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

July 2, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 881533**
Sprint PCS Site ID: CT43XC854
Located at: 75 Roberts Road, Groton, CT 06340

Dear Ms. Bachman:

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

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **75 Roberts Road, Groton, CT 06340**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint's additional antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

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

Sincerely,

Jeff Barbadora
Real Estate Specialist

Enclosures

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

cc: Mr. Mark R. Oefinger, Manager
Town of Groton
45 Fort Hill Road, Groton, CT 06340

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	GROTON TOWER
SITE CASCADE:	CT43XC854
SITE NUMBER:	881533
SITE ADDRESS:	75 ROBERTS ROAD GROTON, CT 06340
SITE TYPE:	MONOPOLE
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

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

LATITUDE (NAD83):
41° 21' 36.8" N
41.360222°

LONGITUDE (NAD83):
-72° 02' 55.1" W
-72.048639°

COUNTY:
NEW LONDON

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
RESIDENTIAL

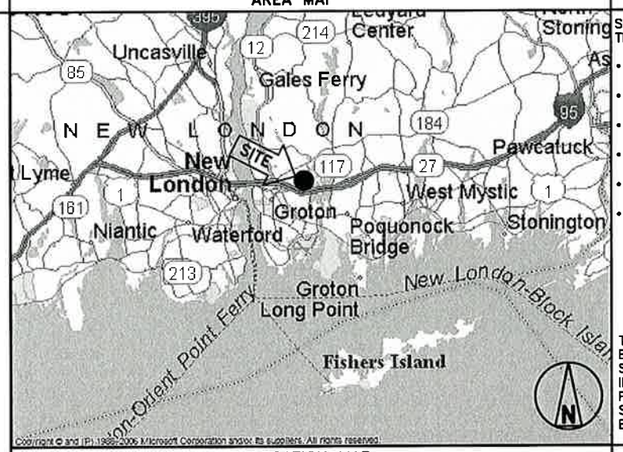
POWER COMPANY:
CL&P
(860) 947-2000

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

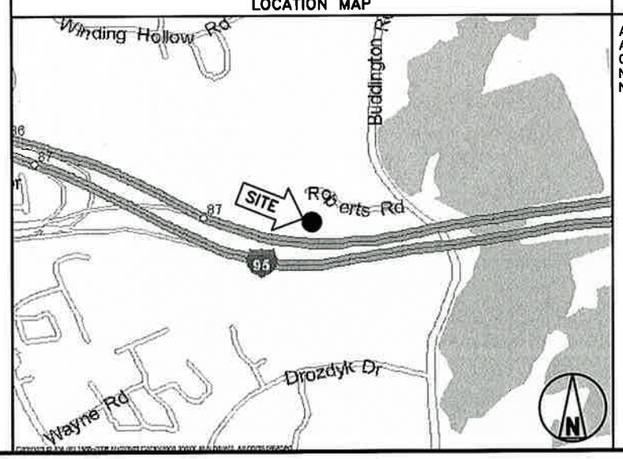
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
PETER.CULBERT@SPRINT.COM

CROWN CM:
JASON D'AMICO
(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

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 CERTIFICATION:
STATE OF CONNECTICUT
JOHN S. STEVENS
No. 21705
LICENSED PROFESSIONAL ENGINEER

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

SITE NAME:
GROTON TOWER

SITE CASCADE:
CT43XC854

SITE ADDRESS:
75 ROBERTS ROAD
GROTON, CT 06340

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:

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

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	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

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	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

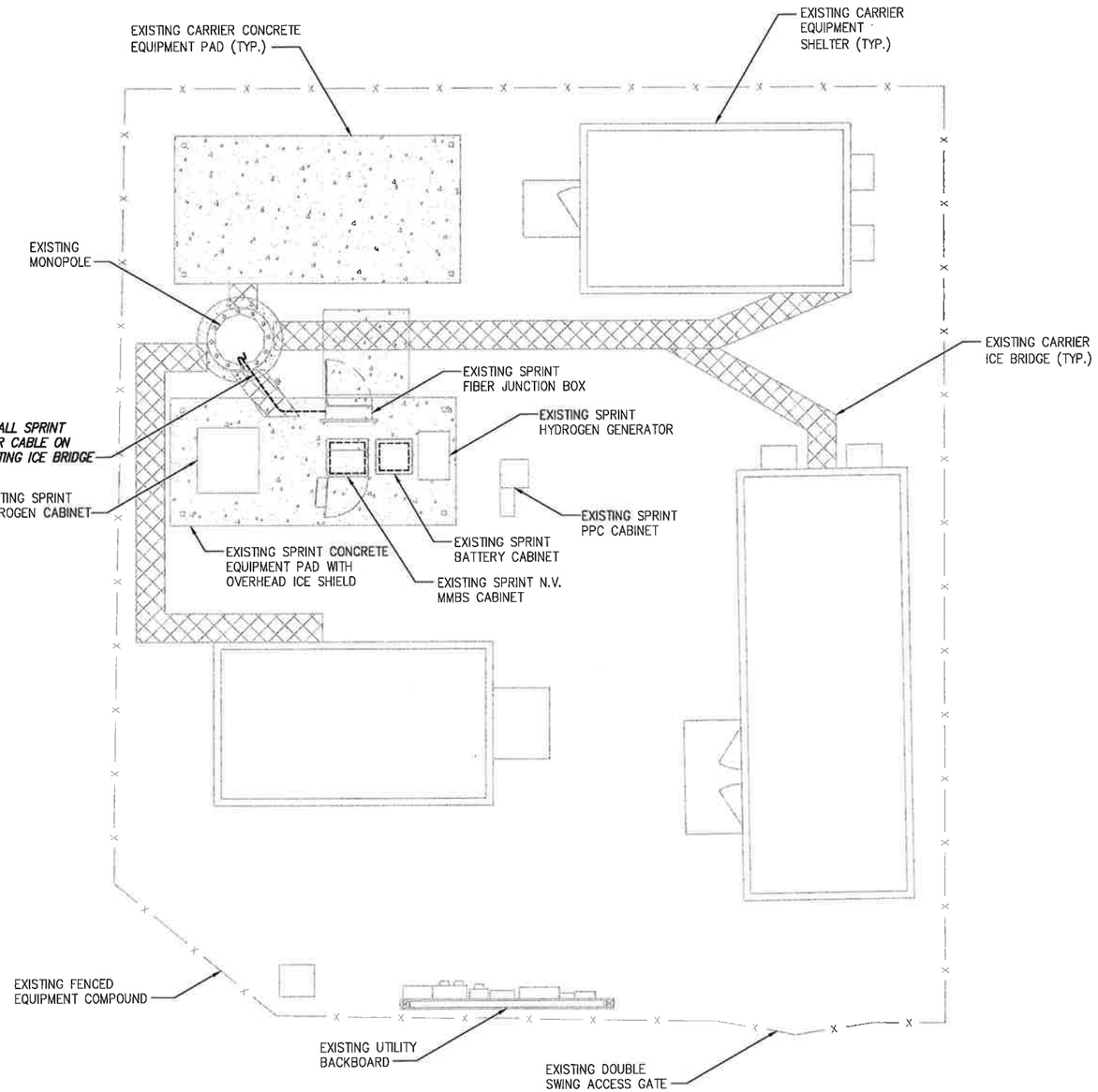
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

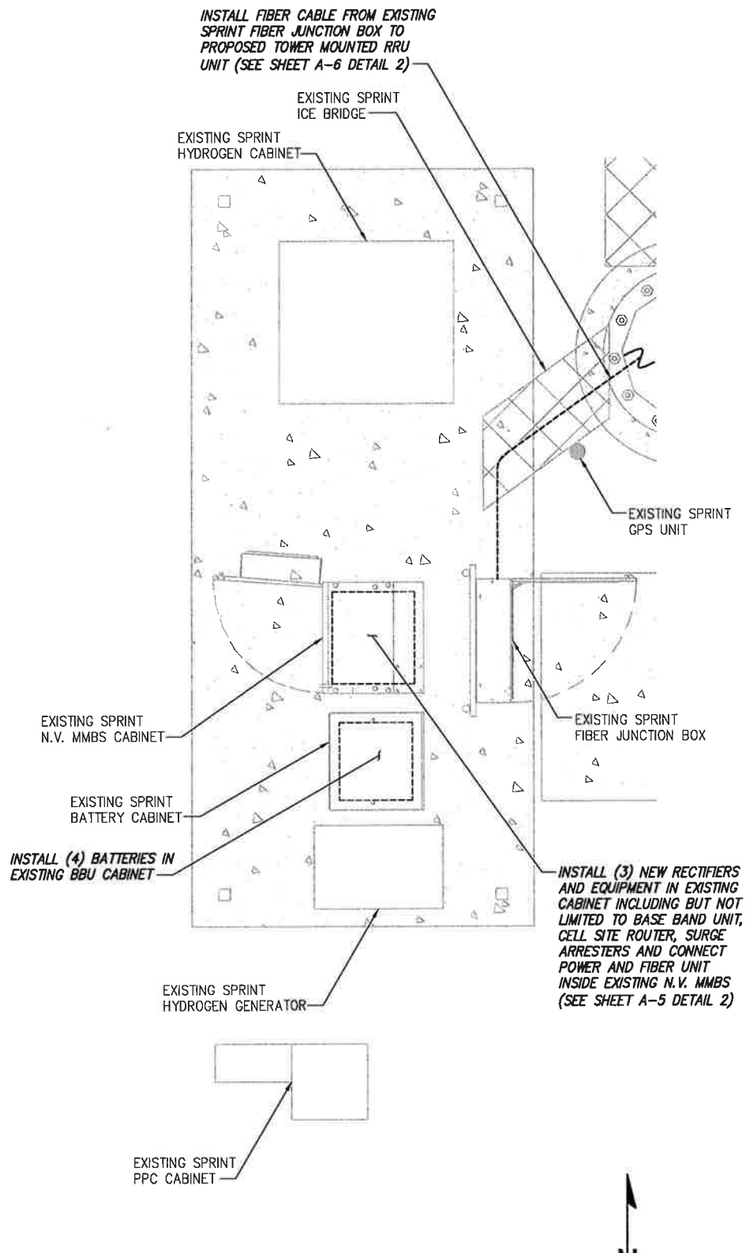
SHEET NUMBER:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

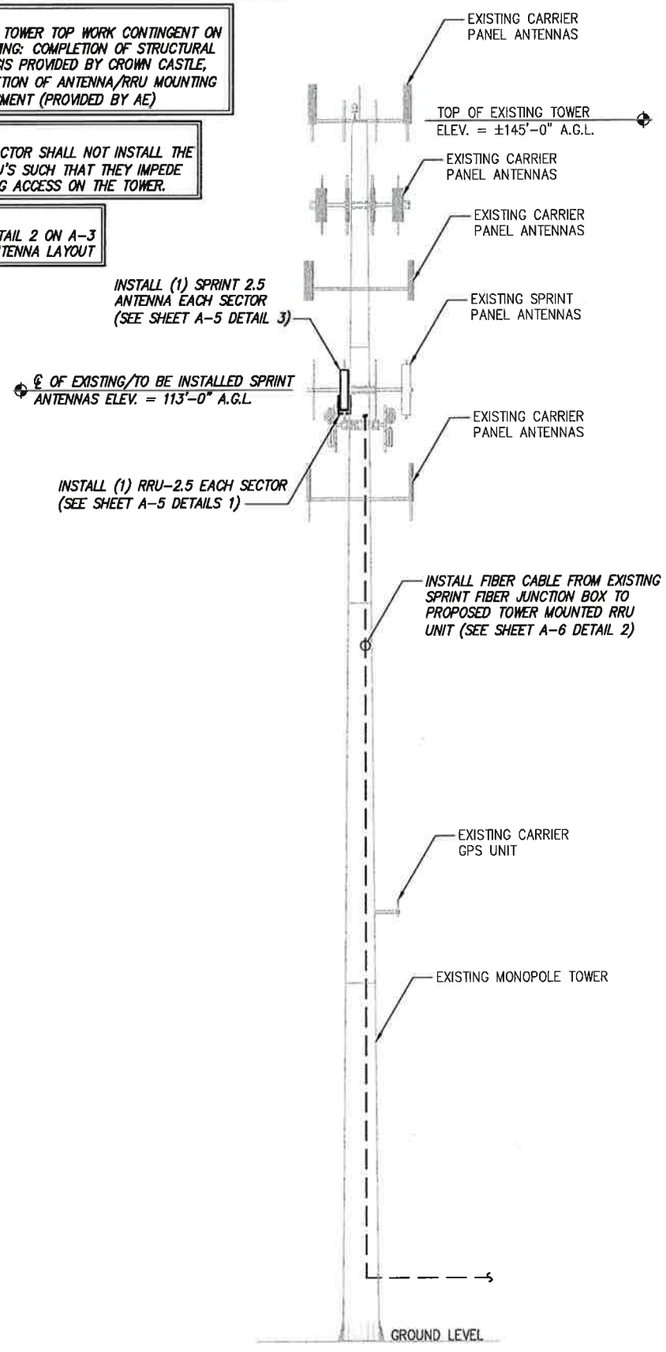
A-1

NOTE:
INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING TOWER OR MOUNT FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.

NOTE:
SPRINT TOWER TOP WORK CONTINGENT ON FOLLOWING: COMPLETION OF STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE, COMPLETION OF ANTENNA/RRU MOUNTING ASSESSMENT (PROVIDED BY AE)

NOTE:
CONTRACTOR SHALL NOT INSTALL THE 2.5 RRU'S SUCH THAT THEY IMPEDE CLIMBING ACCESS ON THE TOWER.

NOTE:
SEE DETAIL 2 ON A-3 FOR ANTENNA LAYOUT



TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 2

DETAIL NOT USED | 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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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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

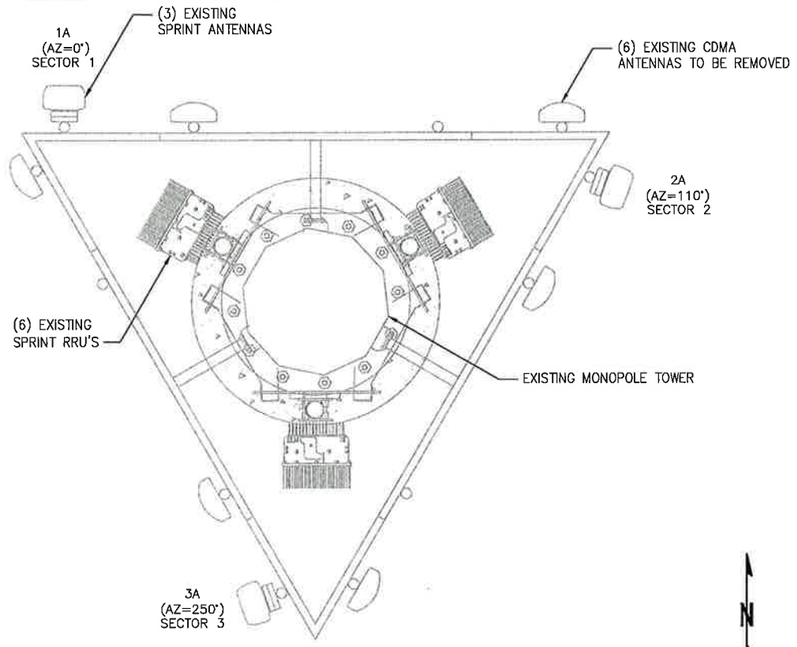
SITE NAME:
GROTON TOWER

SITE CASCADE:
CT43XC854

SITE ADDRESS:
75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:
TOWER ELEVATION & CABLE PLAN

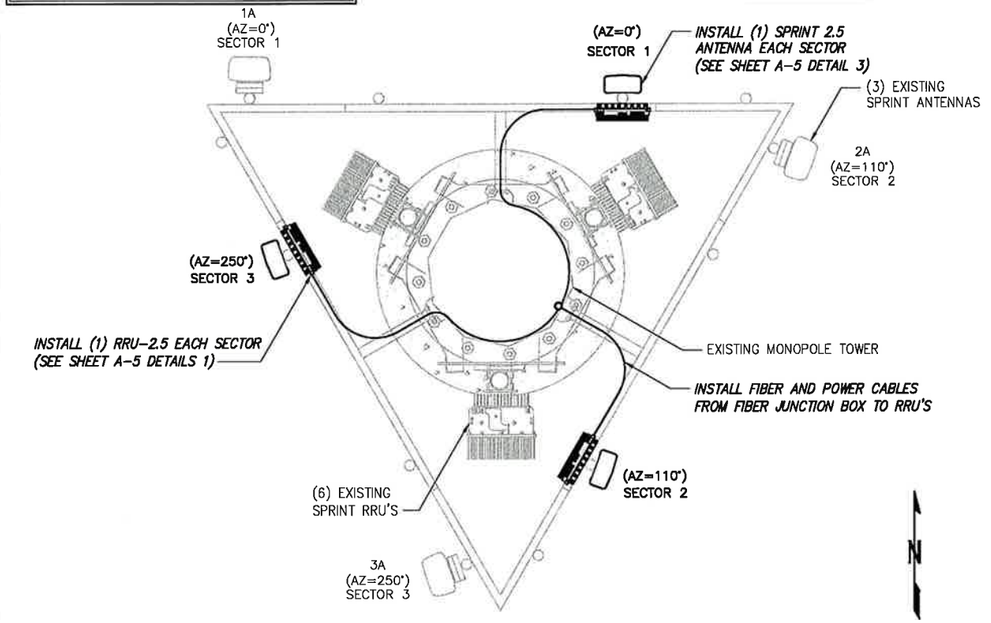
SHEET NUMBER:
A-2



EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1

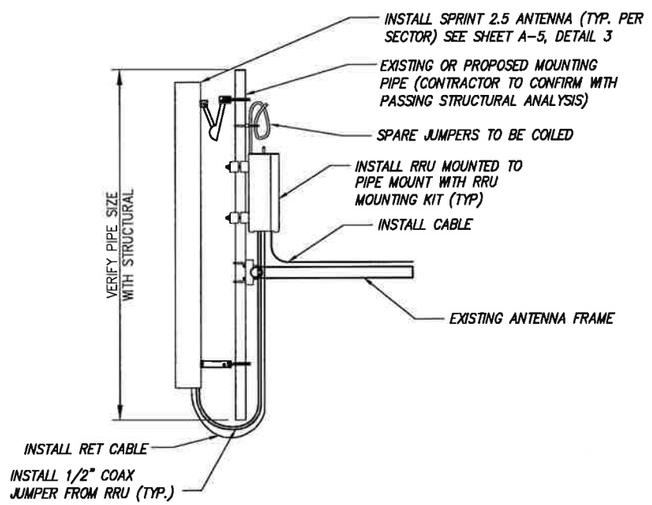
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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



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

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	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

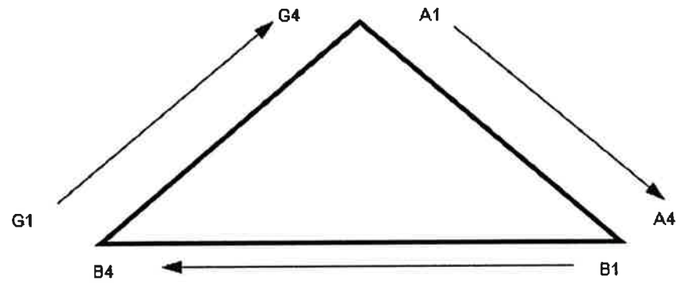
A-3

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	Blue	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	Blue	Blue	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	Blue	Blue	Blue
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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Sprint

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Overland Park, Kansas 66251

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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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REVISIONS:

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ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

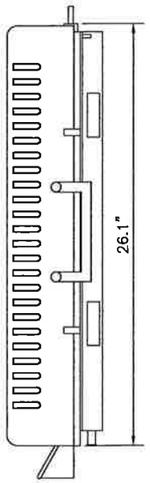
SHEET DESCRIPTION:

COLOR CODING AND NOTES

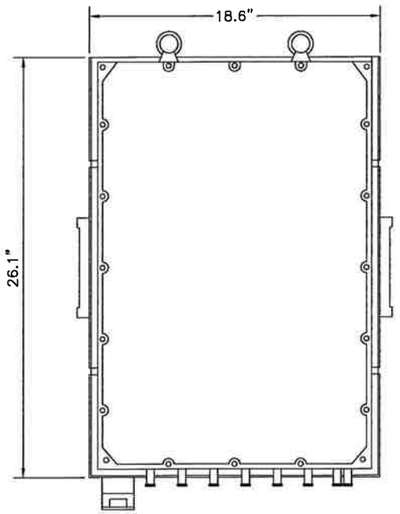
SHEET NUMBER:

A-4

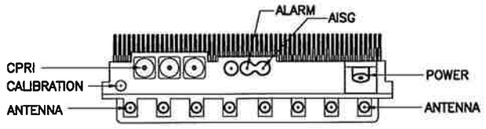
RRU: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

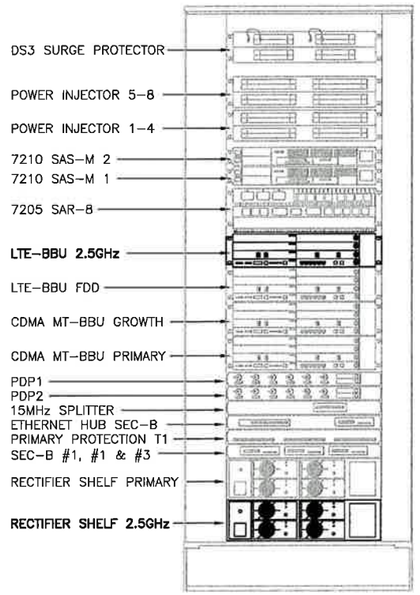


PLAN VIEW

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

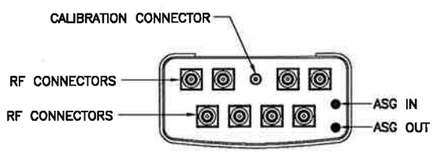


FRONT VIEW

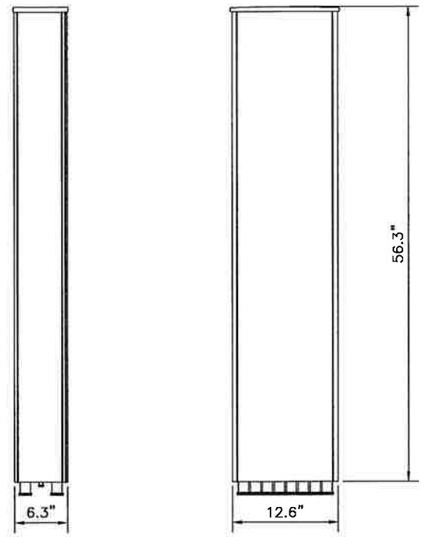
NEW EQUIPMENT IN EXISTING CABINET | NO SCALE | 2

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:

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	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:

EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:

A-5

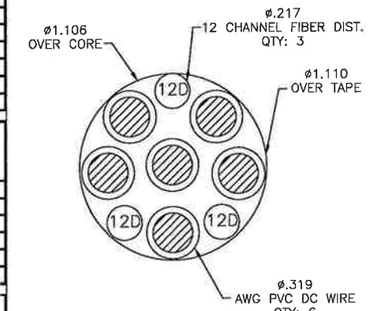
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

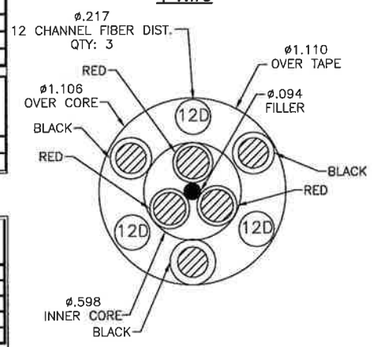
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

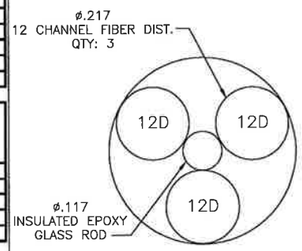
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



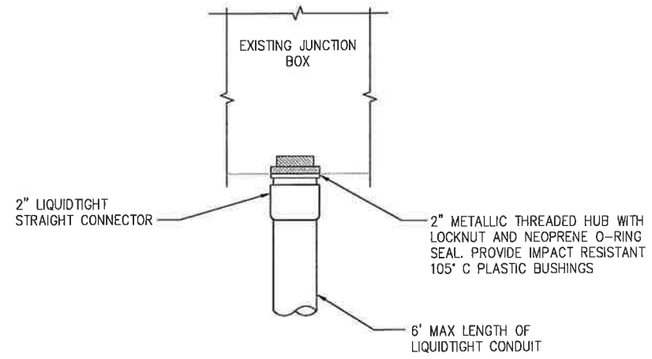
4 AWG



8 & 6 AWG



FIBER ONLY



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2

2.5 CABLE CROSS SECTION DATA | NO SCALE | 1

DETAIL NOT USED | 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:
STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24709
LICENSED PROFESSIONAL ENGINEER

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

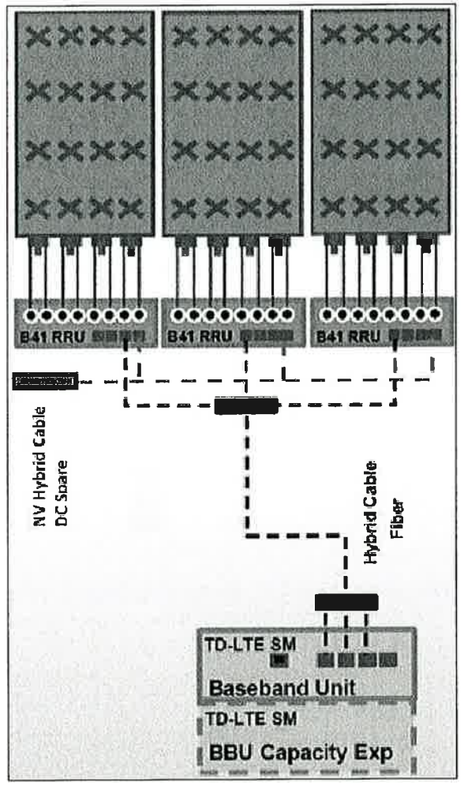
SITE NAME:
GROTON TOWER

SITE CASCADE:
CT43XC854

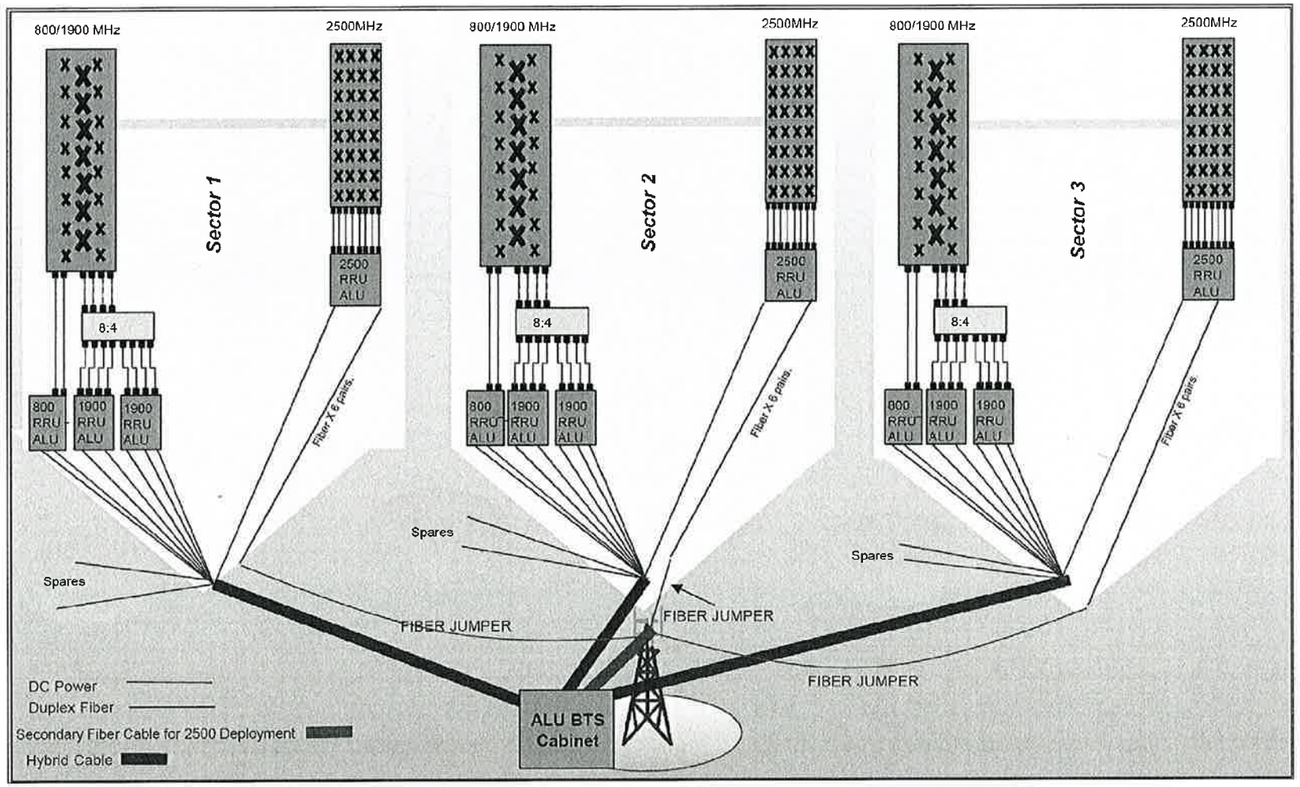
SITE ADDRESS:
75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:
CIVIL DETAILS

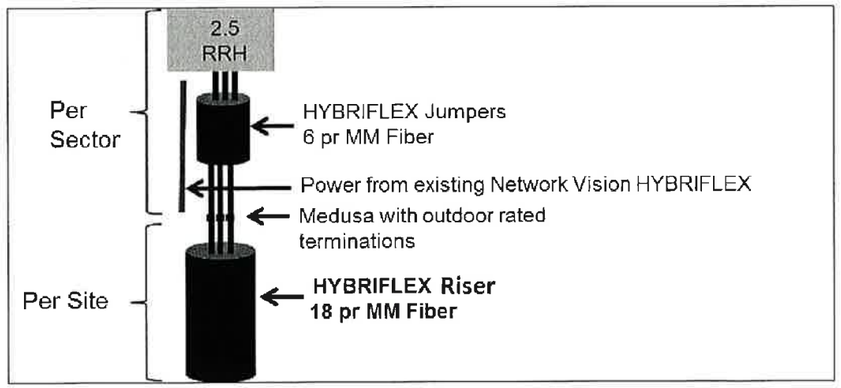
SHEET NUMBER:
A-6



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:

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JOHN S. STEVENS
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LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/29/14	JDV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:

CIVIL DETAILS

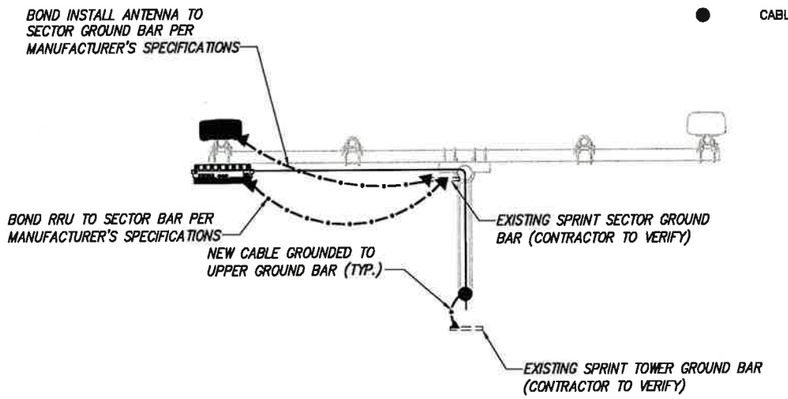
SHEET NUMBER:

A-7

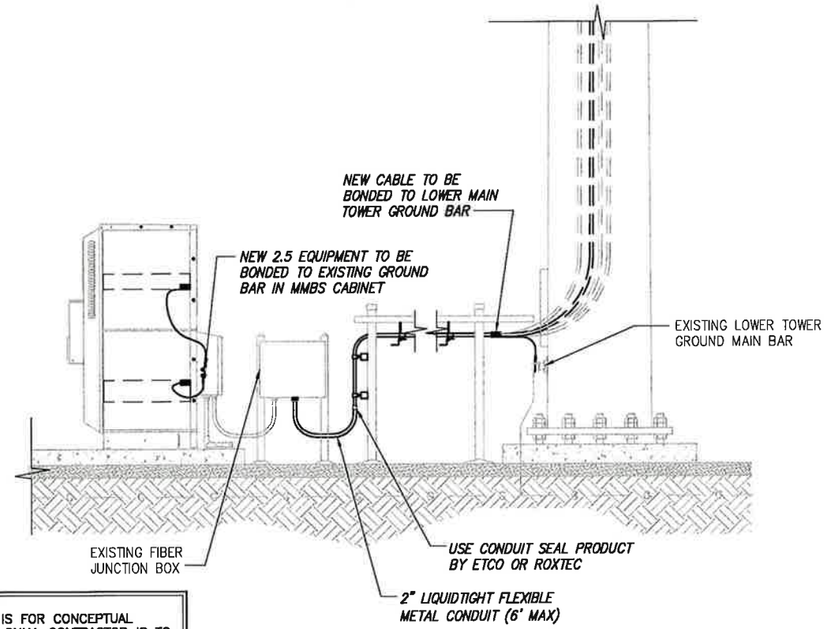
PLAN NOT USED | NO SCALE | 1

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

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SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:

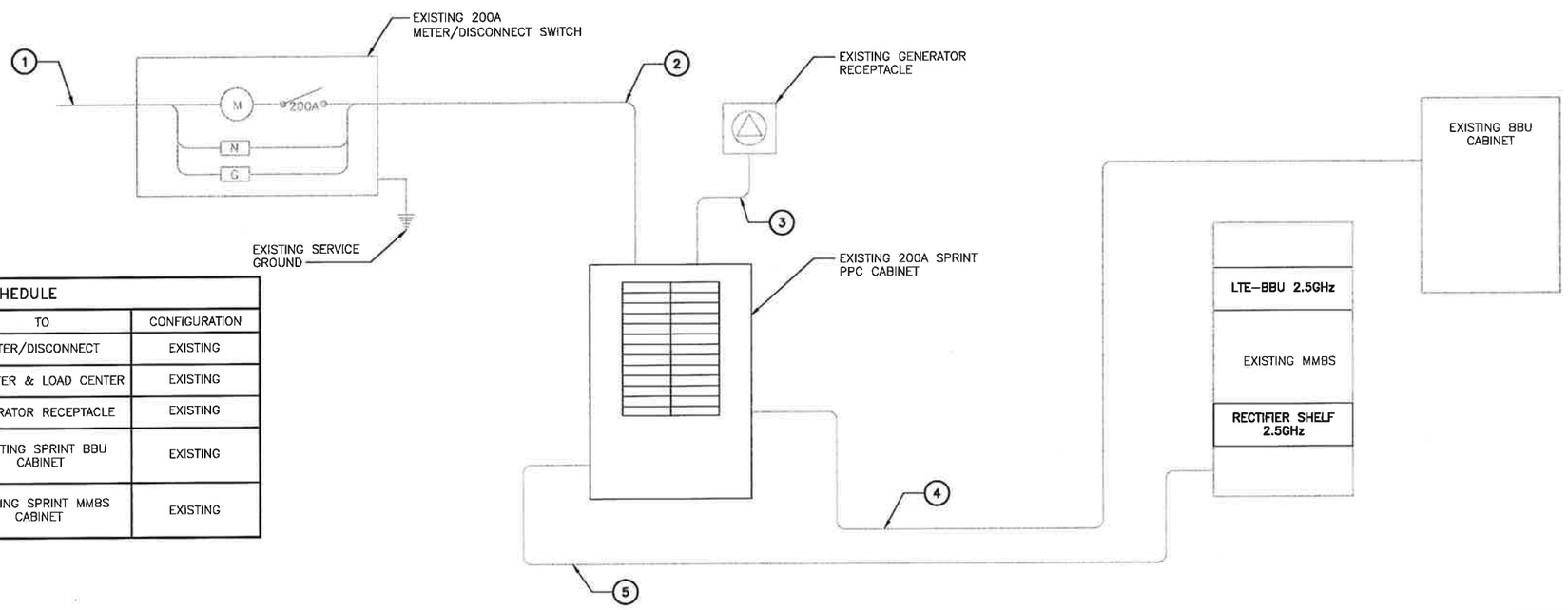
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

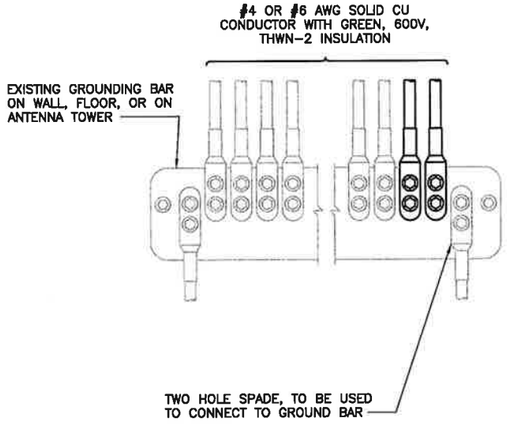
NOTES

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

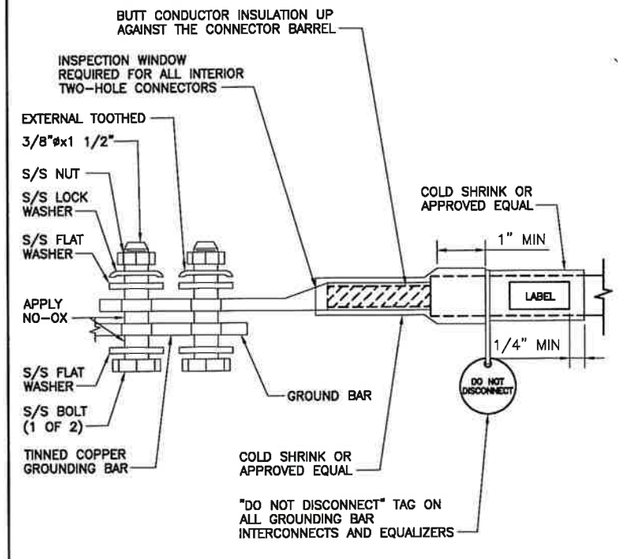
ELECTRICAL ONE–LINE DIAGRAM — NO SCALE — 1



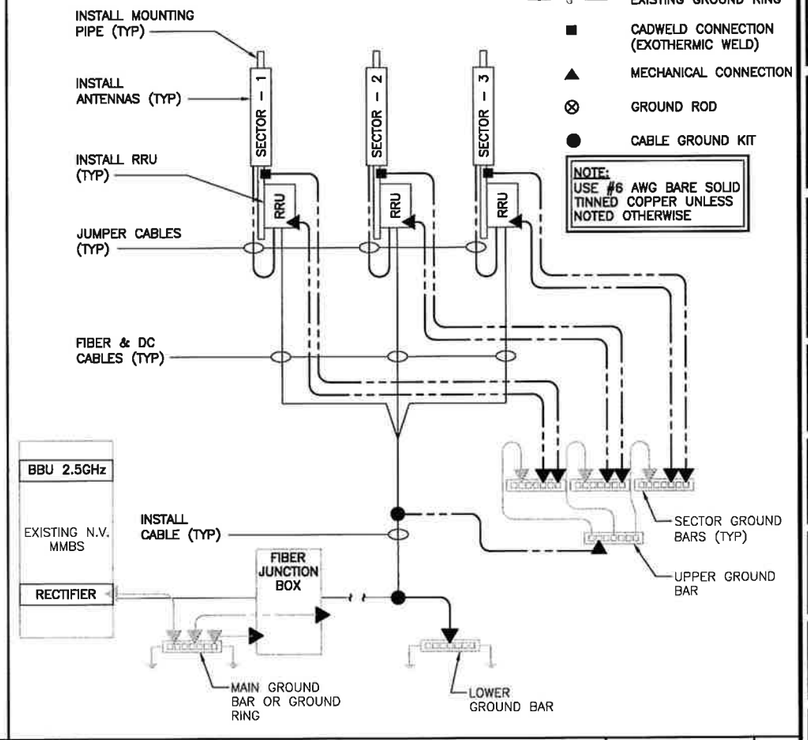
NOTES

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
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	05/29/14	JOV	0

SITE NAME:

GROTON TOWER

SITE CASCADE:

CT43XC854

SITE ADDRESS:

75 ROBERTS ROAD
GROTON, CT 06340

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

Date: **May 21, 2014**

Patrick Byrum
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

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

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	**Scenario 2.5B**
	Carrier Site Number:	CT43XC854
Crown Castle Designation:	**Crown Castle BU Number:**	881533
	Crown Castle Site Name:	GROTON TOWER
	Crown Castle JDE Job Number:	286442
	Crown Castle Work Order Number:	759463
	Crown Castle Application Number:	245708 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	759463
Site Data:	**75 Roberts Road, Groton, New London County, CT** **Latitude *41° 21' 36.8"*, Longitude *-72° 2' 55.1"*** **144.5 Foot - Monopole Tower**	

Dear Patrick Byrum,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 759463, in accordance with application 245708, revision 0.

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

LC4.7: Existing + Reserved + Proposed Equipment w/ Proposed Modifications **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 TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

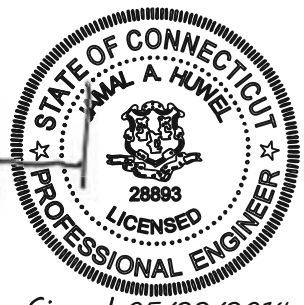
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Structural analysis prepared by: Christopher Hall, E.I.T. / CMS

Respectfully submitted by:

Jamal A. Huwel, P.E.
Manager Engineering



Date Signed:05/22/2014

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 144.5 ft Monopole tower designed by Engineered Endeavors, Inc. in January of 2001. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified per reinforcement drawings prepared by Walker Engineering, in August of 2007. Reinforcement consists of the addition of base plate stiffeners. The tower was later reinforced per reinforcement drawings prepared by Vertical Structures, in November of 2008. Reinforcement consists of weld size increases to the previous base plate stiffener modification.

The proposed modifications drawings, prepared by Crown Castle in February of 2014, consist of shaft reinforcement from 90' to 100', and were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	113.0	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
145.0	146.0	6	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD	12 3	1-5/8 3/8	1
		6	kathrein	782-10250			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP13519			
	145.0	1	andrew	SBNH-1D6565C			
		3	ericsson	RRUS 11			
		1	kmw communications	AM-X-CD-17-65-00T-RET			
		1	powerwave technologies	P65-17-XLH-RR			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 712-1]			
		-	-	-	1	1-5/8	3
135.0	137.0	3	alcatel lucent	RRH2X40-AWS	1	1-5/8	2
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	andrew	HBXX-6517DS-VTM 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
		3	andrew	LNX-6512DS-VTM w/ Mount Pipe			
		6	andrew	CBC721-DF	12	1-5/8	1
		3	antel	BXA-171063/8CF w/ Mount Pipe			
		3	antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
	135.0	1	tower mounts	Platform Mount [LP 712-1]			
125.0	126.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1	1-5/8	2
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	125.0	1	tower mounts	Platform Mount [LP 712-1]	12	1-5/8	1
113.0	113.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
		1	tower mounts	Platform Mount [LP 712-1]			
111.0	111.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
		1	tower mounts	Side Arm Mount [SO 102-3]			
	109.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
100.0	102.0	3	kathrein	800 10504 w/ Mount Pipe	1 6	3/8 7/8	1
	100.0	1	tower mounts	Platform Mount [LP 712-1]			
51.0	52.0	1	lucent	KS24019-L112A	1	1/2	1
	51.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Abandoned Equipment, Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
145	145	12	Allgon	7120.16	-	-
135	135	12	Allgon	7120.16	-	-
125	125	9	Allgon	7120.16	-	-
115	115	12	Allgon	7120.16	-	-
105	105	12	Allgon	7120.16	-	-
95	95	12	Allgon	7120.16	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti	1406209	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	URS	1405796	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI	1405782	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	WEI	2048224	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	VS	2353860	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	CCI	4491288	CCISITES

3.1) Analysis Method

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

tnxTower was used to determine the loads on the modified structure. Additional calculations were performed to determine the stresses in the pole and in the reinforcing elements. These calculations are included in Appendix C.

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
144.5 - 139.5	Pole	TP22.09x21x0.1875	Pole	11.1%	Pass
139.5 - 134.5	Pole	TP23.179x22.09x0.1875	Pole	22.4%	Pass
134.5 - 129.5	Pole	TP24.269x23.179x0.1875	Pole	36.5%	Pass
129.5 - 124.5	Pole	TP25.358x24.269x0.1875	Pole	49.6%	Pass
124.5 - 121.46	Pole	TP26.875x25.358x0.1875	Pole	58.4%	Pass
121.46 - 116.46	Pole	TP26.718x25.646x0.25	Pole	55.4%	Pass

116.46 - 111.46	Pole	TP27.79x26.718x0.25	Pole	65.3%	Pass
111.46 - 106.46	Pole	TP28.863x27.79x0.25	Pole	76.2%	Pass
106.46 - 101.46	Pole	TP29.935x28.863x0.25	Pole	85.8%	Pass
101.46 - 98.5	Pole	TP30.57x29.935x0.25	Pole	91.4%	Pass
98.5 - 93.5	Pole + Reinf.	TP31.642x30.57x0.4	Reinf. 1 Compression	86.9%	Pass
93.5 - 91.84	Pole + Reinf.	TP33x31.642x0.4	Reinf. 1 Compression	89.5%	Pass
91.84 - 86.17	Pole	TP32.72x31.498x0.375	Pole	77.4%	Pass
86.17 - 81.17	Pole	TP33.798x32.72x0.375	Pole	81.7%	Pass
81.17 - 76.17	Pole	TP34.875x33.798x0.375	Pole	85.5%	Pass
76.17 - 71.17	Pole	TP35.952x34.875x0.375	Pole	88.9%	Pass
71.17 - 66.17	Pole	TP37.03x35.952x0.375	Pole	91.8%	Pass
66.17 - 61.17	Pole	TP38.107x37.03x0.375	Pole	94.4%	Pass
61.17 - 56.17	Pole	TP39.185x38.107x0.375	Pole	96.6%	Pass
56.17 - 51.17	Pole	TP40.262x39.185x0.375	Pole	98.6%	Pass
51.17 - 47.92	Pole	TP42.219x40.262x0.375	Pole	99.7%	Pass
47.92 - 41.09	Pole	TP41.679x40.212x0.4375	Pole	91.0%	Pass
41.09 - 36.09	Pole	TP42.752x41.679x0.4375	Pole	92.1%	Pass
36.09 - 31.09	Pole	TP43.826x42.752x0.4375	Pole	93.0%	Pass
31.09 - 26.09	Pole	TP44.899x43.826x0.4375	Pole	93.9%	Pass
26.09 - 21.09	Pole	TP45.972x44.899x0.4375	Pole	94.5%	Pass
21.09 - 16.09	Pole	TP47.046x45.972x0.4375	Pole	95.1%	Pass
16.09 - 11.09	Pole	TP48.119x47.046x0.4375	Pole	95.6%	Pass
11.09 - 6.09	Pole	TP49.193x48.119x0.4375	Pole	96.0%	Pass
6.09 - 1.09	Pole	TP50.266x49.193x0.4375	Pole	96.3%	Pass
1.09 - 0	Pole	TP50.5x50.266x0.4375	Pole	96.4%	Pass
				Summary	
			Pole	99.7%	Pass
			Reinforcement	89.5%	Pass
			Overall	99.7%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	91.3	Pass
1	Base Plate	0	81.0	Pass
1	Base Foundation Soil Interaction	0	47.9	Pass

Structure Rating (max from all components) =	99.7%

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

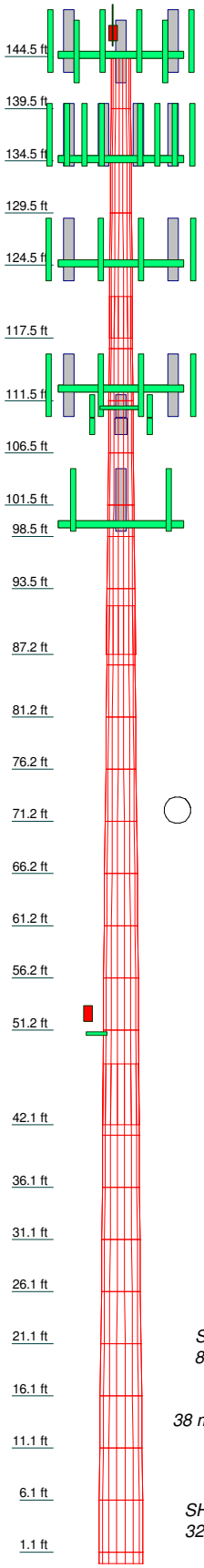
4.1) Recommendations

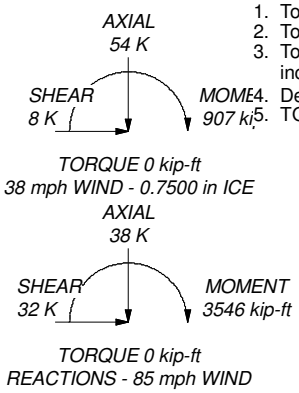
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.1875		21.0000	22.0896		0.2
2	5.00	18	0.1875		22.0896	23.1792		0.2
3	5.00	18	0.1875		23.1792	24.2687		0.2
4	5.00	18	0.1875		24.2687	25.3583		0.2
5	5.06	18	0.1875	3.92	25.3583	26.8750		0.4
6		18	0.2500		26.8750	27.1858		0.4
7	5.00	18	0.2500		27.1858	27.7905		0.4
8	5.00	18	0.2500		27.7905	28.8628		0.4
9	5.00	18	0.2500		28.8628	29.9352		0.4
10	2.96	18	0.2500		29.9352	30.5702		0.2
11	5.00	18	0.4000		30.5702	31.6424		0.6
12	5.00	18	0.4000	4.67	31.6424	33.0000		0.8
13		18	0.3750		33.0000	33.7976		0.7
14	5.00	18	0.3750		33.7976	34.8751		0.7
15	5.00	18	0.3750		34.8751	35.9525		0.7
16	5.00	18	0.3750		35.9525	37.0299		0.7
17	5.00	18	0.3750		37.0299	38.1073		0.7
18	5.00	18	0.3750		38.1073	39.1847		0.8
19	5.00	18	0.3750		39.1847	40.2622		0.8
20	5.00	18	0.3750		40.2622	42.2188		0.8
21	6.33	18	0.3750	5.83	42.2188	42.7522		1.5
22		18	0.4375		42.7522	43.8256		1.3
23	5.00	18	0.4375		43.8256	44.8990		1.0
24	5.00	18	0.4375		44.8990	45.9724		1.0
25	5.00	18	0.4375		45.9724	47.0458		1.0
26	5.00	18	0.4375		47.0458	48.1192		1.1
27	5.00	18	0.4375		48.1192	49.1926		1.1
28	5.00	18	0.4375		49.1926	50.2660		1.1
29	5.00	18	0.4375		50.2660	50.5000		1.1
30	5.00	18	0.4375		50.5000	50.5000		1.2
31	1.09	18	0.4375		50.5000	50.5000		0.3
							A572-65	22.0





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 5'	145	LNX-6512DS-VTM w/ Mount Pipe	135
Flash Beacon Lighting	145	LNX-6512DS-VTM w/ Mount Pipe	135
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	145	DB-T1-6Z-8AB-0Z	135
		Platform Mount [LP 712-1]	135
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	145	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	125
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	145	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	125
RRUS 11	145	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	125
RRUS 11	145	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	125
RRUS 11	145	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	125
(2) 782-10250	145	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	125
(2) 782-10250	145	KRY 112 144/1	125
(2) 782-10250	145	KRY 112 144/1	125
(2) 7770.00 w/ Mount Pipe	145	KRY 112 144/1	125
(2) 7770.00 w/ Mount Pipe	145	Platform Mount [LP 712-1]	125
(2) 7770.00 w/ Mount Pipe	145	APXVSPP18-C-A20 w/ Mount Pipe	113
(2) LGP13519	145	APXVSPP18-C-A20 w/ Mount Pipe	113
(2) LGP13519	145	APXVSPP18-C-A20 w/ Mount Pipe	113
(2) LGP13519	145	TD-RRH8x20-25	113
P65-17-XLH-RR	145	TD-RRH8x20-25	113
AM-X-CD-17-65-00T-RET	145	TD-RRH8x20-25	113
SBNH-1D6565C	145	APXVTM14-C-120 w/ Mount Pipe	113
DC6-48-60-18-8F	145	APXVTM14-C-120 w/ Mount Pipe	113
Platform Mount [LP 712-1]	145	APXVTM14-C-120 w/ Mount Pipe	113
8'x2" Antenna Mount Pipe	145	(2) 6' x 2" Mount Pipe	113
8'x2" Antenna Mount Pipe	145	(2) 6' x 2" Mount Pipe	113
8'x2" Antenna Mount Pipe	145	(2) 6' x 2" Mount Pipe	113
(2) CBC721-DF	135	Platform Mount [LP 712-1]	113
(2) CBC721-DF	135	800MHz 2X50W RRH W/FILTER	111
(2) CBC721-DF	135	800MHz 2X50W RRH W/FILTER	111
BXA-171063/8CF w/ Mount Pipe	135	800MHz 2X50W RRH W/FILTER	111
BXA-171063/8CF w/ Mount Pipe	135	PCS 1900MHz 4x45W-65MHz	111
BXA-171063/8CF w/ Mount Pipe	135	PCS 1900MHz 4x45W-65MHz	111
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	135	PCS 1900MHz 4x45W-65MHz	111
		Side Arm Mount [SO 102-3]	111
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	135	800 10504 w/ Mount Pipe	100
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	135	800 10504 w/ Mount Pipe	100
		800 10504 w/ Mount Pipe	100
(2) FD9R6004/2C-3L	135	Platform Mount [LP 712-1]	100
(2) FD9R6004/2C-3L	135	6' x 2" Mount Pipe	100
(2) FD9R6004/2C-3L	135	6' x 2" Mount Pipe	100
RRH2X40-AWS	135	6' x 2" Mount Pipe	100
RRH2X40-AWS	135	KS24019-L112A	51
RRH2X40-AWS	135	Side Arm Mount [SO 701-1]	51
HBXX-6517DS-VTM w/ Mount Pipe	135		
HBXX-6517DS-VTM w/ Mount Pipe	135		
HBXX-6517DS-VTM w/ Mount Pipe	135		
LNX-6512DS-VTM w/ Mount Pipe	135		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.7%

CROWN CASTLE
We Are Solutions
Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-2254

Job: BU# 881533		
Project:		
Client: Crown Castle	Drawn by: chall	App'd:
Code: TIA/EIA-222-F	Date: 05/19/14	Scale: NTS
Path: X:\ENG Work Area\CHall\Production\Active\881533\shield\881533 mod.eri		Dwg No. E-1

Tower Input Data

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

4) Tower is located in New London County, Connecticut.
5) Basic wind speed of 85 mph.
6) Nominal ice thickness of 0.7500 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56.00 pcf.
9) A wind speed of 38 mph is used in combination with ice.
10) Temperature drop of 50 °F.
11) Deflections calculated using a wind speed of 50 mph.
12) TOWER RATING: 99.7%.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.333.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	144.50-139.50	5.00	0.00	18	21.0000	22.0896	0.1875	0.7500	A572-65 (65 ksi)
L2	139.50-134.50	5.00	0.00	18	22.0896	23.1792	0.1875	0.7500	A572-65 (65 ksi)
L3	134.50-129.50	5.00	0.00	18	23.1792	24.2687	0.1875	0.7500	A572-65 (65 ksi)
L4	129.50-124.50	5.00	0.00	18	24.2687	25.3583	0.1875	0.7500	A572-65 (65 ksi)
L5	124.50-117.54	6.96	3.92	18	25.3583	26.8750	0.1875	0.7500	A572-65 (65 ksi)
L6	117.54-116.46	5.00	0.00	18	25.6458	26.7181	0.2500	1.0000	A572-65 (65 ksi)
L7	116.46-111.46	5.00	0.00	18	26.7181	27.7905	0.2500	1.0000	A572-65 (65 ksi)
L8	111.46-106.46	5.00	0.00	18	27.7905	28.8628	0.2500	1.0000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L9	106.46-101.46	5.00	0.00	18	28.8628	29.9352	0.2500	1.0000	A572-65 (65 ksi)
L10	101.46-98.50	2.96	0.00	18	29.9352	30.5700	0.2500	1.0000	A572-65 (65 ksi)
L11	98.50-93.50	5.00	0.00	18	30.5700	31.6424	0.4000	1.6000	A572-65 (65 ksi)
L12	93.50-87.17	6.33	4.67	18	31.6424	33.0000	0.4000	1.6000	A572-65 (65 ksi)
L13	87.17-86.17	5.67	0.00	18	31.4984	32.7202	0.3750	1.5000	A572-65 (65 ksi)
L14	86.17-81.17	5.00	0.00	18	32.7202	33.7976	0.3750	1.5000	A572-65 (65 ksi)
L15	81.17-76.17	5.00	0.00	18	33.7976	34.8751	0.3750	1.5000	A572-65 (65 ksi)
L16	76.17-71.17	5.00	0.00	18	34.8751	35.9525	0.3750	1.5000	A572-65 (65 ksi)
L17	71.17-66.17	5.00	0.00	18	35.9525	37.0299	0.3750	1.5000	A572-65 (65 ksi)
L18	66.17-61.17	5.00	0.00	18	37.0299	38.1073	0.3750	1.5000	A572-65 (65 ksi)
L19	61.17-56.17	5.00	0.00	18	38.1073	39.1847	0.3750	1.5000	A572-65 (65 ksi)
L20	56.17-51.17	5.00	0.00	18	39.1847	40.2622	0.3750	1.5000	A572-65 (65 ksi)
L21	51.17-42.09	9.08	5.83	18	40.2622	42.2188	0.3750	1.5000	A572-65 (65 ksi)
L22	42.09-41.09	6.83	0.00	18	40.2125	41.6788	0.4375	1.7500	A572-65 (65 ksi)
L23	41.09-36.09	5.00	0.00	18	41.6788	42.7522	0.4375	1.7500	A572-65 (65 ksi)
L24	36.09-31.09	5.00	0.00	18	42.7522	43.8256	0.4375	1.7500	A572-65 (65 ksi)
L25	31.09-26.09	5.00	0.00	18	43.8256	44.8990	0.4375	1.7500	A572-65 (65 ksi)
L26	26.09-21.09	5.00	0.00	18	44.8990	45.9724	0.4375	1.7500	A572-65 (65 ksi)
L27	21.09-16.09	5.00	0.00	18	45.9724	47.0458	0.4375	1.7500	A572-65 (65 ksi)
L28	16.09-11.09	5.00	0.00	18	47.0458	48.1192	0.4375	1.7500	A572-65 (65 ksi)
L29	11.09-6.09	5.00	0.00	18	48.1192	49.1926	0.4375	1.7500	A572-65 (65 ksi)
L30	6.09-1.09	5.00	0.00	18	49.1926	50.2660	0.4375	1.7500	A572-65 (65 ksi)
L31	1.09-0.00	1.09		18	50.2660	50.5000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	21.3240	12.3860	677.8263	7.3884	10.6680	63.5383	1356.5444	6.1942	3.3660	17.952
	22.4303	13.0345	789.9536	7.7752	11.2215	70.3964	1580.9466	6.5185	3.5578	18.975
L2	22.4303	13.0345	789.9536	7.7752	11.2215	70.3964	1580.9466	6.5185	3.5578	18.975
	23.5367	13.6829	913.8108	8.1620	11.7750	77.6059	1828.8241	6.8428	3.7495	19.997
L3	23.5367	13.6829	913.8108	8.1620	11.7750	77.6059	1828.8241	6.8428	3.7495	19.997
	24.6431	14.3313	1049.9817	8.5488	12.3285	85.1669	2101.3449	7.1670	3.9413	21.02
L4	24.6431	14.3313	1049.9817	8.5488	12.3285	85.1669	2101.3449	7.1670	3.9413	21.02
	25.7495	14.9798	1199.0496	8.9356	12.8820	93.0793	2399.6769	7.4913	4.1331	22.043
L5	25.7495	14.9798	1199.0496	8.9356	12.8820	93.0793	2399.6769	7.4913	4.1331	22.043
	27.2896	15.8824	1429.1221	9.4741	13.6525	104.6784	2860.1246	7.9427	4.4000	23.467
L6	26.8951	20.1515	1641.9828	9.0155	13.0281	126.0344	3286.1262	10.0777	4.0737	16.295
	27.1303	21.0025	1858.8918	9.3962	13.5728	136.9570	3720.2296	10.5032	4.2624	17.05
L7	27.1303	21.0025	1858.8918	9.3962	13.5728	136.9570	3720.2296	10.5032	4.2624	17.05
	28.2192	21.8534	2094.1087	9.7769	14.1176	148.3335	4190.9728	10.9288	4.4511	17.805

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L8	28.2192	21.8534	2094.1087	9.7769	14.1176	148.3335	4190.9728	10.9288	4.4511	17.805
	29.3081	22.7043	2348.3752	10.1576	14.6623	160.1639	4699.8404	11.3543	4.6399	18.559
L9	29.3081	22.7043	2348.3752	10.1576	14.6623	160.1639	4699.8404	11.3543	4.6399	18.559
	30.3970	23.5552	2622.4330	10.5382	15.2071	172.4481	5248.3167	11.7798	4.8286	19.314
L10	30.3970	23.5552	2622.4330	10.5382	15.2071	172.4481	5248.3167	11.7798	4.8286	19.314
	31.0416	24.0589	2794.3036	10.7636	15.5296	179.9343	5592.2840	12.0318	4.9403	19.761
L11	31.0416	38.3039	4404.8581	10.7104	15.5296	283.6431	8815.5122	19.1556	4.6763	11.691
	32.1305	39.6653	4891.4468	11.0911	16.0743	304.3016	9789.3298	19.8364	4.8651	12.163
L12	32.1305	39.6653	4891.4468	11.0911	16.0743	304.3016	9789.3298	19.8364	4.8651	12.163
	33.5091	41.3890	5557.2146	11.5730	16.7640	331.4969	11121.7414	20.6984	5.1040	12.76
L13	33.0062	37.0446	4533.5405	11.0488	16.0012	283.3251	9073.0463	18.5258	4.8837	13.023
	33.2250	38.4989	5088.6862	11.4826	16.6219	306.1441	10184.0682	19.2531	5.0988	13.597
L14	33.2250	38.4989	5088.6862	11.4826	16.6219	306.1441	10184.0682	19.2531	5.0988	13.597
	34.3190	39.7813	5614.3259	11.8650	17.1692	326.9999	11236.0392	19.8944	5.2884	14.102
L15	34.3190	39.7813	5614.3259	11.8650	17.1692	326.9999	11236.0392	19.8944	5.2884	14.102
	35.4131	41.0637	6174.9712	12.2475	17.7165	348.5430	12358.0676	20.5357	5.4780	14.608
L16	35.4131	41.0637	6174.9712	12.2475	17.7165	348.5430	12358.0676	20.5357	5.4780	14.608
	36.5071	42.3461	6771.7506	12.6300	18.2639	370.7733	13552.4116	21.1771	5.6676	15.114
L17	36.5071	42.3461	6771.7506	12.6300	18.2639	370.7733	13552.4116	21.1771	5.6676	15.114
	37.6011	43.6285	7405.7925	13.0125	18.8112	393.6909	14821.3297	21.8184	5.8573	15.619
L18	37.6011	43.6285	7405.7925	13.0125	18.8112	393.6909	14821.3297	21.8184	5.8573	15.619
	38.6952	44.9109	8078.2254	13.3950	19.3585	417.2957	16167.0802	22.4597	6.0469	16.125
L19	38.6952	44.9109	8078.2254	13.3950	19.3585	417.2957	16167.0802	22.4597	6.0469	16.125
	39.7892	46.1933	8790.1777	13.7775	19.9058	441.5878	17591.9217	23.1010	6.2365	16.631
L20	39.7892	46.1933	8790.1777	13.7775	19.9058	441.5878	17591.9217	23.1010	6.2365	16.631
	40.8833	47.4757	9542.7779	14.1599	20.4532	466.5671	19098.1123	23.7424	6.4261	17.136
L21	40.8833	47.4757	9542.7779	14.1599	20.4532	466.5671	19098.1123	23.7424	6.4261	17.136
	42.8700	49.8045	11017.1037	14.8545	21.4471	513.6867	22048.7039	24.9070	6.7705	18.055
L22	42.1037	55.2325	11039.5729	14.1201	20.4279	540.4154	22093.6720	27.6215	6.3074	14.417
	42.3217	57.2686	12306.0281	14.6406	21.1728	581.2186	24628.2488	28.6398	6.5655	15.007
L23	42.3217	57.2686	12306.0281	14.6406	21.1728	581.2186	24628.2488	28.6398	6.5655	15.007
	43.4117	58.7592	13292.1392	15.0217	21.7181	612.0306	26601.7686	29.3852	6.7544	15.439
L24	43.4117	58.7592	13292.1392	15.0217	21.7181	612.0306	26601.7686	29.3852	6.7544	15.439
	44.5016	60.2497	14329.5711	15.4028	22.2634	643.6385	28677.9974	30.1306	6.9433	15.87
L25	44.5016	60.2497	14329.5711	15.4028	22.2634	643.6385	28677.9974	30.1306	6.9433	15.87
	45.5916	61.7403	15419.6255	15.7838	22.8087	676.0421	30859.5405	30.8760	7.1322	16.302
L26	45.5916	61.7403	15419.6255	15.7838	22.8087	676.0421	30859.5405	30.8760	7.1322	16.302
	46.6816	63.2309	16563.6043	16.1649	23.3540	709.2416	33149.0034	31.6214	7.3211	16.734
L27	46.6816	63.2309	16563.6043	16.1649	23.3540	709.2416	33149.0034	31.6214	7.3211	16.734
	47.7715	64.7214	17762.8093	16.5459	23.8993	743.2369	35548.9915	32.3669	7.5101	17.166

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L28	47.7715	64.7214	17762.8093	16.5459	23.8993	743.2369	35548.9915	32.3669	7.5101	17.166
	48.8615	66.2120	19018.5426	16.9270	24.4445	778.0280	38062.1102	33.1123	7.6990	17.598
L29	48.8615	66.2120	19018.5426	16.9270	24.4445	778.0280	38062.1102	33.1123	7.6990	17.598
	49.9515	67.7025	20332.1058	17.3081	24.9898	813.6150	40690.9651	33.8577	7.8879	18.029
L30	49.9515	67.7025	20332.1058	17.3081	24.9898	813.6150	40690.9651	33.8577	7.8879	18.029
	51.0414	69.1931	21704.8009	17.6891	25.5351	849.9978	43438.1615	34.6031	8.0768	18.461
L31	51.0414	69.1931	21704.8009	17.6891	25.5351	849.9978	43438.1615	34.6031	8.0768	18.461
	51.2790	69.5180	22012.0267	17.7722	25.6540	858.0349	44053.0173	34.7656	8.1180	18.555

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
L1 144.50-139.50				1	1	1		
L2 139.50-134.50				1	1	1		
L3 134.50-129.50				1	1	1		
L4 129.50-124.50				1	1	1		
L5 124.50-117.54				1	1	1		
L6 117.54-116.46				1	1	1		
L7 116.46-111.46				1	1	1		
L8 111.46-106.46				1	1	1		
L9 106.46-101.46				1	1	1		
L10 101.46-98.50				1	1	1		
L11 98.50-93.50				1	1	0.96836		
L12 93.50-87.17				1	1	0.964492		
L13 87.17-86.17				1	1	1		
L14 86.17-81.17				1	1	1		
L15 81.17-76.17				1	1	1		
L16 76.17-71.17				1	1	1		
L17 71.17-66.17				1	1	1		
L18 66.17-61.17				1	1	1		
L19 61.17-56.17				1	1	1		
L20 56.17-51.17				1	1	1		
L21 51.17-42.09				1	1	1		
L22 42.09-41.09				1	1	1		
L23 41.09-36.09				1	1	1		
L24 36.09-				1	1	1		

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
31.09								
L25 31.09-26.09				1	1	1		
L26 26.09-21.09				1	1	1		
L27 21.09-16.09				1	1	1		
L28 16.09-11.09				1	1	1		
L29 11.09-6.09				1	1	1		
L30 6.09-1.09				1	1	1		
L31 1.09-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
**										
Climbing Ladder (Flat)	B	No	CaAa (Out Of Face)	144.50 - 140.00	36.0000	0	1	No Ice	0.58	4.81
								1/2" Ice	1.03	7.12
								1" Ice	1.48	10.35
								2" Ice	2.37	19.55
								4" Ice	4.15	48.96
Climbing Ladder (Flat)	B	No	CaAa (Out Of Face)	135.00 - 130.00	36.0000	0	1	No Ice	0.58	4.81
								1/2" Ice	1.03	7.12
								1" Ice	1.48	10.35
								2" Ice	2.37	19.55
								4" Ice	4.15	48.96
Climbing Ladder (Flat)	B	No	CaAa (Out Of Face)	125.00 - 120.00	36.0000	0	1	No Ice	0.58	4.81
								1/2" Ice	1.03	7.12
								1" Ice	1.48	10.35
								2" Ice	2.37	19.55
								4" Ice	4.15	48.96
Climbing Ladder (Flat)	B	No	CaAa (Out Of Face)	113.00 - 108.00	36.0000	0	1	No Ice	0.58	4.81
								1/2" Ice	1.03	7.12
								1" Ice	1.48	10.35
								2" Ice	2.37	19.55
								4" Ice	4.15	48.96
Climbing Ladder (Flat)	B	No	CaAa (Out Of Face)	100.00 - 95.00	36.0000	0	1	No Ice	0.58	4.81
								1/2" Ice	1.03	7.12
								1" Ice	1.48	10.35
								2" Ice	2.37	19.55
								4" Ice	4.15	48.96
**										
LDF7-50A(1-5/8")	C	No	Inside Pole	144.50 - 10.00	0.0000	0	1	No Ice	0.00	0.82
								1/2" Ice	0.00	0.82
								1" Ice	0.00	0.82
								2" Ice	0.00	0.82
								4" Ice	0.00	0.82
CR 50 1873(1-5/8")	C	No	Inside Pole	144.50 - 10.00	0.0000	0	12	No Ice	0.00	0.83
								1/2" Ice	0.00	0.83

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
								1" Ice	0.00	0.83
								2" Ice	0.00	0.83
								4" Ice	0.00	0.83
FB-L98B-002-75000(3/8")	C	No	Inside Pole	144.50 - 10.00	0.0000	0	3	No Ice	0.00	0.06
								1/2" Ice	0.00	0.06
								1" Ice	0.00	0.06
								2" Ice	0.00	0.06
								4" Ice	0.00	0.06
2" Rigid Conduit	C	No	Inside Pole	144.50 - 10.00	0.0000	0	1	No Ice	0.00	2.80
								1/2" Ice	0.00	2.80
								1" Ice	0.00	2.80
								2" Ice	0.00	2.80
								4" Ice	0.00	2.80
*										
LDF7-50A(1-5/8")	A	No	Inside Pole	135.00 - 0.00	0.0000	0	12	No Ice	0.00	0.82
								1/2" Ice	0.00	0.82
								1" Ice	0.00	0.82
								2" Ice	0.00	0.82
								4" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	A	No	CaAa (Out Of Face)	135.00 - 0.00	0.0000	0	1	No Ice	0.20	1.30
								1/2" Ice	0.30	2.81
								1" Ice	0.40	4.94
								2" Ice	0.60	11.02
								4" Ice	1.00	30.52
*										
LDF7-50A(1-5/8")	B	No	Inside Pole	125.00 - 10.00	0.0000	0	10	No Ice	0.00	0.82
								1/2" Ice	0.00	0.82
								1" Ice	0.00	0.82
								2" Ice	0.00	0.82
								4" Ice	0.00	0.82
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	B	No	Inside Pole	125.00 - 10.00	0.0000	0	1	No Ice	0.00	1.07
								1/2" Ice	0.00	1.07
								1" Ice	0.00	1.07
								2" Ice	0.00	1.07
								4" Ice	0.00	1.07
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	125.00 - 10.00	0.0000	0	1	No Ice	0.20	0.82
								1/2" Ice	0.30	2.33
								1" Ice	0.40	4.46
								2" Ice	0.60	10.54
								4" Ice	1.00	30.04
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	125.00 - 10.00	0.0000	0	1	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
								2" Ice	0.00	10.54
								4" Ice	0.00	30.04
*										
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	113.00 - 0.00	0.0000	0	3	No Ice	0.00	1.08
								1/2" Ice	0.00	1.08
								1" Ice	0.00	1.08
								2" Ice	0.00	1.08
								4" Ice	0.00	1.08
HB114-21U3M12-XXXF(1-1/4")	C	No	Inside Pole	113.00 - 0.00	0.0000	0	1	No Ice	0.00	1.22
								1/2" Ice	0.00	1.22
								1" Ice	0.00	1.22
								2" Ice	0.00	1.22
								4" Ice	0.00	1.22
*										
FXL 780 PE(7/8)	B	No	CaAa (Out Of Face)	100.00 - 10.00	0.0000	0	6	No Ice	0.00	0.25
								1/2" Ice	0.00	1.22
								1" Ice	0.00	2.80
								2" Ice	0.00	7.80
								4" Ice	0.00	25.12
840 10414(3/8)	B	No	CaAa (Out Of Face)	100.00 - 10.00	0.0000	0	1	No Ice	0.00	0.00
								1/2" Ice	0.00	0.54
								1" Ice	0.00	1.68
								2" Ice	0.00	5.81
								4" Ice	0.00	21.38
*										
LDF4-	C	No	CaAa (Out Of Face)	51.00 - 0.00	0.0000	0	1	No Ice	0.00	0.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
50A(1/2")								1/2" Ice	0.00	0.84
								1" Ice	0.00	2.14
								2" Ice	0.00	6.58
								4" Ice	0.00	22.78
*										
CCI-65FP-045100	A	No	CaAa (Out Of Face)	100.00 - 90.00	0.0000	0	1	No Ice	0.00	0.00
								1/2" Ice	0.00	0.00
								1" Ice	0.00	0.00
								2" Ice	0.00	0.00
								4" Ice	0.00	0.00
CCI-65FP-045100	B	No	CaAa (Out Of Face)	100.00 - 90.00	0.0000	0	1	No Ice	0.00	0.00
								1/2" Ice	0.00	0.00
								1" Ice	0.00	0.00
								2" Ice	0.00	0.00
								4" Ice	0.00	0.00
CCI-65FP-045100	C	No	CaAa (Out Of Face)	100.00 - 90.00	0.0000	0	1	No Ice	0.00	0.00
								1/2" Ice	0.00	0.00
								1" Ice	0.00	0.00
								2" Ice	0.00	0.00
								4" Ice	0.00	0.00
*										

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	144.50-139.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	2.630	0.02
		C	0.000	0.000	0.000	0.000	0.07
L2	139.50-134.50	A	0.000	0.000	0.000	0.099	0.01
		B	0.000	0.000	0.000	0.292	0.00
		C	0.000	0.000	0.000	0.000	0.07
L3	134.50-129.50	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	2.630	0.02
		C	0.000	0.000	0.000	0.000	0.07
L4	129.50-124.50	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.391	0.01
		C	0.000	0.000	0.000	0.000	0.07
L5	124.50-117.54	A	0.000	0.000	0.000	1.378	0.08
		B	0.000	0.000	0.000	4.008	0.10
		C	0.000	0.000	0.000	0.000	0.10
L6	117.54-116.46	A	0.000	0.000	0.000	0.214	0.01
		B	0.000	0.000	0.000	0.214	0.01
		C	0.000	0.000	0.000	0.000	0.01
L7	116.46-111.46	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	1.890	0.06
		C	0.000	0.000	0.000	0.000	0.08
L8	111.46-106.46	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	3.012	0.07
		C	0.000	0.000	0.000	0.000	0.09
L9	106.46-101.46	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.05
		C	0.000	0.000	0.000	0.000	0.09
L10	101.46-98.50	A	0.000	0.000	0.000	0.586	0.03
		B	0.000	0.000	0.000	1.463	0.04
		C	0.000	0.000	0.000	0.000	0.05
L11	98.50-93.50	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	3.035	0.08
		C	0.000	0.000	0.000	0.000	0.09
L12	93.50-87.17	A	0.000	0.000	0.000	1.253	0.07
		B	0.000	0.000	0.000	1.253	0.08
		C	0.000	0.000	0.000	0.000	0.12
L13	87.17-86.17	A	0.000	0.000	0.000	0.198	0.01
		B	0.000	0.000	0.000	0.198	0.01
		C	0.000	0.000	0.000	0.000	0.02

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L14	86.17-81.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L15	81.17-76.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L16	76.17-71.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L17	71.17-66.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L18	66.17-61.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L19	61.17-56.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L20	56.17-51.17	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L21	51.17-42.09	A	0.000	0.000	0.000	1.798	0.10
		B	0.000	0.000	0.000	1.798	0.11
		C	0.000	0.000	0.000	0.000	0.17
L22	42.09-41.09	A	0.000	0.000	0.000	0.198	0.01
		B	0.000	0.000	0.000	0.198	0.01
		C	0.000	0.000	0.000	0.000	0.02
L23	41.09-36.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L24	36.09-31.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L25	31.09-26.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L26	26.09-21.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L27	21.09-16.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L28	16.09-11.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.990	0.06
		C	0.000	0.000	0.000	0.000	0.09
L29	11.09-6.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.216	0.01
		C	0.000	0.000	0.000	0.000	0.04
L30	6.09-1.09	A	0.000	0.000	0.000	0.990	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.02
L31	1.09-0.00	A	0.000	0.000	0.000	0.216	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	144.50-139.50	A	0.894	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	6.215	0.04
		C		0.000	0.000	0.000	0.000	0.07
L2	139.50-134.50	A	0.890	0.000	0.000	0.000	0.188	0.01
		B		0.000	0.000	0.000	0.689	0.00
		C		0.000	0.000	0.000	0.000	0.07

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L3	134.50-129.50	A	0.886	0.000	0.000	0.000	1.876	0.07
		B		0.000	0.000	0.000	6.183	0.04
		C		0.000	0.000	0.000	0.000	0.07
L4	129.50-124.50	A	0.882	0.000	0.000	0.000	1.872	0.07
		B		0.000	0.000	0.000	0.872	0.01
		C		0.000	0.000	0.000	0.000	0.07
L5	124.50-117.54	A	0.877	0.000	0.000	0.000	2.598	0.10
		B		0.000	0.000	0.000	8.745	0.16
		C		0.000	0.000	0.000	0.000	0.10
L6	117.54-116.46	A	0.873	0.000	0.000	0.000	0.403	0.02
		B		0.000	0.000	0.000	0.403	0.02
		C		0.000	0.000	0.000	0.000	0.01
L7	116.46-111.46	A	0.870	0.000	0.000	0.000	1.860	0.07
		B		0.000	0.000	0.000	3.955	0.10
		C		0.000	0.000	0.000	0.000	0.08
L8	111.46-106.46	A	0.866	0.000	0.000	0.000	1.856	0.07
		B		0.000	0.000	0.000	6.548	0.12
		C		0.000	0.000	0.000	0.000	0.09
L9	106.46-101.46	A	0.861	0.000	0.000	0.000	1.851	0.07
		B		0.000	0.000	0.000	1.851	0.09
		C		0.000	0.000	0.000	0.000	0.09
L10	101.46-98.50	A	0.857	0.000	0.000	0.000	1.093	0.04
		B		0.000	0.000	0.000	3.116	0.09
		C		0.000	0.000	0.000	0.000	0.05
L11	98.50-93.50	A	0.853	0.000	0.000	0.000	1.843	0.07
		B		0.000	0.000	0.000	6.548	0.19
		C		0.000	0.000	0.000	0.000	0.09
L12	93.50-87.17	A	0.846	0.000	0.000	0.000	2.325	0.09
		B		0.000	0.000	0.000	2.325	0.20
		C		0.000	0.000	0.000	0.000	0.12
L13	87.17-86.17	A	0.842	0.000	0.000	0.000	0.367	0.01
		B		0.000	0.000	0.000	0.367	0.03
		C		0.000	0.000	0.000	0.000	0.02
L14	86.17-81.17	A	0.839	0.000	0.000	0.000	1.829	0.07
		B		0.000	0.000	0.000	1.829	0.16
		C		0.000	0.000	0.000	0.000	0.09
L15	81.17-76.17	A	0.832	0.000	0.000	0.000	1.822	0.07
		B		0.000	0.000	0.000	1.822	0.16
		C		0.000	0.000	0.000	0.000	0.09
L16	76.17-71.17	A	0.826	0.000	0.000	0.000	1.816	0.07
		B		0.000	0.000	0.000	1.816	0.16
		C		0.000	0.000	0.000	0.000	0.09
L17	71.17-66.17	A	0.819	0.000	0.000	0.000	1.809	0.07
		B		0.000	0.000	0.000	1.809	0.16
		C		0.000	0.000	0.000	0.000	0.09
L18	66.17-61.17	A	0.812	0.000	0.000	0.000	1.802	0.07
		B		0.000	0.000	0.000	1.802	0.16
		C		0.000	0.000	0.000	0.000	0.09
L19	61.17-56.17	A	0.804	0.000	0.000	0.000	1.794	0.07
		B		0.000	0.000	0.000	1.794	0.15
		C		0.000	0.000	0.000	0.000	0.09
L20	56.17-51.17	A	0.795	0.000	0.000	0.000	1.785	0.07
		B		0.000	0.000	0.000	1.785	0.15
		C		0.000	0.000	0.000	0.000	0.09
L21	51.17-42.09	A	0.782	0.000	0.000	0.000	3.217	0.13
		B		0.000	0.000	0.000	3.217	0.27
		C		0.000	0.000	0.000	0.000	0.18
L22	42.09-41.09	A	0.771	0.000	0.000	0.000	0.354	0.01
		B		0.000	0.000	0.000	0.354	0.03
		C		0.000	0.000	0.000	0.000	0.02
L23	41.09-36.09	A	0.764	0.000	0.000	0.000	1.754	0.07
		B		0.000	0.000	0.000	1.754	0.15
		C		0.000	0.000	0.000	0.000	0.10
L24	36.09-31.09	A	0.752	0.000	0.000	0.000	1.742	0.07
		B		0.000	0.000	0.000	1.742	0.15
		C		0.000	0.000	0.000	0.000	0.10
L25	31.09-26.09	A	0.750	0.000	0.000	0.000	1.740	0.07
		B		0.000	0.000	0.000	1.740	0.15
		C		0.000	0.000	0.000	0.000	0.10

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L26	26.09-21.09	A	0.750	0.000	0.000	0.000	1.740	0.07
		B		0.000	0.000	0.000	1.740	0.15
		C		0.000	0.000	0.000	0.000	0.10
L27	21.09-16.09	A	0.750	0.000	0.000	0.000	1.740	0.07
		B		0.000	0.000	0.000	1.740	0.15
		C		0.000	0.000	0.000	0.000	0.10
L28	16.09-11.09	A	0.750	0.000	0.000	0.000	1.740	0.07
		B		0.000	0.000	0.000	1.740	0.15
		C		0.000	0.000	0.000	0.000	0.10
L29	11.09-6.09	A	0.750	0.000	0.000	0.000	1.740	0.07
		B		0.000	0.000	0.000	0.379	0.03
		C		0.000	0.000	0.000	0.000	0.04
L30	6.09-1.09	A	0.750	0.000	0.000	0.000	1.740	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L31	1.09-0.00	A	0.750	0.000	0.000	0.000	0.379	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.01

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	144.50-139.50	0.5271	0.3043	0.9072	0.5238
L2	139.50-134.50	0.0745	0.0139	0.1561	0.0409
L3	134.50-129.50	0.4990	0.0707	0.8481	0.1919
L4	129.50-124.50	0.0914	-0.2092	0.1729	-0.3203
L5	124.50-117.54	0.5481	0.0974	0.8923	0.2068
L6	117.54-116.46	0.2182	-0.1260	0.3457	-0.1996
L7	116.46-111.46	0.3942	-0.0093	0.6567	0.0250
L8	111.46-106.46	0.5821	0.1143	0.9554	0.2376
L9	106.46-101.46	0.2214	-0.1278	0.3534	-0.2040
L10	101.46-98.50	0.5052	0.0587	0.8465	0.1469
L11	98.50-93.50	0.5996	0.1196	0.9957	0.2502
L12	93.50-87.17	0.2242	-0.1295	0.3600	-0.2079
L13	87.17-86.17	0.2245	-0.1296	0.3608	-0.2083
L14	86.17-81.17	0.2251	-0.1299	0.3615	-0.2087
L15	81.17-76.17	0.2259	-0.1304	0.3633	-0.2098
L16	76.17-71.17	0.2268	-0.1309	0.3649	-0.2107
L17	71.17-66.17	0.2276	-0.1314	0.3664	-0.2115
L18	66.17-61.17	0.2283	-0.1318	0.3676	-0.2122
L19	61.17-56.17	0.2290	-0.1322	0.3686	-0.2128
L20	56.17-51.17	0.2297	-0.1326	0.3693	-0.2132
L21	51.17-42.09	0.2306	-0.1332	0.3700	-0.2136
L22	42.09-41.09	0.2308	-0.1333	0.3706	-0.2139
L23	41.09-36.09	0.2312	-0.1335	0.3688	-0.2129
L24	36.09-31.09	0.2318	-0.1338	0.3685	-0.2128
L25	31.09-26.09	0.2323	-0.1341	0.3699	-0.2136
L26	26.09-21.09	0.2329	-0.1344	0.3715	-0.2145
L27	21.09-16.09	0.2334	-0.1347	0.3730	-0.2154
L28	16.09-11.09	0.2339	-0.1350	0.3745	-0.2162
L29	11.09-6.09	0.0525	-0.2500	0.0861	-0.4101
L30	6.09-1.09	0.0000	-0.2835	0.0000	-0.4685
L31	1.09-0.00	0.0000	-0.2836	0.0000	-0.4691

Discrete Tower Loads

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
**									
Lighting Rod 3/4" x 5'	C	From Leg	0.00 0.00 2.50	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.38 0.89 1.36 1.99 3.38	0.38 0.89 1.36 1.99 3.38	0.03 0.03 0.04 0.07 0.16
Flash Beacon Lighting	C	From Leg	0.00 0.00 1.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.70 3.10 3.50 4.30 5.90	2.70 3.10 3.50 4.30 5.90	0.05 0.07 0.09 0.13 0.21
**									
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	A	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	B	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
(2) DUAL BAND 800/1900 FULL BAND MASTHEAD	C	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.55 1.72 1.90 2.28 3.14	0.81 0.94 1.09 1.40 2.12	0.03 0.04 0.05 0.09 0.19
RRUS 11	A	From Leg	4.00 0.00 0.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	0.00 0.00 0.00 0.00 0.00	0.05 0.07 0.09 0.15 0.31
RRUS 11	B	From Leg	4.00 0.00 0.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	0.00 0.00 0.00 0.00 0.00	0.05 0.07 0.09 0.15 0.31
RRUS 11	C	From Leg	4.00 0.00 0.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	0.00 0.00 0.00 0.00 0.00	0.05 0.07 0.09 0.15 0.31
(2) 782-10250	A	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.52 0.63 0.75 1.01 1.63	0.00 0.00 0.00 0.00 0.00	0.01 0.01 0.02 0.03 0.09
(2) 782-10250	B	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.52 0.63 0.75 1.01 1.63	0.00 0.00 0.00 0.00 0.00	0.01 0.01 0.02 0.03 0.09
(2) 782-10250	C	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice	0.52 0.63 0.75	0.00 0.00 0.00	0.01 0.01 0.02

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	1.01	0.00	0.03
						2" Ice	1.63	0.00	0.09
						4" Ice			
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP13519	A	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.34 0.42 0.51 0.73 1.25	0.00 0.00 0.00 0.00 0.00	0.01 0.01 0.01 0.02 0.07
(2) LGP13519	B	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.34 0.42 0.51 0.73 1.25	0.00 0.00 0.00 0.00 0.00	0.01 0.01 0.01 0.02 0.07
(2) LGP13519	C	From Leg	4.00 0.00 1.00	90.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.34 0.42 0.51 0.73 1.25	0.00 0.00 0.00 0.00 0.00	0.01 0.01 0.01 0.02 0.07
P65-17-XLH-RR	A	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.47 12.08 12.71 14.07 17.08	6.80 7.38 7.98 9.18 11.68	0.06 0.12 0.19 0.35 0.78
AM-X-CD-17-65-00T-RET	B	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.31 11.93 12.55 13.88 16.88	6.80 7.38 7.98 9.18 11.68	0.06 0.12 0.19 0.35 0.77
SBNH-1D6565C	C	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.41 12.03 12.65 13.98 17.00	7.70 8.29 8.89 10.11 12.65	0.06 0.13 0.20 0.37 0.81
DC6-48-60-18-8F	B	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
Platform Mount [LP 712-1]	C	None		0.00	145.00	No Ice 1/2"	24.53 29.94	24.53 29.94	1.34 1.65

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
						Ice	35.35	35.35	1.96
						1" Ice	46.17	46.17	2.58
						2" Ice	67.81	67.81	3.82
						4" Ice			
8'x2" Antenna Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
8'x2" Antenna Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
8'x2" Antenna Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	145.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.03 0.04 0.06 0.12 0.30
*									
(2) CBC721-DF	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.45 0.54 0.64 0.87 1.44	0.12 0.18 0.26 0.43 0.88	0.00 0.01 0.01 0.02 0.07
(2) CBC721-DF	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.45 0.54 0.64 0.87 1.44	0.12 0.18 0.26 0.43 0.88	0.00 0.01 0.01 0.02 0.07
(2) CBC721-DF	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.45 0.54 0.64 0.87 1.44	0.12 0.18 0.26 0.43 0.88	0.00 0.01 0.01 0.02 0.07
BXA-171063/8CF w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.52 3.92 4.80 6.71	3.51 4.13 4.76 6.06 9.09	0.03 0.06 0.10 0.20 0.49
BXA-171063/8CF w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.52 3.92 4.80 6.71	3.51 4.13 4.76 6.06 9.09	0.03 0.06 0.10 0.20 0.49
BXA-171063/8CF w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.14 3.52 3.92 4.80 6.71	3.51 4.13 4.76 6.06 9.09	0.03 0.06 0.10 0.20 0.49
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80

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
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.97 8.61 9.22 10.46 13.07	5.80 6.95 7.82 9.60 13.37	0.04 0.10 0.17 0.34 0.80
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
RRH2X40-AWS	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
HBXX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.98 9.65 10.29 11.59 14.32	6.96 8.18 9.14 11.02 15.03	0.07 0.14 0.21 0.40 0.91
HBXX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.98 9.65 10.29 11.59 14.32	6.96 8.18 9.14 11.02 15.03	0.07 0.14 0.21 0.40 0.91
HBXX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.98 9.65 10.29 11.59 14.32	6.96 8.18 9.14 11.02 15.03	0.07 0.14 0.21 0.40 0.91

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
						4" Ice			
LNX-6512DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.79 6.25 6.71 7.67 9.72	4.50 5.17 5.85 7.27 10.37	0.04 0.09 0.14 0.27 0.64
LNX-6512DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.79 6.25 6.71 7.67 9.72	4.50 5.17 5.85 7.27 10.37	0.04 0.09 0.14 0.27 0.64
LNX-6512DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.79 6.25 6.71 7.67 9.72	4.50 5.17 5.85 7.27 10.37	0.04 0.09 0.14 0.27 0.64
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 2.00	0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45
Platform Mount [LP 712-1]	C	None		0.00	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
*									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.83 7.35 7.86 8.93 11.18	5.64 6.48 7.26 8.86 12.29	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice 1/2" Ice	6.83 7.35 7.86	5.64 6.48 7.26	0.11 0.17 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
KRY 112 144/1	A	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02
						2" Ice	0.81	0.53	0.03
						4" Ice	1.36	1.00	0.08
KRY 112 144/1	B	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02
						2" Ice	0.81	0.53	0.03
						4" Ice	1.36	1.00	0.08
KRY 112 144/1	C	From Leg	4.00 0.00 1.00	0.00	125.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02
						2" Ice	0.81	0.53	0.03
						4" Ice	1.36	1.00	0.08
Platform Mount [LP 712-1]	C	None		0.00	125.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
*									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice	8.50	6.95	0.08
						1/2" Ice	9.15	8.13	0.15
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
TD-RRH8x20-25	A	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVTM14-C-120 w/	A	From Leg	4.00	0.00	113.00	No Ice	7.13	4.96	0.07

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
Mount Pipe			0.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.66 8.18 9.26 11.53	5.75 6.47 8.01 11.41	0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.07 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.07 0.13 0.19 0.34 0.75
(2) 6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 712-1]	C	None		0.00	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
*									
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 -2.00	0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Leg	2.00 0.00 -2.00	0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	C	From Leg	2.00 0.00 -2.00	0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 0.00	0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35

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
						4" Ice			
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.00 0.00 0.00	0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.00 0.00 0.00	0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
Side Arm Mount [SO 102-3]	C	None		0.00	111.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
*									
800 10504 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
800 10504 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	0.04 0.07 0.11 0.21 0.51
Platform Mount [LP 712-1]	C	None		0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
*									
KS24019-L112A	C	From Leg	2.00 0.00	0.00	51.00	No Ice 1/2"	0.10 0.18	0.10 0.18	0.01 0.01

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
			1.00			Ice	0.26	0.26	0.01
						1" Ice	0.42	0.42	0.01
						2" Ice	0.74	0.74	0.02
						4" Ice			
Side Arm Mount [SO 701-1]	C	From Leg	1.00	-15.00	51.00	No Ice	0.85	1.67	0.07
			0.00			1/2"	1.14	2.34	0.08
			0.00			Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
						2" Ice	3.17	7.03	0.18
						4" Ice			
*									

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	144.5 - 139.5	Pole	Max Tension	14	0.00	0.00	-0.00
			Max. Compression	14	-4.81	-0.11	-0.21
			Max. Mx	5	-2.10	-32.80	-0.15
			Max. My	8	-2.09	-0.14	-33.01
			Max. Vy	5	5.83	-32.80	-0.15
			Max. Vx	2	-5.86	0.05	32.82
			Max. Torque	5			-0.33
L2	139.5 - 134.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.31	-0.12	0.34
			Max. Mx	5	-3.86	-72.97	-0.09
			Max. My	2	-3.82	0.13	73.71
			Max. Vy	5	11.35	-72.97	-0.09
			Max. Vx	2	-11.53	0.13	73.71
			Max. Torque	5			-0.33
L3	134.5 - 129.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.86	-0.16	0.34
			Max. Mx	5	-4.21	-130.98	-0.18
			Max. My	2	-4.18	0.20	132.61
			Max. Vy	5	11.85	-130.98	-0.18
			Max. Vx	2	-12.03	0.20	132.61
			Max. Torque	11			-0.19
L4	129.5 - 124.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.64	-0.17	0.36
			Max. Mx	5	-6.29	-194.50	-0.26
			Max. My	2	-6.25	0.28	197.05
			Max. Vy	5	15.33	-194.50	-0.26
			Max. Vx	2	-15.52	0.28	197.05
			Max. Torque	11			-0.20
L5	124.5 - 117.54	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.05	-0.21	0.35
			Max. Mx	5	-6.57	-241.58	-0.31
			Max. My	2	-6.53	0.32	244.68
			Max. Vy	5	15.64	-241.58	-0.31
			Max. Vx	2	-15.83	0.32	244.68
			Max. Torque	11			-0.20
L6	117.54 - 116.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.12	-0.27	0.34
			Max. Mx	5	-7.30	-321.20	-0.40
			Max. My	2	-7.27	0.39	325.20
			Max. Vy	5	16.18	-321.20	-0.40
			Max. Vx	2	-16.37	0.39	325.20
			Max. Torque	11			-0.19
L7	116.46 - 111.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.52	-0.32	0.34
			Max. Mx	5	-9.61	-409.35	-0.49
			Max. My	2	-9.58	0.46	414.26
			Max. Vy	5	20.59	-409.35	-0.49
			Max. Vx	2	-20.78	0.46	414.26
			Max. Torque	6			0.20
L8	111.46 - 106.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.09	-0.39	0.32
			Max. Mx	5	-10.62	-516.75	-0.58
			Max. My	2	-10.59	0.52	522.57
			Max. Vy	5	21.94	-516.75	-0.58
			Max. Vx	2	-22.13	0.52	522.57
			Max. Torque	6			0.21
L9	106.46 - 101.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.89	-0.43	0.32
			Max. Mx	5	-11.30	-627.48	-0.67
			Max. My	2	-11.27	0.60	634.23

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	22.36	-627.48	-0.67
			Max. Vx	2	-22.55	0.60	634.23
			Max. Torque	6			0.22
L10	101.46 - 98.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.70	-0.50	0.30
			Max. Mx	5	-13.08	-697.66	-0.72
			Max. My	2	-13.05	0.64	704.95
			Max. Vy	5	24.45	-697.66	-0.72
			Max. Vx	2	-24.64	0.64	704.95
			Max. Torque	6			0.22
L11	98.5 - 93.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.87	-0.67	0.23
			Max. Mx	5	-14.01	-821.25	-0.82
			Max. My	2	-13.98	0.69	829.43
			Max. Vy	5	24.99	-821.25	-0.82
			Max. Vx	2	-25.18	0.69	829.43
			Max. Torque	6			0.23
L12	93.5 - 87.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.25	-0.71	0.22
			Max. Mx	5	-14.31	-862.85	-0.85
			Max. My	2	-14.28	0.71	871.34
			Max. Vy	5	25.14	-862.85	-0.85
			Max. Vx	2	-25.33	0.71	871.34
			Max. Torque	6			0.23
L13	87.17 - 86.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.33	-0.86	0.16
			Max. Mx	5	-15.94	-1007.08	-0.95
			Max. My	2	-15.91	0.79	1016.62
			Max. Vy	5	25.73	-1007.08	-0.95
			Max. Vx	2	-25.92	0.79	1016.62
			Max. Torque	6			0.24
L14	86.17 - 81.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.49	-1.00	0.11
			Max. Mx	5	-16.91	-1136.77	-1.04
			Max. My	2	-16.88	0.86	1147.24
			Max. Vy	5	26.16	-1136.77	-1.04
			Max. Vx	2	-26.35	0.86	1147.24
			Max. Torque	6			0.25
L15	81.17 - 76.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.68	-1.14	0.06
			Max. Mx	5	-17.91	-1268.60	-1.13
			Max. My	2	-17.88	0.93	1279.99
			Max. Vy	5	26.59	-1268.60	-1.13
			Max. Vx	2	-26.77	0.93	1279.99
			Max. Torque	6			0.26
L16	76.17 - 71.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.89	-1.28	0.01
			Max. Mx	5	-18.93	-1402.54	-1.22
			Max. My	2	-18.90	0.99	1414.86
			Max. Vy	5	27.01	-1402.54	-1.22
			Max. Vx	2	-27.19	0.99	1414.86
			Max. Torque	6			0.27
L17	71.17 - 66.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.13	-1.42	-0.04
			Max. Mx	5	-19.98	-1538.57	-1.31
			Max. My	2	-19.96	1.06	1551.80
			Max. Vy	5	27.42	-1538.57	-1.31
			Max. Vx	8	27.61	-1.69	-1551.67
			Max. Torque	6			0.28
L18	66.17 - 61.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.39	-1.57	-0.09
			Max. Mx	5	-21.06	-1676.63	-1.40

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	2	-21.04	1.13	1690.79
			Max. Vy	5	27.82	-1676.63	-1.40
			Max. Vx	8	28.01	-1.80	-1690.66
			Max. Torque	6			0.28
L19	61.17 - 56.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-35.68	-1.72	-0.15
			Max. Mx	5	-22.16	-1816.70	-1.49
			Max. My	2	-22.14	1.19	1831.77
			Max. Vy	5	28.22	-1816.70	-1.49
			Max. Vx	8	28.41	-1.91	-1831.65
			Max. Torque	6			0.29
L20	56.17 - 51.17	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.99	-1.87	-0.20
			Max. Mx	5	-23.29	-1958.73	-1.58
			Max. My	2	-23.27	1.26	1974.71
			Max. Vy	5	28.61	-1958.73	-1.58
			Max. Vx	8	28.79	-2.02	-1974.59
			Max. Torque	6			0.30
L21	51.17 - 42.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.95	-1.74	-0.37
			Max. Mx	5	-24.11	-2052.05	-1.78
			Max. My	8	-24.09	-1.97	-2068.77
			Max. Vy	5	28.90	-2052.05	-1.78
			Max. Vx	8	29.08	-1.97	-2068.77
			Max. Torque	6			0.30
L22	42.09 - 41.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.18	-1.94	-0.46
			Max. Mx	5	-26.76	-2251.54	-2.00
			Max. My	8	-26.74	-2.22	-2269.52
			Max. Vy	5	29.52	-2251.54	-2.00
			Max. Vx	8	29.70	-2.22	-2269.52
			Max. Torque	6			0.16
L23	41.09 - 36.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-42.68	-2.08	-0.52
			Max. Mx	5	-28.07	-2399.97	-2.16
			Max. My	8	-28.06	-2.40	-2418.86
			Max. Vy	5	29.87	-2399.97	-2.16
			Max. Vx	8	30.06	-2.40	-2418.86
			Max. Torque	6			0.17
L24	36.09 - 31.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-44.21	-2.23	-0.58
			Max. Mx	5	-29.42	-2550.13	-2.33
			Max. My	8	-29.41	-2.59	-2569.92
			Max. Vy	5	30.21	-2550.13	-2.33
			Max. Vx	8	30.39	-2.59	-2569.92
			Max. Torque	6			0.18
L25	31.09 - 26.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-45.77	-2.38	-0.64
			Max. Mx	5	-30.79	-2701.96	-2.49
			Max. My	8	-30.78	-2.77	-2722.67
			Max. Vy	5	30.54	-2701.96	-2.49
			Max. Vx	8	30.73	-2.77	-2722.67
			Max. Torque	6			0.19
L26	26.09 - 21.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-47.36	-2.53	-0.71
			Max. Mx	5	-32.18	-2855.48	-2.65
			Max. My	8	-32.18	-2.95	-2877.08
			Max. Vy	5	30.88	-2855.48	-2.65
			Max. Vx	8	31.06	-2.95	-2877.08
			Max. Torque	6			0.20
L27	21.09 -	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	16.09						
			Max. Compression	14	-48.98	-2.68	-0.77
			Max. Mx	5	-33.61	-3010.67	-2.81
			Max. My	8	-33.60	-3.14	-3033.17
			Max. Vy	5	31.22	-3010.67	-2.81
			Max. Vx	8	31.40	-3.14	-3033.17
			Max. Torque	6			0.21
L28	16.09 - 11.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.64	-2.84	-0.84
			Max. Mx	5	-35.06	-3167.54	-2.97
			Max. My	8	-35.05	-3.32	-3190.93
			Max. Vy	5	31.55	-3167.54	-2.97
			Max. Vx	8	31.73	-3.32	-3190.93
			Max. Torque	6			0.22
L29	11.09 - 6.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.15	-2.87	-0.83
			Max. Mx	5	-36.43	-3326.01	-3.12
			Max. My	8	-36.43	-3.48	-3350.30
			Max. Vy	5	31.86	-3326.01	-3.12
			Max. Vx	8	32.05	-3.48	-3350.30
			Max. Torque	6			0.22
L30	6.09 - 1.09	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53.65	-2.85	-0.80
			Max. Mx	5	-37.80	-3486.02	-3.26
			Max. My	8	-37.80	-3.63	-3511.20
			Max. Vy	5	32.17	-3486.02	-3.26
			Max. Vx	8	32.35	-3.63	-3511.20
			Max. Torque	6			0.23
L31	1.09 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-53.98	-2.85	-0.79
			Max. Mx	5	-38.10	-3521.11	-3.29
			Max. My	8	-38.10	-3.67	-3546.48
			Max. Vy	5	32.24	-3521.11	-3.29
			Max. Vx	8	32.42	-3.67	-3546.48
			Max. Torque	6			0.24

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	15	53.98	0.01	7.95
	Max. H_x	11	38.12	32.22	0.03
	Max. H_z	2	38.12	0.03	32.40
	Max. M_x	2	3546.40	0.03	32.40
	Max. M_z	5	3521.11	-32.22	-0.03
	Max. Torsion	6	0.24	-27.92	-16.23
	Min. Vert	1	38.12	0.00	0.00
	Min. H_x	5	38.12	-32.22	-0.03
	Min. H_z	8	38.12	-0.03	-32.40
	Min. M_x	8	-3546.48	-0.03	-32.40
	Min. M_z	11	-3520.28	32.22	0.03
	Min. Torsion	12	-0.22	27.92	16.23

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	38.12	0.00	0.00	0.04	-0.40	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 0 deg - No Ice	38.12	-0.03	-32.40	-3546.40	2.84	0.13
Dead+Wind 30 deg - No Ice	38.12	16.08	-28.05	-3069.68	-1757.91	0.03
Dead+Wind 60 deg - No Ice	38.12	27.89	-16.17	-1770.42	-3047.79	-0.09
Dead+Wind 90 deg - No Ice	38.12	32.22	0.03	3.29	-3521.11	-0.19
Dead+Wind 120 deg - No Ice	38.12	27.92	16.23	1776.12	-3051.02	-0.24
Dead+Wind 150 deg - No Ice	38.12	16.14	28.08	3073.00	-1763.53	-0.22
Dead+Wind 180 deg - No Ice	38.12	0.03	32.40	3546.48	-3.67	-0.13
Dead+Wind 210 deg - No Ice	38.12	-16.08	28.05	3069.77	1757.08	-0.01
Dead+Wind 240 deg - No Ice	38.12	-27.89	16.17	1770.50	3046.96	0.10
Dead+Wind 270 deg - No Ice	38.12	-32.22	-0.03	-3.21	3520.28	0.19
Dead+Wind 300 deg - No Ice	38.12	-27.92	-16.23	-1776.04	3050.19	0.22
Dead+Wind 330 deg - No Ice	38.12	-16.14	-28.08	-3072.92	1762.70	0.20
Dead+Ice+Temp	53.98	0.00	-0.00	0.79	-2.85	0.00
Dead+Wind 0 deg+Ice+Temp	53.98	-0.01	-7.95	-904.91	-2.26	0.08
Dead+Wind 30 deg+Ice+Temp	53.98	3.95	-6.88	-783.19	-452.52	0.06
Dead+Wind 60 deg+Ice+Temp	53.98	6.85	-3.97	-451.38	-782.33	0.02
Dead+Wind 90 deg+Ice+Temp	53.98	7.91	0.01	1.59	-903.33	-0.02
Dead+Wind 120 deg+Ice+Temp	53.98	6.85	3.98	454.35	-783.10	-0.06
Dead+Wind 150 deg+Ice+Temp	53.98	3.96	6.89	785.59	-453.85	-0.08
Dead+Wind 180 deg+Ice+Temp	53.98	0.01	7.95	906.55	-3.80	-0.08
Dead+Wind 210 deg+Ice+Temp	53.98	-3.95	6.88	784.83	446.45	-0.06
Dead+Wind 240 deg+Ice+Temp	53.98	-6.85	3.97	453.02	776.27	-0.02
Dead+Wind 270 deg+Ice+Temp	53.98	-7.91	-0.01	0.05	897.27	0.02
Dead+Wind 300 deg+Ice+Temp	53.98	-6.85	-3.98	-452.71	777.04	0.06
Dead+Wind 330 deg+Ice+Temp	53.98	-3.96	-6.89	-783.95	447.78	0.08
Dead+Wind 0 deg - Service	38.12	-0.01	-11.21	-1229.35	0.71	0.05
Dead+Wind 30 deg - Service	38.12	5.57	-9.70	-1064.09	-609.65	0.01
Dead+Wind 60 deg - Service	38.12	9.65	-5.60	-613.68	-1056.77	-0.03
Dead+Wind 90 deg - Service	38.12	11.15	0.01	1.17	-1220.84	-0.07
Dead+Wind 120 deg - Service	38.12	9.66	5.62	615.71	-1057.90	-0.08
Dead+Wind 150 deg - Service	38.12	5.58	9.72	1065.29	-611.60	-0.07
Dead+Wind 180 deg - Service	38.12	0.01	11.21	1229.43	-1.54	-0.05
Dead+Wind 210 deg - Service	38.12	-5.57	9.70	1064.16	608.82	-0.01
Dead+Wind 240 deg - Service	38.12	-9.65	5.60	613.76	1055.94	0.03
Dead+Wind 270 deg - Service	38.12	-11.15	-0.01	-1.09	1220.01	0.07
Dead+Wind 300 deg - Service	38.12	-9.66	-5.62	-615.64	1057.07	0.08
Dead+Wind 330 deg - Service	38.12	-5.58	-9.72	-1065.21	610.77	0.07

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-38.12	0.00	0.00	38.12	0.00	0.000%
2	-0.03	-38.12	-32.40	0.03	38.12	32.40	0.000%
3	16.08	-38.12	-28.05	-16.08	38.12	28.05	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
4	27.89	-38.12	-16.17	-27.89	38.12	16.17	0.000%
5	32.22	-38.12	0.03	-32.22	38.12	-0.03	0.000%
6	27.92	-38.12	16.23	-27.92	38.12	-16.23	0.000%
7	16.14	-38.12	28.08	-16.14	38.12	-28.08	0.000%
8	0.03	-38.12	32.40	-0.03	38.12	-32.40	0.000%
9	-16.08	-38.12	28.05	16.08	38.12	-28.05	0.000%
10	-27.89	-38.12	16.17	27.89	38.12	-16.17	0.000%
11	-32.22	-38.12	-0.03	32.22	38.12	0.03	0.000%
12	-27.92	-38.12	-16.23	27.92	38.12	16.23	0.000%
13	-16.14	-38.12	-28.08	16.14	38.12	28.08	0.000%
14	0.00	-53.98	0.00	-0.00	53.98	0.00	0.000%
15	-0.01	-53.98	-7.95	0.01	53.98	7.95	0.000%
16	3.95	-53.98	-6.88	-3.95	53.98	6.88	0.000%
17	6.85	-53.98	-3.97	-6.85	53.98	3.97	0.000%
18	7.91	-53.98	0.01	-7.91	53.98	-0.01	0.000%
19	6.85	-53.98	3.98	-6.85	53.98	-3.98	0.000%
20	3.96	-53.98	6.89	-3.96	53.98	-6.89	0.000%
21	0.01	-53.98	7.95	-0.01	53.98	-7.95	0.000%
22	-3.95	-53.98	6.88	3.95	53.98	-6.88	0.000%
23	-6.85	-53.98	3.97	6.85	53.98	-3.97	0.000%
24	-7.91	-53.98	-0.01	7.91	53.98	0.01	0.000%
25	-6.85	-53.98	-3.98	6.85	53.98	3.98	0.000%
26	-3.96	-53.98	-6.89	3.96	53.98	6.89	0.000%
27	-0.01	-38.12	-11.21	0.01	38.12	11.21	0.000%
28	5.57	-38.12	-9.70	-5.57	38.12	9.70	0.000%
29	9.65	-38.12	-5.60	-9.65	38.12	5.60	0.000%
30	11.15	-38.12	0.01	-11.15	38.12	-0.01	0.000%
31	9.66	-38.12	5.62	-9.66	38.12	-5.62	0.000%
32	5.58	-38.12	9.72	-5.58	38.12	-9.72	0.000%
33	0.01	-38.12	11.21	-0.01	38.12	-11.21	0.000%
34	-5.57	-38.12	9.70	5.57	38.12	-9.70	0.000%
35	-9.65	-38.12	5.60	9.65	38.12	-5.60	0.000%
36	-11.15	-38.12	-0.01	11.15	38.12	0.01	0.000%
37	-9.66	-38.12	-5.62	9.66	38.12	5.62	0.000%
38	-5.58	-38.12	-9.72	5.58	38.12	9.72	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00056139
3	Yes	6	0.00000001	0.00011086
4	Yes	6	0.00000001	0.00011091
5	Yes	4	0.00000001	0.00058361
6	Yes	6	0.00000001	0.00011056
7	Yes	6	0.00000001	0.00011148
8	Yes	4	0.00000001	0.00069015
9	Yes	6	0.00000001	0.00011081
10	Yes	6	0.00000001	0.00011051
11	Yes	4	0.00000001	0.00075011
12	Yes	6	0.00000001	0.00011133
13	Yes	6	0.00000001	0.00011066
14	Yes	4	0.00000001	0.00000255
15	Yes	5	0.00000001	0.00069800
16	Yes	5	0.00000001	0.00092781
17	Yes	5	0.00000001	0.00092418
18	Yes	5	0.00000001	0.00069597
19	Yes	5	0.00000001	0.00092649
20	Yes	5	0.00000001	0.00093088
21	Yes	5	0.00000001	0.00069839
22	Yes	5	0.00000001	0.00091877
23	Yes	5	0.00000001	0.00091827
24	Yes	5	0.00000001	0.00069104
25	Yes	5	0.00000001	0.00092040

26	Yes	5	0.00000001	0.00092015
27	Yes	4	0.00000001	0.00031303
28	Yes	5	0.00000001	0.00025419
29	Yes	5	0.00000001	0.00025386
30	Yes	4	0.00000001	0.00031370
31	Yes	5	0.00000001	0.00025266
32	Yes	5	0.00000001	0.00025701
33	Yes	4	0.00000001	0.00031633
34	Yes	5	0.00000001	0.00025339
35	Yes	5	0.00000001	0.00025171
36	Yes	4	0.00000001	0.00031793
37	Yes	5	0.00000001	0.00025568
38	Yes	5	0.00000001	0.00025336

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	144.5 - 139.5	38.30	27	2.39	0.00
L2	139.5 - 134.5	35.81	27	2.37	0.00
L3	134.5 - 129.5	33.33	27	2.35	0.00
L4	129.5 - 124.5	30.90	27	2.29	0.00
L5	124.5 - 117.54	28.54	27	2.22	0.00
L6	121.46 - 116.46	27.14	27	2.17	0.00
L7	116.46 - 111.46	24.89	27	2.12	0.00
L8	111.46 - 106.46	22.73	27	2.02	0.00
L9	106.46 - 101.46	20.66	27	1.92	0.00
L10	101.46 - 98.5	18.71	27	1.80	0.00
L11	98.5 - 93.5	17.62	33	1.73	0.00
L12	93.5 - 87.17	15.84	33	1.65	0.00
L13	91.84 - 86.17	15.28	33	1.62	0.00
L14	86.17 - 81.17	13.38	33	1.56	0.00
L15	81.17 - 76.17	11.80	33	1.46	0.00
L16	76.17 - 71.17	10.32	33	1.36	0.00
L17	71.17 - 66.17	8.96	33	1.26	0.00
L18	66.17 - 61.17	7.70	33	1.15	0.00
L19	61.17 - 56.17	6.54	33	1.05	0.00
L20	56.17 - 51.17	5.50	33	0.95	0.00
L21	51.17 - 42.09	4.57	33	0.84	0.00
L22	47.92 - 41.09	4.01	33	0.78	0.00
L23	41.09 - 36.09	2.95	33	0.70	0.00
L24	36.09 - 31.09	2.26	33	0.61	0.00
L25	31.09 - 26.09	1.67	33	0.52	0.00
L26	26.09 - 21.09	1.17	33	0.43	0.00
L27	21.09 - 16.09	0.76	33	0.35	0.00
L28	16.09 - 11.09	0.44	33	0.26	0.00
L29	11.09 - 6.09	0.21	33	0.18	0.00
L30	6.09 - 1.09	0.06	33	0.10	0.00
L31	1.09 - 0	0.00	33	0.02	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
145.00	Lighting Rod 3/4" x 5'	27	38.30	2.39	0.00	14001
135.00	(2) CBC721-DF	27	33.58	2.35	0.00	7680
125.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	28.77	2.23	0.00	3772
113.00	APXVSPP18-C-A20 w/ Mount Pipe	27	23.38	2.06	0.00	3118
111.00	800MHz 2X50W RRH W/FILTER	27	22.53	2.01	0.00	2888
100.00	800 10504 w/ Mount Pipe	33	18.17	1.77	0.00	2634

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
51.00	KS24019-L112A	33	4.54	0.84	0.00	3010

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	144.5 - 139.5	110.20	2	6.87	0.00
L2	139.5 - 134.5	103.04	2	6.83	0.00
L3	134.5 - 129.5	95.94	2	6.75	0.00
L4	129.5 - 124.5	88.95	2	6.60	0.00
L5	124.5 - 117.54	82.16	2	6.40	0.00
L6	121.46 - 116.46	78.14	2	6.24	0.00
L7	116.46 - 111.46	71.68	2	6.09	0.00
L8	111.46 - 106.46	65.45	2	5.83	0.00
L9	106.46 - 101.46	59.51	2	5.53	0.00
L10	101.46 - 98.5	53.90	8	5.20	0.00
L11	98.5 - 93.5	50.74	8	4.99	0.00
L12	93.5 - 87.17	45.65	8	4.75	0.00
L13	91.84 - 86.17	44.01	8	4.67	0.00
L14	86.17 - 81.17	38.56	8	4.49	0.00
L15	81.17 - 76.17	34.01	8	4.21	0.00
L16	76.17 - 71.17	29.76	8	3.91	0.00
L17	71.17 - 66.17	25.82	8	3.62	0.00
L18	66.17 - 61.17	22.19	8	3.32	0.00
L19	61.17 - 56.17	18.87	8	3.02	0.00
L20	56.17 - 51.17	15.86	8	2.72	0.00
L21	51.17 - 42.09	13.16	8	2.43	0.00
L22	47.92 - 41.09	11.57	8	2.24	0.00
L23	41.09 - 36.09	8.51	8	2.02	0.00
L24	36.09 - 31.09	6.53	8	1.76	0.00
L25	31.09 - 26.09	4.82	8	1.51	0.00
L26	26.09 - 21.09	3.37	8	1.25	0.00
L27	21.09 - 16.09	2.19	8	1.00	0.00
L28	16.09 - 11.09	1.27	8	0.76	0.00
L29	11.09 - 6.09	0.60	8	0.52	0.00
L30	6.09 - 1.09	0.18	8	0.28	0.00
L31	1.09 - 0	0.01	8	0.05	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
145.00	Lighting Rod 3/4" x 5'	2	110.20	6.87	0.00	5025
135.00	(2) CBC721-DF	2	96.64	6.76	0.00	2739
125.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	82.83	6.42	0.00	1343
113.00	APXVSPP18-C-A20 w/ Mount Pipe	2	67.34	5.92	0.00	1106
111.00	800MHz 2X50W RRH W/FILTER	2	64.89	5.80	0.00	1023
100.00	800 10504 w/ Mount Pipe	8	52.33	5.09	0.00	929
51.00	KS24019-L112A	8	13.08	2.42	0.00	1048

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	144.5 - 139.5 (1)	TP22.0896x21x0.1875	5.00	0.00	0.0	39.00	13.0345	-2.09	508.34	0.004
L2	139.5 - 134.5 (2)	TP23.1792x22.0896x0.1875	5.00	0.00	0.0	39.00	13.6829	-3.82	533.63	0.007
L3	134.5 - 129.5 (3)	TP24.2687x23.1792x0.1875	5.00	0.00	0.0	39.00	14.3313	-4.18	558.92	0.007
L4	129.5 - 124.5 (4)	TP25.3583x24.2687x0.1875	5.00	0.00	0.0	39.00	14.9798	-6.25	584.21	0.011
L5	124.5 - 117.54 (5)	TP26.875x25.3583x0.1875	6.96	0.00	0.0	39.00	15.3740	-6.53	599.59	0.011
L6	117.54 - 116.46 (6)	TP26.7181x25.6458x0.25	5.00	0.00	0.0	39.00	21.0025	-7.27	819.10	0.009
L7	116.46 - 111.46 (7)	TP27.7905x26.7181x0.25	5.00	0.00	0.0	39.00	21.8534	-9.58	852.28	0.011
L8	111.46 - 106.46 (8)	TP28.8628x27.7905x0.25	5.00	0.00	0.0	39.00	22.7043	-10.59	885.47	0.012
L9	106.46 - 101.46 (9)	TP29.9352x28.8628x0.25	5.00	0.00	0.0	39.00	23.5552	-11.27	918.65	0.012
L10	101.46 - 98.5 (10)	TP30.57x29.9352x0.25	2.96	0.00	0.0	39.00	24.0590	-13.05	938.30	0.014
L11	98.5 - 93.5 (11)	TP31.6424x30.57x0.4	5.00	0.00	0.0	39.00	39.6653	-13.98	1546.95	0.009
L12	93.5 - 87.17 (12)	TP33x31.6424x0.4	6.33	0.00	0.0	39.00	40.1174	-14.28	1564.58	0.009
L13	87.17 - 86.17 (13)	TP32.7202x31.4984x0.375	5.67	0.00	0.0	39.00	38.4989	-15.91	1501.46	0.011
L14	86.17 - 81.17 (14)	TP33.7976x32.7202x0.375	5.00	0.00	0.0	39.00	39.7813	-16.88	1551.47	0.011
L15	81.17 - 76.17 (15)	TP34.8751x33.7976x0.375	5.00	0.00	0.0	39.00	41.0637	-17.88	1601.48	0.011
L16	76.17 - 71.17 (16)	TP35.9525x34.8751x0.375	5.00	0.00	0.0	39.00	42.3461	-18.90	1651.50	0.011
L17	71.17 - 66.17 (17)	TP37.0299x35.9525x0.375	5.00	0.00	0.0	39.00	43.6285	-19.96	1701.51	0.012
L18	66.17 - 61.17 (18)	TP38.1073x37.0299x0.375	5.00	0.00	0.0	39.00	44.9109	-21.04	1751.52	0.012
L19	61.17 - 56.17 (19)	TP39.1847x38.1073x0.375	5.00	0.00	0.0	39.00	46.1933	-22.14	1801.54	0.012
L20	56.17 - 51.17 (20)	TP40.2622x39.1847x0.375	5.00	0.00	0.0	39.00	47.4757	-23.27	1851.55	0.013
L21	51.17 - 42.09 (21)	TP42.2188x40.2622x0.375	9.08	0.00	0.0	39.00	48.3092	-24.09	1884.06	0.013
L22	42.09 - 41.09 (22)	TP41.6788x40.2125x0.4375	6.83	0.00	0.0	39.00	57.2686	-26.74	2233.48	0.012
L23	41.09 - 36.09 (23)	TP42.7522x41.6788x0.4375	5.00	0.00	0.0	39.00	58.7592	-28.06	2291.61	0.012
L24	36.09 - 31.09 (24)	TP43.8256x42.7522x0.4375	5.00	0.00	0.0	39.00	60.2497	-29.41	2349.74	0.013
L25	31.09 - 26.09 (25)	TP44.899x43.8256x0.4375	5.00	0.00	0.0	39.00	61.7403	-30.78	2407.87	0.013
L26	26.09 - 21.09 (26)	TP45.9724x44.899x0.4375	5.00	0.00	0.0	39.00	63.2309	-32.18	2466.00	0.013
L27	21.09 - 16.09 (27)	TP47.0458x45.9724x0.4375	5.00	0.00	0.0	39.00	64.7214	-33.60	2524.14	0.013
L28	16.09 - 11.09 (28)	TP48.1192x47.0458x0.4375	5.00	0.00	0.0	39.00	66.2120	-35.05	2582.27	0.014
L29	11.09 - 6.09 (29)	TP49.1926x48.1192x0.4375	5.00	0.00	0.0	39.00	67.7025	-36.43	2640.40	0.014
L30	6.09 - 1.09 (30)	TP50.266x49.1926x0.4375	5.00	0.00	0.0	39.00	69.1931	-37.80	2698.53	0.014
L31	1.09 - 0 (31)	TP50.5x50.266x0.4375	1.09	0.00	0.0	39.00	69.5180	-38.10	2711.20	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	144.5 - 139.5 (1)	TP22.0896x21x0.1875	33.06	5.64	39.00	0.144	0.00	0.00	39.00	0.000
L2	139.5 - 134.5 (2)	TP23.1792x22.0896x0.1875	73.71	11.40	39.00	0.292	0.00	0.00	39.00	0.000
L3	134.5 - 129.5 (3)	TP24.2687x23.1792x0.1875	132.61	18.68	39.00	0.479	0.00	0.00	39.00	0.000
L4	129.5 - 124.5 (4)	TP25.3583x24.2687x0.1875	197.05	25.40	39.00	0.651	0.00	0.00	39.00	0.000
L5	124.5 - 117.54 (5)	TP26.875x25.3583x0.1875	244.68	29.94	39.00	0.768	0.00	0.00	39.00	0.000
L6	117.54 - 116.46 (6)	TP26.7181x25.6458x0.25	325.20	28.49	39.00	0.731	0.00	0.00	39.00	0.000
L7	116.46 - 111.46 (7)	TP27.7905x26.7181x0.25	414.26	33.51	39.00	0.859	0.00	0.00	39.00	0.000
L8	111.46 - 106.46 (8)	TP28.8628x27.7905x0.25	522.57	39.15	39.00	1.004	0.00	0.00	39.00	0.000
L9	106.46 - 101.46 (9)	TP29.9352x28.8628x0.25	634.23	44.13	39.00	1.132	0.00	0.00	39.00	0.000
L10	101.46 - 98.5 (10)	TP30.57x29.9352x0.25	704.95	47.01	39.00	1.205	0.00	0.00	39.00	0.000
L11	98.5 - 93.5 (11)	TP31.6424x30.57x0.4	829.43	32.71	39.00	0.839	0.00	0.00	39.00	0.000
L12	93.5 - 87.17 (12)	TP33x31.6424x0.4	871.34	33.59	39.00	0.861	0.00	0.00	39.00	0.000
L13	87.17 - 86.17 (13)	TP32.7202x31.4984x0.375	1016.63	39.85	39.00	1.022	0.00	0.00	39.00	0.000
L14	86.17 - 81.17 (14)	TP33.7976x32.7202x0.375	1147.23	42.10	39.00	1.079	0.00	0.00	39.00	0.000
L15	81.17 - 76.17 (15)	TP34.8751x33.7976x0.375	1279.99	44.07	39.00	1.130	0.00	0.00	39.00	0.000
L16	76.17 - 71.17 (16)	TP35.9525x34.8751x0.375	1414.86	45.79	39.00	1.174	0.00	0.00	39.00	0.000
L17	71.17 - 66.17 (17)	TP37.0299x35.9525x0.375	1551.80	47.30	39.00	1.213	0.00	0.00	39.00	0.000
L18	66.17 - 61.17 (18)	TP38.1073x37.0299x0.375	1690.79	48.62	39.00	1.247	0.00	0.00	39.00	0.000
L19	61.17 - 56.17 (19)	TP39.1847x38.1073x0.375	1831.78	49.78	39.00	1.276	0.00	0.00	39.00	0.000
L20	56.17 - 51.17 (20)	TP40.2622x39.1847x0.375	1974.71	50.79	39.00	1.302	0.00	0.00	39.00	0.000
L21	51.17 - 42.09 (21)	TP42.2188x40.2622x0.375	2068.78	51.38	39.00	1.317	0.00	0.00	39.00	0.000
L22	42.09 - 41.09 (22)	TP41.6788x40.2125x0.4375	2269.52	46.86	39.00	1.201	0.00	0.00	39.00	0.000
L23	41.09 - 36.09 (23)	TP42.7522x41.6788x0.4375	2418.86	47.43	39.00	1.216	0.00	0.00	39.00	0.000
L24	36.09 - 31.09 (24)	TP43.8256x42.7522x0.4375	2569.93	47.91	39.00	1.229	0.00	0.00	39.00	0.000
L25	31.09 - 26.09 (25)	TP44.899x43.8256x0.4375	2722.67	48.33	39.00	1.239	0.00	0.00	39.00	0.000
L26	26.09 - 21.09 (26)	TP45.9724x44.899x0.4375	2877.08	48.68	39.00	1.248	0.00	0.00	39.00	0.000
L27	21.09 - 16.09 (27)	TP47.0458x45.9724x0.4375	3033.17	48.97	39.00	1.256	0.00	0.00	39.00	0.000
L28	16.09 - 11.09 (28)	TP48.1192x47.0458x0.4375	3190.93	49.22	39.00	1.262	0.00	0.00	39.00	0.000
L29	11.09 - 6.09 (29)	TP49.1926x48.1192x0.4375	3350.30	49.41	39.00	1.267	0.00	0.00	39.00	0.000
L30	6.09 - 1.09 (30)	TP50.266x49.1926x0.4375	3511.20	49.57	39.00	1.271	0.00	0.00	39.00	0.000
L31	1.09 - 0 (31)	TP50.5x50.266x0.4375	3546.48	49.60	39.00	1.272	0.00	0.00	39.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	144.5 - 139.5 (1)	TP22.0896x21x0.1875	5.87	0.45	26.00	0.035	0.18	0.02	26.00	0.001
L2	139.5 - 134.5 (2)	TP23.1792x22.0896x0.1875	11.53	0.84	26.00	0.065	0.02	0.00	26.00	0.000
L3	134.5 - 129.5 (3)	TP24.2687x23.1792x0.1875	12.03	0.84	26.00	0.065	0.00	0.00	26.00	0.000
L4	129.5 - 124.5 (4)	TP25.3583x24.2687x0.1875	15.52	1.04	26.00	0.080	0.01	0.00	26.00	0.000
L5	124.5 - 117.54 (5)	TP26.875x25.3583x0.1875	15.83	1.03	26.00	0.079	0.02	0.00	26.00	0.000
L6	117.54 - 116.46 (6)	TP26.7181x25.6458x0.25	16.37	0.78	26.00	0.060	0.04	0.00	26.00	0.000
L7	116.46 - 111.46 (7)	TP27.7905x26.7181x0.25	20.78	0.95	26.00	0.073	0.05	0.00	26.00	0.000
L8	111.46 - 106.46 (8)	TP28.8628x27.7905x0.25	22.13	0.97	26.00	0.075	0.08	0.00	26.00	0.000
L9	106.46 - 101.46 (9)	TP29.9352x28.8628x0.25	22.55	0.96	26.00	0.074	0.09	0.00	26.00	0.000
L10	101.46 - 98.5 (10)	TP30.57x29.9352x0.25	24.64	1.02	26.00	0.079	0.10	0.00	26.00	0.000
L11	98.5 - 93.5 (11)	TP31.6424x30.57x0.4	25.18	0.63	26.00	0.049	0.13	0.00	26.00	0.000
L12	93.5 - 87.17 (12)	TP33x31.6424x0.4	25.33	0.63	26.00	0.049	0.13	0.00	26.00	0.000
L13	87.17 - 86.17 (13)	TP32.7202x31.4984x0.375	25.92	0.67	26.00	0.052	0.14	0.00	26.00	0.000
L14	86.17 - 81.17 (14)	TP33.7976x32.7202x0.375	26.35	0.66	26.00	0.051	0.15	0.00	26.00	0.000
L15	81.17 - 76.17 (15)	TP34.8751x33.7976x0.375	26.77	0.65	26.00	0.050	0.15	0.00	26.00	0.000
L16	76.17 - 71.17 (16)	TP35.9525x34.8751x0.375	27.19	0.64	26.00	0.049	0.16	0.00	26.00	0.000
L17	71.17 - 66.17 (17)	TP37.0299x35.9525x0.375	27.61	0.63	26.00	0.049	0.17	0.00	26.00	0.000
L18	66.17 - 61.17 (18)	TP38.1073x37.0299x0.375	28.01	0.62	26.00	0.048	0.18	0.00	26.00	0.000
L19	61.17 - 56.17 (19)	TP39.1847x38.1073x0.375	28.41	0.61	26.00	0.047	0.19	0.00	26.00	0.000
L20	56.17 - 51.17 (20)	TP40.2622x39.1847x0.375	28.79	0.61	26.00	0.047	0.20	0.00	26.00	0.000
L21	51.17 - 42.09 (21)	TP42.2188x40.2622x0.375	29.08	0.60	26.00	0.046	0.07	0.00	26.00	0.000
L22	42.09 - 41.09 (22)	TP41.6788x40.2125x0.4375	29.70	0.52	26.00	0.040	0.08	0.00	26.00	0.000
L23	41.09 - 36.09 (23)	TP42.7522x41.6788x0.4375	30.06	0.51	26.00	0.039	0.09	0.00	26.00	0.000
L24	36.09 - 31.09 (24)	TP43.8256x42.7522x0.4375	30.39	0.50	26.00	0.039	0.10	0.00	26.00	0.000
L25	31.09 - 26.09 (25)	TP44.899x43.8256x0.4375	30.73	0.50	26.00	0.038	0.11	0.00	26.00	0.000
L26	26.09 - 21.09 (26)	TP45.9724x44.899x0.4375	31.06	0.49	26.00	0.038	0.11	0.00	26.00	0.000
L27	21.09 - 16.09 (27)	TP47.0458x45.9724x0.4375	31.40	0.49	26.00	0.037	0.12	0.00	26.00	0.000
L28	16.09 - 11.09 (28)	TP48.1192x47.0458x0.4375	31.73	0.48	26.00	0.037	0.13	0.00	26.00	0.000
L29	11.09 - 6.09 (29)	TP49.1926x48.1192x0.4375	32.05	0.47	26.00	0.036	0.13	0.00	26.00	0.000
L30	6.09 - 1.09 (30)	TP50.266x49.1926x0.4375	32.35	0.47	26.00	0.036	0.13	0.00	26.00	0.000
L31	1.09 - 0 (31)	TP50.5x50.266x0.4375	32.42	0.47	26.00	0.036	0.13	0.00	26.00	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	144.5 - 139.5 (1)	0.004	0.144	0.000	0.035	0.001	0.149 ✔	1.333	H1-3+VT ✔
L2	139.5 - 134.5 (2)	0.007	0.292	0.000	0.065	0.000	0.300 ✔	1.333	H1-3+VT ✔
L3	134.5 - 129.5 (3)	0.007	0.479	0.000	0.065	0.000	0.488 ✔	1.333	H1-3+VT ✔
L4	129.5 - 124.5 (4)	0.011	0.651	0.000	0.080	0.000	0.664 ✔	1.333	H1-3+VT ✔
L5	124.5 - 117.54 (5)	0.011	0.768	0.000	0.079	0.000	0.780 ✔	1.333	H1-3+VT ✔
L6	117.54 - 116.46 (6)	0.009	0.731	0.000	0.060	0.000	0.740 ✔	1.333	H1-3+VT ✔
L7	116.46 - 111.46 (7)	0.011	0.859	0.000	0.073	0.000	0.872 ✔	1.333	H1-3+VT ✔
L8	111.46 - 106.46 (8)	0.012	1.004	0.000	0.075	0.000	1.017 ✔	1.333	H1-3+VT ✔
L9	106.46 - 101.46 (9)	0.012	1.132	0.000	0.074	0.000	1.145 ✔	1.333	H1-3+VT ✔
L10	101.46 - 98.5 (10)	0.014	1.205	0.000	0.079	0.000	1.221 ✔	1.333	H1-3+VT ✔
L11	98.5 - 93.5 (11)	0.009	0.839	0.000	0.049	0.000	0.848 ✔	1.333	H1-3+VT ✔
L12	93.5 - 87.17 (12)	0.009	0.861	0.000	0.049	0.000	0.871 ✔	1.333	H1-3+VT ✔
L13	87.17 - 86.17 (13)	0.011	1.022	0.000	0.052	0.000	1.033 ✔	1.333	H1-3+VT ✔
L14	86.17 - 81.17 (14)	0.011	1.079	0.000	0.051	0.000	1.091 ✔	1.333	H1-3+VT ✔
L15	81.17 - 76.17 (15)	0.011	1.130	0.000	0.050	0.000	1.142 ✔	1.333	H1-3+VT ✔
L16	76.17 - 71.17 (16)	0.011	1.174	0.000	0.049	0.000	1.186 ✔	1.333	H1-3+VT ✔
L17	71.17 - 66.17 (17)	0.012	1.213	0.000	0.049	0.000	1.225 ✔	1.333	H1-3+VT ✔
L18	66.17 - 61.17 (18)	0.012	1.247	0.000	0.048	0.000	1.259 ✔	1.333	H1-3+VT ✔
L19	61.17 - 56.17 (19)	0.012	1.276	0.000	0.047	0.000	1.289 ✔	1.333	H1-3+VT ✔
L20	56.17 - 51.17 (20)	0.013	1.302	0.000	0.047	0.000	1.315 ✔	1.333	H1-3+VT ✔
L21	51.17 - 42.09 (21)	0.013	1.317	0.000	0.046	0.000	1.331 ✔	1.333	H1-3+VT ✔
L22	42.09 - 41.09 (22)	0.012	1.201	0.000	0.040	0.000	1.214 ✔	1.333	H1-3+VT ✔
L23	41.09 - 36.09 (23)	0.012	1.216	0.000	0.039	0.000	1.229 ✔	1.333	H1-3+VT ✔
L24	36.09 - 31.09 (24)	0.013	1.229	0.000	0.039	0.000	1.241 ✔	1.333	H1-3+VT ✔
L25	31.09 - 26.09 (25)	0.013	1.239	0.000	0.038	0.000	1.252 ✔	1.333	H1-3+VT ✔
L26	26.09 - 21.09 (26)	0.013	1.248	0.000	0.038	0.000	1.262 ✔	1.333	H1-3+VT ✔
L27	21.09 - 16.09 (27)	0.013	1.256	0.000	0.037	0.000	1.269 ✔	1.333	H1-3+VT ✔
L28	16.09 - 11.09 (28)	0.014	1.262	0.000	0.037	0.000	1.276 ✔	1.333	H1-3+VT ✔
L29	11.09 - 6.09	0.014	1.267	0.000	0.036	0.000	1.281 ✔	1.333	H1-3+VT ✔

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	(29)						✔		
L30	6.09 - 1.09	0.014	1.271	0.000	0.036	0.000	1.285	1.333	H1-3+VT ✔
	(30)						✔		
L31	1.09 - 0 (31)	0.014	1.272	0.000	0.036	0.000	1.286	1.333	H1-3+VT ✔
							✔		

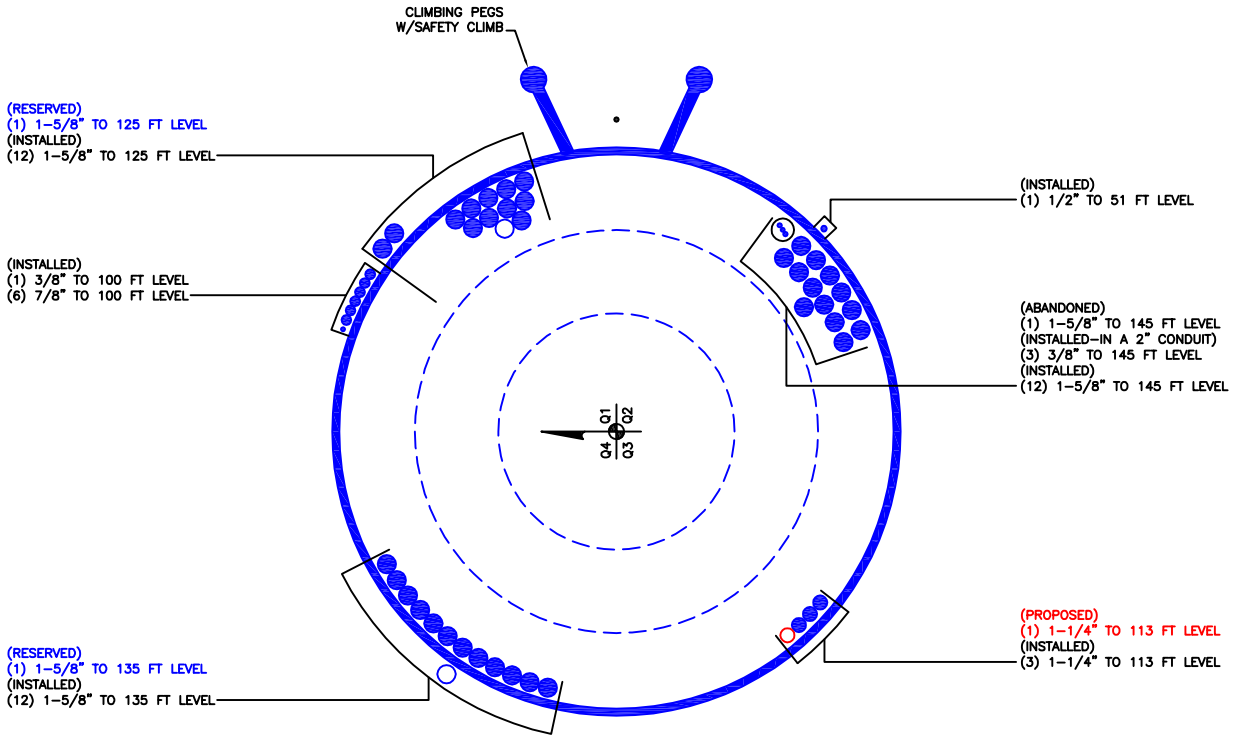
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
L1	144.5 - 139.5	Pole	TP22.0896x21x0.1875	1	-2.09	677.62	11.2	Pass
L2	139.5 - 134.5	Pole	TP23.1792x22.0896x0.1875	2	-3.82	711.33	22.5	Pass
L3	134.5 - 129.5	Pole	TP24.2687x23.1792x0.1875	3	-4.18	745.04	36.6	Pass
L4	129.5 - 124.5	Pole	TP25.3583x24.2687x0.1875	4	-6.25	778.75	49.8	Pass
L5	124.5 - 117.54	Pole	TP26.875x25.3583x0.1875	5	-6.53	799.25	58.5	Pass
L6	117.54 - 116.46	Pole	TP26.7181x25.6458x0.25	6	-7.27	1091.85	55.5	Pass
L7	116.46 - 111.46	Pole	TP27.7905x26.7181x0.25	7	-9.58	1136.09	65.4	Pass
L8	111.46 - 106.46	Pole	TP28.8628x27.7905x0.25	8	-10.59	1180.33	76.3	Pass
L9	106.46 - 101.46	Pole	TP29.9352x28.8628x0.25	9	-11.27	1224.56	85.9	Pass
L10	101.46 - 98.5	Pole	TP30.57x29.9352x0.25	10	-13.05	1250.75	91.6	Pass
L11	98.5 - 93.5	Pole	TP31.6424x30.57x0.4	11	-13.98	2062.08	63.6	Pass
L12	93.5 - 87.17	Pole	TP33x31.6424x0.4	12	-14.28	2085.59	65.3	Pass
L13	87.17 - 86.17	Pole	TP32.7202x31.4984x0.375	13	-15.91	2001.45	77.5	Pass
L14	86.17 - 81.17	Pole	TP33.7976x32.7202x0.375	14	-16.88	2068.11	81.8	Pass
L15	81.17 - 76.17	Pole	TP34.8751x33.7976x0.375	15	-17.88	2134.77	85.7	Pass
L16	76.17 - 71.17	Pole	TP35.9525x34.8751x0.375	16	-18.90	2201.45	89.0	Pass
L17	71.17 - 66.17	Pole	TP37.0299x35.9525x0.375	17	-19.96	2268.11	91.9	Pass
L18	66.17 - 61.17	Pole	TP38.1073x37.0299x0.375	18	-21.04	2334.78	94.5	Pass
L19	61.17 - 56.17	Pole	TP39.1847x38.1073x0.375	19	-22.14	2401.45	96.7	Pass
L20	56.17 - 51.17	Pole	TP40.2622x39.1847x0.375	20	-23.27	2468.12	98.7	Pass
L21	51.17 - 42.09	Pole	TP42.2188x40.2622x0.375	21	-24.09	2511.45	99.8	Pass
L22	42.09 - 41.09	Pole	TP41.6788x40.2125x0.4375	22	-26.74	2977.23	91.1	Pass
L23	41.09 - 36.09	Pole	TP42.7522x41.6788x0.4375	23	-28.06	3054.72	92.2	Pass
L24	36.09 - 31.09	Pole	TP43.8256x42.7522x0.4375	24	-29.41	3132.20	93.1	Pass
L25	31.09 - 26.09	Pole	TP44.899x43.8256x0.4375	25	-30.78	3209.69	93.9	Pass
L26	26.09 - 21.09	Pole	TP45.9724x44.899x0.4375	26	-32.18	3287.18	94.6	Pass
L27	21.09 - 16.09	Pole	TP47.0458x45.9724x0.4375	27	-33.60	3364.68	95.2	Pass
L28	16.09 - 11.09	Pole	TP48.1192x47.0458x0.4375	28	-35.05	3442.17	95.7	Pass
L29	11.09 - 6.09	Pole	TP49.1926x48.1192x0.4375	29	-36.43	3519.65	96.1	Pass
L30	6.09 - 1.09	Pole	TP50.266x49.1926x0.4375	30	-37.80	3597.14	96.4	Pass
L31	1.09 - 0	Pole	TP50.5x50.266x0.4375	31	-38.10	3614.03	96.5	Pass
							Summary	
						Pole (L21)	99.8	Pass
						RATING =	**99.8**	**Pass**

***NOTE: Above stress ratios for reinforced sections are approximate. More exact calculations are presented in Appendix C.**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881533 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity	
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1
144.5 - 139.5	790	n/a	790	13.03	n/a	13.03	11.1%	
139.5 - 134.5	913	n/a	913	13.68	n/a	13.68	22.4%	
134.5 - 129.5	1050	n/a	1050	14.33	n/a	14.33	36.5%	
129.5 - 124.5	1199	n/a	1199	14.98	n/a	14.98	49.6%	
124.5 - 121.46	1296	n/a	1296	15.37	n/a	15.37	58.4%	
121.46 - 116.46	1858	n/a	1858	21.00	n/a	21.00	55.4%	
116.46 - 111.46	2093	n/a	2093	21.85	n/a	21.85	65.3%	
111.46 - 106.46	2348	n/a	2348	22.70	n/a	22.70	76.2%	
106.46 - 101.46	2621	n/a	2621	23.55	n/a	23.55	85.8%	
101.46 - 98.5	2793	n/a	2793	24.06	n/a	24.06	91.4%	
98.5 - 93.5	3100	1810	4910	24.91	13.50	38.41	62.4%	86.9%
93.5 - 91.84	3207	1849	5056	25.19	13.50	38.69	64.8%	89.5%
91.84 - 86.17	5087	n/a	5087	38.50	n/a	38.50	77.4%	
86.17 - 81.17	5612	n/a	5612	39.78	n/a	39.78	81.7%	
81.17 - 76.17	6173	n/a	6173	41.06	n/a	41.06	85.5%	
76.17 - 71.17	6769	n/a	6769	42.34	n/a	42.34	88.9%	
71.17 - 66.17	7403	n/a	7403	43.63	n/a	43.63	91.8%	
66.17 - 61.17	8075	n/a	8075	44.91	n/a	44.91	94.4%	
61.17 - 56.17	8787	n/a	8787	46.19	n/a	46.19	96.6%	
56.17 - 51.17	9539	n/a	9539	47.47	n/a	47.47	98.6%	
51.17 - 47.92	10051	n/a	10051	48.31	n/a	48.31	99.7%	
47.92 - 41.09	12302	n/a	12302	57.27	n/a	57.27	91.0%	
41.09 - 36.09	13288	n/a	13288	58.76	n/a	58.76	92.1%	
36.09 - 31.09	14325	n/a	14325	60.25	n/a	60.25	93.0%	
31.09 - 26.09	15414	n/a	15414	61.74	n/a	61.74	93.9%	
26.09 - 21.09	16558	n/a	16558	63.23	n/a	63.23	94.5%	
21.09 - 16.09	17757	n/a	17757	64.72	n/a	64.72	95.1%	
16.09 - 11.09	19012	n/a	19012	66.21	n/a	66.21	95.6%	
11.09 - 6.09	20325	n/a	20325	67.70	n/a	67.70	96.0%	
6.09 - 1.09	21697	n/a	21697	69.19	n/a	69.19	96.3%	
1.09 - 0	22004	n/a	22004	69.52	n/a	69.52	96.4%	

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
144.5 - 139.5	Pole	TP22.09x21x0.1875	Pole	11.1%	Pass
139.5 - 134.5	Pole	TP23.179x22.09x0.1875	Pole	22.4%	Pass
134.5 - 129.5	Pole	TP24.269x23.179x0.1875	Pole	36.5%	Pass
129.5 - 124.5	Pole	TP25.358x24.269x0.1875	Pole	49.6%	Pass
124.5 - 121.46	Pole	TP26.875x25.358x0.1875	Pole	58.4%	Pass
121.46 - 116.46	Pole	TP26.718x25.646x0.25	Pole	55.4%	Pass
116.46 - 111.46	Pole	TP27.79x26.718x0.25	Pole	65.3%	Pass
111.46 - 106.46	Pole	TP28.863x27.79x0.25	Pole	76.2%	Pass
106.46 - 101.46	Pole	TP29.935x28.863x0.25	Pole	85.8%	Pass
101.46 - 98.5	Pole	TP30.57x29.935x0.25	Pole	91.4%	Pass
98.5 - 93.5	Pole + Reinf.	TP31.642x30.57x0.4	Reinf. 1 Compression	86.9%	Pass
93.5 - 91.84	Pole + Reinf.	TP33x31.642x0.4	Reinf. 1 Compression	89.5%	Pass
91.84 - 86.17	Pole	TP32.72x31.498x0.375	Pole	77.4%	Pass
86.17 - 81.17	Pole	TP33.798x32.72x0.375	Pole	81.7%	Pass
81.17 - 76.17	Pole	TP34.875x33.798x0.375	Pole	85.5%	Pass
76.17 - 71.17	Pole	TP35.952x34.875x0.375	Pole	88.9%	Pass
71.17 - 66.17	Pole	TP37.03x35.952x0.375	Pole	91.8%	Pass
66.17 - 61.17	Pole	TP38.107x37.03x0.375	Pole	94.4%	Pass
61.17 - 56.17	Pole	TP39.185x38.107x0.375	Pole	96.6%	Pass
56.17 - 51.17	Pole	TP40.262x39.185x0.375	Pole	98.6%	Pass
51.17 - 47.92	Pole	TP42.219x40.262x0.375	Pole	99.7%	Pass
47.92 - 41.09	Pole	TP41.679x40.212x0.4375	Pole	91.0%	Pass
41.09 - 36.09	Pole	TP42.752x41.679x0.4375	Pole	92.1%	Pass
36.09 - 31.09	Pole	TP43.826x42.752x0.4375	Pole	93.0%	Pass
31.09 - 26.09	Pole	TP44.899x43.826x0.4375	Pole	93.9%	Pass
26.09 - 21.09	Pole	TP45.972x44.899x0.4375	Pole	94.5%	Pass
21.09 - 16.09	Pole	TP47.046x45.972x0.4375	Pole	95.1%	Pass
16.09 - 11.09	Pole	TP48.119x47.046x0.4375	Pole	95.6%	Pass
11.09 - 6.09	Pole	TP49.193x48.119x0.4375	Pole	96.0%	Pass
6.09 - 1.09	Pole	TP50.266x49.193x0.4375	Pole	96.3%	Pass
1.09 - 0	Pole	TP50.5x50.266x0.4375	Pole	96.4%	Pass
				Summary	
			Pole	99.7%	Pass
			Reinforcement	89.5%	Pass
			Overall	99.7%	Pass

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	144.5 - 139.5	2.0889	33.059	5.8682
2	139.5 - 134.5	3.8243	73.707	11.535
3	134.5 - 129.5	4.1808	132.61	12.033
4	129.5 - 124.5	6.2511	197.05	15.518
5	124.5 - 121.46	6.5327	244.68	15.826
6	121.46 - 116.46	7.269	325.2	16.369
7	116.46 - 111.46	9.5756	414.26	20.776
8	111.46 - 106.46	10.589	522.57	22.127
9	106.46 - 101.46	11.269	634.23	22.55
10	101.46 - 98.5	13.046	704.95	24.64
11	98.5 - 93.5	13.981	829.43	25.179
12	93.5 - 91.84	14.283	871.34	25.332
13	91.84 - 86.17	15.912	1016.6	25.917
14	86.17 - 81.17	16.881	1147.2	26.349
15	81.17 - 76.17	17.879	1280	26.775
16	76.17 - 71.17	18.905	1414.9	27.195
17	71.17 - 66.17	19.957	1551.8	27.607
18	66.17 - 61.17	21.037	1690.8	28.012
19	61.17 - 56.17	22.143	1831.8	28.408
20	56.17 - 51.17	23.274	1974.7	28.794
21	51.17 - 47.92	24.091	2068.8	29.084
22	47.92 - 41.09	26.745	2269.5	29.705
23	41.09 - 36.09	28.062	2418.9	30.058
24	36.09 - 31.09	29.407	2569.9	30.395
25	31.09 - 26.09	30.779	2722.7	30.73
26	26.09 - 21.09	32.177	2877.1	31.064
27	21.09 - 16.09	33.601	3033.2	31.4
28	16.09 - 11.09	35.052	3190.9	31.735
29	11.09 - 6.09	36.427	3350.3	32.046
30	6.09 - 1.09	37.8	3511.2	32.351
31	1.09 - 0	38.101	3546.5	32.419

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	144.5 - 139.5	5		18	21.000	22.090	0.1875	A572-65	1.000
2	139.5 - 134.5	5		18	22.090	23.179	0.1875	A572-65	1.000
3	134.5 - 129.5	5		18	23.179	24.269	0.1875	A572-65	1.000
4	129.5 - 124.5	5		18	24.269	25.358	0.1875	A572-65	1.000
5	124.5 - 121.46	6.96	3.92	18	25.358	26.875	0.1875	A572-65	1.000
6	121.46 - 116.46	5		18	25.646	26.718	0.25	A572-65	1.000
7	116.46 - 111.46	5		18	26.718	27.790	0.25	A572-65	1.000
8	111.46 - 106.46	5		18	27.790	28.863	0.25	A572-65	1.000
9	106.46 - 101.46	5		18	28.863	29.935	0.25	A572-65	1.000
10	101.46 - 98.5	2.96		18	29.935	30.570	0.25	A572-65	1.000
11	98.5 - 93.5	5		18	30.570	31.642	0.4	A572-65	0.968
12	93.5 - 91.84	6.33	4.67	18	31.642	33.000	0.4	A572-65	0.964
13	91.84 - 86.17	5.67		18	31.498	32.720	0.375	A572-65	1.000
14	86.17 - 81.17	5		18	32.720	33.798	0.375	A572-65	1.000
15	81.17 - 76.17	5		18	33.798	34.875	0.375	A572-65	1.000
16	76.17 - 71.17	5		18	34.875	35.952	0.375	A572-65	1.000
17	71.17 - 66.17	5		18	35.952	37.030	0.375	A572-65	1.000
18	66.17 - 61.17	5		18	37.030	38.107	0.375	A572-65	1.000
19	61.17 - 56.17	5		18	38.107	39.185	0.375	A572-65	1.000
20	56.17 - 51.17	5		18	39.185	40.262	0.375	A572-65	1.000
21	51.17 - 47.92	9.08	5.83	18	40.262	42.219	0.375	A572-65	1.000
22	47.92 - 41.09	6.83		18	40.212	41.679	0.4375	A572-65	1.000
23	41.09 - 36.09	5		18	41.679	42.752	0.4375	A572-65	1.000
24	36.09 - 31.09	5		18	42.752	43.826	0.4375	A572-65	1.000
25	31.09 - 26.09	5		18	43.826	44.899	0.4375	A572-65	1.000
26	26.09 - 21.09	5		18	44.899	45.972	0.4375	A572-65	1.000
27	21.09 - 16.09	5		18	45.972	47.046	0.4375	A572-65	1.000
28	16.09 - 11.09	5		18	47.046	48.119	0.4375	A572-65	1.000
29	11.09 - 6.09	5		18	48.119	49.193	0.4375	A572-65	1.000
30	6.09 - 1.09	5		18	49.193	50.266	0.4375	A572-65	1.000
31	1.09 - 0	1.09		18	50.266	50.500	0.4375	A572-65	1.000

CCIpole

per TIA-222- F

Site BU: 881533

Work Order: 759463

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	144.5	26.96	3.92	18	21	26.875	0.1875	0.75	A572-65
2	121.46	34.29	4.67	18	25.65	33	0.25	1	A572-65
3	91.84	49.75	5.83	18	31.50	42.21875	0.375	1.5	A572-65
4	47.92	47.92	0	18	40.21	50.5	0.4375	1.75	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	91.5	98.5	plate	CCI-SFP-045100	3																		
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	I_x (in^4)	I_y (in^4)	L_u (in)	Connection Length (in)	Bolt Hole Size (in)	Reinforcement Material
1	4.5	1	4.5	0.5	0.375	7.594	20.000	n/a	1.1875	A572-65

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

TIA Rev F

Site Data

BU#:	*881533*
Site Name:	*GROTON TOWER*
App #:	*245708 Rev.0*
Pole Manufacturer:	*Other*

Reactions		
Moment:	3546	ft-kips
Axial:	38	kips
Shear:	32	kips

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	59	in

Plate Data		
Diam:	65	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.02	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.625	in
Fillet V. Weld:	0.375	in
Width:	6.75	in
Height:	17.75	in
Thick:	0.625	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	50.5	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

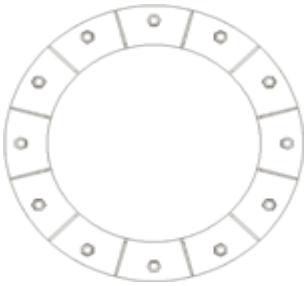
If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results			Stiffened
Maximum Rod Tension:	177.9	Kips	Service, ASD
Allowable Tension:	195.0	Kips	Fty*ASIF
Anchor Rod Stress Ratio:	91.3%	Pass	

Base Plate Results	Flexural Check		Stiffened
Base Plate Stress:	46.2	ksi	Service, ASD
Allowable Plate Stress:	60.0	ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	77.0%	Pass	Y.L. Length: N/A, Roark

Stiffener Results		
Horizontal Weld :	69.9%	Pass
Vertical Weld:	45.8%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	26.3%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	75.7%	Pass
Plate Comp. (AISC Bracket):	81.0%	Pass

Pole Results		
Pole Punching Shear Check:	11.6%	Pass



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

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

Monopole Block Foundation

Checks capacity of monolithic block foundation for a monopole tower per TIA/EIA-222-F

BU #: 881533
Site Name: GROTON TOWER
App No.: 245708 Rev.0

Design Reactions

Shear, **S**:	32.00	kips
Moment, **M**:	3546.00	ft*kips
Height, **H**:	144.50	ft
Weight, **Wt**:	38.00	kips
Base Diameter, **BD**:	50.5	in

Foundation Dimensions

Depth, **D**:	5.0	ft
Block Width, **W**:	30.0	ft
Neglected Depth, **N**:	3.3	ft
Ext. Above Grade, **E**:	0.0	ft
Anchor Steel Length, **Lst**:	72.0	in
Clear Cover, **cc**:	8.0	in

Soil Properties

Soil Unit Weight, **γ**:	0.120	kcf
Allowable Bearing, **Bc**:	12.000	ksf
Int. Angle of Friction, **Φ**:	30.00	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.000	kcf
Base Friction, **μ**:	0.2	
Seismic Zone, **z**:	1	

Material Properties

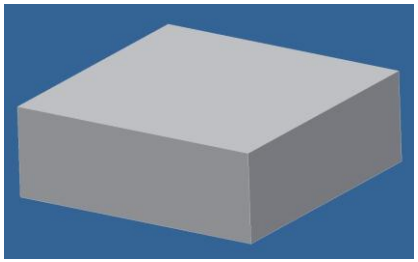
Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	4000	psi
Concrete Density, **δc**:	0.150	kcf

Rebar Properties

Pad Rebar Size, **sp**:	8	
Rebar Quanity, **mp**:	45	25

Design Checks

	Capacity/ Availability	Demands/ Limits	Check	%
Shear (ksf)	71.30	32.00	**OK**	**44.9%**
*Overturning (ft*kips):*	7739.10	3706.00	**OK**	**47.9%**
Bearing (ksf):	12.00	1.62	**OK**	**13.5%**
Shear - 1-Way (kips):	2345.15	846.27	**OK**	**36.1%**
Pad Rebar Area (in²):	35.34	19.51	**OK**	**N/A**
Bar Spacing (in):	6.80	18 > Bs > 2	**OK**	**N/A**
Development Length (in):	172.00	37.00	**OK**	**N/A**



Modification Checks

	Capacity/ Availability	Demands/ Limits	Check
Minimum Extra Thickness (in):	0.00	0.00	**Not Used**
Pad Rebar Area-short (in²):	8.84	1.95	**Not Used**
Pad Rebar Area-long (in2):	2.21	1.95	**Not Used**
Pad Rebar Spacing-short (in2):	17.32	18 > Bs > 2	**Not Used**
Pad Rebar Spacing-long (in2):	85.06	18 > Bs > 2	**Not Used**
End Cap Width (in):	0.00	0.00	**Not Used**
End Cap Rebar Area (in2):	4.81	0.00	**Not Used**
EC Rebar Spacing (in):	-3.16	18 > Bs > 2	**Not Used**
Tie Spacing (in):	17.61	344 > s > 4.5	**Not Used**
Dowel Area (in2):	8.84	0.00	**Not Used**
Dowel Embedment (in):	15.00	6.00	**Not Used**
Shear Strength of Cone (kips):	68.73	23.86	**Not Used**
Dowel Edge Distance (in):	12.00	14.51	**Not Used**
Dowel Spacing (in):	37.33	30.00	**Not Used**
Dowel Edge Distance (vert) (in):	30.00	14.51	**Not Used**
Dowel Devel. Length (in):	-8.00	13.32	**Not Used**

Modifications

Pad Thickness, Te:	0	in	**End Cap Width, Wec**:	0	in
Revised Pad Thickness, **Tx**:	5	ft	Revised Width, **Wx**:	30	ft
Pad Rebar Size, **Se**:	6		EC Rebar Size, **Sec**:	7	per side, top & bottom
Rebar Quanity (long), **me**:	20	5	EC Rebar Quanity, **mec**:	8	0
Rebar Quanity (short), **mex**:	5	5	EC Tie Size, **Sect**:	4	per side
Dowel Size, **Sed**:	7		Tie Quanity, **mect**:	20	0
Dowel Quanity, **med**:	20	0	EC Dowel Size, **Secd**:	6	per side
			Dowel Quanity, **mecd**:	20	0
			Rows of Dowels, **Nd**:	2	
			Dowel Depth, **decd**:	15	in
			Edge Distance, **eecd**:	12	in

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT43XC854

Groton Tower

75 Roberts Road
Groton, CT 06340

July 1, 2014

EBI Project Number: 62143695

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

EBI Consulting
environmental | engineering | due diligence

July 1, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT43XC854 - Groton Tower

Site Total: 46.81% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 75 Roberts Road, Groton, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of µW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz 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 upgrades to the existing Sprint Wireless antenna facility located at 75 Roberts Road, Groton, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 4 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
7) The antenna mounting height centerline for the proposed antennas is **113 feet** above ground level (AGL).
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT43XC854 - Groton Tower
Site Addresss	75 Roberts Road, Groton, CT, 06340
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	113	107	1/2 "	0.5	0	277.39	0.87%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	113	107	1/2 "	0.5	0	39.00	0.22%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	113	107	1/2 "	0.5	0	138.69	0.77%
														Sector total Power Density Value:		1.86%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	113	107	1/2 "	0.5	0	277.39	0.87%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	113	107	1/2 "	0.5	0	39.00	0.22%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	113	107	1/2 "	0.5	0	138.69	0.77%
														Sector total Power Density Value:		1.86%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	113	107	1/2 "	0.5	0	277.39	0.87%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	113	107	1/2 "	0.5	0	39.00	0.22%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	113	107	1/2 "	0.5	0	138.69	0.77%
														Sector total Power Density Value:		1.86%

Site Composite MPE %	
Carrier	MPE %
Sprint	5.57%
MetroPCS	7.54%
T-Mobile	0.24%
AT&T	16.08%
Verizon Wireless	17.38%
Total Site MPE %	**46.81%**

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **5.57% (1.86% from sector 1, 1.86% from sector 2 and 1.86% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **46.81%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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