Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

September 21, 2017

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

RE: **Notice of Exempt Modification for Sprint 2.5 Rework Crown Site BU: 876382**
Sprint Site ID: CT33XC536
1684 Chamberlain Highway, Berlin, CT 06037
Latitude: 41° 35′ 23.07″ / Longitude: -72° 48′ 19.20″

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 120-foot level of the existing 123-foot monopole at 1684 Chamberlain Highway in Berlin, CT. The tower is owned by Crown Castle. The property is owned by the Ronald and Arlene Laviana. Sprint intends to install three (3) antennas, three (3) RRHs, and one (1) hybrid cable.

This facility was approved by the Town of Berlin in Special Permit # 00-02-SP on April 11, 2000. This approval was given without conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Jack Healy, Interim Town Manager, Town of Berlin Planning and Zoning, as well as the property owner.

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

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc: Mr. Jack Healy
240 Kensington Road
Berlin, CT 06037

Planning & Zoning
Town Hall – Room 7
240 Kensington Road
Berlin, CT 06037

Ronald and Arlene Laviana
1684 Chamberlain Highway
Kensington, CT, CT 06037

VOL. 433 PAGE 0333

Town of Berlin

Department of Development Services

April 11, 2000

NOTICE OF DECISION

BERLIN PLANNING AND ZONING COMMISSION

Application: Special Permit - #00-02-SP

Applicant: SPRINT Spectrum L.P. dba SPRINT PCS

Location: Lot 17, Block 15, Chamberlain Highway

At its Regular Meeting of March 23, 2000, the Berlin Planning and Zoning voted five to two to grant the Special Permit Application of SPRINT Spectrum L.P., d/b/a SPRINT PCS for a telecommunications tower and related equipment at Lot 17, Block 15, Chamberlain Highway.

00240

Brian J. Miller, AICP
Director of Development Services

Lawrence J. & Nellie C. Laviana
Owner of Record

Certified Mail (Return Receipt Requested): 7099 3400 0001 5361 6271

Visit Our Web Site: http://www.edc.ci.berlin.ct.us

Town of Berlin, Connecticut • Planning and Zoning Commission
240 Kensington Road • Berlin, CT 06037 • (860) 828-7060 • Fax (860) 828-7180

RECEIVED May 3 2000
AT 12 HR 58 MIN p.m.
AND RECORDED IN
BERLIN LAND RECORDS
VOL. 433 PAGE 333
Cheryl DeFrancesco
ASST TOWN CLERK

Town of Berlin, CT

Property Listing Report

Map Block Lot 19-4-15-17 | Account 1036200

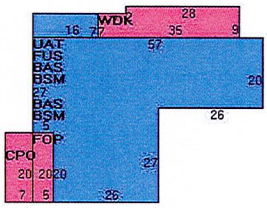
Property Information

Property Location	1684 CHAMBERLAIN HWY
Owner	LAVIANA RONALD L & ARLENE G
Co-Owner	
Mailing Address	1684 CHAMBERLAIN HWY KENSINGTON CT 06037
Land Use	1070 SFR w/Apt
Land Class	R
Zoning Code	MR-1
Census Tract	

Street Index	6
Acreage	65.05
Utilities	Gas,Well,Septic
Lot Setting/Desc	Level
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1800
Stories	2
Building Style	Colonial
Building Use	Residential
Building Condition	B
Floors	Carpet
Total Rooms	12

Bedrooms	6 Bedrooms
Full Bathrooms	3
Half Bathrooms	0
Bath Style	Average
Kitchen Style	Average
Roof Style	Gable
Roof Cover	Asph/F Gls/Cmp

Exterior Walls	Vinyl Siding
Interior Walls	Drywall
Heating Type	Hot Water
Heating Fuel	Gas/Oil
AC Type	None
Gross Bldg Area	8273
Total Living Area	3866

Report Created On 9/20/2017

Town of Berlin, CT

Property Listing Report | Map Block Lot 19-4-15-17 | Account 1036200

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	228800	160200
Extras	4200	4600
Improvements	458500	322700
Outbuildings	225500	157900
Land	1480200	121376
Total	1938700	444076

Outbuilding and Extra Items

Type	Description
Barn 1 Story	638 S.F.
Cell Tower	150 L.F.
Barn 1 Sty w/Bsm	2100 S.F.
Shed Wd Res	420 S.F.
Garage - Avg	504 S.F.
Generator	22 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Upper Story, Finished	1877	1877
Concrete Patio	140	0
Basement	1989	0
First Floor	1989	1989
Porch, Open, Finished	100	0
Attic, Unfinished	1877	0
Deck, Wood	301	0
Total Area	8273	3866

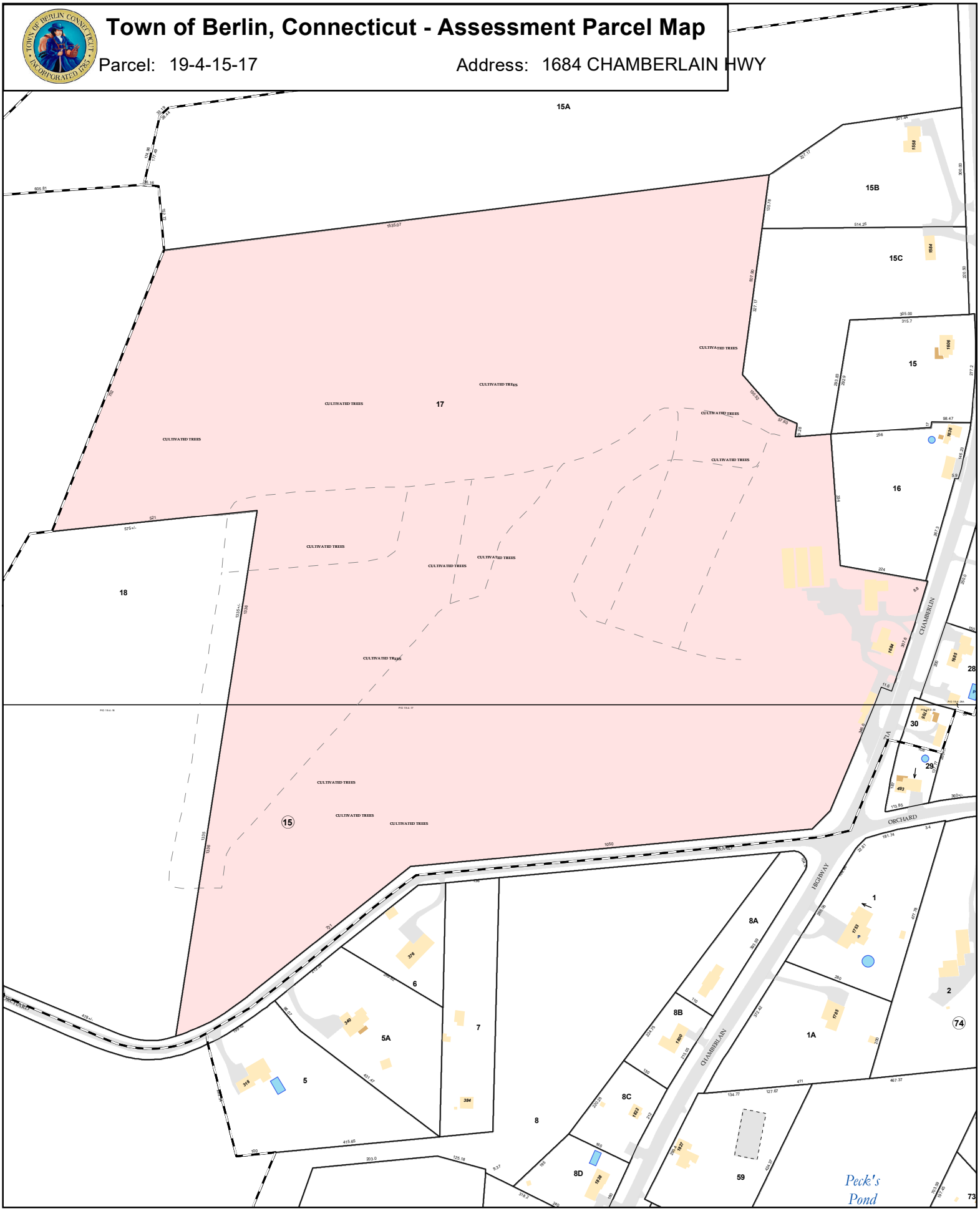
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
LAVIANA,LAWRENCE,,	88/ 223	4/23/1944	
LAVIANA RONALD L & ARLENE G	456/ 137	9/19/2001	0

Report Created On 9/20/2017

Town of Berlin, Connecticut - Assessment Parcel Map

Parcel: 19-4-15-17 Address: 1684 CHAMBERLAIN HWY



N W E S

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 • (203) 404 - 7129

Approximate Scale: 1 inch = 300 feet

0 150 300 450 600 Feet

Map Produced: August 2017

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	BERLIN / LAVIANA ORCHARD
SITE CASCADE:	CT33XC536
SITE NUMBER:	876382
SITE ADDRESS:	1684 CHAMBERLAIN HIGHWAY BERLIN, CT 06037
SITE TYPE:	MONOPOLE TOWER
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

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

LATITUDE (NAD83):
41° 35' 23.07" N
41.589742°

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

COUNTY:
HARTFORD

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
MR-1

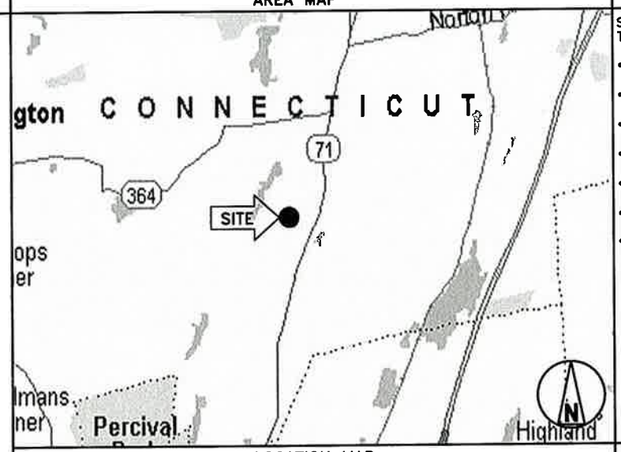
POWER COMPANY:
CONNECTICUT LIGHT & POWER
(860) 947-2000

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

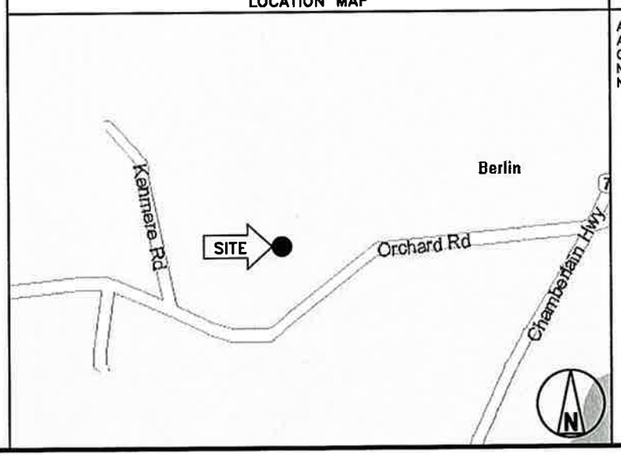
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
peter.culbert@sprint.com

CROWN CASTLE CM:
JASON D'AMICO
(860) 209-0104
JASON.D'AMICO@CROWNCASTLE.COM

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

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

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	1
SP-1	SPRINT SPECIFICATIONS	1
SP-2	SPRINT SPECIFICATIONS	1
SP-3	SPRINT SPECIFICATIONS	1
A-1	SITE PLAN	1
A-2	TOWER ELEVATION & CABLE PLAN	1
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	1
A-4	COLOR CODING & NOTES	1
A-5	EQUIPMENT & MOUNTING DETAILS	1
A-6	CIVIL DETAILS	1
A-7	PLUMBING DIAGRAM	1
E-1	ELECTRICAL & GROUNDING PLAN	1
E-2	ELECTRICAL & GROUNDING DETAILS	1

APPROVED
By Jeff Barbadora at 1:00 pm, Jul 16, 2014

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

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

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
REVISED PER COMMENTS	7/16/14	JLM	1
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:
BERLIN / LAVIANA ORCHARD

SITE CASCADE:
CT33XC536

SITE ADDRESS:
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:
TITLE SHEET & PROJECT DATA

SHEET NUMBER:
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

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

B. COMPANY: SPRINT CORPORATION

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

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

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

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.

3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.

4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.

5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED

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

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
REVISED PER COMMENTS	7/16/14	JLM	1
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

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

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

1.4 TESTS AND INSPECTIONS:

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

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

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

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

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

3.2 REQUIRED TESTS:

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

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

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

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BERLIN / LAVIANA ORCHARD

SITE CASCADE:

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SITE ADDRESS:

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BERLIN, CT 06037

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

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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.

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SHEET DESCRIPTION:
SPRINT SPECIFICATIONS

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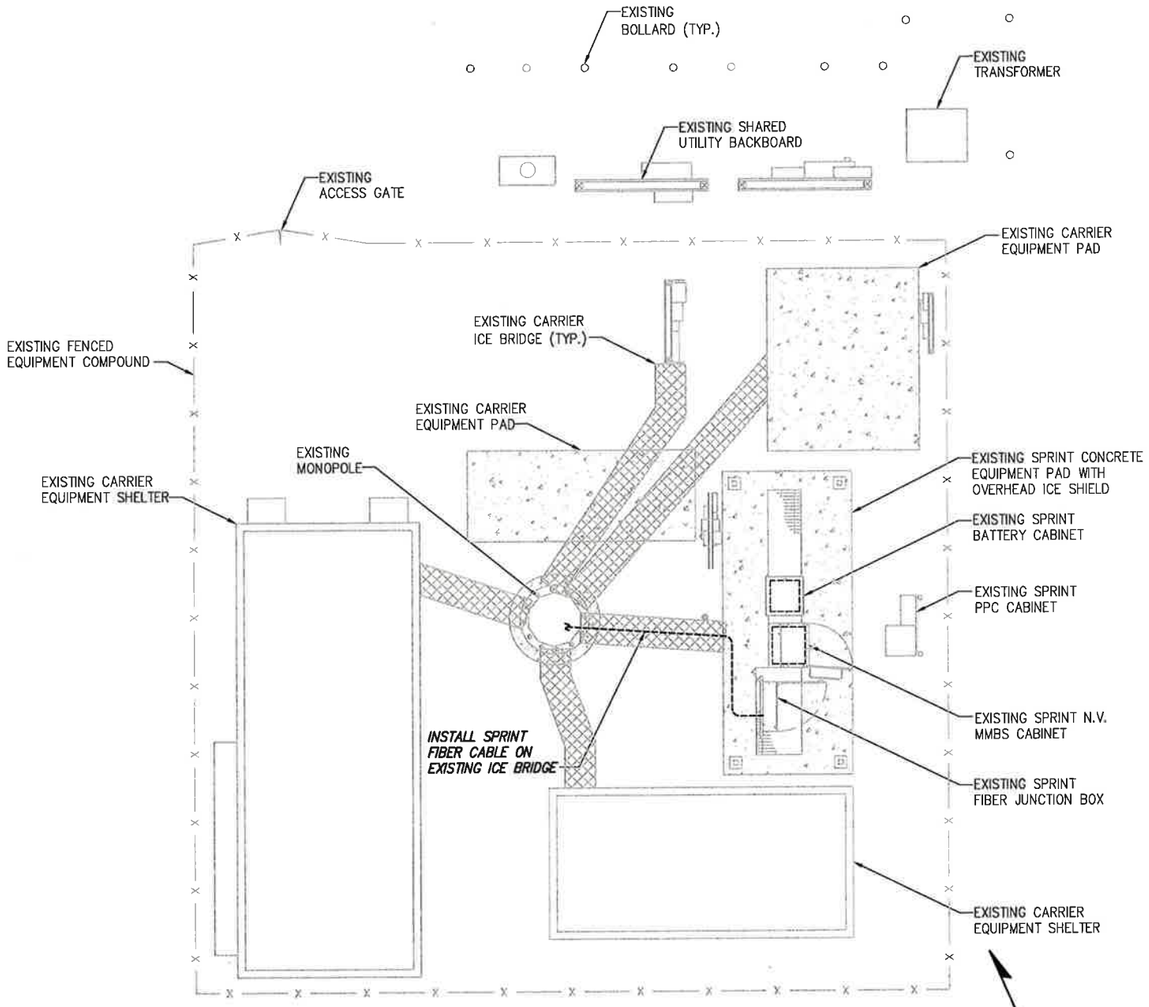
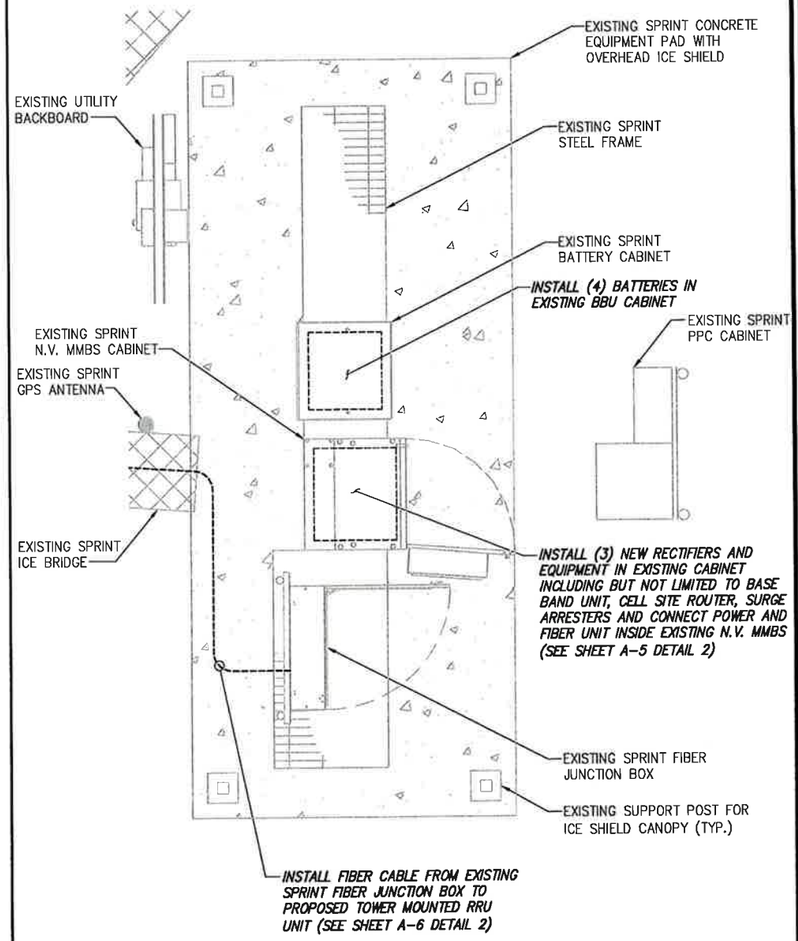
SP-3

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



OVERALL SITE PLAN | SCALE: AS NOTED | 1



SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

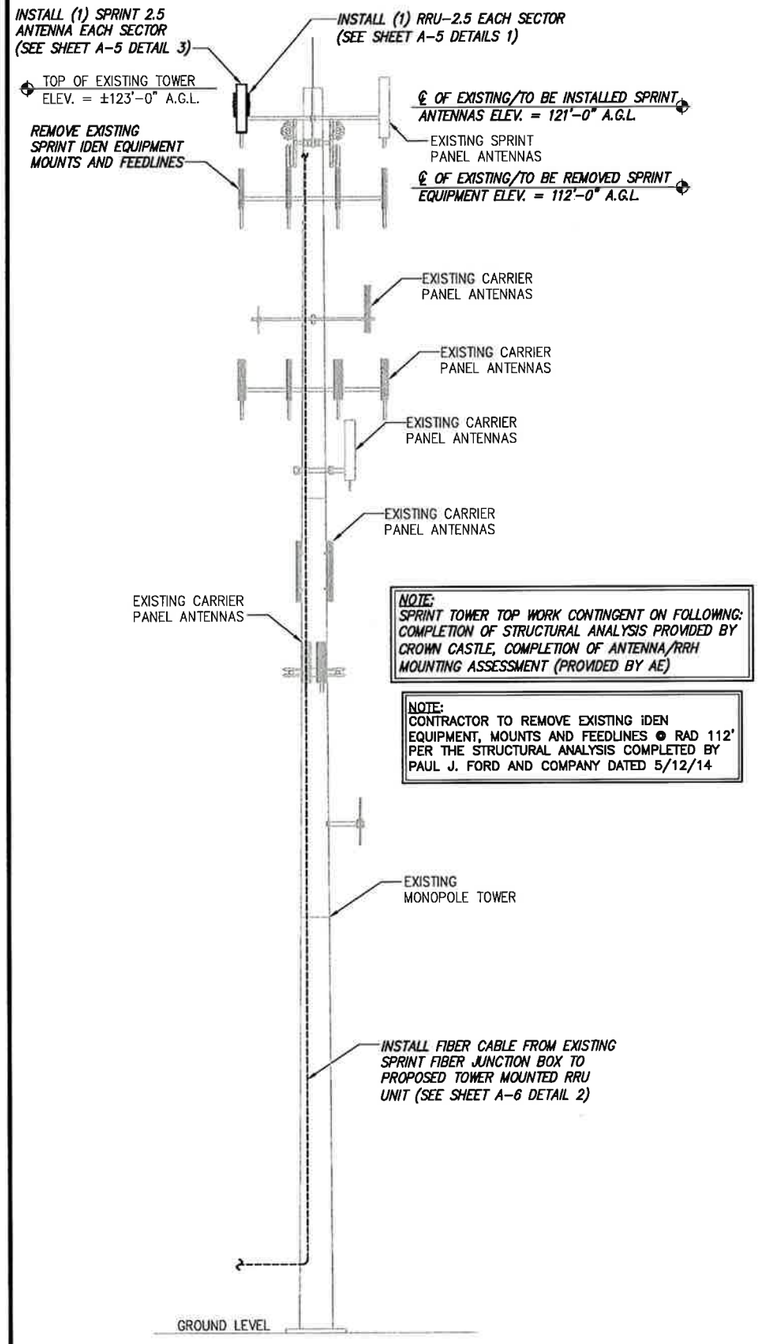
1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

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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CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

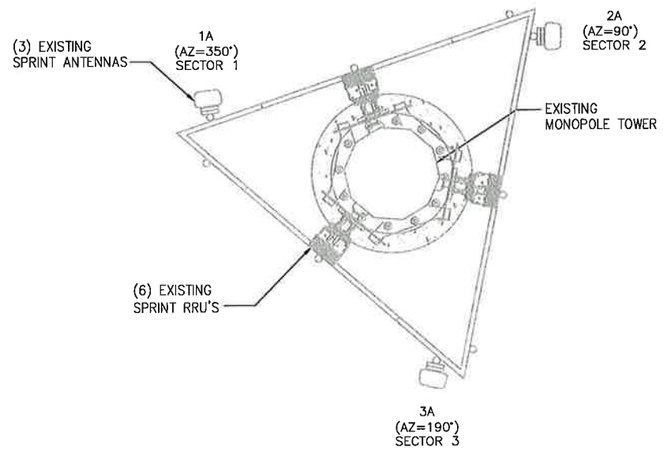
SHEET DESCRIPTION:

TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:

A-2

NOTE:
CONTRACTOR TO REMOVE EXISTING iDEN EQUIPMENT, MOUNTS AND FEEDLINES @ RAD 112' PER THE STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD AND COMPANY DATED 5/12/14



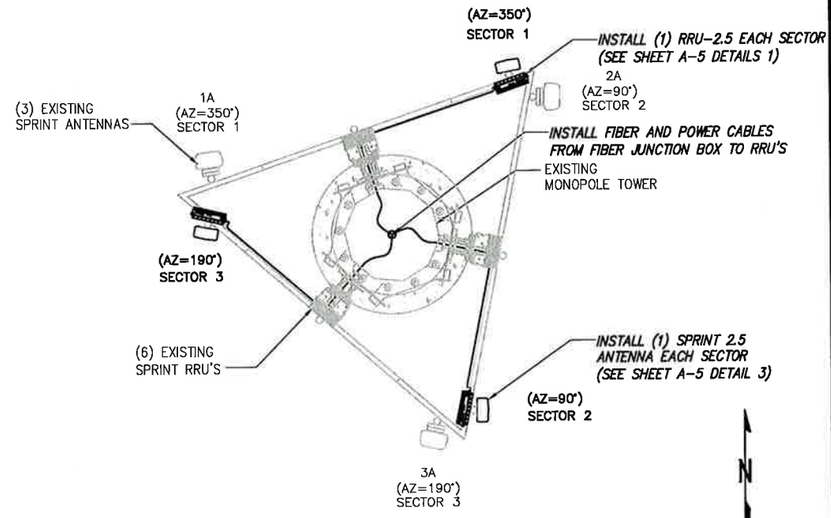
EXISTING ANTENNA & RRU LAYOUT — NO SCALE — 1

DETAIL NOT USED — NO SCALE — 3

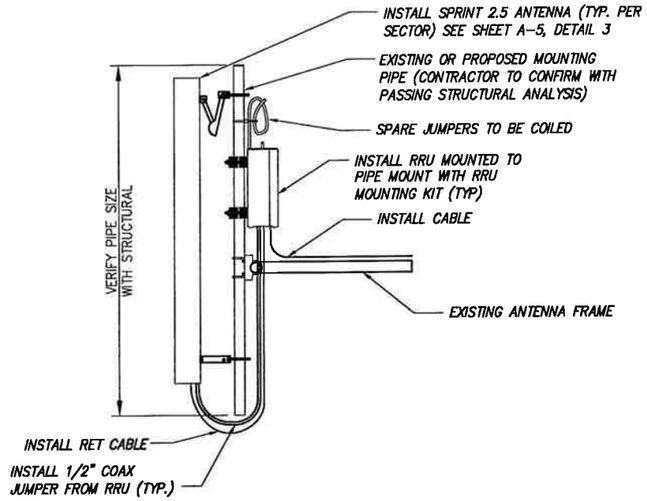
NOTE:
CONTRACTOR TO REMOVE EXISTING iDEN EQUIPMENT, MOUNTS AND FEEDLINES @ RAD 112' PER THE STRUCTURAL ANALYSIS COMPLETED BY PAUL J. FORD AND COMPANY DATED 5/12/14

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



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

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BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

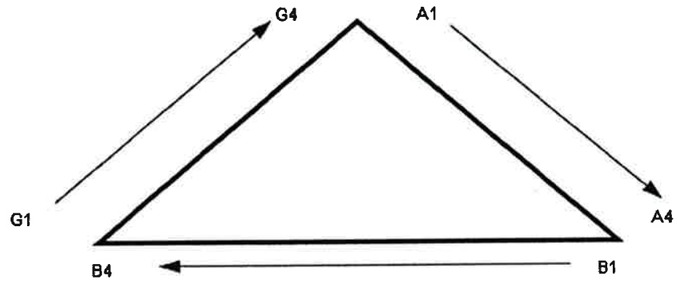
A-3

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

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

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

Figure 1: Antenna Orientation



NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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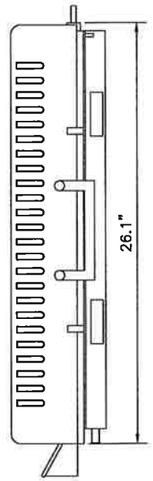
BERLIN, CT 06037

SHEET DESCRIPTION:
COLOR CODING AND NOTES

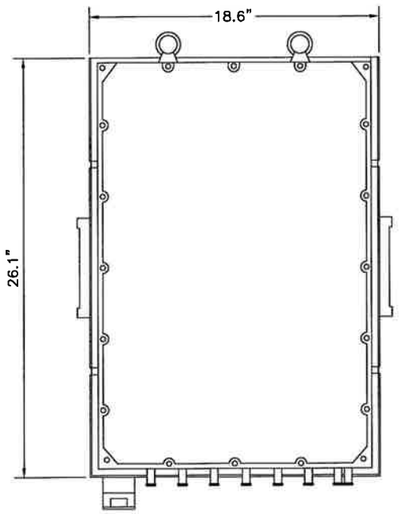
SHEET NUMBER:
A-4

RRU: ALCATEL LUCENT TD-RRH8X20

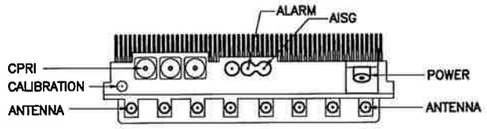
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

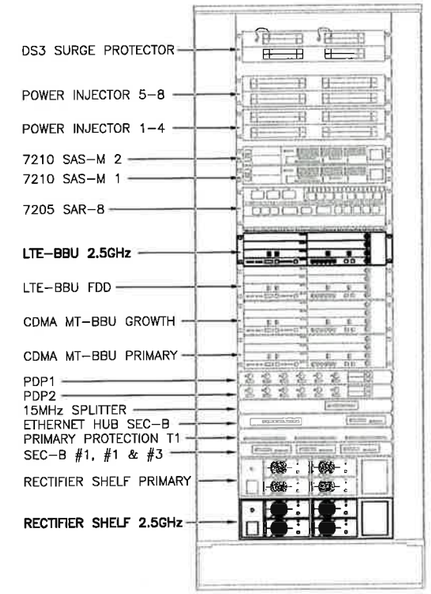


PLAN VIEW

NOTES

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

2.5 RRU | NO SCALE | 1

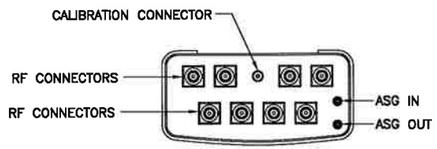


FRONT VIEW

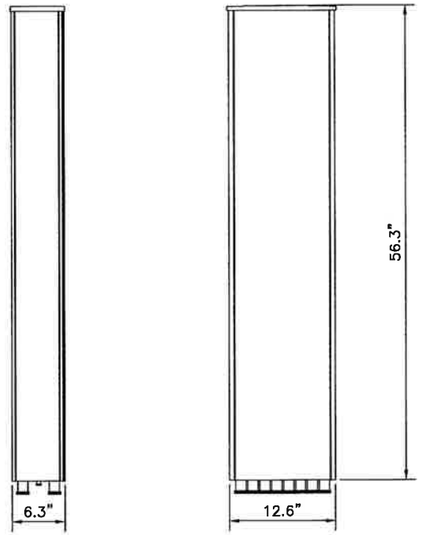
NEW EQUIPMENT IN EXISTING CABINET | NO SCALE | 2

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

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BERLIN, CT 06037

SHEET DESCRIPTION:

EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:

A-5

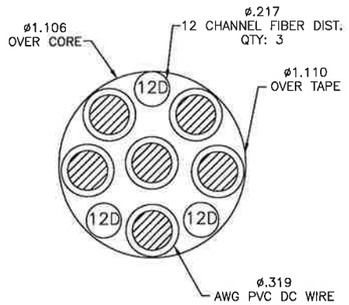
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

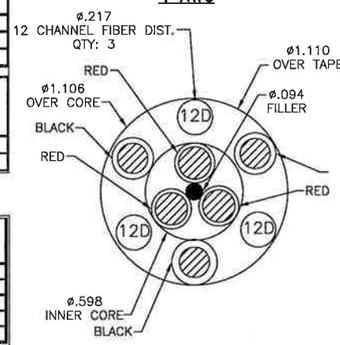
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

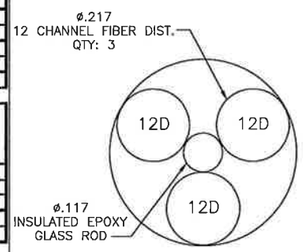
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG

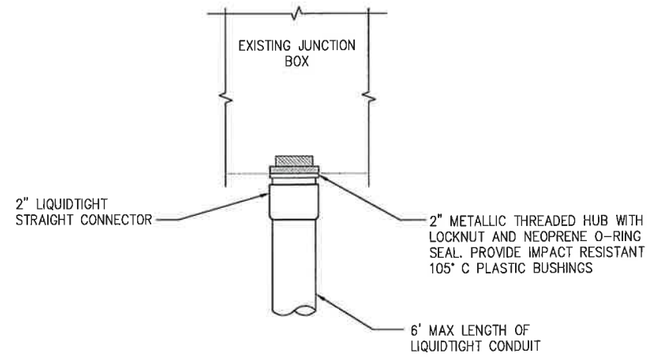


8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

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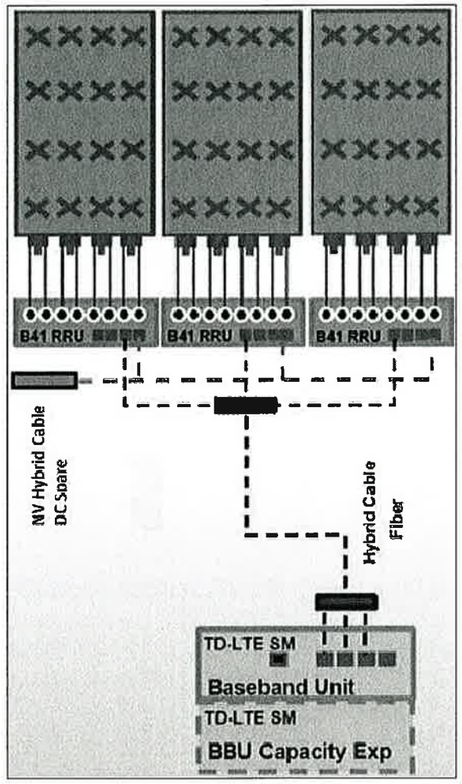
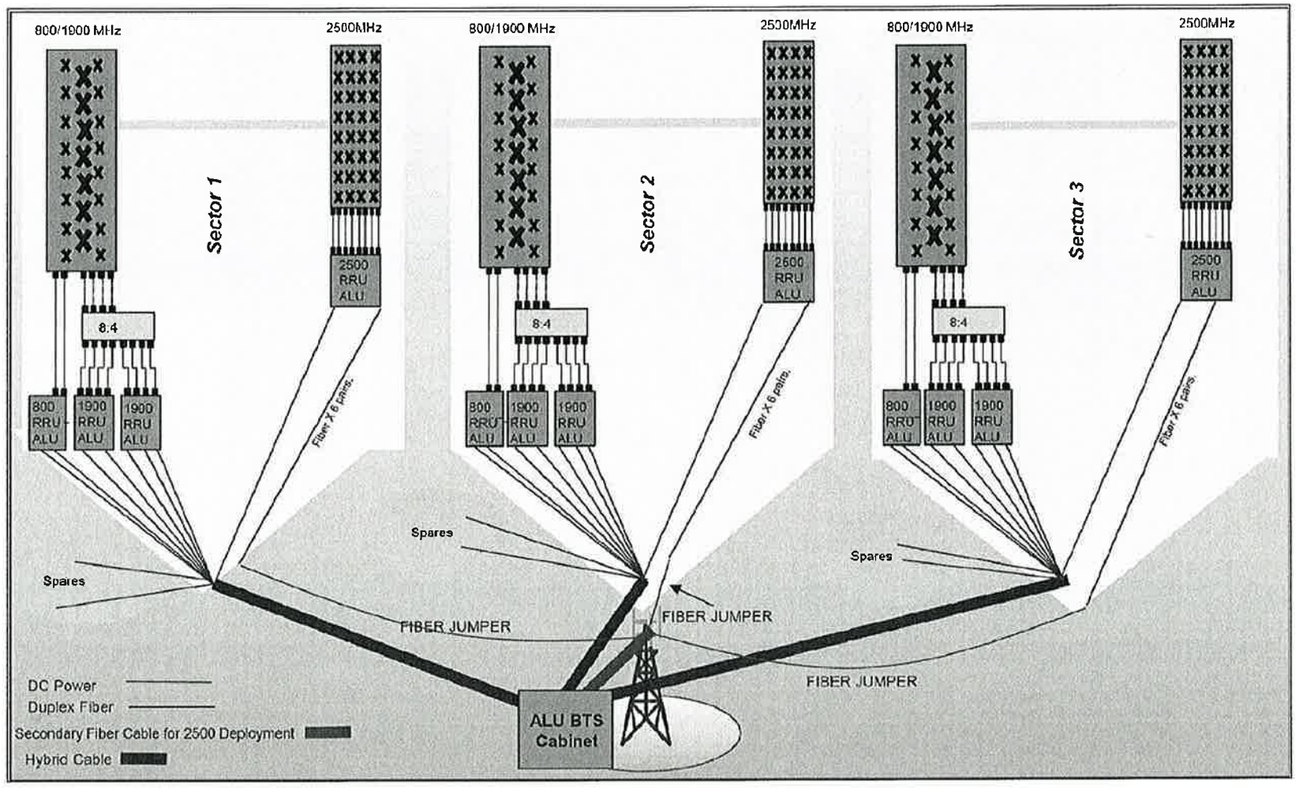
CIVIL DETAILS

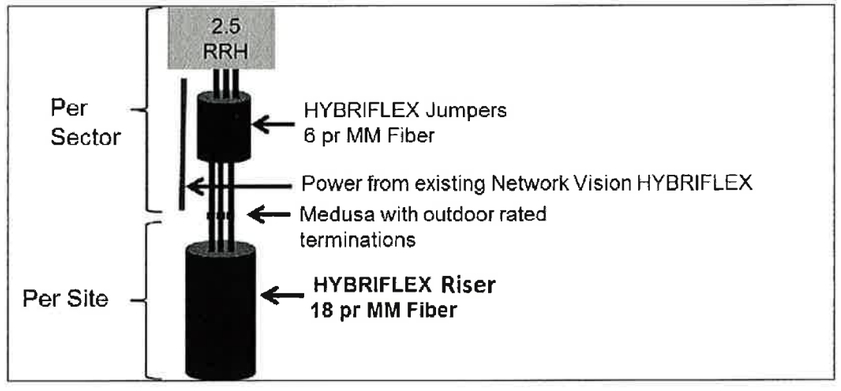
SHEET NUMBER:
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
REVISED PER COMMENTS	7/16/14	JLM	1
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

CIVIL DETAILS

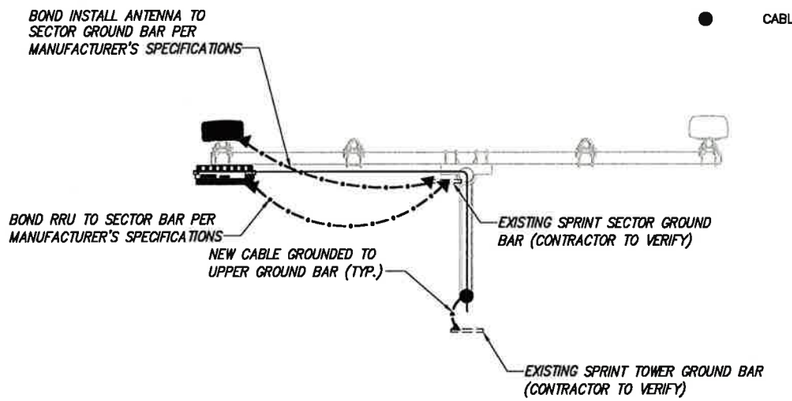
SHEET NUMBER:

A-7

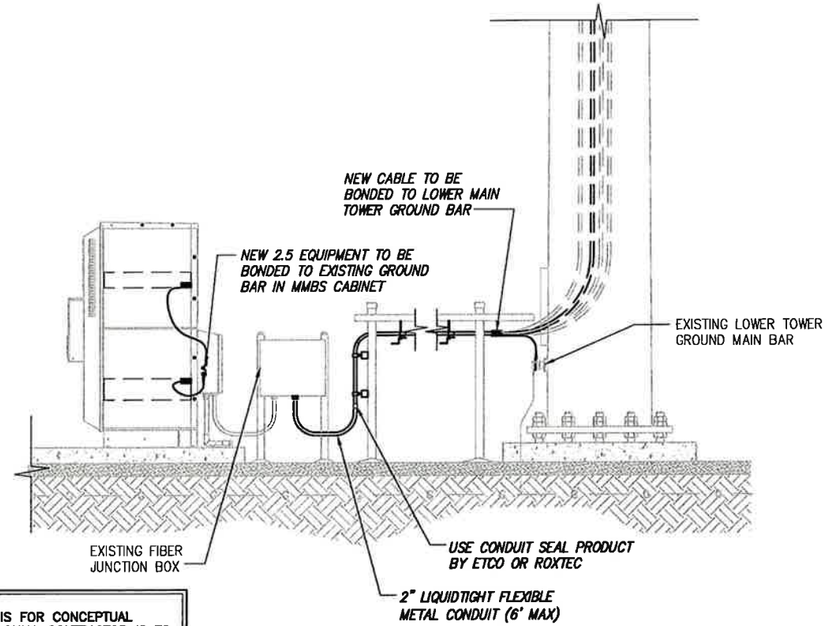
PLAN NOT USED | NO SCALE | 1

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

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
REVISED PER COMMENTS	7/16/14	JLM	1
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

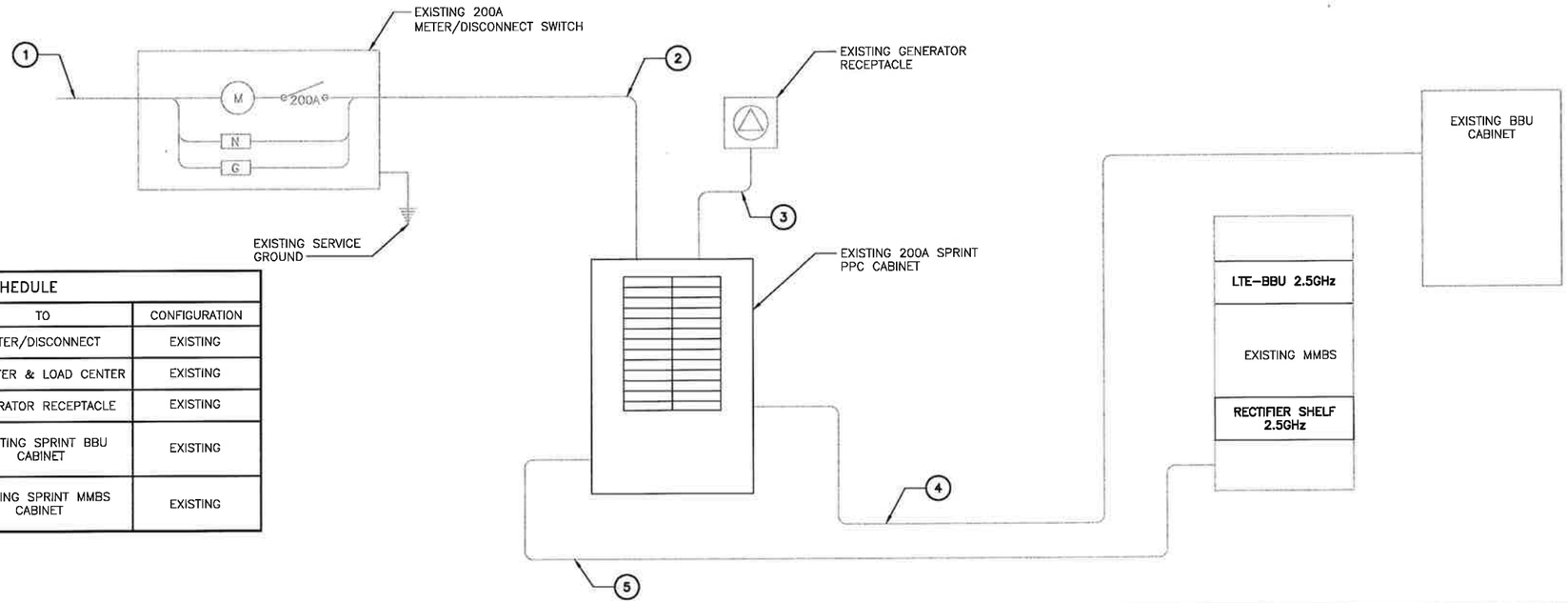
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

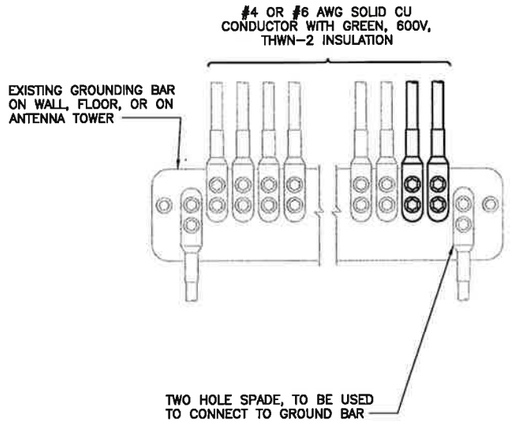
NOTES

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

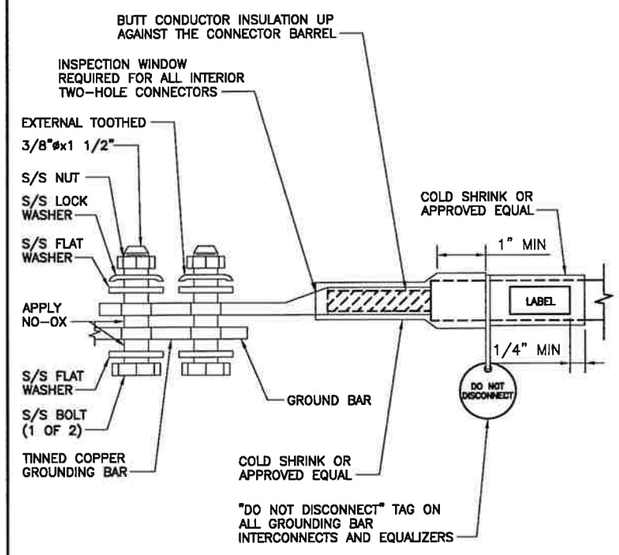
ELECTRICAL ONE–LINE DIAGRAM — NO SCALE — 1



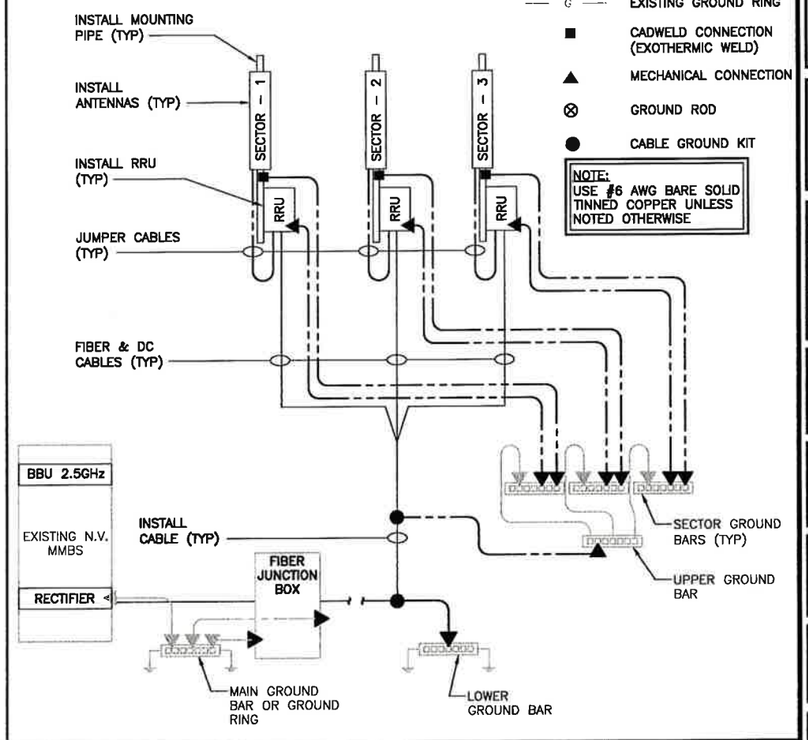
NOTES

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
REVISED PER COMMENTS	7/16/14	JLM	1
ISSUED FOR CONSTRUCTION	5/22/14	JLM	0

SITE NAME:

BERLIN / LAVIANA ORCHARD

SITE CASCADE:

CT33XC536

SITE ADDRESS:

1684 CHAMBERLAIN HIGHWAY
BERLIN, CT 06037

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

PJF PAUL J. FORD & COMPANY

Date: **August 07, 2017**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT33XC536
	Carrier Site Name:	CT33XC536
Crown Castle Designation:	**Crown Castle BU Number:**	876382
	Crown Castle Site Name:	BERLIN / LAVIANA ORCHARD
	Crown Castle JDE Job Number:	450838
	Crown Castle Work Order Number:	1436953
	Crown Castle Application Number:	399466 Rev. 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37517-0755.002.7805
Site Data:	**1684 Chamberlain Highway, BERLIN, Hartford County, CT** **Latitude *41° 35' 23.07"*, Longitude *-72° 48' 19.2"*** **123 Foot - Monopole Tower**	

Dear Charles McGuirt,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1065657, in accordance with application 399466, 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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

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

Respectfully submitted by:

Christopher Poelking, E.I. JJS
Structural Designer

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

8.7.17

tnxTower Report - version 7.0.5.1

Date: **August 07, 2017**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT33XC536
	Carrier Site Name:	CT33XC536
Crown Castle Designation:	**Crown Castle BU Number:**	876382
	Crown Castle Site Name:	BERLIN / LAVIANA ORCHARD
	Crown Castle JDE Job Number:	450838
	Crown Castle Work Order Number:	1436953
	Crown Castle Application Number:	399466 Rev. 0
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37517-0755.002.7805
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Respectfully submitted by:

Christopher Poelking, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 123-ft Monopole tower designed by SUMMIT in July of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	121.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	121.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
	120.0	1	tower mounts	Platform Mount [LP 1201-1]			
118.0	118.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	-	-	1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-3]			
100.0	101.0	3	commscope	TMAT1921B78-21A	12	1-5/8	2
		3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe			
		3	rfs celwave	FDAP5002-1A20			
		3	andrew	ETT19V2S12UB	-	-	1
		3	ericsson	KRY 112 144/1			
	100.0	1	tower mounts	T-Arm Mount [TA 602-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
93.0	94.0	3	alcatel lucent	RRH2X40-AWS	13	1-5/8	1
		3	andrew	LNX-6514DS-A1M w/ Mount Pipe			
		3	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe			
		2	antel	BXA-171063-8BF-2 w/ Mount Pipe			
		1	antel	BXA-171085-8BF-EDIN-0 w/ Mount Pipe			
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
	93.0	1	tower mounts	Platform Mount [LP 1201-1]			
75.0	75.0	3	rfs celwave	APXV18-206517S-C	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
65.0	66.0	6	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe	12 1* 2*	1-5/8 3/8 3/4	1
		6	powerwave technologies	TT19-08BP111-001			
	65.0	6	ericsson	RRUS-11			
		3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	T-Arm Mount [TA 601-3]			
50.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	50.0	1	tower mounts	Side Arm Mount [SO 702-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
*Installed in conduit

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)
-	-	-	-	-	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 05/05/2000	1629353	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF, 29200-0802, 06/06/2000	1629413	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF, 29200-0802, 06/06/2000	1629384	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 080828.04, 12/11/2008	2611098	CCISITES
4-POST-MODIFICATION INSPECTION	SGS, 145202, 9/8/2014	5287888	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37508-0979, 10/29/2008	2339268	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	123 - 82.25	Pole	TP28.114x22x0.1875	1	-10.36	1004.22	53.5	Pass
L2	82.25 - 57	Pole	TP31.5277x27.2139x0.25	2	-16.72	1728.10	71.7	Pass
L3	57 - 40.75	Pole	TP33.966x31.5277x0.4476	3	-19.67	2022.88	77.8	Pass
L4	40.75 - 26.25	Pole	TP35.6415x32.4332x0.465	4	-25.41	2253.89	92.6	Pass
L5	26.25 - 0	Pole	TP39.58x35.6415x0.4871	5	-33.32	2822.89	96.2	Pass
							Summary	
						Pole (L5)	96.2	Pass
						Rating =	96.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1, 2	Anchor Rods	0	88.1	Pass
1	Base Plate	0	51.8	Pass
1	Base Foundation Structural Steel	0	67.9	Pass
1	Base Foundation Soil Interaction	0	47.8	Pass

Structure Rating (max from all components) =	**96.2%**

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

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 97 mph.
4) Structure Class II.
5) Exposure Category C.
6) Topographic Category 1.
7) Crest Height 0.0000 ft.
8) Nominal ice thickness of 1.0000 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	123.0000-82.2500	40.7500	3.50	18	22.0000	28.1140	0.1875	0.7500	A607-60 (60 ksi)
L2	82.2500-57.0000	28.7500	0.00	18	27.2139	31.5277	0.2500	1.0000	A607-65 (65 ksi)
L3	57.0000-40.7500	16.2500	4.25	18	31.5277	33.9660	0.4476	1.7902	Reinf 37.89 ksi (38 ksi)
L4	40.7500-26.2500	18.7500	0.00	18	32.4332	35.6415	0.4650	1.8601	Reinf 37.98 ksi (38 ksi)
L5	26.2500-0.0000	26.2500		18	35.6415	39.5800	0.4871	1.9485	Reinf 40.86 ksi (41 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

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.3394	12.9812	780.3007	7.7434	11.1760	69.8193	1561.6281	6.4918	3.5420	18.891
	28.5477	16.6198	1637.5523	9.9139	14.2819	114.6592	3277.2593	8.3115	4.6181	24.63
L2	28.1670	21.3958	1965.3102	9.5722	13.8246	142.1599	3933.2064	10.6999	4.3496	17.399
	32.0141	24.8189	3067.5417	11.1036	16.0161	191.5287	6139.1198	12.4118	5.1089	20.436
L3	32.0141	44.1511	5388.2311	11.0335	16.0161	336.4261	10783.5522	22.0798	4.7612	10.638
	34.4900	47.6148	6758.4488	11.8990	17.2547	391.6868	13525.7906	23.8119	5.1903	11.597
L4	33.6720	47.1842	6092.1274	11.3487	16.4761	369.7564	12192.2709	23.5966	4.8898	10.515
	36.1913	51.9196	8116.5882	12.4877	18.1059	448.2845	16243.8564	25.9647	5.4545	11.73
L5	36.1913	54.3540	8486.4797	12.4798	18.1059	468.7138	16984.1262	27.1821	5.4156	11.117
	40.1906	60.4435	11670.2972	13.8780	20.1066	580.4201	23355.9504	30.2275	6.1087	12.54

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 123.0000-82.2500				1	1	1			
L2 82.2500-57.0000				1	1	1			
L3 57.0000-40.7500				1	1	1			
L4 40.7500-26.2500				1	1	1			
L5 26.2500-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HB114-1-08U4-M5J(1-1/4)	C	No	Inside Pole	120.0000 - 0.0000	3	No Ice	0.0000	1.08
						1/2" Ice	0.0000	1.08
						1" Ice	0.0000	1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	CaAa (Out Of Face)	120.0000 - 0.0000	1	No Ice	0.1540	1.22
						1/2" Ice	0.2540	2.47
						1" Ice	0.3540	4.32
****								
AL7-50(1-5/8)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	6	No Ice	0.0000	0.52
						1/2" Ice	0.0000	2.02
						1" Ice	0.0000	4.14
AL7-50(1-5/8)	C	No	CaAa (Out Of Face)	100.0000 - 75.0000	5	No Ice	0.0000	0.52
						1/2" Ice	0.0000	2.02
						1" Ice	0.0000	4.14
AL7-50(1-5/8)	C	No	CaAa (Out Of Face)	100.0000 - 75.0000	1	No Ice	0.1960	0.52
						1/2" Ice	0.2960	2.02
						1" Ice	0.3960	4.14
AL7-50(1-5/8)	C	No	Inside Pole	100.0000 - 0.0000	6	No Ice	0.0000	0.52
						1/2" Ice	0.0000	0.52
						1" Ice	0.0000	0.52
****								

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8)	C	No	Inside Pole	93.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	93.0000 - 0.0000	1	No Ice	0.0000	1.30
						1/2" Ice	0.0000	1.30
						1" Ice	0.0000	1.30
****								
AVA7-50(1-5/8)	C	No	Inside Pole	75.0000 - 0.0000	4	No Ice	0.0000	0.70
						1/2" Ice	0.0000	0.70
						1" Ice	0.0000	0.70
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	No Ice	0.0000	0.70
						1/2" Ice	0.0000	2.23
						1" Ice	0.0000	4.38
AVA7-50(1-5/8)	C	No	CaAa (Out Of Face)	75.0000 - 0.0000	1	No Ice	0.2010	0.70
						1/2" Ice	0.3010	2.23
						1" Ice	0.4010	4.38
****								
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	65.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	2.33
						1" Ice	0.0000	4.46
LDF7-50A(1-5/8")	C	No	Inside Pole	65.0000 - 0.0000	6	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
FB-L98B-002-75000(3/8")	C	No	Inside Pole	65.0000 - 0.0000	1	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	65.0000 - 0.0000	2	No Ice	0.0000	0.59
						1/2" Ice	0.0000	0.59
						1" Ice	0.0000	0.59
2" (Nominal) Conduit	C	No	Inside Pole	65.0000 - 0.0000	1	No Ice	0.0000	0.72
						1/2" Ice	0.0000	0.72
						1" Ice	0.0000	0.72
****								
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	50.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.84
						1" Ice	0.0000	2.14
**********								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	59.5000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
******								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	123.0000-82.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.292	0.40
L2	82.2500-57.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.448	0.72
L3	57.0000-40.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.154	0.62
L4	40.7500-26.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.168	0.55
L5	26.2500-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.787	1.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	123.0000-82.2500	A	2.239	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	34.145	2.09
L2	82.2500-57.0000	A	2.154	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	33.306	3.83
L3	57.0000-40.7500	A	2.080	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	30.182	3.22
L4	40.7500-26.2500	A	2.002	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	26.932	2.92
L5	26.2500-0.0000	A	1.821	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	44.525	4.52

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	123.0000-82.2500	-0.2717	0.1568	-0.7021	0.4053
L2	82.2500-57.0000	-0.4179	0.2413	-1.0106	0.5835
L3	57.0000-40.7500	-0.5989	0.3458	-1.3235	0.7641
L4	40.7500-26.2500	-0.6038	0.3486	-1.3523	0.7807
L5	26.2500-0.0000	-0.6123	0.3535	-1.3326	0.7694

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
3/4" x 8 ft lightning rod	C	None		0.00	123.0000	No Ice	0.6000	0.6000	0.01
						1/2" Ice	1.4146	1.4146	0.02
						1" Ice	2.2458	2.2458	0.03
****									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	120.0000	No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						1" Ice	9.3462	9.0212	0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	120.0000	No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						1" Ice	9.3462	9.0212	0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	120.0000	No Ice	8.2619	6.9458	0.08
						1/2" Ice	8.8215	8.1266	0.15
						1" Ice	9.3462	9.0212	0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	120.0000	No Ice	6.5799	4.9591	0.08
						1/2" Ice	7.0306	5.7544	0.13
						1" Ice	7.4733	6.4723	0.19
APXVTM14-C-120 w/	B	From Leg	4.0000	0.00	120.0000	No Ice	6.5799	4.9591	0.08

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert ft ft ft*	*Azimuth Adjustment °*	*Placement ft*		*C_AA_A Front ft^2*	*C_AA_A Side ft^2*	*Weight K*
Mount Pipe			0.00 1.00			1/2" Ice 1" Ice	7.0306 7.4733	5.7544 6.4723	0.13 0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	120.0000	No Ice 1/2" Ice 1" Ice	6.5799 7.0306 7.4733	4.9591 5.7544 6.4723	0.08 0.13 0.19
(3) TD-RRH8x20-25	A	From Leg	4.0000 0.00 1.00	0.00	120.0000	No Ice 1/2" Ice 1" Ice	4.0455 4.2975 4.5570	1.5345 1.7142 1.9008	0.07 0.10 0.13
Platform Mount [LP 1201-1]	C	None		0.00	120.0000	No Ice 1/2" Ice 1" Ice	23.1000 26.8000 30.5000	23.1000 26.8000 30.5000	2.10 2.50 2.90
(2) 2.375" OD x 5' Mount Pipe	A	From Face	4.0000 0.00 1.00	0.00	120.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
(2) 2.375" OD x 5' Mount Pipe	B	From Face	4.0000 0.00 1.00	0.00	120.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
(2) 2.375" OD x 5' Mount Pipe	C	From Face	4.0000 0.00 1.00	0.00	120.0000	No Ice 1/2" Ice 1" Ice	1.1875 1.4956 1.8071	1.1875 1.4956 1.8071	0.02 0.03 0.04
****									
800MHz 2X50W RRH W/FILTER	A	From Face	2.0000 0.00 0.00	0.00	118.0000	No Ice 1/2" Ice 1" Ice	2.0583 2.2398 2.4287	1.9317 2.1087 2.2931	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	B	From Face	2.0000 0.00 0.00	0.00	118.0000	No Ice 1/2" Ice 1" Ice	2.0583 2.2398 2.4287	1.9317 2.1087 2.2931	0.06 0.09 0.11
800MHz 2X50W RRH W/FILTER	C	From Face	2.0000 0.00 0.00	0.00	118.0000	No Ice 1/2" Ice 1" Ice	2.0583 2.2398 2.4287	1.9317 2.1087 2.2931	0.06 0.09 0.11
PCS 1900MHz 4x45W-65MHz	A	From Face	2.0000 0.00 0.00	0.00	118.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Face	2.0000 0.00 0.00	0.00	118.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Face	2.0000 0.00 0.00	0.00	118.0000	No Ice 1/2" Ice 1" Ice	2.3218 2.5266 2.7388	2.2381 2.4407 2.6507	0.06 0.08 0.11
Side Arm Mount [SO 102-3]	C	None		0.00	118.0000	No Ice 1/2" Ice 1" Ice	3.0000 3.4800 3.9600	3.0000 3.4800 3.9600	0.08 0.11 0.14
****									
ETT19V2S12UB	A	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.5718 0.6683 0.7722	0.2761 0.3495 0.4323	0.01 0.02 0.03
ETT19V2S12UB	B	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.5718 0.6683 0.7722	0.2761 0.3495 0.4323	0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ETT19V2S12UB	C	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.5718 0.6683 0.7722	0.2761 0.3495 0.4323	0.01 0.02 0.03
KRY 112 144/1	A	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.3500 0.4259 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
KRY 112 144/1	B	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.3500 0.4259 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
KRY 112 144/1	C	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.3500 0.4259 0.5093	0.1750 0.2343 0.3009	0.01 0.01 0.02
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	6.8239 7.2751 7.7192	3.4938 4.2631 4.9598	0.06 0.11 0.16
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	6.8239 7.2751 7.7192	3.4938 4.2631 4.9598	0.06 0.11 0.16
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	6.8239 7.2751 7.7192	3.4938 4.2631 4.9598	0.06 0.11 0.16
FDAP5002-1A20	A	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.4600 0.5467 0.6409	0.1829 0.2419 0.3082	0.01 0.01 0.02
FDAP5002-1A20	B	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.4600 0.5467 0.6409	0.1829 0.2419 0.3082	0.01 0.01 0.02
FDAP5002-1A20	C	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.4600 0.5467 0.6409	0.1829 0.2419 0.3082	0.01 0.01 0.02
TMAT1921B78-21A	A	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.6525 0.7545 0.8640	0.3000 0.3759 0.4593	0.02 0.02 0.03
TMAT1921B78-21A	B	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.6525 0.7545 0.8640	0.3000 0.3759 0.4593	0.02 0.02 0.03
TMAT1921B78-21A	C	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	0.6525 0.7545 0.8640	0.3000 0.3759 0.4593	0.02 0.02 0.03
T-Arm Mount [TA 602-3]	C	None		0.00	100.0000	No Ice 1/2" Ice 1" Ice	11.5900 15.4400 19.2900	11.5900 15.4400 19.2900	0.77 0.99 1.21
2.375" OD x 6' Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.03 0.04 0.05
2.375" OD x 6' Mount Pipe	B	From Leg	4.0000 0.00 1.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice	1.4250 1.9250 2.2939	1.4250 1.9250 2.2939	0.03 0.04 0.05
2.375" OD x 6' Mount Pipe	C	From Leg	4.0000	0.00	100.0000	No Ice	1.4250	1.4250	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.9250	1.9250	0.04
			1.00			1" Ice	2.2939	2.2939	0.05
****									
****									
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.0000	0.00	93.0000	No Ice	4.9453	3.6927	0.03
			0.00			1/2" Ice	5.3243	4.2947	0.07
			1.00			1" Ice	5.7120	4.9133	0.12
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000	0.00	93.0000	No Ice	4.9453	3.6927	0.03
			0.00			1/2" Ice	5.3243	4.2947	0.07
			1.00			1" Ice	5.7120	4.9133	0.12
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000	0.00	93.0000	No Ice	4.9453	3.6927	0.03
			0.00			1/2" Ice	5.3243	4.2947	0.07
			1.00			1" Ice	5.7120	4.9133	0.12
BXA-171063-12CF-EDIN-X w/ Mount Pipe	A	From Leg	4.0000	0.00	93.0000	No Ice	5.0290	5.2887	0.04
			0.00			1/2" Ice	5.5830	6.4594	0.09
			1.00			1" Ice	6.1033	7.3479	0.14
BXA-171063-12CF-EDIN-X w/ Mount Pipe	B	From Leg	4.0000	0.00	93.0000	No Ice	5.0290	5.2887	0.04
			0.00			1/2" Ice	5.5830	6.4594	0.09
			1.00			1" Ice	6.1033	7.3479	0.14
BXA-171063-12CF-EDIN-X w/ Mount Pipe	C	From Leg	4.0000	0.00	93.0000	No Ice	5.0290	5.2887	0.04
			0.00			1/2" Ice	5.5830	6.4594	0.09
			1.00			1" Ice	6.1033	7.3479	0.14
LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.0000	0.00	93.0000	No Ice	8.4106	7.0817	0.06
			0.00			1/2" Ice	8.9745	8.2729	0.13
			1.00			1" Ice	9.5048	9.1847	0.21
LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.0000	0.00	93.0000	No Ice	8.4106	7.0817	0.06
			0.00			1/2" Ice	8.9745	8.2729	0.13
			1.00			1" Ice	9.5048	9.1847	0.21
LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.0000	0.00	93.0000	No Ice	8.4106	7.0817	0.06
			0.00			1/2" Ice	8.9745	8.2729	0.13
			1.00			1" Ice	9.5048	9.1847	0.21
BXA-171063-8BF-2 w/ Mount Pipe	A	From Leg	4.0000	0.00	93.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2" Ice	3.5550	3.9709	0.06
			1.00			1" Ice	3.9298	4.5951	0.10
BXA-171063-8BF-2 w/ Mount Pipe	B	From Leg	4.0000	0.00	93.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2" Ice	3.5550	3.9709	0.06
			1.00			1" Ice	3.9298	4.5951	0.10
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.0000	0.00	93.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2" Ice	3.5550	3.9709	0.06
			1.00			1" Ice	3.9298	4.5951	0.10
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000	0.00	93.0000	No Ice	4.8000	2.0000	0.04
			0.00			1/2" Ice	5.0704	2.1926	0.08
			1.00			1" Ice	5.3481	2.3926	0.12
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.00	93.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			1.00			1" Ice	0.4656	0.1685	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.0000	0.00	93.0000	No Ice	0.3142	0.0762	0.00
			0.00			1/2" Ice	0.3862	0.1189	0.01
			1.00			1" Ice	0.4656	0.1685	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) FD9R6004/2C-3L	C	From Leg	4.0000 0.00 1.00	0.00	93.0000	No Ice 1/2" Ice 1" Ice	0.3142 0.3862 0.4656	0.0762 0.1189 0.1685	0.00 0.01 0.01
RRH2X40-AWS	A	From Leg	4.0000 0.00 1.00	0.00	93.0000	No Ice 1/2" Ice 1" Ice	2.1614 2.3597 2.5655	1.4199 1.5903 1.7676	0.04 0.06 0.08
RRH2X40-AWS	B	From Leg	4.0000 0.00 1.00	0.00	93.0000	No Ice 1/2" Ice 1" Ice	2.1614 2.3597 2.5655	1.4199 1.5903 1.7676	0.04 0.06 0.08
RRH2X40-AWS	C	From Leg	4.0000 0.00 1.00	0.00	93.0000	No Ice 1/2" Ice 1" Ice	2.1614 2.3597 2.5655	1.4199 1.5903 1.7676	0.04 0.06 0.08
Platform Mount [LP 1201-1]	C	None		0.00	93.0000	No Ice 1/2" Ice 1" Ice	23.1000 26.8000 30.5000	23.1000 26.8000 30.5000	2.10 2.50 2.90
****									
APXV18-206517S-C	A	From Face	1.0000 0.00 0.00	0.00	75.0000	No Ice 1/2" Ice 1" Ice	5.1667 5.6182 6.0772	3.0375 3.4693 3.9086	0.03 0.05 0.09
APXV18-206517S-C	B	From Face	1.0000 0.00 0.00	0.00	75.0000	No Ice 1/2" Ice 1" Ice	5.1667 5.6182 6.0772	3.0375 3.4693 3.9086	0.03 0.05 0.09
APXV18-206517S-C	C	From Face	1.0000 0.00 0.00	0.00	75.0000	No Ice 1/2" Ice 1" Ice	5.1667 5.6182 6.0772	3.0375 3.4693 3.9086	0.03 0.05 0.09
Pipe Mount [PM 601-3]	C	None		0.00	75.0000	No Ice 1/2" Ice 1" Ice	4.3900 5.4800 6.5700	4.3900 5.4800 6.5700	0.20 0.24 0.28
****									
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.3042 7.4790 8.3676	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.3042 7.4790 8.3676	0.07 0.14 0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462	6.3042 7.4790 8.3676	0.07 0.14 0.21
(2) RRUS-11	A	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	2.7908 2.9984 3.2134	1.1923 1.3395 1.4957	0.05 0.07 0.09
(2) RRUS-11	B	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	2.7908 2.9984 3.2134	1.1923 1.3395 1.4957	0.05 0.07 0.09
(2) RRUS-11	C	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	2.7908 2.9984 3.2134	1.1923 1.3395 1.4957	0.05 0.07 0.09
DC6-48-60-18-8F	C	From Face	4.0000 0.00 0.00	0.00	65.0000	No Ice 1/2" Ice	0.9167 1.4583 1.6431	0.9167 1.4583 1.6431	0.02 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) P65-15-XLH-RR w/ Mount Pipe	A	From Face	4.0000 0.00 1.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	5.5471 5.9195 6.2999	4.1885 4.8037 5.4357	0.06 0.11 0.16
(2) P65-15-XLH-RR w/ Mount Pipe	B	From Face	4.0000 0.00 1.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	5.5471 5.9195 6.2999	4.1885 4.8037 5.4357	0.06 0.11 0.16
(2) P65-15-XLH-RR w/ Mount Pipe	C	From Face	4.0000 0.00 1.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	5.5471 5.9195 6.2999	4.1885 4.8037 5.4357	0.06 0.11 0.16
(2) TT19-08BP111-001	A	From Face	4.0000 0.00 1.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	0.5527 0.6487 0.7520	0.4455 0.5342 0.6303	0.02 0.02 0.03
(2) TT19-08BP111-001	B	From Face	4.0000 0.00 1.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	0.5527 0.6487 0.7520	0.4455 0.5342 0.6303	0.02 0.02 0.03
(2) TT19-08BP111-001	C	From Face	4.0000 0.00 1.00	0.00	65.0000	No Ice 1/2" Ice 1" Ice	0.5527 0.6487 0.7520	0.4455 0.5342 0.6303	0.02 0.02 0.03
T-Arm Mount [TA 601-3]	C	None		0.00	65.0000	No Ice 1/2" Ice 1" Ice	10.9000 14.6500 18.4000	10.9000 14.6500 18.4000	0.73 0.93 1.13
****									
KS24019-L112A	A	From Face	2.0000 0.00 1.00	0.00	50.0000	No Ice 1/2" Ice 1" Ice	0.1407 0.1979 0.2621	0.1407 0.1979 0.2621	0.01 0.01 0.01
Side Arm Mount [SO 702-1]	A	None		0.00	50.0000	No Ice 1/2" Ice 1" Ice	1.0000 1.0000 1.0000	1.4300 2.0500 2.6700	0.03 0.04 0.05

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 123.0000-82.2500	102.0094	1.271	29.046	86.402	A	0.000	86.402	86.402	100.00	0.000	0.000
					B	0.000	86.402		100.00	0.000	0.000
					C	0.000	86.402		100.00	0.000	9.292
L2 82.2500-57.0000	69.3560	1.172	26.814	63.315	A	0.000	63.315	63.315	100.00	0.000	0.000
					B	0.000	63.315		100.00	0.000	0.000
					C	0.000	63.315		100.00	0.000	9.448
L3 57.0000-40.7500	48.7742	1.088	24.898	45.029	A	0.000	45.029	45.029	100.00	0.000	0.000
					B	0.000	45.029		100.00	0.000	0.000
					C	0.000	45.029		100.00	0.000	9.154
L4 40.7500-26.2500	33.4129	1.005	22.992	42.209	A	0.000	42.209	42.209	100.00	0.000	0.000
					B	0.000	42.209		100.00	0.000	0.000
					C	0.000	42.209		100.00	0.000	8.168
L5 26.2500-0.0000	12.8959	0.85	19.450	83.543	A	0.000	83.543	83.543	100.00	0.000	0.000
					B	0.000	83.543		100.00	0.000	0.000
					C	0.000	83.543		100.00	0.000	14.787

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 123.0000-82.2500	102.0094	1.271	7.717	2.2389	101.608	A	0.000	101.608	101.608	100.00	0.000	0.000
						B	0.000	101.608		100.00	0.000	0.000
						C	0.000	101.608		100.00	0.000	34.145
L2 82.2500-57.0000	69.3560	1.172	7.124	2.1542	72.738	A	0.000	72.738	72.738	100.00	0.000	0.000
						B	0.000	72.738		100.00	0.000	0.000
						C	0.000	72.738		100.00	0.000	33.306
L3 57.0000-40.7500	48.7742	1.088	6.615	2.0797	50.661	A	0.000	50.661	50.661	100.00	0.000	0.000
						B	0.000	50.661		100.00	0.000	0.000
						C	0.000	50.661		100.00	0.000	30.182
L4 40.7500-26.2500	33.4129	1.005	6.109	2.0025	47.235	A	0.000	47.235	47.235	100.00	0.000	0.000
						B	0.000	47.235		100.00	0.000	0.000
						C	0.000	47.235		100.00	0.000	26.932
L5 26.2500-0.0000	12.8959	0.85	5.168	1.8206	91.508	A	0.000	91.508	91.508	100.00	0.000	0.000
						B	0.000	91.508		100.00	0.000	0.000
						C	0.000	91.508		100.00	0.000	44.525

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 123.0000-82.2500	102.0094	1.271	9.943	86.402	A	0.000	86.402	86.402	100.00	0.000	0.000
					B	0.000	86.402		100.00	0.000	0.000
					C	0.000	86.402		100.00	0.000	9.292
L2 82.2500-57.0000	69.3560	1.172	9.179	63.315	A	0.000	63.315	63.315	100.00	0.000	0.000
					B	0.000	63.315		100.00	0.000	0.000
					C	0.000	63.315		100.00	0.000	9.448
L3 57.0000-40.7500	48.7742	1.088	8.524	45.029	A	0.000	45.029	45.029	100.00	0.000	0.000
					B	0.000	45.029		100.00	0.000	0.000
					C	0.000	45.029		100.00	0.000	9.154
L4 40.7500-26.2500	33.4129	1.005	7.871	42.209	A	0.000	42.209	42.209	100.00	0.000	0.000
					B	0.000	42.209		100.00	0.000	0.000
					C	0.000	42.209		100.00	0.000	8.168
L5 26.2500-0.0000	12.8959	0.85	6.659	83.543	A	0.000	83.543	83.543	100.00	0.000	0.000
					B	0.000	83.543		100.00	0.000	0.000
					C	0.000	83.543		100.00	0.000	14.787

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice

Comb. No.	Description
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	123 - 82.25	Pole	Max Tension	30	0.00	0.00	-0.00
			Max. Compression	26	-29.87	1.99	4.10
			Max. Mx	20	-10.44	280.91	1.40
			Max. My	2	-10.36	0.12	296.45
			Max. Vy	20	-13.83	280.91	1.40
			Max. Vx	2	-14.33	0.12	296.45
			Max. Torque	19			-1.26
L2	82.25 - 57	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.14	6.29	1.32
			Max. Mx	20	-16.77	756.42	1.20
			Max. My	2	-16.72	0.37	785.79
			Max. Vy	20	-20.36	756.42	1.20
			Max. Vx	2	-20.85	0.37	785.79
			Max. Torque	19			-1.26
L3	57 - 40.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-53.01	9.03	-0.11
			Max. Mx	20	-19.72	1009.37	1.12
			Max. My	2	-19.67	0.58	1044.38
			Max. Vy	20	-21.80	1009.37	1.12
			Max. Vx	2	-22.29	0.58	1044.38
			Max. Torque	17			-1.38
L4	40.75 - 26.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-63.59	13.38	-2.51
			Max. Mx	20	-25.44	1438.04	0.96
			Max. My	2	-25.41	0.88	1481.82
			Max. Vy	20	-23.82	1438.04	0.96
			Max. Vx	2	-24.30	0.88	1481.82
			Max. Torque	15			-1.82

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	26.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.79	18.77	-5.57
			Max. Mx	20	-33.32	2090.37	0.71
			Max. My	2	-33.32	1.33	2146.05
			Max. Vy	20	-25.87	2090.37	0.71
			Max. Vx	2	-26.34	1.33	2146.05
			Max. Torque	15			-2.50

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	76.79	-8.21	-0.00
	Max. H_x	20	33.34	25.85	-0.00
	Max. H_z	3	25.00	0.00	26.32
	Max. M_x	2	2146.05	0.00	26.32
	Max. M_z	8	2087.68	-25.85	-0.00
	Max. Torsion	3	2.50	0.00	26.32
	Min. Vert	7	25.00	-22.38	13.16
	Min. H_x	8	33.34	-25.85	-0.00
	Min. H_z	15	25.00	0.00	-26.32
	Min. M_x	14	-2144.65	0.00	-26.32
	Min. M_z	20	-2090.37	25.85	-0.00
	Min. Torsion	15	-2.50	0.00	-26.32

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	27.78	0.00	0.00	-0.55	1.09	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	33.34	-0.00	-26.32	-2146.05	1.33	-2.50
0.9 Dead+1.6 Wind 0 deg - No Ice	25.00	-0.00	-26.32	-2125.93	0.99	-2.50
1.2 Dead+1.6 Wind 30 deg - No Ice	33.34	12.92	-22.79	-1858.66	-1043.12	-2.07
0.9 Dead+1.6 Wind 30 deg - No Ice	25.00	12.92	-22.79	-1841.21	-1033.81	-2.08
1.2 Dead+1.6 Wind 60 deg - No Ice	33.34	22.38	-13.16	-1073.44	-1807.78	-1.09
0.9 Dead+1.6 Wind 60 deg - No Ice	25.00	22.38	-13.16	-1063.28	-1791.41	-1.10
1.2 Dead+1.6 Wind 90 deg - No Ice	33.34	25.85	0.00	-0.71	-2087.68	0.18
0.9 Dead+1.6 Wind 90 deg - No Ice	25.00	25.85	0.00	-0.51	-2068.73	0.17
1.2 Dead+1.6 Wind 120 deg - No Ice	33.34	22.38	13.16	1072.03	-1807.78	1.40
0.9 Dead+1.6 Wind 120 deg - No Ice	25.00	22.38	13.16	1062.26	-1791.41	1.39
1.2 Dead+1.6 Wind 150 deg - No Ice	33.34	12.92	22.79	1857.26	-1043.12	2.25
0.9 Dead+1.6 Wind 150 deg - No Ice	25.00	12.92	22.79	1840.19	-1033.81	2.24
1.2 Dead+1.6 Wind 180 deg - No Ice	33.34	-0.00	26.32	2144.65	1.33	2.50
0.9 Dead+1.6 Wind 180 deg - No Ice	25.00	-0.00	26.32	2124.91	0.99	2.50
1.2 Dead+1.6 Wind 210 deg - No Ice	33.34	-12.92	22.79	1857.26	1045.79	2.08
0.9 Dead+1.6 Wind 210 deg - No Ice	25.00	-12.92	22.79	1840.20	1035.80	2.09

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 240 deg - No Ice	33.34	-22.38	13.16	1072.04	1810.46	1.10
0.9 Dead+1.6 Wind 240 deg - No Ice	25.00	-22.38	13.16	1062.26	1793.40	1.11
1.2 Dead+1.6 Wind 270 deg - No Ice	33.34	-25.85	0.00	-0.71	2090.37	-0.18
0.9 Dead+1.6 Wind 270 deg - No Ice	25.00	-25.85	0.00	-0.51	2070.73	-0.17
1.2 Dead+1.6 Wind 300 deg - No Ice	33.34	-22.38	-13.16	-1073.45	1810.46	-1.41
0.9 Dead+1.6 Wind 300 deg - No Ice	25.00	-22.38	-13.16	-1063.29	1793.40	-1.40
1.2 Dead+1.6 Wind 330 deg - No Ice	33.34	-12.92	-22.79	-1858.67	1045.79	-2.26
0.9 Dead+1.6 Wind 330 deg - No Ice	25.00	-12.92	-22.79	-1841.22	1035.80	-2.25
1.2 Dead+1.0 Ice	76.79	-0.00	-0.00	5.57	18.77	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	76.79	-0.00	-8.30	-701.09	18.80	-1.39
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	76.79	4.11	-7.19	-606.41	-328.81	-0.93
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	76.79	7.11	-4.15	-347.75	-583.28	-0.22
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	76.79	8.21	0.00	5.58	-676.31	0.54
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	76.79	7.11	4.15	358.92	-583.28	1.16
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	76.79	4.11	7.19	617.58	-328.81	1.47
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	76.79	-0.00	8.30	712.26	18.80	1.39
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	76.79	-4.11	7.19	617.58	366.42	0.93
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	76.79	-7.11	4.15	358.92	620.89	0.22
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	76.79	-8.21	0.00	5.58	714.03	-0.55
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	76.79	-7.11	-4.15	-347.75	620.89	-1.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	76.79	-4.11	-7.19	-606.41	366.41	-1.48
Dead+Wind 0 deg - Service	27.78	0.00	-5.63	-457.27	1.11	-0.00
Dead+Wind 30 deg - Service	27.78	2.76	-4.88	-396.08	-221.22	-0.14
Dead+Wind 60 deg - Service	27.78	4.79	-2.82	-228.93	-383.98	-0.24
Dead+Wind 90 deg - Service	27.78	5.53	-0.00	-0.59	-443.56	-0.27
Dead+Wind 120 deg - Service	27.78	4.79	2.82	227.76	-383.98	-0.23
Dead+Wind 150 deg - Service	27.78	2.76	4.88	394.91	-221.22	-0.13
Dead+Wind 180 deg - Service	27.78	0.00	5.63	456.10	1.11	0.00
Dead+Wind 210 deg - Service	27.78	-2.76	4.88	394.91	223.45	0.14
Dead+Wind 240 deg - Service	27.78	-4.79	2.82	227.76	386.21	0.24
Dead+Wind 270 deg - Service	27.78	-5.53	-0.00	-0.59	445.79	0.27
Dead+Wind 300 deg - Service	27.78	-4.79	-2.82	-228.93	386.21	0.23
Dead+Wind 330 deg - Service	27.78	-2.76	-4.88	-396.08	223.45	0.13

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-27.78	0.00	0.00	27.78	0.00	0.000%
2	0.00	-33.34	-26.32	0.00	33.34	26.32	0.000%
3	0.00	-25.00	-26.32	0.00	25.00	26.32	0.000%
4	12.92	-33.34	-22.79	-12.92	33.34	22.79	0.000%
5	12.92	-25.00	-22.79	-12.92	25.00	22.79	0.000%
6	22.38	-33.34	-13.16	-22.38	33.34	13.16	0.000%
7	22.38	-25.00	-13.16	-22.38	25.00	13.16	0.000%
8	25.85	-33.34	0.00	-25.85	33.34	-0.00	0.000%
9	25.85	-25.00	0.00	-25.85	25.00	-0.00	0.000%
10	22.38	-33.34	13.16	-22.38	33.34	-13.16	0.000%
11	22.38	-25.00	13.16	-22.38	25.00	-13.16	0.000%
12	12.92	-33.34	22.79	-12.92	33.34	-22.79	0.000%
13	12.92	-25.00	22.79	-12.92	25.00	-22.79	0.000%
14	0.00	-33.34	26.32	0.00	33.34	-26.32	0.000%
15	0.00	-25.00	26.32	0.00	25.00	-26.32	0.000%
16	-12.92	-33.34	22.79	12.92	33.34	-22.79	0.000%
17	-12.92	-25.00	22.79	12.92	25.00	-22.79	0.000%
18	-22.38	-33.34	13.16	22.38	33.34	-13.16	0.000%
19	-22.38	-25.00	13.16	22.38	25.00	-13.16	0.000%
20	-25.85	-33.34	0.00	25.85	33.34	-0.00	0.000%
21	-25.85	-25.00	0.00	25.85	25.00	-0.00	0.000%
22	-22.38	-33.34	-13.16	22.38	33.34	13.16	0.000%
23	-22.38	-25.00	-13.16	22.38	25.00	13.16	0.000%
24	-12.92	-33.34	-22.79	12.92	33.34	22.79	0.000%
25	-12.92	-25.00	-22.79	12.92	25.00	22.79	0.000%
26	0.00	-76.79	0.00	0.00	76.79	0.00	0.000%
27	0.00	-76.79	-8.30	0.00	76.79	8.30	0.000%
28	4.11	-76.79	-7.19	-4.11	76.79	7.19	0.000%
29	7.11	-76.79	-4.15	-7.11	76.79	4.15	0.000%
30	8.21	-76.79	0.00	-8.21	76.79	-0.00	0.000%
31	7.11	-76.79	4.15	-7.11	76.79	-4.15	0.000%
32	4.11	-76.79	7.19	-4.11	76.79	-7.19	0.000%
33	0.00	-76.79	8.30	0.00	76.79	-8.30	0.000%
34	-4.11	-76.79	7.19	4.11	76.79	-7.19	0.000%
35	-7.11	-76.79	4.15	7.11	76.79	-4.15	0.000%
36	-8.21	-76.79	0.00	8.21	76.79	-0.00	0.000%
37	-7.11	-76.79	-4.15	7.11	76.79	4.15	0.000%
38	-4.11	-76.79	-7.19	4.11	76.79	7.19	0.000%
39	0.00	-27.78	-5.63	0.00	27.78	5.63	0.000%
40	2.76	-27.78	-4.88	-2.76	27.78	4.88	0.000%
41	4.79	-27.78	-2.82	-4.79	27.78	2.82	0.000%
42	5.53	-27.78	0.00	-5.53	27.78	0.00	0.000%
43	4.79	-27.78	2.82	-4.79	27.78	-2.82	0.000%
44	2.76	-27.78	4.88	-2.76	27.78	-4.88	0.000%
45	0.00	-27.78	5.63	0.00	27.78	-5.63	0.000%
46	-2.76	-27.78	4.88	2.76	27.78	-4.88	0.000%
47	-4.79	-27.78	2.82	4.79	27.78	-2.82	0.000%
48	-5.53	-27.78	0.00	5.53	27.78	0.00	0.000%
49	-4.79	-27.78	-2.82	4.79	27.78	2.82	0.000%
50	-2.76	-27.78	-4.88	2.76	27.78	4.88	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	5	0.00000001	0.00006684
3	Yes	4	0.00000001	0.00090754
4	Yes	5	0.00000001	0.00079616
5	Yes	5	0.00000001	0.00034718
6	Yes	5	0.00000001	0.00084764
7	Yes	5	0.00000001	0.00037320
8	Yes	4	0.00000001	0.00066061
9	Yes	4	0.00000001	0.00039493
10	Yes	5	0.00000001	0.00082565
11	Yes	5	0.00000001	0.00036290
12	Yes	5	0.00000001	0.00080459

13	Yes	5	0.00000001	0.00035191
14	Yes	5	0.00000001	0.00006681
15	Yes	4	0.00000001	0.00090671
16	Yes	5	0.00000001	0.00086698
17	Yes	5	0.00000001	0.00038132
18	Yes	5	0.00000001	0.00079756
19	Yes	5	0.00000001	0.00034931
20	Yes	4	0.00000001	0.00066122
21	Yes	4	0.00000001	0.00039517
22	Yes	5	0.00000001	0.00081758
23	Yes	5	0.00000001	0.00035849
24	Yes	5	0.00000001	0.00085680
25	Yes	5	0.00000001	0.00037558
26	Yes	4	0.00000001	0.00002248
27	Yes	5	0.00000001	0.00017482
28	Yes	5	0.00000001	0.00034354
29	Yes	5	0.00000001	0.00038362
30	Yes	4	0.00022933	0.00098271
31	Yes	5	0.00000001	0.00040792
32	Yes	5	0.00000001	0.00033859
33	Yes	5	0.00000001	0.00017330
34	Yes	5	0.00000001	0.00045145
35	Yes	5	0.00000001	0.00039437
36	Yes	5	0.00000001	0.00011640
37	Yes	5	0.00000001	0.00038242
38	Yes	5	0.00000001	0.00047187
39	Yes	4	0.00000001	0.00006627
40	Yes	4	0.00000001	0.00026023
41	Yes	4	0.00000001	0.00029853
42	Yes	4	0.00000001	0.00009471
43	Yes	4	0.00000001	0.00024881
44	Yes	4	0.00000001	0.00028548
45	Yes	4	0.00000001	0.00006555
46	Yes	4	0.00000001	0.00028867
47	Yes	4	0.00000001	0.00025039
48	Yes	4	0.00000001	0.00009512
49	Yes	4	0.00000001	0.00030050
50	Yes	4	0.00000001	0.00026351

Maximum Tower Deflections - Service Wind

Section No.	*Elevation ft*	*Horz. Deflection in*	*Gov. Load Comb.*	*Tilt °*	*Twist °*
L1	123 - 82.25	16.58	39	1.13	0.00
L2	85.75 - 57	8.29	39	0.93	0.00
L3	57 - 40.75	3.63	39	0.58	0.00
L4	45 - 26.25	2.31	39	0.47	0.00
L5	26.25 - 0	0.80	39	0.29	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	*Appurtenance*	*Gov. Load Comb.*	*Deflection in*	*Tilt °*	*Twist °*	*Radius of Curvature ft*
123.0000	3/4" x 8 ft lightning rod	39	16.58	1.13	0.00	42201
120.0000	APXVSPP18-C-A20 w/ Mount Pipe	39	15.87	1.12	0.00	42201
118.0000	800MHz 2X50W RRH W/FILTER	39	15.40	1.11	0.00	42201
100.0000	ETT19V2S12UB	39	11.27	1.04	0.00	9173
93.0000	BXA-70063-4CF-EDIN-X w/ Mount Pipe	39	9.76	0.99	0.00	7033
75.0000	APXV18-206517S-C	39	6.31	0.80	0.00	4967
65.0000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	39	4.71	0.67	0.00	4457
50.0000	KS24019-L112A	39	2.83	0.51	0.00	6098

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	123 - 82.25	77.58	2	5.26	0.02
L2	85.75 - 57	38.87	2	4.34	0.01
L3	57 - 40.75	17.03	2	2.72	0.00
L4	45 - 26.25	10.86	2	2.19	0.00
L5	26.25 - 0	3.73	2	1.35	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
123.0000	3/4" x 8 ft lightning rod	2	77.58	5.26	0.02	9287
120.0000	APXVSPP18-C-A20 w/ Mount Pipe	2	74.28	5.22	0.02	9287
118.0000	800MHz 2X50W RRH W/FILTER	2	72.09	5.19	0.02	9287
100.0000	ETT19V2S12UB	2	52.82	4.85	0.01	2016
93.0000	BXA-70063-4CF-EDIN-X w/ Mount Pipe	2	45.76	4.63	0.01	1544
75.0000	APXV18-206517S-C	2	29.59	3.76	0.01	1077
65.0000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	2	22.11	3.16	0.01	958
50.0000	KS24019-L112A	2	13.26	2.40	0.00	1304

Compression Checks
Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	123 - 82.25 (1)	TP28.114x22x0.1875	40.7500	0.0000	0.0	16.3072	-10.36	1004.22	0.010
L2	82.25 - 57 (2)	TP31.5277x27.2139x0.25	28.7500	0.0000	0.0	24.8189	-16.72	1728.10	0.010
L3	57 - 40.75 (3)	TP33.966x31.5277x0.4476	16.2500	0.0000	0.0	46.7089	-19.67	2022.88	0.010
L4	40.75 - 26.25 (4)	TP35.6415x32.4332x0.465	18.7500	0.0000	0.0	51.9196	-25.41	2253.89	0.011
L5	26.25 - 0 (5)	TP39.58x35.6415x0.4871	26.2500	0.0000	0.0	60.4435	-33.32	2822.89	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	123 - 82.25 (1)	TP28.114x22x0.1875	296.45	566.41	0.523	0.00	566.41	0.000
L2	82.25 - 57 (2)	TP31.5277x27.2139x0.25	785.79	1111.32	0.707	0.00	1111.32	0.000
L3	57 - 40.75 (3)	TP33.966x31.5277x0.4476	1044.38	1359.98	0.768	0.00	1359.98	0.000
L4	40.75 - 26.25 (4)	TP35.6415x32.4332x0.465	1481.82	1621.71	0.914	0.00	1621.71	0.000
L5	26.25 - 0 (5)	TP39.58x35.6415x0.4871	2146.05	2258.94	0.950	0.00	2258.94	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	123 - 82.25 (1)	TP28.114x22x0.1875	14.33	502.11	0.029	0.40	1134.21	0.000
L2	82.25 - 57 (2)	TP31.5277x27.2139x0.25	20.85	864.05	0.024	0.92	2225.36	0.000
L3	57 - 40.75 (3)	TP33.966x31.5277x0.4476	22.29	1011.44	0.022	1.28	2723.29	0.000
L4	40.75 - 26.25 (4)	TP35.6415x32.4332x0.465	24.30	1126.94	0.022	1.81	3247.39	0.001
L5	26.25 - 0 (5)	TP39.58x35.6415x0.4871	26.34	1411.45	0.019	2.50	4523.42	0.001

Pole Interaction Design Data

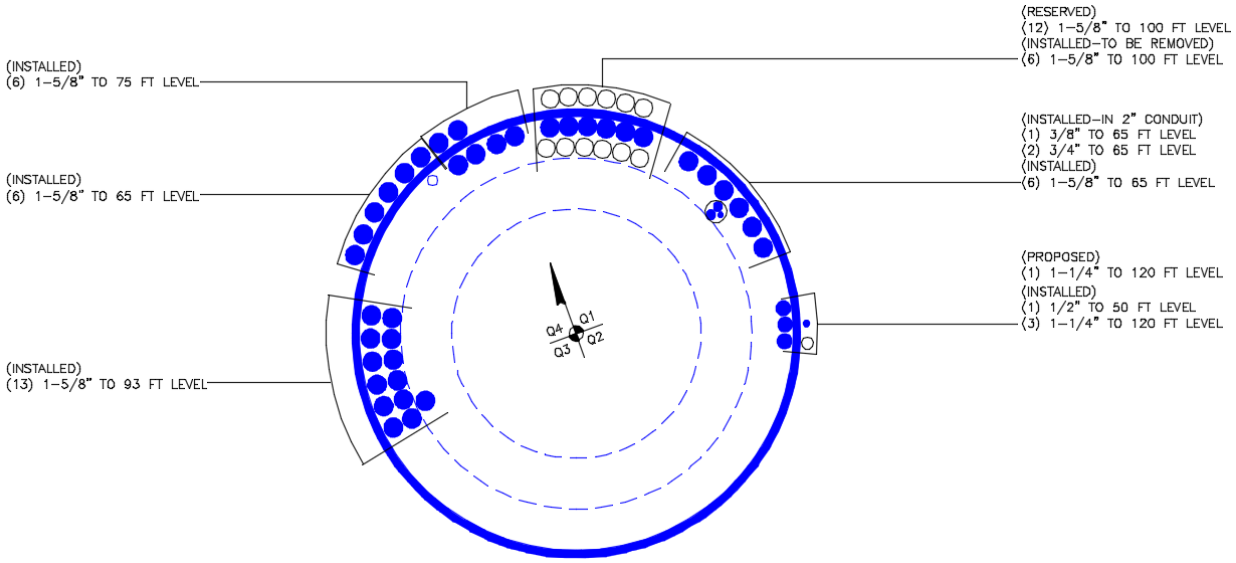
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	123 - 82.25 (1)	0.010	0.523	0.000	0.029	0.000	0.535	1.000	4.8.2
L2	82.25 - 57 (2)	0.010	0.707	0.000	0.024	0.000	0.717	1.000	4.8.2
L3	57 - 40.75 (3)	0.010	0.768	0.000	0.022	0.000	0.778	1.000	4.8.2
L4	40.75 - 26.25 (4)	0.011	0.914	0.000	0.022	0.001	0.926	1.000	4.8.2
L5	26.25 - 0 (5)	0.012	0.950	0.000	0.019	0.001	0.962	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	123 - 82.25	Pole	TP28.114x22x0.1875	1	-10.36	1004.22	53.5	Pass
L2	82.25 - 57	Pole	TP31.5277x27.2139x0.25	2	-16.72	1728.10	71.7	Pass
L3	57 - 40.75	Pole	TP33.966x31.5277x0.4476	3	-19.67	2022.88	77.8	Pass
L4	40.75 - 26.25	Pole	TP35.6415x32.4332x0.465	4	-25.41	2253.89	92.6	Pass
L5	26.25 - 0	Pole	TP39.58x35.6415x0.4871	5	-33.32	2822.89	96.2	Pass
							Summary	
						Pole (L5)	96.2	Pass
						RATING =	**96.2**	**Pass**

APPENDIX B

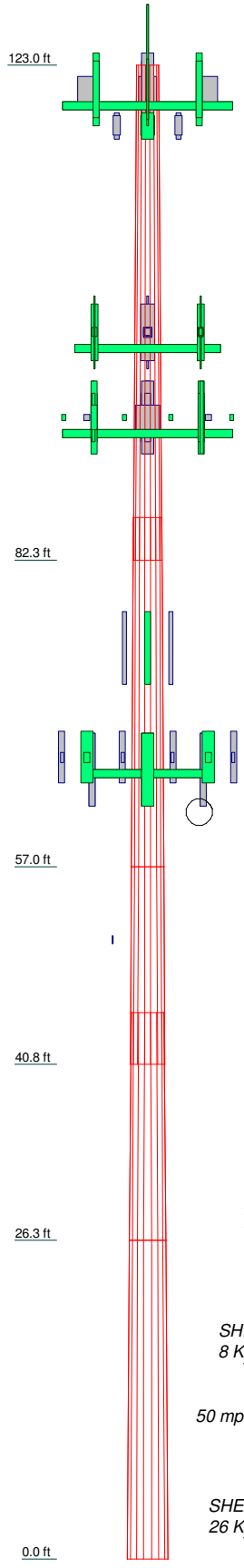
BASE LEVEL DRAWING


(RESERVED)
(12) 1-5/8" TO 100 FT LEVEL
(INSTALLED-TO BE REMOVED)
(6) 1-5/8" TO 100 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 75 FT LEVEL
(INSTALLED-IN 2" CONDUIT)
(1) 3/8" TO 65 FT LEVEL
(2) 3/4" TO 65 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 65 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 65 FT LEVEL
(PROPOSED)
(1) 1-1/4" TO 120 FT LEVEL
(INSTALLED)
(1) 1/2" TO 50 FT LEVEL
(3) 1-1/4" TO 120 FT LEVEL
(INSTALLED)
(13) 1-5/8" TO 93 FT LEVEL
Q1
Q2
Q3
Q4

APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	40.7500	18	0.1875	3.5000	22.0000	28.1140	A607-60	2.1
2	28.7500	18	0.2500		27.2139	31.5277	A607-65	2.3
3	16.2500	18	0.4476	4.2500	31.5277	33.9660	Reinf 37.89 ksi	2.5
4	18.7500	18	0.4650		32.4332	35.6415	Reinf 37.98 ksi	3.2
5	26.2500	18	0.4871		35.6415	39.5800	Reinf 40.86 ksi	5.1
								15.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
3/4" x 8 ft lightning rod	123
APXVSPP18-C-A20 w/ Mount Pipe	120
APXVSPP18-C-A20 w/ Mount Pipe	120
APXVSPP18-C-A20 w/ Mount Pipe	120
APXVTM14-C-120 w/ Mount Pipe	120
APXVTM14-C-120 w/ Mount Pipe	120
APXVTM14-C-120 w/ Mount Pipe	120
(3) TD-RRH8x20-25	120
Platform Mount [LP 1201-1]	120
(2) 2.375" OD x 5' Mount Pipe	120
(2) 2.375" OD x 5' Mount Pipe	120
(2) 2.375" OD x 5' Mount Pipe	120
800MHz 2X50W RRH W/FILTER	118
800MHz 2X50W RRH W/FILTER	118
800MHz 2X50W RRH W/FILTER	118
PCS 1900MHz 4x45W-65MHz	118
PCS 1900MHz 4x45W-65MHz	118
PCS 1900MHz 4x45W-65MHz	118
Side Arm Mount [SO 102-3]	118
ETT19V2S12UB	100
ETT19V2S12UB	100
ETT19V2S12UB	100
KRY 112 144/1	100
KRY 112 144/1	100
KRY 112 144/1	100
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	100
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	100
APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	100
FDAP5002-1A20	100
FDAP5002-1A20	100
FDAP5002-1A20	100
TMAT1921B78-21A	100
TMAT1921B78-21A	100
TMAT1921B78-21A	100
T-Arm Mount [TA 602-3]	100
2.375" OD x 6' Mount Pipe	100
2.375" OD x 6' Mount Pipe	100
2.375" OD x 6' Mount Pipe	100
BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
BXA-70063-4CF-EDIN-X w/ Mount Pipe	93
BXA-70063-4CF-EDIN-X w/ Mount Pipe	93

TYPE	ELEVATION
BXA-171063-12CF-EDIN-X w/ Mount Pipe	93
BXA-171063-12CF-EDIN-X w/ Mount Pipe	93
BXA-171063-12CF-EDIN-X w/ Mount Pipe	93
LNX-6514DS-A1M w/ Mount Pipe	93
LNX-6514DS-A1M w/ Mount Pipe	93
LNX-6514DS-A1M w/ Mount Pipe	93
BXA-171063-8BF-2 w/ Mount Pipe	93
BXA-171063-8BF-2 w/ Mount Pipe	93
BXA-171085-8BF-EDIN-0 w/ Mount Pipe	93
DB-T1-6Z-8AB-0Z	93
(2) FD9R6004/2C-3L	93
(2) FD9R6004/2C-3L	93
(2) FD9R6004/2C-3L	93
RRH2X40-AWS	93
RRH2X40-AWS	93
RRH2X40-AWS	93
Platform Mount [LP 1201-1]	93
APXV18-206517S-C	75
APXV18-206517S-C	75
APXV18-206517S-C	75
Pipe Mount [PM 601-3]	75
AM-X-CD-16-65-00T-RET w/ Mount Pipe	65
AM-X-CD-16-65-00T-RET w/ Mount Pipe	65
AM-X-CD-16-65-00T-RET w/ Mount Pipe	65
(2) RRUS-11	65
(2) RRUS-11	65
(2) RRUS-11	65
DC6-48-60-18-8F	65
(2) P65-15-XLH-RR w/ Mount Pipe	65
(2) P65-15-XLH-RR w/ Mount Pipe	65
(2) P65-15-XLH-RR w/ Mount Pipe	65
(2) TT19-08BP111-001	65
(2) TT19-08BP111-001	65
(2) TT19-08BP111-001	65
T-Arm Mount [TA 601-3]	65
KS24019-L112A	50
Side Arm Mount [SO 702-1]	50

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 37.98 ksi	38 ksi	48 ksi
A607-65	65 ksi	80 ksi	Reinf 40.86 ksi	41 ksi	52 ksi
Reinf 37.89 ksi	38 ksi	48 ksi			

ALL REACTIONS ARE FACTORED

AXIAL 77 K

SHEAR 8 K

MOMENT 718

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 33 K

SHEAR 26 K

MOMENT 2146 kip-ft

TORQUE 3 kip-ft
REACTIONS - 97 mph WIND

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 96.2%

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

Job: **123' Monopole / Berlin / Laviana Orchard**			
Project: **PJF# 37517-0755.002.7805 / BU# 876382**			
Client: Crown Castle International	Drawn by: Christopher Poelking	App'd:	
Code: TIA-222-G	Date: 08/07/17	Scale: NTS	
Path:		Dwg No. E-1	

PAUL J. FORD & COMPANY
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v4.4 - Effective 7-12-13

Date: 8/7/2017
PJF Project: 37517-0755.002.7805
Client Ref. # BU 876382
Site Name: Berlin/ Laviana Orchard
Description: 123 ft MP
Owner: CCI
Engineer: CP

Asymmetric Anchor Rod Analysis

Moment =	2146	k-ft	TIA Ref.	G	Location =	Base Plate		
Axial =	33.0	kips	ASIF =	N/A	η =	0.50	for BP, Rev. G Sect. 4.9.9	
Shear =	26.0	kips	Max Ratio =	105.0%	Threads =	N/A	for FP, Rev. G	
Anchor Qty =	12							

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

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in^2	Area, in^2	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	37.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
2	2.250	#18J A615 Gr 75	75	100	52.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
3	2.250	#18J A615 Gr 75	75	100	127.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
4	2.250	#18J A615 Gr 75	75	100	142.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
5	2.250	#18J A615 Gr 75	75	100	217.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
6	2.250	#18J A615 Gr 75	75	100	232.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
7	2.250	#18J A615 Gr 75	75	100	307.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
8	2.250	#18J A615 Gr 75	75	100	322.5	46.00	0.00	3.98	183.78	178.28	188.11	0.00	260.00	72.4%
9	2.250	#18J A615 Gr 75	75	100	0.0	48.08	0.00	3.98	191.96	186.46	196.30	222.71	222.71	88.1%
10	2.250	#18J A615 Gr 75	75	100	90.0	48.08	0.00	3.98	191.96	186.46	196.30	222.71	222.71	88.1%
11	2.250	#18J A615 Gr 75	75	100	180.0	48.08	0.00	3.98	191.96	186.46	196.30	222.71	222.71	88.1%
12	2.250	#18J A615 Gr 75	75	100	270.0	48.08	0.00	3.98	191.96	186.46	196.30	222.71	222.71	88.1%
					.			47.76						

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

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

Site Data

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

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	8	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	46	in
Anchor Spacing:	6	in

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

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

Pole Data		
Diam:	39.58	in
Thick:	0.28125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	1387.94	ft-kips
Factored Axial, Pu:	22	kips
Factored Shear, Vu:	17.3	kips

Reactions adjusted to account for post installed anchor rods

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	188.1	Kips
Axial Design Strength, Φ*Fu*Anet:	260.0	Kips
Anchor Rod Stress Ratio:	72.4%	**Pass**

Refer to "Asymmetric Anchor Rod Analysis" spreadsheet for post-installed anchor capacities.

Base Plate Results	Flexural Check	
Base Plate Stress:	25.7	ksi
PL Design Bending Strength, Φ*Fy:	49.5	ksi
Base Plate Stress Ratio:	51.8%	**Pass**

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

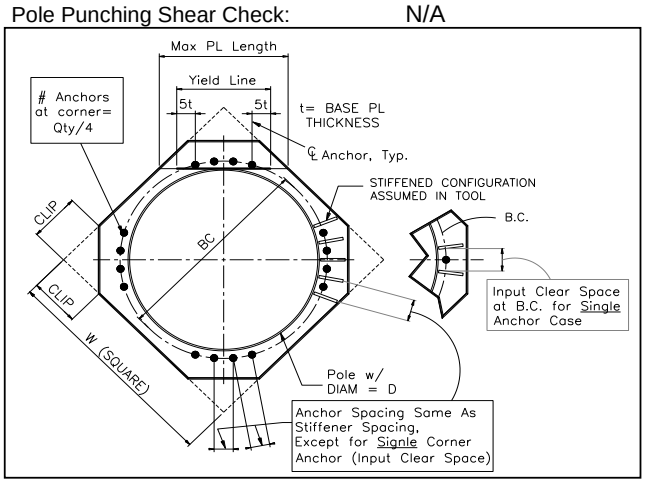
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check:	N/A



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

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Job Number: 37517-0755.002.7805
Site Number: 876382
Site Name: Berlin/Laviana Orchard

By: CP
Date: 8/7/2017

DRILLED PIER SOIL AND STEEL ANALYSIS - TIA-222-G

Factored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, Mu =	2146.0		k-ft
Shear, Vu =	26.0		kips
Axial Load, Pu1 =	33.0		kips (from 1.2D + 1.6W)*
Axial Load, Pu2 =	24.8	0.0	kips (from 0.9D + 1.6W)**
OTMu =	2159.0	0.0	k-ft @ Ground

***Axial Load, Pu1 will be used for Soil Compression Analysis.**
****Axial Load, Pu2 will be used for Steel Analysis.**

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-08
Seismic Design Category =	D
Reference Standard =	TIA-222-G
Use 1.3 Load Factor?	No
Load Factor =	1.00

Drilled Pier Parameters

Diameter =	6	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	20	ft
fc' =	3	ksi
εc =	0.003	in/in
L / D Ratio =	3.42	
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

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

Load Combinations Checked per TIA-222-G

1. (0.75) Ult. Skin Friction + (0.75) Ult. End Bearing + (1.2) Effective Soil Wt. - (1.2) Buoyant Conc. Wt. ≥ Comp.
2. (0.75) Ult. Skin Friction + (0.9) Buoyant Conc. Wt. ≥ Uplift

Steel Parameters

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

Soil Parameters

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

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

Direct Embed Pole Shaft Parameters

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

Maximum Capacity Ratios

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

*Note: The drilled pier foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the drilled pier is based the recommendations of the site specific geotechnical report. In the absence of any recommendations, the frost depth at the site or one half of the drilled pier diameter (whichever is greater) shall be ignored.

Define Soil Layers

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

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

Soil Results: Overturning

Depth to COR =	14.38	ft, from Grade
Bending Moment, Mu =	2532.95	k-ft, from COR
Resisting Moment, ΦMn =	5298.66	k-ft, from COR

MOMENT RATIO = 47.8% OK

Shear, Vu =	26.00	kips
Resisting Shear, ΦVn =	54.39	kips

SHEAR RATIO = 47.8% OK

Soil Results: Uplift

Uplift, Tu =	0.00	kips
Uplift Capacity, ΦTn =	70.31	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, Cu =	33.00	kips
Comp. Capacity, ΦCn =	962.74	kips

COMPRESSION RATIO = 3.4% OK

Steel Results (ACI 318-08):

Minimum Steel Area =	13.57	sq in
Actual Steel Area =	24.96	sq in
Axial, ΦPn (min) =	-1347.84	kips, Where ΦMn = 0 k-ft
Axial, ΦPn (max) =	6144.47	kips, Where ΦMn = 0 k-ft

Axial Load, Pu =	44.79	kips @ 4.75 ft Below Grade
Moment, Mu =	2268.46	k-ft @ 4.75 ft Below Grade
Moment, ΦMn =	3339.32	k-ft

MOMENT RATIO = 67.9% OK

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

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

Site Data

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

Loads Already Factored		
For M (WL)	1	<----Disregard
For P (DL)	1	<----Disregard

Pier Properties

Concrete:

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

Reinforcement:

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

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

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

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

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	2268.46	ft-kips **(* Note)**
Max. Factored Shaft Pu:	44.79	kips
Max Axial Force Type:	Comp.	

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

Load Factor	Shaft Factored Loads		
1.00	Mu:	2268.46	ft-kips
1.00	Pu:	44.79	kips

Material Properties

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

ACI 318 Code

Select Analysis ACI Code=	2008	

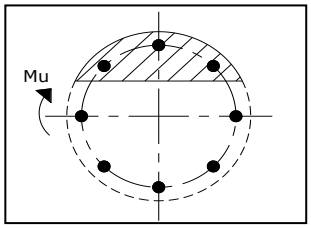
Seismic Properties

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

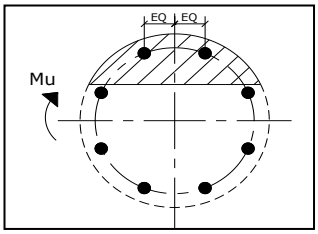
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**12.51**	in
Extreme Steel Strain, ϵt:	**0.0128**	
	ϵt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	44.79	kips
Drilled Shaft Moment Capacity, φMn:	**3339.32**	ft-kips
Drilled Shaft Superimposed Mu:	**2268.46**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**67.9%**

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

SPRINT Existing Facility

Site ID: CT33XC536

Berlin / Laviana Orchard
1684 Chamberlain Highway
Berlin, CT 06037

September 8, 2017

EBI Project Number: 6217003916

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	31.42 %

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

EBI Consulting
environmental | engineering | due diligence

September 8, 2017

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

Emissions Analysis for Site: **CT33XC536 – Berlin / Laviana Orchard**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **1684 Chamberlain Highway, Berlin, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **1684 Chamberlain Highway, Berlin, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **121 feet** above ground level (AGL) for **Sector A**, **121 feet** above ground level (AGL) for **Sector B** and **121 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general population threshold limits.

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**121 feet**	Height (AGL):	**121 feet**	Height (AGL):	**121 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**2.32 %**	Antenna B1 MPE%	**2.32 %**	Antenna C1 MPE%	**2.32 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**121 feet**	Height (AGL):	**121 feet**	Height (AGL):	**121 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.69 %**	Antenna B2 MPE%	**1.69 %**	Antenna C2 MPE%	**1.69 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**4.01 %**
Town	0.01 %
MetroPCS	1.43 %
Clearwire	0.14 %
T-Mobile	4.08 %
Verizon Wireless	10.66 %
AT&T	11.09 %
Site Total MPE %:	**31.42 %**

SPRINT Sector A Total:	4.01 %
SPRINT Sector B Total:	4.01 %
SPRINT Sector C Total:	4.01 %
Site Total:	31.42 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	121	1.19	850 MHz	567	0.21%
Sprint 850 MHz LTE	2	437.55	121	2.38	850 MHz	567	0.42%
Sprint 1900 MHz (PCS) CDMA	5	622.47	121	8.46	1900 MHz (PCS)	1000	0.85%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	121	8.46	1900 MHz (PCS)	1000	0.85%
Sprint 2500 MHz (BRS) LTE	8	778.09	121	16.92	2500 MHz (BRS)	1000	1.69%
						Total:*	**4.01%**

*NOTE: Totals may vary by 0.01% due to summing of remainders

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	4.01 %
Sector B:	4.01 %
Sector C:	4.01 %
SPRINT Maximum Total (per sector):	4.01 %
Site Total:	31.42 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **31.42 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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