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

July 10, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 826768**
Sprint PCS Site ID: CT54XC712
Located at: 171 Town Hill Rd, Plymouth, CT 06783

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 The Honorable David V. Merchant, Mayor for Town of Plymouth.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **171 Town Hill Rd, Plymouth, CT 06783**. 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: The Honorable David V. Merchant, Mayor
Town of Plymouth
Town Hall, 80 Main Street
Terryville, CT 06786

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	TERRYVILLE - VOICESTREAM
SITE CASCADE:	CT54XC712
SITE NUMBER:	826768
SITE ADDRESS:	171 TOWN HILL RD PLYMOUTH, CT 06783
SITE TYPE:	MONOPOLE
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

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

LATITUDE (NAD83):
41° 40' 6.197" N
41.668392°

LONGITUDE (NAD83):
73° 1' 11.842" W
-73.019878°

COUNTY:
LITCHFIELD

ZONING JURISDICTION:
PLYMOUTH

ZONING DISTRICT:
RA-1

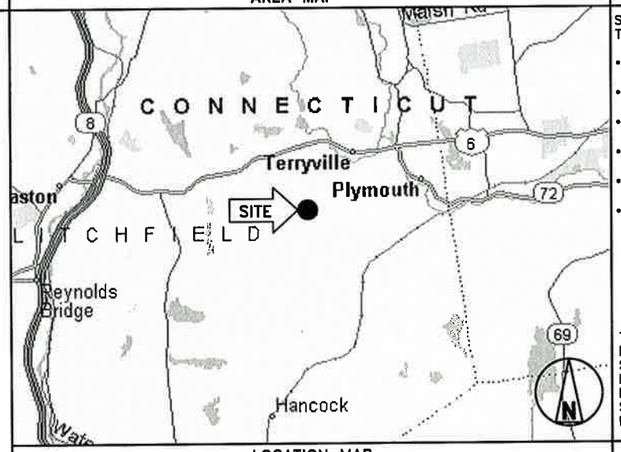
POWER COMPANY:
CONNECTICUT LIGHT AND POWER
(800) 286-2000

SPRINT PM:
PETER GIARD
(508) 801-0074
peter.giard@sprint.com

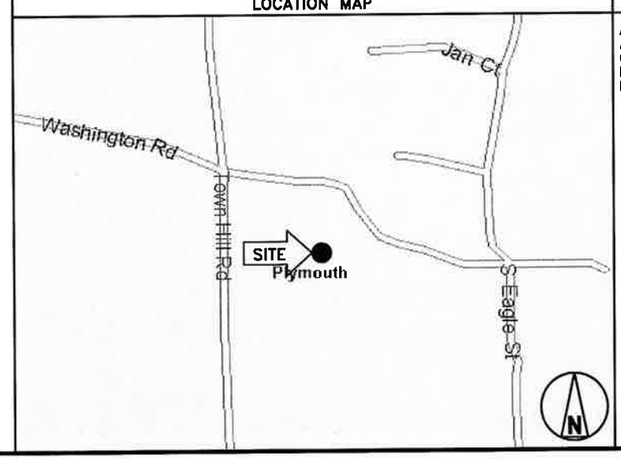
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
peter.culbert@sprint.com

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	SKB	0

SITE NAME:
TERRYVILLE - VOICESTEAM

SITE CASCADE:
CT54XC712

SITE ADDRESS:
171 TOWN HILL RD
PLYMOUTH, CT 06783

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. 24706
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

171 TOWN HILL RD
PLYMOUTH, CT 06783

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

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

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

1.4 TESTS AND INSPECTIONS:

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

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

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

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

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

3.2 REQUIRED TESTS:

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

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

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.
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Albany, NY 12205
Office # (518) 690-0790
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JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24795
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

171 TOWN HILL RD
PLYMOUTH, CT 06783

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
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	SKB	0

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

171 TOWN HILL RD
PLYMOUTH, CT 06783

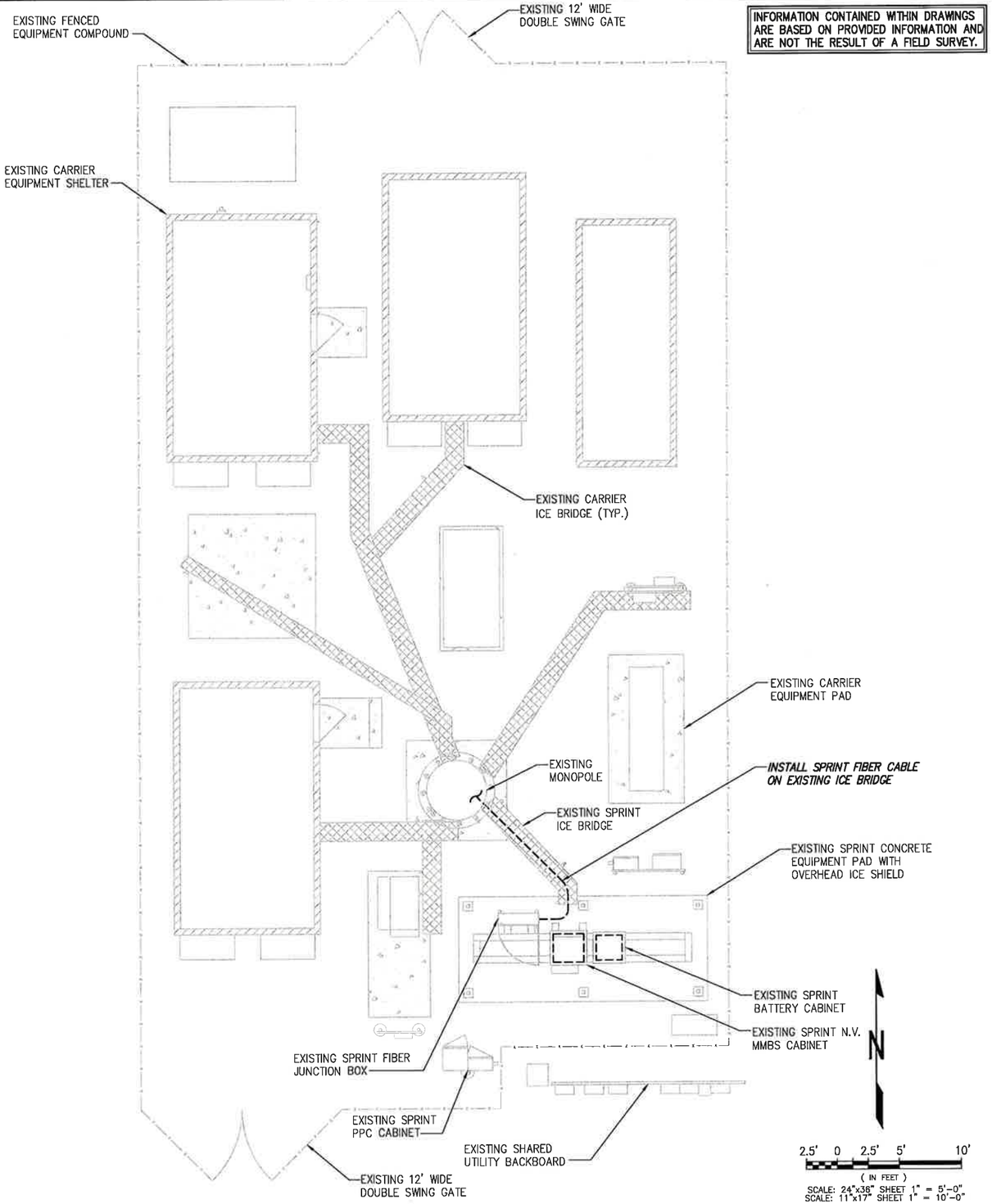
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

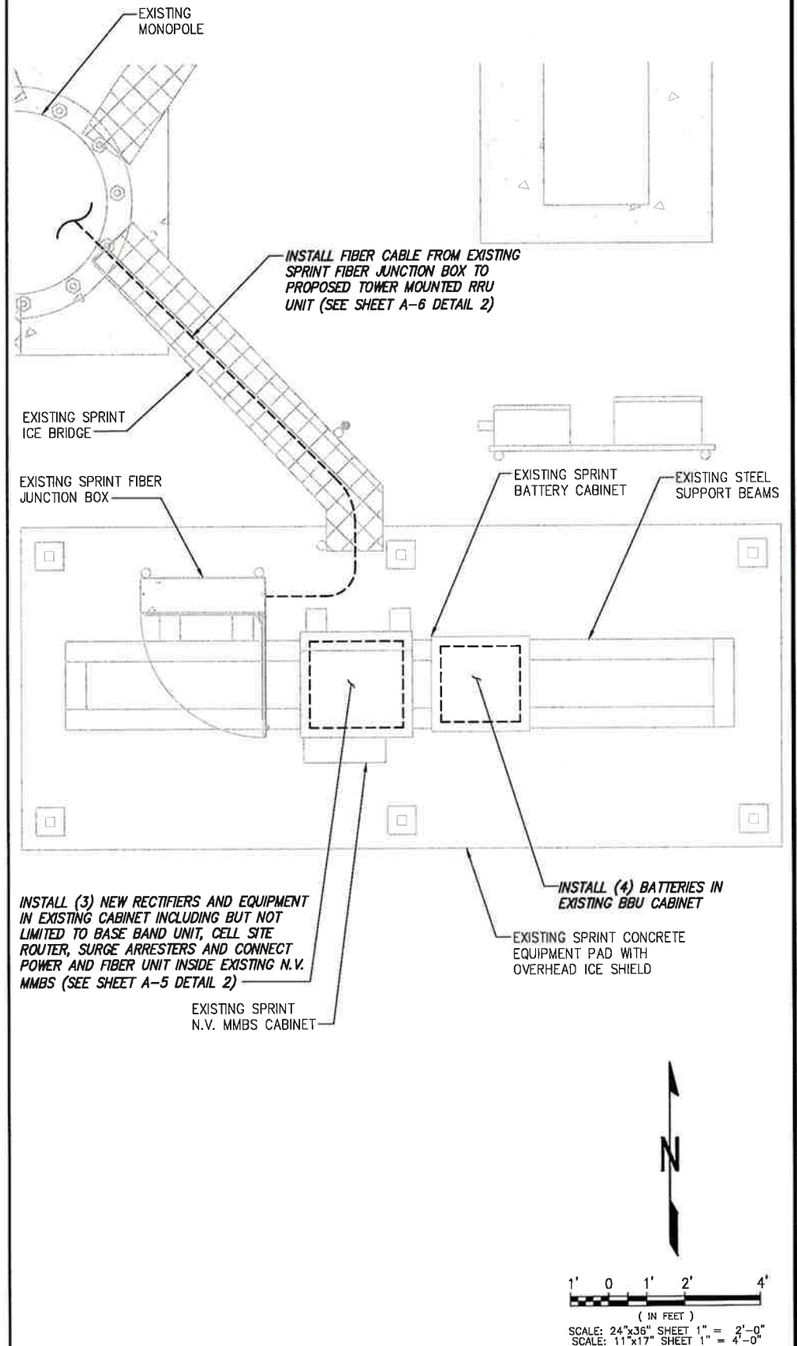
SHEET NUMBER:

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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SITE CASCADE:

CT54XC712

SITE ADDRESS:

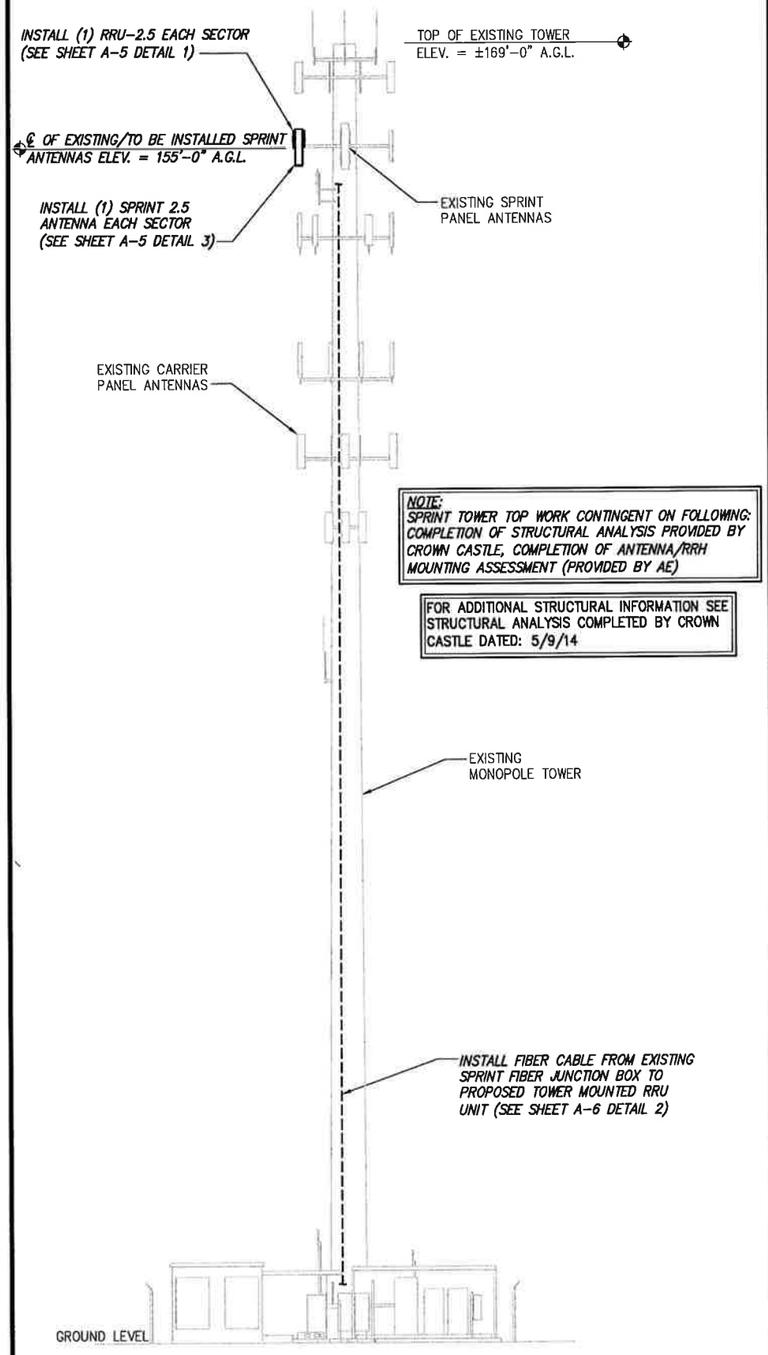
171 TOWN HILL RD
PLYMOUTH, CT 06783

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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SITE NAME:

TERRYVILLE - VOICESTEAM

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CT54XC712

SITE ADDRESS:

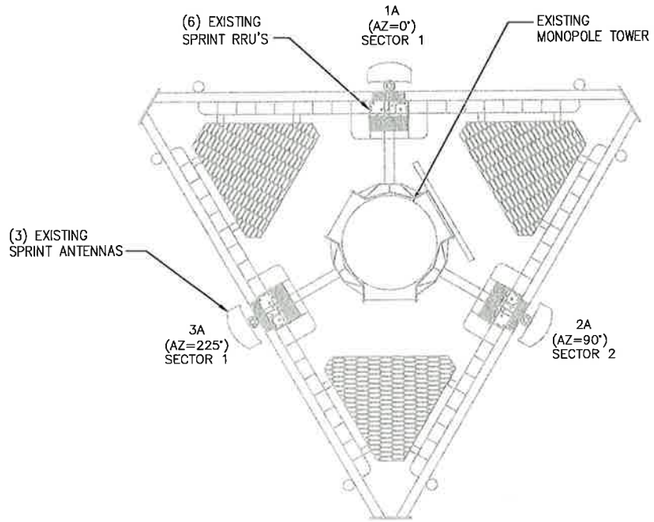
171 TOWN HILL RD
PLYMOUTH, CT 06783

SHEET DESCRIPTION:

TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:

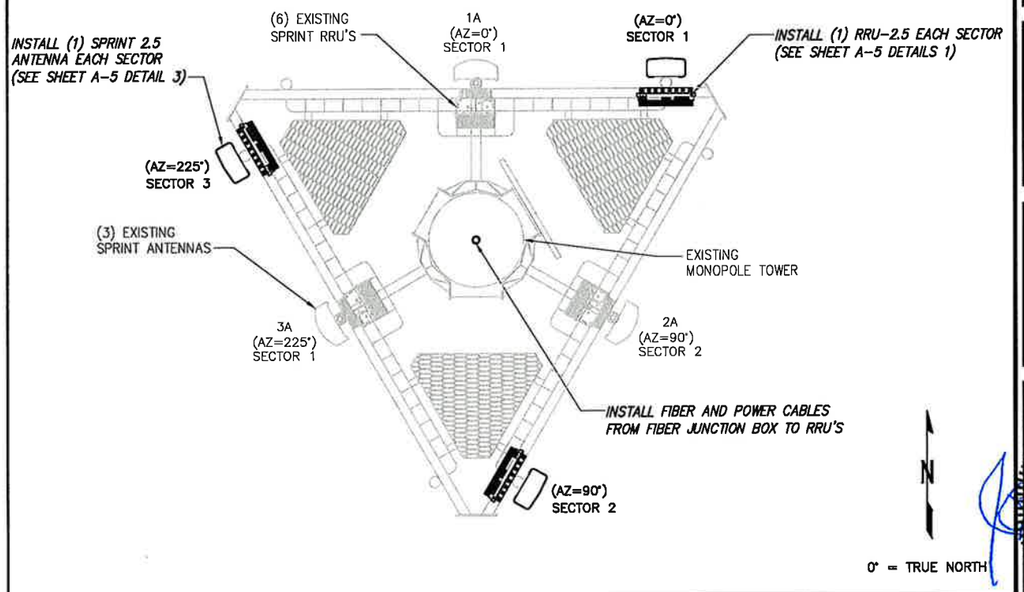
A-2



EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1

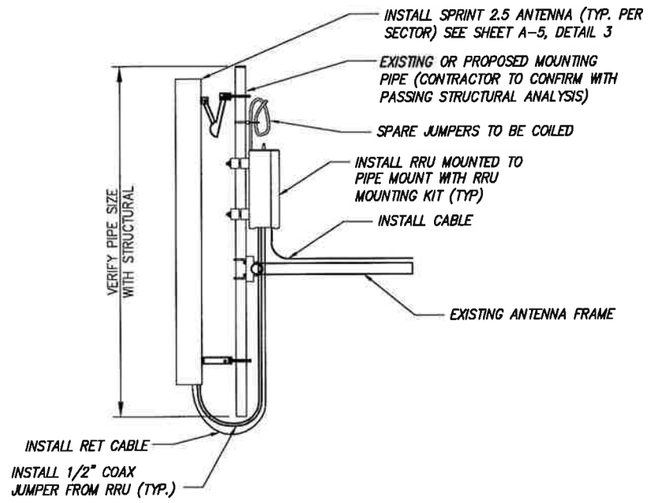
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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. 24105
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

171 TOWN HILL RD
PLYMOUTH, CT 06783

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

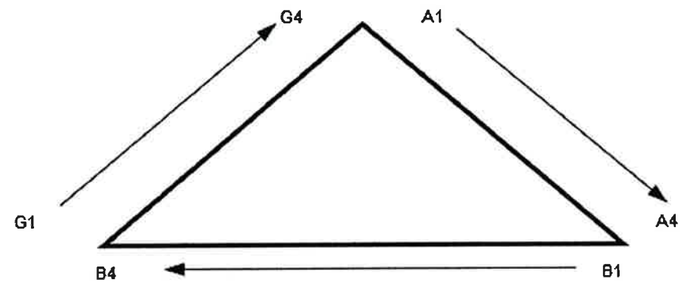
A-3

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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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	SKB	0

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

171 TOWN HILL RD
PLYMOUTH, CT 06783

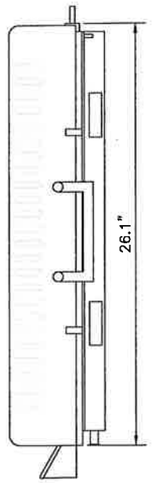
SHEET DESCRIPTION:

COLOR CODING AND NOTES

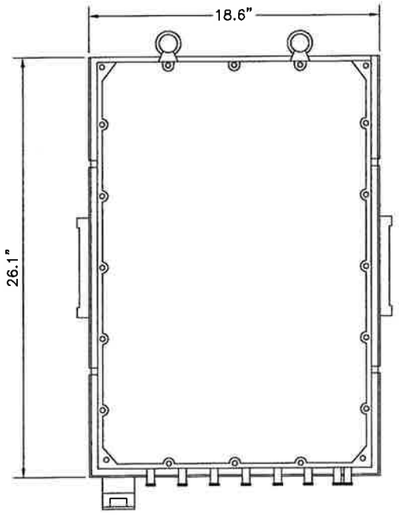
SHEET NUMBER:

A-4

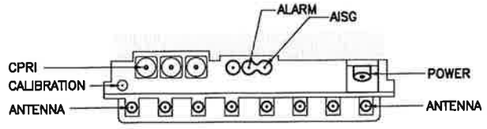
RRU: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

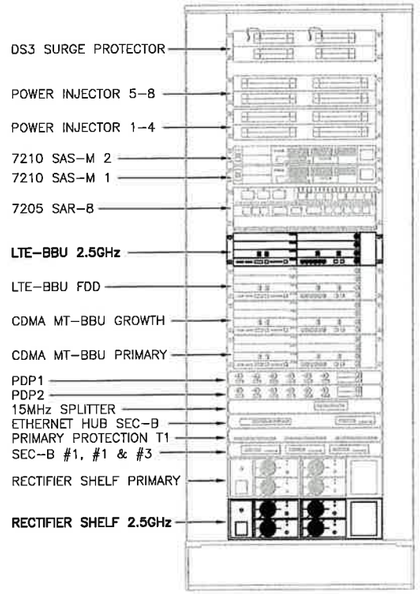


PLAN VIEW

NOTES

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

2.5 RRU	NO SCALE	1

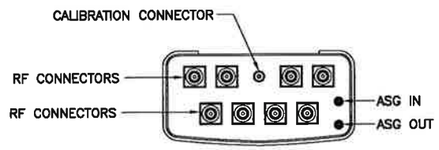


FRONT VIEW

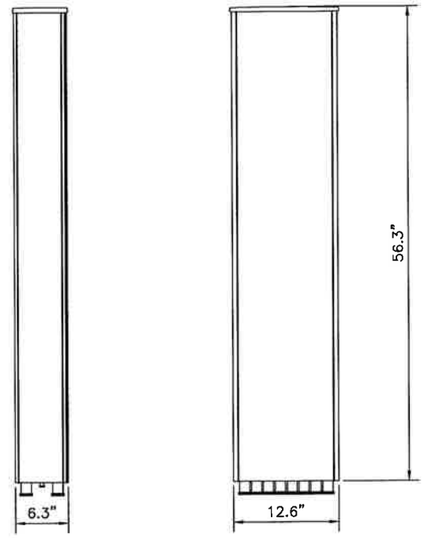
NEW EQUIPMENT IN EXISTING CABINET	NO SCALE	2

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA	NO SCALE	3

DETAIL NOT USED	NO SCALE	4

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

PLANS PREPARED BY:
INFINIGY Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-000

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:
TERRYVILLE - VOICESTEAM

SITE CASCADE:
CT54XC712

SITE ADDRESS:
171 TOWN HILL RD
PLYMOUTH, CT 06783

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

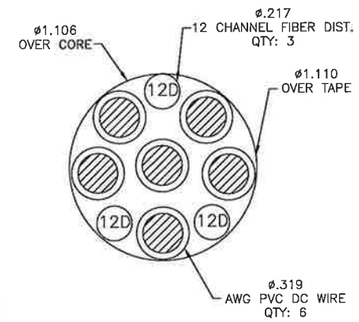
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

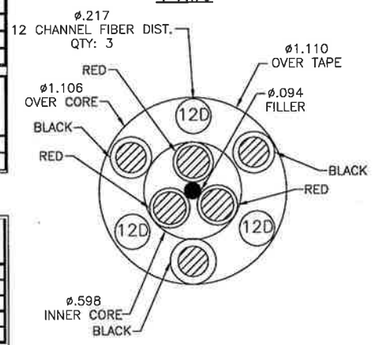
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

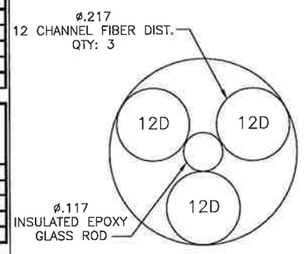
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG



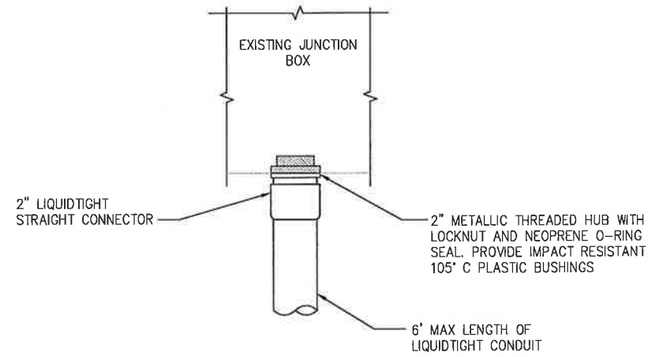
B & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA

NO SCALE | 1



FIBER JUNCTION BOX PENETRATION

NO SCALE | 2

DETAIL NOT USED

NO SCALE | 3

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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. 24706
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

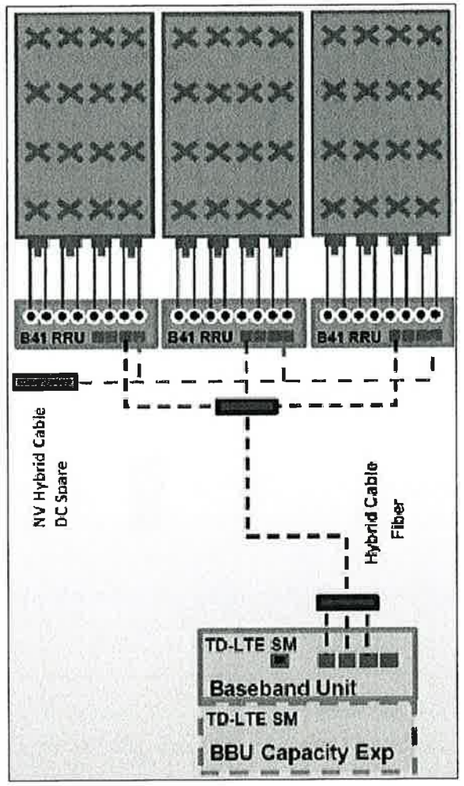
171 TOWN HILL RD
PLYMOUTH, CT 06783

SHEET DESCRIPTION:

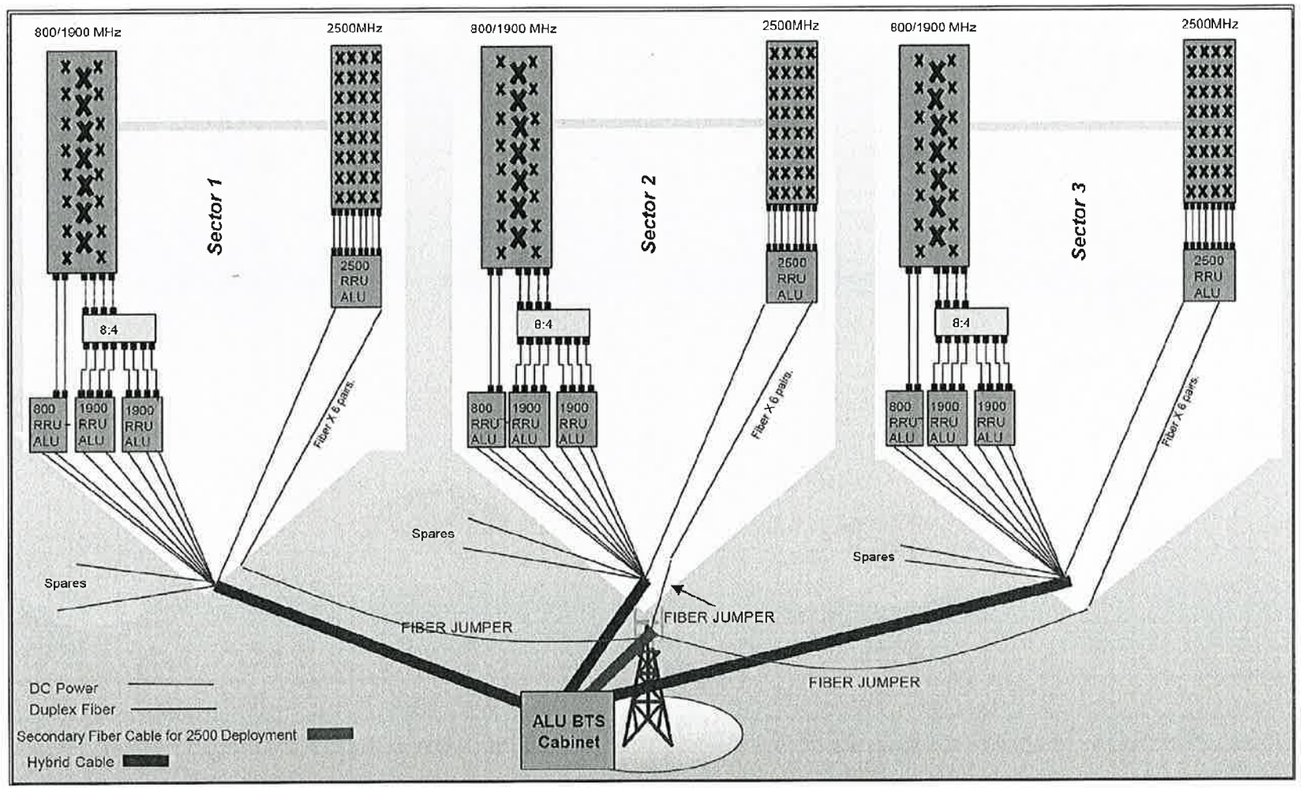
CIVIL DETAILS

SHEET NUMBER:

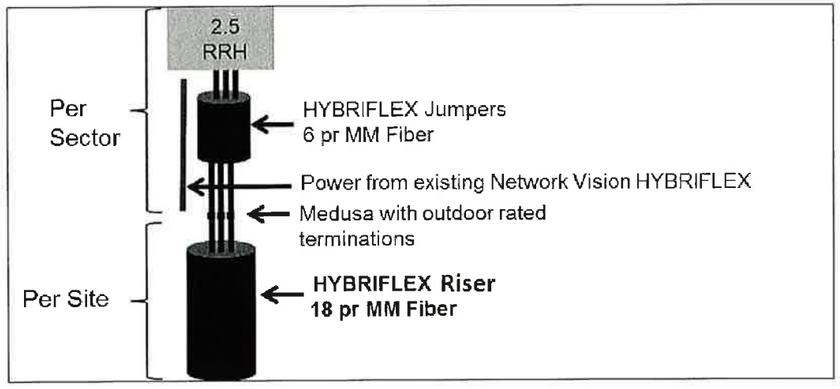
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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No. 24705
LICENSED
PROFESSIONAL ENGINEER

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SITE CASCADE:

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PLYMOUTH, CT 06783

SHEET DESCRIPTION:

CIVIL DETAILS

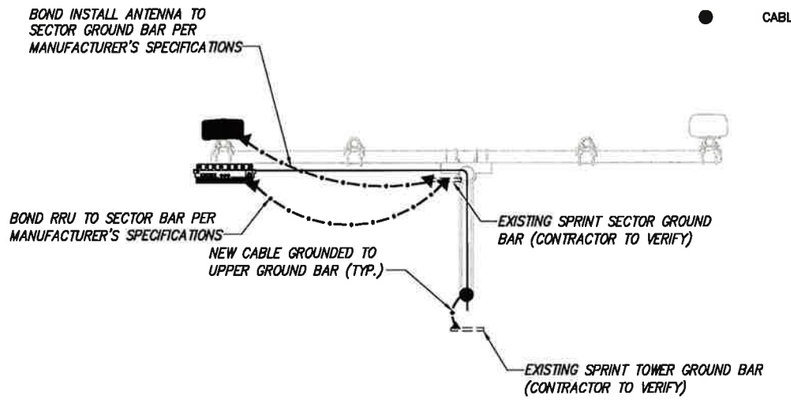
SHEET NUMBER:

A-7

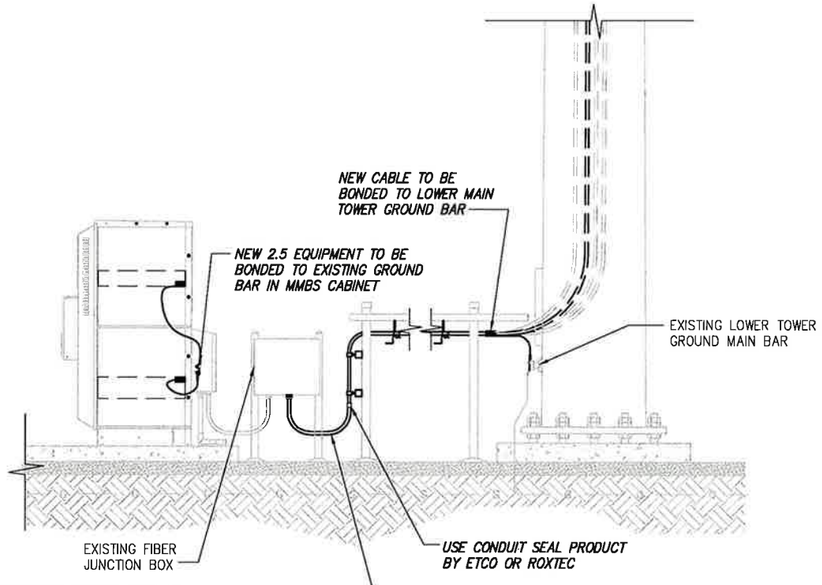
PLAN NOT USED | NO SCALE | 1

LEGEND:

- G — EXISTING GROUND RING
- ■ CADWELD CONNECTION (EXOTHERMIC WELD)
- ▲ MECHANICAL CONNECTION
- ⊗ GROUND ROD
- ● CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2



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

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

PLANS PREPARED FOR:

Sprint

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PLYMOUTH, CT 06783

SHEET DESCRIPTION:

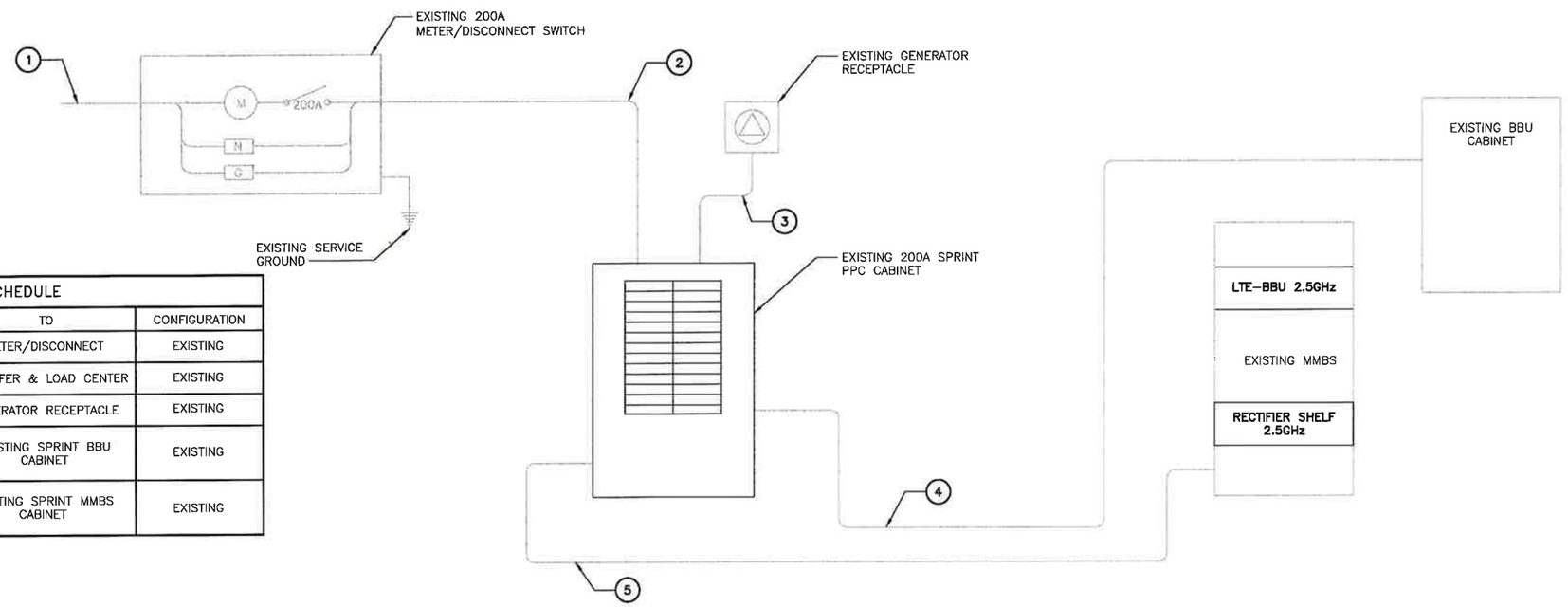
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

NOTES

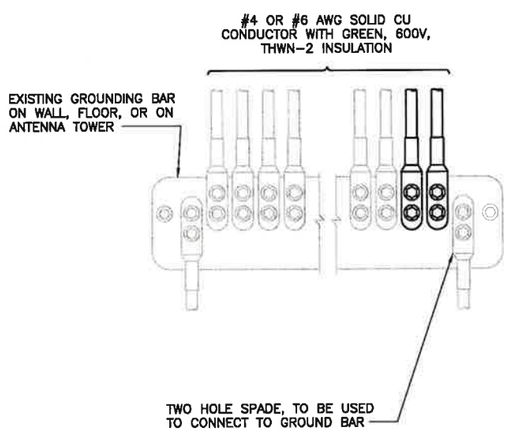
CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



CIRCUIT SCHEDULE

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

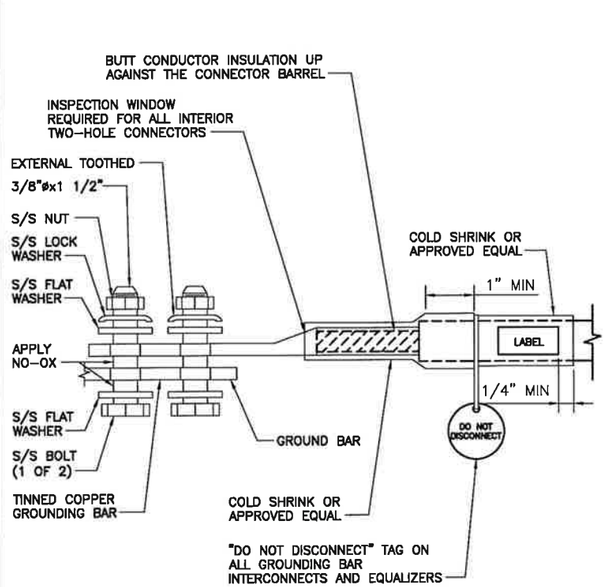
ELECTRICAL ONE–LINE DIAGRAM — NO SCALE — 1



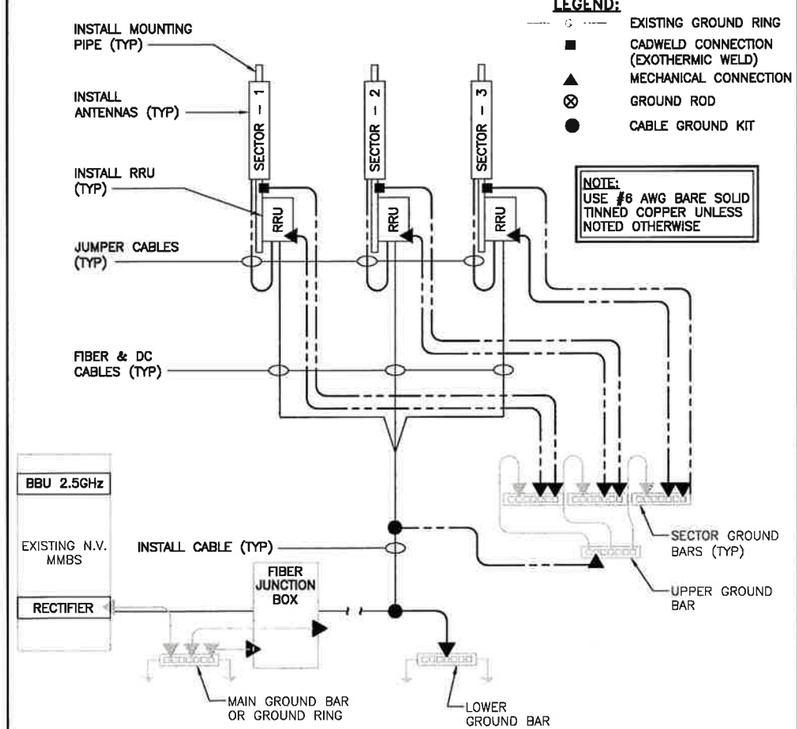
NOTES

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

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



TWO HOLE LUG — NO SCALE — 3



GROUNDING RISER DIAGRAM — NO SCALE — 4

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353–000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

TERRYVILLE - VOICESTEAM

SITE CASCADE:

CT54XC712

SITE ADDRESS:

171 TOWN HILL RD
PLYMOUTH, CT 06783

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

Date: **May 09, 2014**

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

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate**	**Scenario 2.5A**
	Carrier Site Number:	CT54XC712
Crown Castle Designation:	**Crown Castle BU Number:**	826768
	Crown Castle Site Name:	PLYMOUTH/RT 6
	Crown Castle JDE Job Number:	286423
	Crown Castle Work Order Number:	757731
	Crown Castle Application Number:	245725 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	757731
Site Data:	**171 Town Hill Road, Plymouth, Litchfield County, CT** **Latitude *41° 40' 6.197"*, Longitude *-73° 1' 11.842"*** **169 Foot - Monopole Tower**	

Dear Patrick Byrum,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 757731, in accordance with application 245725, 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:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 80 mph fastest mile.

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

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

Structural analysis prepared by: Nithesh Poojari S / Drew Stephens

Respectfully submitted by:

Jamal A. Huwel, P.E
Manager Engineering

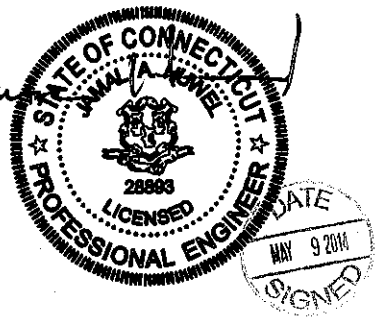


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 169 ft. Monopole tower designed by PiRod Manufactures Inc. in September of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 28.1 mph with 1 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
155.0	155.0	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
164.0	169.0	1	decibel	ASP-952	16 4	1-5/8 7/8	2
		1	rfs celwave	PD220			
		1	rfs celwave	PD455-6			
		1	sinclair	SRL-229			
	165.0	3	rfs celwave	ATMAA1412D-1A20			
	164.0	6	ericsson	AIR 21 w/ Mount Pipe			
		3	ericsson	AIR 33 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 403-1]			
155.0	155.0	3	alcatel lucent	1900MHz RRH	3	1-1/4	1
		3	alcatel lucent	800MHZ RRH			
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 303-1]			
144.0	144.0	3	antel	BXA-171085-8BF-EDIN-0 w/ Mount Pipe	12	1-5/8	1
		3	antel	BXA-70063/6CF w/ Mount Pipe			
		6	antel	LPA-80080/6CF w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 304-1]			
127.0	127.0	12	decibel	DB846G90A-XY w/ Mount Pipe	12	1-5/8	1
		1	tower mounts	Platform Mount [LP 304-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
121.0	125.0	1	rfs celwave	201-4	1	1/2	1
	121.0	1	tower mounts	Side Arm Mount [SO 701-1]			
115.0	115.0	6	ericsson	RRUS 11	12 2 1	1-5/8 3/4 3/8	1
		6	kathrein	AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		12	powerwave technologies	LGP2140X			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 304-1]			
105.0	105.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
80.0	91.0	1	rfs celwave	PD455-6	1	7/8	1
	80.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Existing, Proposed, and Future Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
170	170	12	ems wireless	RR65-16-00XP	12	1-5/8
160	160	12	ems wireless	RR65-16-00XP	12	1-5/8
150	150	12	ems wireless	RR65-16-00XP	12	1-5/8
140	140	12	ems wireless	RR65-16-00XP	12	1-5/8
130	130	12	ems wireless	RR65-16-00XP	12	1-5/8
120	120	12	ems wireless	RR65-16-00XP	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C.	3491991	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PiRod, Inc.	3678682	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiRod, Inc.	3491992	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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	169 - 164.25	Pole	TP26x18x0.25	1	-0.309	1062.230	0.2	Pass
L2	164.25 - 129.125	Pole	TP34.063x21.5x0.313	2	-10.521	1674.088	32.0	Pass
L3	129.125 - 95.458	Pole	TP41.75x32.153x0.375	3	-21.453	2486.285	55.3	Pass
L4	95.458 - 62.625	Pole	TP49.063x39.806x0.375	4	-30.152	2928.654	75.1	Pass
L5	62.625 - 30.625	Pole	TP56.125x46.955x0.375	5	-39.981	3355.108	86.6	Pass
L6	30.625 - 0	Pole	TP62.938x53.847x0.375	6	-52.991	3684.958	98.4	Pass
							Summary	
						Pole (L6)	98.4	Pass
						Rating =	98.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	87.7	Pass
1,2	Base Plate	0	98.4	Pass
1	Base Foundation	0	91.3	Pass

Structure Rating (max from all components) =	98.4%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Base plates have the same capacity as their respective shaft.

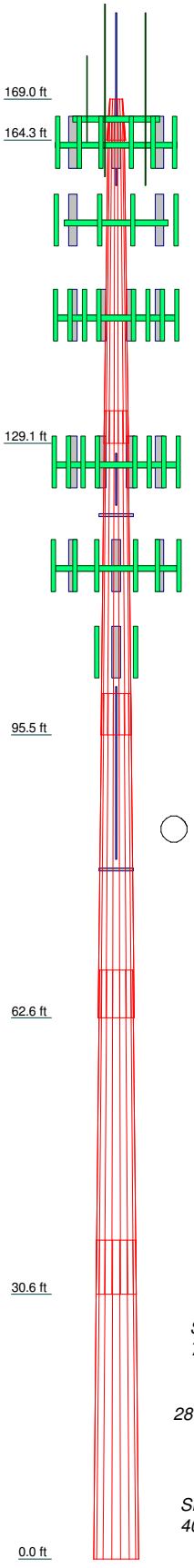
4.1) Recommendations

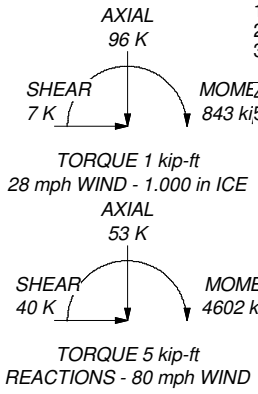
The tower and its foundation have sufficient capacity to carry the existing and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	4.750	18	0.250	2.375	18.000	26.000		0.3
2	37.500	18	0.313	3.833	21.500	34.063		3.5
3	37.500	18	0.375	4.667	32.153	41.750		5.6
4	37.500	18	0.375	5.500	39.806	49.063		6.7
5	37.500	18	0.375	6.250	46.955	56.125		7.8
6	36.875	18	0.375		53.847	62.938		8.7
							A572-65	





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' x 2" Mount Pipe	167	BXA-171085-8BF-EDIN-0 w/ Mount Pipe	144
6' x 2" Mount Pipe	167	BXA-171085-8BF-EDIN-0 w/ Mount Pipe	144
6' x 2" Mount Pipe	167	BXA-70063/6CF w/ Mount Pipe	144
Side Arm Mount [SO 701-3]	167	BXA-70063/6CF w/ Mount Pipe	144
AIR 33 w/ Mount Pipe	164	BXA-70063/6CF w/ Mount Pipe	144
AIR 33 w/ Mount Pipe	164	(2) FD9R6004/2C-3L	144
AIR 33 w/ Mount Pipe	164	(2) FD9R6004/2C-3L	144
ATMAA1412D-1A20	164	(2) FD9R6004/2C-3L	144
ATMAA1412D-1A20	164	Platform Mount [LP 403-1]	144
ATMAA1412D-1A20	164	(4) DB846G90A-XY w/ Mount Pipe	127
PD455-6	164	(4) DB846G90A-XY w/ Mount Pipe	127
SRL-229	164	(4) DB846G90A-XY w/ Mount Pipe	127
PD220	164	Platform Mount [LP 304-1]	127
ASP-952	164	201-4	121
(2) AIR 21 w/ Mount Pipe	164	Side Arm Mount [SO 701-1]	121
(2) AIR 21 w/ Mount Pipe	164	(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	115
(2) AIR 21 w/ Mount Pipe	164	(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	115
(3) 4' x 2" Pipe Mount	164	(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	115
(3) 4' x 2" Pipe Mount	164	AM-X-CD-16-65-00T-RET w/ Mount Pipe	115
(3) 4' x 2" Pipe Mount	164	AM-X-CD-16-65-00T-RET w/ Mount Pipe	115
Platform Mount [LP 403-1]	164	AM-X-CD-16-65-00T-RET w/ Mount Pipe	115
Lightning Rod 5/8" x 5' on 15' Pole	162	(2) RRUS 11	115
APXVTM14-C-120 w/ Mount Pipe	155	(2) RRUS 11	115
APXVTM14-C-120 w/ Mount Pipe	155	(2) RRUS 11	115
APXVTM14-C-120 w/ Mount Pipe	155	(2) LGP2140X	115
TD-RRH8x20-25	155	(4) LGP2140X	115
TD-RRH8x20-25	155	(6) LGP2140X	115
TD-RRH8x20-25	155	DC6-48-60-18-8F	115
APXVSPP18-C-A20 w/ Mount Pipe	155	6' x 2" Mount Pipe	115
APXVSPP18-C-A20 w/ Mount Pipe	155	6' x 2" Mount Pipe	115
APXVSPP18-C-A20 w/ Mount Pipe	155	6' x 2" Mount Pipe	115
1900MHz RRH	155	Platform Mount [LP 304-1]	115
1900MHz RRH	155	APXV18-206517S-C w/ Mount Pipe	105
1900MHz RRH	155	APXV18-206517S-C w/ Mount Pipe	105
800MHZ RRH	155	APXV18-206517S-C w/ Mount Pipe	105
800MHZ RRH	155	PD455-6	80
800MHZ RRH	155	5' x 2" Pipe Mount	80
7'x2" Pipe Mount	155	Side Arm Mount [SO 701-1]	80
7'x2" Pipe Mount	155		
7'x2" Pipe Mount	155		
Platform Mount [LP 303-1]	155		
5' Dipole	148		
Side Arm Mount [SO 305-1]	148		
Pipe Mount [PM 601-1]	148		
(2) LPA-80080/6CF w/ Mount Pipe	144		
(2) LPA-80080/6CF w/ Mount Pipe	144		
(2) LPA-80080/6CF w/ Mount Pipe	144		
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	144		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.4%

CROWN CASTLE
We Are Solutions

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

Job: ***BU# 826768***			
Project:			
Client: Crown Castle	Drawn by: dstephens		App'd:
Code: TIA/EIA-222-F	Date: 05/09/14		Scale: NTS
Path: X:\ENG Work Area\DStephens\India QA\826768\Temp\826768.er			Dwg No. E-1

Tower Input Data

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

1) Tower is located in Litchfield County, Connecticut.
2) Basic wind speed of 80 mph.
3) Nominal ice thickness of 1.000 in.
4) Ice thickness is considered to increase with height.
5) Ice density of 56.000 pcf.
6) A wind speed of 28 mph is used in combination with ice.
7) Temperature drop of 50.000 °F.
8) Deflections calculated using a wind speed of 50 mph.
9) A non-linear (P-delta) analysis was used.
10) Pressures are calculated at each section.
11) Stress ratio used in pole design is 1.333.
12) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	169.000-164.250	4.750	2.375	18	18.000	26.000	0.250	1.000	A572-65 (65 ksi)
L2	164.250-129.125	37.500	3.833	18	21.500	34.063	0.313	1.250	A572-65 (65 ksi)
L3	129.125-95.458	37.500	4.667	18	32.153	41.750	0.375	1.500	A572-65 (65 ksi)
L4	95.458-62.625	37.500	5.500	18	39.806	49.063	0.375	1.500	A572-65 (65 ksi)
L5	62.625-30.625	37.500	6.250	18	46.955	56.125	0.375	1.500	A572-65 (65 ksi)
L6	30.625-0.000	36.875		18	53.847	62.938	0.375	1.500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.278	14.085	560.634	6.301	9.144	61.312	1122.006	7.044	2.728	10.912
	26.401	20.433	1711.654	9.141	13.208	129.592	3425.561	10.218	4.136	16.544
L2	22.640	21.015	1191.883	7.522	10.922	109.127	2385.334	10.510	3.234	10.349
	34.588	33.476	4817.433	11.981	17.304	278.404	9641.206	16.741	5.445	17.424
L3	33.645	37.824	4825.847	11.281	16.334	295.449	9658.044	18.916	4.999	13.331
	42.394	49.247	10650.982	14.688	21.209	502.192	21315.979	24.628	6.688	17.835
L4	41.590	46.932	9218.884	13.998	20.221	455.900	18449.898	23.471	6.346	16.922
	49.819	57.950	17355.138	17.284	24.924	696.329	34733.112	28.981	7.975	21.267
L5	49.045	55.442	15197.404	16.536	23.853	637.126	30414.805	27.726	7.604	20.277
	56.991	66.356	26056.151	19.791	28.511	913.882	52146.587	33.185	9.218	24.581
L6	56.242	63.645	22990.379	18.982	27.354	840.473	46011.009	31.828	8.817	23.512
	63.908	74.465	36822.895	22.210	31.972	1151.714	73694.242	37.240	10.417	27.779

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 169.000-164.250				1	1	1		
L2 164.250-129.125				1	1	1		
L3 129.125-95.458				1	1	1		
L4 95.458-62.625				1	1	1		
L5 62.625-30.625				1	1	1		
L6 30.625-0.000				1	1	1		

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 klf
LDF5-50A(7/8")	B	No	Inside Pole	164.000 - 0.000	4	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF7-50A(1-5/8")	C	No	Inside Pole	164.000 - 0.000	16	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
HB114-1-08U4-M6F(1 1/4")	B	No	Inside Pole	155.000 - 0.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
HB114-21U3M12-XXXF(1-1/4")	B	No	Inside Pole	155.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
LDF4-50A(1/2")	A	No	Inside Pole	148.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	144.000 - 0.000	12	No Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
***								
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	127.000 - 0.000	3	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	127.000 - 0.000	9	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
***								
LDF4-50A(1/2")	A	No	Inside Pole	121.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
***								
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	115.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
2-1/2" Rigid Conduit	A	No	CaAa (Out Of Face)	115.000 - 0.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.005
						1" Ice	0.000	0.007
						2" Ice	0.000	0.014
						4" Ice	0.000	0.035
FB-L98-002-XXX(3/8)	A	No	CaAa (Out Of Face)	115.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
WR-VG86T(3/4)	A	No	CaAa (Out Of Face)	115.000 - 0.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.007
						4" Ice	0.000	0.024
***								
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	105.000 - 0.000	2	No Ice	0.198	0.001
						1/2" Ice	0.298	0.002
						1" Ice	0.398	0.004
						2" Ice	0.598	0.011
						4" Ice	0.998	0.030
LDF7-50A(1-5/8")	B	No	CaAa (Out Of Face)	105.000 - 0.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.011
						4" Ice	0.000	0.030
***								
LDF5-50A(7/8")	A	No	CaAa (Out Of Face)	80.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.008
						4" Ice	0.000	0.025
***								

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

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	169.000-164.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	164.250-129.125	A	0.000	0.000	0.000	0.000	0.003
		B	0.000	0.000	0.000	0.000	0.179
		C	0.000	0.000	0.000	0.000	0.604
L3	129.125-95.458	A	0.000	0.000	0.000	18.736	0.592
		B	0.000	0.000	0.000	3.779	0.264
		C	0.000	0.000	0.000	0.000	0.773
L4	95.458-62.625	A	0.000	0.000	0.000	19.503	0.797
		B	0.000	0.000	0.000	13.002	0.373
		C	0.000	0.000	0.000	0.000	0.754
L5	62.625-30.625	A	0.000	0.000	0.000	19.008	0.782
		B	0.000	0.000	0.000	12.672	0.364
		C	0.000	0.000	0.000	0.000	0.735
L6	30.625-0.000	A	0.000	0.000	0.000	18.191	0.748
		B	0.000	0.000	0.000	12.128	0.348
		C	0.000	0.000	0.000	0.000	0.703

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	169.000-164.250	A	1.214	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	164.250-129.125	A	1.195	0.000	0.000	0.000	0.000	0.003
		B		0.000	0.000	0.000	0.000	0.179
		C		0.000	0.000	0.000	0.000	0.604
L3	129.125-95.458	A	1.158	0.000	0.000	0.000	41.352	3.828
		B		0.000	0.000	0.000	8.340	0.540
		C		0.000	0.000	0.000	0.000	0.773
L4	95.458-62.625	A	1.110	0.000	0.000	0.000	42.310	4.921
		B		0.000	0.000	0.000	28.207	1.279
		C		0.000	0.000	0.000	0.000	0.754
L5	62.625-30.625	A	1.042	0.000	0.000	0.000	40.322	4.591
		B		0.000	0.000	0.000	26.881	1.191
		C		0.000	0.000	0.000	0.000	0.735
L6	30.625-0.000	A	1.000	0.000	0.000	0.000	37.345	4.039
		B		0.000	0.000	0.000	24.896	1.064
		C		0.000	0.000	0.000	0.000	0.703

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	169.000-164.250	0.000	0.000	0.000	0.000
L2	164.250-129.125	0.000	0.000	0.000	0.000
L3	129.125-95.458	0.130	-0.617	0.227	-1.077
L4	95.458-62.625	0.407	-0.470	0.687	-0.793
L5	62.625-30.625	0.419	-0.484	0.715	-0.826
L6	30.625-0.000	0.428	-0.495	0.730	-0.842

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 5' on 15' Pole	C	From Leg	0.500 0.000 8.000	0.000	162.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.875 5.917 7.957 11.732 17.522	3.875 5.917 7.957 11.732 17.522	0.086 0.129 0.178 0.304 0.723
***									
(2) AIR 21 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.771 7.292 7.807 8.869 11.116	5.701 6.552 7.329 8.938 12.371	0.112 0.169 0.232 0.383 0.807
(2) AIR 21 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.771 7.292 7.807 8.869 11.116	5.701 6.552 7.329 8.938 12.371	0.112 0.169 0.232 0.383 0.807
(2) AIR 21 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.771 7.292 7.807 8.869 11.116	5.701 6.552 7.329 8.938 12.371	0.112 0.169 0.232 0.383 0.807
AIR 33 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.537 7.042 7.545 8.581 10.777	5.821 6.630 7.389 8.960 12.318	0.120 0.177 0.240 0.389 0.807
AIR 33 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.537 7.042 7.545 8.581 10.777	5.821 6.630 7.389 8.960 12.318	0.120 0.177 0.240 0.389 0.807
AIR 33 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.537 7.042 7.545 8.581 10.777	5.821 6.630 7.389 8.960 12.318	0.120 0.177 0.240 0.389 0.807
ATMAA1412D-1A20	A	From Leg	4.000 0.000 1.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.467 0.575 0.691 0.951 1.573	1.167 1.314 1.469 1.806 2.584	0.013 0.021 0.030 0.056 0.137
ATMAA1412D-1A20	B	From Leg	4.000 0.000 1.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.467 0.575 0.691 0.951 1.573	1.167 1.314 1.469 1.806 2.584	0.013 0.021 0.030 0.056 0.137
ATMAA1412D-1A20	C	From Leg	4.000 0.000 1.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.467 0.575 0.691 0.951 1.573	1.167 1.314 1.469 1.806 2.584	0.013 0.021 0.030 0.056 0.137
PD455-6	A	From Leg	3.000 0.000 5.000	0.000	164.000	No Ice 1/2" Ice 1" Ice	6.050 8.281 10.529 15.075	6.050 8.281 10.529 15.075	0.023 0.067 0.125 0.283

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice 4" Ice	24.367	24.367	0.772
SRL-229	A	From Leg	4.000 0.000 5.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.450 8.633 10.833 15.283 24.014	6.450 8.633 10.833 15.283 24.014	0.025 0.071 0.131 0.293 0.785
PD220	B	From Leg	3.000 0.000 5.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.080 5.300 7.537 12.060 21.307	3.080 5.300 7.537 12.060 21.307	0.023 0.049 0.088 0.209 0.622
ASP-952	C	From Leg	3.000 0.000 5.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.025 4.156 5.304 6.963 9.760	3.025 4.156 5.304 6.963 9.760	0.017 0.039 0.069 0.149 0.403
6' x 2" Mount Pipe	A	From Leg	3.000 0.000 1.000	0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe	B	From Leg	3.000 0.000 1.000	0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe	C	From Leg	3.000 0.000 1.000	0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Side Arm Mount [SO 701-3]	C	None		0.000	167.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.830 3.920 5.010 7.190 11.550	2.830 3.920 5.010 7.190 11.550	0.195 0.237 0.279 0.363 0.531
(3) 4' x 2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(3) 4' x 2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
(3) 4' x 2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	164.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.785 1.028 1.281 1.814 3.111	0.785 1.028 1.281 1.814 3.111	0.029 0.035 0.044 0.072 0.167
Platform Mount [LP 403-1]	C	None		0.000	164.000	No Ice 1/2" Ice	18.850 24.300 29.750	18.850 24.300 29.750	1.500 1.797 2.093

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	40.650	40.650	2.686
						2" Ice	62.450	62.450	3.872
						4" Ice			
***									
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.074 0.128 0.190 0.335 0.749
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.074 0.128 0.190 0.335 0.749
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.134 7.662 8.183 9.256 11.526	4.959 5.754 6.472 8.010 11.412	0.074 0.128 0.190 0.335 0.749
TD-RRH8x20-25	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
TD-RRH8x20-25	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.720 5.014 5.316 5.948 7.314	1.703 1.920 2.145 2.622 3.680	0.070 0.097 0.128 0.201 0.397
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
1900MHz RRH	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
1900MHz RRH	B	From Leg	4.000	0.000	155.000	No Ice	2.907	3.801	0.044

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
			0.000 0.000			1/2" Ice 1" Ice 2" Ice 4" Ice	3.145 3.391 3.909 5.050	4.065 4.337 4.908 6.152	0.075 0.110 0.192 0.407
1900MHz RRH	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
800MHZ RRH	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800MHZ RRH	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800MHZ RRH	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
7'x2" Pipe Mount	A	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.663 2.391 2.825 3.706 5.578	1.663 2.391 2.825 3.706 5.578	0.026 0.039 0.056 0.105 0.266
7'x2" Pipe Mount	B	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.663 2.391 2.825 3.706 5.578	1.663 2.391 2.825 3.706 5.578	0.026 0.039 0.056 0.105 0.266
7'x2" Pipe Mount	C	From Leg	4.000 0.000 0.000	0.000	155.000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	1.663 2.391 2.825 3.706 5.578	1.663 2.391 2.825 3.706 5.578	0.026 0.039 0.056 0.105 0.266
Platform Mount [LP 303-1]	C	None		0.000	155.000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	14.660 18.870 23.080 31.500 48.340	14.660 18.870 23.080 31.500 48.340	1.250 1.481 1.713 2.175 3.101
***									
5' Dipole	A	From Leg	3.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice Ice 1" Ice 2" Ice 4" Ice	2.435 2.758 3.100 3.911 5.667	2.435 2.758 3.100 3.911 5.667	0.020 0.045 0.073 0.142 0.335
Side Arm Mount [SO 305-1]	A	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice Ice 1" Ice 2" Ice	0.940 1.480 2.020 3.100 5.260	1.410 2.170 2.930 4.450 7.490	0.030 0.043 0.057 0.083 0.136

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			
Pipe Mount [PM 601-1]	A	From Leg	0.500 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.740 4.480 5.960 8.920	0.900 1.120 1.340 1.780 2.660	0.065 0.079 0.093 0.122 0.178
***									
(2) LPA-80080/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.564 5.105 5.612 6.651 8.834	10.728 11.990 12.968 14.980 19.217	0.046 0.113 0.187 0.363 0.857
(2) LPA-80080/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.564 5.105 5.612 6.651 8.834	10.728 11.990 12.968 14.980 19.217	0.046 0.113 0.187 0.363 0.857
(2) LPA-80080/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.564 5.105 5.612 6.651 8.834	10.728 11.990 12.968 14.980 19.217	0.046 0.113 0.187 0.363 0.857
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.061 0.099 0.193 0.488
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.061 0.099 0.193 0.488
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.179 3.555 3.964 4.853 6.767	3.353 3.971 4.595 5.893 8.885	0.029 0.061 0.099 0.193 0.488
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.695 6.849 7.715 9.497 13.262	0.040 0.100 0.168 0.331 0.798
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.695 6.849 7.715 9.497 13.262	0.040 0.100 0.168 0.331 0.798
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.695 6.849 7.715 9.497 13.262	0.040 0.100 0.168 0.331 0.798
(2) FD9R6004/2C-3L	A	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice 1/2" Ice	0.367 0.451 0.543	0.085 0.136 0.196	0.003 0.005 0.009

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
						1" Ice	0.755	0.343	0.020
						2" Ice	1.281	0.740	0.063
						4" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
(2) FD9R6004/2C-3L	C	From Leg	4.000 0.000 0.000	0.000	144.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
Platform Mount [LP 403-1]	C	None		0.000	144.000	No Ice	18.850	18.850	1.500
						1/2" Ice	24.300	24.300	1.797
						1" Ice	29.750	29.750	2.093
						2" Ice	40.650	40.650	2.686
						4" Ice	62.450	62.450	3.872
***									
(4) DB846G90A-XY w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	127.000	No Ice	5.229	7.529	0.041
						1/2" Ice	5.783	8.715	0.098
						1" Ice	6.303	9.615	0.162
						2" Ice	7.365	11.449	0.318
						4" Ice	9.694	15.603	0.770
(4) DB846G90A-XY w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	127.000	No Ice	5.229	7.529	0.041
						1/2" Ice	5.783	8.715	0.098
						1" Ice	6.303	9.615	0.162
						2" Ice	7.365	11.449	0.318
						4" Ice	9.694	15.603	0.770
(4) DB846G90A-XY w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	127.000	No Ice	5.229	7.529	0.041
						1/2" Ice	5.783	8.715	0.098
						1" Ice	6.303	9.615	0.162
						2" Ice	7.365	11.449	0.318
						4" Ice	9.694	15.603	0.770
Platform Mount [LP 304-1]	C	None		0.000	127.000	No Ice	17.460	17.460	1.349
						1/2" Ice	22.440	22.440	1.625
						1" Ice	27.420	27.420	1.900
						2" Ice	37.380	37.380	2.451
						4" Ice	57.300	57.300	3.554
***									
201-4	A	From Leg	3.000 0.000 4.000	0.000	121.000	No Ice	1.125	1.125	0.004
						1/2" Ice	2.004	2.004	0.014
						1" Ice	2.898	2.898	0.029
						2" Ice	4.314	4.314	0.076
						4" Ice	6.532	6.532	0.245
Side Arm Mount [SO 701-1]	A	From Leg	1.500 0.000 0.000	0.000	121.000	No Ice	0.850	1.670	0.065
						1/2" Ice	1.140	2.340	0.079
						1" Ice	1.430	3.010	0.093
						2" Ice	2.010	4.350	0.121
						4" Ice	3.170	7.030	0.177
***									
(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice	7.846	6.650	0.086
						1/2" Ice	8.452	7.873	0.150
						1" Ice	9.088	8.844	0.222
						2" Ice	10.376	10.726	0.393
							13.072	14.690	0.883

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			
(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.846 8.452 9.088 10.376 13.072	6.650 7.873 8.844 10.726 14.690	0.086 0.150 0.222 0.393 0.883
(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.846 8.452 9.088 10.376 13.072	6.650 7.873 8.844 10.726 14.690	0.086 0.150 0.222 0.393 0.883
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
(2) RRUS 11	A	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
(2) RRUS 11	B	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
(2) RRUS 11	C	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
(2) LGP2140X	A	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.260 1.416 1.581 1.936 2.750	0.378 0.493 0.617 0.890 1.541	0.019 0.026 0.035 0.060 0.140
(4) LGP2140X	B	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.260 1.416 1.581 1.936 2.750	0.378 0.493 0.617 0.890 1.541	0.019 0.026 0.035 0.060 0.140
(6) LGP2140X	C	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice	1.260 1.416 1.581 1.936	0.378 0.493 0.617 0.890	0.019 0.026 0.035 0.060

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice 4" Ice	2.750	1.541	0.140
DC6-48-60-18-8F	C	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.266 1.456 1.658 2.093 3.098	1.266 1.456 1.658 2.093 3.098	0.020 0.035 0.053 0.095 0.215
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Platform Mount [LP 304-1]	C	None		0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.460 22.440 27.420 37.380 57.300	17.460 22.440 27.420 37.380 57.300	1.349 1.625 1.900 2.451 3.554
***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	1.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.404 5.960 6.481 7.547 9.919	4.700 5.860 6.734 8.515 12.277	0.052 0.097 0.150 0.280 0.679
APXV18-206517S-C w/ Mount Pipe	B	From Leg	1.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.404 5.960 6.481 7.547 9.919	4.700 5.860 6.734 8.515 12.277	0.052 0.097 0.150 0.280 0.679
APXV18-206517S-C w/ Mount Pipe	C	From Leg	1.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.404 5.960 6.481 7.547 9.919	4.700 5.860 6.734 8.515 12.277	0.052 0.097 0.150 0.280 0.679
***									
PD455-6	A	From Leg	3.000 0.000 11.000	0.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.050 8.281 10.529 15.075 24.367	6.050 8.281 10.529 15.075 24.367	0.023 0.067 0.125 0.283 0.772
5' x 2" Pipe Mount	A	From Leg	3.000 0.000 0.000	0.000	80.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.393 1.703 2.351 3.778	1.000 1.393 1.703 2.351 3.778	0.029 0.037 0.048 0.082 0.196
Side Arm Mount [SO 701-	A	From Leg	1.500	0.000	80.000	No Ice	0.850	1.670	0.065

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
1]			0.000 0.000			1/2" Ice 1" Ice 2" Ice 4" Ice	1.140 1.430 2.010 3.170	2.340 3.010 4.350 7.030	0.079 0.093 0.121 0.177

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	169 - 164.25	Pole	Max Tension	2	0.000	-0.000	-0.000
			Max. Compression	14	-0.677	-0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-0.309	0.912	0.000
			Max. My	2	-0.309	0.000	0.912
			Max. Vy	11	-0.457	0.454	0.000
			Max. Vx	2	-0.457	0.000	0.454
			Max. Torque	18			0.000
L2	164.25 - 129.125	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-21.412	0.147	1.885
			Max. Mx	11	-10.527	348.452	0.247
			Max. My	2	-10.521	0.071	349.774
			Max. Vy	11	-16.101	348.452	0.247
			Max. Vx	2	-16.171	0.071	349.774
			Max. Torque	5			2.470
L3	129.125 - 95.458	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-43.538	0.355	7.118
			Max. Mx	11	-21.449	1114.726	0.516
			Max. My	2	-21.453	-0.197	1116.487
			Max. Vy	11	-28.956	1114.726	0.516
			Max. Vx	2	-28.888	-0.197	1116.487
			Max. Torque	5			2.947
L4	95.458 - 62.625	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-59.004	-1.225	16.702
			Max. Mx	11	-30.151	2107.823	1.268
			Max. My	2	-30.155	-1.415	2108.983
			Max. Vy	5	33.031	-2107.665	4.238
			Max. Vx	2	-32.934	-1.415	2108.983
			Max. Torque	5			4.263
L5	62.625 - 30.625	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-75.350	-3.078	25.780
			Max. Mx	5	-39.981	-3194.039	6.720
			Max. My	2	-39.984	-2.667	3193.452
			Max. Vy	5	36.332	-3194.039	6.720
			Max. Vx	2	-36.235	-2.667	3193.452
			Max. Torque	5			4.405
L6	30.625 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-95.653	-5.319	36.584
			Max. Mx	5	-52.991	-4597.991	9.798
			Max. My	2	-52.991	-4.176	4595.348
			Max. Vy	5	39.734	-4597.991	9.798
			Max. Vx	2	-39.636	-4.176	4595.348
			Max. Torque	5			4.578

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	95.653	-0.000	0.000
	Max. H_x	11	53.011	39.707	-0.030
	Max. H_z	2	53.011	-0.030	39.610
	Max. M_x	2	4595.348	-0.030	39.610
	Max. M_z	5	4597.991	-39.707	0.030
	Max. Torsion	5	4.578	-39.707	0.030
	Min. Vert	1	53.011	0.000	0.000
	Min. H_x	5	53.011	-39.707	0.030
	Min. H_z	8	53.011	0.030	-39.610
	Min. M_x	8	-4582.899	0.030	-39.610
	Min. M_z	11	-4596.815	39.707	-0.030
	Min. Torsion	11	-4.578	39.707	-0.030

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	53.011	0.000	0.000	-6.034	-0.583	0.000
Dead+Wind 0 deg - No Ice	53.011	0.030	-39.610	-4595.348	-4.176	-0.154
Dead+Wind 30 deg - No Ice	53.011	19.880	-34.318	-3982.313	-2302.403	-2.422
Dead+Wind 60 deg - No Ice	53.011	34.403	-19.831	-2303.880	-3983.852	-4.042
Dead+Wind 90 deg - No Ice	53.011	39.707	-0.030	-9.797	-4597.991	-4.578
Dead+Wind 120 deg - No Ice	53.011	34.372	19.779	2285.246	-3980.264	-3.888
Dead+Wind 150 deg - No Ice	53.011	19.827	34.288	3966.295	-2296.186	-2.156
Dead+Wind 180 deg - No Ice	53.011	-0.030	39.610	4582.899	2.996	0.154
Dead+Wind 210 deg - No Ice	53.011	-19.880	34.318	3969.873	2301.212	2.423
Dead+Wind 240 deg - No Ice	53.011	-34.403	19.831	2291.454	3982.663	4.042
Dead+Wind 270 deg - No Ice	53.011	-39.707	0.030	-2.625	4596.815	4.578
Dead+Wind 300 deg - No Ice	53.011	-34.372	-19.779	-2297.677	3979.099	3.887
Dead+Wind 330 deg - No Ice	53.011	-19.827	-34.288	-3978.740	2295.018	2.155
Dead+Ice+Temp	95.653	0.000	-0.000	-36.584	-5.319	0.000
Dead+Wind 0 deg+Ice+Temp	95.653	0.004	-6.657	-842.802	-5.836	0.043
Dead+Wind 30 deg+Ice+Temp	95.653	3.341	-5.767	-735.052	-409.580	-0.498
Dead+Wind 60 deg+Ice+Temp	95.653	5.782	-3.332	-440.171	-705.006	-0.905
Dead+Wind 90 deg+Ice+Temp	95.653	6.675	-0.004	-37.172	-812.955	-1.070
Dead+Wind 120 deg+Ice+Temp	95.653	5.778	3.325	365.964	-704.502	-0.948
Dead+Wind 150 deg+Ice+Temp	95.653	3.334	5.763	661.215	-408.706	-0.572
Dead+Wind 180 deg+Ice+Temp	95.653	-0.004	6.657	769.469	-4.826	-0.043
Dead+Wind 210 deg+Ice+Temp	95.653	-3.341	5.767	661.720	398.919	0.498
Dead+Wind 240 deg+Ice+Temp	95.653	-5.782	3.332	366.839	694.345	0.905
Dead+Wind 270 deg+Ice+Temp	95.653	-6.675	0.004	-36.162	802.293	1.070
Dead+Wind 300 deg+Ice+Temp	95.653	-5.778	-3.325	-439.297	693.840	0.948
Dead+Wind 330 deg+Ice+Temp	95.653	-3.334	-5.763	-734.548	398.044	0.572
Dead+Wind 0 deg - Service	53.011	0.012	-15.473	-1800.515	-1.990	-0.061
Dead+Wind 30 deg - Service	53.011	7.766	-13.406	-1560.832	-900.559	-0.952
Dead+Wind 60 deg - Service	53.011	13.439	-7.746	-904.592	-1557.981	-1.588
Dead+Wind 90 deg - Service	53.011	15.511	-0.012	-7.640	-1798.095	-1.799
Dead+Wind 120 deg - Service	53.011	13.427	7.726	889.687	-1556.578	-1.527
Dead+Wind 150 deg - Service	53.011	7.745	13.394	1546.951	-898.130	-0.846
Dead+Wind 180 deg - Service	53.011	-0.012	15.473	1788.035	0.814	0.061
Dead+Wind 210 deg - Service	53.011	-7.766	13.406	1548.353	899.382	0.952
Dead+Wind 240 deg - Service	53.011	-13.439	7.746	892.115	1556.804	1.588
Dead+Wind 270 deg - Service	53.011	-15.511	0.012	-4.836	1796.920	1.799
Dead+Wind 300 deg - Service	53.011	-13.427	-7.726	-902.165	1555.405	1.527
Dead+Wind 330 deg - Service	53.011	-7.745	-13.394	-1559.431	896.956	0.846

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	0.000	-53.011	0.000	0.000	53.011	0.000	0.000%
2	0.030	-53.011	-39.610	-0.030	53.011	39.610	0.000%
3	19.880	-53.011	-34.318	-19.880	53.011	34.318	0.000%
4	34.403	-53.011	-19.831	-34.403	53.011	19.831	0.000%
5	39.707	-53.011	-0.030	-39.707	53.011	0.030	0.000%
6	34.372	-53.011	19.779	-34.372	53.011	-19.779	0.000%
7	19.827	-53.011	34.288	-19.827	53.011	-34.288	0.000%
8	-0.030	-53.011	39.610	0.030	53.011	-39.610	0.000%
9	-19.880	-53.011	34.318	19.880	53.011	-34.318	0.000%
10	-34.403	-53.011	19.831	34.403	53.011	-19.831	0.000%
11	-39.707	-53.011	0.030	39.707	53.011	-0.030	0.000%
12	-34.372	-53.011	-19.779	34.372	53.011	19.779	0.000%
13	-19.827	-53.011	-34.288	19.827	53.011	34.288	0.000%
14	0.000	-95.653	0.000	-0.000	95.653	0.000	0.000%
15	0.004	-95.653	-6.657	-0.004	95.653	6.657	0.000%
16	3.341	-95.653	-5.767	-3.341	95.653	5.767	0.000%
17	5.782	-95.653	-3.332	-5.782	95.653	3.332	0.000%
18	6.675	-95.653	-0.004	-6.675	95.653	0.004	0.000%
19	5.778	-95.653	3.325	-5.778	95.653	-3.325	0.000%
20	3.334	-95.653	5.763	-3.334	95.653	-5.763	0.000%
21	-0.004	-95.653	6.657	0.004	95.653	-6.657	0.000%
22	-3.341	-95.653	5.767	3.341	95.653	-5.767	0.000%
23	-5.782	-95.653	3.332	5.782	95.653	-3.332	0.000%
24	-6.675	-95.653	0.004	6.675	95.653	-0.004	0.000%
25	-5.778	-95.653	-3.325	5.778	95.653	3.325	0.000%
26	-3.334	-95.653	-5.763	3.334	95.653	5.763	0.000%
27	0.012	-53.011	-15.473	-0.012	53.011	15.473	0.000%
28	7.766	-53.011	-13.406	-7.766	53.011	13.406	0.000%
29	13.439	-53.011	-7.746	-13.439	53.011	7.746	0.000%
30	15.511	-53.011	-0.012	-15.511	53.011	0.012	0.000%
31	13.427	-53.011	7.726	-13.427	53.011	-7.726	0.000%
32	7.745	-53.011	13.394	-7.745	53.011	-13.394	0.000%
33	-0.012	-53.011	15.473	0.012	53.011	-15.473	0.000%
34	-7.766	-53.011	13.406	7.766	53.011	-13.406	0.000%
35	-13.439	-53.011	7.746	13.439	53.011	-7.746	0.000%
36	-15.511	-53.011	0.012	15.511	53.011	-0.012	0.000%
37	-13.427	-53.011	-7.726	13.427	53.011	7.726	0.000%
38	-7.745	-53.011	-13.394	7.745	53.011	13.394	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00036938
3	Yes	5	0.00000001	0.00088852
4	Yes	5	0.00000001	0.00095671
5	Yes	5	0.00000001	0.00008891
6	Yes	5	0.00000001	0.00087169
7	Yes	5	0.00000001	0.00092552
8	Yes	4	0.00000001	0.00040949
9	Yes	5	0.00000001	0.00093661
10	Yes	5	0.00000001	0.00087069
11	Yes	5	0.00000001	0.00008561
12	Yes	5	0.00000001	0.00094886
13	Yes	5	0.00000001	0.00089279
14	Yes	4	0.00000001	0.00013392
15	Yes	5	0.00000001	0.00026265
16	Yes	5	0.00000001	0.00028351
17	Yes	5	0.00000001	0.00028321
18	Yes	5	0.00000001	0.00025421
19	Yes	5	0.00000001	0.00026440
20	Yes	5	0.00000001	0.00026243
21	Yes	5	0.00000001	0.00024087
22	Yes	5	0.00000001	0.00026124

23	Yes	5	0.00000001	0.00026275
24	Yes	5	0.00000001	0.00025218
25	Yes	5	0.00000001	0.00028083
26	Yes	5	0.00000001	0.00028163
27	Yes	4	0.00000001	0.00017753
28	Yes	5	0.00000001	0.00008504
29	Yes	5	0.00000001	0.00009914
30	Yes	4	0.00000001	0.00046987
31	Yes	5	0.00000001	0.00008195
32	Yes	5	0.00000001	0.00009216
33	Yes	4	0.00000001	0.00017792
34	Yes	5	0.00000001	0.00009431
35	Yes	5	0.00000001	0.00008172
36	Yes	4	0.00000001	0.00046381
37	Yes	5	0.00000001	0.00009767
38	Yes	5	0.00000001	0.00008595

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 164.25	38.730	28	1.853	0.008
L2	166.625 - 129.125	37.808	28	1.853	0.008
L3	132.958 - 95.458	25.140	28	1.688	0.004
L4	100.125 - 62.625	14.547	28	1.354	0.003
L5	68.125 - 30.625	6.786	28	0.927	0.002
L6	36.875 - 0	2.028	28	0.494	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.000	6' x 2" Mount Pipe	28	37.954	1.853	0.008	43003
164.000	(2) AIR 21 w/ Mount Pipe	28	36.791	1.851	0.008	43003
162.000	Lightning Rod 5/8" x 5' on 15' Pole	28	36.017	1.848	0.008	32052
155.000	APXVTM14-C-120 w/ Mount Pipe	28	33.323	1.827	0.008	17072
148.000	5' Dipole	28	30.664	1.794	0.007	11625
144.000	(2) LPA-80080/6CF w/ Mount Pipe	28	29.166	1.769	0.006	9832
127.000	(4) DB846G90A-XY w/ Mount Pipe	28	23.052	1.637	0.004	6331
121.000	201-4	28	21.017	1.581	0.003	5849
115.000	(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	28	19.055	1.521	0.003	5435
105.000	APXV18-206517S-C w/ Mount Pipe	28	15.965	1.412	0.003	4861
80.000	PD455-6	28	9.348	1.092	0.002	4489

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 164.25	98.724	3	4.727	0.021

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L2	166.625 - 129.125	96.378	3	4.727	0.021
L3	132.958 - 95.458	64.112	4	4.306	0.011
L4	100.125 - 62.625	37.116	4	3.456	0.007
L5	68.125 - 30.625	17.322	4	2.367	0.004
L6	36.875 - 0	5.179	4	1.262	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
167.000	6' x 2" Mount Pipe	3	96.748	4.727	0.021	17135
164.000	(2) AIR 21 w/ Mount Pipe	3	93.787	4.722	0.021	17135
162.000	Lightning Rod 5/8" x 5' on 15' Pole	3	91.816	4.714	0.021	12759
155.000	APXVTM14-C-120 w/ Mount Pipe	3	84.954	4.662	0.019	6782
148.000	5' Dipole	3	78.179	4.577	0.017	4614
144.000	(2) LPA-80080/6CF w/ Mount Pipe	4	74.363	4.515	0.015	3901
127.000	(4) DB846G90A-XY w/ Mount Pipe	4	58.791	4.176	0.010	2507
121.000	201-4	4	53.605	4.034	0.009	2314
115.000	(2) AP14/17-880/1940/088D/ADT/XXP w/ Mount Pipe	4	48.607	3.882	0.008	2148
105.000	APXV18-206517S-C w/ Mount Pipe	4	40.732	3.603	0.007	1919
80.000	PD455-6	4	23.858	2.788	0.005	1767

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	169 - 164.25 (1)	TP26x18x0.25	4.750	0.000	0.0	39.000	20.433	-0.309	796.872	0.000
L2	164.25 - 129.125 (2)	TP34.063x21.5x0.313	37.500	0.000	0.0	39.000	32.202	-10.521	1255.880	0.008
L3	129.125 - 95.458 (3)	TP41.75x32.153x0.375	37.500	0.000	0.0	39.000	47.825	-21.453	1865.180	0.012
L4	95.458 - 62.625 (4)	TP49.063x39.806x0.375	37.500	0.000	0.0	39.000	56.334	-30.152	2197.040	0.014
L5	62.625 - 30.625 (5)	TP56.125x46.955x0.375	37.500	0.000	0.0	39.000	64.537	-39.981	2516.960	0.016
L6	30.625 - 0 (6)	TP62.938x53.847x0.375	36.875	0.000	0.0	37.124	74.465	-52.991	2764.410	0.019

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	169 - 164.25 (1)	TP26x18x0.25	0.913	0.085	39.000	0.002	0.000	0.000	39.000	0.000
L2	164.25 - 129.125 (2)	TP34.063x21.5x0.313	349.774	16.298	39.000	0.418	0.000	0.000	39.000	0.000
L3	129.125 - 95.458 (3)	TP41.75x32.153x0.375	1116.483	28.296	39.000	0.726	0.000	0.000	39.000	0.000
L4	95.458 - 62.625 (4)	TP49.063x39.806x0.375	2110.242	38.491	39.000	0.987	0.000	0.000	39.000	0.000
L5	62.625 - 30.625 (5)	TP56.125x46.955x0.375	3197.108	44.389	39.000	1.138	0.000	0.000	39.000	0.000
L6	30.625 - 0 (6)	TP62.938x53.847x0.375	4602.058	47.950	37.124	1.292	0.000	0.000	37.124	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	169 - 164.25 (1)	TP26x18x0.25	0.355	0.017	26.000	0.001	0.000	0.000	26.000	0.000
L2	164.25 - 129.125 (2)	TP34.063x21.5x0.313	16.171	0.502	26.000	0.039	0.205	0.005	26.000	0.000
L3	129.125 - 95.458 (3)	TP41.75x32.153x0.375	28.888	0.604	26.000	0.046	0.554	0.007	26.000	0.000
L4	95.458 - 62.625 (4)	TP49.063x39.806x0.375	32.986	0.586	26.000	0.045	2.509	0.022	26.000	0.001
L5	62.625 - 30.625 (5)	TP56.125x46.955x0.375	36.335	0.563	26.000	0.043	3.968	0.027	26.000	0.001
L6	30.625 - 0 (6)	TP62.938x53.847x0.375	39.736	0.534	26.000	0.041	4.042	0.021	26.000	0.001

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	169 - 164.25 (1)	0.000	0.002	0.000	0.001	0.000	0.003 ✔	1.333	H1-3+VT ✔
L2	164.25 - 129.125 (2)	0.008	0.418	0.000	0.039	0.000	0.427 ✔	1.333	H1-3+VT ✔
L3	129.125 - 95.458 (3)	0.012	0.726	0.000	0.046	0.000	0.738 ✔	1.333	H1-3+VT ✔
L4	95.458 - 62.625 (4)	0.014	0.987	0.000	0.045	0.001	1.001 ✔	1.333	H1-3+VT ✔
L5	62.625 - 30.625 (5)	0.016	1.138	0.000	0.043	0.001	1.155 ✔	1.333	H1-3+VT ✔
L6	30.625 - 0 (6)	0.019	1.292	0.000	0.041	0.001	1.311 ✔	1.333	H1-3+VT ✔

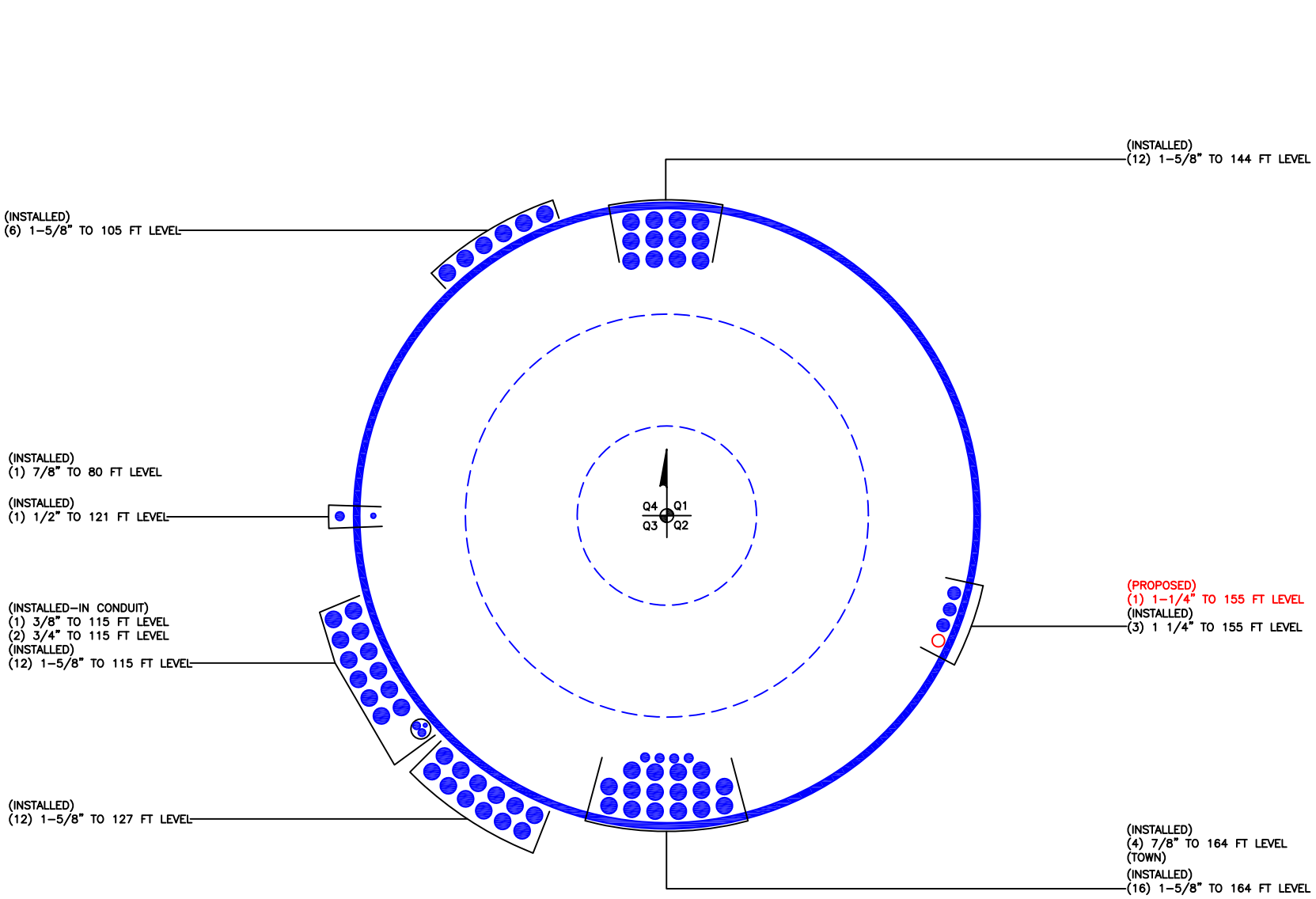
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	169 - 164.25	Pole	TP26x18x0.25	1	-0.309	1062.230	0.2	Pass
L2	164.25 - 129.125	Pole	TP34.063x21.5x0.313	2	-10.521	1674.088	32.0	Pass
L3	129.125 - 95.458	Pole	TP41.75x32.153x0.375	3	-21.453	2486.285	55.3	Pass
L4	95.458 - 62.625	Pole	TP49.063x39.806x0.375	4	-30.152	2928.654	75.1	Pass
L5	62.625 - 30.625	Pole	TP56.125x46.955x0.375	5	-39.981	3355.108	86.6	Pass
L6	30.625 - 0	Pole	TP62.938x53.847x0.375	6	-52.991	3684.958	98.4	Pass
							Summary	
						Pole (L6)	98.4	Pass
						RATING =	**98.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 826768 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#:	*826768*
Site Name:	*PLYMOUTH/RT 6*
App #:	*245725 - Rev. 0*
Pole Manufacturer:	*Pirod*

Reactions		
Moment:	4602	ft-kips
Axial:	53	kips
Shear:	40	kips

Anchor Rod Data		
Qty:	45	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	68	in

Plate Data		
Diam:	73	in
Thick:	1.5	in
Grade:	50	ksi
Single-Rod B-eff:	4.44	in

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

Pole Data		
Diam:	62.9375	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

Maximum Rod Tension:	71.0 Kips	Rigid
Allowable Tension:	81.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	87.7% **Pass**	Fty*ASIF

Base Plate Results Flexural Check

Base Plate Stress:	Rohn/Pirod, OK	Rigid
Allowable Plate Stress:	50.0 ksi	Service ASD
Base Plate Stress Ratio:	Rohn/Pirod, OK	0.75*Fy*ASIF
		Y.L. Length: 25.75

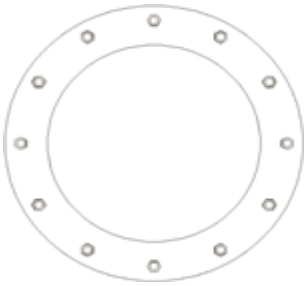
n/a

Stiffener Results N/A for Rohn / Pirod

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



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

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

Monopole Pier and Pad Foundation

BU # : 826768
Site Name: PLYMOUTH/RT 6
App. Number: 245725 - Rev. 0

TIA-222 Revision: F

Design Reactions

Shear, **S**:	40	kips
Moment, **M**:	4602	ft-kips
Tower Height, **H**:	169	ft
Tower Weight, **Wt**:	53	kips
Base Diameter, **BD**:	5.24	ft

Foundation Dimensions

Depth, **D**:	8.5	ft
Pad Width, **W**:	27	ft
Neglected Depth, **N**:	3.5	ft
Thickness, **T**:	2.50	ft
Pier Diameter, **Pd**:	7.50	ft
Ext. Above Grade, **E**:	0.50	ft
BP Dist. Above Pier:	3	in.
Clear Cover, **Cc**:	3.0	in

Soil Properties

Soil Unit Weight, **γ**:	0.135	kcf
Ult. Bearing Capacity, Bc:	12.0	ksf
Angle of Friction, **Φ**:	30	deg
Cohesion, **Co**:	0.000	ksf
Passive Pressure, **Pp**:	0.250	ksf
Base Friction, **μ**:	0.60	

Material Properties

Rebar Yield Strength, **Fy**:	60000	psi
Concrete Strength, **F'c**:	4000	psi
Concrete Unit Weight, **δc**:	0.150	kcf
Seismic Zone, **z**:	1	

Rebar Properties

Pier Rebar Size, **Sp**:	9	
Pier Rebar Quanity, **mp**:	39	32
Pad Rebar Size, **Spad**:	9	
Pad Rebar Quanity, **mpad**:	36	16
Pier Tie Size, **St**:	4	3
Tie Quanity, **mt**:	11	7

Design Checks

	Capacity/ Availability	Demand/ Limits	Check
Req'd Pier Diam.(ft)	7.5	7.244791667	**OK**
Overturning (ft-kips)	8177.15	4602.00	**56.3%**
Shear Capacity (kips)	335.03	40.00	**11.9%**
Bearing (ksf)	9.00	3.23	**35.9%**
Pad Shear - 1-way (kips)	812.57	684.28	**84.2%**
Pad Shear - 2-way (kips)	1834.78	146.43	**8.0%**
Pad Moment Capacity (k-ft)	4123.81	2037.42	**49.4%**
Pier Moment Capacity (k-ft)	5327.72	4862.00	**91.3%**

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT54XC712

Terryville - Voicestream

171 Town Hill Road
Plymouth, CT 06783

June 16, 2014

EBI Project Number: 62143383

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

EBI Consulting
environmental | engineering | due diligence

June 16, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT54XC712 - Terryville - Voicestream

Site Total: 78.01% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 171 Town Hill Road, Plymouth, 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 171 Town Hill Road, Plymouth, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
7) The antenna mounting height centerline for the proposed antennas is **155 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	CT54XC712 - Terryville - Voicestream
Site Addresss	171 Town Hill Road, Plymouth, CT, 06783
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	155	149	1/2 "	0.5	0	277.39	0.45%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	155	149	1/2 "	0.5	0	39.00	0.11%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	155	149	1/2 "	0.5	0	138.69	0.40%
														Sector total Power Density Value:		0.96%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	155	149	1/2 "	0.5	0	277.39	0.45%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	155	149	1/2 "	0.5	0	39.00	0.11%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	155	149	1/2 "	0.5	0	138.69	0.40%
														Sector total Power Density Value:		0.96%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	155	149	1/2 "	0.5	0	277.39	0.45%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	155	149	1/2 "	0.5	0	39.00	0.11%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	155	149	1/2 "	0.5	0	138.69	0.40%
														Sector total Power Density Value:		0.96%

Site Composite MPE %	
Carrier	MPE %
Sprint	2.87%
MetroPCS	6.17%
T-Mobile	1.31%
Town	20.35%
Verizon Wireless	18.13%
Nextel	4.87%
AT&T	24.31%
Total Site MPE %	**78.01%**

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **2.87% (0.96% from sector 1, 0.96% from sector 2 and 0.96% 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 **78.01%** 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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