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

July 7, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 876339**
Sprint PCS Site ID: CT03XC155
Located at: 782 Old Clinton Road, Westbrook, CT 06498

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. Noel Bishop, First Selectman for Town of Westbrook.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **782 Old Clinton Road, Westbrook, CT 06498**. 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. Noel Bishop, First Selectman
Town of Westbrook
866 Boston Post Road
Westbrook, CT 06498

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	POND MEADOW RD. STABLE
SITE CASCADE:	CT03XC155
SITE NUMBER:	876339
SITE ADDRESS:	782 OLD CLINTON RD WESTBROOK, CT 06498-1767
SITE TYPE:	MONOPOLE TOWER
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

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

LATITUDE (NAD83):
41° 17' 25.7" N
41.290472°

LONGITUDE (NAD83):
72° 28' 7.9" W
-72.468861°

COUNTY:
MIDDLESEX

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
RR – RURAL RESIDENTIAL

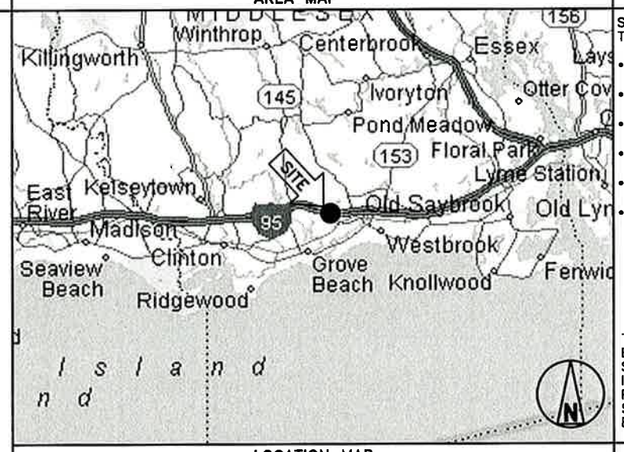
POWER COMPANY:
CL&P
(860) 947-2000

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

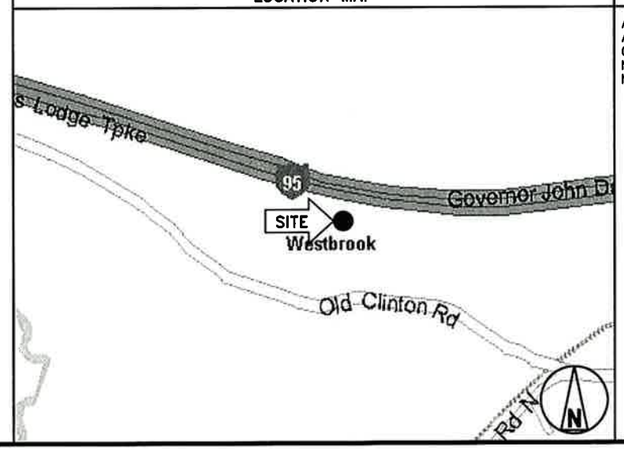
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
peter.culbert@sprint.com

CROWN CASTLE 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 353-000

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:
POND MEADOW RD. STABLE

SITE CASCADE:
CT03XC155

SITE ADDRESS:
782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

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 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD. STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

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.

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Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD. STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

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 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD.
STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

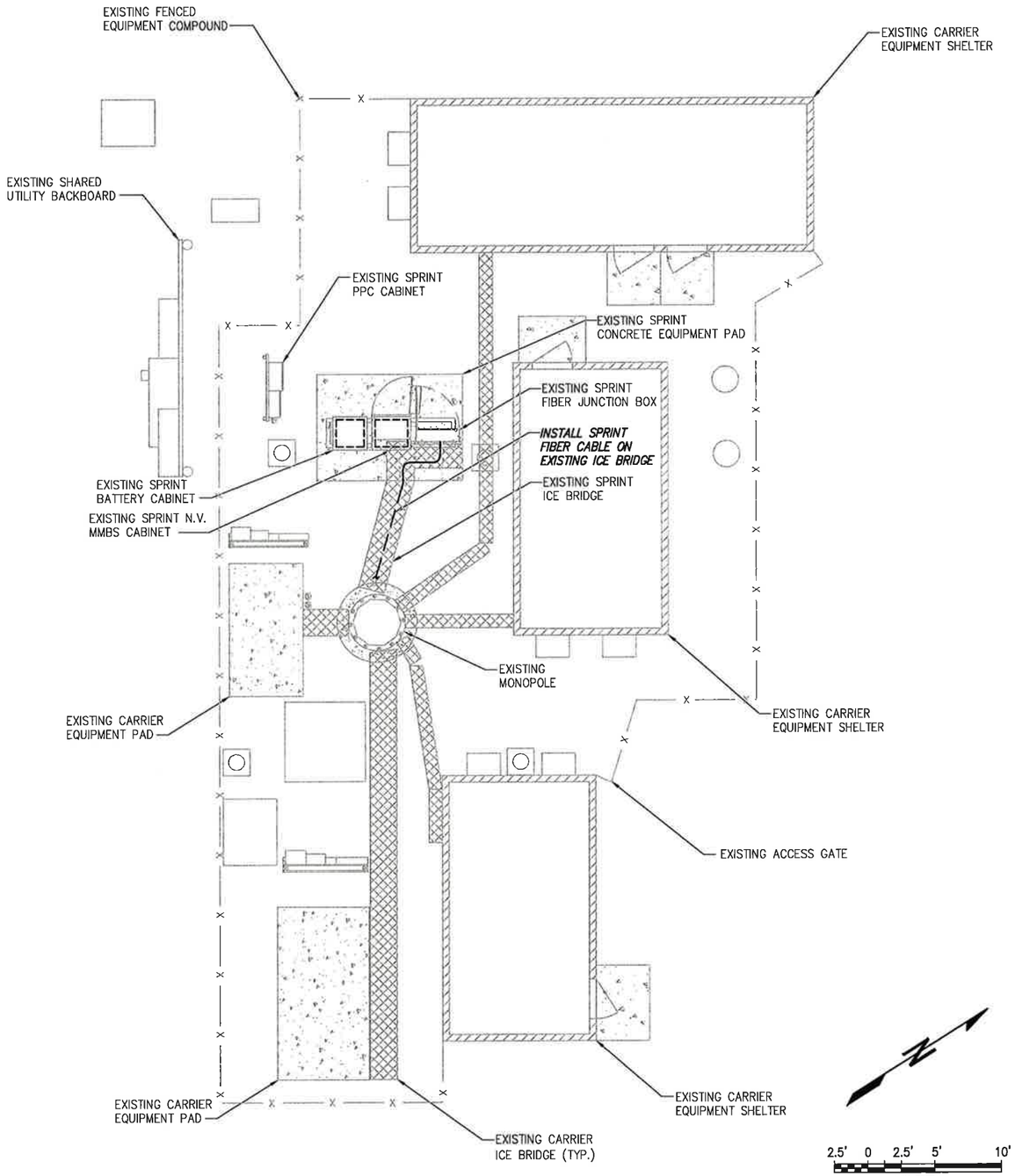
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

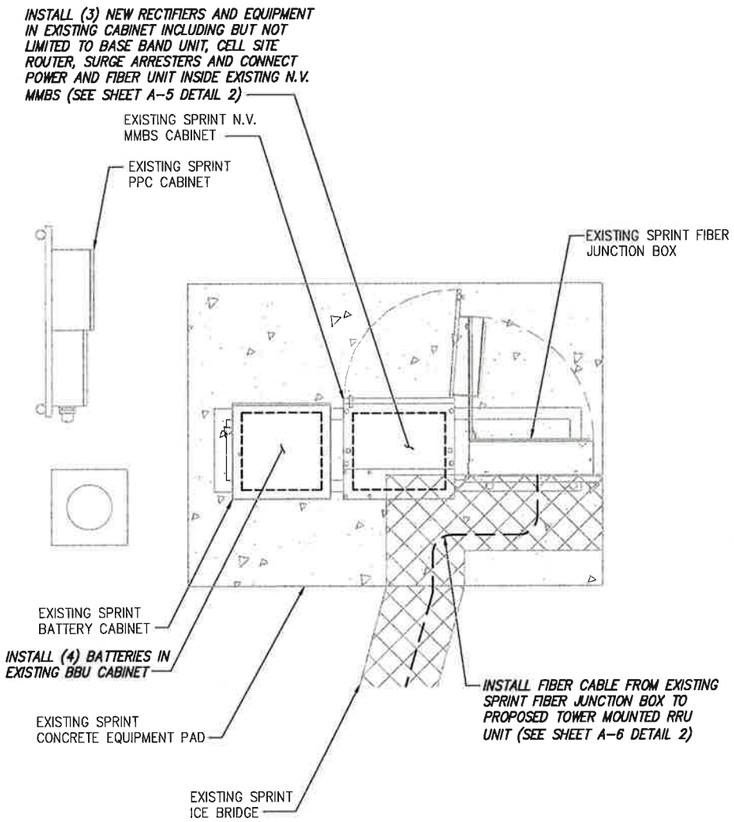
SHEET NUMBER:

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 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD. STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

SITE PLAN

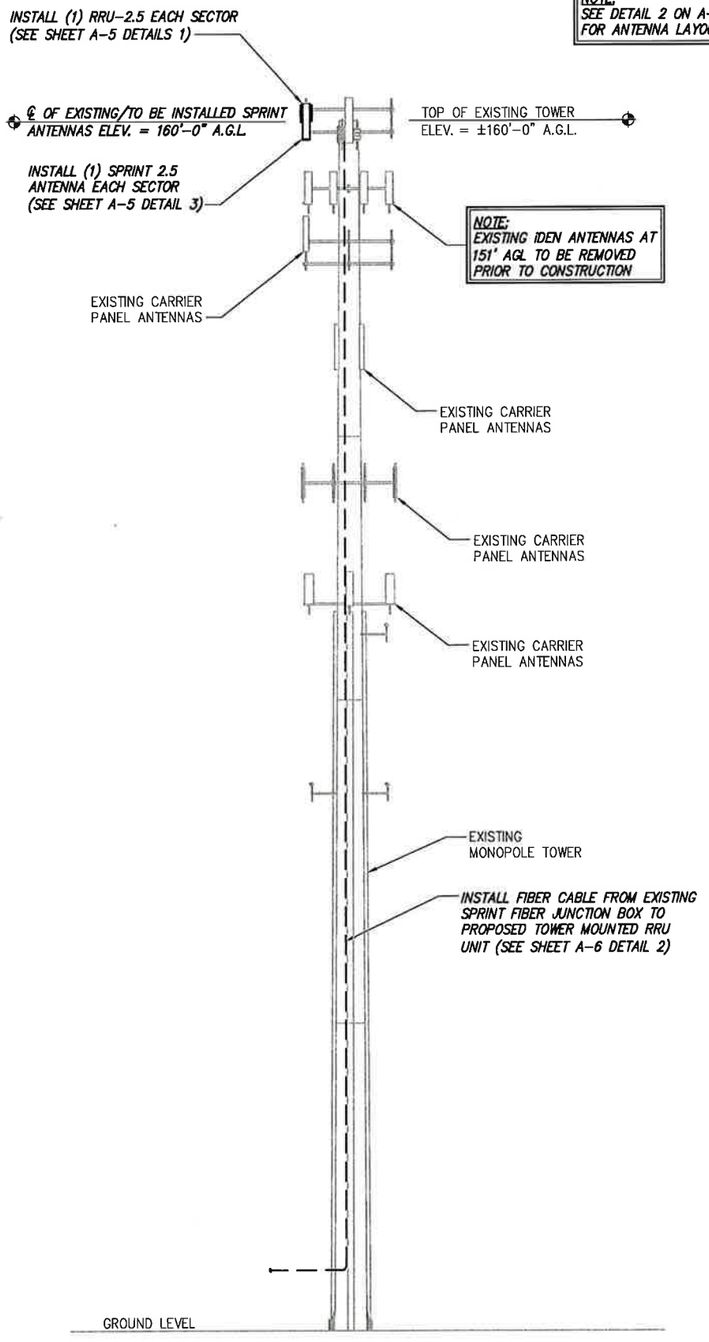
SHEET NUMBER:

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:
SEE DETAIL 2 ON A-3 FOR ANTENNA LAYOUT



TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

DETAIL NOT USED | NO SCALE | 2

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REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD. STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

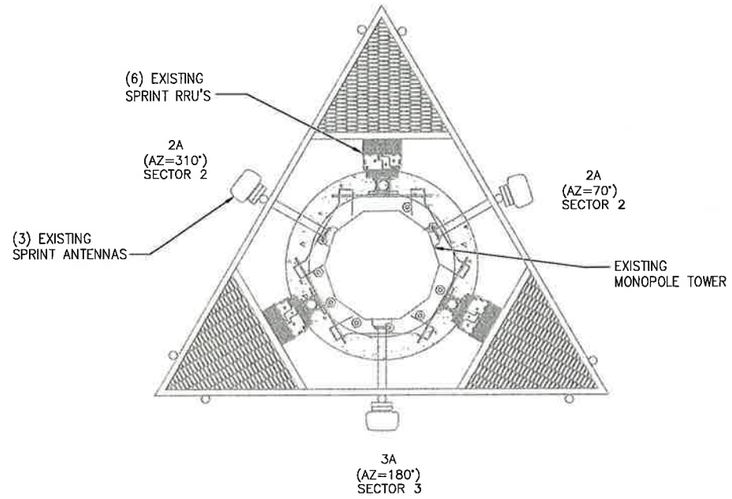
SHEET DESCRIPTION:

TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:

A-2

NOTE:
EXISTING iDEN ANTENNAS AT 151' AGL TO BE REMOVED PRIOR TO CONSTRUCTION



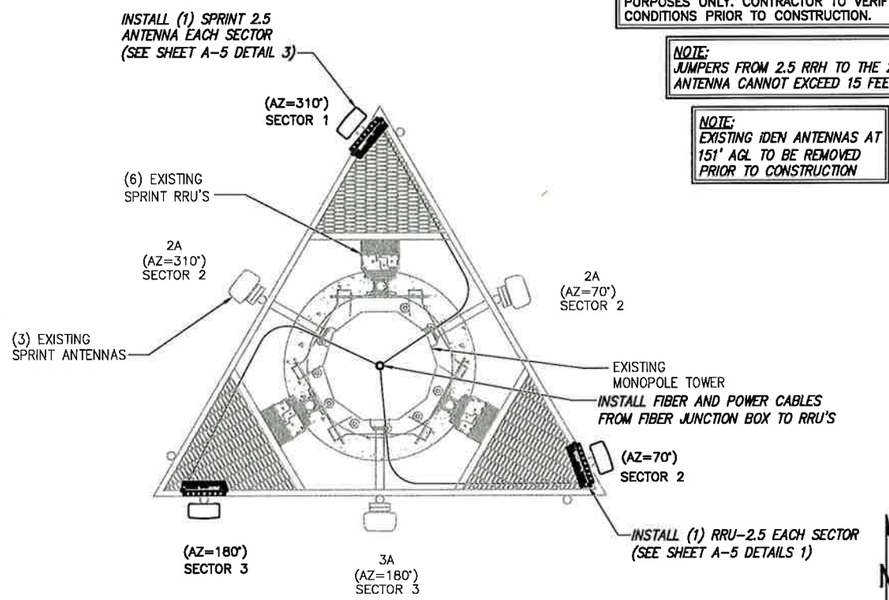
0° = TRUE NORTH

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

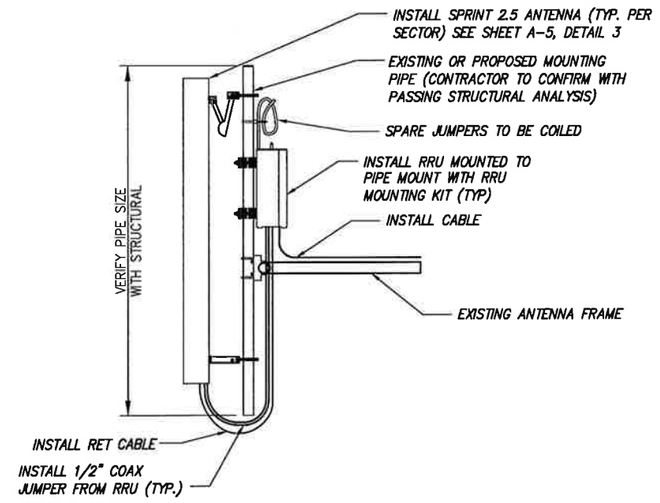
NOTE:
EXISTING iDEN ANTENNAS AT 151' AGL TO BE REMOVED PRIOR TO CONSTRUCTION



0° = TRUE NORTH

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 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD. STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

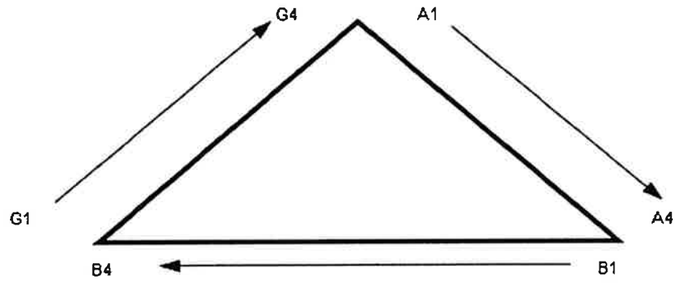
A-3

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	Yellow	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	Yellow	Yellow	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	Yellow	Yellow	Yellow
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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Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-000

MLA PARTNER:
CROWN CASTLE

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

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:
POND MEADOW RD.
STABLE

SITE CASCADE:
CT03XC155

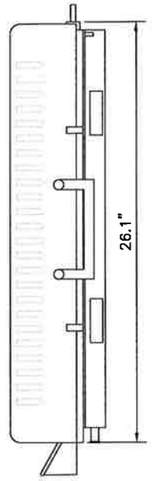
SITE ADDRESS:
782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:
COLOR CODING AND NOTES

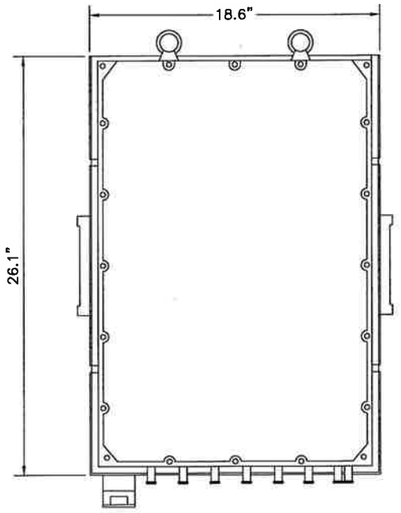
SHEET NUMBER:
A-4

RRU: ALCATEL LUCENT TD-RRH8X20

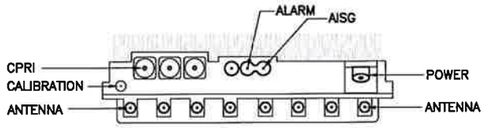
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

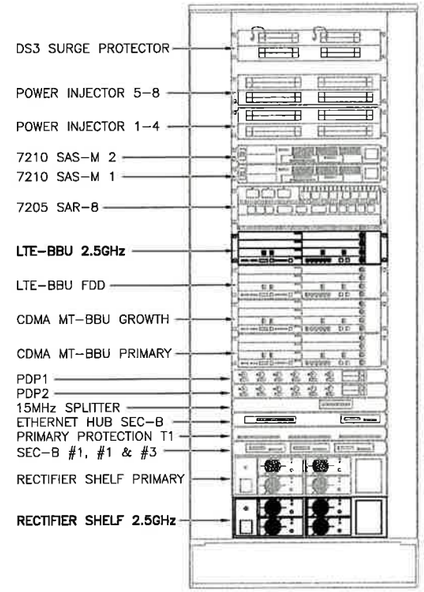


PLAN VIEW

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

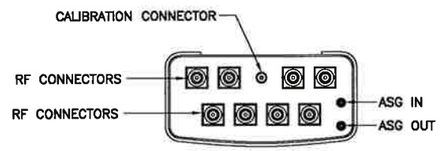


FRONT VIEW

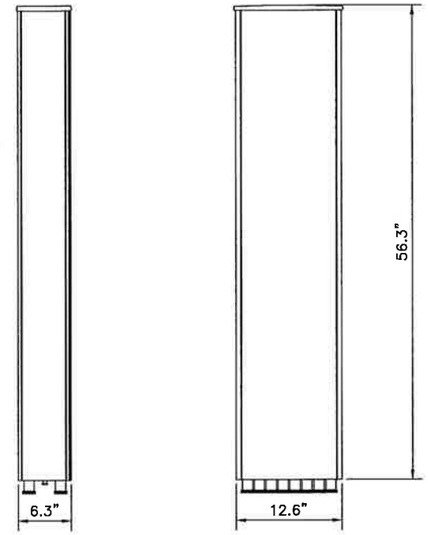
NEW EQUIPMENT IN EXISTING CABINET	NO SCALE	2

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 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD. STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:

A-5

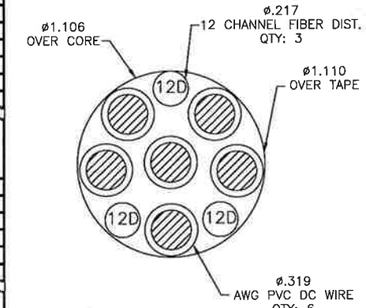
RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	**Hybrid cable** MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft
8 AWG Power	**Hybrid cable** MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	**Hybrid cable** MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	**Hybrid cable** MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

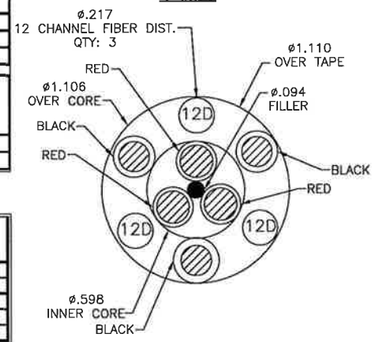
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

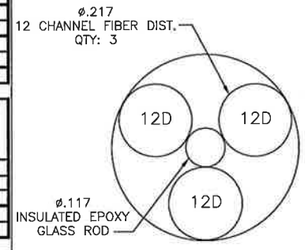
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG



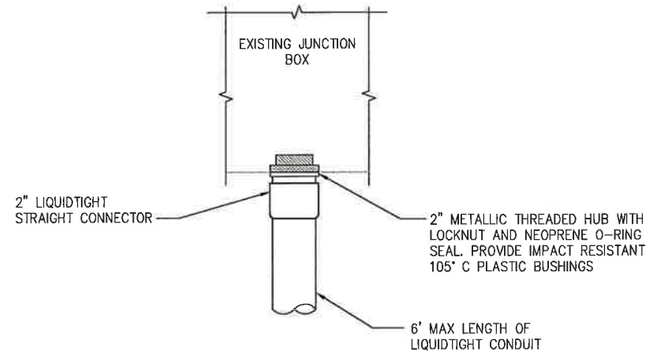
8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA

NO SCALE | 1



FIBER JUNCTION BOX PENETRATION

NO SCALE | 2

DETAIL NOT USED

NO SCALE | 3

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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Office # (518) 690-0790
Fax # (518) 690-0793

JOB NUMBER 353-000

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CROWN CASTLE

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DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
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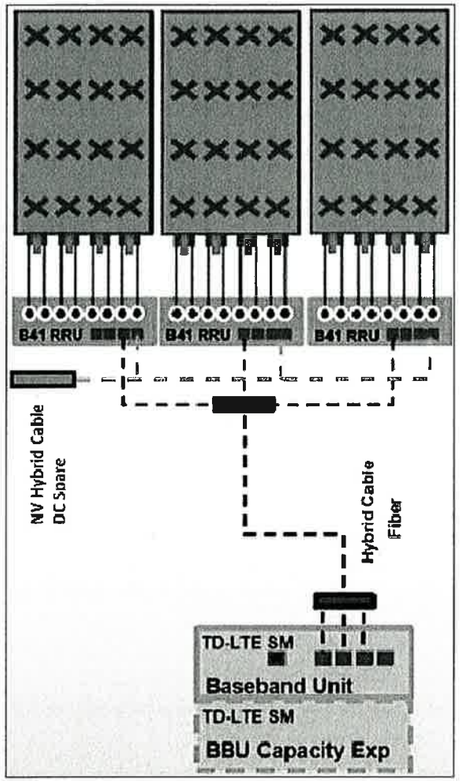
782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

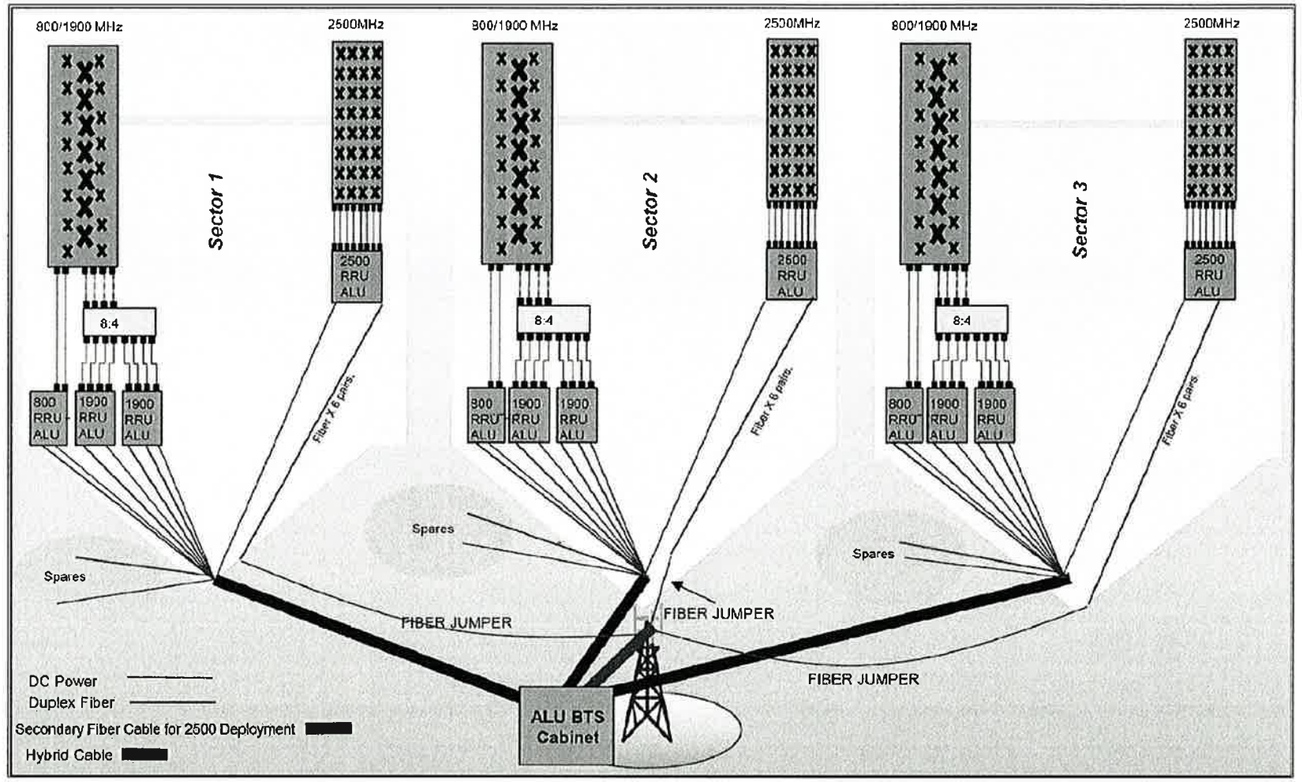
CIVIL DETAILS

SHEET NUMBER:

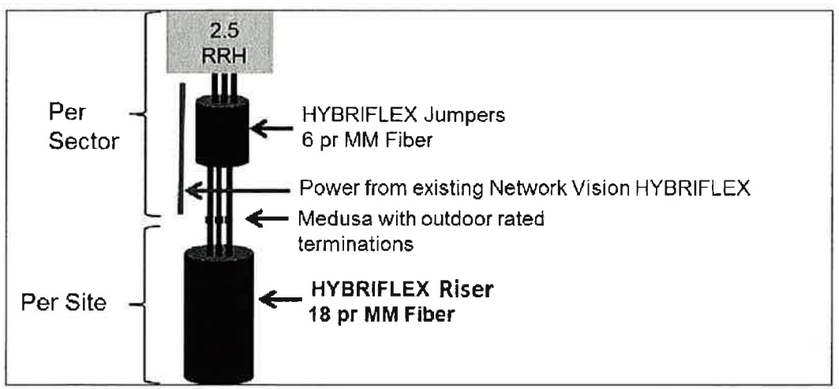
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

PLANS PREPARED FOR:

Sprint

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Overland Park, Kansas 66251

PLANS PREPARED BY:

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CT03XC155

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WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

CIVIL DETAILS

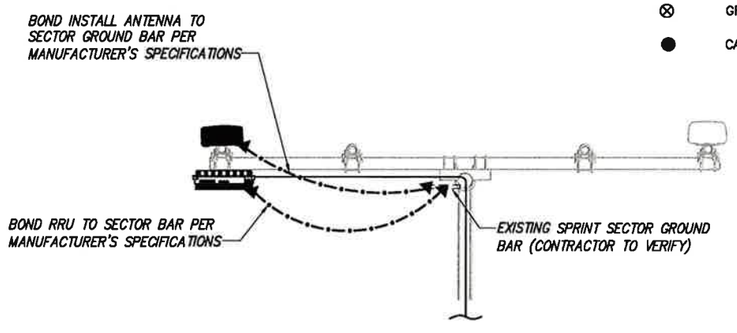
SHEET NUMBER:

A-7

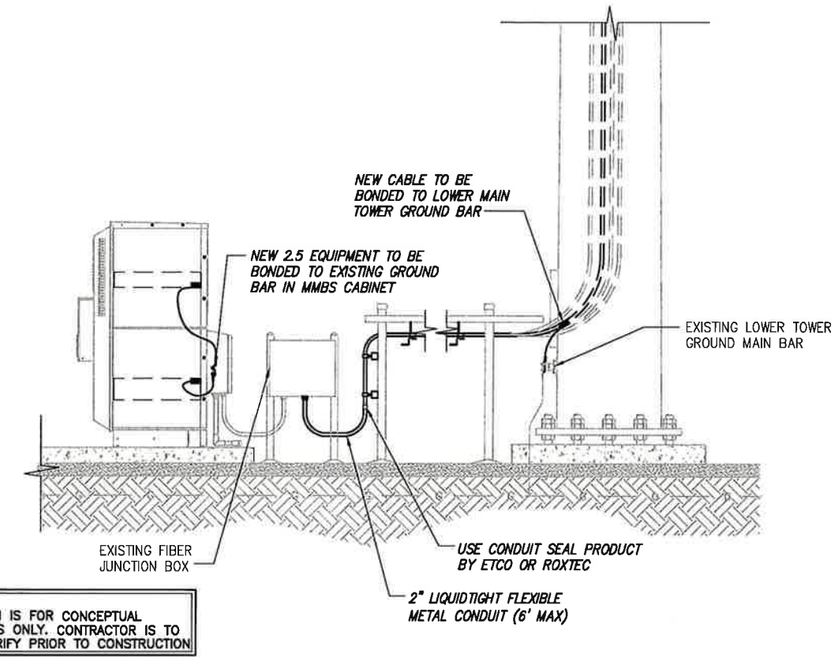
PLAN NOT USED | NO SCALE | 1

LEGEND:

—— G ——	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

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SITE CASCADE:

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SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

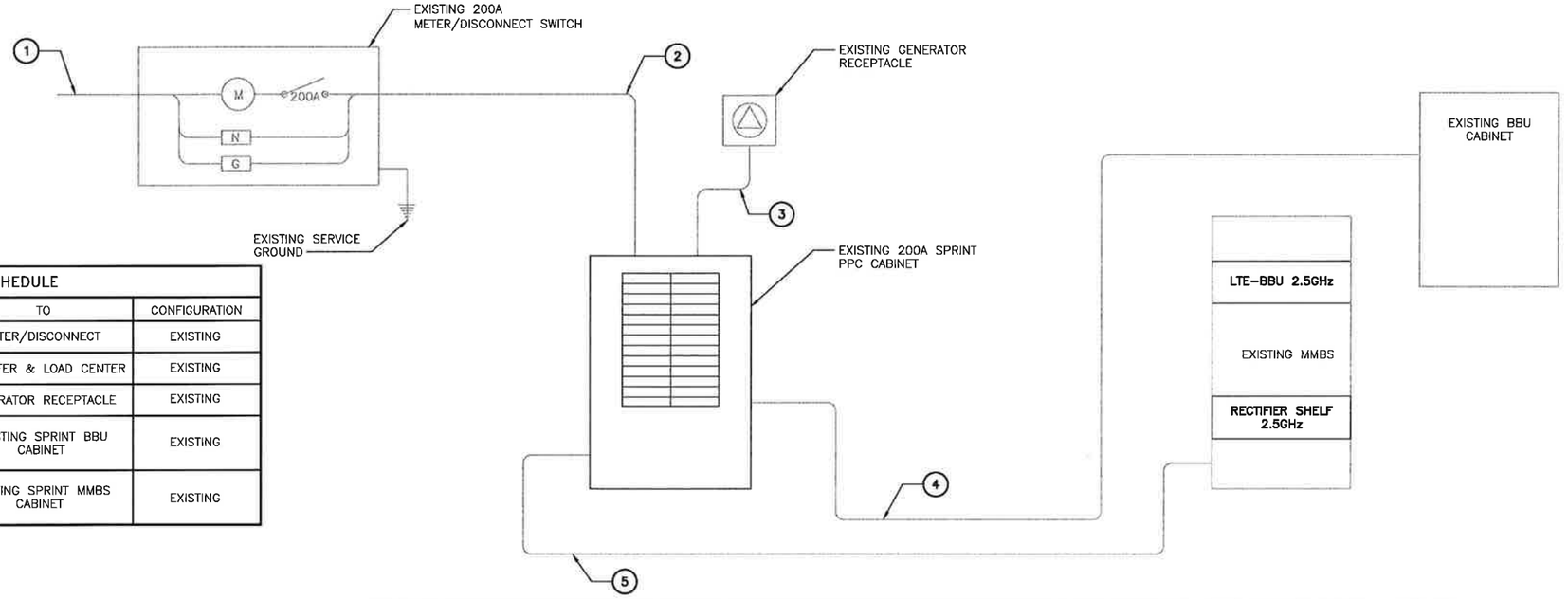
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

NOTES

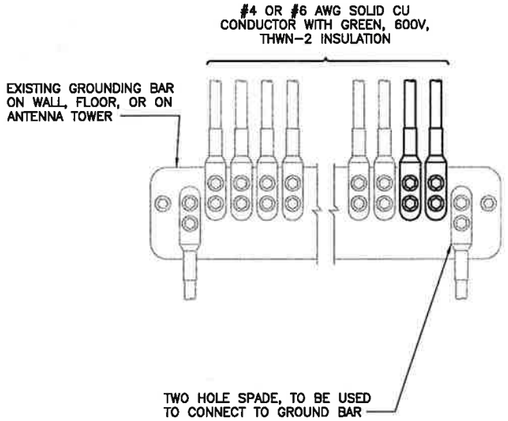
CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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

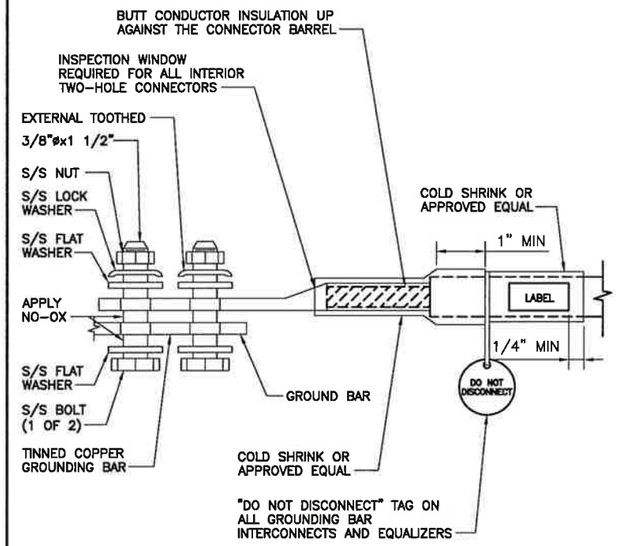
ELECTRICAL ONE–LINE DIAGRAM — NO SCALE — 1



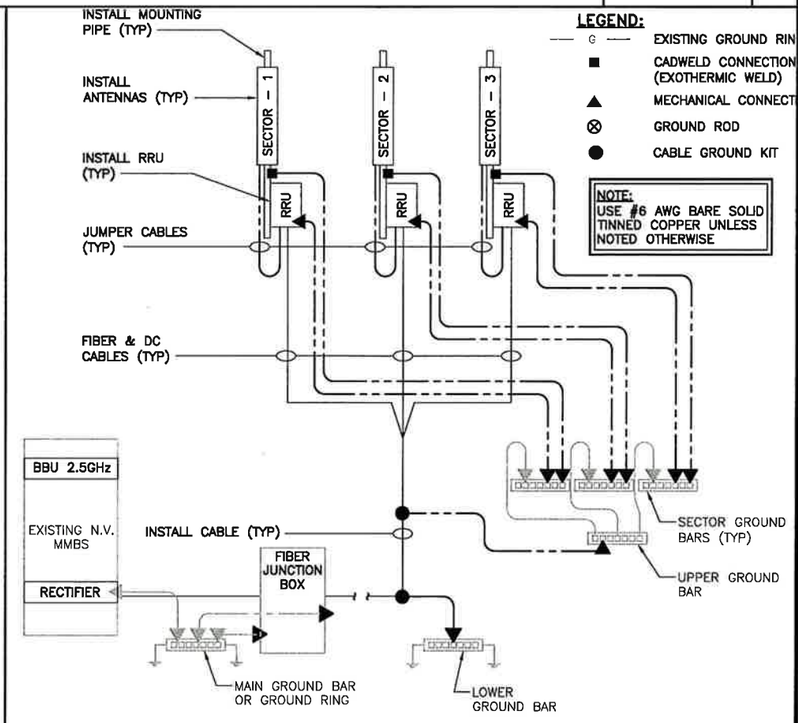
NOTES

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 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/25/14	AJD	0

SITE NAME:

POND MEADOW RD.
STABLE

SITE CASCADE:

CT03XC155

SITE ADDRESS:

782 OLD CLINTON RD
WESTBROOK, CT 06498-1767

SHEET DESCRIPTION:

ELECTRICAL &
GROUNDING DETAILS

SHEET NUMBER:

E-2

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **June 11, 2014**

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

Paul J. Ford and Company
250 East Broad Street, Suite 600
Columbus, Ohio 43215
614.221.6679

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate – Scenario 2.5A**	
	Carrier Site Number:	CT03XC155
Crown Castle Designation:	**Crown Castle BU Number:**	876339
	Crown Castle Site Name:	POND MEADOW RD. STABLE
	Crown Castle JDE Job Number:	286435
	Crown Castle Work Order Number:	758784
	Crown Castle Application Number:	245635 Rev. 3
Engineering Firm Designation:	**Paul J. Ford Project Number:**	37513-0634.002.7805
Site Data:	**782 Old Clinton Road, WESTBROOK, Middlesex County, CT** **Latitude *41° 17' 25.7"*, Longitude *-72° 28' 7.9"*** **160 Foot - Monopole Tower**	

Dear Charles Trask,

Paul J. Ford 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 652668, in accordance with application 245635, revision 3.

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:

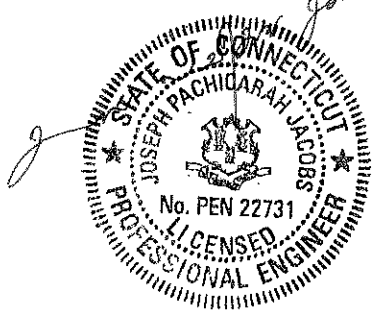
LC11: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code 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.

We at *Paul J. Ford* 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:

Kevin Mahlum, E.I.
Structural Designer



tnxTower Report - version 6.1.4.1

JUN 12 2014

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **June 11, 2014**

Charles Trask
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3530 Toringdon Way Suite 300
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Structural analysis prepared by:

Kevin Mahlum, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by VALMONT in July of 1998. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 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
159.0	160.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ 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
159.0	160.0	1	rfs celwave	APXV9ERR18-C-A20 w/ Pipe	3	1-1/4	1
		2		APXVSPP18-C-A20 w/ Pipe			
	159.0	1	tower mounts	Platform Mount [LP 602-1]			
155.0	156.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
	155.0	1	tower mounts	Side Arm Mount [SO 102-3]			
	154.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
151.0	153.0	12	allgon	7130.16 w/ Pipe	12	1-1/4	3
	151.0	1	tower mounts	T-Arm Mount [TA 602-3]			
141.0	145.0	3	ems wireless	RR65-18-02DP w/ Pipe	-	-	3
		3	ericsson	AIR 21 B2A B4P w/ Pipe	7	1-5/8	2
		3		AIR 21 B4A B2P w/ Pipe			
		3		KRY 112 144/1			
	141.0	1	tower mounts	Platform Mount [LP 602-1]	6	1-5/8	1
130.0	130.0	3	rfs celwave	APXV18-206517S-ACU w/ Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
116.0	118.0	3	alcatel lucent	RRH2X40-AWS	1	1-5/8	2
		3	andrew	HBX-6517DS-VTM w/ Pipe			
		3		LNX-6514DS-VTM w/ Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		4	antel	LPA-80063-4CF-EDIN-5 w/ Pipe	-	-	3
		2		LPA-80080-4CF-EDIN-0 w/ Pipe			
		2	antel	BXA-171063-8BF-EDIN-2 w/ Pipe	12	1-5/8	1
		3		BXA-70063-6CF-EDIN-2 w/ Pipe			
		1	swedcom	SPXW 8515 w/ Pipe			
	116.0	6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 303-1]			
96.0	103.0	1	gps	GPS_A	1	½	1
		1	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD	-	-	3
	98.0	6		DUAL BAND 800/1900 FULL BAND MASTHEAD			
		6	css	DUO1417-8686 w/ Pipe			
		3	powerwave technologies	7770.00 w/ Pipe			
		6		LGP13519			
		6		7770.00 w/ Pipe	1 2	3/8 5/8	2
		6		TT19-08BP111-001			
		6	ericsson	RRUS-11			
		3	kmw communications	AM-X-CD-14-65-00T-RET w/ Pipe			
		1	raycap	DC6-48-60-18-8F			
	96.0	1	tower mounts	T-Arm Mount [TA 602-3]	12	1-5/8	1
92.0	93.0	1	lucent	KS24019-L112A	1	1/2	1
	92.0	1	tower mounts	Side Arm Mount [SO 701-1]			
71.0	72.0	2	gps	GPS_A	2	1/2	1
	71.0	2	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment to be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 10-12295E G1, 01/10/2011	1532966	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Semaan, 17818, 07/06/1998	1533020	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont, 17618-98, 07/14/1998	1531985	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 111347, 07/18/2011	2923975	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 131001.876339, 08/23/2013	4023333	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) Monopole was reinforced in conformance with the referenced modification drawings.
5) All coax going to the 141' elevation will be installed internally.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	160 - 117.33	Pole	TP30.46x22.35x0.2188	1	-6.50	1015.10	58.1	Pass
L2	117.33 - 94	Pole	TP34.4549x29.1348x0.281	2	-13.56	1599.24	82.0	Pass
L3	94 - 82.5	Pole	TP36.64x34.4549x0.3817	3	-14.80	1970.09	75.8	Pass
L4	82.5 - 72.75	Pole	TP37.9427x34.8315x0.375	4	-18.64	2358.28	82.5	Pass
L5	72.75 - 56	Pole	TP41.1385x37.9427x0.4482	5	-22.93	2974.47	80.9	Pass
L6	56 - 40.583	Pole	TP44.08x41.1385x0.6042	6	-25.88	3331.82	79.8	Pass
L7	40.583 - 31.5	Pole	TP45.0389x41.6473x0.6915	7	-33.49	3778.19	82.7	Pass
L8	31.5 - 28.75	Pole	TP45.5593x45.0389x0.7353	8	-34.62	4065.20	78.7	Pass
L9	28.75 - 11	Pole	TP48.9184x45.5593x0.6172	9	-41.27	4203.64	86.1	Pass
L10	11 - 8.5	Pole	TP49.3915x48.9184x0.698	10	-42.35	4789.58	77.1	Pass
L11	8.5 - 0	Pole	TP51x49.3915x0.5706	11	-45.52	4349.94	89.1	Pass
							Summary	
						Pole (L11)	89.1	Pass
						Rating =	89.1	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	67.5	Pass
1	Base Plate	0	44.5	Pass
1	Base Foundation Steel Interaction	0	63.2	Pass
1	Base Foundation Soil Interaction	0	49.0	Pass

Structure Rating (max from all components) =	89.1%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.
2) Worst case scenario between existing and post installed anchors.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	160.00-117.33	42.67	4.67	12	22.3500	30.4600	0.2188	0.8752	A572-65 (65 ksi)
L2	117.33-94.00	28.00	0.00	12	29.1348	34.4549	0.2810	1.1240	A572-65 (65 ksi)
L3	94.00-82.50	11.50	5.50	12	34.4549	36.6400	0.3817	1.5269	Reinf 56.91 ksi (57 ksi)
L4	82.50-72.75	15.25	0.00	12	34.8315	37.9427	0.3750	1.5000	A572-65 (65 ksi)
L5	72.75-56.00	16.75	0.00	12	37.9427	41.1385	0.4482	1.7928	Reinf 63.33 ksi (63 ksi)
L6	56.00-40.58	15.42	6.42	12	41.1385	44.0800	0.6042	2.4167	Reinf 50.68 ksi (51 ksi)
L7	40.58-31.50	15.50	0.00	12	41.6473	45.0389	0.6915	2.7660	Reinf 47.84 ksi (48 ksi)
L8	31.50-28.75	2.75	0.00	12	45.0389	45.5593	0.7353	2.9414	Reinf 47.89 ksi (48 ksi)
L9	28.75-11.00	17.75	0.00	12	45.5593	48.9184	0.6172	2.4689	Reinf 54.75 ksi (55 ksi)
L10	11.00-8.50	2.50	0.00	12	48.9184	49.3915	0.6980	2.7919	Reinf 54.72 ksi (55 ksi)
L11	8.50-0.00	8.50		12	49.3915	51.0000	0.5706	2.2824	Reinf 58.70 ksi (59 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	23.1384	15.5922	974.7742	7.9230	11.5773	84.1970	1975.1568	7.6740	5.4034	24.696
	31.5345	21.3060	2487.0596	10.8263	15.7783	157.6255	5039.4571	10.4862	7.5769	34.629
L2	31.0812	26.1075	2774.3255	10.3297	15.0918	183.8296	5621.5357	12.8493	7.0550	25.107

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
	35.6704	30.9213	4609.2822	12.2343	17.8477	258.2570	9339.6554	15.2185	8.4808	30.181
L3	35.6704	41.8818	6206.3643	12.1982	17.8477	347.7411	12575.7767	20.6129	8.2109	21.51
	37.9325	44.5676	7478.5836	12.9805	18.9795	394.0344	15153.6378	21.9348	8.7965	23.044
L4	37.2219	41.6062	6305.0275	12.3354	18.0427	349.4499	12775.6952	20.4773	8.3298	22.213
	39.2811	45.3629	8171.7520	13.4492	19.6543	415.7744	16558.1850	22.3263	9.1636	24.436
L5	39.2811	54.1121	9709.8973	13.4230	19.6543	494.0344	19674.8844	26.6323	8.9675	20.008
	42.5897	58.7244	12410.4071	14.5671	21.3097	582.3820	25146.8495	28.9024	9.8239	21.919
L6	42.5897	78.8579	16537.7537	14.5113	21.3097	776.0656	33509.9727	38.8114	9.4059	15.568
	45.6350	84.5805	20405.7007	15.5643	22.8334	893.6761	41347.4819	41.6279	10.1942	16.873
L7	44.5701	91.1921	19524.2452	14.6622	21.5733	905.0189	39561.4140	44.8820	9.3083	13.461
	46.6277	98.7439	24787.5378	15.8764	23.3302	1062.4673	50226.2719	48.5988	10.2172	14.776
L8	46.6277	104.9018	26281.2956	15.8607	23.3302	1126.4942	53253.0300	51.6295	10.0997	13.735
	47.1665	106.1340	27218.3529	16.0470	23.5997	1153.3328	55151.7623	52.2359	10.2392	13.924
L9	47.1665	89.3216	23027.6290	16.0893	23.5997	975.7578	46660.2194	43.9614	10.5557	17.102
	50.6440	95.9976	28586.4826	17.2918	25.3397	1128.1298	57923.9640	47.2471	11.4559	18.56
L10	50.6440	108.3751	32164.4912	17.2629	25.3397	1269.3314	65173.9794	53.3389	11.2395	16.103
	51.1338	109.4384	33120.5272	17.4323	25.5848	1294.5404	67111.1675	53.8622	11.3663	16.285
L11	51.1338	89.6986	27288.6795	17.4779	25.5848	1066.5983	55294.2631	44.1469	11.7077	20.519
	52.7991	92.6539	30075.8312	18.0537	26.4180	1138.4598	60941.7881	45.6015	12.1388	21.274

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 160.00-117.33				1	1	1		
L2 117.33-94.00				1	1	1		
L3 94.00-82.50				1	1	1		
L4 82.50-72.75				1	1	1		
L5 72.75-56.00				1	1	1		
L6 56.00-40.58				1	1	1		
L7 40.58-31.50				1	1	1		
L8 31.50-28.75				1	1	1		
L9 28.75-11.00				1	1	1		
L10 11.00-8.50				1	1	1		
L11 8.50-0.00				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	Total Number		C_AA_A ft^2/ft	Weight plf
****								
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	159.00 - 0.00	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	159.00 - 0.00	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
***								
****								
LDF7-50A(1-5/8")	C	No	Inside Pole	141.00 - 0.00	6	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
AL7-50(1 5/8)	C	No	Inside Pole	141.00 - 0.00	7	No Ice	0.00	0.52
						1/2" Ice	0.00	0.52
						1" Ice	0.00	0.52
						2" Ice	0.00	0.52
						4" Ice	0.00	0.52
****								
AVA7-50(1-5/8")	C	No	Inside Pole	130.00 - 0.00	6	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
						2" Ice	0.00	0.72
						4" Ice	0.00	0.72
****								
LDF7-50A(1-5/8")	C	No	Inside Pole	116.00 - 0.00	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
LDF7-50A(1-5/8")	C	No	Inside Pole	116.00 - 0.00	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
****								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	96.00 - 0.00	2	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")	C	No	CaAa (Out Of Face)	96.00 - 0.00	10	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
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	96.00 - 0.00	1	No Ice	0.00	0.15
						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
FB-L98-002-XXX(3/8)	C	No	CaAa (Out Of	96.00 - 0.00	1	No Ice	0.00	0.06

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.00	0.61
						1" Ice	0.00	1.77
						2" Ice	0.00	5.91
						4" Ice	0.00	21.54
WR-VG82ST-BRDA(5/8")	C	No	CaAa (Out Of Face)	96.00 - 0.00	2	No Ice	0.00	0.31
						1/2" Ice	0.00	1.01
						1" Ice	0.00	2.32
						2" Ice	0.00	6.77
						4" Ice	0.00	23.01
***								
LDF4-50A(1/2")	C	No	Inside Pole	92.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
****								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	71.00 - 0.00	2	No Ice	0.00	0.15
						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
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	58.25 - 0.00	1	No Ice	0.21	0.00
						1/2" Ice	0.32	0.00
						1" Ice	0.43	0.00
						2" Ice	0.65	0.00
						4" Ice	1.10	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	74.00 - 44.00	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00
						2" Ice	0.57	0.00
						4" Ice	1.01	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	13.00 - 0.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	42.25 - 27.25	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	96.00 - 86.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
						2" Ice	0.61	0.00
						4" Ice	1.06	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	160.00-117.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.44
L2	117.33-94.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.125	0.66
L3	94.00-82.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.887	0.45
L4	82.50-72.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.017	0.38

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
L5	72.75-56.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.196	0.65
L6	56.00-40.58	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.095	0.60
L7	40.58-31.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.003	0.36
L8	31.50-28.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.120	0.11
L9	28.75-11.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.310	0.69
L10	11.00-8.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.928	0.10
L11	8.50-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.553	0.33

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	160.00-117.33	A	0.890	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.44
L2	117.33-94.00	A	0.862	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.233	0.75
L3	94.00-82.50	A	0.844	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.270	0.93
L4	82.50-72.75	A	0.831	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.543	0.79
L5	72.75-56.00	A	0.812	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.069	1.37
L6	56.00-40.58	A	0.785	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	21.008	1.24
L7	40.58-31.50	A	0.758	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	13.023	0.73
L8	31.50-28.75	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.862	0.21
L9	28.75-11.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	20.177	1.38
L10	11.00-8.50	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.511	0.19
L11	8.50-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.937	0.66

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	160.00-117.33	0.0000	0.0000	0.0000	0.0000
L2	117.33-94.00	-0.0654	0.0378	-0.1212	0.0700
L3	94.00-82.50	-0.5658	0.3267	-0.9214	0.5320
L4	82.50-72.75	-0.4725	0.2728	-0.7758	0.4479
L5	72.75-56.00	-0.6124	0.3536	-1.0258	0.5922
L6	56.00-40.58	-0.7771	0.4487	-1.2455	0.7191
L7	40.58-31.50	-0.8277	0.4779	-1.3059	0.7540
L8	31.50-28.75	-0.8317	0.4802	-1.2983	0.7496
L9	28.75-11.00	-0.7126	0.4114	-1.1185	0.6458
L10	11.00-8.50	-0.8429	0.4867	-1.3283	0.7669
L11	8.50-0.00	-0.8457	0.4883	-1.3359	0.7713

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
*****									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	7.47 8.66 9.56 11.39 15.53	0.09 0.16 0.24 0.42 0.94
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	159.00	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	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	159.00	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	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	159.00	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	0.08 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Leg	4.00 0.00 1.00	0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40

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
TD-RRH8x20-25	B	From Leg	4.00 0.00 1.00	0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Leg	4.00 0.00 1.00	0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
Platform Mount [LP 602-1]	C	None		0.0000	159.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.03 38.71 45.39 58.75 85.47	32.03 38.71 45.39 58.75 85.47	1.34 1.80 2.26 3.17 5.00
****									
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.00 0.00 1.00	0.0000	155.00	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	B	From Leg	2.00 0.00 1.00	0.0000	155.00	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 1.00	0.0000	155.00	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
800MHz 2X50W RRH W/FILTER	A	From Leg	2.00 0.00 -1.00	0.0000	155.00	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 -1.00	0.0000	155.00	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 -1.00	0.0000	155.00	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
Side Arm Mount [SO 102-3]	C	None		0.0000	155.00	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
**** ****									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00	0.0000	141.00	No Ice 1/2"	6.83 7.35	5.64 6.48	0.11 0.17

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			4.00			Ice	7.86	7.26	0.23
						1" Ice	8.93	8.86	0.38
						2" Ice	11.18	12.29	0.81
						4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 4.00	0.0000	141.00	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 4.00	0.0000	141.00	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 4.00	0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.17	5.63 6.47 7.25 8.85 12.28	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 4.00	0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.17	5.63 6.47 7.25 8.85 12.28	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 4.00	0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.82 7.34 7.85 8.92 11.17	5.63 6.47 7.25 8.85 12.28	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	A	From Leg	4.00 0.00 4.00	0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	B	From Leg	4.00 0.00 4.00	0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
KRY 112 144/1	C	From Leg	4.00 0.00 4.00	0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.41 0.50 0.59 0.81 1.36	0.20 0.27 0.35 0.53 1.00	0.01 0.01 0.02 0.03 0.08
Platform Mount [LP 602-1]	C	None		0.0000	141.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	32.03 38.71 45.39 58.75 85.47	32.03 38.71 45.39 58.75 85.47	1.34 1.80 2.26 3.17 5.00
****									
APXV18-206517S-ACU w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68

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
APXV18-206517S-ACU w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-ACU w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.05 0.10 0.15 0.28 0.68
Pipe Mount [PM 601-3]	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	0.20 0.24 0.28 0.36 0.53
****									
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	116.00	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-2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	116.00	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-2 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	116.00	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
SPXW 8515 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.48 3.89 4.31 5.18 7.07	3.86 4.45 5.11 6.46 9.46	0.03 0.07 0.11 0.21 0.52
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.18 3.56 3.96 4.85 6.77	3.35 3.97 4.60 5.89 8.89	0.03 0.06 0.10 0.19 0.49
(2) FD9R6004/2C-3L	A	From Leg	4.00 0.00 0.00	0.0000	116.00	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 0.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice	0.37 0.45 0.54 0.75	0.08 0.14 0.20 0.34	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
						2" Ice 4" Ice	1.28	0.74	0.06
(2) FD9R6004/2C-3L	C	From Leg	4.00 0.00 0.00	0.0000	116.00	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
LNX-6514DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.63 9.29 9.90 11.17 13.82	7.07 8.25 9.15 10.98 15.01	0.06 0.13 0.21 0.39 0.90
LNX-6514DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.63 9.29 9.90 11.17 13.82	7.07 8.25 9.15 10.98 15.01	0.06 0.13 0.21 0.39 0.90
LNX-6514DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.63 9.29 9.90 11.17 13.82	7.07 8.25 9.15 10.98 15.01	0.06 0.13 0.21 0.39 0.90
HBX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
HBX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
HBX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	116.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.54 6.11 6.65 7.75 10.11	5.02 6.22 7.17 9.01 12.90	0.05 0.09 0.15 0.28 0.69
DB-T1-6Z-8AB-0Z	A	From Leg	4.00 0.00 2.00	0.0000	116.00	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
RRH2X40-AWS	A	From Leg	4.00 0.00 2.00	0.0000	116.00	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	0.0000	116.00	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	0.0000	116.00	No Ice 1/2" Ice	2.52 2.75 2.99	1.59 1.80 2.01	0.04 0.06 0.08

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	3.50	2.46	0.13
						2" Ice	4.61	3.48	0.28
						4" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	116.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
						2" Ice	31.50	31.50	2.18
						4" Ice	48.34	48.34	3.10
****									
GPS_A	C	From Leg	4.00 0.00 7.00	0.0000	96.00	No Ice	0.30	0.30	0.00
						1/2" Ice	0.37	0.37	0.00
						1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
						4" Ice	1.15	1.15	0.08
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	6.12	4.25	0.06
						1/2" Ice	6.63	5.01	0.10
						1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
						4" Ice	10.36	10.41	0.66
AM-X-CD-14-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	5.74	4.02	0.05
						1/2" Ice	6.20	4.63	0.10
						1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
						4" Ice	9.67	9.74	0.63
AM-X-CD-14-65-00T-RET w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	5.74	4.02	0.05
						1/2" Ice	6.20	4.63	0.10
						1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
						4" Ice	9.67	9.74	0.63
AM-X-CD-14-65-00T-RET w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	5.74	4.02	0.05
						1/2" Ice	6.20	4.63	0.10
						1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
						4" Ice	9.67	9.74	0.63
(2) RRUS-11	A	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	3.25	1.37	0.05
						1/2" Ice	3.49	1.55	0.07
						1" Ice	3.74	1.74	0.09
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
(2) RRUS-11	B	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice	3.25	1.37	0.05
						1/2" Ice	3.49	1.55	0.07
						1" Ice	3.74	1.74	0.09
						2" Ice	4.27	2.14	0.15
						4" Ice	5.43	3.04	0.31
(2) RRUS-11	C	From Leg	4.00	0.0000	96.00	No Ice	3.25	1.37	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00 2.00			1/2" Ice 1" Ice 2" Ice 4" Ice	3.49 3.74 4.27 5.43	1.55 1.74 2.14 3.04	0.07 0.09 0.15 0.31
(2) TT19-08BP111-001	A	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.64 0.76 0.88 1.14 1.78	0.52 0.62 0.74 0.99 1.59	0.02 0.02 0.03 0.05 0.12
(2) TT19-08BP111-001	B	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.64 0.76 0.88 1.14 1.78	0.52 0.62 0.74 0.99 1.59	0.02 0.02 0.03 0.05 0.12
(2) TT19-08BP111-001	C	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.64 0.76 0.88 1.14 1.78	0.52 0.62 0.74 0.99 1.59	0.02 0.02 0.03 0.05 0.12
DC6-48-60-18-8F	A	From Leg	4.00 0.00 2.00	0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.22 2.44 2.66 3.15 4.21	2.22 2.44 2.66 3.15 4.21	0.02 0.04 0.06 0.12 0.27
T-Arm Mount [TA 602-3]	C	None		0.0000	96.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.59 15.44 19.29 26.99 42.39	11.59 15.44 19.29 26.99 42.39	0.77 0.99 1.21 1.64 2.50
****									
KS24019-L112A	C	From Leg	4.00 0.00 1.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.16 0.22 0.30 0.48 0.95	0.16 0.22 0.30 0.48 0.95	0.01 0.01 0.01 0.02 0.06
Side Arm Mount [SO 701-1]	C	None		0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18
****									
GPS_A	B	From Leg	4.00 0.00 1.00	0.0000	71.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
GPS_A	C	From Leg	4.00 0.00 1.00	0.0000	71.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08
Side Arm Mount [SO 701-1]	B	None		0.0000	71.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43 2.01	1.67 2.34 3.01 4.35	0.07 0.08 0.09 0.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.17	7.03	0.18
						4" Ice			
Side Arm Mount [SO 701-1]	C	None		0.0000	71.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
******									

Tower Pressures - No Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 160.00-117.33	137.81	1.504	28	93.892	A	0.000	93.892	93.892	100.00	0.000	0.000
					B	0.000	93.892		100.00	0.000	0.000
					C	0.000	93.892		100.00	0.000	0.000
L2 117.33-94.00	105.40	1.393	26	62.677	A	0.000	62.677	62.677	100.00	0.000	0.000
					B	0.000	62.677		100.00	0.000	0.000
					C	0.000	62.677		100.00	0.000	1.125
L3 94.00-82.50	88.19	1.324	24	34.066	A	0.000	34.066	34.066	100.00	0.000	0.000
					B	0.000	34.066		100.00	0.000	0.000
					C	0.000	34.066		100.00	0.000	5.887
L4 82.50-72.75	77.58	1.277	24	30.020	A	0.000	30.020	30.020	100.00	0.000	0.000
					B	0.000	30.020		100.00	0.000	0.000
					C	0.000	30.020		100.00	0.000	4.017
L5 72.75-56.00	64.26	1.21	22	55.192	A	0.000	55.192	55.192	100.00	0.000	0.000
					B	0.000	55.192		100.00	0.000	0.000
					C	0.000	55.192		100.00	0.000	9.196
L6 56.00-40.58	48.20	1.114	21	54.742	A	0.000	54.742	54.742	100.00	0.000	0.000
					B	0.000	54.742		100.00	0.000	0.000
					C	0.000	54.742		100.00	0.000	11.095
L7 40.58-31.50	36.01	1.025	19	33.339	A	0.000	33.339	33.339	100.00	0.000	0.000
					B	0.000	33.339		100.00	0.000	0.000
					C	0.000	33.339		100.00	0.000	7.003
L8 31.50-28.75	30.12	1	18	10.381	A	0.000	10.381	10.381	100.00	0.000	0.000
					B	0.000	10.381		100.00	0.000	0.000
					C	0.000	10.381		100.00	0.000	2.120
L9 28.75-11.00	19.77	1	18	69.874	A	0.000	69.874	69.874	100.00	0.000	0.000
					B	0.000	69.874		100.00	0.000	0.000
					C	0.000	69.874		100.00	0.000	11.310
L10 11.00-8.50	9.75	1	18	10.241	A	0.000	10.241	10.241	100.00	0.000	0.000
					B	0.000	10.241		100.00	0.000	0.000
					C	0.000	10.241		100.00	0.000	1.928
L11 8.50-0.00	4.23	1	18	35.555	A	0.000	35.555	35.555	100.00	0.000	0.000
					B	0.000	35.555		100.00	0.000	0.000
					C	0.000	35.555		100.00	0.000	6.553

Tower Pressure - With Ice

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 160.00-117.33	137.81	1.504	5	0.8903	100.224	A	0.000	100.224	100.224	100.00	0.000	0.000
						B	0.000	100.224		100.00	0.000	0.000
						C	0.000	100.224		100.00	0.000	0.000
L2 117.33-94.00	105.40	1.393	5	0.8621	66.139	A	0.000	66.139	66.139	100.00	0.000	0.000
						B	0.000	66.139		100.00	0.000	0.000
						C	0.000	66.139		100.00	0.000	2.233
L3 94.00-82.50	88.19	1.324	5	0.8439	35.684	A	0.000	35.684	35.684	100.00	0.000	0.000
						B	0.000	35.684		100.00	0.000	0.000
						C	0.000	35.684		100.00	0.000	11.270
L4 82.50-72.75	77.58	1.277	5	0.8310	31.392	A	0.000	31.392	31.392	100.00	0.000	0.000
						B	0.000	31.392		100.00	0.000	0.000
						C	0.000	31.392		100.00	0.000	7.543
L5 72.75-56.00	64.26	1.21	4	0.8124	57.460	A	0.000	57.460	57.460	100.00	0.000	0.000
						B	0.000	57.460		100.00	0.000	0.000
						C	0.000	57.460		100.00	0.000	18.069
L6 56.00-40.58	48.20	1.114	4	0.7849	56.759	A	0.000	56.759	56.759	100.00	0.000	0.000
						B	0.000	56.759		100.00	0.000	0.000
						C	0.000	56.759		100.00	0.000	21.008
L7 40.58-31.50	36.01	1.025	4	0.7579	34.527	A	0.000	34.527	34.527	100.00	0.000	0.000
						B	0.000	34.527		100.00	0.000	0.000
						C	0.000	34.527		100.00	0.000	13.023
L8 31.50-28.75	30.12	1	4	0.7500	10.725	A	0.000	10.725	10.725	100.00	0.000	0.000
						B	0.000	10.725		100.00	0.000	0.000
						C	0.000	10.725		100.00	0.000	3.862
L9 28.75-11.00	19.77	1	4	0.7500	72.093	A	0.000	72.093	72.093	100.00	0.000	0.000
						B	0.000	72.093		100.00	0.000	0.000
						C	0.000	72.093		100.00	0.000	20.177
L10 11.00-8.50	9.75	1	4	0.7500	10.553	A	0.000	10.553	10.553	100.00	0.000	0.000
						B	0.000	10.553		100.00	0.000	0.000
						C	0.000	10.553		100.00	0.000	3.511
L11 8.50-0.00	4.23	1	4	0.7500	36.618	A	0.000	36.618	36.618	100.00	0.000	0.000
						B	0.000	36.618		100.00	0.000	0.000
						C	0.000	36.618		100.00	0.000	11.937

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 160.00-117.33	137.81	1.504	10	93.892	A	0.000	93.892	93.892	100.00	0.000	0.000
					B	0.000	93.892		100.00	0.000	0.000
					C	0.000	93.892		100.00	0.000	0.000
L2 117.33-94.00	105.40	1.393	9	62.677	A	0.000	62.677	62.677	100.00	0.000	0.000
					B	0.000	62.677		100.00	0.000	0.000
					C	0.000	62.677		100.00	0.000	1.125
L3 94.00-82.50	88.19	1.324	8	34.066	A	0.000	34.066	34.066	100.00	0.000	0.000
					B	0.000	34.066		100.00	0.000	0.000
					C	0.000	34.066		100.00	0.000	5.887
L4 82.50-72.75	77.58	1.277	8	30.020	A	0.000	30.020	30.020	100.00	0.000	0.000
					B	0.000	30.020		100.00	0.000	0.000
					C	0.000	30.020		100.00	0.000	4.017
L5 72.75-56.00	64.26	1.21	8	55.192	A	0.000	55.192	55.192	100.00	0.000	0.000
					B	0.000	55.192		100.00	0.000	0.000
					C	0.000	55.192		100.00	0.000	9.196
L6 56.00-40.58	48.20	1.114	7	54.742	A	0.000	54.742	54.742	100.00	0.000	0.000
					B	0.000	54.742		100.00	0.000	0.000
					C	0.000	54.742		100.00	0.000	11.095
L7 40.58-31.50	36.01	1.025	7	33.339	A	0.000	33.339	33.339	100.00	0.000	0.000
					B	0.000	33.339		100.00	0.000	0.000
					C	0.000	33.339		100.00	0.000	7.003

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L8 31.50-28.75	30.12	1	6	10.381	A	0.000	10.381	10.381	100.00	0.000	0.000
					B	0.000	10.381		100.00	0.000	0.000
					C	0.000	10.381		100.00	0.000	2.120
L9 28.75-11.00	19.77	1	6	69.874	A	0.000	69.874	69.874	100.00	0.000	0.000
					B	0.000	69.874		100.00	0.000	0.000
					C	0.000	69.874		100.00	0.000	11.310
L10 11.00-8.50	9.75	1	6	10.241	A	0.000	10.241	10.241	100.00	0.000	0.000
					B	0.000	10.241		100.00	0.000	0.000
					C	0.000	10.241		100.00	0.000	1.928
L11 8.50-0.00	4.23	1	6	35.555	A	0.000	35.555	35.555	100.00	0.000	0.000
					B	0.000	35.555		100.00	0.000	0.000
					C	0.000	35.555		100.00	0.000	6.553

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	160 - 117.33	Pole	Max Tension	36	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
			Max. Compression	14	-12.60	-0.04	-0.02
			Max. Mx	5	-6.51	-348.06	0.44
			Max. My	8	-6.50	0.41	-348.59
			Max. Vy	11	-13.76	347.98	-0.43
			Max. Vx	2	-13.78	-0.46	348.54
			Max. Torque	9			0.12
L2	117.33 - 94	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24.47	0.14	0.79
			Max. Mx	5	-13.58	-897.88	1.01
			Max. My	2	-13.56	-0.75	902.45
			Max. Vy	11	-25.01	897.87	-0.52
			Max. Vx	8	25.17	0.77	-901.89
			Max. Torque	11			-1.08
L3	94 - 82.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.15	0.58	0.53
			Max. Mx	11	-14.81	1050.93	-0.64
			Max. My	2	-14.80	-0.72	1056.26
			Max. Vy	11	-25.96	1050.93	-0.64
			Max. Vx	8	26.12	0.94	-1055.83
			Max. Torque	11			-1.08
L4	82.5 - 72.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-31.27	1.63	-0.07
			Max. Mx	11	-18.66	1464.48	-0.94
			Max. My	2	-18.64	-0.68	1471.83
			Max. Vy	11	-28.18	1464.48	-0.94
			Max. Vx	8	28.34	1.34	-1471.65
			Max. Torque	11			-1.02
L5	72.75 - 56	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.73	2.91	-0.86
			Max. Mx	11	-22.94	1958.77	-1.28
			Max. My	8	-22.93	1.80	-1968.41
			Max. Vy	11	-30.72	1958.77	-1.28
			Max. Vx	8	30.87	1.80	-1968.41
			Max. Torque	11			-0.98
L6	56 - 40.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.30	3.63	-1.27
			Max. Mx	11	-25.88	2241.10	-1.47
			Max. My	8	-25.88	2.05	-2252.06
			Max. Vy	11	-32.02	2241.10	-1.47
			Max. Vx	8	32.17	2.05	-2252.06
			Max. Torque	4			0.87
L7	40.583 - 31.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-49.31	4.90	-2.01
			Max. Mx	11	-33.50	2755.94	-1.80
			Max. My	8	-33.49	2.50	-2769.17
			Max. Vy	11	-34.30	2755.94	-1.80
			Max. Vx	8	34.46	2.50	-2769.17
			Max. Torque	4			0.87
L8	31.5 - 28.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-50.63	5.12	-2.13
			Max. Mx	11	-34.63	2850.80	-1.86
			Max. My	8	-34.62	2.58	-2864.43
			Max. Vy	11	-34.68	2850.80	-1.86
			Max. Vx	8	34.83	2.58	-2864.43
			Max. Torque	4			0.87
L9	28.75 - 11	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-58.41	6.63	-3.00
			Max. Mx	11	-41.28	3486.45	-2.25
			Max. My	8	-41.27	3.12	-3502.64
			Max. Vy	11	-36.95	3486.45	-2.25
			Max. Vx	8	37.10	3.12	-3502.64
			Max. Torque	3			0.90
L10	11 - 8.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-59.65	6.85	-3.13
			Max. Mx	11	-42.35	3579.26	-2.31
			Max. My	8	-42.35	3.19	-3595.80
			Max. Vy	11	-37.29	3579.26	-2.31
			Max. Vx	8	37.44	3.19	-3595.80

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	3			0.91
L11	8.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-63.35	7.62	-3.57
			Max. Mx	11	-45.52	3900.97	-2.50
			Max. My	8	-45.52	3.46	-3918.73
			Max. Vy	11	-38.40	3900.97	-2.50
			Max. Vx	8	38.55	3.46	-3918.73
			Max. Torque	3			0.97

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	63.35	0.00	-0.00
	Max. H_x	11	45.53	38.39	-0.01
	Max. H_z	2	45.53	-0.01	38.54
	Max. M_x	2	3917.41	-0.01	38.54
	Max. M_z	5	3897.74	-38.39	0.01
	Max. Torsion	3	0.97	-19.21	33.38
	Min. Vert	8	45.53	0.01	-38.54
	Min. H_x	5	45.53	-38.39	0.01
	Min. H_z	8	45.53	0.01	-38.54
	Min. M_x	8	-3918.73	0.01	-38.54
	Min. M_z	11	-3900.97	38.39	-0.01
	Min. Torsion	9	-0.96	19.21	-33.38

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	45.53	-0.00	0.00	0.65	1.59	0.00
Dead+Wind 0 deg - No Ice	45.53	0.01	-38.54	-3917.41	-0.23	-0.81
Dead+Wind 30 deg - No Ice	45.53	19.21	-33.38	-3393.85	-1949.89	-0.97
Dead+Wind 60 deg - No Ice	45.53	33.25	-19.28	-1960.23	-3376.66	-0.87
Dead+Wind 90 deg - No Ice	45.53	38.39	-0.01	-1.18	-3897.74	-0.53
Dead+Wind 120 deg - No Ice	45.53	33.24	19.26	1958.36	-3374.82	-0.05
Dead+Wind 150 deg - No Ice	45.53	19.19	33.37	3393.33	-1946.70	0.44
Dead+Wind 180 deg - No Ice	45.53	-0.01	38.54	3918.73	3.46	0.81
Dead+Wind 210 deg - No Ice	45.53	-19.21	33.38	3395.16	1953.11	0.96
Dead+Wind 240 deg - No Ice	45.53	-33.25	19.28	1961.55	3379.89	0.86
Dead+Wind 270 deg - No Ice	45.53	-38.39	0.01	2.50	3900.97	0.53
Dead+Wind 300 deg - No Ice	45.53	-33.24	-19.26	-1957.04	3378.06	0.06
Dead+Wind 330 deg - No Ice	45.53	-19.19	-33.37	-3392.01	1949.93	-0.43
Dead+Ice+Temp	63.35	-0.00	0.00	3.57	7.62	0.00
Dead+Wind 0 deg+Ice+Temp	63.35	0.00	-8.97	-931.38	7.48	-0.31
Dead+Wind 30 deg+Ice+Temp	63.35	4.47	-7.77	-806.30	-458.00	-0.29
Dead+Wind 60 deg+Ice+Temp	63.35	7.74	-4.49	-464.19	-798.65	-0.20
Dead+Wind 90 deg+Ice+Temp	63.35	8.94	-0.00	3.27	-923.21	-0.05
Dead+Wind 120 deg+Ice+Temp	63.35	7.74	4.48	470.84	-798.28	0.11
Dead+Wind 150 deg+Ice+Temp	63.35	4.47	7.77	813.22	-457.35	0.24
Dead+Wind 180 deg+Ice+Temp	63.35	-0.00	8.97	938.68	8.23	0.31
Dead+Wind 210	63.35	-4.47	7.77	813.62	473.73	0.29

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+Ice+Temp						
Dead+Wind 240 deg+Ice+Temp	63.35	-7.74	4.49	471.50	814.39	0.20
Dead+Wind 270 deg+Ice+Temp	63.35	-8.94	0.00	4.02	938.92	0.05
Dead+Wind 300 deg+Ice+Temp	63.35	-7.74	-4.48	-463.55	814.02	-0.11
Dead+Wind 330 deg+Ice+Temp	63.35	-4.47	-7.77	-805.94	473.08	-0.24
Dead+Wind 0 deg - Service	45.53	0.00	-13.33	-1356.40	0.98	-0.28
Dead+Wind 30 deg - Service	45.53	6.65	-11.55	-1175.01	-674.27	-0.34
Dead+Wind 60 deg - Service	45.53	11.51	-6.67	-678.48	-1168.42	-0.30
Dead+Wind 90 deg - Service	45.53	13.28	-0.00	0.02	-1348.95	-0.18
Dead+Wind 120 deg - Service	45.53	11.50	6.66	678.69	-1167.78	-0.02
Dead+Wind 150 deg - Service	45.53	6.64	11.55	1175.68	-673.17	0.15
Dead+Wind 180 deg - Service	45.53	-0.00	13.33	1357.71	2.25	0.28
Dead+Wind 210 deg - Service	45.53	-6.65	11.55	1176.32	677.51	0.33
Dead+Wind 240 deg - Service	45.53	-11.51	6.67	679.80	1171.65	0.30
Dead+Wind 270 deg - Service	45.53	-13.28	0.00	1.30	1352.18	0.18
Dead+Wind 300 deg - Service	45.53	-11.50	-6.66	-677.38	1171.01	0.02
Dead+Wind 330 deg - Service	45.53	-6.64	-11.55	-1174.37	676.40	-0.15

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	-45.53	0.00	0.00	45.53	0.00	0.000%
2	0.01	-45.53	-38.54	-0.01	45.53	38.54	0.007%
3	19.21	-45.53	-33.38	-19.21	45.53	33.38	0.000%
4	33.25	-45.53	-19.28	-33.25	45.53	19.28	0.000%
5	38.39	-45.53	-0.01	-38.39	45.53	0.01	0.007%
6	33.24	-45.53	19.26	-33.24	45.53	-19.26	0.000%
7	19.19	-45.53	33.37	-19.19	45.53	-33.37	0.000%
8	-0.01	-45.53	38.54	0.01	45.53	-38.54	0.007%
9	-19.21	-45.53	33.38	19.21	45.53	-33.38	0.000%
10	-33.25	-45.53	19.28	33.25	45.53	-19.28	0.000%
11	-38.39	-45.53	0.01	38.39	45.53	-0.01	0.007%
12	-33.24	-45.53	-19.26	33.24	45.53	19.26	0.000%
13	-19.19	-45.53	-33.37	19.19	45.53	33.37	0.000%
14	0.00	-63.35	0.00	0.00	63.35	-0.00	0.000%
15	0.00	-63.35	-8.97	-0.00	63.35	8.97	0.000%
16	4.47	-63.35	-7.77	-4.47	63.35	7.77	0.000%
17	7.74	-63.35	-4.49	-7.74	63.35	4.49	0.000%
18	8.94	-63.35	-0.00	-8.94	63.35	0.00	0.000%
19	7.74	-63.35	4.48	-7.74	63.35	-4.48	0.000%
20	4.47	-63.35	7.77	-4.47	63.35	-7.77	0.000%
21	-0.00	-63.35	8.97	0.00	63.35	-8.97	0.000%
22	-4.47	-63.35	7.77	4.47	63.35	-7.77	0.000%
23	-7.74	-63.35	4.49	7.74	63.35	-4.49	0.000%
24	-8.94	-63.35	0.00	8.94	63.35	-0.00	0.000%
25	-7.74	-63.35	-4.48	7.74	63.35	4.48	0.000%
26	-4.47	-63.35	-7.77	4.47	63.35	7.77	0.000%
27	0.00	-45.53	-13.34	-0.00	45.53	13.33	0.003%
28	6.65	-45.53	-11.55	-6.65	45.53	11.55	0.001%
29	11.51	-45.53	-6.67	-11.51	45.53	6.67	0.001%
30	13.28	-45.53	-0.00	-13.28	45.53	0.00	0.003%
31	11.50	-45.53	6.66	-11.50	45.53	-6.66	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
32	6.64	-45.53	11.55	-6.64	45.53	-11.55	0.001%
33	-0.00	-45.53	13.34	0.00	45.53	-13.33	0.003%
34	-6.65	-45.53	11.55	6.65	45.53	-11.55	0.001%
35	-11.51	-45.53	6.67	11.51	45.53	-6.67	0.001%
36	-13.28	-45.53	0.00	13.28	45.53	-0.00	0.003%
37	-11.50	-45.53	-6.66	11.50	45.53	6.66	0.001%
38	-6.64	-45.53	-11.55	6.64	45.53	11.55	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	13	0.00008120	0.00009259
3	Yes	17	0.00000001	0.00011734
4	Yes	17	0.00000001	0.00011985
5	Yes	13	0.00008125	0.00012554
6	Yes	17	0.00000001	0.00011705
7	Yes	17	0.00000001	0.00011837
8	Yes	13	0.00008120	0.00009596
9	Yes	17	0.00000001	0.00011977
10	Yes	17	0.00000001	0.00011710
11	Yes	13	0.00008124	0.00011854
12	Yes	17	0.00000001	0.00011910
13	Yes	17	0.00000001	0.00011795
14	Yes	6	0.00000001	0.00000001
15	Yes	15	0.00000001	0.00013694
16	Yes	15	0.00000001	0.00014954
17	Yes	15	0.00000001	0.00014941
18	Yes	15	0.00000001	0.00013578
19	Yes	15	0.00000001	0.00014942
20	Yes	15	0.00000001	0.00014986
21	Yes	15	0.00000001	0.00013732
22	Yes	16	0.00000001	0.00006450
23	Yes	16	0.00000001	0.00006433
24	Yes	15	0.00000001	0.00013735
25	Yes	16	0.00000001	0.00006416
26	Yes	16	0.00000001	0.00006420
27	Yes	13	0.00008538	0.00004215
28	Yes	14	0.00000001	0.00009525
29	Yes	14	0.00000001	0.00010185
30	Yes	13	0.00008539	0.00004559
31	Yes	14	0.00000001	0.00009510
32	Yes	14	0.00000001	0.00009850
33	Yes	13	0.00008537	0.00004223
34	Yes	14	0.00000001	0.00010158
35	Yes	14	0.00000001	0.00009466
36	Yes	13	0.00008538	0.00004403
37	Yes	14	0.00000001	0.00010046
38	Yes	14	0.00000001	0.00009737

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 117.33	33.877	33	1.9008	0.0010
L2	122 - 94	19.518	33	1.6092	0.0012
L3	94 - 82.5	11.161	33	1.1863	0.0007
L4	88 - 72.75	9.725	33	1.0976	0.0006

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L5	72.75 - 56	6.508	33	0.8830	0.0004
L6	56 - 40.583	3.858	33	0.6260	0.0002
L7	47 - 31.5	2.778	33	0.5197	0.0002
L8	31.5 - 28.75	1.282	33	0.3814	0.0001
L9	28.75 - 11	1.071	33	0.3529	0.0001
L10	11 - 8.5	0.162	33	0.1366	0.0000
L11	8.5 - 0	0.098	33	0.1098	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	APXVSPP18-C-A20 w/ Mount Pipe	33	33.482	1.8954	0.0010	32811
155.00	PCS 1900MHz 4x45W-65MHz	33	31.902	1.8740	0.0010	32811
141.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	33	26.447	1.7886	0.0012	8634
130.00	APXV18-206517S-ACU w/ Mount Pipe	33	22.342	1.6973	0.0012	5467
116.00	BXA-70063-6CF-EDIN-2 w/ Mount Pipe	33	17.514	1.5288	0.0011	3974
96.00	GPS_A	33	11.667	1.2172	0.0007	3193
92.00	KS24019-L112A	33	10.670	1.1561	0.0007	3689
71.00	GPS_A	33	6.186	0.8563	0.0004	3377

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 117.33	97.639	8	5.4801	0.0029
L2	122 - 94	56.284	8	4.6405	0.0034
L3	94 - 82.5	32.194	8	3.4224	0.0020
L4	88 - 72.75	28.055	8	3.1666	0.0017
L5	72.75 - 56	18.777	8	2.5477	0.0012
L6	56 - 40.583	11.132	8	1.8062	0.0007
L7	47 - 31.5	8.016	8	1.4997	0.0005
L8	31.5 - 28.75	3.701	8	1.1008	0.0004
L9	28.75 - 11	3.091	8	1.0184	0.0003
L10	11 - 8.5	0.468	8	0.3943	0.0001
L11	8.5 - 0	0.282	8	0.3169	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
159.00	APXVSPP18-C-A20 w/ Mount Pipe	8	96.500	5.4648	0.0029	11576
155.00	PCS 1900MHz 4x45W-65MHz	8	91.949	5.4030	0.0030	11576
141.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	8	76.241	5.1571	0.0034	3044
130.00	APXV18-206517S-ACU w/ Mount Pipe	8	64.419	4.8940	0.0035	1925
116.00	BXA-70063-6CF-EDIN-2 w/ Mount Pipe	8	50.509	4.4090	0.0032	1396

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
96.00	GPS_A	8	33.654	3.5115	0.0022	1116
92.00	KS24019-L112A	8	30.779	3.3352	0.0019	1289
71.00	GPS_A	8	17.849	2.4708	0.0011	1175

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	160 - 117.33 (1)	TP30.46x22.35x0.2188	42.67	0.00	0.0	36.823	20.6807	-6.50	761.52	0.009
L2	117.33 - 94 (2)	TP34.4549x29.1348x0.281	28.00	0.00	0.0	38.800	30.9213	-13.56	1199.73	0.011
L3	94 - 82.5 (3)	TP36.64x34.4549x0.3817	11.50	0.00	0.0	34.146	43.2831	-14.80	1477.94	0.010
L4	82.5 - 72.75 (4)	TP37.9427x34.8315x0.375	15.25	0.00	0.0	39.000	45.3629	-18.64	1769.15	0.011
L5	72.75 - 56 (5)	TP41.1385x37.9427x0.4482	16.75	0.00	0.0	37.998	58.7244	-22.93	2231.41	0.010
L6	56 - 40.583 (6)	TP44.08x41.1385x0.6042	15.42	0.00	0.0	30.408	82.1985	-25.88	2499.49	0.010
L7	40.583 - 31.5 (7)	TP45.0389x41.6473x0.6915	15.50	0.00	0.0	28.704	98.7439	-33.49	2834.35	0.012
L8	31.5 - 28.75 (8)	TP45.5593x45.0389x0.7353	2.75	0.00	0.0	28.734	106.1340	-34.62	3049.66	0.011
L9	28.75 - 11 (9)	TP48.9184x45.5593x0.6172	17.75	0.00	0.0	32.850	95.9976	-41.27	3153.52	0.013
L10	11 - 8.5 (10)	TP49.3915x48.9184x0.698	2.50	0.00	0.0	32.832	109.4380	-42.35	3593.08	0.012
L11	8.5 - 0 (11)	TP51x49.3915x0.5706	8.50	0.00	0.0	35.220	92.6539	-45.52	3263.27	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	160 - 117.33 (1)	TP30.46x22.35x0.2188	348.85	28.195	36.823	0.766	0.00	0.000	36.823	0.000
L2	117.33 - 94 (2)	TP34.4549x29.1348x0.281	902.45	41.932	38.800	1.081	0.00	0.000	38.800	0.000
L3	94 - 82.5 (3)	TP36.64x34.4549x0.3817	1056.27	34.116	34.146	0.999	0.00	0.000	34.146	0.000
L4	82.5 - 72.75 (4)	TP37.9427x34.8315x0.375	1471.83	42.480	39.000	1.089	0.00	0.000	39.000	0.000
L5	72.75 - 56 (5)	TP41.1385x37.9427x0.4482	1968.41	40.559	37.998	1.067	0.00	0.000	37.998	0.000
L6	56 - 40.583 (6)	TP44.08x41.1385x0.6042	2252.06	32.031	30.408	1.053	0.00	0.000	30.408	0.000
L7	40.583 - 31.5 (7)	TP45.0389x41.6473x0.6915	2769.17	31.276	28.704	1.090	0.00	0.000	28.704	0.000
L8	31.5 - 28.75 (8)	TP45.5593x45.0389x0.7353	2864.43	29.803	28.734	1.037	0.00	0.000	28.734	0.000
L9	28.75 - 11 (9)	TP48.9184x45.5593x0.6172	3502.64	37.258	32.850	1.134	0.00	0.000	32.850	0.000
L10	11 - 8.5 (10)	TP49.3915x48.9184x0.698	3595.81	33.332	32.832	1.015	0.00	0.000	32.832	0.000
L11	8.5 - 0 (11)	TP51x49.3915x0.5706	3918.72	41.306	35.220	1.173	0.00	0.000	35.220	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	160 - 117.33 (1)	TP30.46x22.35x0.2188	13.79	0.667	26.000	0.052	0.12	0.005	26.000	0.000
L2	117.33 - 94 (2)	TP34.4549x29.1348x0.281	25.17	0.814	26.000	0.064	0.03	0.001	26.000	0.000
L3	94 - 82.5 (3)	TP36.64x34.4549x0.3817	26.12	0.603	22.764	0.054	0.04	0.001	22.764	0.000
L4	82.5 - 72.75 (4)	TP37.9427x34.8315x0.375	28.34	0.625	26.000	0.049	0.13	0.002	26.000	0.000
L5	72.75 - 56 (5)	TP41.1385x37.9427x0.4482	30.87	0.526	25.332	0.042	0.26	0.003	25.332	0.000
L6	56 - 40.583 (6)	TP44.08x41.1385x0.6042	32.17	0.391	20.272	0.039	0.35	0.002	20.272	0.000
L7	40.583 - 31.5 (7)	TP45.0389x41.6473x0.6915	34.46	0.349	19.136	0.037	0.50	0.003	19.136	0.000
L8	31.5 - 28.75 (8)	TP45.5593x45.0389x0.7353	34.83	0.328	19.156	0.035	0.53	0.003	19.156	0.000
L9	28.75 - 11 (9)	TP48.9184x45.5593x0.6172	37.10	0.386	21.900	0.036	0.69	0.003	21.900	0.000
L10	11 - 8.5 (10)	TP49.3915x48.9184x0.698	37.44	0.342	21.888	0.032	0.71	0.003	21.888	0.000
L11	8.5 - 0 (11)	TP51x49.3915x0.5706	38.55	0.416	23.480	0.036	0.81	0.004	23.480	0.000

Pole Interaction Design Data

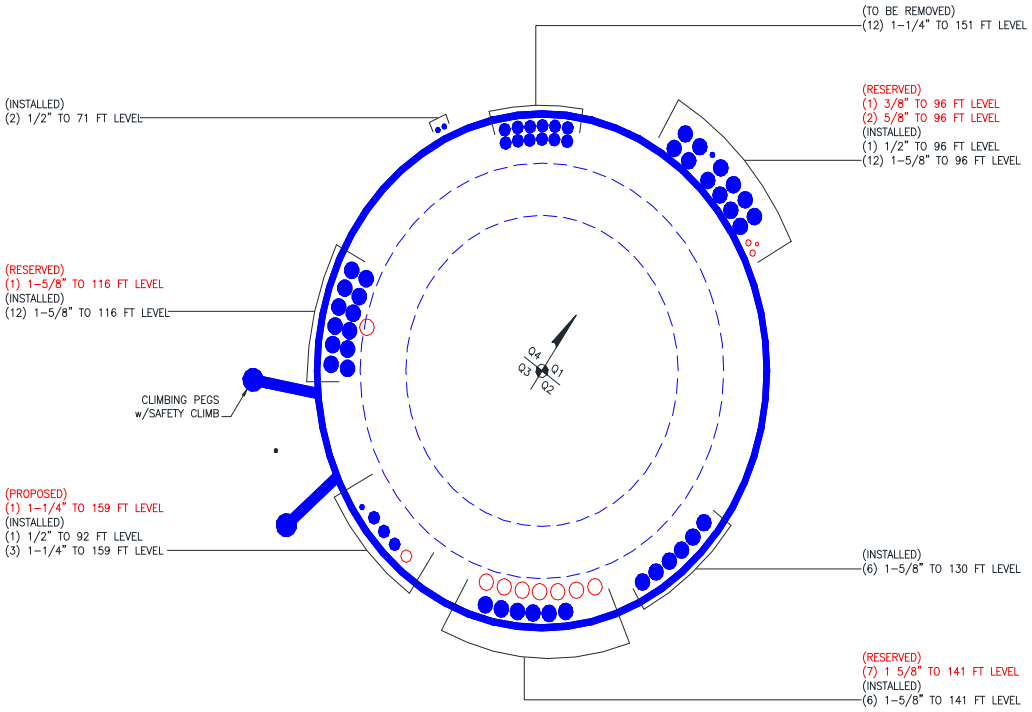
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 117.33 (1)	0.009	0.766	0.000	0.052	0.000	0.775 ✔	1.333	H1-3+VT ✔
L2	117.33 - 94 (2)	0.011	1.081	0.000	0.064	0.000	1.093 ✔	1.333	H1-3+VT ✔
L3	94 - 82.5 (3)	0.010	0.999	0.000	0.054	0.000	1.010 ✔	1.333	H1-3+VT ✔
L4	82.5 - 72.75 (4)	0.011	1.089	0.000	0.049	0.000	1.100 ✔	1.333	H1-3+VT ✔
L5	72.75 - 56 (5)	0.010	1.067	0.000	0.042	0.000	1.078 ✔	1.333	H1-3+VT ✔
L6	56 - 40.583 (6)	0.010	1.053	0.000	0.039	0.000	1.064 ✔	1.333	H1-3+VT ✔
L7	40.583 - 31.5 (7)	0.012	1.090	0.000	0.037	0.000	1.102 ✔	1.333	H1-3+VT ✔
L8	31.5 - 28.75 (8)	0.011	1.037	0.000	0.035	0.000	1.049 ✔	1.333	H1-3+VT ✔
L9	28.75 - 11 (9)	0.013	1.134	0.000	0.036	0.000	1.148 ✔	1.333	H1-3+VT ✔
L10	11 - 8.5 (10)	0.012	1.015	0.000	0.032	0.000	1.027 ✔	1.333	H1-3+VT ✔
L11	8.5 - 0 (11)	0.014	1.173	0.000	0.036	0.000	1.187 ✔	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	160 - 117.33	Pole	TP30.46x22.35x0.2188	1	-6.50	1015.10	58.1	Pass
L2	117.33 - 94	Pole	TP34.4549x29.1348x0.281	2	-13.56	1599.24	82.0	Pass
L3	94 - 82.5	Pole	TP36.64x34.4549x0.3817	3	-14.80	1970.09	75.8	Pass
L4	82.5 - 72.75	Pole	TP37.9427x34.8315x0.375	4	-18.64	2358.28	82.5	Pass
L5	72.75 - 56	Pole	TP41.1385x37.9427x0.4482	5	-22.93	2974.47	80.9	Pass
L6	56 - 40.583	Pole	TP44.08x41.1385x0.6042	6	-25.88	3331.82	79.8	Pass
L7	40.583 - 31.5	Pole	TP45.0389x41.6473x0.6915	7	-33.49	3778.19	82.7	Pass
L8	31.5 - 28.75	Pole	TP45.5593x45.0389x0.7353	8	-34.62	4065.20	78.7	Pass
L9	28.75 - 11	Pole	TP48.9184x45.5593x0.6172	9	-41.27	4203.64	86.1	Pass
L10	11 - 8.5	Pole	TP49.3915x48.9184x0.698	10	-42.35	4789.58	77.1	Pass
L11	8.5 - 0	Pole	TP51x49.3915x0.5706	11	-45.52	4349.94	89.1	Pass
							Summary	
						Pole (L11)	89.1	Pass
						RATING =	**89.1**	**Pass**

APPENDIX B

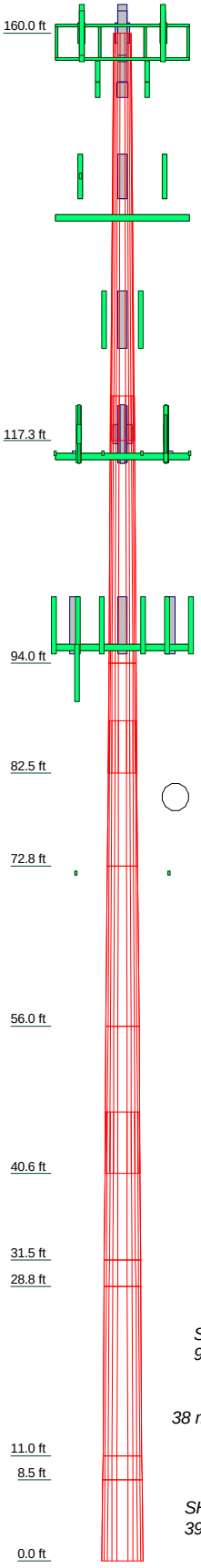
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9	10	11
Length (ft)	42.67	28.00	11.50	15.25	16.75	15.42	15.50	2.75	17.75	2.50	8.50
Number of Sides	12	12	12	12	12	12	12	12	12	12	12
Thickness (in)	0.2188	0.2810	0.3817	0.3750	0.4482	0.6042	0.6915	0.7353	0.6172	0.6980	0.5706
Socket Length (ft)	4.67		5.50			6.42					
Top Dia (in)	22.3500	29.1348	34.4549	34.8315	37.9427	41.1385	41.6473	45.0389	45.5593	48.9184	49.3915
Bot Dia (in)	30.4600	34.4549	36.6400	37.9427	41.1385	44.0800	45.0389	45.5593	48.9184	49.3915	51.0000
Grade	A572-65		Reinf 56.91 ksi		A572-65	Reinf 63.33 ksi	Reinf 50.68 ksi	Reinf 47.84 ksi	Reinf 47.89 ksi	Reinf 54.75 ksi	Reinf 58.70 ksi
Weight (K)	2.7	2.7	1.7	2.3	3.2	4.3	5.0	1.0	5.6	0.9	2.6



AXIAL 63 K
SHEAR 9 K
MOMENT 941 kip-ft
TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE
AXIAL 46 K
SHEAR 39 K
MOMENT 3919 kip-ft
TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	159	SPXW 8515 w/ Mount Pipe	116
APXV9ERR18-C-A20 w/ Mount Pipe	159	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	116
APXVSPP18-C-A20 w/ Mount Pipe	159	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	116
APXVTM14-C-120 w/ Mount Pipe	159	(2) FD9R6004/2C-3L	116
APXVTM14-C-120 w/ Mount Pipe	159	(2) FD9R6004/2C-3L	116
APXVTM14-C-120 w/ Mount Pipe	159	(2) FD9R6004/2C-3L	116
TD-RRH8x20-25	159	LNX-6514DS-VTM w/ Mount Pipe	116
TD-RRH8x20-25	159	LNX-6514DS-VTM w/ Mount Pipe	116
TD-RRH8x20-25	159	LNX-6514DS-VTM w/ Mount Pipe	116
Platform Mount [LP 602-1]	159	HBX-6517DS-VTM w/ Mount Pipe	116
PCS 1900MHz 4x45W-65MHz	155	HBX-6517DS-VTM w/ Mount Pipe	116
PCS 1900MHz 4x45W-65MHz	155	HBX-6517DS-VTM w/ Mount Pipe	116
PCS 1900MHz 4x45W-65MHz	155	DB-T1-6Z-8AB-0Z	116
800MHz 2X50W RRH W/FILTER	155	RRH2X40-AWS	116
800MHz 2X50W RRH W/FILTER	155	RRH2X40-AWS	116
800MHz 2X50W RRH W/FILTER	155	RRH2X40-AWS	116
Side Arm Mount [SO 102-3]	155	Platform Mount [LP 303-1]	116
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	141	GPS_A	96
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	141	(2) 7770.00 w/ Mount Pipe	96
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	141	(2) 7770.00 w/ Mount Pipe	96
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	141	(2) 7770.00 w/ Mount Pipe	96
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	141	AM-X-CD-14-65-00T-RET w/ Mount Pipe	96
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	141	AM-X-CD-14-65-00T-RET w/ Mount Pipe	96
KRY 112 144/1	141	AM-X-CD-14-65-00T-RET w/ Mount Pipe	96
KRY 112 144/1	141	(2) RRUS-11	96
KRY 112 144/1	141	(2) RRUS-11	96
Platform Mount [LP 602-1]	141	(2) RRUS-11	96
APXV18-206517S-ACU w/ Mount Pipe	130	(2) TT19-08BP111-001	96
APXV18-206517S-ACU w/ Mount Pipe	130	(2) TT19-08BP111-001	96
APXV18-206517S-ACU w/ Mount Pipe	130	(2) TT19-08BP111-001	96
Pipe Mount [PM 601-3]	130	DC6-48-60-18-8F	96
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	116	T-Arm Mount [TA 602-3]	96
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	116	KS24019-L112A	92
BXA-70063-6CF-EDIN-2 w/ Mount Pipe	116	Side Arm Mount [SO 701-1]	92
		GPS_A	71
		GPS_A	71
		Side Arm Mount [SO 701-1]	71
		Side Arm Mount [SO 701-1]	71

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	Reinf 47.89 ksi	48 ksi	60 ksi
Reinf 56.91 ksi	57 ksi	72 ksi	Reinf 54.75 ksi	55 ksi	69 ksi
Reinf 63.33 ksi	63 ksi	80 ksi	Reinf 54.72 ksi	55 ksi	69 ksi
Reinf 50.68 ksi	51 ksi	64 ksi	Reinf 58.70 ksi	59 ksi	74 ksi
Reinf 47.84 ksi	48 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex 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: 89.1%

Paul J. Ford
250 East Broad Street, Suite 600
Columbus, Ohio 43215
Phone: 614.221.6679
FAX: 614.448.4118

Job: **160-Ft Monopole / Pond Meadow**			
Project: **37511-0419 / BU# 876339**			
Client: Crown Castle	Drawn by: Kevin Mahlum	App'd:	
Code: TIA/EIA-222-F	Date: 06/11/14	Scale: NTS	
Path: G:\TOWER\375_Crown_Castle\2013\37513-0634 BU 876339\WO 758784 BU 876339 - 002 SA\37513-0634.002.eri		Dwg No. E-1	

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v4.0 - Effective 1-12-12

Date: 6/11/2014
PJF Project: 37513-0634.002
Client Ref. # BU 876339
Site Name: Pond Meadow
Description: 160 Ft Monopole
Owner: CCI
Engineer: KMM

Asymmetric Anchor Rod Analysis

Moment =	3919	k-ft	TIA Ref.	F	Location =	Base Plate		
Axial =	46.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9	
Shear =	39.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	25							

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Anchor Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
2	2.250	#18J A615 Gr 75	75	100	22.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
3	2.250	#18J A615 Gr 75	75	100	45.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
4	2.250	#18J A615 Gr 75	75	100	67.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
5	2.250	#18J A615 Gr 75	75	100	90.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
6	2.250	#18J A615 Gr 75	75	100	112.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
7	2.250	#18J A615 Gr 75	75	100	135.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
8	2.250	#18J A615 Gr 75	75	100	157.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
9	2.250	#18J A615 Gr 75	75	100	180.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
10	2.250	#18J A615 Gr 75	75	100	202.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
11	2.250	#18J A615 Gr 75	75	100	225.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
12	2.250	#18J A615 Gr 75	75	100	247.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
13	2.250	#18J A615 Gr 75	75	100	270.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
14	2.250	#18J A615 Gr 75	75	100	292.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
15	2.250	#18J A615 Gr 75	75	100	315.0	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
16	2.250	#18J A615 Gr 75	75	100	337.5	59.30	0.00	3.98	133.12	129.04	129.04	0.00	195.00	66.2%
17	2.000	A193 Gr B7	105	125	15.0	65.80	0.00	3.14	116.42	113.19	113.19	0.00	172.79	65.5%
18	2.000	A193 Gr B7	105	125	45.0	65.80	0.00	3.14	116.42	113.19	113.19	0.00	172.79	65.5%
19	2.000	A193 Gr B7	105	125	135.0	65.80	0.00	3.14	116.42	113.19	113.19	0.00	172.79	65.5%
20	2.000	A193 Gr B7	105	125	165.0	65.80	0.00	3.14	116.42	113.19	113.19	0.00	172.79	65.5%
21	2.000	A193 Gr B7	105	125	255.0	65.80	0.00	3.14	116.42	113.19	113.19	0.00	172.79	65.5%
22	2.000	A193 Gr B7	105	125	285.0	65.80	0.00	3.14	116.42	113.19	113.19	0.00	172.79	65.5%
23	1.750	F1554 Gr 105	105	125	105.0	67.80	0.00	2.41	91.80	89.34	89.34	0.00	132.29	67.5%
24	1.750	F1554 Gr 105	105	125	225.0	67.80	0.00	2.41	91.80	89.34	89.34	0.00	132.29	67.5%
25	1.750	F1554 Gr 105	105	125	345.0	67.80	0.00	2.41	91.80	89.34	89.34	0.00	132.29	67.5%
								89.75						

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

TIA Rev F

Site Data

BU#:	*876339*
Site Name:	
App #:	
Pole Manufacturer:	*Other*

Reactions		
Moment:	2590.9	ft-kips
Axial:	32.6	kips
Shear:	27.7	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	59.3	in

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

Anchor Rod Results

Maximum Rod Tension:	129.0	Kips	Rigid
Allowable Tension:	195.0	Kips	Service, ASD
Anchor Rod Stress Ratio:	66.2%	**Pass**	Fty*ASIF

Plate Data		
Diam:	65.3	in
Thick:	2.75	in
Grade:	60	ksi
Single-Rod B-eff:	10.25	in

Base Plate Results Flexural Check

Base Plate Stress:	26.7	ksi	Rigid
Allowable Plate Stress:	60.0	ksi	Service ASD
Base Plate Stress Ratio:	44.5%	**Pass**	0.75*Fy*ASIF
			Y.L. Length: 30.26

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

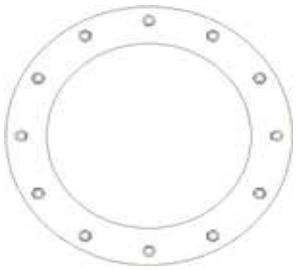
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	51	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	



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

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

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v4.1 - Effective 7-3-12

Date: 6/11/2014
PJF Project: 37513-0634
Client Ref. # 876339
Site Name: Pond Meadow Rd. Stable
Description: 160' Pole
Owner: CCI
Engineer: KMM

Asymmetric Anchor Rod Analysis

Moment =	5562	k-ft	TIA Ref.	F	Location =	Base Plate	
Axial =	0.0	kips	ASIF =	1.3333	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	0.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	4						

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.750	Williams R71	127.7	150	45.0	322.44	0.00	2.66	207.00	207.00	207.00	207.00	207.00	100.0%
2	1.750	Williams R71	127.7	150	135.0	322.44	0.00	2.66	207.00	207.00	207.00	207.00	207.00	100.0%
3	1.750	Williams R71	127.7	150	225.0	322.44	0.00	2.66	207.00	207.00	207.00	207.00	207.00	100.0%
4	1.750	Williams R71	127.7	150	315.0	322.44	0.00	2.66	207.00	207.00	207.00	207.00	207.00	100.0%
								10.65						

Capacity of Rock Anchors to add to resisting overturning moment

Foundation Loads:

Pole weight or tower leg compression =	**46**	(kips)
Horizontal load at top of pier =	**39**	(kips)
Overturning moment at top of pier=	**3919**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**110**	(pcf)
Allowable soil bearing =	**15**	(ksf)
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**R**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**7.5**	(ft)
Footing thickness =	**3.5**	(ft)
Footing width =	**23**	(ft)
Footing length =	**23**	(ft)

Concrete:

Concrete strength =	**4**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

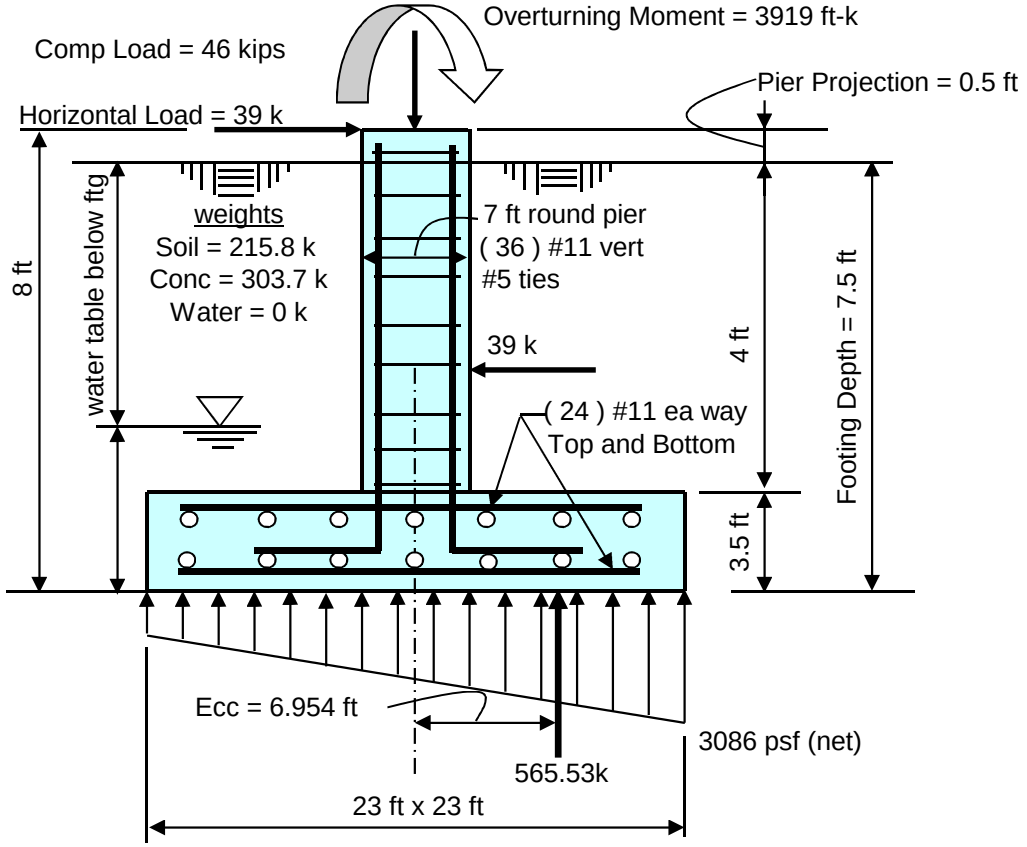
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#11**	bar
quantity of pad rebar =	**24**	(ea direction)

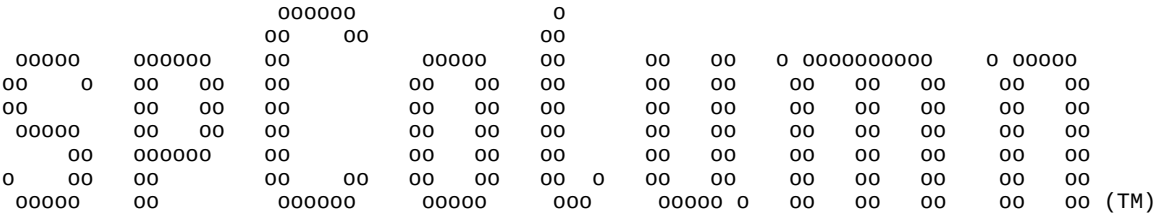
Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#11**	bar
vertical rebar quantity =	**36**	
size of pier ties =	**#5**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 75.0 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 3.086 ksf Allowable Net Soil Bearing = 15 ksf **Soil Bearing Stress Ratio = 0.21 Okay**	Ult Bending Shear Capacity = 126 psi Ult Bending Shear Stress = 40 psi **Bending Shear Stress Ratio = 0.31 Okay**
Ftg Overturning Resistance ** = 12066 ft-kips Overturning Moment = 3933 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 3.068 **Ratio = 0.49 Okay** ** Includes Resistance from Rock Anchors	Pad Bending Moment Capacity= 6022 ft-k Pad Bending Moment = 1852 ft-k **Bending Moment Stress Ratio = 0.31 OK**



spColumn v4.80 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: G:\TOWER\375_Crown_Castle\2013\37513-0634 BU 876339\WO 758784 BU 87...\37513-0634.002.col
Project:
Column: Engineer:
Code: ACI 318-11 Units: English

Run Option: Investigation Slenderness: Not considered
Run Axis: X-axis Column Type: Structural

Material Properties:
==========
f'c = 3 ksi fy = 60 ksi
Ec = 3122.02 ksi Es = 29000 ksi
Ultimate strain = 0.003 in/in
Beta1 = 0.85

Section:
========
Circular: Diameter = 84 in

Gross section area, Ag = 5541.77 in^2
Ix = 2.44392e+006 in^4 Iy = 2.44392e+006 in^4
rx = 21 in ry = 21 in
Xo = 0 in Yo = 0 in

Reinforcement:
==========
Bar Set: ASTM A615

Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)	Size	Diam (in)	Area (in^2)
# 3	0.38	0.11	# 4	0.50	0.20	# 5	0.63	0.31
# 6	0.75	0.44	# 7	0.88	0.60	# 8	1.00	0.79
# 9	1.13	1.00	# 10	1.27	1.27	# 11	1.41	1.56
# 14	1.69	2.25	# 18	2.26	4.00			

Confinement: Tied; #3 ties with #10 bars, #4 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Layout: Circular
Pattern: All Sides Equal (Cover to transverse reinforcement)
Total steel area: As = 56.16 in^2 at rho = 1.01%
Minimum clear spacing = 5.18 in

36 #11 Cover = 3 in

Factored Loads and Moments with Corresponding Capacities:
==========

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	46.00	5322.85	8426.50	1.583	17.43	79.79	0.01073	0.900

*** End of output ***

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

Sprint Existing Facility

Site ID: CT03XC155

Pond Meadow Road Stable

782 Old Clinton Road
Westbrook, CT 06498

July 2, 2014

EBI Project Number: 62143750

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

EBI Consulting
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July 2, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC155 - Pond Meadow Road Stable

Site Total: 64.35% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 782 Old Clinton Road, Westbrook, 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 782 Old Clinton Road, Westbrook, 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) 3 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 **160 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	CT03XC155 - Pond Meadow Road Stable
Site Addresss	782 Old Clinton Road, Westbrook, CT, 06498
Site Type	Guyed Tower

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	3	60	5.9	160	154	1/2 "	0.5	0	208.04	0.32%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	160	154	1/2 "	0.5	0	39.00	0.10%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	160	154	1/2 "	0.5	0	138.69	0.37%
														Sector total Power Density Value:		0.79%

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	3	60	5.9	160	154	1/2 "	0.5	0	208.04	0.32%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	160	154	1/2 "	0.5	0	39.00	0.10%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	160	154	1/2 "	0.5	0	138.69	0.37%
														Sector total Power Density Value:		0.79%

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	3	60	5.9	160	154	1/2 "	0.5	0	208.04	0.32%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	160	154	1/2 "	0.5	0	39.00	0.10%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	160	154	1/2 "	0.5	0	138.69	0.37%
														Sector total Power Density Value:		0.79%

Site Composite MPE %	
Carrier	MPE %
Sprint	2.37%
Nextel	2.47%
T-Mobile	0.16%
MetroPCS	4.03%
Verizon Wireless	26.72%
AT&T	28.60%
Total Site MPE %	**64.35%**

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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 **2.37% (0.79% from sector 1, 0.79% from sector 2 and 0.79% 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 **64.35%** 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.

Scott Heffernan
RF Engineering Director

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