London County, CT
Latitude: 41° 20' 8.35" / Longitude: -72° 13' 18.28"

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 122-foot level of the existing 151.292-foot self-support tower at 93 Roxbury Road, East Lyme, CT. The tower is owned by Crown Castle. The property is owned by the Town of East Lyme. Sprint intends to install (3) antennas and (3) RRUs with (1) hybrid cable.

This facility was approved by the Connecticut Siting Council Petition No. 116 on January 3, 1990. This approval was given without conditions.

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 the landowner and municipality, The First Selectman of East Lyme, Mark C. Nickerson, the Director of Planning Gary A. Goeschel, II and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

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

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: First Selectman Mark C. Nickerson
Town of East Lyme
108 Pennsylvania Ave
Niantic, CT 06357-1510

Gary A. Goeschel, II, Director of Planning
Town of East Lyme
108 Pennsylvania Ave
Niantic, CT 06357-1510

93 ROXBURY RD

Location	93 ROXBURY RD	**Mblu**	15.0/ 3/ / /
Acct#	008267	**Owner**	METRO MOBILE CTS OF N L INC
Assessment	$811,230	**Appraisal**	$1,158,900
PID	4698	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$33,900	$1,125,000	$1,158,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$23,730	$787,500	$811,230

Owner of Record

Owner	METRO MOBILE CTS OF N L INC	**Sale Price**	$0
Co-Owner	C/O CROWN ATLANTIC CO	**Certificate**	
Address	PMB 353 4017 WASHINGTON RD MCMURRAY, PA 15317	**Book & Page**	297/ 552
		Sale Date	03/05/1990

Ownership History

Ownership History
No Data for Ownership History

Building Information

Building 1 : Section 1

Year Built:	1990
Living Area:	450
Replacement Cost:	$36,171
Building Percent Good:	85
Replacement Cost Less Depreciation:	$30,700

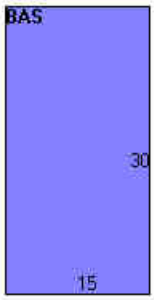
Building Attributes

Field	Description
STYLE	Commercial
MODEL	Commercial
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Tar & Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	NA
Heating Type	None
AC Type	None
Bldg Use	TEL X STA MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	430C
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	NONE
Ceiling/Wall	NONE
Rooms/Prtns	LIGHT
Wall Height	10
% Comn Wall	0

Building Photo

(http://images.vgsi.com/photos2/EastLymeCTPhotos//\01\00\33/

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	450	450
		450	450

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	430C
Description	TEL X STA MDL-94
Zone	R40

Land Line Valuation

Size (Acres)	0.09
Frontage	0
Depth	0

Neighborhood		**Assessed Value**	$787,500
Alt Land Appr Category	No	**Appraised Value**	$1,125,000

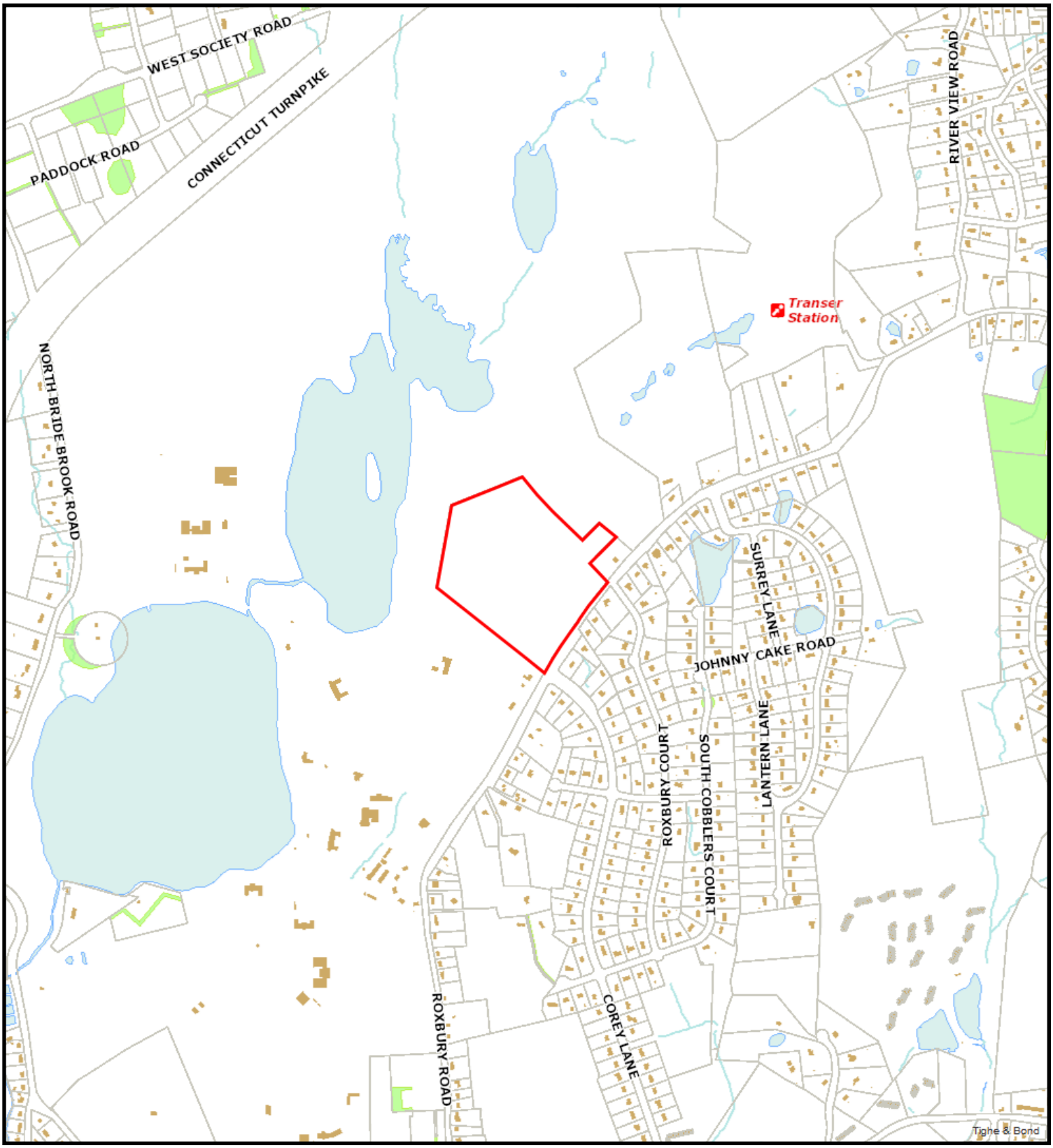
Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
FN4	FENCE-8' CHAIN			250 L.F.	$3,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$33,900	$1,125,000	$1,158,900
2015	$23,300	$62,700	$86,000
2014	$23,300	$62,700	$86,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$23,730	$787,500	$811,230
2015	$16,310	$43,890	$60,200
2014	$16,310	$43,890	$60,200



parcel map

8/2/2017 9:49:24 AM

Scale: 1"=1000'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

ORIGINAL

An application of Metro Mobile CTS of New London Inc., for a Certificate of Environmental Compatibility and Public Need for the construction, operation, and maintenance of cellular telephone tower and associated equipment in the Town of East Lyme, Connecticut.	:	Docket No. 116 Connecticut Siting Council January 3, 1990

DECISION AND ORDER

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council finds that the effects associated with the construction, operation, and maintenance of a cellular telephone facility at the proposed East Lyme site, 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 significant either alone or cumulatively with other effects, 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 Section 16-50k of the General Statutes of Connecticut (CGS), be issued to Metro Mobile CTS of New London, Inc., for the construction, operation, and maintenance of a cellular telecommunications tower, associated equipment, and building at the proposed East Lyme site in East Lyme, 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 self-supporting, lattice tower including antennas and associated equipment shall not exceed a height of 343 feet AMSL.
2. The facility shall be constructed in accordance with the State of Connecticut Basic Building Code.

3. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M plan shall include detailed plans of the site preparation with compacted fill and adjustment for tower height in relation to the new site elevation.

4. The Certificate Holder shall comply with any future radio frequency (RF) standard, promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted in this Decision and Order shall be brought into compliance with such standards.

5. The Certificate Holder or its successor shall provide the Council a recalculated report of power density if and when additional channels over the proposed 60 channels, higher wattage over the proposed 100 watts per channel, or if other circumstances in operation cause a change in power density above the levels originally calculated in the application.

6. The Certificate Holder or its successor shall permit public or private entities to share space on the East Lyme tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. If this facility does not initially provide, or permanently ceases to provide cellular service following completion of construction, this Decision and Order shall be void, and the tower and all associated equipment in this application shall be dismantled and removed or reapplication for any new use shall be made to the Council before any such new use is made.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the issuance of this Decision and Order, or within three years after the completion of any appeal to this Decision and Order.

Pursuant to Section 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. A notice of issuance shall be published in the New London Day.

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 State Agencies.

The parties or intervenors to this proceeding are:

Metro Mobile CTS of New London, Inc. (Applicant)
100 Corporate Drive
Windsor, CT 06095

ATTN: Gary Schulman
General Manager

Robinson and Cole (Its Representative)
One Commercial Plaza
Hartford, CT 06103-3597
Attn: Earl W. Phillips, Jr., Esq.

SNET Cellular, Inc. (Intervenor)
227 Church Street
New Haven, CT 06506

Peter J. Tyrrell (Its Representative)
SNET Cellular, Inc.
Room 1021
227 Church Street
New Haven, CT 06506

3782E-9-11

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case in Docket No. 116 or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut the 3rd day of January, 1990.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner Peter Boucher Designee: Robert A. Pulito	Yes
Commissioner Leslie Carothers Designee: Brian Emerick	Absent
Harry E. Covey	Yes
Mortimer A. Gelston	Yes
Daniel P. Lynch, Jr.	Yes
Paulann H. Sheets	Yes
William H. Smith	Yes
Colin C. Tait	Yes

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	EAST LYME
SITE CASCADE:	CT03XC110
SITE NUMBER:	806384
SITE ADDRESS:	93 ROXBURY ROAD NIANTIC, CT 06357
SITE TYPE:	SELF SUPPORT TOWER
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

TOWER OWNER:
CROWN ATLANTIC COMPANY LLC
2000 CORPORATE DRIVE
CANONSBURG, PA 15317
(704) 405-6555

LATITUDE (NAD83):
41° 20' 8.35" N
41.335653°

LONGITUDE (NAD83):
72° 13' 18.28" W
-72.221744°

COUNTY:
NEW LONDON

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
R40

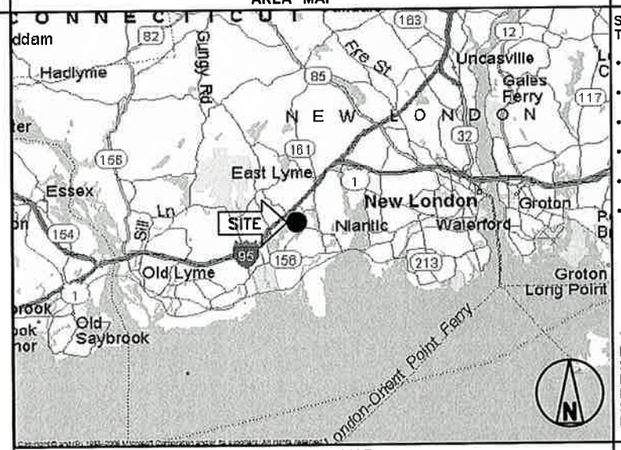
POWER COMPANY:
CL&P
(888)-783-6617

SPRINT PM:
PETER GIARD
(508) 801-0074
PETER.GIARD@SPRINT.COM

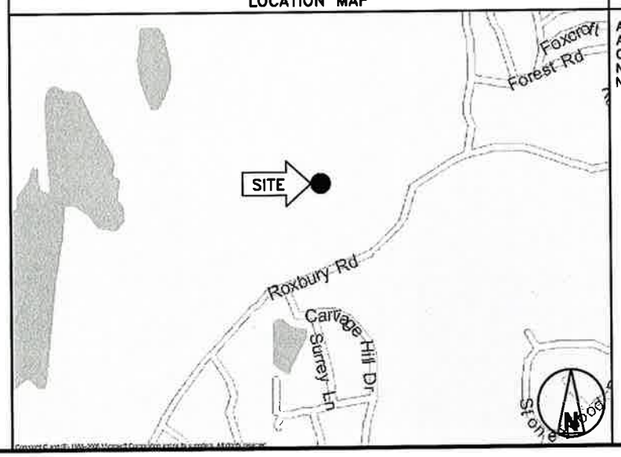
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
peter.culbert@sprint.com

CROWN CM:
JASON D'AMICO
PHONE: 860-209-0104
JASON.D'AMICO@CROWNCASTLE.COM

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL 2.5 EQUIPMENT IN EXISTING N.V. MMBS CABINET
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRU'S TO TOWER
- INSTALL (27) JUMPER CABLES
- INSTALL (1) FIBER CABLE
- INSTALL (4) BATTERIES IN EXISTING BBU CABINET

THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

APPLICABLE CODES

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALL IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE (2012 IBC)
2. TIA-EIA-222-G OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

811 Know what's **below.** **Call** before you dig. www.call811.com

DRAWING INDEX

SHEET NO:	SHEET TITLE	REV
T-1	TITLE SHEET & PROJECT DATA	0
SP-1	SPRINT SPECIFICATIONS	0
SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION & CABLE PLAN	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	COLOR CODING & NOTES	0
A-5	EQUIPMENT & MOUNTING DETAILS	0
A-6	CIVIL DETAILS	0
A-7	PLUMBING DIAGRAM	0
E-1	ELECTRICAL & GROUNDING PLAN	0
E-2	ELECTRICAL & GROUNDING DETAILS	0

APPROVED
By Jason D'Amico at 9:43 am, Jul 06, 2017

APPROVED
By Jeff Barbadora at 3:36 pm, May 25, 2014

PLANS PREPARED FOR:
Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:
INFINIGY Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-XXX

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

SITE NAME: EAST LYME

SITE CASCADE: CT03XC110

SITE ADDRESS: 93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION: TITLE SHEET & PROJECT DATA

SHEET NUMBER: T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

1. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
7. AMERICAN CONCRETE INSTITUTE (ACI)
8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
11. PORTLAND CEMENT ASSOCIATION (PCA)
12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
13. BRICK INDUSTRY ASSOCIATION (BIA)
14. AMERICAN WELDING SOCIETY (AWS)
15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
17. DOOR AND HARDWARE INSTITUTE (DHI)
18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
19. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.

B. COMPANY: SPRINT CORPORATION

C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.

D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.

E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.

C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

NOTE: IN SHORT-FORM SPECIFICATIONS ON THE DRAWINGS, A/E TO INSERT LIST OF APPLICABLE MOPS INCLUDING EN-2012-001, EN-2013-002, EL-0568, AND TS-0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 EXISTING CONDITIONS: NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

A. A COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED

A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

TOWER OWNER NOTIFICATION
ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.

1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.

1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN

D. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COAX SWEEPS AND FIBER TESTS PER TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;

1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPs

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

1. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
2. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.

8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.

9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.

10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

11. ALL AVAILABLE JURISDICTIONAL INFORMATION

12. PDF SCAN OF REDLINES PRODUCED IN FIELD

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.

1. CONCRETE MIX AND CYLINDER BREAK REPORTS.

2. STRUCTURAL BACKFILL COMPACTION REPORTS.

3. SITE RESISTANCE TO EARTH TEST.

4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION

5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.

6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;

1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.

2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;

3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.

4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING---TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;

6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.

7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.

9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:

1. 1SHELTER AND TOWER OVERVIEW.

2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).

3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).

4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).

5. PHOTOS OF TOWER SECTION STACKING.

6. CONCRETE TESTING / SAMPLES.

7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.

8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.

9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.

10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.

11. COAX CABLE ENTRY INTO SHELTER.

12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.

14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.

15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.

16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.

17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.

18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.

19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.

20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.

21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.

22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

25. ALL BTS GROUND CONNECTIONS.

26. ALL GROUND TEST WELLS.

27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.

28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.

29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.

30. GPS ANTENNAS.

31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.

32. DOGHOUSE/CABLE EXIT FROM ROOF.

33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.

34. MASTER BUS BAR.

35. TELCO BOARD AND NIU.

36. ELECTRICAL DISTRIBUTION WALL.

37. CABLE ENTRY WITH SURGE SUPPRESSION.

38. ENTRANCE TO EQUIPMENT ROOM.

39. COAX WEATHERPROOFING--TOP AND BOTTOM OF TOWER.

40. COAX GROUNDING –TOP AND BOTTOM OF TOWER.

41. ANTENNA AND MAST GROUNDING.

42. LANDSCAPING – WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

93 ROXBURY ROAD
NIANTIC, CT 06357

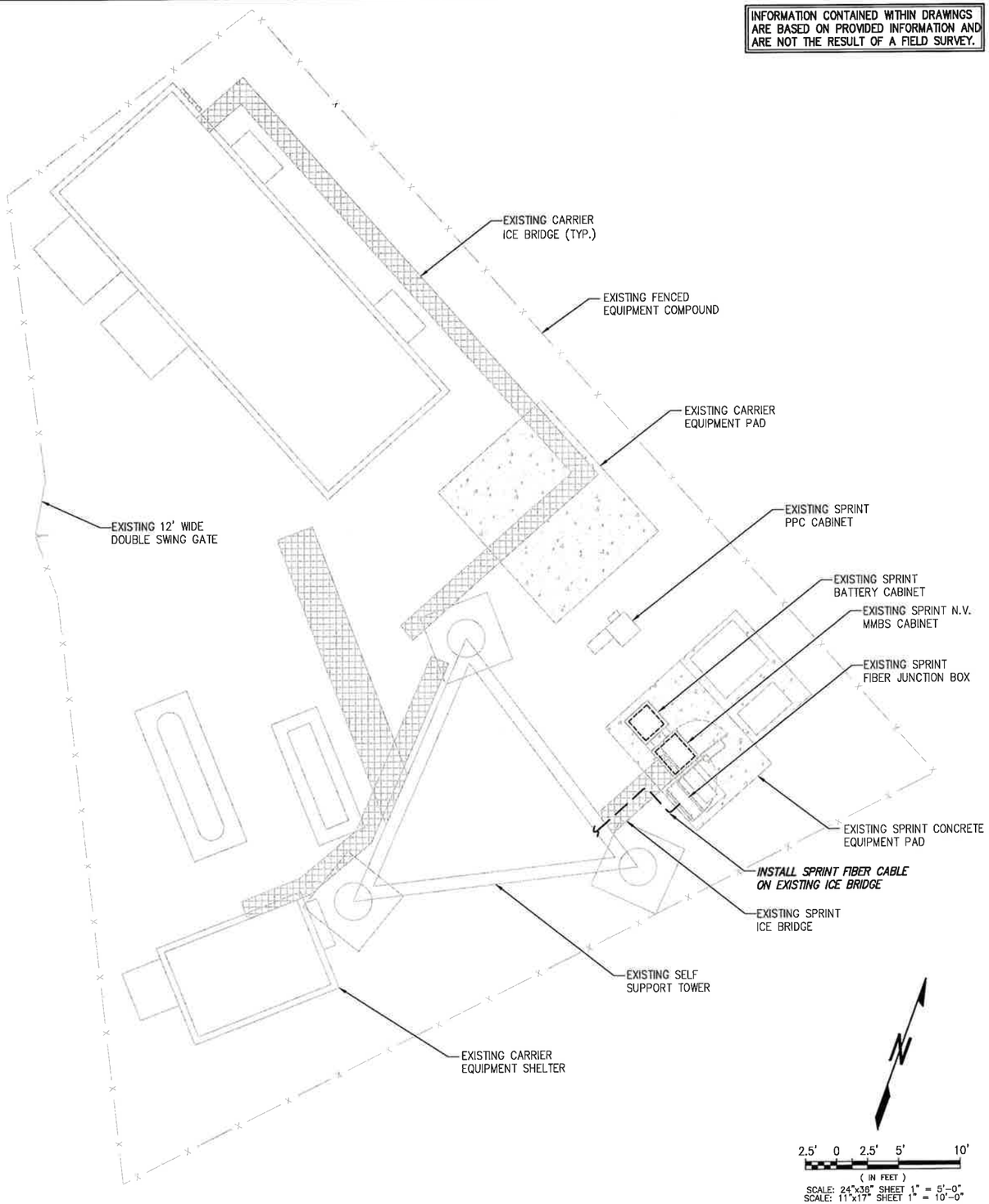
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

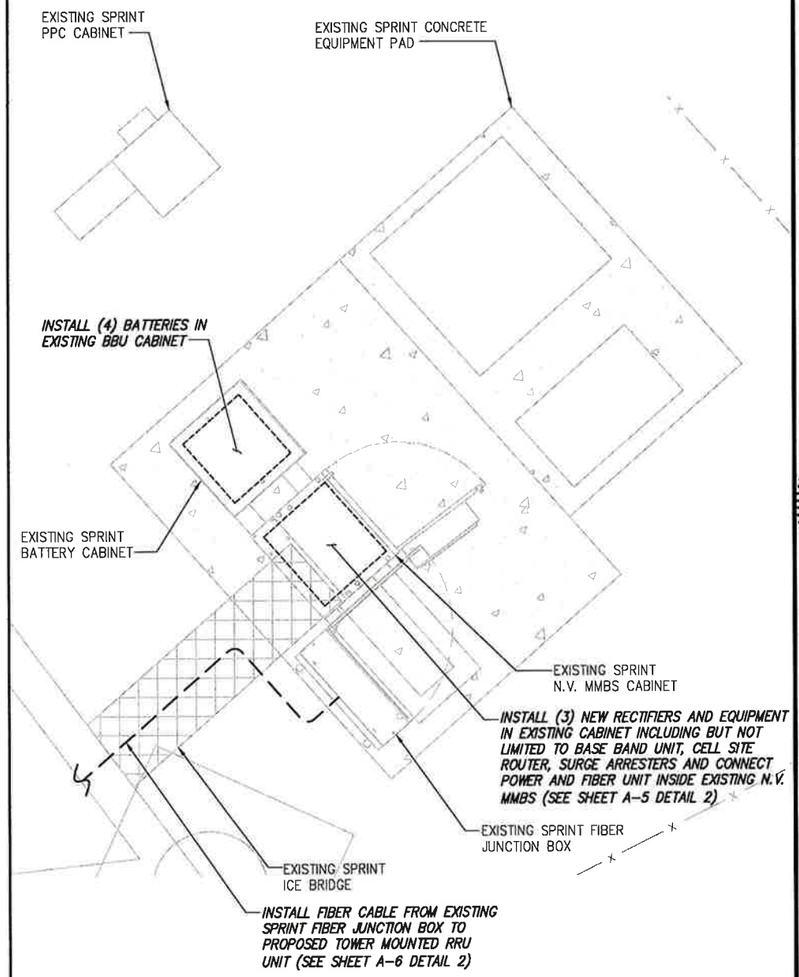
SHEET NUMBER:

SP-3

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION AND ARE NOT THE RESULT OF A FIELD SURVEY.



OVERALL SITE PLAN | SCALE: AS NOTED | 1



SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

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ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

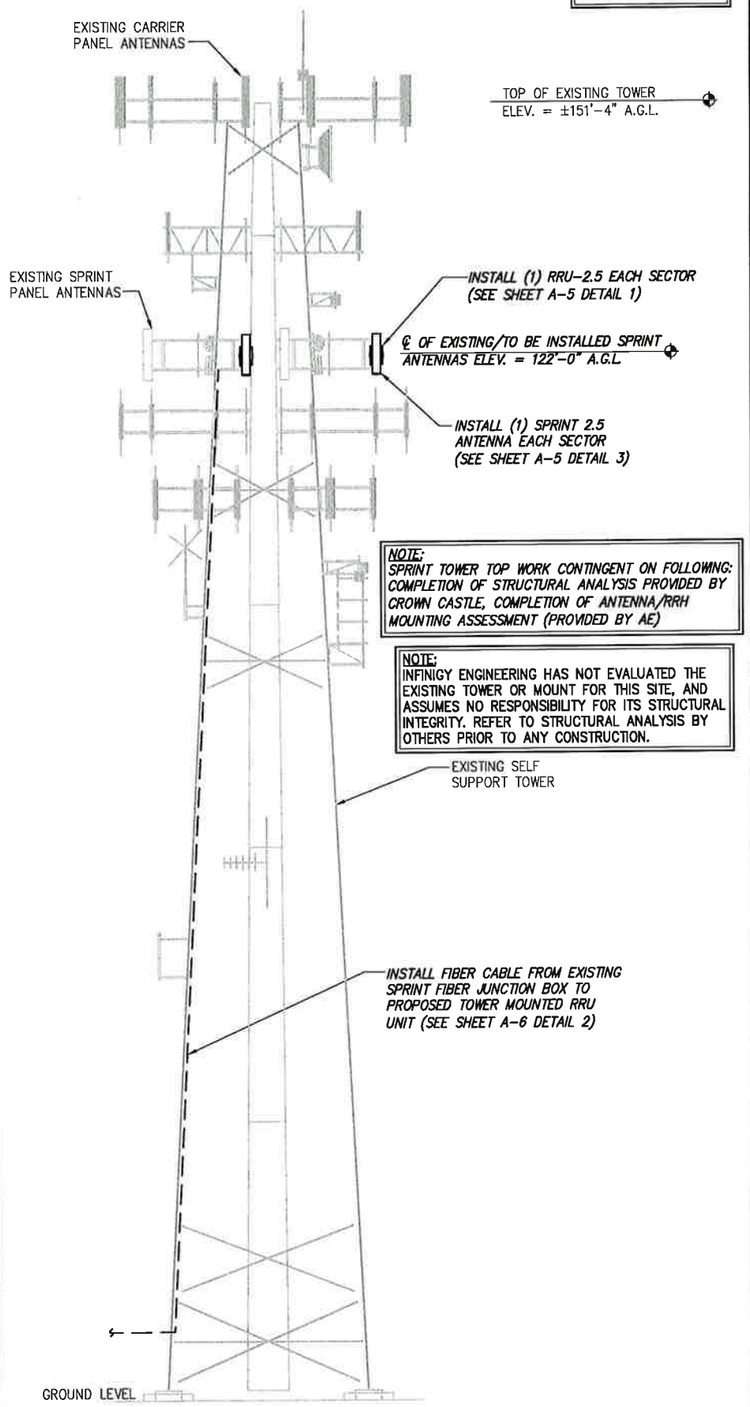
93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

A-1



TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

DETAIL NOT USED | NO SCALE | 2

PLANS PREPARED FOR:

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SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

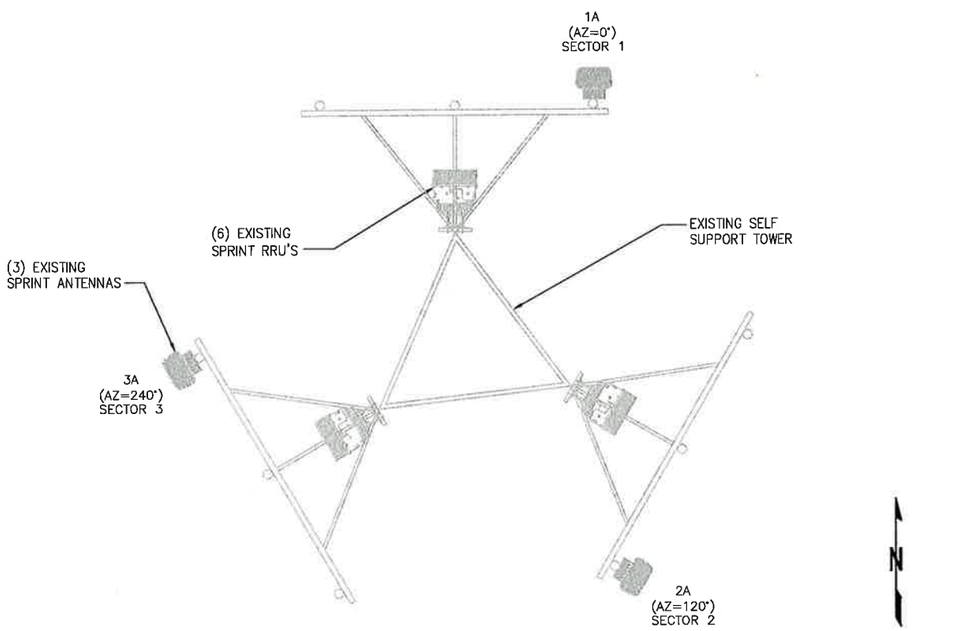
93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

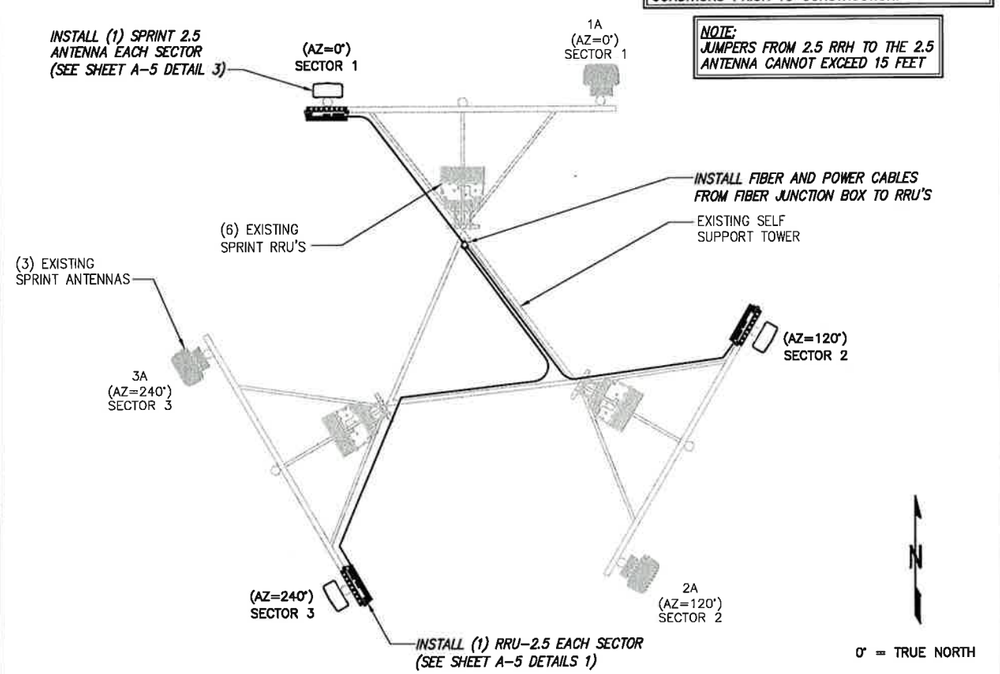
TOWER ELEVATION
& CABLE PLAN

SHEET NUMBER:

A-2

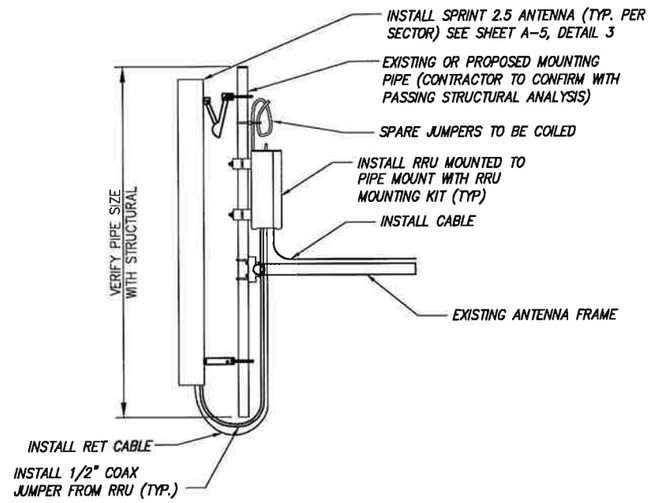


EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1



FINAL ANTENNA LAYOUT | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3



NOTES:

1. CUT DC CONDUCTORS TO LENGTH.
2. COIL FIBER CABLE AND SECURE AT SIDE OF RRU.
3. DO NO EXCEED BEND RADIUS.

NOTE:
CONTRACTOR TO POSITION RRU ON MOUNT BEHIND ANTENNA SUCH THAT THE RRU DOES NOT INTERFERE WITH THE EXISTING PLATFORM/T-ARM MOUNTING HARDWARE.

NOTE:
SPARE DC CABLES ARE COILED UP ON NV RRHS AT SPRINT ARRAY. THESE ARE TO BE USED TO POWER UP THE 2.5 RRHS AND TIED INTO EXISTING DC BREAKERS INSIDE THE FIBER JUNCTION BOX LOCATED AT EQUIPMENT.

NOTE:
THE DIAGRAM IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO REFER TO PASSING STRUCTURAL ANALYSIS FOR ANTENNA AND RRU MOUNTING DETAILS

TYPICAL ANTENNA & RRU MOUNTING DETAILS | NO SCALE | 4

THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

NOTE:
JUMPERS FROM 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15 FEET

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DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

ANTENNA LAYOUT
& MOUNTING DETAILS

SHEET NUMBER:

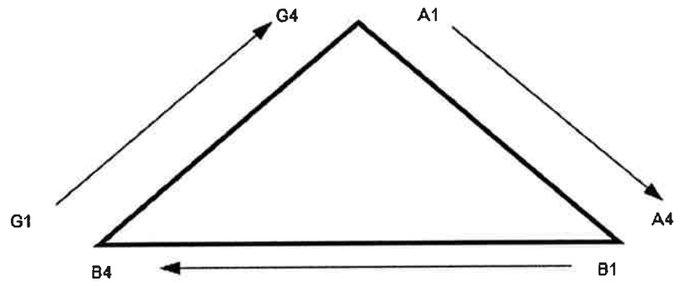
A-3

NV CABLES			
BAND	INDICATOR	PORT	COLOR
800-1	YEL GRN	NV-1	GRN
1900-1	YEL RED	NV-2	BLU
1900-2	YEL BRN	NV-3	BRN
1900-3	YEL BLU	NV-4	WHT
1900-4	YEL SLT	NV-5	RED
800-2	YEL ORG	NV-6	SLT
SPARE	YEL WHT	NV-7	PPL
2500	YEL PPL	NV-8	ORG

HYBRID	
HYBRID	COLOR
1	GRN
2	BLU
3	BRN
4	WHT
5	RED
6	SLT
7	PPL
8	ORG

2.5 Band		
2500 Radio 1		COLOR
YEL	WHT	GRN
YEL	WHT	BLU
YEL	WHT	BRN
YEL	WHT	WHT
YEL	WHT	RED
YEL	WHT	SLT
YEL	WHT	PPL
YEL	WHT	ORG

Figure 1: Antenna Orientation



NOTES:

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.

2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAK–OUT CYLINDER. THERE SHALL BE A 1" SPACE BETWEEN EACH RING FOR THE CABLE IDENTIFIER, AND NO SPACES BETWEEN THE FREQUENCY BANDS.

3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.

4. THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.

5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE NEXT COLOR IN THE SEQUENCE FOR ADDITIONAL CABLES IN EACH SECTOR.

6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.

7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.

8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Yellow	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Yellow	Yellow	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Yellow	Yellow	Yellow
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

Example – Sector 2, Cable 2, 800mhz Radio #1

Example – Sector 3, Cable 1, 1900mhz Radio #1

Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

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JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

REVISIONS:

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ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

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EAST LYME

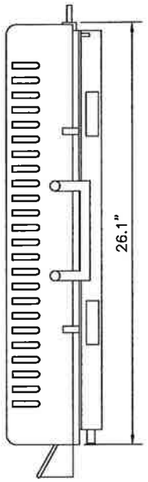
SITE CASCADE:
CT03XC110

SITE ADDRESS:
93 ROXBURY ROAD
NIANTIC, CT 06357

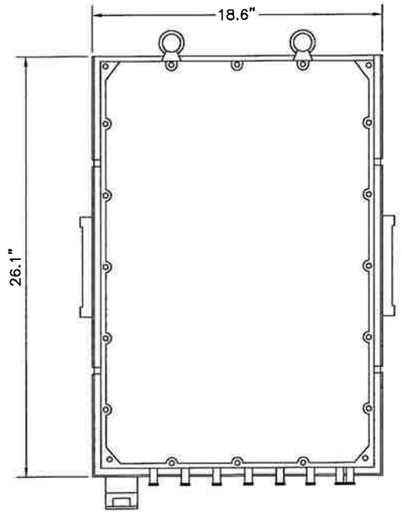
SHEET DESCRIPTION:
COLOR CODING AND NOTES

SHEET NUMBER:
A-4

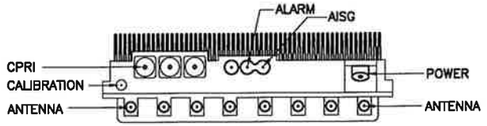
RRU: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

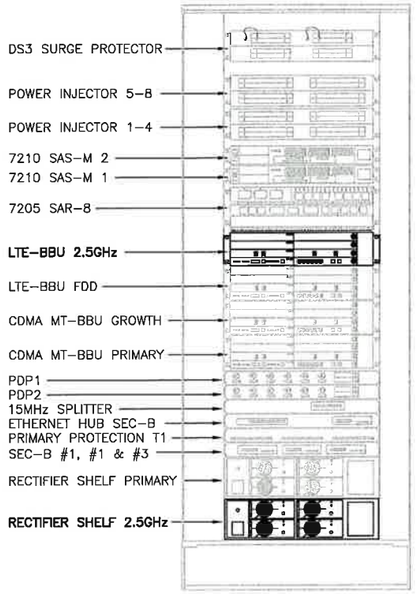


PLAN VIEW

NOTES

COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRU'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRU PACKAGES IN THE RAIN

2.5 RRU	NO SCALE	1

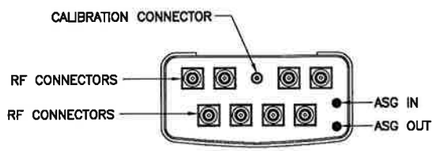


FRONT VIEW

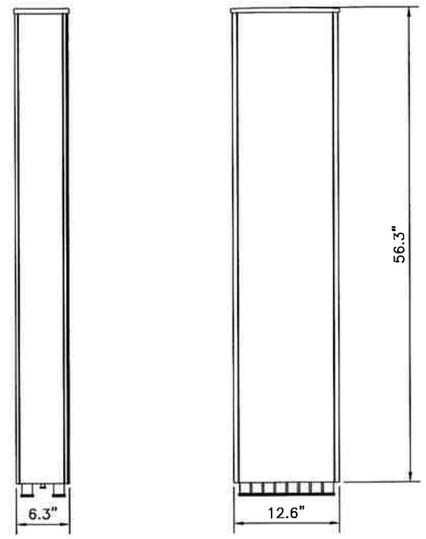
NEW EQUIPMENT IN EXISTING CABINET	NO SCALE	2

ANTENNA: RFS APXVTM14-C-I20

RADOME MATERIAL:	ASA
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD.in(mim):	56.3"x12.6"x6.3" (1430x320x160mm)
WEIGHT:	52.9 lbs
CONNECTORS:	(8) 4.1/9.5 DIN FEMALE (1) NF – CALIBRATION CONNECTOR



PLAN VIEW



2.5 ANTENNA	NO SCALE	3

DETAIL NOT USED	NO SCALE	4

PLANS PREPARED FOR:
Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:
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JOB NUMBER 353-XXX

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
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BRIAN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

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CT03XC110

SITE ADDRESS:
93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

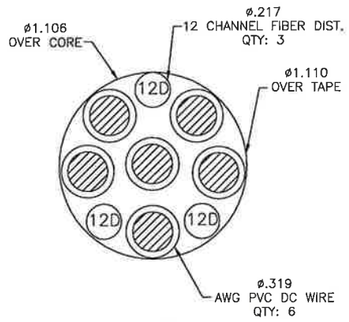
RFS HYBRIFLEX RISER CABLE SCHEDULE

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, 50 ft	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, 50 ft	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 pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	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: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

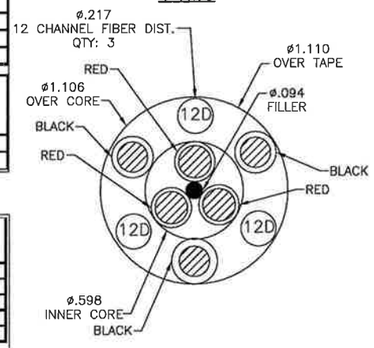
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

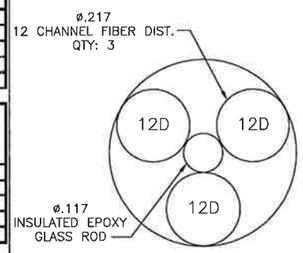
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG

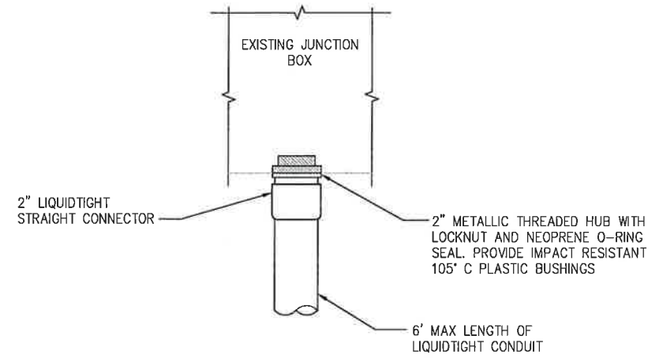


8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

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JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/22/14	MAP	0

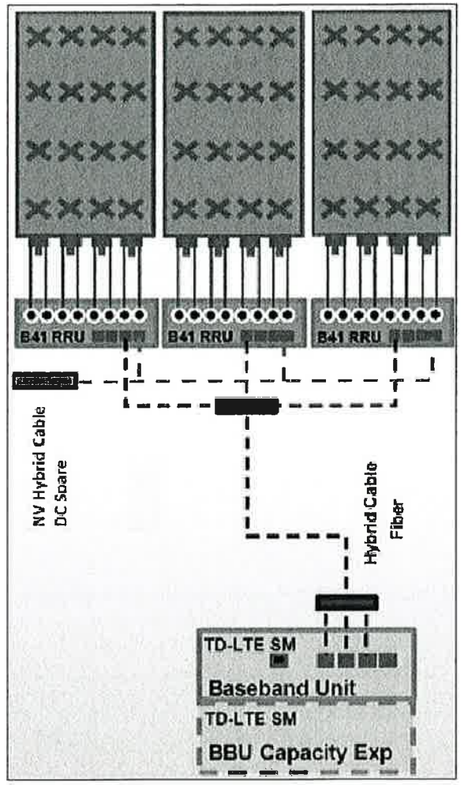
SITE NAME:
EAST LYME

SITE CASCADE:
CT03XC110

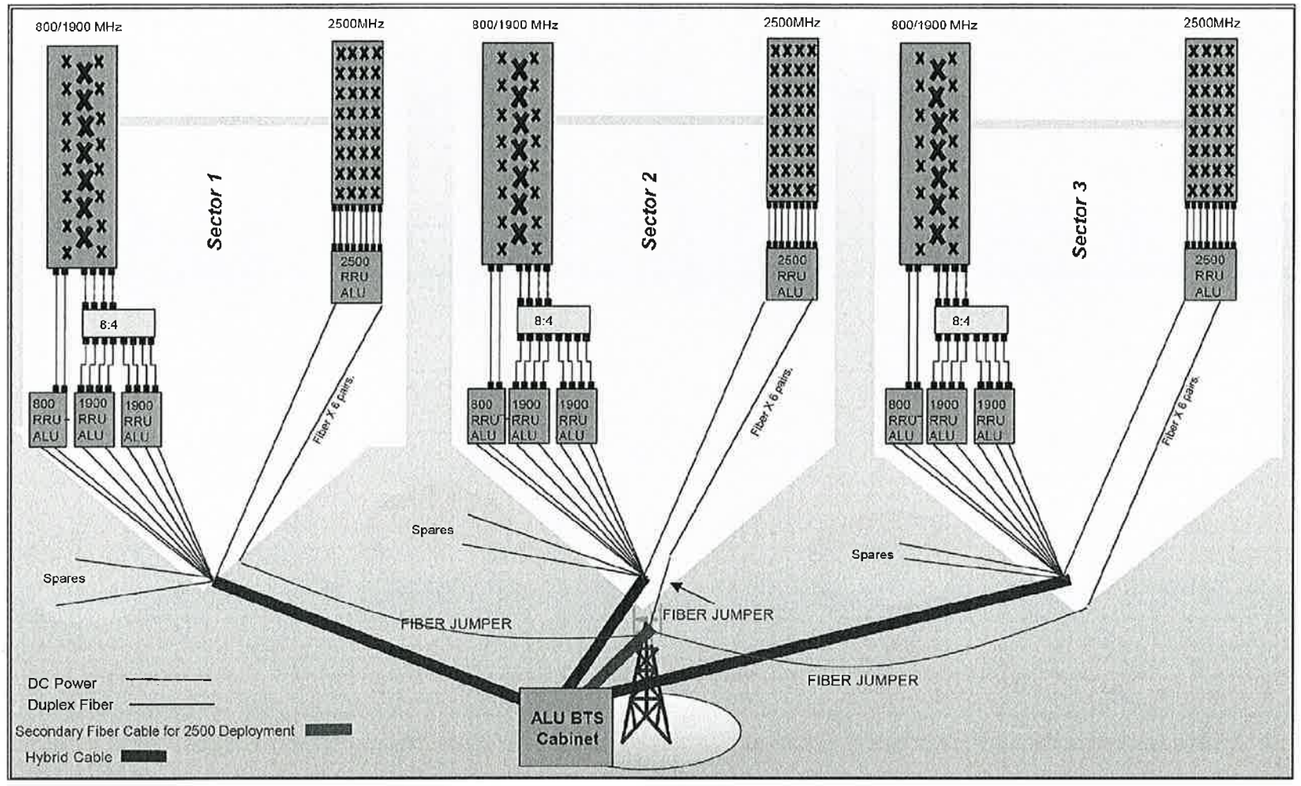
SITE ADDRESS:
93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:
CIVIL DETAILS

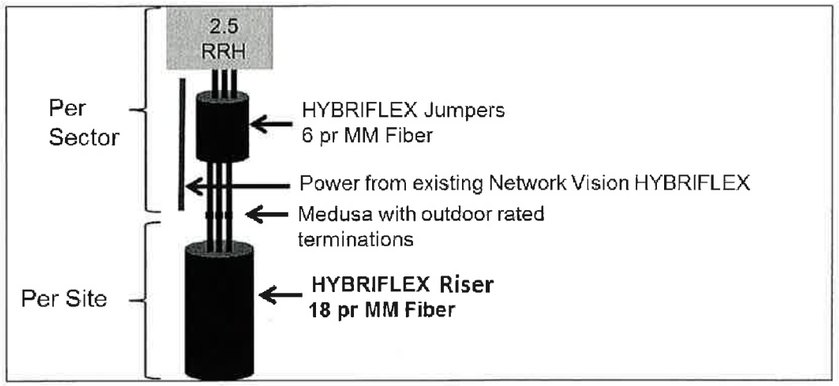
SHEET NUMBER:
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER

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93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

CIVIL DETAILS

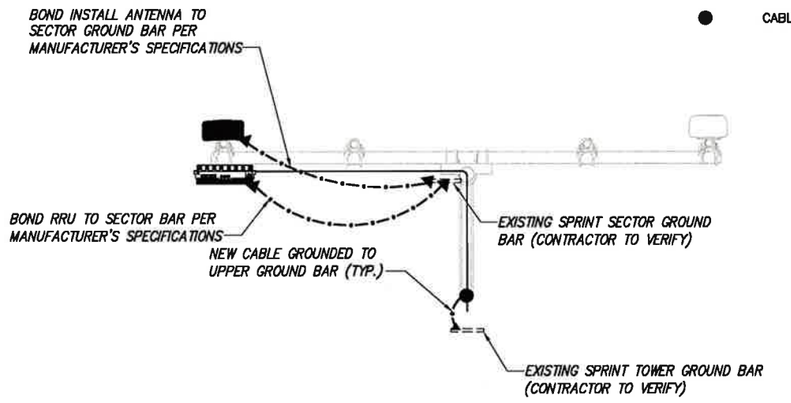
SHEET NUMBER:

A-7

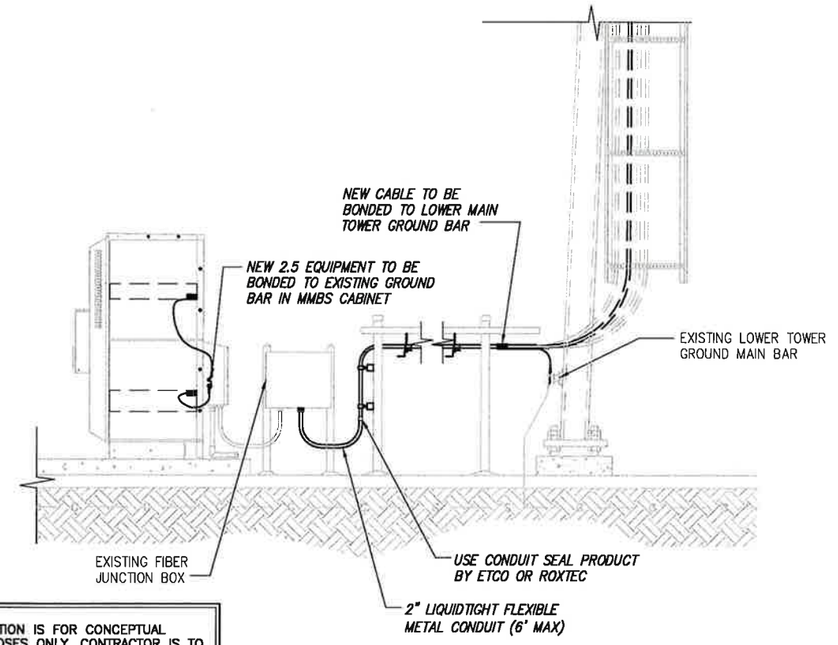
PLAN NOT USED | NO SCALE | 1

LEGEND:

- EXISTING GROUND RING
- CADWELD CONNECTION (EXOTHERMIC WELD)
- MECHANICAL CONNECTION
- GROUND ROD
- CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2



NOTE:
DEPICTION IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO FIELD VERIFY PRIOR TO CONSTRUCTION

TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION) | NO SCALE | 3

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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No. 24705
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PROFESSIONAL ENGINEER

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SITE NAME:

EAST LYME

SITE CASCADE:

CT03XC110

SITE ADDRESS:

93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

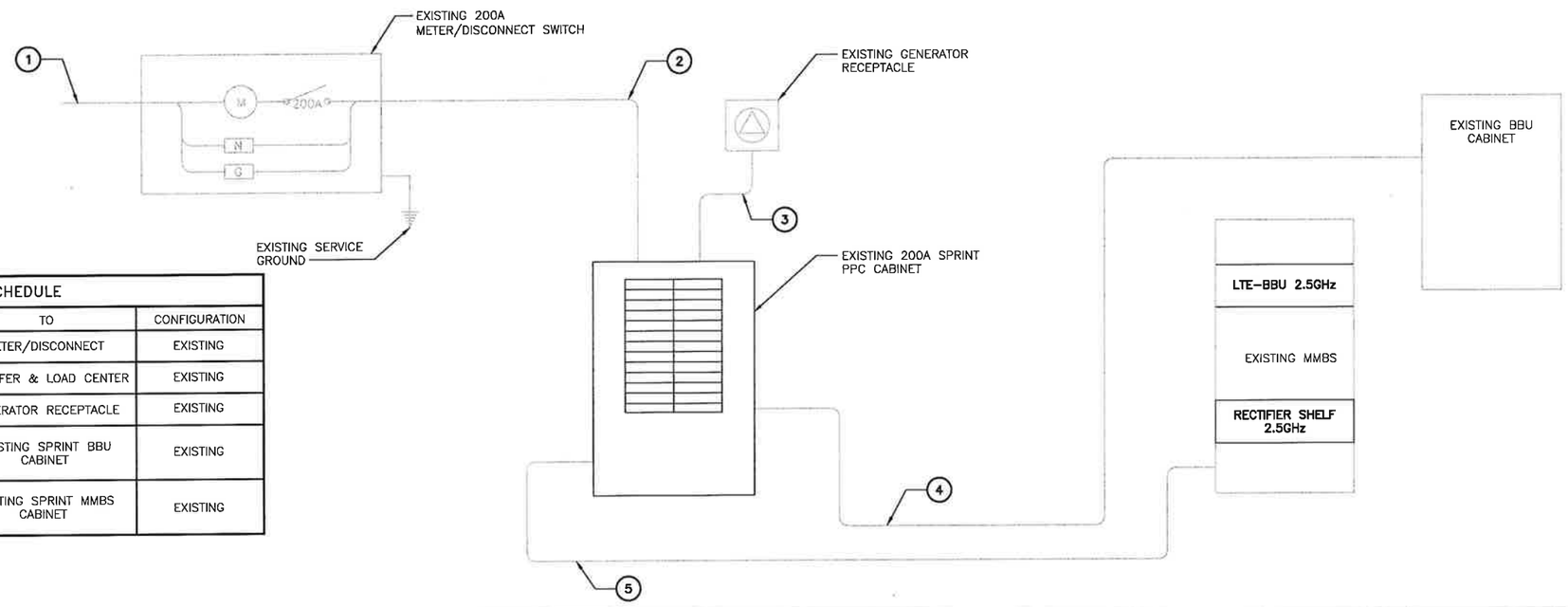
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

NOTES

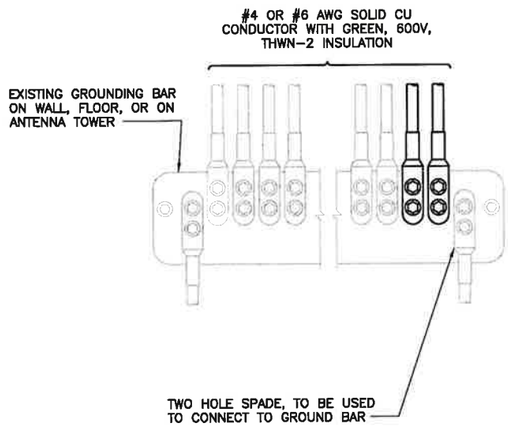
CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



CIRCUIT SCHEDULE

NO	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	EXISTING
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EXISTING SPRINT BBU CABINET	EXISTING
5	TRANSFER & LOAD CENTER	EXISTING SPRINT MMBS CABINET	EXISTING

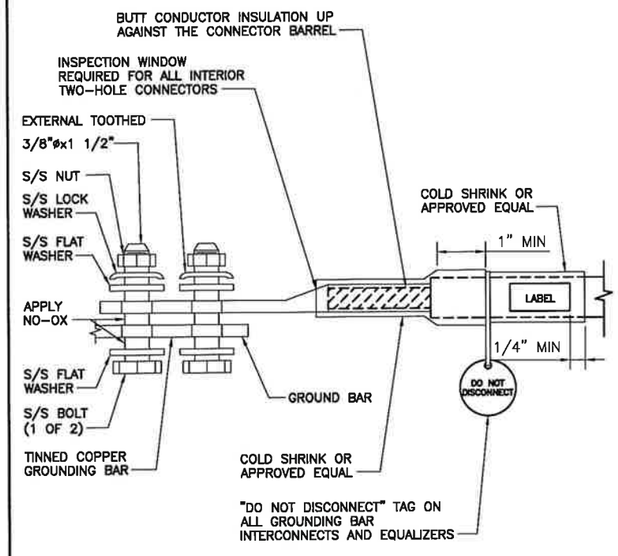
ELECTRICAL ONE-LINE DIAGRAM — NO SCALE — 1



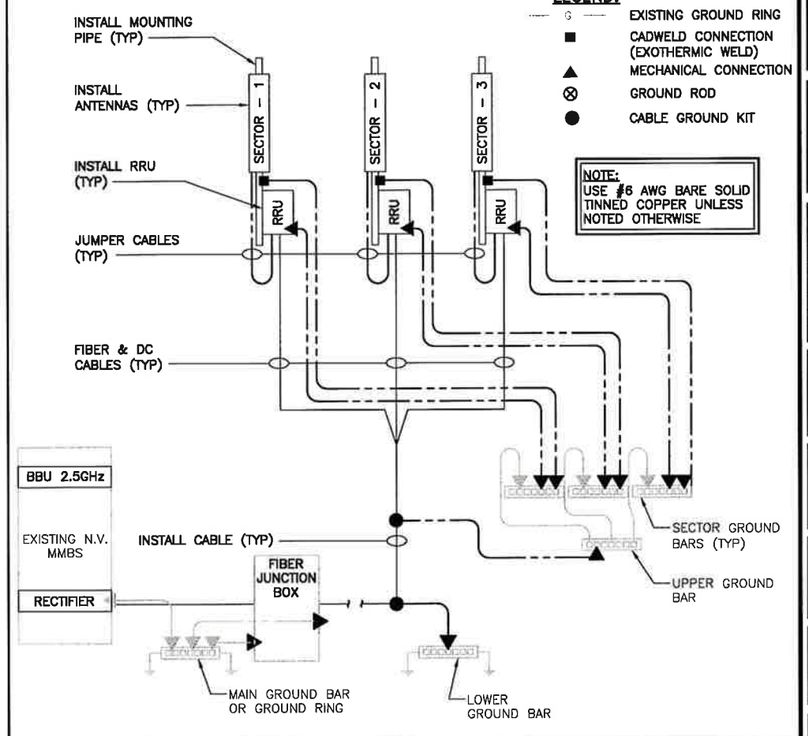
NOTES

1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR — NO SCALE — 2



TWO HOLE LUG — NO SCALE — 3



GROUNDING RISER DIAGRAM — NO SCALE — 4

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
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JOB NUMBER 353-XXX

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT JOHN S. STEVENS No. 24705 LICENSED PROFESSIONAL ENGINEER

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SITE ADDRESS:

93 ROXBURY ROAD
NIANTIC, CT 06357

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

PJF PAUL J. FORD & COMPANY | 50 Years 1965 - 2015

Date: **June 14, 2017**

Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad St Suite 600
Columbus, OH 43215
614-221-6679

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC110
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	806384
	Crown Castle Site Name:	NLN 136 943455
	Crown Castle JDE Job Number:	439472
	Crown Castle Work Order Number:	1417835
	Crown Castle Application Number:	391709 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37517-2297.001.8700
Site Data:	**93 ROXBURY ROAD, EAST LYME, New London County, CT** **Latitude *41° 20' 8.35"*, Longitude *-72° 13' 18.28"*** **151.292 Foot - Self Support Tower**	

Dear Marianne Dunst,

Paul J Ford and Company 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 1046920, in accordance with application 391709, revision 1.

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 144 mph per section 1609.3.1 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a topographic category 1 and crest height of 0 feet, and Risk Category III were used in this analysis.

We at *Paul J Ford and Company* 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.

Respectfully submitted by:

Christina Hedges, PE
Project Manager

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

JUN 16 2017

Date: **June 14, 2017**

Marianne Dunst
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 E. Broad St Suite 600
Columbus, OH 43215
614-221-6679

Subject: **Structural Analysis Report**

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	Carrier Site Number:	CT03XC110
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Christina Hedges, PE
Project Manager

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 151.292 ft Self Support tower designed by ROHN in March of 1990. The tower was originally designed for a wind speed of 85 mph per EIA-222-D.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 144 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

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
121.0	122.0	3	alcatel lucent	TD-RRH8x20-25	1	1 1/4	
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	157.0	1	telewave	ANT150F2	1	7/8	1
	152.0	1	motorola	WB2900			
	150.0	1	tower mounts	2.5' x 2-3/8" Pipe Mount			
148.0	149.0	3	alcatel lucent	B13 RRH 4X30			2
		3	alcatel lucent	B66A RRH4X45			
		3	amphenol	QUAD656C0000X w/ Mount Pipe			
		2	rfs celwave	DB-B1-6C-12AB-0Z			
		3	alcatel lucent	RRH2X60-PCS	6 8	1 5/8 7/8	1
		6	commscope	HBXX-6517DS-A2M w/ Mount Pipe			
		3	commscope	LNX-6514DS-AIM w/ Mount Pipe			
	148.0	1	tower mounts	Sector Mount [SM 510-3]			
146.0	146.0	1	panasonic	WV-CW864	2	3/8	1
133.0	134.0	3	kathrein	800 10504 w/ Mount Pipe	6	1 5/8	1
	133.0	1	tower mounts	Sector Mount [SM 104-3]			
128.0	130.5	1	telewave	ANT150F2	1	7/8	1
	128.0	1	tower mounts	Side Arm Mount [SO 305-1]			
	127.0	1	motorola	WB2900			
121.0	122.0	3	alcatel lucent	1900MHz RRH (65MHz)	3	1 1/4	1
		3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	121.0	1	tower mounts	Sector Mount [SM 505-3]			
103.0	103.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	6 1	1 5/8 1 1/4	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			
		1	tower mounts	Sector Mount [SM 701-3]			
90.0	96.0	1	generic	10 ft x 2" omni whip			1
	90.0	1	tower mounts	Side Arm Mount [SO 302-1]			
83.0	91.0	1	motorola	WB2900	2	5/16	1
	86.5	1	telewave	ANT150D3			
	83.0	1	tower mounts	Side Arm Mount [SO 305-1]			
61.0	61.0	1	maxrad	BMOY8905	1	5/16	1
50.0	52.0	1	lucent	KS24019-L112A	1	1/2	1
	50.0	1	tower mounts	Side Arm Mount [SO 305-1]			

Notes:
1) Existing Equipment
2) Future Equipment

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings	March 5, 1990, Rohn	24792JC	258359
Foundation Drawings	March 5, 1990, Rohn	24792JC	958525
Geotechnical Report	July 19, 1989, Dr. Clarence Welti	-	258373
Modification Drawings	January 16, 2003, All Points Technology	CT105761	801526
Modification Drawings	February 26, 2008, (Revised July 9, 2008) Vertical Structures	2008-004-030	2215933
Modification Drawings	May 14, 2009, PJF	41709-0057	2457486
Modification Drawings	May 10, 2011, PJF	37511-0187Mod	2883931

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	151.292 - 146.229	Leg	ROHN 2.5 STD	3	-6.20	57.61	10.8	Pass
T2	146.229 - 141.167	Leg	ROHN 2.5 STD	15	-9.50	57.61	16.5	Pass
T3	141.167 - 121.042	Leg	ROHN 2.5 EH	24	-33.90	58.52	57.9	Pass
T4	121.042 - 114.313	Leg	ROHN 2.5 EH (GR)	48	-40.08	64.40	62.2	Pass
T5	114.313 - 107.646	Leg	ROHN 2.5 EH (GR)	57	-51.46	64.40	79.9	Pass
T6	107.646 - 100.917	Leg	ROHN 2.5 EH (GR)	66	-69.36	100.07	69.3	Pass
T7	100.917 - 94.2014	Leg	ROHN 3 EH (GR)	78	-75.24	108.41	69.4	Pass
T8	94.2014 - 87.4861	Leg	ROHN 3 EH (GR)	87	-87.58	145.20	60.3	Pass
T9	87.4861 - 80.7708	Leg	ROHN 3 EH (GR)	99	-107.84	145.63	74.0	Pass
T10	80.7708 - 70.6875	Leg	ROHN 4 EH (GR)	111	-117.00	142.78	81.9	Pass
T11	70.6875 - 60.6041	Leg	ROHN 4 EH (GR)	120	-135.64	212.04	64.0 70.9 (b)	Pass
T12	60.6041 - 50.5104	Leg	ROHN 4 EH (GR)	132	-165.24	213.19	77.5	Pass
T13	50.5104 - 40.4166	Leg	ROHN 4 EH (GR)	144	-183.92	213.29	86.2	Pass
T14	40.4166 - 30.3125	Leg	ROHN 5 EH (GR)	156	-192.85	246.97	78.1	Pass
T15	30.3125 - 20.2083	Leg	ROHN 5 EH (GR)	165	-221.54	320.59	69.1 78.1 (b)	Pass
T16	20.2083 - 10.1041	Leg	ROHN 5 EH (GR)	177	-230.18	320.67	71.8	Pass
T17	10.1041 - 0	Leg	ROHN 5 EH (GR)	189	-258.90	320.73	80.7	Pass
T1	151.292 - 146.229	Diagonal	L 1.5 x 1.5 x 3/16	9	-1.03	3.33	31.0	Pass
T2	146.229 - 141.167	Diagonal	L 2 x 2 x 3/16	19	-3.41	8.15	41.9 46.1 (b)	Pass
T3	141.167 - 121.042	Diagonal	L2 1/2x2 1/2x3/16	33	-4.66	9.73	47.9 73.8 (b)	Pass
T4	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	54	-6.13	8.85	69.2	Pass
T5	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	63	-6.30	8.08	78.0	Pass
T6	107.646 - 100.917	Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	72	-7.55	32.54	23.2 58.5 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T7	100.917 - 94.2014	Diagonal	L3x3x3/16	84	-8.05	12.09	66.6	Pass
T8	94.2014 - 87.4861	Diagonal	L3x3x3/16	90	-8.54	11.05	77.2	Pass
T9	87.4861 - 80.7708	Diagonal	2L 3 x 3 x 3/16 (1/4)	102	-9.04	41.68	21.7 70.8 (b)	Pass
T10	80.7708 - 70.6875	Diagonal	2L3x3x3/16x1/4	114	-10.20	35.01	29.1 73.1 (b)	Pass
T11	70.6875 - 60.6041	Diagonal	2L3x3x3/16x1/4	123	-10.85	32.74	33.1 74.5 (b)	Pass
T12	60.6041 - 50.5104	Diagonal	2L3x3x1/4x1/4	135	-11.10	40.69	27.3 76.6 (b)	Pass
T13	50.5104 - 40.4166	Diagonal	2L3x3x1/4x1/4	147	-11.45	37.20	30.8 47.0 (b)	Pass
T14	40.4166 - 30.3125	Diagonal	2L3 1/2x3 1/2x1/4x1/4	159	-11.70	55.38	21.1 49.8 (b)	Pass
T15	30.3125 - 20.2083	Diagonal	2L3 1/2x3 1/2x1/4x1/4	168	-12.65	51.06	24.8 50.9 (b)	Pass
T16	20.2083 - 10.1041	Diagonal	2L 4 x 4 x 1/4 (1/4)	180	-12.53	68.88	18.2 52.9 (b)	Pass
T17	10.1041 - 0	Diagonal	2L 4 x 4 x 1/4 (1/4)	192	-13.56	64.90	20.9 54.6 (b)	Pass
T6	107.646 - 100.917	Secondary Horizontal	L 2 x 2 x 3/16	74	-1.08	4.83	22.4	Pass
T8	94.2014 - 87.4861	Secondary Horizontal	L 2 x 2 x 3/16	95	-1.52	3.91	38.9	Pass
T9	87.4861 - 80.7708	Secondary Horizontal	L 2 x 2 x 3/16	107	-1.74	3.53	49.4	Pass
T11	70.6875 - 60.6041	Secondary Horizontal	L2 1/2x2 1/2x3/16	128	-2.35	5.55	42.4	Pass
T12	60.6041 - 50.5104	Secondary Horizontal	L3x3x1/4	140	-2.69	11.19	24.0 33.8 (b)	Pass
T13	50.5104 - 40.4166	Secondary Horizontal	L3x3x1/4	152	-3.01	9.93	30.3 37.8 (b)	Pass
T15	30.3125 - 20.2083	Secondary Horizontal	L 3 x 3 x 3/16	173	-3.65	6.20	58.8	Pass
T16	20.2083 - 10.1041	Secondary Horizontal	L3x3x3/16	186	-3.99	5.61	71.2	Pass
T17	10.1041 - 0	Secondary Horizontal	L 3.5 x 3.5 x 1/4	197	-4.29	10.75	40.0 41.1 (b)	Pass
T1	151.292 - 146.229	Top Girt	L2 1/2x2 1/2x3/16	5	-0.19	5.01	3.9	Pass
T3	141.167 - 121.042	Top Girt	L2 1/2x2 1/2x3/16	25	-0.85	5.00	16.9	Pass
							Summary	
						Leg (T13)	86.2	Pass
						Diagonal (T5)	78.0	Pass
						Secondary Horizontal (T16)	51.0	Pass
						Top Girt (T3)	16.9	Pass
						Bolt Checks	78.1	Pass
						RATING =	**86.2**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods		84.5	Pass
1	Base Foundation		56.1	Pass
1	Base Foundation Soil Interaction		81.1	Pass

Structure Rating (max from all components) =	86.2%

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

APPENDIX A

TNXTOWER OUTPUT

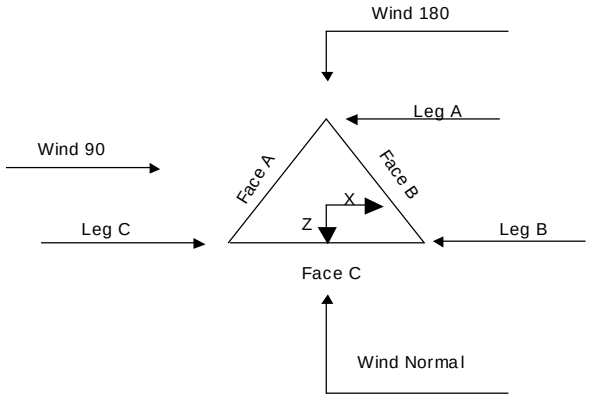
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 151.29 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 8.56 ft at the top and 22.78 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

3) Tower is located in New London County, Connecticut.
4) ASCE 7-10 Wind Data is used.
5) Basic wind speed of 144 mph.
6) Risk Category III and IV.
7) Exposure Category B.
8) Topographic Category 1.
9) Crest Height 0.00 ft.
10) Nominal ice thickness of 0.7500 in.
11) Ice thickness is considered to increase with height.
12) Ice density of 56 pcf.
13) A wind speed of 50 mph is used in combination with ice.
14) Deflections calculated using a wind speed of 60 mph.
15) A non-linear (P-delta) analysis was used.
16) Grouted pipe f'_c is 7 ksi.
17) Pressures are calculated at each section.
18) Stress ratio used in tower member design is 1.
19) 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	151.29-146.23			8.56	1	5.06
T2	146.23-141.17			8.56	1	5.06
T3	141.17-121.04			8.56	1	20.13
T4	121.04-114.31			10.56	1	6.73
T5	114.31-107.65			11.24	1	6.67
T6	107.65-100.92			11.92	1	6.73
T7	100.92-94.20			12.60	1	6.72
T8	94.20-87.49			13.30	1	6.72
T9	87.49-80.77			14.00	1	6.72
T10	80.77-70.69			14.70	1	10.08
T11	70.69-60.60			15.70	1	10.08
T12	60.60-50.51			16.70	1	10.09
T13	50.51-40.42			17.73	1	10.09
T14	40.42-30.31			18.77	1	10.10
T15	30.31-20.21			19.78	1	10.10
T16	20.21-10.10			20.78	1	10.10
T17	10.10-0.00			21.78	1	10.10

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	151.29-146.23	4.94	X Brace	No	No	0.7500	0.7500
T2	146.23-141.17	4.94	X Brace	No	No	0.7500	0.7500
T3	141.17-121.04	6.67	X Brace	No	No	0.7500	0.7500
T4	121.04-114.31	6.67	X Brace	No	No	0.7500	0.0000
T5	114.31-107.65	6.67	X Brace	No	No	0.0000	0.0000
T6	107.65-100.92	6.67	X Brace	No	Yes	0.0000	0.7500
T7	100.92-94.20	6.65	X Brace	No	No	0.7500	0.0000
T8	94.20-87.49	6.72	X Brace	No	Yes	0.0000	0.0000
T9	87.49-80.77	6.63	X Brace	No	Yes	0.0000	1.0000
T10	80.77-70.69	10.00	X Brace	No	No	1.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T11	70.69-60.60	10.08	X Brace	No	Yes	0.0000	0.0000
T12	60.60-50.51	9.91	X Brace	No	Yes	1.0000	1.2500
T13	50.51-40.42	9.91	X Brace	No	Yes	1.0000	1.2500
T14	40.42-30.31	10.00	X Brace	No	No	1.2500	0.0000
T15	30.31-20.21	10.00	X Brace	No	Yes	0.0000	1.2500
T16	20.21-10.10	10.00	X Brace	No	Yes	1.2500	0.0000
T17	10.10-0.00	10.00	X Brace	No	Yes	0.0000	1.2500

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 151.29-146.23	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2 146.23-141.17	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)
T3 141.17-121.04	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 121.04-114.31	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 114.31-107.65	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 107.65-100.92	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Double Angle	2L 2.5 x 2.5 x 3/16 (3/16)	A36 (36 ksi)
T7 100.92-94.20	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 94.20-87.49	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T9 87.49-80.77	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Double Angle	2L 3 x 3 x 3/16 (1/4)	A36 (36 ksi)
T10 80.77-70.69	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T11 70.69-60.60	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T12 60.60-50.51	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T13 50.51-40.42	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T14 40.42-30.31	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T15 30.31-20.21	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T16 20.21-10.10	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L 4 x 4 x 1/4 (1/4)	A572-50 (50 ksi)
T17 10.10-0.00	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L 4 x 4 x 1/4 (1/4)	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 151.29-146.23	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T3 141.17-121.04	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T6 107.65-100.92	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 94.20-87.49	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T9 87.49-80.77	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 70.69-60.60	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T12 60.60-50.51	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T13 50.51-40.42	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 30.31-20.21	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 20.21-10.10	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 10.10-0.00	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 151.29-146.23	0.30	0.1875	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T2 146.23-141.17	0.30	0.1875	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T3 141.17-121.04	0.80	0.1875	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T4 121.04-114.31	0.27	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T5 114.31-107.65	0.27	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T6 107.65-100.92	1.25	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T7 100.92-94.20	0.93	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T8 94.20-87.49	0.47	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T9 87.49-80.77	0.47	0.4375	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T10 80.77-70.69	0.45	0.2500	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T11 70.69-60.60	0.45	0.2500	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T12 60.60-50.51	0.45	0.2500	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T13 50.51-40.42	0.45	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T14 40.42-30.31	0.45	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T15 30.31-20.21	0.45	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T16 20.21-10.10	1.50	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000
T17 10.10-0.00	1.50	0.5000	A36 (36 ksi)	1	1	1	0.0000	30.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 151.29-146.23	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 146.23-141.17	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 141.17-121.04	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 121.04-114.31	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 114.31-107.65	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 107.65-100.92	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T7 100.92-94.20	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 94.20-87.49	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T9 87.49-80.77	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T10 80.77-70.69	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 70.69-60.60	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T12 60.60-50.51	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T13 50.51-40.42	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T14 40.42-30.31	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 30.31-20.21	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T16 20.21-10.10	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1
T17 10.10-0.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	0.5	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 151.29-146.23	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 146.23-141.17	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 141.17-121.04	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 121.04-114.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 114.31-107.65	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 107.65-100.92	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T7 100.92-94.20	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 94.20-87.49	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 87.49-80.77	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 80.77-70.69	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 70.69-60.60	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 60.60-50.51	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 50.51-40.42	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40.42-30.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 30.31-20.21	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 20.21-10.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 10.10-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 151.29-146.23	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 146.23-141.17	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 141.17-121.04	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 121.04-114.31	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 114.31-107.65	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T6 107.65-100.92	2.5000	3.0000	2.5000	3.0000	0.0000	0.0000	0.0000	0.0000
T7 100.92-94.20	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T8 94.20-87.49	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T9 87.49-80.77	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T10 80.77-70.69	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T11 70.69-60.60	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T12 60.60-50.51	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T13 50.51-40.42	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T14 40.42-30.31	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T15 30.31-20.21	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T16 20.21-10.10	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000
T17 10.10-0.00	2.5000	4.8750	2.5000	4.8750	0.0000	0.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 151.29-146.23	Flange	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T2 146.23-141.17	Flange	0.6250 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T3 141.17-121.04	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T4 121.04-114.31	Flange	0.7500 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T5 114.31-107.65	Flange	0.7500 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T6 107.65-100.92	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T7 100.92-94.20	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T8 94.20-87.49	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T9 87.49-80.77	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T10 80.77-70.69	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T11 70.69-60.60	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T12 60.60-50.51	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T13 50.51-40.42	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T14 40.42-30.31	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T15 30.31-20.21	Flange	1.0625 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T16 20.21-10.10	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T17 10.10-0.00	Flange	1.0000 A354-BC	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 2.5 EH (GR)	50	2.2535	4.2383	16.498	4769	36175	61
ROHN 3 EH (GR)	50	3.0159	6.6052	24.023	4769	37356	63
ROHN 4 EH (GR)	50	4.4074	11.4969	38.949	4769	38952	66

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 5 EH (GR)	50	6.1120	18.1937	58.701	4769	40357	68

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1.5'' flat Cable Ladder Rail	B	No	Af (CaAa)	103.00 - 8.00	0.0000	0.45	2	2	24.0000 1.5000	1.5000		1.80
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	103.00 - 8.00	0.0000	0.45	7	3	0.2700 0.5000	1.9800		0.82
LDF4P-50A (1/2 FOAM) ** *******	B	No	Ar (CaAa)	50.00 - 8.00	-1.0000	0.49	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	148.00 - 8.00	-1.0000	-0.4	8	8	1.0000 0.5000	1.0900		0.33
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	148.00 - 8.00	2.0000	-0.4	3	3	0.2700 0.5000	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	148.00 - 8.00	2.0000	-0.45	3	3	0.2700 0.5000	1.9800		0.82
LDF2-50(3/8")	B	No	Ar (CaAa)	146.00 - 8.00	-1.0000	-0.45	2	2	0.4400	0.4400		0.08
HB114-1-08U4-M5J(1 1/4")	B	No	Ar (CaAa)	121.00 - 8.00	-2.0000	-0.4	4	4	0.7600 0.5000	1.5400		1.08
1.5'' flat Cable Ladder Rail	B	No	Af (CaAa)	148.00 - 8.00	0.0000	-0.4	2	2	24.0000 0.5000	1.5000		1.80
1.5'' flat Cable Ladder Rail **	B	No	Af (CaAa)	121.00 - 8.00	-1.0000	-0.4	1	1	24.0000 1.5000	1.5000		1.80
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	128.00 - 8.00	0.0000	0.45	2	2	1.0000 1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	A	No	Ar (CaAa)	151.29 - 128.00	0.0000	0.45	1	1	1.0000 1.0900	1.0900		0.33
9207 (5/16")	A	No	Ar (CaAa)	61.00 - 8.00	0.0000	0.43	3	2	0.3300	0.3300		0.06
9207 (5/16")	A	No	Ar (CaAa)	83.00 - 61.00	0.0000	0.43	1	1	0.3300	0.3300		0.06
FXL 1873 PE(1 5/8")	A	No	Ar (CaAa)	133.00 - 8.00	0.0000	0.38	6	6	0.2700 0.5000	1.9800		0.01
1.5'' flat Cable Ladder Rail **	A	No	Af (CaAa)	133.00 - 8.00	0.0000	0.4	2	2	24.0000 1.5000	1.5000		1.80

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
2.5' x 2-3/8'' Pipe Mount	A	From Leg	1.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.46 0.62 0.78	0.46 0.62 0.78	0.03 0.03 0.04

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			
WB2900	A	From Leg	2.00	0.0000	150.00	No Ice	2.04	0.53	0.01
			0.00			1/2" Ice	2.24	0.65	0.02
			2.00			1" Ice	2.44	0.78	0.04
ANT150F2	A	From Leg	2.00	0.0000	150.00	No Ice	1.20	1.20	0.01
			0.00			1/2" Ice	1.60	1.60	0.02
			7.00			1" Ice	1.91	1.91	0.04
**									
Sector Mount [SM 510-3]	B	None		0.0000	148.00	No Ice	40.10	40.10	2.40
						1/2" Ice	57.33	57.33	3.09
						1" Ice	74.56	74.56	3.78
LNX-6514DS-AIM w/ Mount Pipe	A	From Face	4.00	0.0000	148.00	No Ice	8.41	7.08	0.06
			0.00			1/2" Ice	8.97	8.27	0.13
			1.00			1" Ice	9.50	9.18	0.21
LNX-6514DS-AIM w/ Mount Pipe	B	From Face	4.00	0.0000	148.00	No Ice	8.41	7.08	0.06
			0.00			1/2" Ice	8.97	8.27	0.13
			1.00			1" Ice	9.50	9.18	0.21
LNX-6514DS-AIM w/ Mount Pipe	C	From Face	4.00	0.0000	148.00	No Ice	8.41	7.08	0.06
			0.00			1/2" Ice	8.97	8.27	0.13
			1.00			1" Ice	9.50	9.18	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Face	4.00	0.0000	148.00	No Ice	8.77	6.96	0.07
			0.00			1/2" Ice	9.34	8.18	0.14
			1.00			1" Ice	9.89	9.14	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Face	4.00	0.0000	148.00	No Ice	8.77	6.96	0.07
			0.00			1/2" Ice	9.34	8.18	0.14
			1.00			1" Ice	9.89	9.14	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Face	4.00	0.0000	148.00	No Ice	8.77	6.96	0.07
			0.00			1/2" Ice	9.34	8.18	0.14
			1.00			1" Ice	9.89	9.14	0.21
RRH2X60-PCS	A	From Face	4.00	0.0000	148.00	No Ice	2.20	1.72	0.06
			0.00			1/2" Ice	2.39	1.90	0.08
			1.00			1" Ice	2.59	2.09	0.10
RRH2X60-PCS	B	From Face	4.00	0.0000	148.00	No Ice	2.20	1.72	0.06
			0.00			1/2" Ice	2.39	1.90	0.08
			1.00			1" Ice	2.59	2.09	0.10
RRH2X60-PCS	C	From Face	4.00	0.0000	148.00	No Ice	2.20	1.72	0.06
			0.00			1/2" Ice	2.39	1.90	0.08
			1.00			1" Ice	2.59	2.09	0.10
QUAD656C0000X w/ Mount Pipe	A	From Leg	4.00	0.0000	148.00	No Ice	13.48	7.33	0.08
			0.00			1/2" Ice	14.10	8.55	0.17
			1.00			1" Ice	14.68	9.50	0.28
QUAD656C0000X w/ Mount Pipe	B	From Leg	4.00	0.0000	148.00	No Ice	13.48	7.33	0.08
			0.00			1/2" Ice	14.10	8.55	0.17
			1.00			1" Ice	14.68	9.50	0.28
QUAD656C0000X w/ Mount Pipe	C	From Leg	4.00	0.0000	148.00	No Ice	13.48	7.33	0.08
			0.00			1/2" Ice	14.10	8.55	0.17
			1.00			1" Ice	14.68	9.50	0.28
B66A RRH4X45	A	From Leg	4.00	0.0000	148.00	No Ice	2.58	1.63	0.07
			0.00			1/2" Ice	2.79	1.81	0.09
			1.00			Ice	3.01	2.00	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			
B66A RRH4X45	B	From Leg	4.00	0.0000	148.00	No Ice	2.58	1.63	0.07
			0.00			1/2" Ice	2.79	1.81	0.09
			1.00			1" Ice	3.01	2.00	0.11
B66A RRH4X45	C	From Leg	4.00	0.0000	148.00	No Ice	2.58	1.63	0.07
			0.00			1/2" Ice	2.79	1.81	0.09
			1.00			1" Ice	3.01	2.00	0.11
B13 RRH 4X30	A	From Leg	4.00	0.0000	148.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			1.00			1" Ice	2.43	1.64	0.09
B13 RRH 4X30	B	From Leg	4.00	0.0000	148.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			1.00			1" Ice	2.43	1.64	0.09
B13 RRH 4X30	C	From Leg	4.00	0.0000	148.00	No Ice	2.06	1.32	0.06
			0.00			1/2" Ice	2.24	1.48	0.07
			1.00			1" Ice	2.43	1.64	0.09
DB-B1-6C-12AB-0Z	A	From Leg	4.00	0.0000	148.00	No Ice	3.36	2.19	0.03
			0.00			1/2" Ice	3.60	2.39	0.06
			1.00			1" Ice	3.84	2.61	0.09
DB-B1-6C-12AB-0Z	B	From Leg	4.00	0.0000	148.00	No Ice	3.36	2.19	0.03
			0.00			1/2" Ice	3.60	2.39	0.06
			1.00			1" Ice	3.84	2.61	0.09
**									
WV-CW864	A	From Leg	1.00	0.0000	146.00	No Ice	0.80	0.80	0.01
			0.00			1/2" Ice	1.44	1.44	0.01
			0.00			1" Ice	2.08	2.08	0.02
**									
Sector Mount [SM 104-3]	A	None		0.0000	133.00	No Ice	30.02	30.02	0.95
						1/2" Ice	40.48	40.48	1.40
						1" Ice	50.94	50.94	1.86
800 10504 w/ Mount Pipe	A	From Leg	3.50	0.0000	133.00	No Ice	3.59	3.18	0.04
			3.50			1/2" Ice	4.01	3.91	0.07
			1.00			1" Ice	4.42	4.58	0.11
800 10504 w/ Mount Pipe	B	From Leg	3.50	0.0000	133.00	No Ice	3.59	3.18	0.04
			3.50			1/2" Ice	4.01	3.91	0.07
			1.00			1" Ice	4.42	4.58	0.11
800 10504 w/ Mount Pipe	C	From Leg	3.50	0.0000	133.00	No Ice	3.59	3.18	0.04
			3.50			1/2" Ice	4.01	3.91	0.07
			1.00			1" Ice	4.42	4.58	0.11
**									
Side Arm Mount [SO 305-1]	C	From Leg	2.00	0.0000	128.00	No Ice	0.94	1.41	0.03
			0.00			1/2" Ice	1.48	2.17	0.04
			0.00			1" Ice	2.02	2.93	0.06
WB2900	C	From Leg	4.00	0.0000	128.00	No Ice	2.04	0.53	0.01
			0.00			1/2" Ice	2.24	0.65	0.02
			-1.00			1" Ice	2.44	0.78	0.04
ANT150F2	C	From Leg	4.00	0.0000	128.00	No Ice	1.22	1.22	0.01
			0.00			1/2" Ice	1.60	1.60	0.02
			2.50			1" Ice	1.91	1.91	0.04
**									

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
Sector Mount [SM 505-3]	A	None		0.0000	121.00	No Ice	34.86	34.86	1.73
						1/2" Ice	49.79	49.79	2.32
						1" Ice	64.72	64.72	2.91
1900MHz RRH (65MHz)	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	2.32	2.24	0.06
						1/2" Ice	2.53	2.44	0.08
						1" Ice	2.74	2.65	0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	2.06	1.93	0.06
						1/2" Ice	2.24	2.11	0.09
						1" Ice	2.43	2.29	0.11
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	8.26	6.95	0.08
						1/2" Ice	8.82	8.13	0.15
						1" Ice	9.35	9.02	0.23
1900MHz RRH (65MHz)	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	2.32	2.24	0.06
						1/2" Ice	2.53	2.44	0.08
						1" Ice	2.74	2.65	0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	2.06	1.93	0.06
						1/2" Ice	2.24	2.11	0.09
						1" Ice	2.43	2.29	0.11
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	8.26	7.47	0.09
						1/2" Ice	8.82	8.66	0.16
						1" Ice	9.35	9.56	0.24
1900MHz RRH (65MHz)	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	2.32	2.24	0.06
						1/2" Ice	2.53	2.44	0.08
						1" Ice	2.74	2.65	0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	2.06	1.93	0.06
						1/2" Ice	2.24	2.11	0.09
						1" Ice	2.43	2.29	0.11
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	8.26	6.95	0.08
						1/2" Ice	8.82	8.13	0.15
						1" Ice	9.35	9.02	0.23
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	6.58	4.96	0.08
						1/2" Ice	7.03	5.75	0.13
						1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	6.58	4.96	0.08
						1/2" Ice	7.03	5.75	0.13
						1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	4.05	1.53	0.07
						1/2" Ice	4.30	1.71	0.10
						1" Ice	4.56	1.90	0.13
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	121.00	No Ice	6.58	4.96	0.08
						1/2" Ice	7.03	5.75	0.13
						1" Ice	7.47	6.47	0.19
**									

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
**									
Sector Mount [SM 701-3]	A	None		0.0000	103.00	No Ice	19.73	19.73	0.82
						1/2" Ice	27.41	27.41	1.17
						1" Ice	35.09	35.09	1.51
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	6.32	5.63	0.11
						1/2" Ice	6.76	6.42	0.17
						1" Ice	7.20	7.12	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	6.32	5.63	0.11
						1/2" Ice	6.76	6.42	0.17
						1" Ice	7.20	7.12	0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	6.33	5.64	0.11
						1/2" Ice	6.78	6.43	0.17
						1" Ice	7.21	7.13	0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	6.32	5.63	0.11
						1/2" Ice	6.76	6.42	0.17
						1" Ice	7.20	7.12	0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						1" Ice	13.14	12.91	0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						1" Ice	13.14	12.91	0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	11.68	9.84	0.08
						1/2" Ice	12.40	11.37	0.17
						1" Ice	13.14	12.91	0.27
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	0.35	0.17	0.01
						1/2" Ice	0.43	0.23	0.01
						1" Ice	0.51	0.30	0.02
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	0.35	0.17	0.01
						1/2" Ice	0.43	0.23	0.01
						1" Ice	0.51	0.30	0.02
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	0.35	0.17	0.01
						1/2" Ice	0.43	0.23	0.01
						1" Ice	0.51	0.30	0.02
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	2.83	1.18	0.05
						1/2" Ice	3.04	1.33	0.07
						1" Ice	3.26	1.48	0.10
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	2.83	1.18	0.05
						1/2" Ice	3.04	1.33	0.07
						1" Ice	3.26	1.48	0.10
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.0000	103.00	No Ice	2.83	1.18	0.05
						1/2" Ice	3.04	1.33	0.07
						1" Ice	3.26	1.48	0.10

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
**									
******									
Side Arm Mount [SO 302-1]	B	From Leg	2.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	1.67 2.51 3.35	3.27 4.99 6.71	0.06 0.09 0.12
10 ft x 2" omni whip	B	From Leg	4.00 0.00 6.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	2.00 3.02 4.07	2.00 3.02 4.07	0.02 0.04 0.06
******									
WB2900	A	From Leg	3.00 0.00 8.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	2.04 2.24 2.44	0.53 0.65 0.78	0.01 0.02 0.04
10'x2" Pipe Mount	A	From Leg	3.00 0.00 9.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	2.00 3.02 4.07	2.00 3.02 4.07	0.07 0.09 0.11
Side Arm Mount [SO 305-1]	A	From Leg	1.50 0.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	0.94 1.48 2.02	1.41 2.17 2.93	0.03 0.04 0.06
ANT150D3	A	From Leg	3.00 0.00 3.50	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.60 2.88 4.16	1.60 2.88 4.16	0.02 0.02 0.03
**									
BMOY8905	B	From Face	1.50 0.00 0.00	0.0000	61.00	No Ice 1/2" Ice 1" Ice	0.66 1.75 2.85	0.66 1.75 2.85	0.00 0.01 0.03
**									
Side Arm Mount [SO 305-1]	B	From Leg	1.50 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	0.94 1.48 2.02	1.41 2.17 2.93	0.03 0.04 0.06
KS24019-L112A	B	From Leg	3.00 0.00 2.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	0.14 0.20 0.26	0.14 0.20 0.26	0.01 0.01 0.01
**									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice

Comb. No.	Description
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	254.65	28.14	-17.04
	Max. H_x	18	254.65	28.14	-17.04
	Max. H_z	5	-193.12	-20.76	14.59
	Min. Vert	7	-215.23	-23.86	14.48
	Min. H_x	7	-215.23	-23.86	14.48
	Min. H_z	18	254.65	28.14	-17.04
Leg B	Max. Vert	10	255.39	-27.97	-17.29
	Max. H_x	23	-214.17	23.68	14.68
	Max. H_z	25	-192.02	20.50	14.93
	Min. Vert	23	-214.17	23.68	14.68
	Min. H_x	10	255.39	-27.97	-17.29
	Min. H_z	10	255.39	-27.97	-17.29
Leg A	Max. Vert	2	257.46	0.30	32.98
	Max. H_x	20	17.13	5.20	1.55
	Max. H_z	2	257.46	0.30	32.98
	Min. Vert	15	-214.07	-0.26	-27.92
	Min. H_x	9	13.14	-5.18	1.17
	Min. H_z	15	-214.07	-0.26	-27.92

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	151.292 - 146.229	2.190	39	0.1220	0.0095
T2	146.229 - 141.167	2.063	39	0.1218	0.0094
T3	141.167 - 121.042	1.933	39	0.1208	0.0090
T4	121.042 - 114.313	1.435	39	0.1106	0.0076
T5	114.313 - 107.646	1.277	39	0.1054	0.0069
T6	107.646 - 100.917	1.131	39	0.0990	0.0062
T7	100.917 - 94.2014	0.995	39	0.0915	0.0058
T8	94.2014 - 87.4861	0.864	39	0.0854	0.0050
T9	87.4861 - 80.7708	0.743	39	0.0785	0.0043
T10	80.7708 - 70.6875	0.635	39	0.0708	0.0039
T11	70.6875 - 60.6041	0.486	39	0.0624	0.0033
T12	60.6041 - 50.5104	0.357	39	0.0533	0.0027
T13	50.5104 - 40.4166	0.248	39	0.0433	0.0022
T14	40.4166 - 30.3125	0.163	39	0.0329	0.0017
T15	30.3125 - 20.2083	0.095	39	0.0251	0.0012
T16	20.2083 - 10.1041	0.046	39	0.0170	0.0008
T17	10.1041 - 0	0.012	39	0.0086	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	2.5' x 2-3/8" Pipe Mount	39	2.158	0.1220	0.0095	76308
148.00	Sector Mount [SM 510-3]	39	2.108	0.1220	0.0094	76308
146.00	WV-CW864	39	2.057	0.1218	0.0094	78001
133.00	Sector Mount [SM 104-3]	39	1.726	0.1177	0.0085	123617
128.00	Side Arm Mount [SO 305-1]	39	1.603	0.1151	0.0081	126495
121.00	Sector Mount [SM 505-3]	39	1.434	0.1106	0.0076	114750
103.00	Sector Mount [SM 701-3]	39	1.037	0.0937	0.0059	101419
90.00	Side Arm Mount [SO 302-1]	39	0.787	0.0813	0.0045	38877
83.00	WB2900	39	0.670	0.0733	0.0040	63999
61.00	MFB-1503	39	0.362	0.0537	0.0027	69190
50.00	Side Arm Mount [SO 305-1]	39	0.243	0.0428	0.0021	46919

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	151.292 - 146.229	12.335	2	0.6839	0.0547
T2	146.229 - 141.167	11.627	2	0.6830	0.0540
T3	141.167 -	10.897	2	0.6776	0.0522

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
	121.042				
T4	121.042 - 114.313	8.096	2	0.6217	0.0436
T5	114.313 - 107.646	7.210	2	0.5925	0.0399
T6	107.646 - 100.917	6.384	2	0.5568	0.0357
T7	100.917 - 94.2014	5.623	2	0.5147	0.0332
T8	94.2014 - 87.4861	4.883	2	0.4804	0.0289
T9	87.4861 - 80.7708	4.198	2	0.4420	0.0247
T10	80.7708 - 70.6875	3.588	2	0.3988	0.0223
T11	70.6875 - 60.6041	2.747	2	0.3518	0.0189
T12	60.6041 - 50.5104	2.022	2	0.3004	0.0153
T13	50.5104 - 40.4166	1.407	2	0.2444	0.0125
T14	40.4166 - 30.3125	0.925	2	0.1855	0.0096
T15	30.3125 - 20.2083	0.543	2	0.1416	0.0071
T16	20.2083 - 10.1041	0.265	2	0.0962	0.0045
T17	10.1041 - 0	0.071	2	0.0485	0.0023

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	2.5' x 2-3/8" Pipe Mount	2	12.156	0.6839	0.0546	13440
148.00	Sector Mount [SM 510-3]	2	11.877	0.6837	0.0543	13440
146.00	WV-CW864	2	11.594	0.6829	0.0539	13753
133.00	Sector Mount [SM 104-3]	2	9.734	0.6609	0.0489	22499
128.00	Side Arm Mount [SO 305-1]	2	9.040	0.6465	0.0468	23145
121.00	Sector Mount [SM 505-3]	2	8.091	0.6216	0.0436	21028
103.00	Sector Mount [SM 701-3]	2	5.854	0.5273	0.0340	18664
90.00	Side Arm Mount [SO 302-1]	2	4.446	0.4574	0.0260	6898
83.00	WB2900	2	3.785	0.4125	0.0230	11270
61.00	MFB-1503	2	2.048	0.3025	0.0155	12070
50.00	Side Arm Mount [SO 305-1]	2	1.379	0.2414	0.0123	8417

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	151.292	Diagonal	A325N	0.5000	1	1.09	4.69	0.232 ✔	1	Member Block Shear
		Top Girt	A325N	0.5000	1	0.19	7.95	0.024 ✔	1	Bolt Shear
T2	146.229	Leg	A325N	0.6250	4	1.53	20.71	0.074 ✔	1	Bolt Tension
		Diagonal	A325X	0.5000	1	3.34	7.25	0.461 ✔	1	Member Block Shear
T3	141.167	Leg	A325N	0.6250	4	6.93	20.71	0.335 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.5000	1	4.57	6.20	0.738 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.99	6.20	0.160 ✔	1	Member Bearing
T4	121.042	Diagonal	A325N	0.5000	2	3.04	6.53	0.466 ✔	1	Member Block Shear
T5	114.313	Diagonal	A325N	0.5000	2	3.12	6.53	0.478 ✔	1	Member Block Shear
T6	107.646	Leg	A325N	0.7500	4	14.20	29.82	0.476 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	7.26	12.40	0.585 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	1.08	6.83	0.158 ✔	1	Member Block Shear
T7	100.917	Diagonal	A325N	0.5000	2	4.07	7.03	0.579 ✔	1	Member Block Shear
T8	94.2014	Diagonal	A325N	0.5000	2	4.09	7.03	0.582 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.6250	1	1.52	6.83	0.222 ✔	1	Member Block Shear
T9	87.4861	Leg	A325N	0.8750	4	22.73	40.59	0.560 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	8.78	12.40	0.708 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	1.74	6.83	0.255 ✔	1	Member Block Shear
T10	80.7708	Diagonal	A325N	0.6250	1	10.17	13.92	0.731 ✔	1	Gusset Bearing
T11	70.6875	Leg	A325N	0.8750	4	28.77	40.59	0.709 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	10.37	13.92	0.745 ✔	1	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	2.35	7.83	0.300 ✔	1	Member Bearing
T12	60.6041	Diagonal	A325N	0.6250	1	10.66	13.92	0.766 ✔	1	Gusset Bearing
		Secondary Horizontal	A325N	0.5000	1	2.69	7.95	0.338 ✔	1	Bolt Shear
T13	50.5104	Leg	A325N	1.0000	4	39.02	53.01	0.736 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	11.00	23.40	0.470 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	3.01	7.95	0.378 ✔	1	Bolt Shear
T14	40.4166	Diagonal	A325N	0.6250	1	11.65	23.40	0.498 ✔	1	Member Bearing
T15	30.3125	Leg	A325N	1.0625	4	46.72	59.85	0.781 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	12.65	24.85	0.509 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3.65	7.83	0.466 ✔	1	Member Bearing
T16	20.2083	Diagonal	A325N	0.6250	1	12.39	23.40	0.529 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	3.99	7.83	0.510 ✔	1	Member Bearing
T17	10.1041	Leg	A354-BC	1.0000	6	36.08	55.22	0.653 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	13.56	24.85	0.546 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	4.29	10.44	0.411 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	ROHN 2.5 STD	5.06	4.94	62.5 K=1.00	1.7040	-6.20	57.61	0.108 [1] ✔
T2	146.229 - 141.167	ROHN 2.5 STD	5.06	4.94	62.5 K=1.00	1.7040	-9.50	57.61	0.165 [1] ✔
T3	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7 K=1.00	2.2535	-33.90	58.52	0.579 [1] ✔
T4	121.042 - 114.313	ROHN 2.5 EH (GR)	6.74	6.68	86.7 K=1.00	2.2535	-40.08	64.40	0.622 [1] ✔
T5	114.313 - 107.646	ROHN 2.5 EH (GR)	6.68	6.68	86.7 K=1.00	2.2535	-51.46	64.40	0.799 [1] ✔
T6	107.646 - 100.917	ROHN 2.5 EH (GR)	6.74	3.43	44.6 K=1.00	2.2535	-69.36	100.07	0.693 [1] ✔
T7	100.917 - 94.2014	ROHN 3 EH (GR)	6.73	6.66	70.4 K=1.00	3.0159	-75.24	108.41	0.694 [1] ✔
T8	94.2014 - 87.4861	ROHN 3 EH (GR)	6.73	3.45	36.4 K=1.00	3.0159	-87.58	145.20	0.603 [1] ✔
T9	87.4861 - 80.7708	ROHN 3 EH (GR)	6.73	3.40	35.9 K=1.00	3.0159	-107.84	145.63	0.740 [1] ✔
T10	80.7708 - 70.6875	ROHN 4 EH (GR)	10.10	10.02	81.4 K=1.00	4.4074	-117.00	142.78	0.819 [1] ✔
T11	70.6875 - 60.6041	ROHN 4 EH (GR)	10.10	5.21	42.3 K=1.00	4.4074	-135.64	212.04	0.640 [1] ✔
T12	60.6041 - 50.5104	ROHN 4 EH (GR)	10.11	5.11	41.5 K=1.00	4.4074	-165.24	213.19	0.775 [1] ✔
T13	50.5104 - 40.4166	ROHN 4 EH (GR)	10.11	5.10	41.4 K=1.00	4.4074	-183.92	213.29	0.862 [1] ✔
T14	40.4166 - 30.3125	ROHN 5 EH (GR)	10.12	10.02	65.4 K=1.00	6.1120	-192.85	246.97	0.781 [1] ✔
T15	30.3125 - 20.2083	ROHN 5 EH (GR)	10.12	5.13	33.5 K=1.00	6.1120	-221.54	320.59	0.691 [1] ✔
T16	20.2083 - 10.1041	ROHN 5 EH (GR)	10.12	5.12	33.4 K=1.00	6.1120	-230.18	320.67	0.718 [1] ✔
T17	10.1041 - 0	ROHN 5 EH (GR)	10.12	5.12	33.4 K=1.00	6.1120	-258.90	320.73	0.807 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L 1.5 x 1.5 x 3/16	9.24	4.62	189.1 K=1.00	0.5273	-1.03	3.33	0.310 [1] ✔
T2	146.229 - 141.167	L 2 x 2 x 3/16	9.24	4.62	140.8 K=1.00	0.7150	-3.41	8.15	0.419 [1] ✔
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	144.7 K=1.00	0.9020	-4.66	9.73	0.479 [1] ✔
T4	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	151.7 K=1.00	0.9020	-6.13	8.85	0.692 [1] ✔
T5	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	158.8 K=1.00	0.9020	-6.30	8.08	0.780 [1] ✔
T6	107.646 - 100.917	2L 2.5 x 2.5 x 3/16 (3/16)	13.32	6.84	105.5 K=1.00	1.8047	-7.55	32.54	0.232 [1] ✔
T7	100.917 - 94.2014	L3x3x3/16	13.81	7.09	142.7 K=1.00	1.0900	-8.05	12.09	0.666 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	94.2014 - 87.4861	L3x3x3/16	14.46	7.41	149.3 K=1.00	1.0900	-8.54	11.05	0.772 [1] ✔
T9	87.4861 - 80.7708	2L 3 x 3 x 3/16 (1/4)	15.05	7.71	98.4 K=1.00	2.1797	-9.04	41.68	0.217 [1] ✔
T10	80.7708 - 70.6875	2L3x3x3/16x1/4	17.36	8.97	114.5 K=1.00	2.1797	-10.20	35.01	0.291 [1] ✔
T11	70.6875 - 60.6041	2L3x3x3/16x1/4	18.25	9.41	120.2 K=1.00	2.1797	-10.85	32.74	0.331 [1] ✔
T12	60.6041 - 50.5104	2L3x3x1/4x1/4	19.03	9.80	126.3 K=1.00	2.8750	-11.10	40.69	0.273 [1] ✔
T13	50.5104 - 40.4166	2L3x3x1/4x1/4	19.93	10.24	132.1 K=1.00	2.8750	-11.45	37.20	0.308 [1] ✔
T14	40.4166 - 30.3125	2L3 1/2x3 1/2x1/4x1/4	20.81	10.67	117.3 K=1.00	3.3750	-11.70	55.38	0.211 [1] ✔
T15	30.3125 - 20.2083	2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2 K=1.00	3.3750	-12.65	51.06	0.248 [1] ✔
T16	20.2083 - 10.1041	2L 4 x 4 x 1/4 (1/4)	22.61	11.57	110.8 K=1.00	3.8750	-12.53	68.88	0.182 [1] ✔
T17	10.1041 - 0	2L 4 x 4 x 1/4 (1/4)	23.51	12.01	115.1 K=1.00	3.8750	-13.56	64.90	0.209 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	107.646 - 100.917	L 2 x 2 x 3/16	12.25	6.01	182.9 K=1.00	0.7150	-1.08	4.83	0.224 [1] ✔
T8	94.2014 - 87.4861	L 2 x 2 x 3/16	13.64	6.68	203.3 K=1.00	0.7150	-1.52	3.91	0.389 [1] ✔
T9	87.4861 - 80.7708	L 2 x 2 x 3/16	14.34	7.02	213.9 K=1.00	0.7150	-1.74	3.53	0.494 [1] ✔
T11	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	7.90	191.6 K=1.00	0.9020	-2.35	5.55	0.424 [1] ✔
T12	60.6041 - 50.5104	L3x3x1/4	17.20	8.41	170.5 K=1.00	1.4400	-2.69	11.19	0.240 [1] ✔
T13	50.5104 - 40.4166	L3x3x1/4	18.24	8.93	181.0 K=1.00	1.4400	-3.01	9.93	0.303 [1] ✔
T15	30.3125 - 20.2083	L 3 x 3 x 3/16	20.26	9.90	199.2 K=1.00	1.0898	-3.65	6.20	0.588 [1] ✔
T16	20.2083 - 10.1041	L3x3x3/16	21.27	10.41	209.5 K=1.00	1.0900	-3.99	5.61	0.712 [1] ✔
T17	10.1041 - 0	L 3.5 x 3.5 x 1/4	22.27	10.90	188.5 K=1.00	1.6900	-4.29	10.75	0.400 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L2 1/2x2 1/2x3/16 KL/R > 200 (C) - 5	8.56	8.32	201.8 K=1.00	0.9020	-0.19	5.01	0.039 [1] ✔
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16 KL/R > 200 (C) - 25	8.57	8.33	201.9 K=1.00	0.9020	-0.85	5.00	0.169 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	ROHN 2.5 STD	5.06	4.94	62.5	1.7040	0.79	76.68	0.010 [1] ✔
T2	146.229 - 141.167	ROHN 2.5 STD	5.06	4.94	62.5	1.7040	6.13	76.68	0.080 [1] ✔
T3	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7	2.2535	27.72	101.41	0.273 [1] ✔
T4	121.042 - 114.313	ROHN 2.5 EH (GR)	6.74	6.68	86.7	2.2535	31.48	101.41	0.310 [1] ✔
T5	114.313 - 107.646	ROHN 2.5 EH (GR)	6.68	6.68	86.7	2.2535	41.90	101.41	0.413 [1] ✔
T6	107.646 - 100.917	ROHN 2.5 EH (GR)	6.74	3.43	44.6	2.2535	56.78	101.41	0.560 [1] ✔
T7	100.917 - 94.2014	ROHN 3 EH (GR)	6.73	6.66	70.4	3.0159	61.89	135.72	0.456 [1] ✔
T8	94.2014 - 87.4861	ROHN 3 EH (GR)	6.73	3.45	36.4	3.0159	73.23	135.72	0.540 [1] ✔
T9	87.4861 - 80.7708	ROHN 3 EH (GR)	6.73	3.40	35.9	3.0159	90.92	135.72	0.670 [1] ✔
T10	80.7708 - 70.6875	ROHN 4 EH (GR)	10.10	10.02	81.4	4.4074	98.77	198.34	0.498 [1] ✔
T11	70.6875 - 60.6041	ROHN 4 EH (GR)	10.10	5.21	42.3	4.4074	115.21	198.34	0.581 [1] ✔
T12	60.6041 - 50.5104	ROHN 4 EH (GR)	10.11	5.11	41.5	4.4074	140.46	198.34	0.708 [1] ✔
T13	50.5104 - 40.4166	ROHN 4 EH (GR)	10.11	5.10	41.4	4.4074	156.09	198.34	0.787 [1] ✔
T14	40.4166 - 30.3125	ROHN 5 EH (GR)	10.12	10.02	65.4	6.1120	163.32	275.04	0.594 [1] ✔
T15	30.3125 - 20.2083	ROHN 5 EH (GR)	10.12	5.13	33.5	6.1120	186.86	275.04	0.679 [1] ✔
T16	20.2083 - 10.1041	ROHN 5 EH (GR)	10.12	5.12	33.4	6.1120	193.58	275.04	0.704 [1] ✔
T17	10.1041 - 0	ROHN 5 EH (GR)	10.12	5.12	33.4	6.1120	216.48	275.04	0.787 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L 1.5 x 1.5 x 3/16	9.24	4.62	121.4	0.3076	1.09	13.38	0.081 [1] ✔
T2	146.229 - 141.167	L 2 x 2 x 3/16	9.24	4.62	89.9	0.4484	3.34	19.50	0.171 [1] ✔
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	92.1	0.5886	4.57	25.60	0.179 [1] ✔
T4	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	96.5	0.5886	6.08	25.60	0.238 [1] ✔
T5	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	101.0	0.5886	6.24	25.60	0.244 [1] ✔
T6	107.646 - 100.917	2L 2.5 x 2.5 x 3/16 (3/16)	13.32	6.84	105.5	1.1777	7.26	51.23	0.142 [1] ✔
T7	100.917 - 94.2014	L3x3x3/16	13.81	7.09	90.6	0.7296	8.15	31.74	0.257 [1] ✔
T8	94.2014 - 87.4861	L3x3x3/16	14.46	7.41	94.7	0.7296	8.19	31.74	0.258 [1] ✔
T9	87.4861 - 80.7708	2L 3 x 3 x 3/16 (1/4)	15.05	7.71	98.4	1.4590	8.78	63.47	0.138 [1] ✔
T10	80.7708 - 70.6875	2L3x3x3/16x1/4	17.36	8.97	114.5	1.4238	10.17	61.94	0.164 [1] ✔
T11	70.6875 - 60.6041	2L3x3x3/16x1/4	18.25	9.41	120.2	1.4238	10.37	61.94	0.167 [1] ✔
T12	60.6041 - 50.5104	2L3x3x1/4x1/4	19.03	9.80	126.3	1.8750	10.66	91.41	0.117 [1] ✔
T13	50.5104 - 40.4166	2L3x3x1/4x1/4	19.93	10.24	132.1	1.8750	11.00	91.41	0.120 [1] ✔
T14	40.4166 - 30.3125	2L3 1/2x3 1/2x1/4x1/4	20.81	10.67	117.3	2.2500	11.65	109.69	0.106 [1] ✔
T15	30.3125 - 20.2083	2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2	2.2500	11.83	109.69	0.108 [1] ✔
T16	20.2083 - 10.1041	2L 4 x 4 x 1/4 (1/4)	22.61	11.57	110.8	2.6250	12.39	127.97	0.097 [1] ✔
T17	10.1041 - 0	2L 4 x 4 x 1/4 (1/4)	23.51	12.01	115.1	2.6250	12.41	127.97	0.097 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	107.646 - 100.917	L 2 x 2 x 3/16	12.25	12.01	233.6	0.4308	1.08	18.74	0.058 [1] ✔
T8	94.2014 - 87.4861	L 2 x 2 x 3/16	13.64	13.35	259.7	0.4308	1.52	18.74	0.081 [1] ✔
T9	87.4861 - 80.7708	L 2 x 2 x 3/16	14.34	14.04	273.2	0.4308	1.74	18.74	0.093 [1] ✔
T11	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	15.81	243.8	0.5710	2.35	24.84	0.095 [1] ✔
T12	60.6041 - 50.5104	L3x3x1/4	17.20	16.82	217.1	0.9628	2.69	41.88	0.064 [1] ✔
T13	50.5104 - 40.4166	L3x3x1/4	18.24	17.86	230.5	0.9628	3.01	41.88	0.072 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T15	30.3125 - 20.2083	L 3 x 3 x 3/16	20.26	19.80	252.9	0.7119	3.65	30.97	0.118 [1] ✔
T16	20.2083 - 10.1041	L3x3x3/16	21.27	20.81	266.0	0.7120	3.99	30.97	0.129 [1] ✔
T17	10.1041 - 0	L 3.5 x 3.5 x 1/4	22.27	21.80	239.9	1.1269	4.29	49.02	0.088 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	151.292 - 146.229	L2 1/2x2 1/2x3/16	8.56	8.32	128.4	0.5886	0.11	25.60	0.004 [1] ✔
T3	141.167 - 121.042	L2 1/2x2 1/2x3/16	8.57	8.33	128.5	0.5886	0.99	25.60	0.039 [1] ✔

[1] P_u / ϕP_n controls

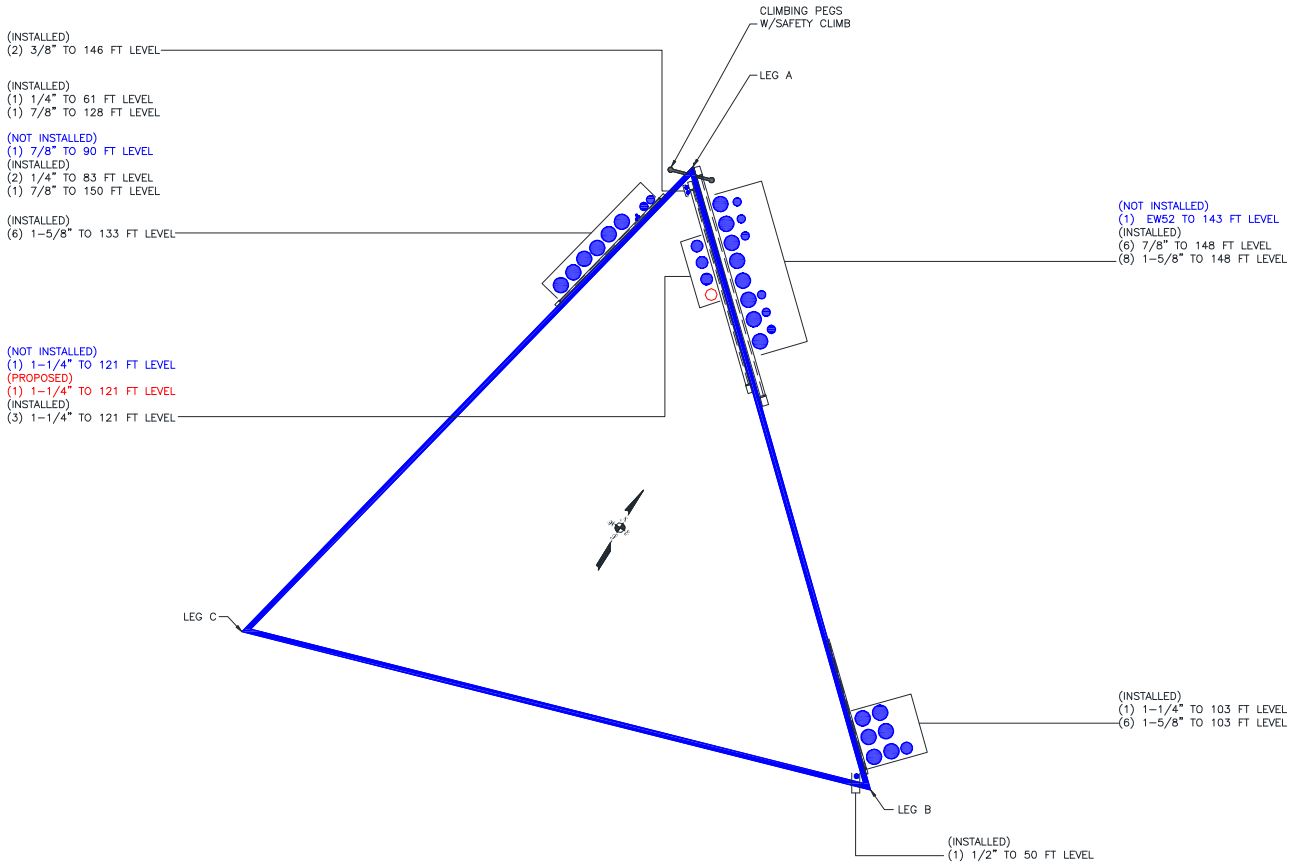
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	151.292 - 146.229	Leg	ROHN 2.5 STD	3	-6.20	57.61	10.8	Pass
T2	146.229 - 141.167	Leg	ROHN 2.5 STD	15	-9.50	57.61	16.5	Pass
T3	141.167 - 121.042	Leg	ROHN 2.5 EH	24	-33.90	58.52	57.9	Pass
T4	121.042 - 114.313	Leg	ROHN 2.5 EH (GR)	48	-40.08	64.40	62.2	Pass
T5	114.313 - 107.646	Leg	ROHN 2.5 EH (GR)	57	-51.46	64.40	79.9	Pass
T6	107.646 - 100.917	Leg	ROHN 2.5 EH (GR)	66	-69.36	100.07	69.3	Pass
T7	100.917 - 94.2014	Leg	ROHN 3 EH (GR)	78	-75.24	108.41	69.4	Pass
T8	94.2014 - 87.4861	Leg	ROHN 3 EH (GR)	87	-87.58	145.20	60.3	Pass
T9	87.4861 - 80.7708	Leg	ROHN 3 EH (GR)	99	-107.84	145.63	74.0	Pass
T10	80.7708 - 70.6875	Leg	ROHN 4 EH (GR)	111	-117.00	142.78	81.9	Pass
T11	70.6875 - 60.6041	Leg	ROHN 4 EH (GR)	120	-135.64	212.04	64.0 70.9 (b)	Pass
T12	60.6041 - 50.5104	Leg	ROHN 4 EH (GR)	132	-165.24	213.19	77.5	Pass
T13	50.5104 - 40.4166	Leg	ROHN 4 EH (GR)	144	-183.92	213.29	86.2	Pass
T14	40.4166 - 30.3125	Leg	ROHN 5 EH (GR)	156	-192.85	246.97	78.1	Pass
T15	30.3125 - 20.2083	Leg	ROHN 5 EH (GR)	165	-221.54	320.59	69.1 78.1 (b)	Pass
T16	20.2083 - 10.1041	Leg	ROHN 5 EH (GR)	177	-230.18	320.67	71.8	Pass
T17	10.1041 - 0	Leg	ROHN 5 EH (GR)	189	-258.90	320.73	80.7	Pass
T1	151.292 - 146.229	Diagonal	L 1.5 x 1.5 x 3/16	9	-1.03	3.33	31.0	Pass
T2	146.229 - 141.167	Diagonal	L 2 x 2 x 3/16	19	-3.41	8.15	41.9 46.1 (b)	Pass
T3	141.167 - 121.042	Diagonal	L2 1/2x2 1/2x3/16	33	-4.66	9.73	47.9 73.8 (b)	Pass
T4	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	54	-6.13	8.85	69.2	Pass
T5	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	63	-6.30	8.08	78.0	Pass
T6	107.646 - 100.917	Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	72	-7.55	32.54	23.2 58.5 (b)	Pass
T7	100.917 - 94.2014	Diagonal	L3x3x3/16	84	-8.05	12.09	66.6	Pass
T8	94.2014 - 87.4861	Diagonal	L3x3x3/16	90	-8.54	11.05	77.2	Pass
T9	87.4861 - 80.7708	Diagonal	2L 3 x 3 x 3/16 (1/4)	102	-9.04	41.68	21.7 70.8 (b)	Pass
T10	80.7708 - 70.6875	Diagonal	2L3x3x3/16x1/4	114	-10.20	35.01	29.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							73.1 (b)	
T11	70.6875 - 60.6041	Diagonal	2L3x3x3/16x1/4	123	-10.85	32.74	33.1	Pass
							74.5 (b)	
T12	60.6041 - 50.5104	Diagonal	2L3x3x1/4x1/4	135	-11.10	40.69	27.3	Pass
							76.6 (b)	
T13	50.5104 - 40.4166	Diagonal	2L3x3x1/4x1/4	147	-11.45	37.20	30.8	Pass
							47.0 (b)	
T14	40.4166 - 30.3125	Diagonal	2L3 1/2x3 1/2x1/4x1/4	159	-11.70	55.38	21.1	Pass
							49.8 (b)	
T15	30.3125 - 20.2083	Diagonal	2L3 1/2x3 1/2x1/4x1/4	168	-12.65	51.06	24.8	Pass
							50.9 (b)	
T16	20.2083 - 10.1041	Diagonal	2L 4 x 4 x 1/4 (1/4)	180	-12.53	68.88	18.2	Pass
							52.9 (b)	
T17	10.1041 - 0	Diagonal	2L 4 x 4 x 1/4 (1/4)	192	-13.56	64.90	20.9	Pass
							54.6 (b)	
T6	107.646 - 100.917	Secondary Horizontal	L 2 x 2 x 3/16	74	-1.08	4.83	22.4	Pass
T8	94.2014 - 87.4861	Secondary Horizontal	L 2 x 2 x 3/16	95	-1.52	3.91	38.9	Pass
T9	87.4861 - 80.7708	Secondary Horizontal	L 2 x 2 x 3/16	107	-1.74	3.53	49.4	Pass
T11	70.6875 - 60.6041	Secondary Horizontal	L2 1/2x2 1/2x3/16	128	-2.35	5.55	42.4	Pass
T12	60.6041 - 50.5104	Secondary Horizontal	L3x3x1/4	140	-2.69	11.19	24.0	Pass
							33.8 (b)	
T13	50.5104 - 40.4166	Secondary Horizontal	L3x3x1/4	152	-3.01	9.93	30.3	Pass
							37.8 (b)	
T15	30.3125 - 20.2083	Secondary Horizontal	L 3 x 3 x 3/16	173	-3.65	6.20	58.8	Pass
T16	20.2083 - 10.1041	Secondary Horizontal	L3x3x3/16	186	-3.99	5.61	71.2	Pass
T17	10.1041 - 0	Secondary Horizontal	L 3.5 x 3.5 x 1/4	197	-4.29	10.75	40.0	Pass
							41.1 (b)	
T1	151.292 - 146.229	Top Girt	L2 1/2x2 1/2x3/16	5	-0.19	5.01	3.9	Pass
T3	141.167 - 121.042	Top Girt	L2 1/2x2 1/2x3/16	25	-0.85	5.00	16.9	Pass
							Summary	
						Leg (T13)	86.2	Pass
						Diagonal (T5)	78.0	Pass
						Secondary Horizontal (T16)	51.0	Pass
						Top Girt (T3)	16.9	Pass
						Bolt Checks	78.1	Pass
						RATING =	**86.2**	**Pass**

APPENDIX B

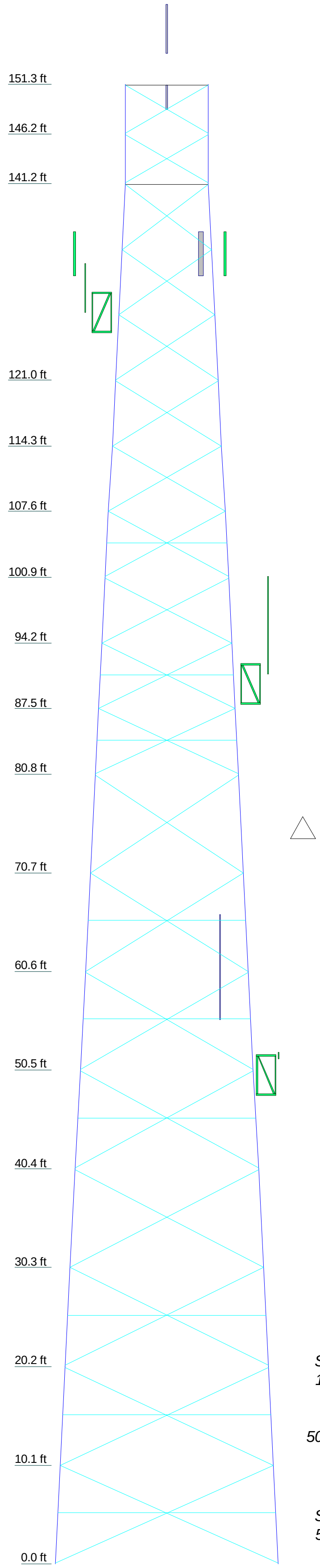
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	ROHN 2.5 STD	A572-50	A	A36	E	N.A.	8.5625	2 @ 4.9375	0.3
T2	ROHN 2.5 STD	A572-50	B	A36	N.A.	N.A.		2 @ 4.9375	0.2
T3	ROHN 2.5 EH	A572-50	L2 1/2x2 1/2x3/16	A36	L2 1/2x2 1/2x3/16	N.A.		6 @ 6.66667	1.2
T4	ROHN 2.5 EH (GR)	A572-50	L2 1/2x2 1/2x3/16	A36	N.A.	N.A.	10.5625	6 @ 6.66667	0.5
T5	ROHN 2.5 EH (GR)	A572-50	L2 1/2x2 1/2x3/16	A36	N.A.	N.A.	11.243	6 @ 6.66667	0.5
T6	ROHN 2.5 EH (GR)	A572-50	C	A36	N.A.	B	11.9236	6 @ 6.66667	0.9
T7	ROHN 3 EH (GR)	A572-50	L3x3x3/16	A36	N.A.	N.A.	12.6041	1 @ 6.65278	0.7
T8	ROHN 3 EH (GR)	A572-50	L3x3x3/16	A36	N.A.	L 2 x 2 x 3/16	13.302	1 @ 6.71528	0.8
T9	ROHN 3 EH (GR)	A572-50	D	A36	N.A.	L 2 x 2 x 3/16	14	1 @ 6.63194	1.1
T10	ROHN 4 EH (GR)	A572-50	2L3x3x3/16x1/4	A36	N.A.	N.A.	14.6979	1 @ 10	1.6
T11	ROHN 4 EH (GR)	A572-50	2L3x3x3/16x1/4	A36	N.A.	E	15.6979	1 @ 10.0833	1.8
T12	ROHN 4 EH (GR)	A572-50	2L3x3x1/4x1/4	A572-50	N.A.	L3x3x1/4	16.6979	2 @ 9.90625	2.2
T13	ROHN 4 EH (GR)	A572-50	2L3x3x1/4x1/4	A572-50	N.A.	L3x3x1/4	17.7343	2 @ 9.90625	2.3
T14	ROHN 5 EH (GR)	A572-50	2L3 1/2x3 1/2x1/4x1/4	A572-50	N.A.	N.A.	18.7708	3 @ 10	2.7
T15	ROHN 5 EH (GR)	A572-50	2L3 1/2x3 1/2x1/4x1/4	A572-50	N.A.	L 3 x 3 x 3/16	19.7761	3 @ 10	3.0
T16	ROHN 5 EH (GR)	A572-50	2L 4 x 4 x 1/4 (1/4)	A572-50	N.A.	L3x3x3/16	20.7813	3 @ 10	3.3
T17	ROHN 5 EH (GR)	A572-50	2L 4 x 4 x 1/4 (1/4)	A572-50	N.A.	L 3.5 x 3.5 x 1/4	21.7813	1 @ 9.99997	3.5
							22.7813		26.5



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L 1.5 x 1.5 x 3/16	D	2L 3 x 3 x 3/16 (1/4)
B	L 2 x 2 x 3/16	E	L2 1/2x2 1/2x3/16
C	2L 2.5 x 2.5 x 3/16 (3/16)		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 144 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 Risk Category III and IV.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Grouted pipe f'c is 7 ksi
9. TOWER RATING: 86.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 257 K
SHEAR: 33 K

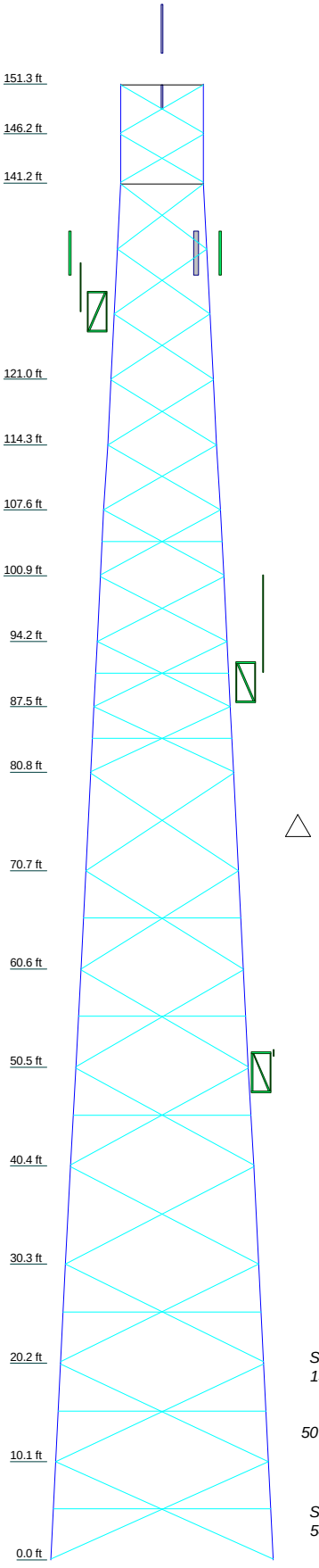
UPLIFT: -215 K
SHEAR: 28 K

AXIAL 149 K
SHEAR 13 K
MOMENT 1356 kip-ft
TORQUE 8 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 48 K
SHEAR 54 K
MOMENT 4762 kip-ft
TORQUE 38 kip-ft
REACTIONS - 144 mph WIND

Paul J Ford and Company 250 E. Broad St Suite 600, Columbus, OH 43215, Phone: 614-221-6679, FAX: 614-448-4105	Job: **Modified 152-ft S/S Tower; East Lyme, CT**		
	Project: **BU #806384 (PJF #37516-3357)**		
	Client: Crown Castle	Drawn by: chedges	App'd:
	Code: TIA-222-G	Date: 06/14/17	Scale: NTS
	Path: G:\TOWER375_Crown_Castle\2017\37517-2297_806384_NLN 136 943455\37517-2297.001.8700_SA_14178356\37517-2297.001.eri		Dwg No. E-1

Section			T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17
Legs			ROHN 2.5 STD		ROHN 2.5 EH		ROHN 2.5 EH (GR)		ROHN 3 EH (GR)			ROHN 4 EH (GR)					ROHN 5 EH (GR)		
Leg Grade			A572-50																
Diagonals	A	8.5625	L2 1/2x2 1/2x3/16																
	B	2 @ 4.9375																	
	C	6 @ 6.66667																	
	D	1 @ 6.63194	L3x3x3/16																
Diagonal Grade			A36																
Top Girts			N.A.																
Sec. Horizontals	E	22.7813	L2 1/2x2 1/2x3/16																
	B	N.A.																	
	C	11.9236																	
	D	14	L 2 x 2 x 3/16																
	E	15.6979																	
Face Width (ft)	A	8.5625	N.A.																
	B	2 @ 4.9375																	
	C	6 @ 6.66667																	
	D	1 @ 6.63194																	
	E	1 @ 10.0833																	
# Panels @ (ft)	A	2 @ 4.9375	N.A.																
	B	2 @ 4.9375																	
	C	6 @ 6.66667																	
	D	1 @ 6.63194																	
	E	1 @ 10																	
Weight (K)		26.5	0.3	0.2	1.2	0.5	0.5	0.9	0.7	0.8	1.1	1.6	1.8	2.2	2.3	2.7	3.0	3.3	3.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2.5' x 2-3/8" Pipe Mount	150	800MHz 2X50W RRH W/FILTER	121
WB2900	150	APXVSPP18-C-A20 w/ Mount Pipe	121
ANT150F2	150	TD-RRH8x20-25	121
Sector Mount [SM 510-3]	148	APXVTM14-C-120 w/ Mount Pipe	121
LNX-6514DS-AIM w/ Mount Pipe	148	TD-RRH8x20-25	121
LNX-6514DS-AIM w/ Mount Pipe	148	APXVTM14-C-120 w/ Mount Pipe	121
LNX-6514DS-AIM w/ Mount Pipe	148	TD-RRH8x20-25	121
(2) HBXX-6517DS-A2M w/ Mount Pipe	148	APXVTM14-C-120 w/ Mount Pipe	121
(2) HBXX-6517DS-A2M w/ Mount Pipe	148	Sector Mount [SM 701-3]	103
(2) HBXX-6517DS-A2M w/ Mount Pipe	148	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	103
RRH2X60-PCS	148	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	103
RRH2X60-PCS	148	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	103
RRH2X60-PCS	148	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	103
QUAD656C0000X w/ Mount Pipe	148	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	103
QUAD656C0000X w/ Mount Pipe	148	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	103
QUAD656C0000X w/ Mount Pipe	148	LNX-6515DS-VTM w/ Mount Pipe	103
B66A RRH4X45	148	LNX-6515DS-VTM w/ Mount Pipe	103
B66A RRH4X45	148	LNX-6515DS-VTM w/ Mount Pipe	103
B66A RRH4X45	148	KRY 112 144/1	103
B13 RRH 4X30	148	KRY 112 144/1	103
B13 RRH 4X30	148	KRY 112 144/1	103
B13 RRH 4X30	148	RRUS 11 B12	103
DB-B1-6C-12AB-0Z	148	RRUS 11 B12	103
DB-B1-6C-12AB-0Z	148	RRUS 11 B12	103
WV-CW864	146	Side Arm Mount [SO 302-1]	90
Sector Mount [SM 104-3]	133	10 ft x 2" omni whip	90
800 10504 w/ Mount Pipe	133	WB2900	83
800 10504 w/ Mount Pipe	133	10'x2" Pipe Mount	83
800 10504 w/ Mount Pipe	133	Side Arm Mount [SO 305-1]	83
Side Arm Mount [SO 305-1]	128	ANT150D3	83
WB2900	128	BMOY8905	61
ANT150F2	128	Side Arm Mount [SO 305-1]	50
Sector Mount [SM 505-3]	121	KS24019-L112A	50
1900MHz RRH (65MHz)	121		
800MHz 2X50W RRH W/FILTER	121		
APXVSPP18-C-A20 w/ Mount Pipe	121		
1900MHz RRH (65MHz)	121		
800MHz 2X50W RRH W/FILTER	121		
APXV9ERR18-C-A20 w/ Mount Pipe	121		
1900MHz RRH (65MHz)	121		

SYMBOL LIST

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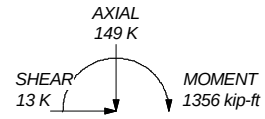
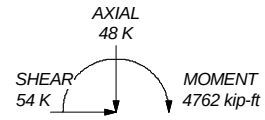
9. TOWER RATING: 86.2%

ALL REACTIONS ARE FACTORED

MAX. TOWER REACTIONS AT BASE:
DOWN: 257 K
SHEAR: 32 K
UPLIFT: -215 K
SHEAR: 28 K



TORQUE 8 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 38 kip-ft
REACTIONS - 144 mph WIND

Paul J Ford and Company
250 E. Broad St Suite 600
Columbus, OH 43215
Phone: 614-221-6679
FAX: 614-448-4105

Job: **Modified 152-ft S/S Tower; East Lyme, CT**		
Project: **BU #806384 (PJF #37516-3357)**		
Client: Crown Castle	Drawn by: chedges	App'd:
Code: TIA-222-G	Date: 06/16/17	Scale: NTS
Path:		Dwg No. E-1

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By CMH Date 6/14/2017
Project # 37517-2297

Existing and Post-Installed Anchor Rod Capacity

Loads

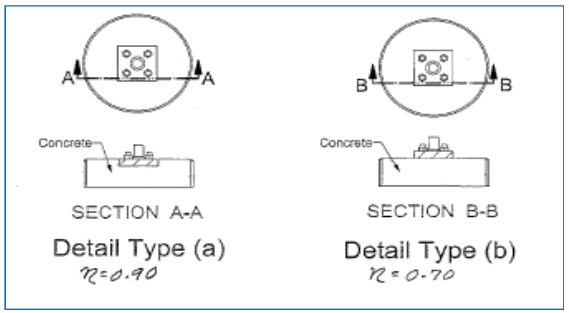
Uplift :	215	kips	1.00	Maximum Ratio
Shear :	27	kips		

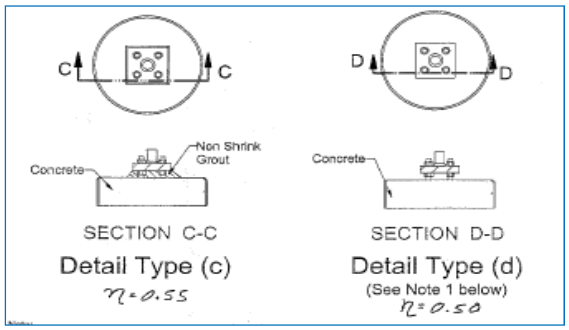
Existing Anchor Rods

Anchor Rod Condition (n) :	0.55	
Anchor Rod ø :	1	in
Anchor Rod Quantity :	4	
Anchor Rod Grade :	A193 Gr B7	
F_y :	105	ksi
F_u :	125	ksi
Threads per Inch :	8	
Total Net Area :	2.42	in^2
Applied Tensile Load :	155.67	kip
Applied Shear Load :	27.00	kip
ϕ :	0.8	
Total Anchor Rod Capacity ϕRnt :	242.30	kip
Existing Anchor Rod Ratio :	0.845	
		inches
		k-in
	33.13	kips
	60.57	kips
	10.05	k-in
Interaction Ratio :		
Governing Stress Ratio :	0.845	

Post-Installed Anchor Rods

Anchors Take Shear Load :	No	
Anchor Rod ø :	7/8	in
Anchor Rod Quantity :	2	
Anchor Rod Grade :	A193 Gr B7	
F_y :	105	ksi
F_u :	125	ksi
Threads per Inch :	9	
Total Net Area :	0.92	in^2
Applied Tensile Load :	59.33	kip
Applied Shear Load :	0.00	kip
ϕ :	0.8	
Total Anchor Rod Capacity ϕRnt :	92.35	kip
Post-Installed Anchor Rod Ratio :	0.642	
		inches
		k-in
	25.37	kips
	46.17	kips
	6.69	k-in
Interaction Ratio :		





PJF Job No. **37517-2297** Project Name: **BU806384** Engineer: CMH

Factored Foundation Loads:

	Comp	Uplift	
Factored Axial Load (+Comp, -Ten) =	**288.5**	**-191.4**	kips
Factored Horiz. Load at Top of Pier =	**33**	**28**	kips
Factored OTM at Top of Pier =	**0**	**0**	kips

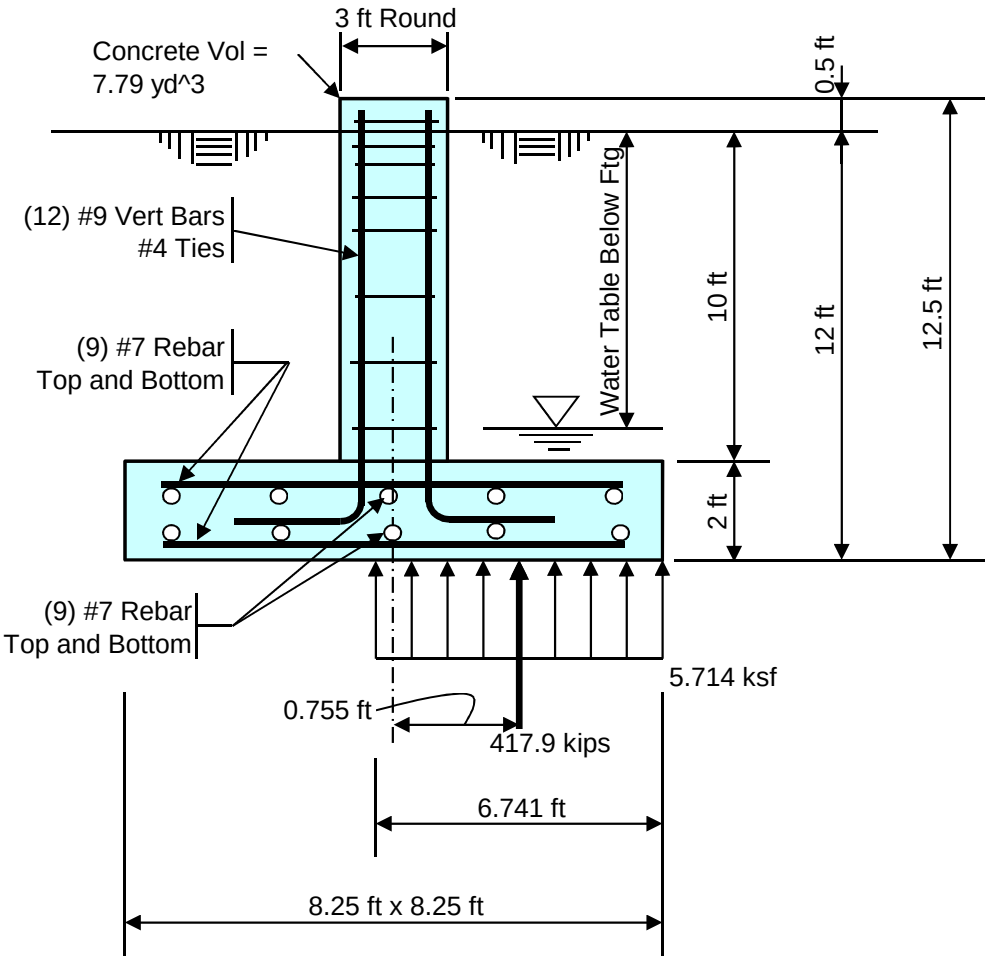
LRFD Resistance and Load Factors:

	Φ	Dead Load Factors	
Soil Bearing =	**0.75**		
Soil Weight =	**0.75**	1.2	0.9
Concrete Weight =	**0.9**	1.2	0.9

Soil Properties:

Depth to Water Table = **99** ft
Uplift Cone from **Top** of footing
Depth to Ignore for Uplift and PP = **0** ft
Side Friction has been included.
Passive Pressure has been included on the pier and pad.

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
12	**125**	**0**	**31**	**12**	**12.00**



Dimensions:

Pier Shape = **Round**
Pier Width = **3** ft Diameter
Pier Height above Grade = **0.5** ft
Depth to Bottom of Footing = **12** ft
Footing Thickness = **2** ft
Footing Width, B = **8.25** ft
Footing Length, L = **8.25** ft

Concrete:

Concrete Strength = **3** ksi
Rebar Strength = **60** ksi

Total Pad Reinf Stl = **10.80** in^2 >= 4.28 in^2 = Min Stl, OK
Total Pier Reinf Stl = **12.00** in^2 >= 5.09 in^2 = Min Stl, OK
Footing Thickness = **2.00** ft >= 1.69 ft = Min Ftg Thk, OK

Summary Results:

	Required		Available		
Maximum Net Soil Bearing =	**5.724**	ksf	**9.000**	ksf	Stress Ratio = **63.6%** in Soil Bearing
Uplift =	**191.4**	kips	**236.1**	kips	Stress Ratio = **81.1%** in Uplift
Punching Shear Stress =	**0.076**	ksi	**0.164**	ksi	Stress Ratio = **46.2%** in Punching Shear
Bending Shear Stress =	**58.9**	kips	**160.1**	kips	Stress Ratio = **36.8%** in Bending Shear
Bending Moment =	**236.11**	k-ft	**462.8**	k-ft	Stress Ratio = **51.0%** in Bending Moment
Conc Pier Reinforcing Steel =	**294.0**	k-ft	**523.8**	k-ft	Stress Ratio = **56.1%** in Pier Rebar

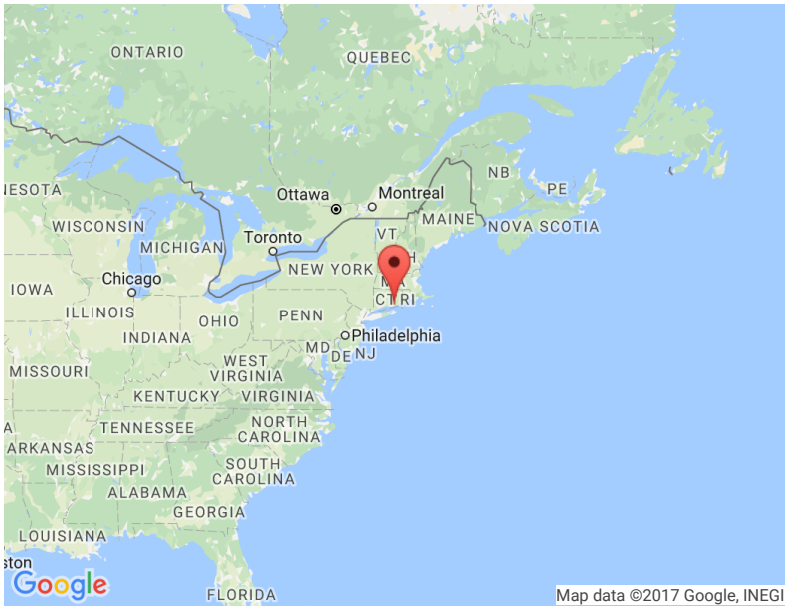
Search Results

Query Date: Tue Jun 13 2017
Latitude: 41.3350
Longitude: -72.2210

ASCE 7-10 Windspeeds (3-sec peak gust in mph*):

Risk Category I: 123
Risk Category II: 133
Risk Category III-IV: 144
MRI 10-Year:** 79
MRI 25-Year:** 89
MRI 50-Year:** 98
MRI 100-Year:** 108

ASCE 7-05 Windspeed:
119 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
85 (fastest mile in mph)



*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

Print your results

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EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT03XC110

East Lyme
93 Roxbury Road
Niantic, CT 06357

July 26, 2017

EBI Project Number: 6217003225

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.82 %

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

EBI Consulting
environmental | engineering | due diligence

July 26, 2017

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

Emissions Analysis for Site: **CT03XC110 – East Lyme**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **93 Roxbury Road, Niantic, 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 **93 Roxbury Road, Niantic, 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 **122 feet** above ground level (AGL) for **Sector A**, **122 feet** above ground level (AGL) for **Sector B** and **122 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):	**122 feet**	Height (AGL):	**122 feet**	Height (AGL):	**122 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%	**2.28 %**	Antenna B1 MPE%	**2.28 %**	Antenna C1 MPE%	**2.28 %**
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):	**122 feet**	Height (AGL):	**122 feet**	Height (AGL):	**122 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%	**1.66 %**	Antenna B2 MPE%	**1.66 %**	Antenna C2 MPE%	**1.66 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.94 %**
T-Mobile	4.28 %
Verizon Wireless	3.10 %
MetroPCS	0.48 %
Town	0.02 %
Site Total MPE %:	**11.82 %**

SPRINT Sector A Total:	3.94 %
SPRINT Sector B Total:	3.94 %
SPRINT Sector C Total:	3.94 %
Site Total:	11.82 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	122	1.17	850 MHz	567	0.21%
Sprint 850 MHz LTE	2	437.55	122	2.34	850 MHz	567	0.41%
Sprint 1900 MHz (PCS) CDMA	5	622.47	122	8.32	1900 MHz (PCS)	1000	0.83%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	122	8.32	1900 MHz (PCS)	1000	0.83%
Sprint 2500 MHz (BRS) LTE	8	778.09	122	16.63	2500 MHz (BRS)	1000	1.66%
						Total:	**3.94%**

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:	3.94 %
Sector B:	3.94 %
Sector C:	3.94 %
SPRINT Maximum Total (per sector):	3.94 %
Site Total:	11.82 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.82 %** 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.