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

June 26, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 876382**
Sprint PCS Site ID: CT33XC536
Located at: 1684 Chamberlain Highway, Berlin, CT 06037

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 Mrs. Denise McNair, Manager for Town of Berlin.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **1684 Chamberlain Highway, Berlin, CT 06037**. 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: Mrs. Denise McNair, Manager
Town of Berlin
240 Kensington Road
Berlin, CT 06037

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	BERLIN / LAVIANA ORCHARD
SITE CASCADE:	CT33XC536
SITE NUMBER:	876382
SITE ADDRESS:	1684 CHAMBERLAIN HIGHWAY BERLIN, CT 06037
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° 35' 23.07" N
41.589742°

LONGITUDE (NAD83):
72° 48' 19.2" W
-72.805556°

COUNTY:
HARTFORD

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
MR-1

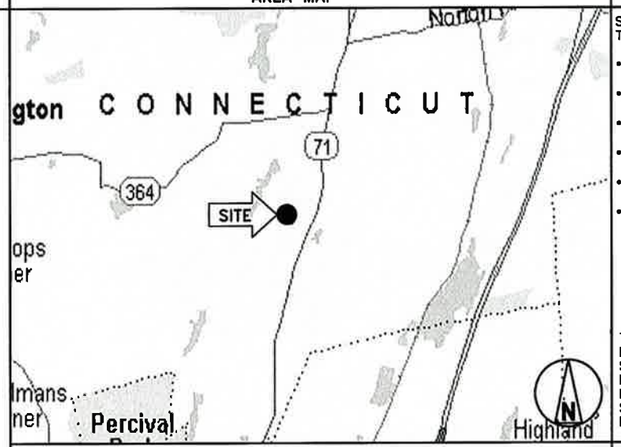
POWER COMPANY:
CONNECTICUT LIGHT & POWER
(860) 947-2000

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

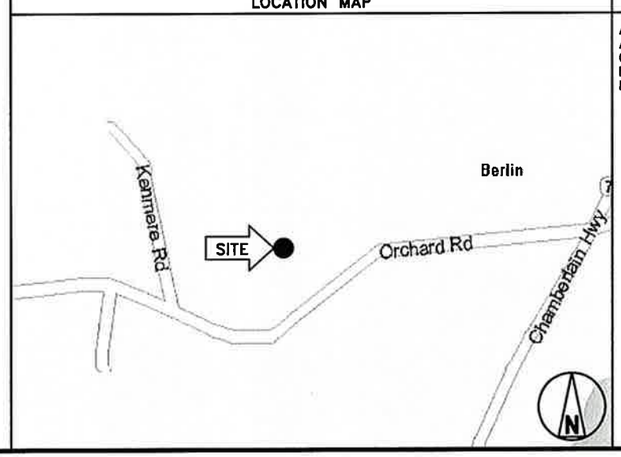
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
peter.culbert@sprint.com

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
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:
BERLIN / LAVIANA ORCHARD

SITE CASCADE:
CT33XC536

SITE ADDRESS:
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:
BERLIN / LAVIANA ORCHARD

SITE CASCADE:
CT33XC536

SITE ADDRESS:
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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

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Overland Park, Kansas 66251

PLANS PREPARED BY:

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Albany, NY 12205
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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
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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.

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Albany, NY 12205
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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
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

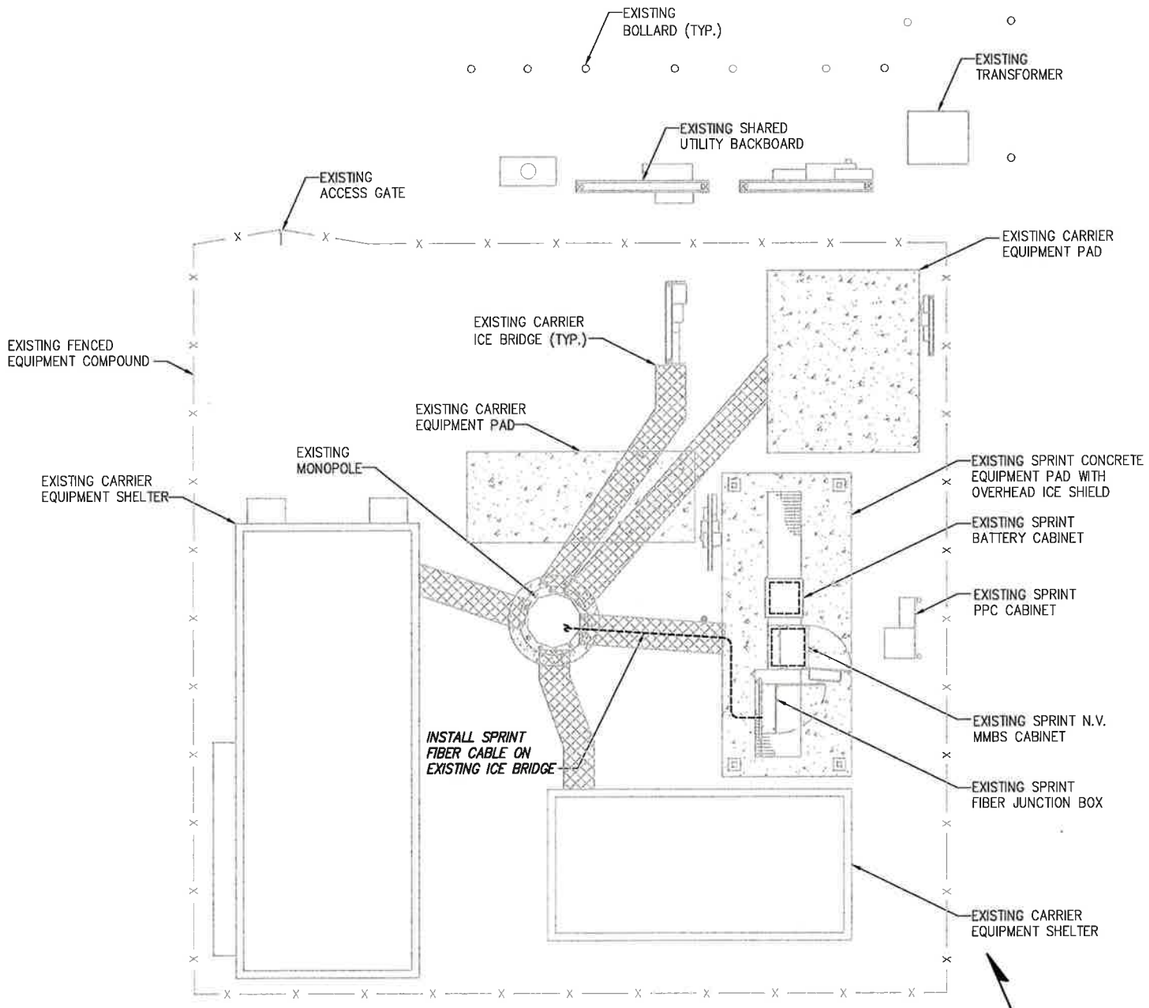
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

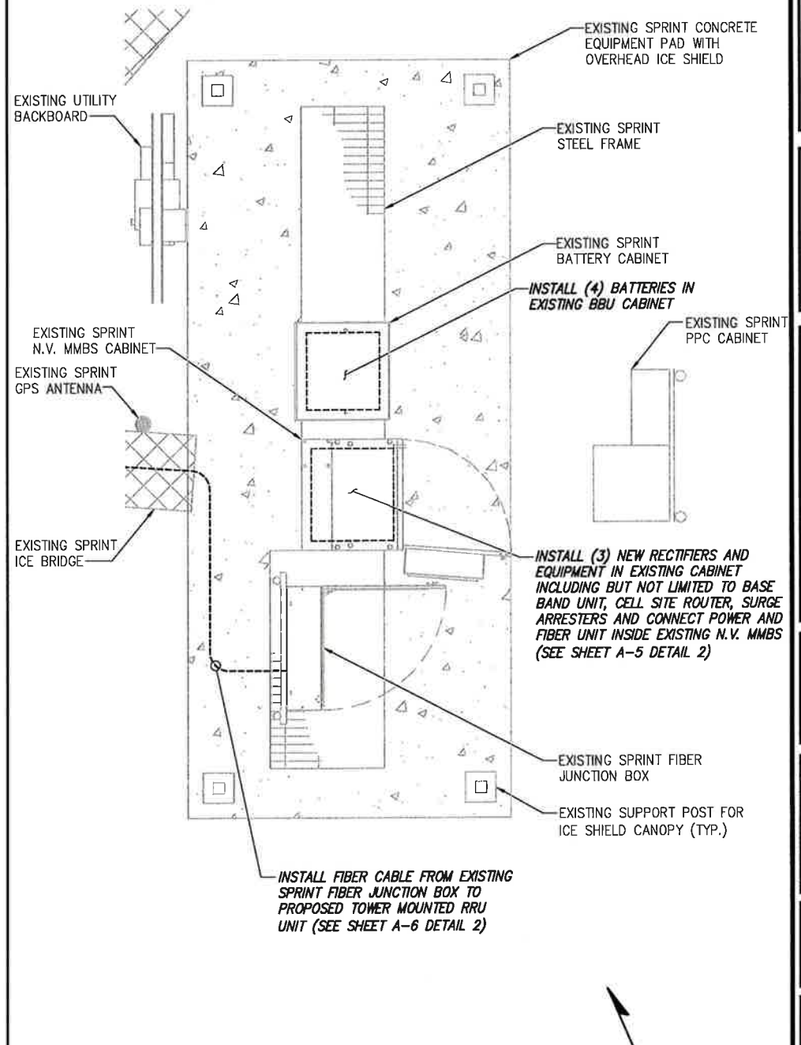
SHEET NUMBER:

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:

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STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24765
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
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SITE NAME:

BERLIN / LAVIANA ORCHARD

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CT33XC536

SITE ADDRESS:

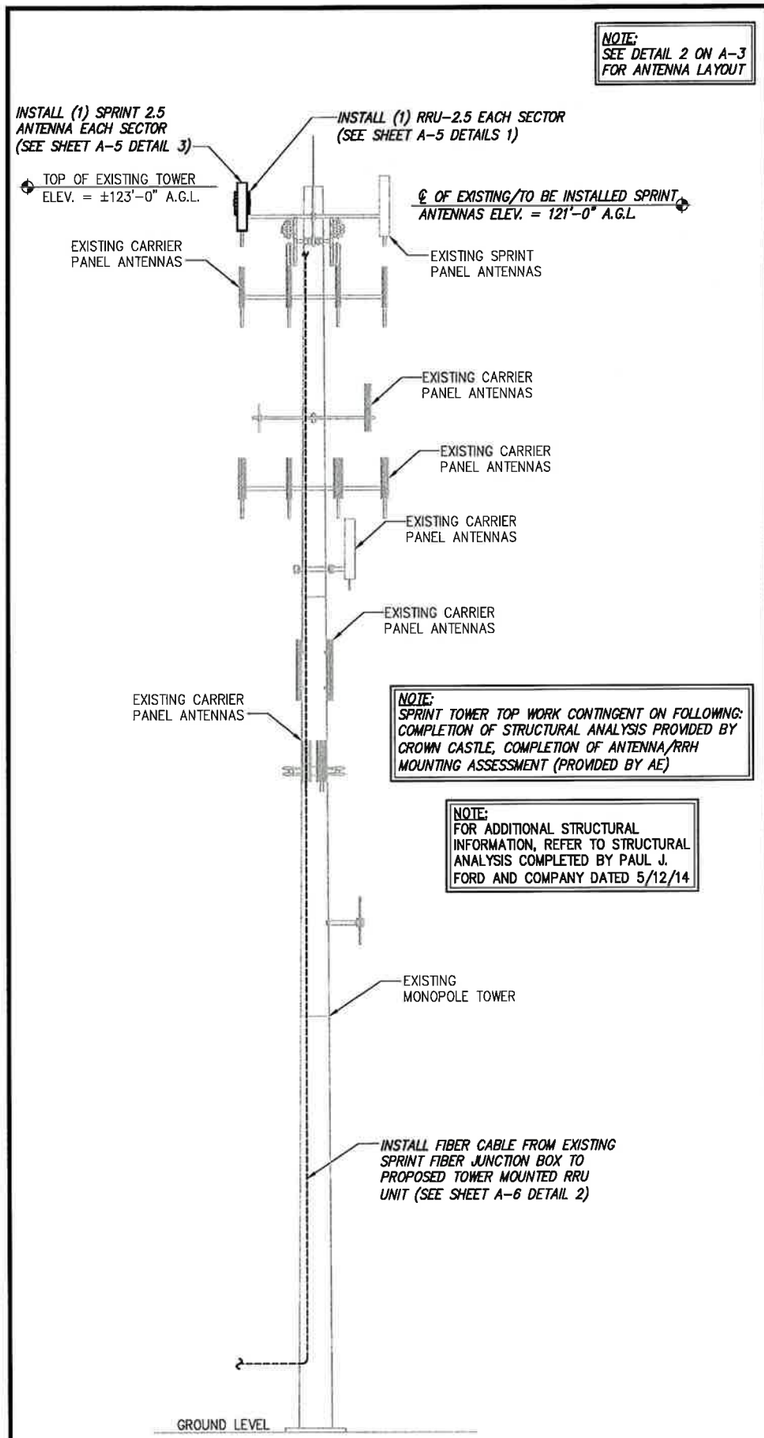
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

A-1



TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

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BERLIN / LAVIANA ORCHARD

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SITE ADDRESS:

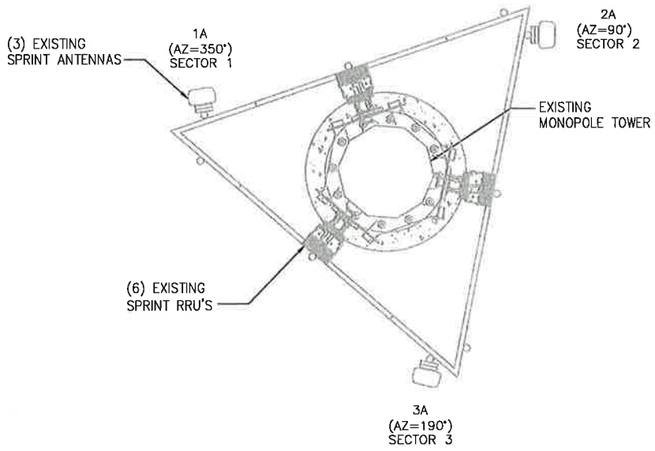
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:

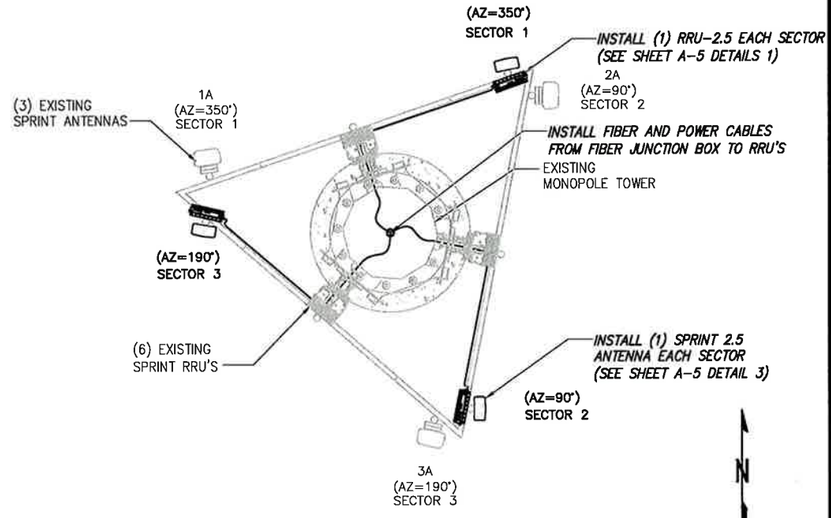
A-2



EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1

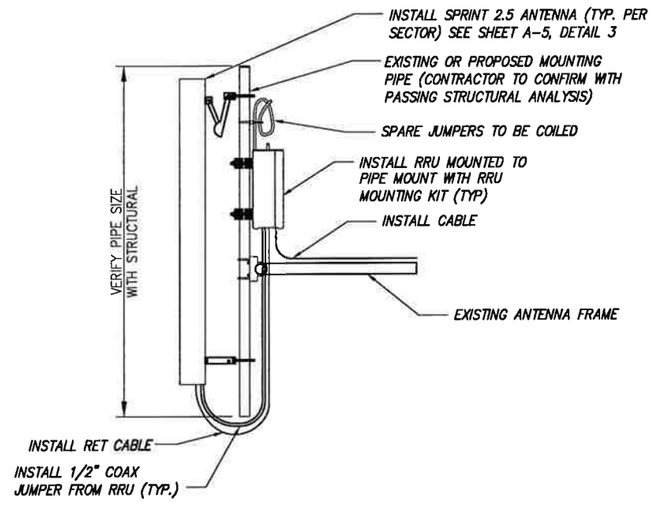
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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



FINAL ANTENNA LAYOUT | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3



NOTES:

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

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

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

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

TYPICAL ANTENNA & RRU MOUNTING DETAILS | NO SCALE | 4

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	5/22/14	JJM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

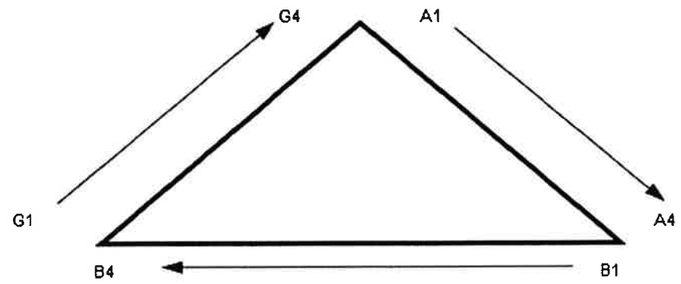
A-3

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

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

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

Figure 1: Antenna Orientation



NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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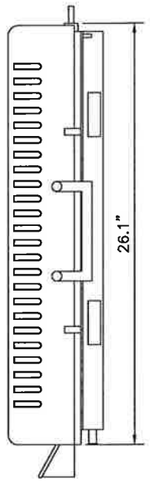
CT33XC536

SITE ADDRESS:
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

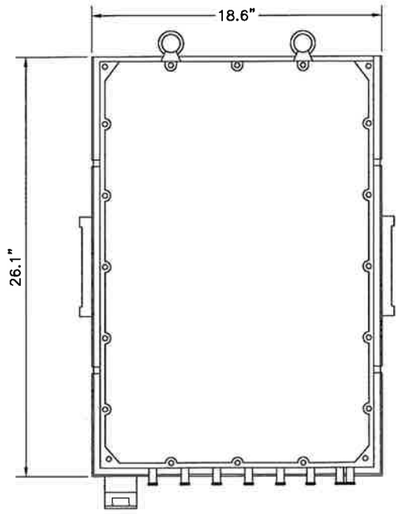
SHEET DESCRIPTION:
COLOR CODING AND NOTES

SHEET NUMBER:
A-4

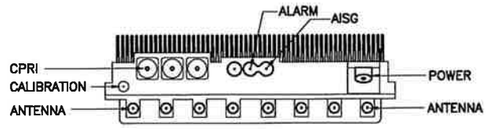
RRU: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

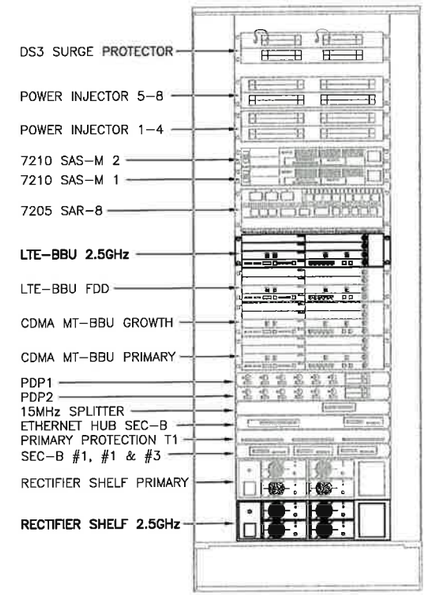


PLAN VIEW

NOTES

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

2.5 RRU	NO SCALE	1

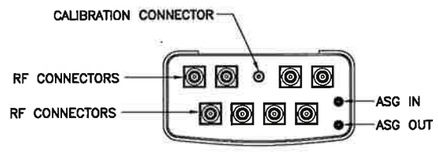


FRONT VIEW

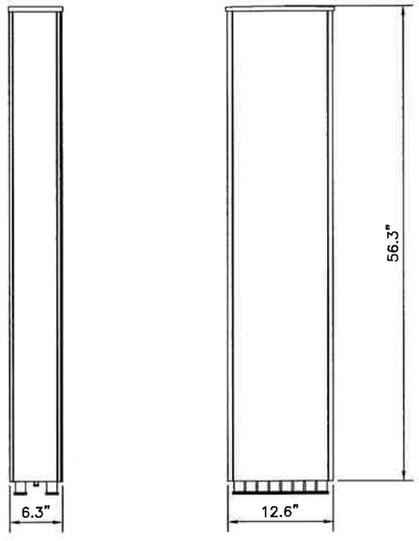
NEW EQUIPMENT IN EXISTING CABINET	NO SCALE	2

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA	NO SCALE	3

DETAIL NOT USED	NO SCALE	4

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

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SITE CASCADE:
CT33XC536

SITE ADDRESS:
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

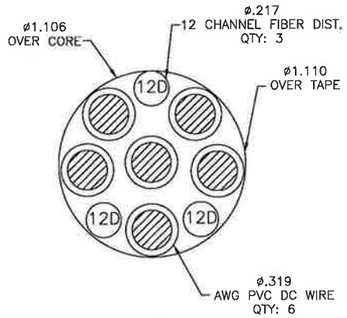
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

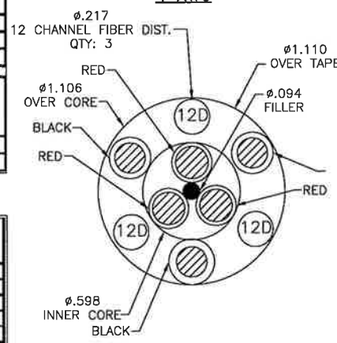
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

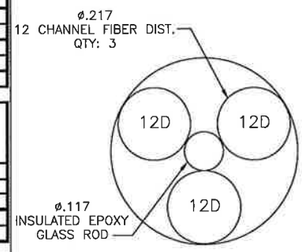
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG

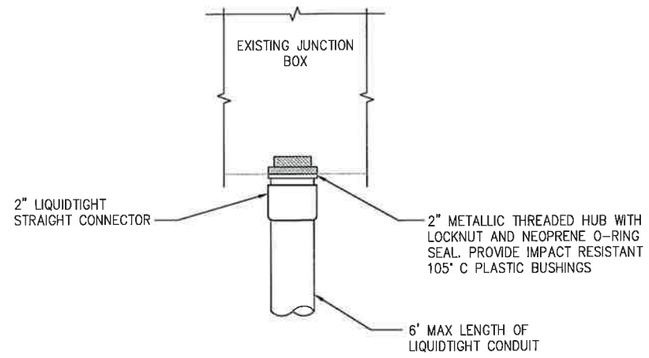


8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

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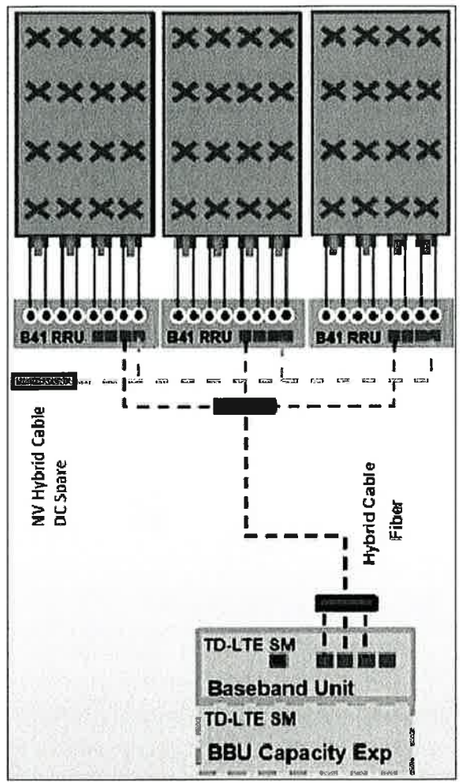
SHEET DESCRIPTION:

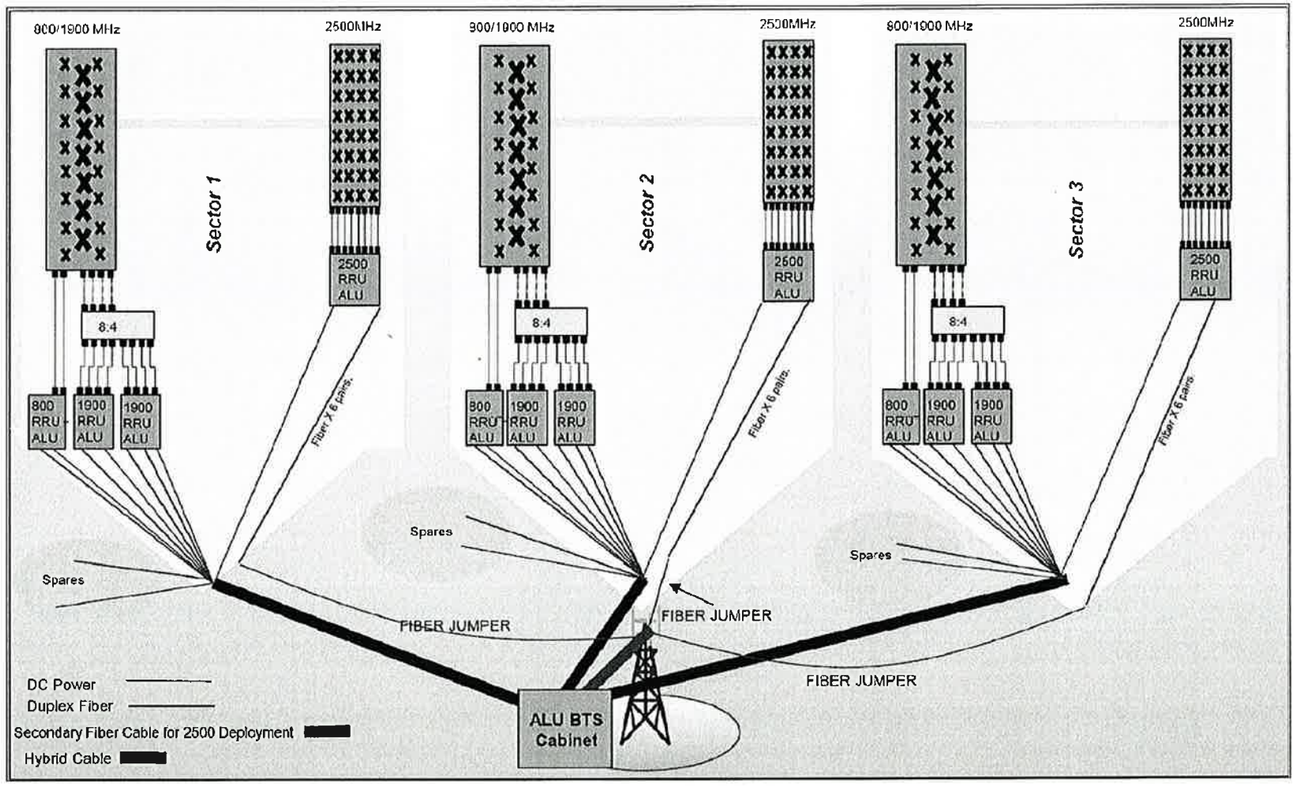
CIVIL DETAILS

SHEET NUMBER:

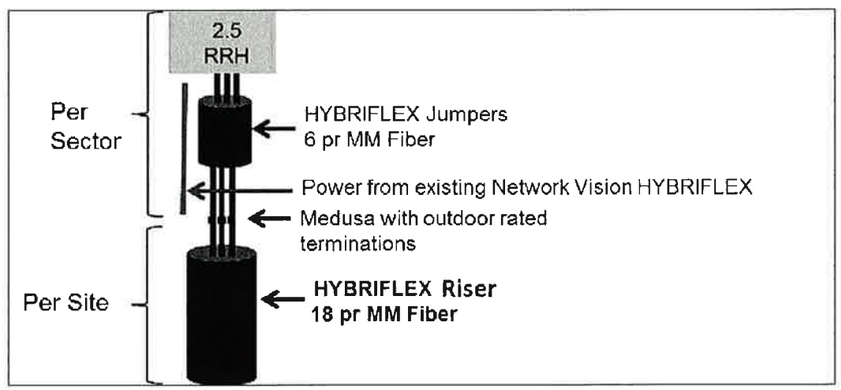
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

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SHEET DESCRIPTION:

CIVIL DETAILS

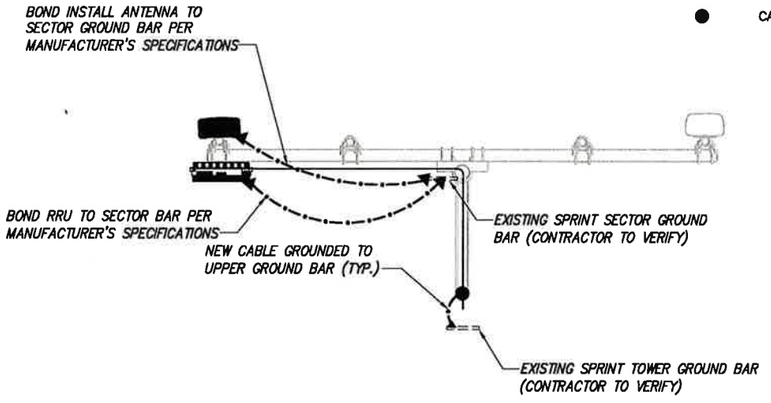
SHEET NUMBER:

A-7

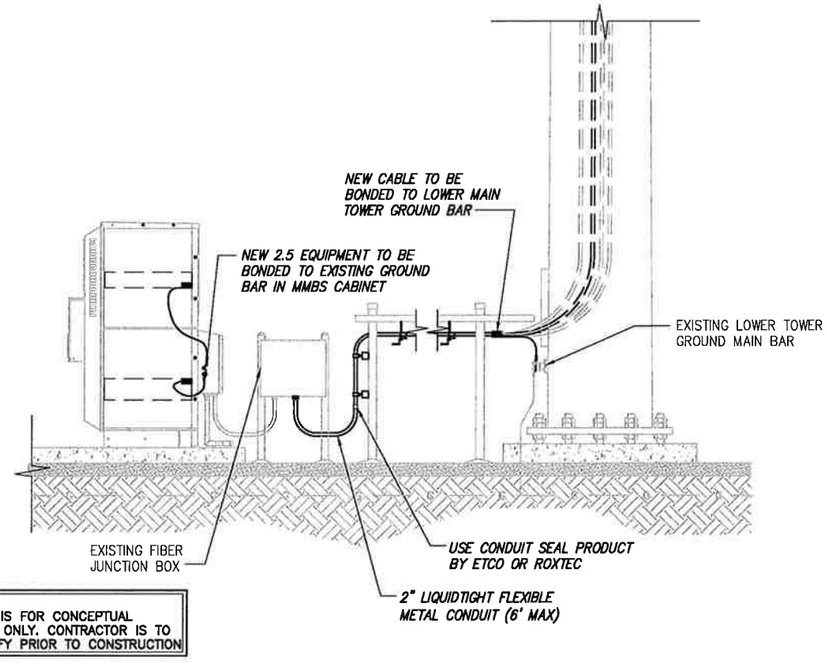
PLAN NOT USED | NO SCALE | 1

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

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BERLIN, CT 06037

SHEET DESCRIPTION:

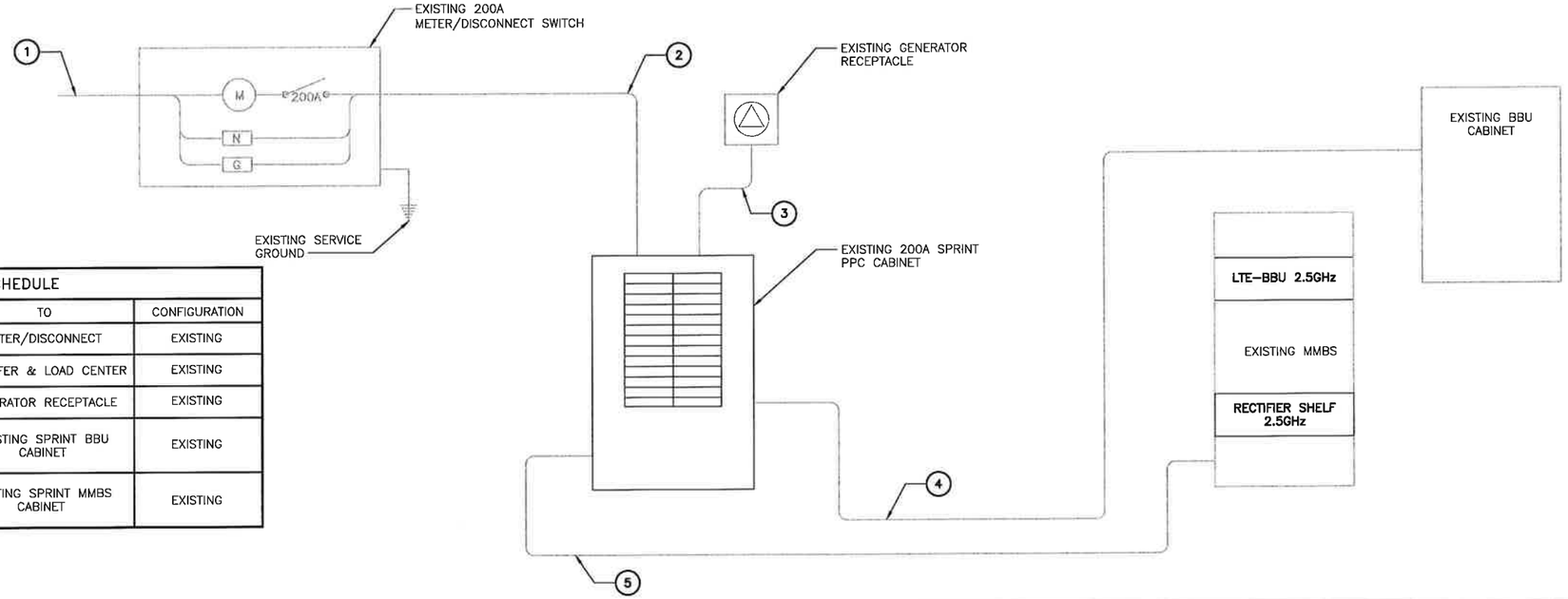
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

NOTES

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

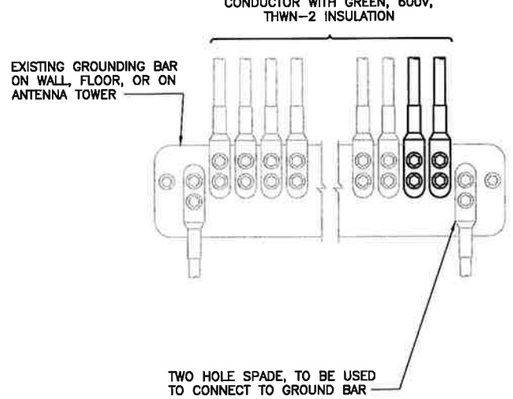


CIRCUIT SCHEDULE

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

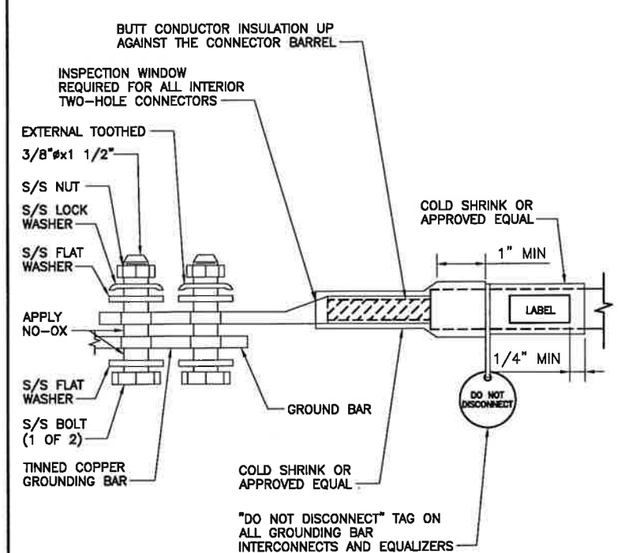


NOTES

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.

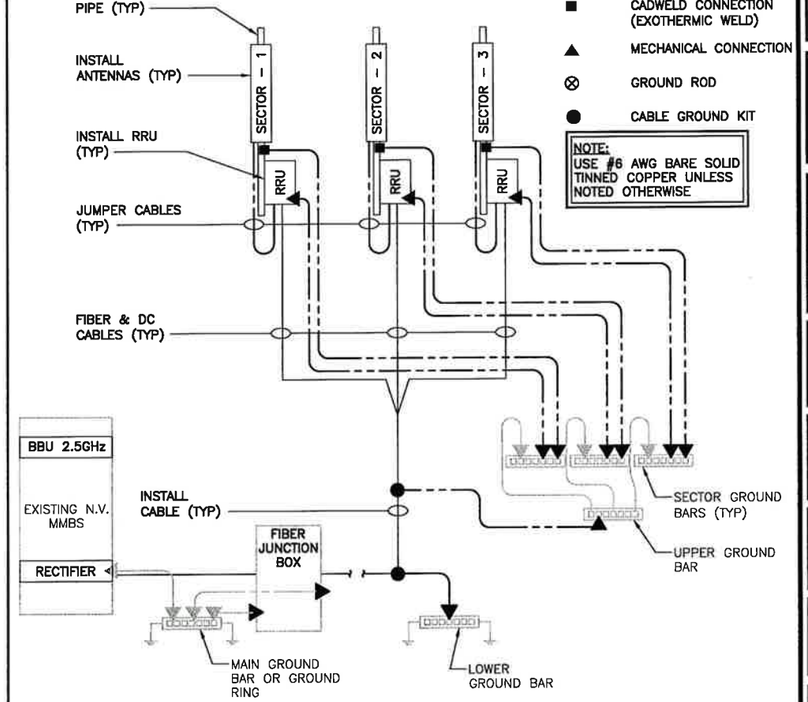
INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

NO SCALE | 2



TWO HOLE LUG

NO SCALE | 3



LEGEND:

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

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
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

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: **May 12, 2014**

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

Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH 43215
614.221.6679

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	**Scenario 2.5A**
	Carrier Site Number:	CT33XC536
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876382
	Crown Castle Site Name:	BERLIN / LAVIANA ORCHARD
	Crown Castle JDE Job Number:	286439
	Crown Castle Work Order Number:	759032
	Crown Castle Application Number:	245697 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-0616_R1
Site Data:	**1684 Chamberlain Highway, BERLIN, Hartford County, CT** **Latitude *41° 35' 23.07"*, Longitude *-72° 48' 19.2"*** **123 Foot - Monopole Tower**	

Dear Patrick Byrum,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 646109, in accordance with application 245697, revision 0.

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

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 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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

Respectfully submitted by:

Nick Parente, E.I.
Structural Designer

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

tnxTower Report - version 6.1.4.1

MAY 13 2014

PAUL J. FORD AND COMPANY
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Nick Parente, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 123 ft Monopole tower designed by SUMMIT in July of 2000. 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 the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 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
120.0	121.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	121.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
	120.0	1	tower mounts	Platform Mount [LP 712-1]			
118.0	118.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-1]			
112.0	113.0	12	decibel	DB844H90E-XY w/Mount Pipe	12	7/8	**4**
	112.0	1	tower mounts	Platform Mount [LP 713-1]			
100.0	101.0	3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ mount pipe	6	1-5/8	2
		3	rfs celwave	ATMAA1412D-1A20			
		3	rfs celwave	ATMPP1412D-1CWA			
		3	ems wireless	RR65-18-02DP w/ Mount Pipe	6	1-5/8	1
	100.0	1	tower mounts	T-Arm Mount [TA 602-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
93.0	94.0	3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe	1	1-5/8	2
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		3	alcatel lucent	RRH2X40-AWS			
		3	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe			
		2	antel	BXA-171063-8BF-2 w/ Mount Pipe	12	1-5/8	1
		1	antel	BXA-171085-8BF-EDIN-0 w/ Mount Pipe			
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
	93.0	1	tower mounts	Platform Mount [LP 712-1]			
75.0	75.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
65.0	66.0	6	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe	1 2 12 1	3/8 3/4 1-5/8 2 (conduit)	1
		6	powerwave technologies	TT19-08BP111-001			
	65.0	6	ericsson	RRUS-11			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	T-Arm Mount [TA 702-3]			
50.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	50.0	1	tower mounts	Side Arm Mount [SO 702-1]			

Notes:
1) Existing
2) Reserved Equipment
3) Equipment to be removed
4) IDEN Equipment to be removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
GEOTECHNICAL REPORTS	Dr. Clarence Welti, 05/05/2000	1629353	CCISITES
TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF, 29200-0802, 06/06/2000	1629413	CCISITES
TOWER MANUFACTURER DRAWINGS	PJF, 29200-0802, 06/06/2000	1629384	CCISITES
POST MOD BPSA	Vertical Solutions, 080828.04, 12/11/2008	2611098	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.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	123 - 82.25	Pole	TP28.114x22x0.1875	1	-7.02	782.55	53.4	Pass
L2	82.25 - 57.75	Pole	TP31.4152x27.2139x0.25	2	-11.87	1285.62	74.8	Pass
L3	57.75 - 40.75	Pole	TP33.966x31.4152x0.4476	3	-14.46	1796.16	69.2	Pass
L4	40.75 - 29.75	Pole	TP35.1164x32.4332x0.4681	4	-18.43	1982.96	79.3	Pass
L5	29.75 - 0	Pole	TP39.58x35.1164x0.487	5	-25.72	2506.49	84.8	Pass
							Summary	
						Pole (L5)	84.8	Pass
						Rating =	84.8	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC11

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	0	72.5	Pass
1	Base Plate	0	55.4	Pass
1,3	Base Foundation Soil Interaction	0	56.0	Pass
1	Base Foundation Structural Steel	0	68.3	Pass

Structure Rating (max from all components) =	84.8%

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.
3) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

4.1) Recommendations

Remove IDEN equipment, mounts and feedlines at the 122 ft. elevation.

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:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80.00 mph.
3) Nominal ice thickness of 1.0000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.00 pcf.
6) A wind speed of 37.60 mph is used in combination with ice.
7) Deflections calculated using a wind speed of 50.00 mph.
8) A non-linear (P-delta) analysis was used.
9) Pressures are calculated at each section.
10) Stress ratio used in pole design is 1.333.
11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *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	123.0000-82.2500	40.7500	3.50	18	22.0000	28.1140	0.1875	0.7500	A607-60 (60 ksi)
L2	82.2500-57.7500	28.0000	0.00	18	27.2139	31.4152	0.2500	1.0000	A607-65 (65 ksi)
L3	57.7500-40.7500	17.0000	4.25	18	31.4152	33.9660	0.4476	1.7902	Reinf 48.08 ksi (48 ksi)
L4	40.7500-29.7500	15.2500	0.00	18	32.4332	35.1164	0.4681	1.8725	Reinf 48.16 ksi (48 ksi)
L5	29.7500-0.0000	29.7500		18	35.1164	39.5800	0.4870	1.9481	Reinf 51.86 ksi (52 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	22.3394	12.9812	780.3007	7.7434	11.1760	69.8193	1561.6281	6.4918	3.5420	18.891
	28.5477	16.6198	1637.5523	9.9139	14.2819	114.6592	3277.2593	8.3115	4.6181	24.63
L2	28.1670	21.3958	1965.3100	9.5722	13.8246	142.1599	3933.2059	10.6999	4.3496	17.399
	31.8998	24.7296	3034.5518	11.0636	15.9589	190.1476	6073.0965	12.3671	5.0891	20.356
L3	31.8998	43.9913	5329.9163	10.9935	15.9589	333.9771	10666.845	21.9998	4.7414	10.594

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
	34.4900	47.6148	6758.4488	11.8990	17.2547	391.6868	13525.7908	23.8119	5.1903	11.597
L4	33.6928	47.4941	6130.9552	11.3476	16.4761	372.1130	12269.9776	23.7516	4.8843	10.434
	35.6581	51.4808	7808.1088	12.3001	17.8391	437.6958	15626.4918	25.7453	5.3566	11.443
L5	35.6581	53.5301	8110.0693	12.2934	17.8391	454.6227	16230.8100	26.7701	5.3233	10.93
	40.1906	60.4300	11667.7604	13.8780	20.1066	580.2939	23350.8735	30.2207	6.1089	12.543

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
LDF6-50A(1-1/4")	C	No	Inside Pole	120.0000 - 0.0000	3	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	120.0000 - 0.0000	1	No Ice	0.0000	1.08
						1/2" Ice	0.0000	1.08
						1" Ice	0.0000	1.08
						2" Ice	0.0000	1.08
						4" Ice	0.0000	1.08
***								
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	100.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
AL7-50(1 5/8)	C	No	Inside Pole	100.0000 - 0.0000	6	No Ice	0.0000	0.52
						1/2" Ice	0.0000	0.52
						1" Ice	0.0000	0.52
						2" Ice	0.0000	0.52
						4" Ice	0.0000	0.52
***								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	93.0000 - 0.0000	1	No Ice	0.1980	0.82
						1/2" Ice	0.2980	2.33
						1" Ice	0.3980	4.46
						2" Ice	0.5980	10.54
						4" Ice	0.9980	30.04
LDF7-50A(1-5/8")	C	No	Inside Pole	93.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
***								
AVA7-50(1-5/8)	C	No	Inside Pole	75.0000 - 0.0000	4	No Ice	0.0000	0.70
						1/2" Ice	0.0000	0.70
						1" Ice	0.0000	0.70
						2" Ice	0.0000	0.70
						4" Ice	0.0000	0.70
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	No Ice	0.0000	0.70
						1/2" Ice	0.0000	2.23
						1" Ice	0.0000	4.38
						2" Ice	0.0000	10.50
						4" Ice	0.0000	30.07
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	No Ice	0.2010	0.70
						1/2" Ice	0.3010	2.23
						1" Ice	0.4010	4.38
						2" Ice	0.6010	10.50
						4" Ice	1.0010	30.07
***								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of	65.0000 - 0.0000	6	No Ice	0.0000	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
						2" Ice	0.0000	10.54
						4" Ice	0.0000	30.04
LDF7-50A(1-5/8")	C	No	Inside Pole	65.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
FB-L98B-002-75000(3/8")	C	No	Inside Pole	65.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
						2" Ice	0.0000	0.06
						4" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	65.0000 - 0.0000	2	No Ice	0.0000	0.59
						1/2" Ice	0.0000	0.59
						1" Ice	0.0000	0.59
						2" Ice	0.0000	0.59
						4" Ice	0.0000	0.59
2" Conduit (1 1/2" EMT)	C	No	Inside Pole	65.0000 - 0.0000	1	No Ice	0.0000	1.16
						1/2" Ice	0.0000	1.16
						1" Ice	0.0000	1.16
						2" Ice	0.0000	1.16
						4" Ice	0.0000	1.16
***								
LDF4-50A(1/2")	C	No	Inside Pole	50.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
********** ********								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	59.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
						2" Ice	0.6528	0.00
						4" Ice	1.0972	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	123.0000-	A	0.000	0.000	0.000	0.000	0.00
	82.2500	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.128	0.37
L2	82.2500-57.7500	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	8.683	0.69
L3	57.7500-40.7500	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	10.325	0.65
L4	40.7500-29.7500	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	6.681	0.42
L5	29.7500-0.0000	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	18.068	1.14

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	123.0000-	A	1.145	0.000	0.000	0.000	0.000	0.00
	82.2500	B		0.000	0.000	0.000	0.000	0.00

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
		C		0.000	0.000	0.000	4.591	0.42
L2	82.2500-57.7500	A	1.094	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	18.690	1.16
L3	57.7500-40.7500	A	1.049	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	21.420	1.25
L4	40.7500-29.7500	A	1.008	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	13.860	0.81
L5	29.7500-0.0000	A	1.000	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	36.580	2.12

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	123.0000-82.2500	-0.0721	0.0417	-0.1392	0.0804
L2	82.2500-57.7500	-0.4064	0.2347	-0.7215	0.4166
L3	57.7500-40.7500	-0.6451	0.3725	-1.0721	0.6190
L4	40.7500-29.7500	-0.6502	0.3754	-1.0882	0.6282
L5	29.7500-0.0000	-0.6601	0.3811	-1.1026	0.6366

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
3/4" x 8 ft lightning rod	C	None	0.0000	123.0000	No Ice	0.6000	0.6000	0.01
					1/2" Ice	1.4146	1.4146	0.02
					1" Ice	2.2458	2.2458	0.03
					2" Ice	3.6690	3.6690	0.07
					4" Ice	5.7417	5.7417	0.21
***								
TD-RRH8x20-25	A	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
TD-RRH8x20-25	B	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
TD-RRH8x20-25	C	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice	7.1342	4.9591	0.08
						1/2" Ice	7.6618	5.7544	0.13
						1" Ice	8.1830	6.4723	0.19
						2" Ice	9.2563	8.0099	0.34
						4" Ice	11.5262	11.4120	0.75
APXVTM14-C-120 w/	B	From Face	4.0000	0.0000	120.0000	No Ice	7.1342	4.9591	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
Mount Pipe			0.00 1.00			1/2" Ice 1" Ice 2" Ice 4" Ice	7.6618 8.1830 9.2563 11.5262	5.7544 6.4723 8.0099 11.4120	0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.1342 7.6618 8.1830 9.2563 11.5262	4.9591 5.7544 6.4723 8.0099 11.4120	0.08 0.13 0.19 0.34 0.75
2.375" OD x 5' Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.1875 1.4956 1.8071 2.4580 3.9194	1.1875 1.4956 1.8071 2.4580 3.9194	0.02 0.03 0.04 0.08 0.20
2.375" OD x 5' Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.1875 1.4956 1.8071 2.4580 3.9194	1.1875 1.4956 1.8071 2.4580 3.9194	0.02 0.03 0.04 0.08 0.20
2.375" OD x 5' Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.1875 1.4956 1.8071 2.4580 3.9194	1.1875 1.4956 1.8071 2.4580 3.9194	0.02 0.03 0.04 0.08 0.20
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.9458 8.1266 9.0212 10.8440 14.8507	0.08 0.15 0.23 0.41 0.91
Platform Mount [LP 712-1]	C	None		0.0000	120.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.5300 29.9400 35.3500 46.1700 67.8100	24.5300 29.9400 35.3500 46.1700 67.8100	1.34 1.65 1.96 2.58 3.82
**									
800MHz 2X50W RRH W/FILTER	A	From Face	2.0000 0.00 0.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4014 2.6131 2.8335 3.3002 4.3372	2.2536 2.4602 2.6753 3.1316 4.1479	0.06 0.09 0.11 0.17 0.34
800MHz 2X50W RRH W/FILTER	B	From Face	2.0000 0.00 0.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.4014 2.6131 2.8335 3.3002 4.3372	2.2536 2.4602 2.6753 3.1316 4.1479	0.06 0.09 0.11 0.17 0.34

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
800MHz 2X50W RRH W/FILTER	C	From Face	2.0000 0.00 0.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.4014 2.6131 2.8335 3.3002 4.3372	2.2536 2.4602 2.6753 3.1316 4.1479	0.06 0.09 0.11 0.17 0.34
PCS 1900MHz 4x45W-65MHz	A	From Face	2.0000 0.00 0.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.7087 2.9477 3.1953 3.7164 4.8623	2.6111 2.8475 3.0925 3.6084 4.7439	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	B	From Face	2.0000 0.00 0.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.7087 2.9477 3.1953 3.7164 4.8623	2.6111 2.8475 3.0925 3.6084 4.7439	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Face	2.0000 0.00 0.00	0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.7087 2.9477 3.1953 3.7164 4.8623	2.6111 2.8475 3.0925 3.6084 4.7439	0.06 0.08 0.11 0.17 0.35
Side Arm Mount [SO 102-1]	C	None		0.0000	118.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.5000 1.7400 1.9800 2.4600 3.4200	1.5000 1.7500 2.0000 2.5000 3.5000	0.03 0.04 0.04 0.07 0.11
** ***									
APX16DWV-16DWV-S-E-A20 w/ mount pipe	A	From Face	4.0000 0.00 1.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.4657 7.9944 8.5176 9.5949 11.8728	3.4938 4.2631 4.9598 6.4031 9.4897	0.06 0.11 0.16 0.30 0.68
APX16DWV-16DWV-S-E-A20 w/ mount pipe	B	From Face	4.0000 0.00 1.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.4657 7.9944 8.5176 9.5949 11.8728	3.4938 4.2631 4.9598 6.4031 9.4897	0.06 0.11 0.16 0.30 0.68
APX16DWV-16DWV-S-E-A20 w/ mount pipe	C	From Face	4.0000 0.00 1.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.4657 7.9944 8.5176 9.5949 11.8728	3.4938 4.2631 4.9598 6.4031 9.4897	0.06 0.11 0.16 0.30 0.68
ATMAA1412D-1A20	A	From Face	4.0000 0.00 1.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.1667 1.3136 1.4691 1.8062 2.5840	0.4667 0.5747 0.6914 0.9506 1.5728	0.01 0.02 0.03 0.06 0.14
ATMAA1412D-1A20	B	From Face	4.0000 0.00 1.00	0.0000	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.1667 1.3136 1.4691 1.8062 2.5840	0.4667 0.5747 0.6914 0.9506 1.5728	0.01 0.02 0.03 0.06 0.14
ATMAA1412D-1A20	C	From Face	4.0000 0.00	0.0000	100.0000	No Ice 1/2"	1.1667 1.3136	0.4667 0.5747	0.01 0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
				1.00			Ice	1.4691	0.6914	0.03
							1" Ice	1.8062	0.9506	0.06
							2" Ice	2.5840	1.5728	0.14
							4" Ice			
ATMPP1412D-1CWA	A	From Face	4.0000	0.0000	100.0000	No Ice		1.1672	0.4159	0.01
			0.00			1/2"		1.3174	0.5298	0.02
			1.00			Ice		1.4762	0.6523	0.03
						1" Ice		1.8197	0.9232	0.05
						2" Ice		2.6105	1.5688	0.13
						4" Ice				
ATMPP1412D-1CWA	B	From Face	4.0000	0.0000	100.0000	No Ice		1.1672	0.4159	0.01
			0.00			1/2"		1.3174	0.5298	0.02
			1.00			Ice		1.4762	0.6523	0.03
						1" Ice		1.8197	0.9232	0.05
						2" Ice		2.6105	1.5688	0.13
						4" Ice				
ATMPP1412D-1CWA	C	From Face	4.0000	0.0000	100.0000	No Ice		1.1672	0.4159	0.01
			0.00			1/2"		1.3174	0.5298	0.02
			1.00			Ice		1.4762	0.6523	0.03
						1" Ice		1.8197	0.9232	0.05
						2" Ice		2.6105	1.5688	0.13
						4" Ice				
RR65-18-02DP w/ Mount Pipe	A	From Face	4.0000	0.0000	100.0000	No Ice		4.5931	3.3194	0.03
			0.00			1/2"		5.0883	4.0888	0.07
			1.00			Ice		5.5778	4.7844	0.12
						1" Ice		6.5876	6.2255	0.22
						2" Ice		8.7306	9.3076	0.56
						4" Ice				
RR65-18-02DP w/ Mount Pipe	B	From Face	4.0000	0.0000	100.0000	No Ice		4.5931	3.3194	0.03
			0.00			1/2"		5.0883	4.0888	0.07
			1.00			Ice		5.5778	4.7844	0.12
						1" Ice		6.5876	6.2255	0.22
						2" Ice		8.7306	9.3076	0.56
						4" Ice				
RR65-18-02DP w/ Mount Pipe	C	From Face	4.0000	0.0000	100.0000	No Ice		4.5931	3.3194	0.03
			0.00			1/2"		5.0883	4.0888	0.07
			1.00			Ice		5.5778	4.7844	0.12
						1" Ice		6.5876	6.2255	0.22
						2" Ice		8.7306	9.3076	0.56
						4" Ice				
T-Arm Mount [TA 602-3]	C	None			0.0000	100.0000	No Ice	11.5900	11.5900	0.77
							1/2"	15.4400	15.4400	0.99
							Ice	19.2900	19.2900	1.21
							1" Ice	26.9900	26.9900	1.64
							2" Ice	42.3900	42.3900	2.50
							4" Ice			
***										
DB-T1-6Z-8AB-0Z	A	From Face	4.0000	0.0000	93.0000	No Ice		5.6000	2.3333	0.04
			0.00			1/2"		5.9154	2.5580	0.08
			1.00			Ice		6.2395	2.7914	0.12
						1" Ice		6.9136	3.2840	0.21
						2" Ice		8.3654	4.3728	0.45
						4" Ice				
RRH2X40-AWS	A	From Face	4.0000	0.0000	93.0000	No Ice		2.9764	1.5960	0.04
			0.00			1/2"		3.2363	1.8239	0.06
			1.00			Ice		3.5048	2.0605	0.08
						1" Ice		4.0678	2.5596	0.14
						2" Ice		5.2975	3.6614	0.29
						4" Ice				
RRH2X40-AWS	B	From Face	4.0000	0.0000	93.0000	No Ice		2.9764	1.5960	0.04
			0.00			1/2"		3.2363	1.8239	0.06
			1.00			Ice		3.5048	2.0605	0.08
						1" Ice		4.0678	2.5596	0.14
						2" Ice		5.2975	3.6614	0.29
						4" Ice				

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
RRH2X40-AWS	C	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.9764 3.2363 3.5048 4.0678 5.2975	1.5960 1.8239 2.0605 2.5596 3.6614	0.04 0.06 0.08 0.14 0.29
BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.0290 5.5830 6.1033 7.1662 9.4380	5.2887 6.4594 7.3479 9.1478 12.9475	0.04 0.09 0.14 0.27 0.68
BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.0290 5.5830 6.1033 7.1662 9.4380	5.2887 6.4594 7.3479 9.1478 12.9475	0.04 0.09 0.14 0.27 0.68
BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.0290 5.5830 6.1033 7.1662 9.4380	5.2887 6.4594 7.3479 9.1478 12.9475	0.04 0.09 0.14 0.27 0.68
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6927 4.2947 4.9133 6.2583 9.2851	0.03 0.07 0.12 0.23 0.58
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6927 4.2947 4.9133 6.2583 9.2851	0.03 0.07 0.12 0.23 0.58
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6927 4.2947 4.9133 6.2583 9.2851	0.03 0.07 0.12 0.23 0.58
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6927 4.2947 4.9133 6.2583 9.2851	0.03 0.07 0.12 0.23 0.58
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6927 4.2947 4.9133 6.2583 9.2851	0.03 0.07 0.12 0.23 0.58
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.3988 5.8435 6.2986 7.2405 9.2612	3.6927 4.2947 4.9133 6.2583 9.2851	0.03 0.07 0.12 0.23 0.58
BXA-171063-8BF-2 w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	3.1789 3.5550 3.9637 4.8533 6.7671	3.3530 3.9709 4.5951 5.8933 8.8855	0.03 0.06 0.10 0.19 0.49

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice			
BXA-171063-8BF-2 w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.1789 3.5550 3.9637 4.8533 6.7671	3.3530 3.9709 4.5951 5.8933 8.8855	0.03 0.06 0.10 0.19 0.49
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.1789 3.5550 3.9637 4.8533 6.7671	3.3530 3.9709 4.5951 5.8933 8.8855	0.03 0.06 0.10 0.19 0.49
(2) FD9R6004/2C-3L	A	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	B	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C-3L	C	From Face	4.0000 0.00 1.00	0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.3665 0.4506 0.5433 0.7546 1.2808	0.0846 0.1362 0.1965 0.3430 0.7396	0.00 0.01 0.01 0.02 0.06
Platform Mount [LP 712-1]	C	None		0.0000	93.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.5300 29.9400 35.3500 46.1700 67.8100	24.5300 29.9400 35.3500 46.1700 67.8100	1.34 1.65 1.96 2.58 3.82
***									
APXV18-206517S-C w/ Mount Pipe	A	From Face	1.0000 0.00 0.00	0.0000	75.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4042 5.9597 6.4808 7.5467 9.9193	4.7000 5.8600 6.7338 8.5150 12.2774	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	B	From Face	1.0000 0.00 0.00	0.0000	75.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4042 5.9597 6.4808 7.5467 9.9193	4.7000 5.8600 6.7338 8.5150 12.2774	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	C	From Face	1.0000 0.00 0.00	0.0000	75.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4042 5.9597 6.4808 7.5467 9.9193	4.7000 5.8600 6.7338 8.5150 12.2774	0.05 0.10 0.15 0.28 0.68
Pipe Mount [PM 601-3]	C	None		0.0000	75.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.3900 5.4800 6.5700 8.7500 13.1100	4.3900 5.4800 6.5700 8.7500 13.1100	0.20 0.24 0.28 0.36 0.53
***									
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	4.0000 0.00	0.0000	65.0000	No Ice 1/2"	8.4975 9.1490	6.3042 7.4790	0.07 0.14

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			Ice	9.7672	8.3676	0.21
						1" Ice	11.0311	10.1785	0.38
						2" Ice	13.6786	14.0237	0.87
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.3042 7.4790 8.3676 10.1785 14.0237	0.07 0.14 0.21 0.38 0.87
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.4975 9.1490 9.7672 11.0311 13.6786	6.3042 7.4790 8.3676 10.1785 14.0237	0.07 0.14 0.21 0.38 0.87
(2) RRUS-11	C	From Face	4.0000 0.00 0.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	B	From Face	4.0000 0.00 0.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
(2) RRUS-11	A	From Face	4.0000 0.00 0.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
DC6-48-60-18-8F	A	From Face	4.0000 0.00 0.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5667 2.7978 3.0377 3.5432 4.6580	2.5667 2.7978 3.0377 3.5432 4.6580	0.02 0.04 0.07 0.13 0.30
(2) P65-15-XLH-RR w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.0666 6.5095 6.9621 7.8961 9.8876	4.1885 4.8037 5.4357 6.8365 9.9536	0.06 0.11 0.16 0.29 0.65
(2) P65-15-XLH-RR w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.0666 6.5095 6.9621 7.8961 9.8876	4.1885 4.8037 5.4357 6.8365 9.9536	0.06 0.11 0.16 0.29 0.65
(2) P65-15-XLH-RR w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.0666 6.5095 6.9621 7.8961 9.8876	4.1885 4.8037 5.4357 6.8365 9.9536	0.06 0.11 0.16 0.29 0.65
(2) TT19-08BP111-001	A	From Face	4.0000 0.00 1.00	0.0000	65.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.6449 0.7568 0.8773 1.1444 1.7822	0.5198 0.6232 0.7354 0.9856 1.5896	0.02 0.02 0.03 0.05 0.12
(2) TT19-08BP111-001	B	From Face	4.0000	0.0000	65.0000	No Ice	0.6449	0.5198	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	0.7568	0.6232	0.02
			1.00				1" Ice	0.8773	0.7354	0.03
							2" Ice	1.1444	0.9856	0.05
							4" Ice	1.7822	1.5896	0.12
(2) TT19-08BP111-001	C	From Face	4.0000		0.0000	65.0000	No Ice	0.6449	0.5198	0.02
			0.00				1/2" Ice	0.7568	0.6232	0.02
			1.00				1" Ice	0.8773	0.7354	0.03
							2" Ice	1.1444	0.9856	0.05
							4" Ice	1.7822	1.5896	0.12
T-Arm Mount [TA 702-3]	C	None			0.0000	65.0000	No Ice	5.6400	5.6400	0.34
							1/2" Ice	6.5500	6.5500	0.43
							1" Ice	7.4600	7.4600	0.52
							2" Ice	9.2800	9.2800	0.70
							4" Ice	12.9200	12.9200	1.06
***										
KS24019-L112A	C	From Face	2.0000		0.0000	50.0000	No Ice	0.1556	0.1556	0.01
			0.00				1/2" Ice	0.2247	0.2247	0.01
			1.00				1" Ice	0.3025	0.3025	0.01
							2" Ice	0.4840	0.4840	0.02
							4" Ice	0.9506	0.9506	0.06
Side Arm Mount [SO 702-1]	C	None			0.0000	50.0000	No Ice	1.0000	1.4300	0.03
							1/2" Ice	1.0000	2.0500	0.04
							1" Ice	1.0000	2.6700	0.05
							2" Ice	1.0000	3.9100	0.07
							4" Ice	1.0000	6.3900	0.12

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 123.0000-82.2500	102.0855	1.381	22.58	85.089	A	0.000	85.089	85.089	100.00	0.000	0.000
					B	0.000	85.089		100.00	0.000	0.000
					C	0.000	85.089		100.00	0.000	2.128
L2 82.2500-57.7500	69.7462	1.238	20.29	60.387	A	0.000	60.387	60.387	100.00	0.000	0.000
					B	0.000	60.387		100.00	0.000	0.000
					C	0.000	60.387		100.00	0.000	8.683
L3 57.7500-40.7500	49.1395	1.12	18.36	46.312	A	0.000	46.312	46.312	100.00	0.000	0.000
					B	0.000	46.312		100.00	0.000	0.000
					C	0.000	46.312		100.00	0.000	10.325
L4 40.7500-29.7500	35.1980	1.019	16.69	31.303	A	0.000	31.303	31.303	100.00	0.000	0.000
					B	0.000	31.303		100.00	0.000	0.000
					C	0.000	31.303		100.00	0.000	6.681
L5 29.7500-0.0000	14.5787	1	16.38	92.592	A	0.000	92.592	92.592	100.00	0.000	0.000
					B	0.000	92.592		100.00	0.000	0.000
					C	0.000	92.592		100.00	0.000	18.068

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 123.0000-82.2500	102.0855	1.381	4.99	1.1451	92.867	A	0.000	92.867	92.867	100.00	0.000	0.000
						B	0.000	92.867		100.00	0.000	0.000
						C	0.000	92.867		100.00	0.000	4.591
L2 82.2500-57.7500	69.7462	1.238	4.48	1.0940	65.063	A	0.000	65.063	65.063	100.00	0.000	0.000
						B	0.000	65.063		100.00	0.000	0.000
						C	0.000	65.063		100.00	0.000	18.690
L3 57.7500-40.7500	49.1395	1.12	4.06	1.0489	49.284	A	0.000	49.284	49.284	100.00	0.000	0.000
						B	0.000	49.284		100.00	0.000	0.000
						C	0.000	49.284		100.00	0.000	21.420
L4 40.7500-29.7500	35.1980	1.019	3.69	1.0078	33.226	A	0.000	33.226	33.226	100.00	0.000	0.000
						B	0.000	33.226		100.00	0.000	0.000
						C	0.000	33.226		100.00	0.000	13.860
L5 29.7500-0.0000	14.5787	1	3.62	1.0000	97.551	A	0.000	97.551	97.551	100.00	0.000	0.000
						B	0.000	97.551		100.00	0.000	0.000
						C	0.000	97.551		100.00	0.000	36.580

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 123.0000-82.2500	102.0855	1.381	8.82	85.089	A	0.000	85.089	85.089	100.00	0.000	0.000
					B	0.000	85.089		100.00	0.000	0.000
					C	0.000	85.089		100.00	0.000	2.128
L2 82.2500-57.7500	69.7462	1.238	7.93	60.387	A	0.000	60.387	60.387	100.00	0.000	0.000
					B	0.000	60.387		100.00	0.000	0.000
					C	0.000	60.387		100.00	0.000	8.683
L3 57.7500-40.7500	49.1395	1.12	7.17	46.312	A	0.000	46.312	46.312	100.00	0.000	0.000
					B	0.000	46.312		100.00	0.000	0.000
					C	0.000	46.312		100.00	0.000	10.325
L4 40.7500-29.7500	35.1980	1.019	6.52	31.303	A	0.000	31.303	31.303	100.00	0.000	0.000
					B	0.000	31.303		100.00	0.000	0.000
					C	0.000	31.303		100.00	0.000	6.681
L5 29.7500-0.0000	14.5787	1	6.40	92.592	A	0.000	92.592	92.592	100.00	0.000	0.000
					B	0.000	92.592		100.00	0.000	0.000
					C	0.000	92.592		100.00	0.000	18.068

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
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice

Comb. No.	Description
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
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	123 - 82.25	Pole	Max Tension	24	0.00	-0.00	-0.00
			Max. Compression	14	-14.99	0.69	0.31
			Max. Mx	11	-7.02	231.08	0.56
			Max. My	2	-7.03	0.65	230.45
			Max. Vy	11	-11.34	231.08	0.56
			Max. Vx	2	-11.28	0.65	230.45
			Max. Torque	3			0.45
L2	82.25 - 57.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23.72	1.69	0.14
			Max. Mx	11	-11.88	606.65	2.08
			Max. My	2	-11.88	2.35	604.09
			Max. Vy	11	-16.54	606.65	2.08
			Max. Vx	8	16.48	-1.61	-603.90
			Max. Torque	3			0.93
L3	57.75 - 40.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.24	2.35	-0.27
			Max. Mx	11	-14.47	823.65	2.69
			Max. My	2	-14.47	3.16	820.10
			Max. Vy	11	-17.50	823.65	2.69
			Max. Vx	8	17.44	-2.19	-820.06
			Max. Torque	3			0.95
L4	40.75 - 29.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.47	3.14	-0.72
			Max. Mx	11	-18.43	1098.94	3.44
			Max. My	8	-18.44	-2.88	-1094.34
			Max. Vy	11	-18.54	1098.94	3.44
			Max. Vx	8	18.48	-2.88	-1094.34
			Max. Torque	3			0.98
L5	29.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.77	4.74	-1.65
			Max. Mx	11	-25.72	1677.14	4.87
			Max. My	8	-25.72	-4.18	-1670.58
			Max. Vy	11	-20.32	1677.14	4.87
			Max. Vx	8	20.26	-4.18	-1670.58
			Max. Torque	8			-1.07

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	24	41.77	5.85	0.01
	Max. H_x	11	25.73	20.31	0.05
	Max. H_z	2	25.73	0.05	20.25
	Max. M_x	2	1670.13	0.05	20.25
	Max. M_z	5	1675.31	-20.31	-0.05
	Max. Torsion	2	1.07	0.05	20.25
	Min. Vert	1	25.73	0.00	0.00
	Min. H_x	5	25.73	-20.31	-0.05
	Min. H_z	8	25.73	-0.05	-20.25
	Min. M_x	8	-1670.58	-0.05	-20.25
	Min. M_z	11	-1677.14	20.31	0.05
	Min. Torsion	8	-1.07	-0.05	-20.25

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	25.73	0.00	0.00	0.22	0.89	0.00
Dead+Wind 0 deg - No Ice	25.73	-0.05	-20.25	-1670.13	6.00	-1.07
Dead+Wind 30 deg - No Ice	25.73	10.11	-17.51	-1443.80	-832.80	-1.05
Dead+Wind 60 deg - No Ice	25.73	17.56	-10.08	-830.54	-1448.20	-0.76
Dead+Wind 90 deg - No Ice	25.73	20.31	0.05	5.32	-1675.31	-0.26
Dead+Wind 120 deg - No Ice	25.73	17.62	10.17	839.80	-1453.29	0.31
Dead+Wind 150 deg - No Ice	25.73	10.20	17.56	1449.33	-841.61	0.80
Dead+Wind 180 deg - No Ice	25.73	0.05	20.25	1670.58	-4.18	1.07
Dead+Wind 210 deg - No Ice	25.73	-10.11	17.51	1444.25	834.62	1.05
Dead+Wind 240 deg - No Ice	25.73	-17.56	10.08	830.99	1450.03	0.76
Dead+Wind 270 deg - No Ice	25.73	-20.31	-0.05	-4.87	1677.14	0.26
Dead+Wind 300 deg - No Ice	25.73	-17.62	-10.17	-839.36	1455.11	-0.31
Dead+Wind 330 deg - No Ice	25.73	-10.20	-17.56	-1448.89	843.44	-0.79
Dead+Ice	41.77	-0.00	0.00	1.65	4.74	-0.00
Dead+Wind 0 deg+Ice	41.77	-0.01	-5.83	-492.66	6.05	-0.35
Dead+Wind 30 deg+Ice	41.77	2.91	-5.04	-425.82	-241.98	-0.31
Dead+Wind 60 deg+Ice	41.77	5.06	-2.90	-244.43	-423.89	-0.20
Dead+Wind 90 deg+Ice	41.77	5.85	0.01	2.90	-490.92	-0.03
Dead+Wind 120 deg+Ice	41.77	5.07	2.93	249.90	-425.11	0.15
Dead+Wind 150 deg+Ice	41.77	2.93	5.06	430.39	-244.10	0.29
Dead+Wind 180 deg+Ice	41.77	0.01	5.83	496.01	3.60	0.35
Dead+Wind 210 deg+Ice	41.77	-2.91	5.04	429.17	251.64	0.31
Dead+Wind 240 deg+Ice	41.77	-5.06	2.90	247.78	433.54	0.20
Dead+Wind 270 deg+Ice	41.77	-5.85	-0.01	0.45	500.57	0.03
Dead+Wind 300 deg+Ice	41.77	-5.07	-2.93	-246.55	434.77	-0.15
Dead+Wind 330 deg+Ice	41.77	-2.93	-5.06	-427.04	253.76	-0.29
Dead+Wind 0 deg - Service	25.73	-0.02	-7.91	-652.66	2.90	-0.42
Dead+Wind 30 deg - Service	25.73	3.95	-6.84	-564.20	-324.95	-0.41
Dead+Wind 60 deg - Service	25.73	6.86	-3.94	-324.50	-565.50	-0.30
Dead+Wind 90 deg - Service	25.73	7.93	0.02	2.21	-654.27	-0.10
Dead+Wind 120 deg - Service	25.73	6.88	3.97	328.39	-567.49	0.12
Dead+Wind 150 deg - Service	25.73	3.98	6.86	566.63	-328.40	0.31
Dead+Wind 180 deg - Service	25.73	0.02	7.91	653.11	-1.08	0.42
Dead+Wind 210 deg - Service	25.73	-3.95	6.84	564.64	326.78	0.41
Dead+Wind 240 deg - Service	25.73	-6.86	3.94	324.94	567.33	0.30
Dead+Wind 270 deg - Service	25.73	-7.93	-0.02	-1.77	656.10	0.10
Dead+Wind 300 deg - Service	25.73	-6.88	-3.97	-327.94	569.32	-0.12
Dead+Wind 330 deg - Service	25.73	-3.98	-6.86	-566.19	330.23	-0.31

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-25.73	0.00	0.00	25.73	0.00	0.000%
2	-0.05	-25.73	-20.25	0.05	25.73	20.25	0.000%
3	10.11	-25.73	-17.51	-10.11	25.73	17.51	0.000%
4	17.56	-25.73	-10.08	-17.56	25.73	10.08	0.000%
5	20.31	-25.73	0.05	-20.31	25.73	-0.05	0.000%
6	17.62	-25.73	10.17	-17.62	25.73	-10.17	0.000%
7	10.20	-25.73	17.56	-10.20	25.73	-17.56	0.000%
8	0.05	-25.73	20.25	-0.05	25.73	-20.25	0.000%
9	-10.11	-25.73	17.51	10.11	25.73	-17.51	0.000%
10	-17.56	-25.73	10.08	17.56	25.73	-10.08	0.000%
11	-20.31	-25.73	-0.05	20.31	25.73	0.05	0.000%
12	-17.62	-25.73	-10.17	17.62	25.73	10.17	0.000%
13	-10.20	-25.73	-17.56	10.20	25.73	17.56	0.000%
14	0.00	-41.77	0.00	0.00	41.77	0.00	0.000%
15	-0.01	-41.77	-5.83	0.01	41.77	5.83	0.000%
16	2.91	-41.77	-5.04	-2.91	41.77	5.04	0.000%
17	5.06	-41.77	-2.90	-5.06	41.77	2.90	0.000%
18	5.85	-41.77	0.01	-5.85	41.77	-0.01	0.000%
19	5.07	-41.77	2.93	-5.07	41.77	-2.93	0.000%
20	2.93	-41.77	5.06	-2.93	41.77	-5.06	0.000%
21	0.01	-41.77	5.83	-0.01	41.77	-5.83	0.000%
22	-2.91	-41.77	5.04	2.91	41.77	-5.04	0.000%
23	-5.06	-41.77	2.90	5.06	41.77	-2.90	0.000%
24	-5.85	-41.77	-0.01	5.85	41.77	0.01	0.000%
25	-5.07	-41.77	-2.93	5.07	41.77	2.93	0.000%
26	-2.93	-41.77	-5.06	2.93	41.77	5.06	0.000%
27	-0.02	-25.73	-7.91	0.02	25.73	7.91	0.000%
28	3.95	-25.73	-6.84	-3.95	25.73	6.84	0.000%
29	6.86	-25.73	-3.94	-6.86	25.73	3.94	0.000%
30	7.93	-25.73	0.02	-7.93	25.73	-0.02	0.000%
31	6.88	-25.73	3.97	-6.88	25.73	-3.97	0.000%
32	3.98	-25.73	6.86	-3.98	25.73	-6.86	0.000%
33	0.02	-25.73	7.91	-0.02	25.73	-7.91	0.000%
34	-3.95	-25.73	6.84	3.95	25.73	-6.84	0.000%
35	-6.86	-25.73	3.94	6.86	25.73	-3.94	0.000%
36	-7.93	-25.73	-0.02	7.93	25.73	0.02	0.000%
37	-6.88	-25.73	-3.97	6.88	25.73	3.97	0.000%
38	-3.98	-25.73	-6.86	3.98	25.73	6.86	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	123 - 82.25	23.673	37	1.5996	0.0022
L2	85.75 - 57.75	11.869	37	1.3232	0.0019
L3	57.75 - 40.75	5.344	37	0.8422	0.0010
L4	45 - 29.75	3.321	37	0.6687	0.0007
L5	29.75 - 0	1.468	37	0.4666	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.0000	3/4" x 8 ft lightning rod	37	23.673	1.5996	0.0022	30288
120.0000	TD-RRH8x20-25	37	22.668	1.5874	0.0022	30288
118.0000	800MHz 2X50W RRH W/FILTER	37	21.998	1.5792	0.0022	30288
100.0000	APX16DWV-16DWV-S-E-A20 w/ mount pipe	37	16.124	1.4772	0.0021	6583
93.0000	DB-T1-6Z-8AB-0Z	37	13.973	1.4128	0.0020	5047
75.0000	APXV18-206517S-C w/ Mount	37	9.037	1.1464	0.0016	3503

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
65.0000	Pipe AM-X-CD-16-65-00T-RET w/ Mount Pipe	37	6.757	0.9642	0.0012	3104
50.0000	KS24019-L112A	37	4.058	0.7329	0.0008	4400

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	123 - 82.25	60.440	12	4.0862	0.0056
L2	85.75 - 57.75	30.321	12	3.3807	0.0048
L3	57.75 - 40.75	13.657	12	2.1526	0.0026
L4	45 - 29.75	8.490	12	1.7094	0.0018
L5	29.75 - 0	3.752	12	1.1928	0.0011

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.0000	3/4" x 8 ft lightning rod	12	60.440	4.0862	0.0056	11969
120.0000	TD-RRH8x20-25	12	57.875	4.0552	0.0056	11969
118.0000	800MHz 2X50W RRH W/FILTER	12	56.168	4.0340	0.0056	11969
100.0000	APX16DWV-16DWV-S-E-A20 w/ mount pipe	12	41.178	3.7738	0.0054	2600
93.0000	DB-T1-6Z-8AB-0Z	12	35.691	3.6093	0.0052	1992
75.0000	APXV18-206517S-C w/ Mount Pipe	12	23.090	2.9293	0.0040	1380
65.0000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	12	17.268	2.4640	0.0031	1220
50.0000	KS24019-L112A	12	10.372	1.8734	0.0021	1726

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	123 - 82.25 (1)	TP28.114x22x0.1875	40.7500	0.0000	0.0	36.000	16.3072	-7.02	587.06	0.012
L2	82.25 - 57.75 (2)	TP31.4152x27.2139x0.25	28.0000	0.0000	0.0	39.000	24.7296	-11.87	964.45	0.012
L3	57.75 - 40.75 (3)	TP33.966x31.4152x0.4476	17.0000	0.0000	0.0	28.848	46.7089	-14.46	1347.46	0.011
L4	40.75 - 29.75 (4)	TP35.1164x32.4332x0.4681	15.2500	0.0000	0.0	28.896	51.4808	-18.43	1487.59	0.012
L5	29.75 - 0 (5)	TP39.58x35.1164x0.487	29.7500	0.0000	0.0	31.116	60.4300	-25.72	1880.34	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	123 - 82.25 (1)	TP28.114x22x0.1875	231.37	25.155	36.000	0.699	0.00	0.000	36.000	0.000
L2	82.25 - 57.75 (2)	TP31.4152x27.2139x0.25	607.80	38.357	39.000	0.984	0.00	0.000	39.000	0.000
L3	57.75 - 40.75	TP33.966x31.4152x0.447	825.14	26.276	28.848	0.911	0.00	0.000	28.848	0.000

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 $\frac{f_{by}}{F_{by}}$
	(3)	6								
L4	40.75 - 29.75 (4)	TP35.1164x32.4332x0.4681	1100.85	30.181	28.896	1.044	0.00	0.000	28.896	0.000
L5	29.75 - 0 (5)	TP39.58x35.1164x0.487	1679.84	34.738	31.116	1.116	0.00	0.000	31.116	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	123 - 82.25 (1)	TP28.114x22x0.1875	11.37	0.697	24.000	0.058	0.01	0.001	24.000	0.000
L2	82.25 - 57.75 (2)	TP31.4152x27.2139x0.25	16.57	0.670	26.000	0.052	0.07	0.002	26.000	0.000
L3	57.75 - 40.75 (3)	TP33.966x31.4152x0.4476	17.53	0.375	19.232	0.039	0.13	0.002	19.232	0.000
L4	40.75 - 29.75 (4)	TP35.1164x32.4332x0.4681	18.57	0.361	19.264	0.037	0.19	0.003	19.264	0.000
L5	29.75 - 0 (5)	TP39.58x35.1164x0.487	20.36	0.337	20.744	0.032	0.31	0.003	20.744	0.000

Pole Interaction Design Data

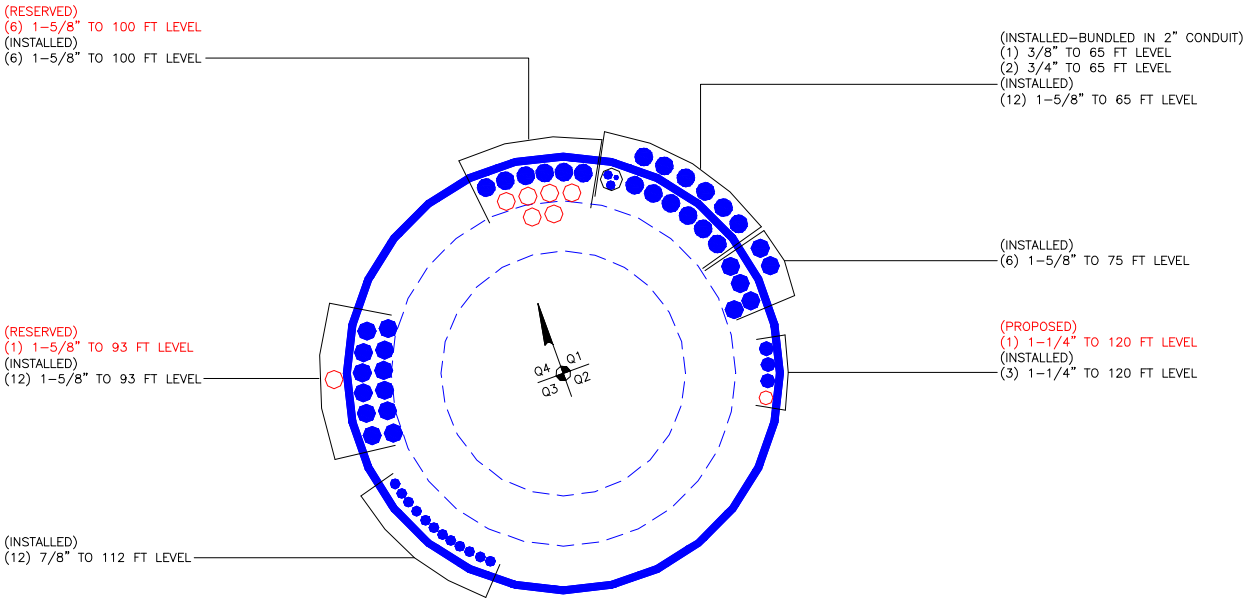
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	123 - 82.25 (1)	0.012	0.699	0.000	0.058	0.000	0.712 ✔	1.333	H1-3+VT ✔
L2	82.25 - 57.75 (2)	0.012	0.984	0.000	0.052	0.000	0.997 ✔	1.333	H1-3+VT ✔
L3	57.75 - 40.75 (3)	0.011	0.911	0.000	0.039	0.000	0.922 ✔	1.333	H1-3+VT ✔
L4	40.75 - 29.75 (4)	0.012	1.044	0.000	0.037	0.000	1.057 ✔	1.333	H1-3+VT ✔
L5	29.75 - 0 (5)	0.014	1.116	0.000	0.032	0.000	1.130 ✔	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	123 - 82.25	Pole	TP28.114x22x0.1875	1	-7.02	782.55	53.4	Pass
L2	82.25 - 57.75	Pole	TP31.4152x27.2139x0.25	2	-11.87	1285.62	74.8	Pass
L3	57.75 - 40.75	Pole	TP33.966x31.4152x0.4476	3	-14.46	1796.16	69.2	Pass
L4	40.75 - 29.75	Pole	TP35.1164x32.4332x0.4681	4	-18.43	1982.96	79.3	Pass
L5	29.75 - 0	Pole	TP39.58x35.1164x0.487	5	-25.72	2506.49	84.8	Pass
							Summary	
						Pole (L5)	84.8	Pass
						RATING =	**84.8**	**Pass**

APPENDIX B

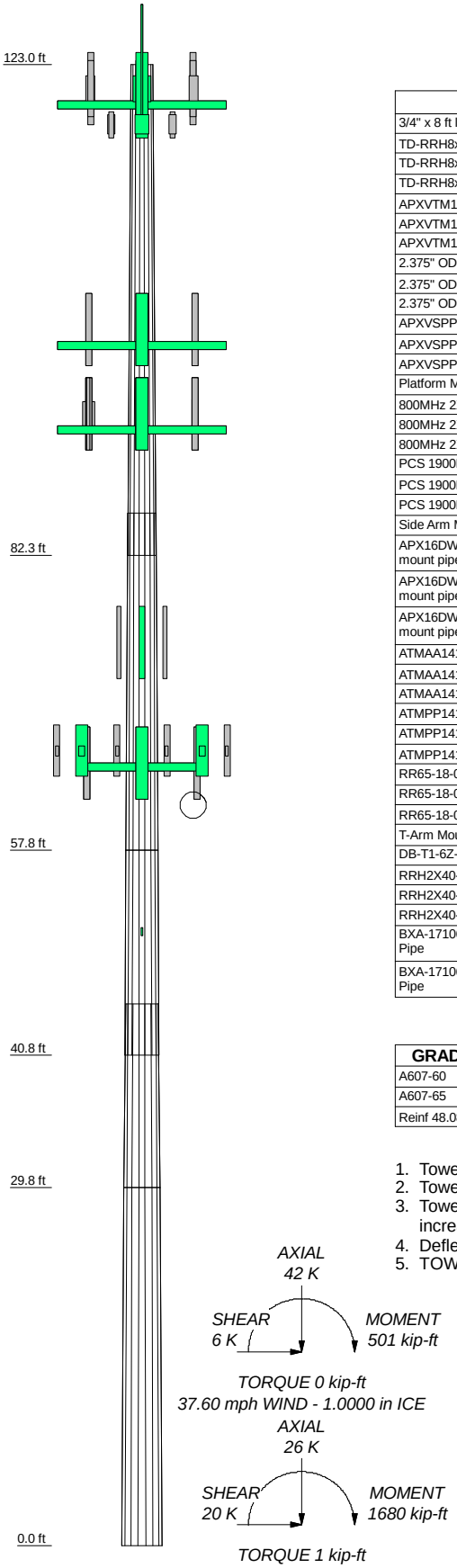
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	40.7500	18	0.1875	3.5000	22.0000	28.1140	A607-60	2.1
2	28.0000	18	0.2500		27.2139	31.4152	A607-65	2.2
3	17.0000	18	0.4476	4.2500	31.4152	33.9660	Reinf 48.08 ksi	2.6
4	15.2500	18	0.4681		32.4332	35.1164	Reinf 48.16 ksi	2.6
5	29.7500	18	0.4870		35.1164	39.5800	Reinf 51.86 ksi	5.8
								15.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3/4" x 8 ft lightning rod	123	BXA-171063-12CF-EDIN-X w/ Mount Pipe	93
TD-RRH8x20-25	120	BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
TD-RRH8x20-25	120	BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
TD-RRH8x20-25	120	BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
APXVTM14-C-120 w/ Mount Pipe	120	BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
APXVTM14-C-120 w/ Mount Pipe	120	BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
APXVTM14-C-120 w/ Mount Pipe	120	BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
2.375" OD x 5' Mount Pipe	120	BXA-171063-8BF-2 w/ Mount Pipe	93
2.375" OD x 5' Mount Pipe	120	BXA-171063-8BF-2 w/ Mount Pipe	93
2.375" OD x 5' Mount Pipe	120	BXA-171085-8BF-EDIN-0 w/ Mount Pipe	93
APXVSPP18-C-A20 w/ Mount Pipe	120	(2) FD9R6004/2C-3L	93
APXVSPP18-C-A20 w/ Mount Pipe	120	(2) FD9R6004/2C-3L	93
APXVSPP18-C-A20 w/ Mount Pipe	120	(2) FD9R6004/2C-3L	93
Platform Mount [LP 712-1]	120	Platform Mount [LP 712-1]	93
800MHz 2X50W RRH W/FILTER	118	APXV18-206517S-C w/ Mount Pipe	75
800MHz 2X50W RRH W/FILTER	118	APXV18-206517S-C w/ Mount Pipe	75
800MHz 2X50W RRH W/FILTER	118	APXV18-206517S-C w/ Mount Pipe	75
PCS 1900MHz 4x45W-65MHz	118	Pipe Mount [PM 601-3]	75
PCS 1900MHz 4x45W-65MHz	118	AM-X-CD-16-65-00T-RET w/ Mount Pipe	65
PCS 1900MHz 4x45W-65MHz	118	AM-X-CD-16-65-00T-RET w/ Mount Pipe	65
Side Arm Mount [SO 102-1]	118	AM-X-CD-16-65-00T-RET w/ Mount Pipe	65
APX16DWV-16DWV-S-E-A20 w/ mount pipe	100	(2) RRUS-11	65
APX16DWV-16DWV-S-E-A20 w/ mount pipe	100	(2) RRUS-11	65
APX16DWV-16DWV-S-E-A20 w/ mount pipe	100	(2) RRUS-11	65
ATMAA1412D-1A20	100	DC6-48-60-18-8F	65
ATMAA1412D-1A20	100	(2) P65-15-XLH-RR w/ Mount Pipe	65
ATMAA1412D-1A20	100	(2) P65-15-XLH-RR w/ Mount Pipe	65
ATMPP1412D-1CWA	100	(2) P65-15-XLH-RR w/ Mount Pipe	65
ATMPP1412D-1CWA	100	(2) TT19-08BP111-001	65
ATMPP1412D-1CWA	100	(2) TT19-08BP111-001	65
RR65-18-02DP w/ Mount Pipe	100	(2) TT19-08BP111-001	65
RR65-18-02DP w/ Mount Pipe	100	T-Arm Mount [TA 702-3]	65
RR65-18-02DP w/ Mount Pipe	100	KS24019-L112A	50
T-Arm Mount [TA 602-3]	100	Side Arm Mount [SO 702-1]	50
DB-T1-6Z-8AB-0Z	93		
RRH2X40-AWS	93		
RRH2X40-AWS	93		
RRH2X40-AWS	93		
BXA-171063-12CF-EDIN-X w/ Mount Pipe	93		
BXA-171063-12CF-EDIN-X w/ Mount Pipe	93		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 48.16 ksi	48 ksi	61 ksi
A607-65	65 ksi	80 ksi	Reinf 51.86 ksi	52 ksi	65 ksi
Reinf 48.08 ksi	48 ksi	61 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 84.8%

Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job:	***Ex. 123-ft Monopole / Berlin/Laviana Orchard***		
Project:	***BU#876382 / PJF# 37513-0616***		
Client: Crown Castle	Drawn by: Nick Parente, E.I.	App'd:	
Code: TIA/EIA-222-F	Date: 05/13/14	Scale: NTS	
Path: G:\TOWER\375_Crown_Castle\2013\37513-0616 BU 876382\WO 759032 BU 876382 - 780637513-0616_R1_Reinforced.eri		Dwg No. E-1	

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

v4.4 - Effective 7-12-13

Date: 5/13/2014
PJF Project: 37513-0616
Client Ref. # BU 876382
Site Name: Berlin/ Laviana Orchard
Description: 123 ft MP
Owner: CCI
Engineer: NZP

Asymmetric Anchor Rod Analysis

Moment =	1680	k-ft	TIA Ref.	F		Location =	Base Plate	
Axial =	26.0	kips	ASIF =	1.3333		η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	20.0	kips	Max Ratio =	105.0%		Threads =	N/A	for FP, Rev. G
Anchor Qty =	12							

**** 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	2.250	#18J A615 Gr 75	75	100	37.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
2	2.250	#18J A615 Gr 75	75	100	52.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
3	2.250	#18J A615 Gr 75	75	100	127.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
4	2.250	#18J A615 Gr 75	75	100	142.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
5	2.250	#18J A615 Gr 75	75	100	217.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
6	2.250	#18J A615 Gr 75	75	100	232.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
7	2.250	#18J A615 Gr 75	75	100	307.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
8	2.250	#18J A615 Gr 75	75	100	322.5	46.00	0.00	3.98	145.62	141.29	141.29	0.00	195.00	72.5%
9	2.250	#18J A615 Gr 75	75	100	0.0	47.25	0.00	3.98	149.52	145.18	145.18	0.00	195.00	74.5%
10	2.250	#18J A615 Gr 75	75	100	90.0	47.25	0.00	3.98	149.52	145.18	145.18	0.00	195.00	74.5%
11	2.250	#18J A615 Gr 75	75	100	180.0	47.25	0.00	3.98	149.52	145.18	145.18	0.00	195.00	74.5%
12	2.250	#18J A615 Gr 75	75	100	270.0	47.25	0.00	3.98	149.52	145.18	145.18	0.00	195.00	74.5%
					.			47.76						

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#:
Site Name:
App #:

Anchor Rod Data		
Qty:	8	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	46	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	44	in
Thick:	2.75	in
Grade:	55	ksi
Clip Distance:	5	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
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

Pole Data		
Diam:	39.58	in
Thick:	0.2812	in
Grade:	65	ksi
# of Sides:	0	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	1099.8	ft-kips
Unfactored Axial, P:	17.3	kips
Unfactored Shear, V:	13.3	kips

reactions adjusted to account for post installed anchor rods

Anchor Rod Results

TIA F --> Maximum Rod Tension	141.3	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	72.5%	**Pass**

Base Plate Results Flexural Check

Base Plate Stress:	30.5	ksi
Allowable PL Bending Stress:	55.0	ksi
Base Plate Stress Ratio:	55.4%	**Pass**

PL Ref. Data	
Yield Line (in):	22.65
Max PL Length:	22.65

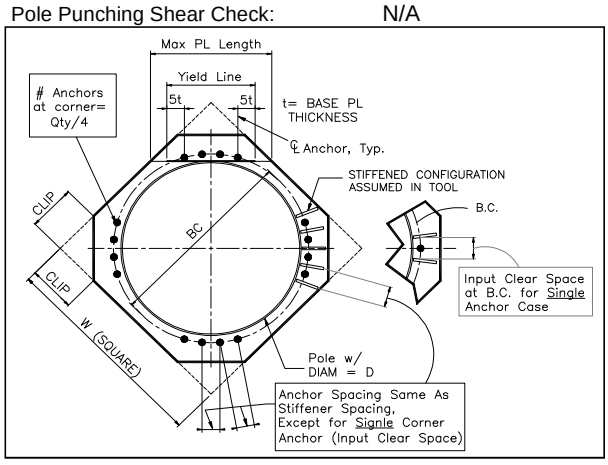
N/A - Unstiffened

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



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

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

Job Number:	37513-0616_R1_LC11	**Page:**	1
Site Number:	876382	**By:**	nzp
Site Name:	Berlin/Laviana Orchard	**Date:**	5/13/2014

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	1680.0		k-ft
Shear, V =	20.0		kips
Axial Load, P =	26.0		kips
OTM =	1690.0	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-02
Seismic Design Category =	D
Reference Standard =	TIA/EIA-222-F
Use 1.3 Load Factor?	Yes
Load Factor =	1.30

Drilled Pier Parameters

Diameter =	6	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	20	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA/EIA-222-F

1. Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. ≥ Comp.
2. Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 ≥ Uplift
3. Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 ≥ Uplift

Steel Parameters

Number of Bars =	16	
Rebar Size =	#11	
Rebar Fy =	60	ksi
Rebar MOE =	29000	ksi
Tie Size =	#5	
Side Clear Cover to Ties =	4	in

Soil Parameters

Water Table Depth =	15.00	ft
Depth to Ignore Soil =	3.33	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	100.0%
Maximum Steel Ratio =	100.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strengh = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	5	135		38	Sand				5
2	10	135		38	Sand		600		15
3	5	135		38	Sand	40000	600		20
4									
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	14.38	ft, from Grade	Shear, V =	20.00	kips
Bending Moment, M =	1977.58	k-ft, from COR	Resisting Shear, Va =	35.72	kips
Resisting Moment, Ma =	3532.31	k-ft, from COR			

MOMENT RATIO = 56.0% OK **SHEAR RATIO = 56.0% OK**

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	62.50	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	26.00	kips
Allowable Comp. Cap., Ca =	639.71	kips

COMPRESSION RATIO = 4.1% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	13.57	sq in
Actual Steel Area =	24.96	sq in
Allowable Min Axial, Pa =	-1036.80	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	4726.51	kips, Where Ma = 0 k-ft

Axial Load, P =	47.21	kips @ 4.50 ft Below Grade
Moment, M =	1772.72	k-ft @ 4.50 ft Below Grade
Allowable Moment, Ma =	2594.26	k-ft

MOMENT RATIO = 68.3% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876382*
Site Name: *Berlin/Laviana Orchard*
App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	6.0	ft
Concrete Area =	4071.5	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	5.11	ft
Vert. Cage Diameter =	61.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	16	
As Total=	24.96	in^2
A s/ Aconc, Rho:	0.0061	0.61%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:
(3)*(Sqrt(f'c)/Fy: 0.0027
200 / Fy: 0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.61%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	6144.47	kips
at Mu=(ϕ=0.65)Mn=	3164.92	ft-kips
Max Tu, (φ=0.9) Tn =	1347.84	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	1772.72	ft-kips **(* Note)**
Max. Service Shaft P:	47.21	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.30	Mu:	2304.536	ft-kips
1.30	Pu:	61.373	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

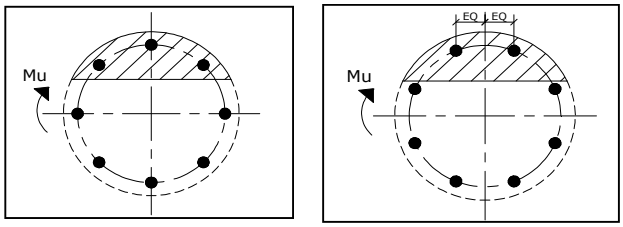
Seismic Properties

Seismic Design Category = D
Seismic Risk = **High**

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **12.62** in
Extreme Steel Strain, ϵt: **0.0127**
ϵt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	61.37	kips
Drilled Shaft Moment Capacity, φMn:	**3372.55**	ft-kips
Drilled Shaft Superimposed Mu:	**2304.54**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**68.3%**

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

Sprint Existing Facility

Site ID: CT33XC536

Berlin / Laviana Orchard

1684 Chamberlain Highway
Berlin, CT 06037

June 15, 2014

EBI Project Number: 62143382

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

EBI Consulting
environmental | engineering | due diligence

June 15, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT33XC536 - Berlin / Laviana Orchard

Site Total: 51.03% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 1684 Chamberlain Highway, Berlin, 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 1684 Chamberlain Highway, Berlin, 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) 2 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 **121 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	CT33XC536 - Berlin / Laviana Orchard
Site Addresss	1684 Chamberlain Highway, Berlin, CT, 06037
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.38%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	121	115	1/2 "	0.5	0	39.00	0.19%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.66%
														Sector total Power Density Value:		1.23%

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	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.38%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	121	115	1/2 "	0.5	0	39.00	0.19%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.66%
														Sector total Power Density Value:		1.23%

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	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.38%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	121	115	1/2 "	0.5	0	39.00	0.19%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.66%
														Sector total Power Density Value:		1.23%

Site Composite MPE %	
Carrier	MPE %
Sprint	3.69%
Town	0.05%
MetroPCS	12.16%
Clearwire	1.28%
Nextel	4.47%
T-Mobile	9.58%
Verizon Wireless	10.64%
AT&T	9.16%
Total Site MPE %	**51.03%**

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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 **3.69% (1.23% from sector 1, 1.23% from sector 2 and 1.23% 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 **51.03%** 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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