



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

July 7, 2014

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

RE: Sprint PCS-Exempt Modification - Crown Site BU: 876340
Sprint PCS Site ID: CT03XC160
Located at: 238 Meridan Road, Middlefield, CT 06457

Dear Ms. Bachman:

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

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **238 Meridan Road, Middlefield, CT 06457**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint’s operations at the site (Exhibit-3).

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint’s additional antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.
5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

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

Sincerely,



Jeff Barbadora
Real Estate Specialist

Enclosures

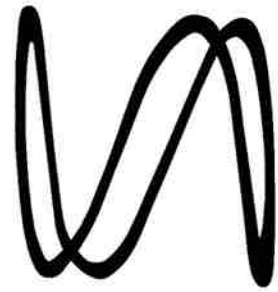
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Jon A. Brayshaw, First Selectman
Town of Middlefield
393 Jackson Hill Road
Middlefield, CT 06455

Sprint



CROWN CASTLE

PROJECT: 2.5 EQUIPMENT DEPLOYMENT
 SITE NAME: COE HILL
 SITE CASCADE: CT03XC160
 SITE NUMBER: 876340
 SITE ADDRESS: 238 MERIDAN RD.
 MIDDLEFIELD, CT 06457
 SITE TYPE: MONOPOLE
 MARKET: NORTHERN CONNECTICUT

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/26/14	AJD	0

SITE NAME:

COE HILL

SITE CASCADE:

CT03XC160

SITE ADDRESS:

238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:

TITLE SHEET & PROJECT DATA

SHEET NUMBER:

T-1

SITE INFORMATION

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

LATITUDE (NAD83):
41° 32' 50.98" N
41.545983°

LONGITUDE (NAD83):
72° 42' 59.41" W
-72.714933°

COUNTY:
MIDDLESEX

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
DD #1

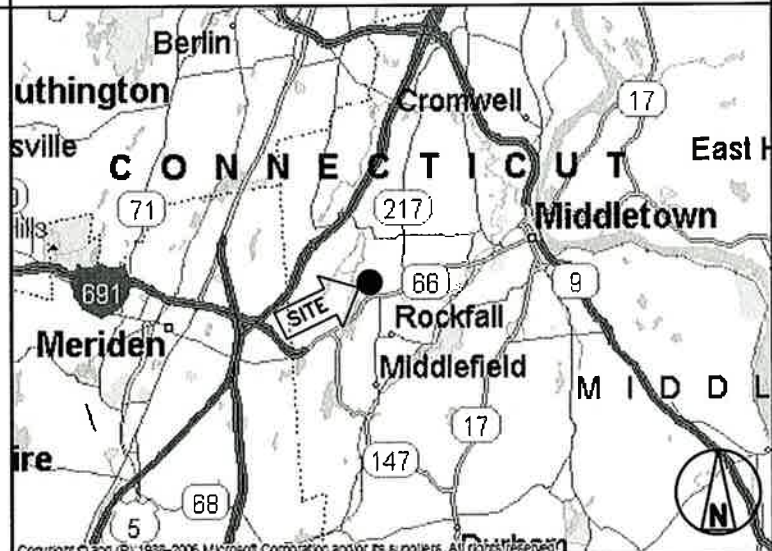
POWER COMPANY:
CL&P
(860) 947-2000

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

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

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

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

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

THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

APPLICABLE CODES

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALL IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE (2012 IBC)
2. TIA-EIA-222-G OR LATEST EDITION
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES



DRAWING INDEX

SHEET NO:	SHEET TITLE	REV
T-1	TITLE SHEET & PROJECT DATA	0
SP-1	SPRINT SPECIFICATIONS	0
SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION & CABLE PLAN	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	COLOR CODING & NOTES	0
A-5	EQUIPMENT & MOUNTING DETAILS	0
A-6	CIVIL DETAILS	0
A-7	PLUMBING DIAGRAM	0
E-1	ELECTRICAL & GROUNDING PLAN	0
E-2	ELECTRICAL & GROUNDING DETAILS	0

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:



6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:



Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-XXX

MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/26/14	A.D	0

SITE NAME:

COE HILL

SITE CASCADE:

CT03XC160

SITE ADDRESS:

238 MERIDAN RD.
MIDDLEFIELD, CT 06457

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 ANTENNA 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 CIVL 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. 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 - ANTENNAALIGN ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/26/14	AJD	0

SITE NAME:

COE HILL

SITE CASCADE:

CT03XC160

SITE ADDRESS:

238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
 8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
 9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
 10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
 11. ALL AVAILABLE JURISDICTIONAL INFORMATION
 12. PDF SCAN OF REDLINES PRODUCED IN FIELD
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
- D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.
- 3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.
- A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
 2. STRUCTURAL BACKFILL COMPACTION REPORTS.
 3. SITE RESISTANCE TO EARTH TEST.
 4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
 5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
 6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".
- B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;
1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
 2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
 3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS - PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
 4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING; AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
 5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
 6. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
 7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
 8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
 9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 - SUBMITTALS & TESTS

PART 1 - GENERAL

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

1.2 RELATED DOCUMENTS:

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 WEEKLY REPORTS:

- A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.
- B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

- A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

- A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

- A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

- A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:

1. SHELTER AND TOWER OVERVIEW.
2. TOWER FOUNDATION(S) - FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
5. PHOTOS OF TOWER SECTION STACKING.
6. CONCRETE TESTING / SAMPLES.
7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.
10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
11. COAX CABLE ENTRY INTO SHELTER.
12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
25. ALL BTS GROUND CONNECTIONS.
26. ALL GROUND TEST WELLS.
27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
30. GPS ANTENNAS.
31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
32. DOGHOUSE/CABLE EXIT FROM ROOF.
33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
34. MASTER BUS BAR.
35. TELCO BOARD AND NIU.
36. ELECTRICAL DISTRIBUTION WALL.
37. CABLE ENTRY WITH SURGE SUPPRESSION.
38. ENTRANCE TO EQUIPMENT ROOM.
39. COAX WEATHERPROOFING--TOP AND BOTTOM OF TOWER.
40. COAX GROUNDING -TOP AND BOTTOM OF TOWER.
41. ANTENNA AND MAST GROUNDING.
42. LANDSCAPING - WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

PLANS PREPARED FOR:



6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:



1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 890-0790
Fax # (518) 890-0793
JOB NUMBER 353-1004

MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:	DESCRIPTION	DATE	BY	REV
FOR PERMIT		6/26/14	AJD	0

SITE NAME:
COE HILL

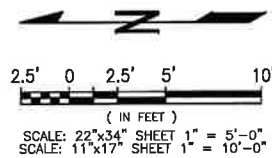
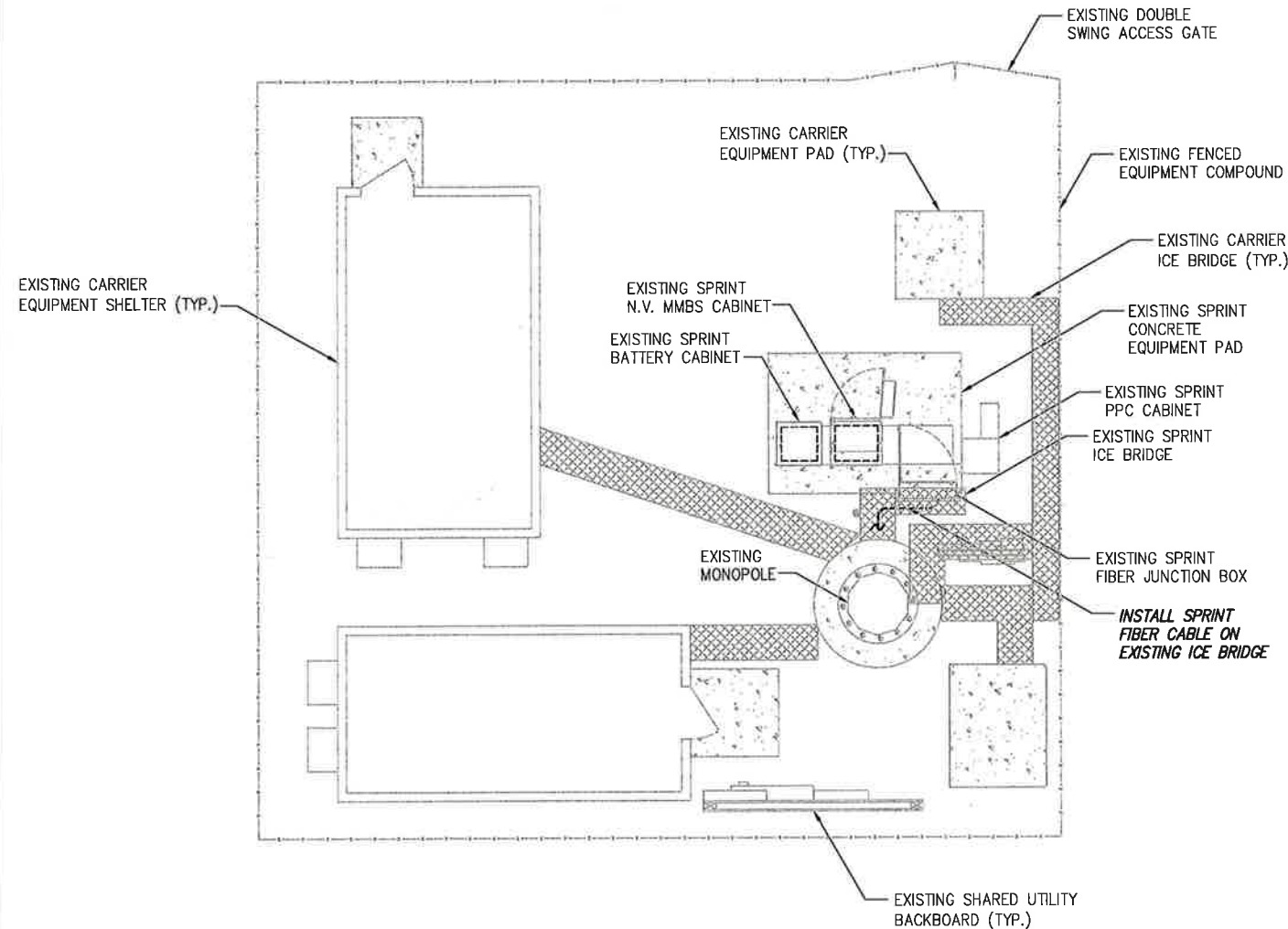
SITE CASCADE:
CT03XC160

SITE ADDRESS:
**238 MERIDAN RD.
MIDDLEFIELD, CT 06457**

SHEET DESCRIPTION:
SPRINT SPECIFICATIONS

SHEET NUMBER:
SP-3

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



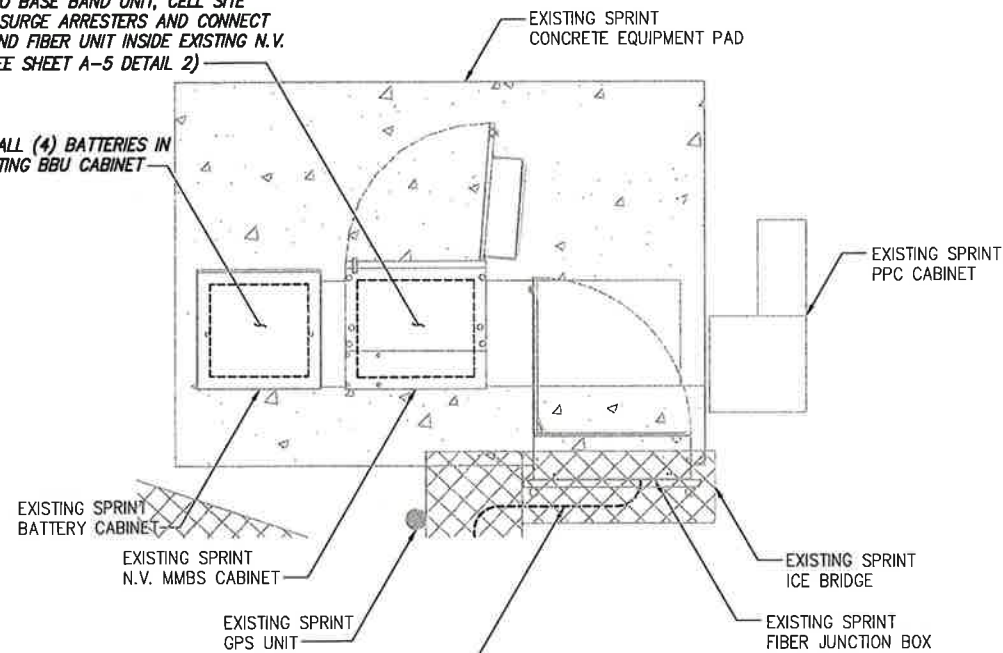
OVERALL SITE PLAN

SCALE: AS NOTED

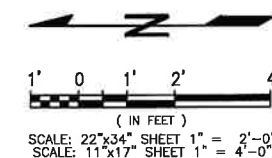
1

INSTALL (3) NEW RECTIFIERS AND EQUIPMENT IN EXISTING CABINET INCLUDING BUT NOT LIMITED TO BASE BAND UNIT, CELL SITE ROUTER, SURGE ARRESTERS AND CONNECT POWER AND FIBER UNIT INSIDE EXISTING N.V. MMBS (SEE SHEET A-5 DETAIL 2)

INSTALL (4) BATTERIES IN EXISTING BBU CABINET



INSTALL FIBER CABLE FROM EXISTING SPRINT FIBER JUNCTION BOX TO PROPOSED TOWER MOUNTED RRU UNIT (SEE SHEET A-6 DETAIL 2)



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 353-1001

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	5/26/14	AJD	0

SITE NAME:

COE HILL

SITE CASCADE:

CT03XC160

SITE ADDRESS:

238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:

SITE PLAN

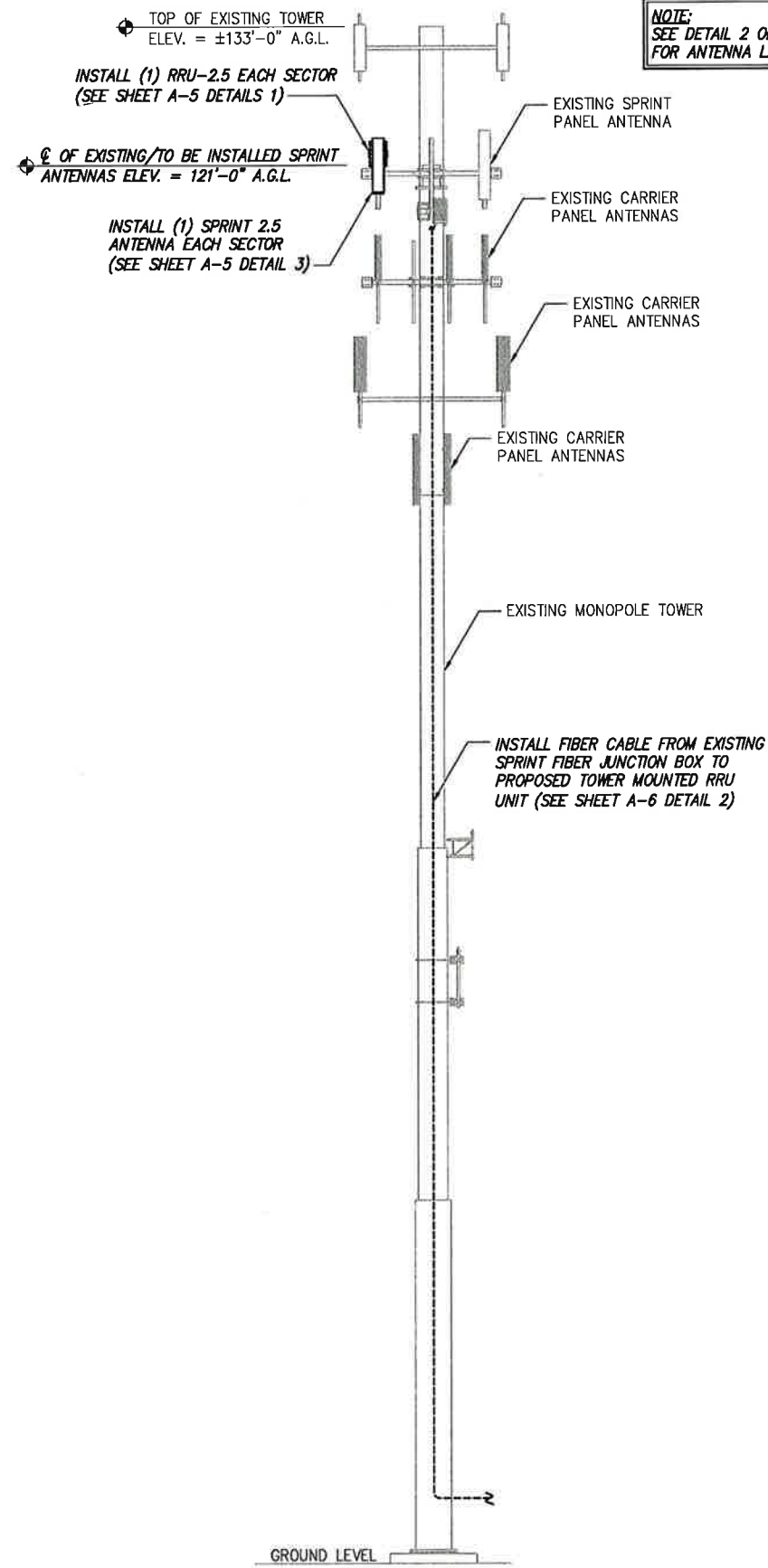
SHEET NUMBER:

A-1

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

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

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



DETAIL NOT USED NO SCALE 2

TOWER ELEVATION NO SCALE 1 DETAIL NOT USED NO SCALE 3 DETAIL NOT USED NO SCALE 4

PLANS PREPARED FOR:




6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:



1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-1004

MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:
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REPRODUCED, DISSEMINATED OR REDISTRIBUTED
WITHOUT THE EXPRESS WRITTEN CONSENT OF
SPRINT.

REVISIONS:

DESCRIPTION	DATE	BY	REV
FOR PERMIT	6/26/14	AJD	0

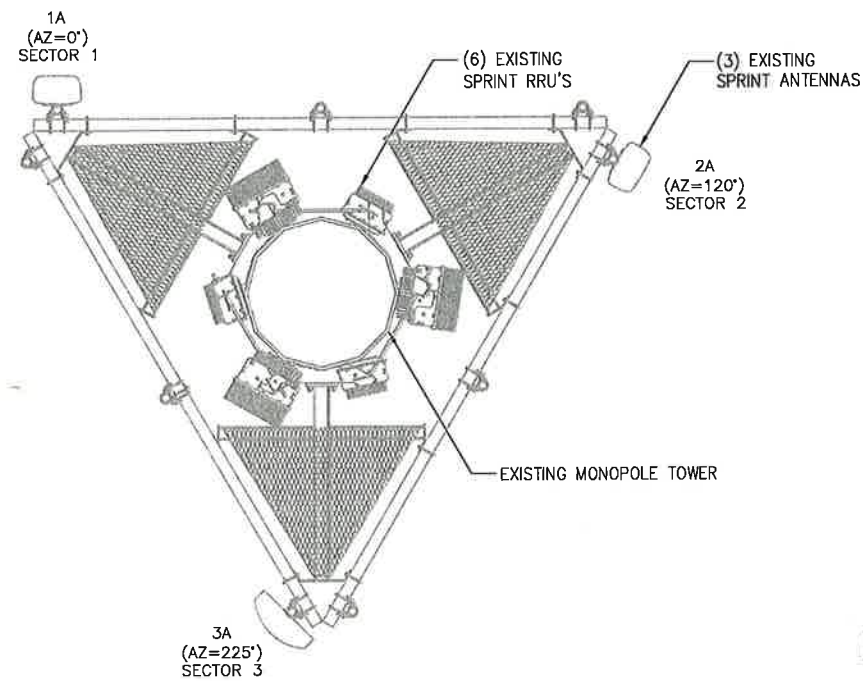
SITE NAME:
COE HILL

SITE CASCADE:
CT03XC160

SITE ADDRESS:
238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:
**TOWER ELEVATION
& CABLE PLAN**

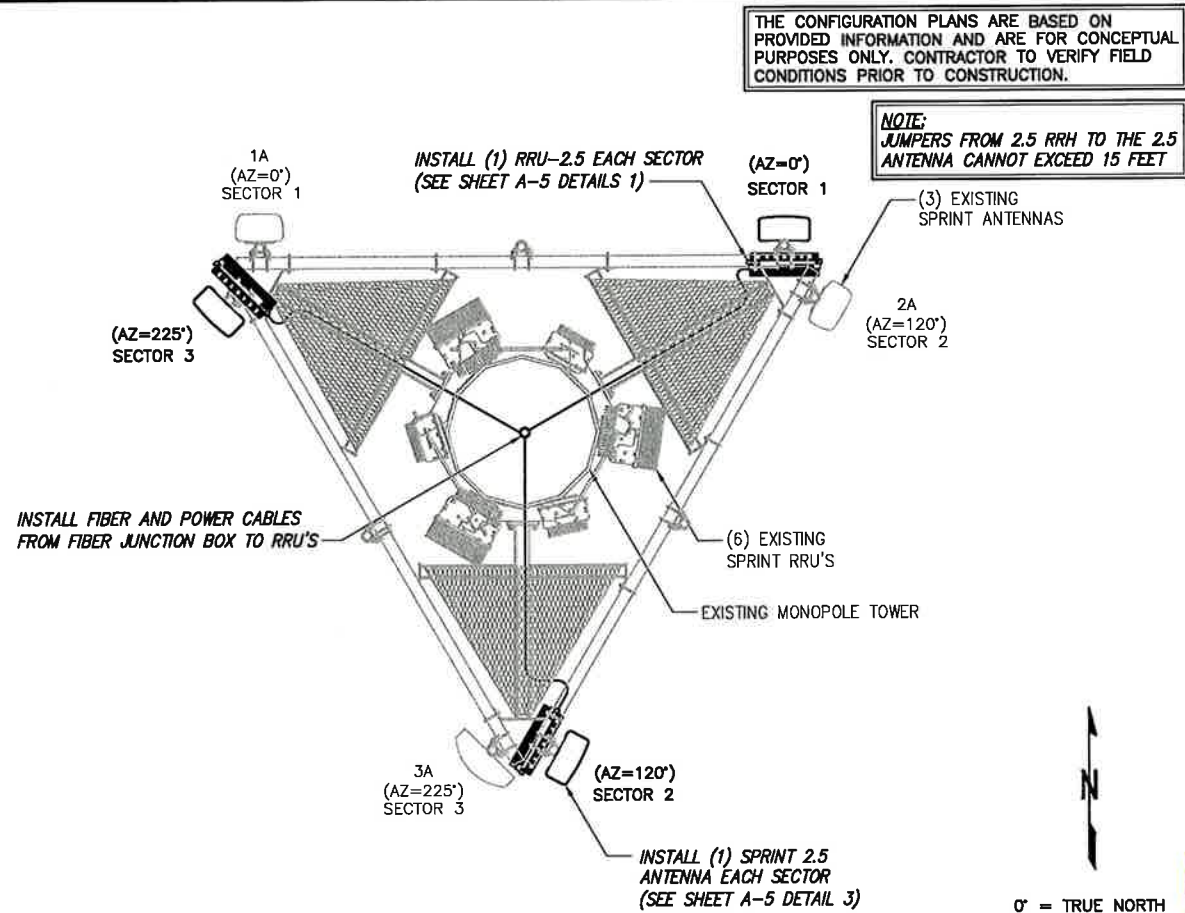
SHEET NUMBER:
A-2



EXISTING ANTENNA & RRU LAYOUT

NO SCALE

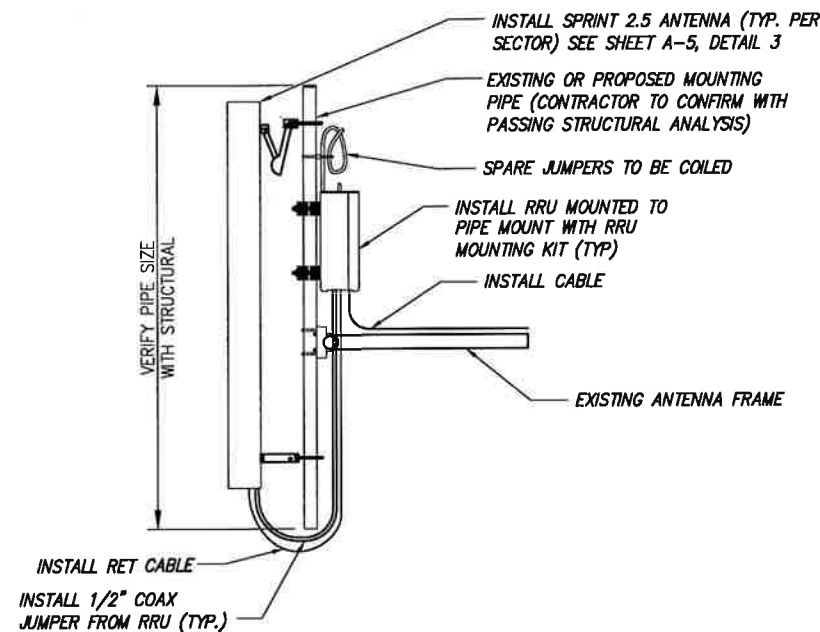
1



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 NOT 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.

DETAIL NOT USED

NO SCALE

3

TYPICAL ANTENNA & RRU MOUNTING DETAILS

NO SCALE

4

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-100X

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:



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COE HILL

SITE CASCADE:

CT03XC160

SITE ADDRESS:

238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

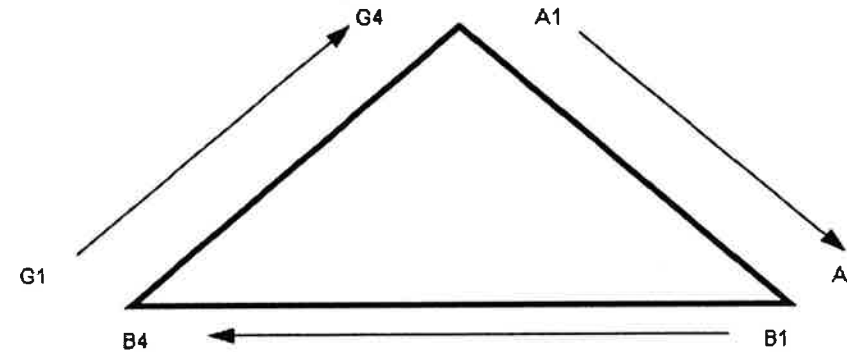
A-3

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



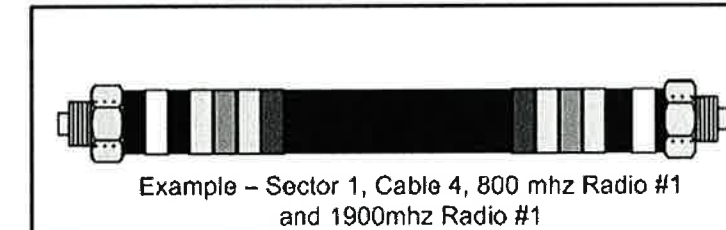
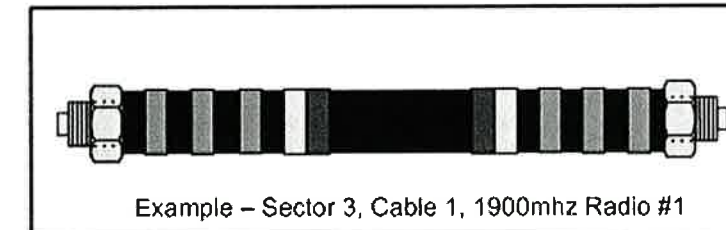
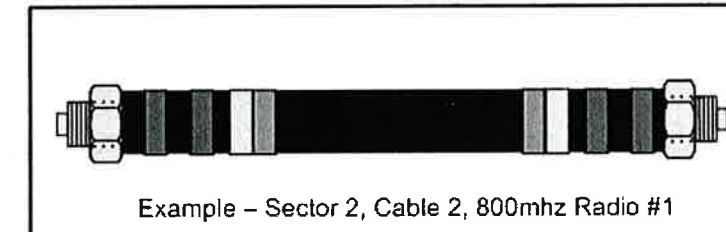
NOTES:

- ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
- 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.
- 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.
- 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.
- 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.
- 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.
- HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
- 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
	2	Blue	No Tape	No Tape
	3	White	No Tape	No Tape
	4	White	No Tape	No Tape
	5	Red	No Tape	No Tape
	6	Grey	No Tape	No Tape
	7	Purple	No Tape	No Tape
	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
	2	Blue	Blue	No Tape
	3	White	White	No Tape
	4	White	White	No Tape
	5	Red	Red	No Tape
	6	Grey	Grey	No Tape
	7	Purple	Purple	No Tape
	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
	2	Blue	Blue	Blue
	3	White	White	White
	4	White	White	White
	5	Red	Red	Red
	6	Grey	Grey	Grey
	7	Purple	Purple	Purple
	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



PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-100X

MLA PARTNER:

ENGINEERING LICENSE:

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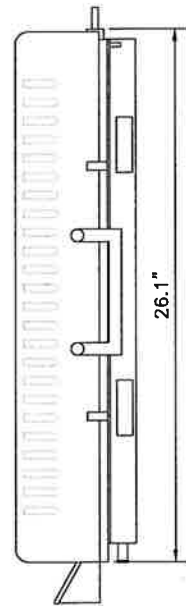
SITE CASCADE:
CT03XC160

SITE ADDRESS:
238 MERIDAN RD.
MIDDLEFIELD, CT 06457

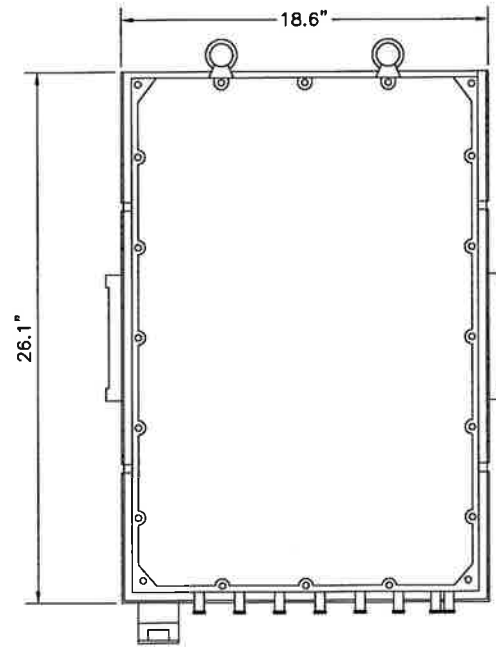
SHEET DESCRIPTION:
COLOR CODING AND NOTES

SHEET NUMBER:
A-4

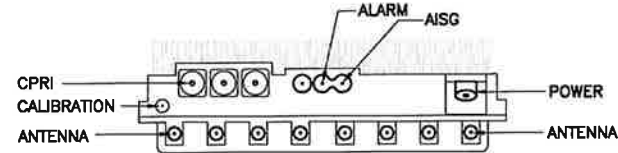
RRU: ALCATEL LUCENT TD-RRH8X20
 COLOR: LIGHT GREY
 WEIGHT: 70 LBS.



SIDE VIEW



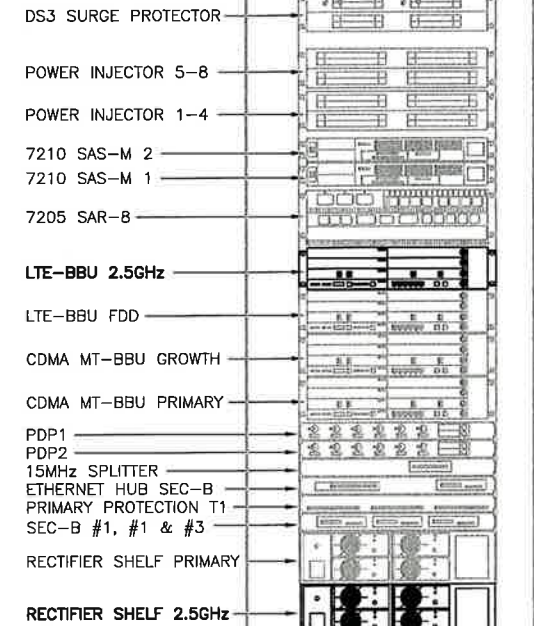
FRONT VIEW



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



FRONT VIEW

- DS3 SURGE PROTECTOR
- POWER INJECTOR 5-8
- POWER INJECTOR 1-4
- 7210 SAS-M 2
- 7210 SAS-M 1
- 7205 SAR-B
- LTE-BBU 2.5GHz
- LTE-BBU FDD
- CDMA MT-BBU GROWTH
- CDMA MT-BBU PRIMARY
- PDP1
- PDP2
- 15MHz SPLITTER
- ETHERNET HUB SEC-B
- PRIMARY PROTECTION T1
- SEC-B #1, #1 & #3
- RECTIFIER SHELF PRIMARY
- RECTIFIER SHELF 2.5GHz

PLANS PREPARED FOR:

6580 Sprint Parkway
 Overland Park, Kansas 66251

PLANS PREPARED BY:

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

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COE HILL

SITE CASCADE:
CT03XC160

SITE ADDRESS:
 238 MERIDAN RD.
 MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

2.5 RRU

NO SCALE

1

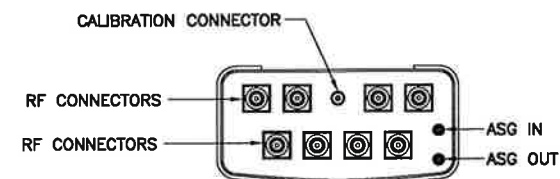
NEW EQUIPMENT IN EXISTING CABINET

NO SCALE

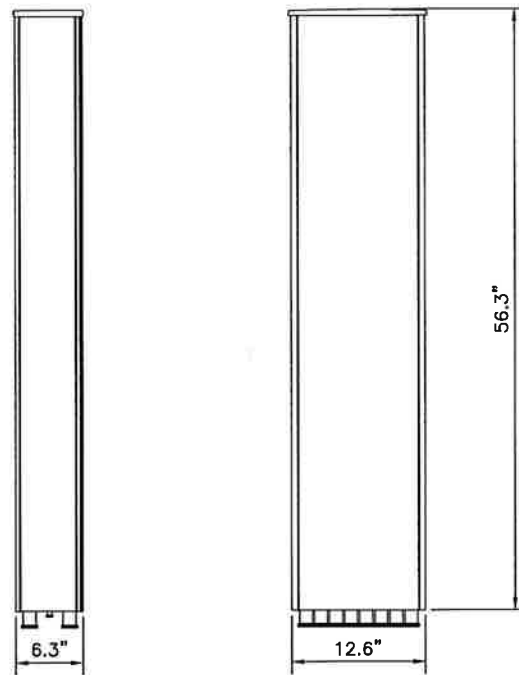
2

ANTENNA: RFS APXVM14-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

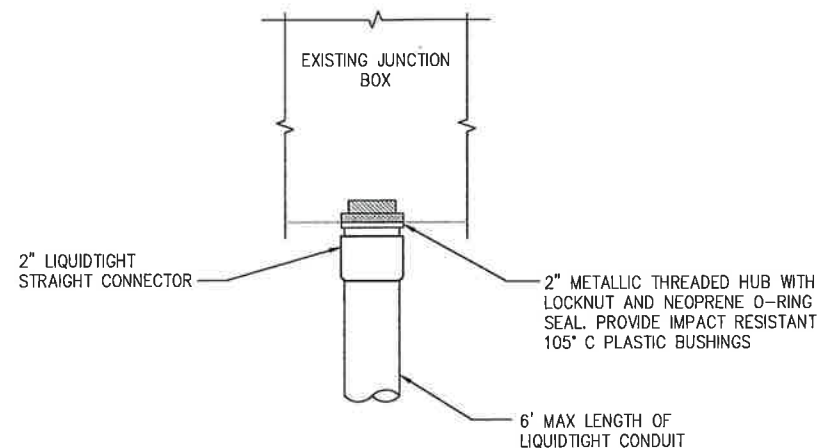
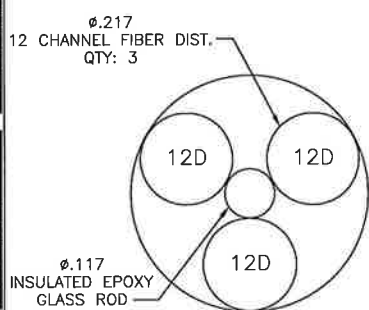
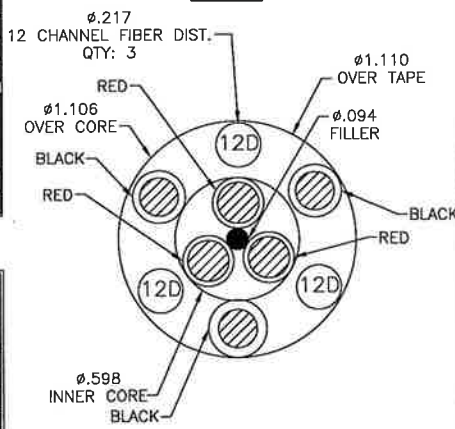
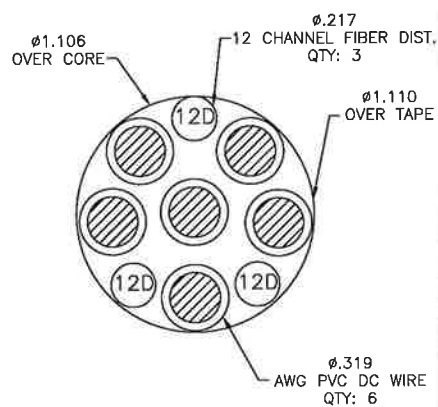
RFS HYBRIFLEX RISER CABLE SCHEDULE

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 pairs, 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 pairs, 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 RISER CABLE AND HYBRID JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.



FIBER JUNCTION BOX PENETRATION

NO SCALE

2

2.5 CABLE CROSS SECTION DATA

NO SCALE

1

DETAIL NOT USED

NO SCALE

3

PLANS PREPARED FOR:



PLANS PREPARED BY:



1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 680-0790
Fax # (518) 680-0793

JOB NUMBER 353-100X

MLA PARTNER:



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COE HILL

SITE CASCADE:

CT03XC160

SITE ADDRESS:

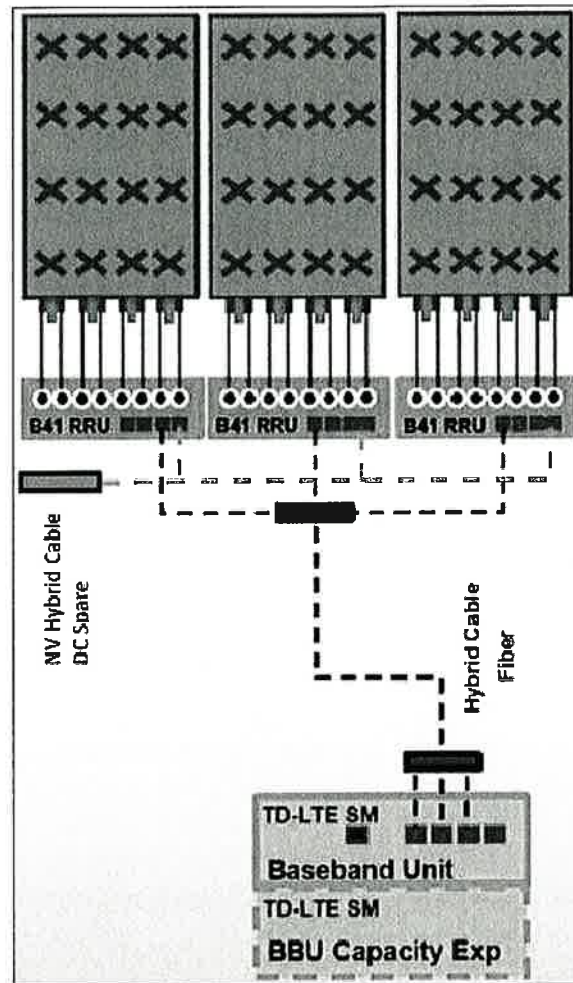
238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:

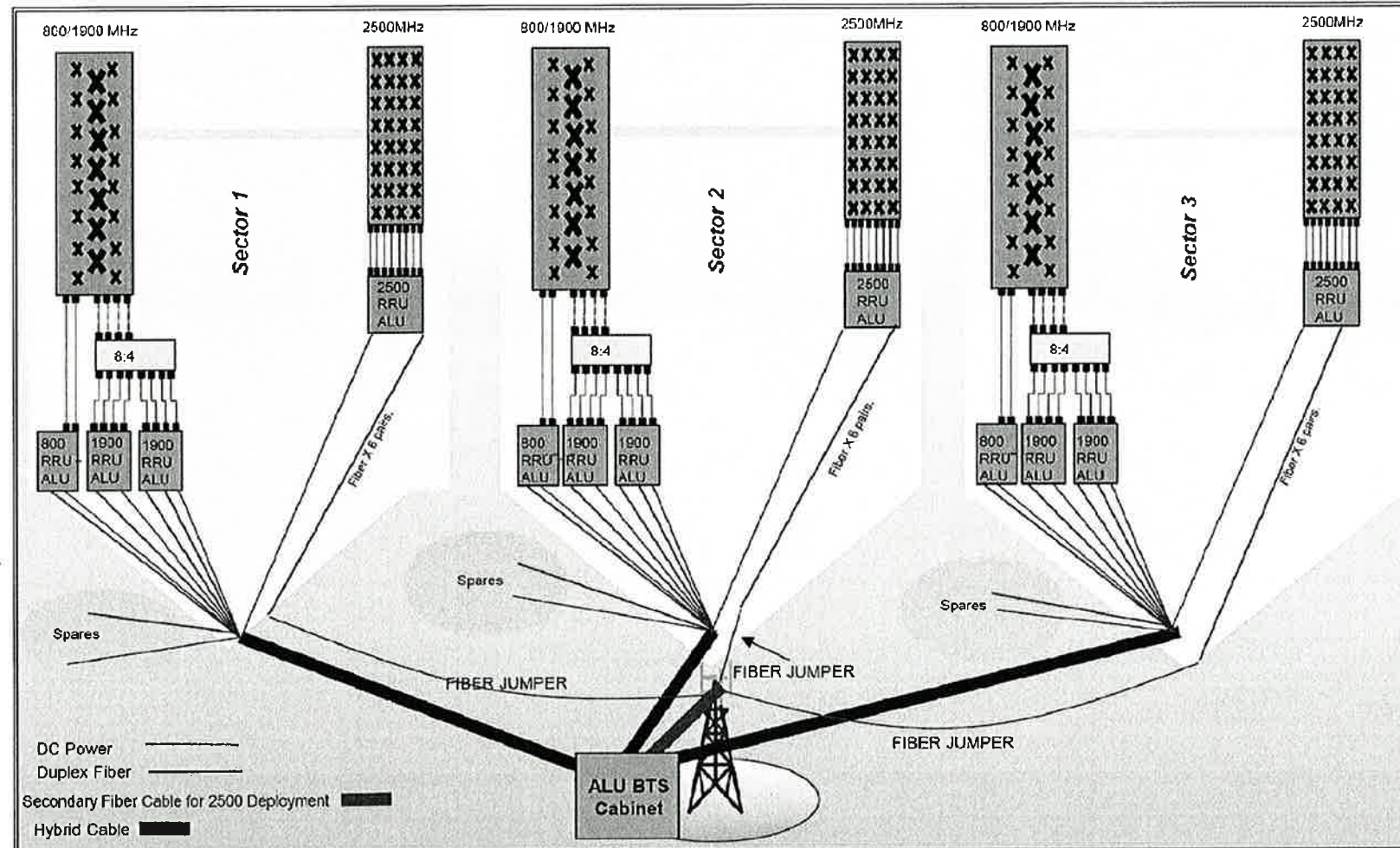
CIVIL DETAILS

SHEET NUMBER:

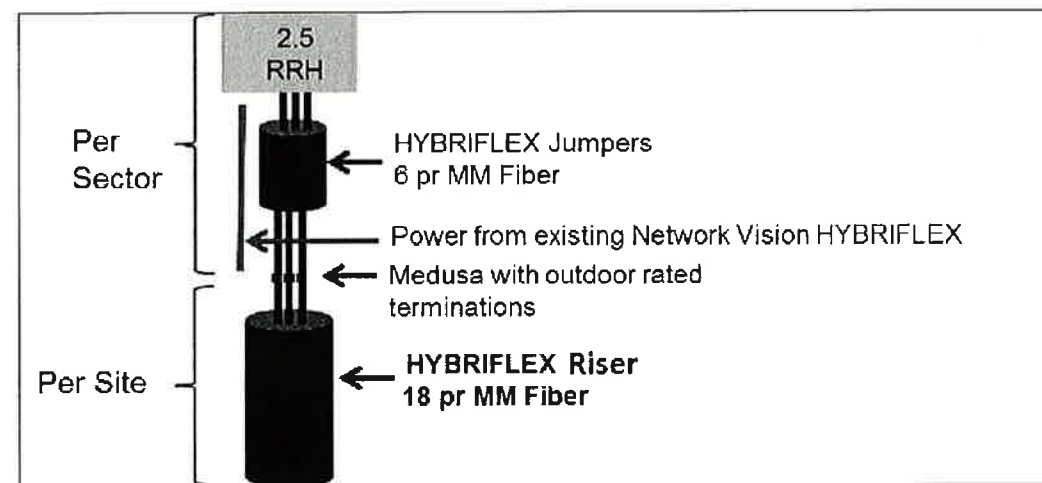
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
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MIDDLEFIELD, CT 06457

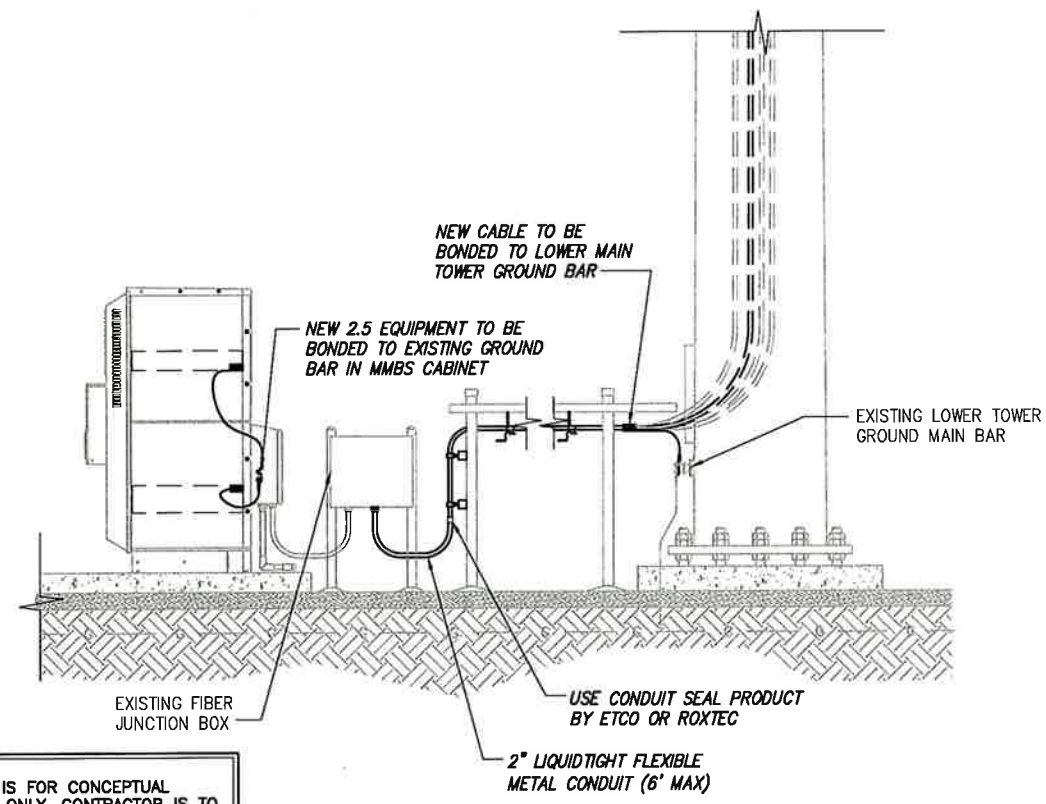
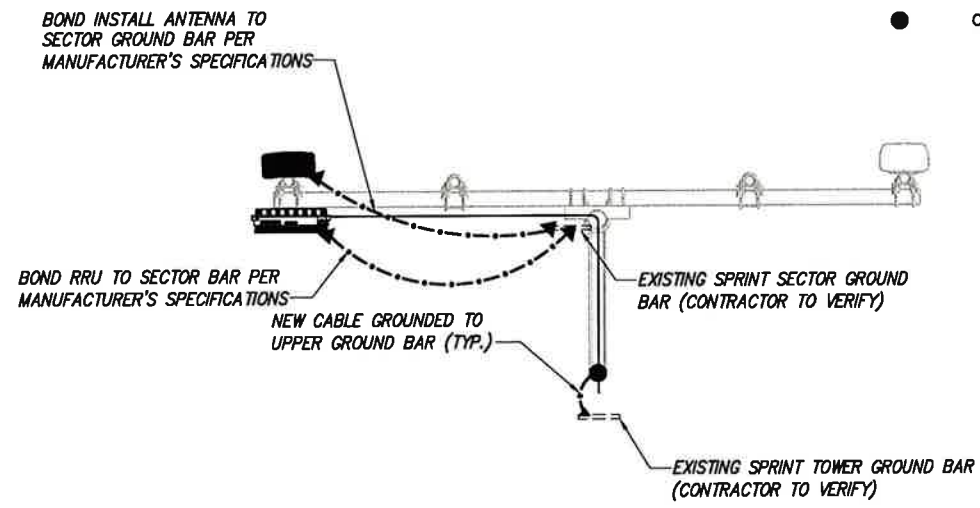
SHEET DESCRIPTION:
CIVIL DETAILS

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



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

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SITE ADDRESS:
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 MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:
E-1

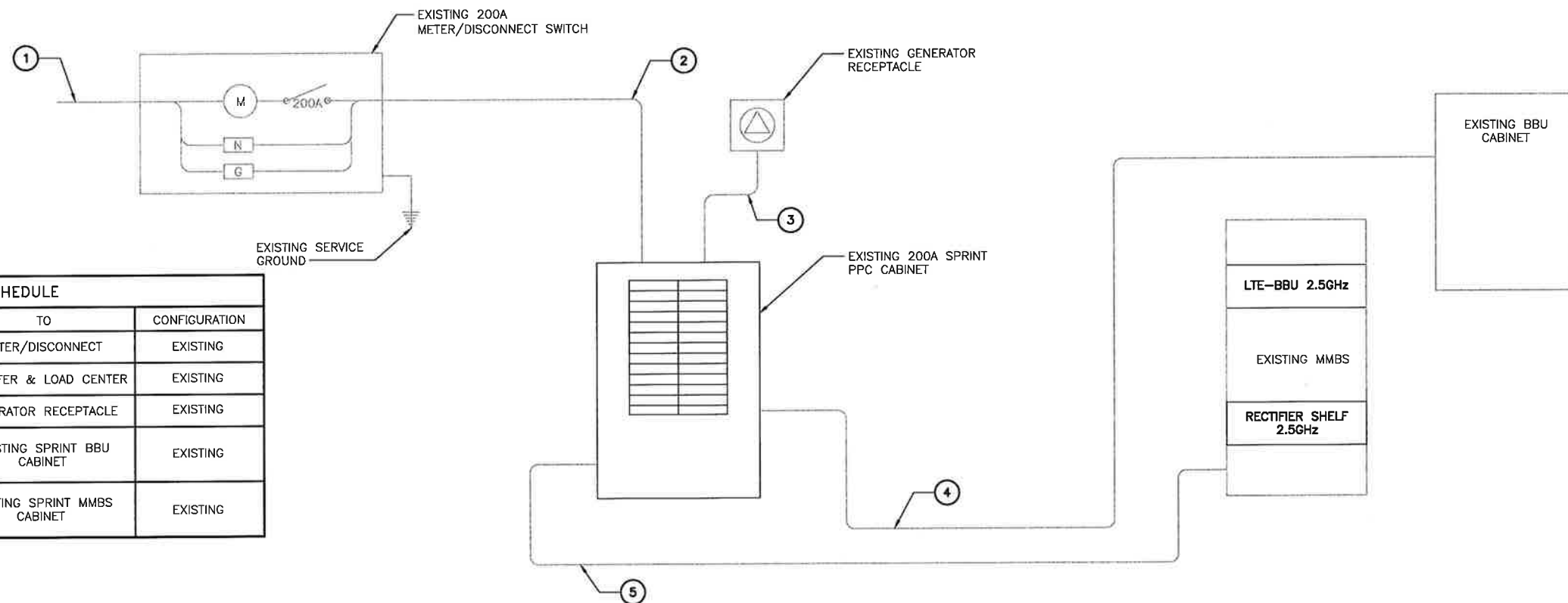
TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION)

NO SCALE 3

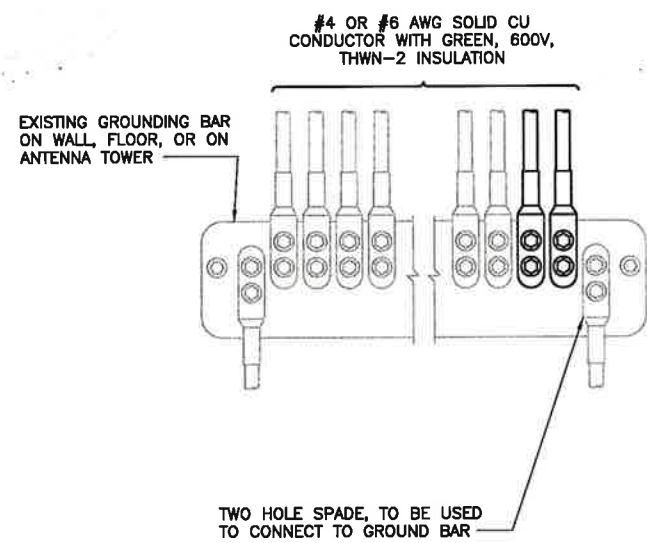
NOTES
 CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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

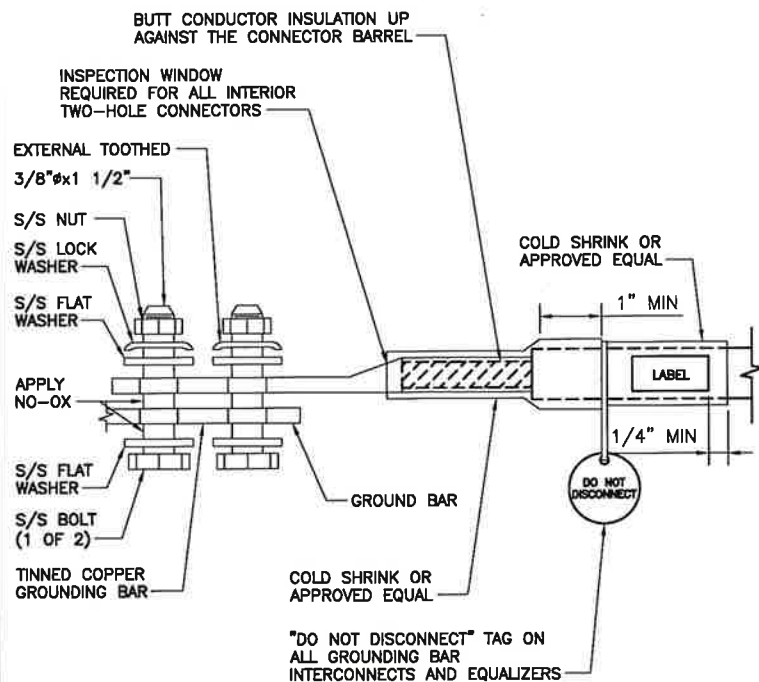


NOTES
 1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
 2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

NO SCALE

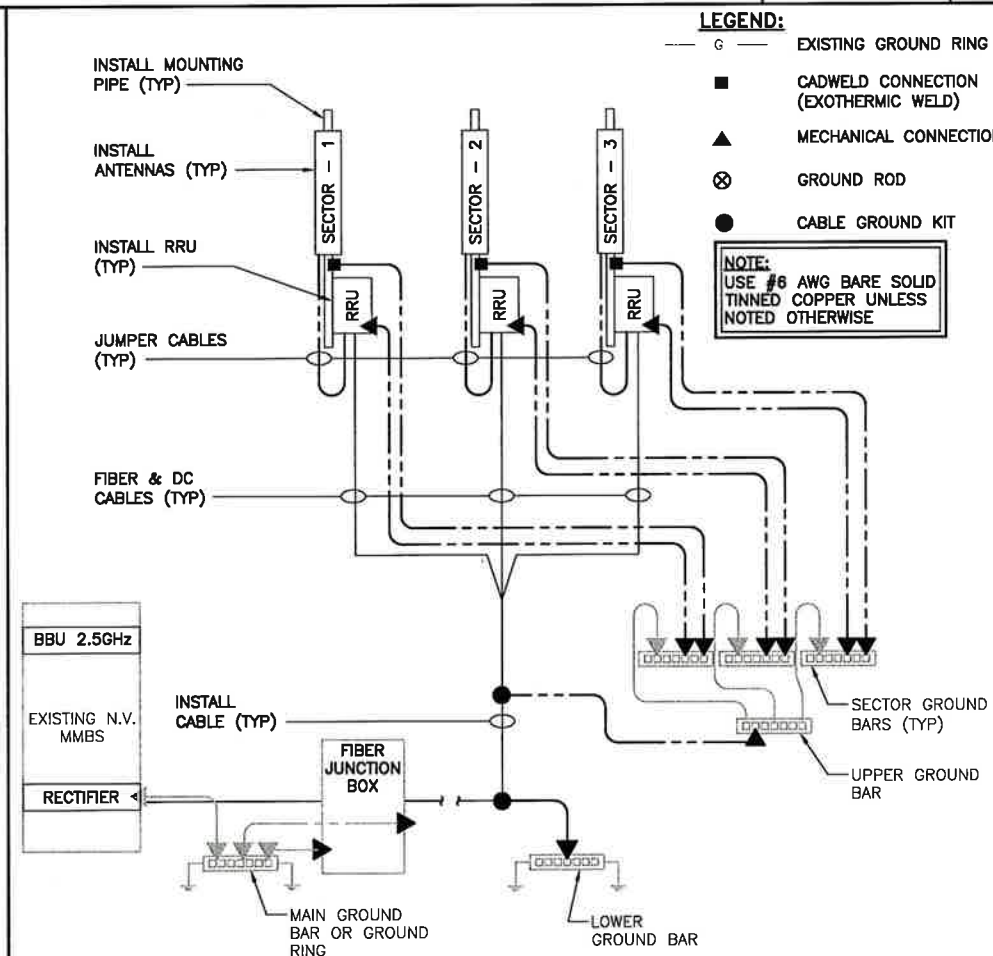
2



TWO HOLE LUG

NO SCALE

3



GROUNDING RISER DIAGRAM

NO SCALE

4

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



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CT03XC160

SITE ADDRESS:

238 MERIDAN RD.
MIDDLEFIELD, CT 06457

SHEET DESCRIPTION:

ELECTRICAL &
GROUNDING DETAILS

SHEET NUMBER:

E-2



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS

250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **June 05, 2014**

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

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

Subject: Structural Analysis Report

Carrier Designation: *Sprint PCS Co-Locate* Scenario 2.5B
Carrier Site Number: CT03XC160
Carrier Site Name: N/A

Crown Castle Designation: **Crown Castle BU Number:** 876340
Crown Castle Site Name: COE HILL
Crown Castle JDE Job Number: 286436
Crown Castle Work Order Number: 758736
Crown Castle Application Number: 245647 Rev. 4

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37513-1268.002

Site Data: 238 Meridan Rd., MIDDLEFIELD, Middlesex County, CT
Latitude 41° 32' 50.98", Longitude -72° 42' 59.41"
133.5 Foot - Monopole Tower

Dear Charles Trask,

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 652671, in accordance with application 245647, revision 4.

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

LC5: Existing + Proposed Equipment

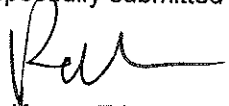

Sufficient Capacity

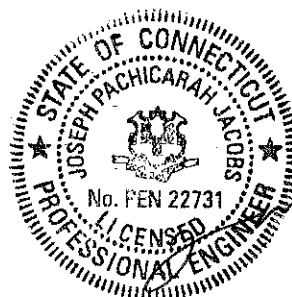
Note: See Table I and Table II for the proposed and existing loading, respectively.

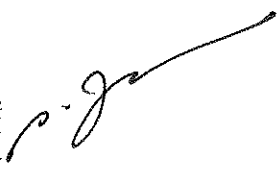
The structural analysis was performed for this tower in accordance with the requirements of the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford 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:


Bob Koors, E.I.
Structural Designer 




JUN 0 5 2014



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

Date: **June 05, 2014**

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

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

Subject: Structural Analysis Report

Carrier Designation: **Sprint PCS Co-Locate** Scenario 2.5B
Carrier Site Number: CT03XC160
Carrier Site Name: N/A

Crown Castle Designation: **Crown Castle BU Number:** 876340
Crown Castle Site Name: COE HILL
Crown Castle JDE Job Number: 286436
Crown Castle Work Order Number: 758736
Crown Castle Application Number: 245647 Rev. 4

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37513-1268.002

Site Data: **238 Meridan Rd., MIDDLEFIELD, Middlesex County, CT**
Latitude 41° 32' 50.98", Longitude -72° 42' 59.41"
133.5 Foot - Monopole Tower

Dear Charles Trask,

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 652671, in accordance with application 245647, revision 4.

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

LC5: Existing + Proposed Equipment

Sufficient Capacity

Note: See Table I and Table II for the proposed and existing loading, respectively.

The structural analysis was performed for this tower in accordance with the requirements of the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford 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.

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Bob Koors, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 133.5 ft Monopole tower designed by SUMMIT in January of 1998. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut Building Code using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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
119.0	121.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing 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
131.0	132.0	6	ericsson	RRUS-11	12 1 1 2	1-1/4 1-1/2 3/8 3/4	1
		2	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		7	powerwave technologies	P65-15-XLH-RR w/ Mount Pipe			
		6	powerwave technologies	TT19-08BP111-001			
		1	raycap	DC6-48-60-18-8F			
	131.0	1	tower mounts	Platform Mount [LP 712-1]			
119.0	121.0	4	decibel	DB980H90T2E-M w/ Mount Pipe	3	1-1/4	1
		2	decibel	DB982H33E-M w/ Mount Pipe			
		1	powerwave technologies	P40-16-XLPP-RR-A w/ Mount Pipe			
		2	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
	119.0	1	tower mounts	Platform Mount [LP 712-1]			
117.0	117.0	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]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
101.0	104.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	12 1	1-1/4 1-5/8	1
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			
	101.0	1	tower mounts	Platform Mount [LP 713-1]			
95.0	95.0	3	rfs celwave	APXV18-206517S-ACU w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
60.0	61.0	1	symmetricom	58532A	1	1/2	1
	60.0	1	tower mounts	Side Arm Mount [SO 304-1]			
50.0	51.0	1	lucent	KS24019-L112A	1	1/2	1
	50.0	1	tower mounts	Side Arm Mount [SO 102-1]			

- Notes:
 1) Existing Equipment
 2) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	SEA, 96684.03G, 10/07/97	1613531	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 37510-0656 RP, 09/02/10	2427628	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF, 29298-051, 01/23/98	1613597	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF, 29298-051, 01/23/98	1533009	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	FDH, 08-01314E, 05/05/09	2331830	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	133.5 - 121.5	Pole	TP10.75x10.75x0.365	1	-2.52	333.35	64.8	Pass
L2	121.5 - 119	Pole	TP22x10.75x0.365	2	-2.53	333.35	64.8	Pass
L3	119 - 85.25	Pole	TP28.414x22x0.25	3	-10.14	1178.65	75.5	Pass
L4	85.25 - 75	Pole	TP30.362x28.414x0.5002	4	-11.37	1966.48	53.9	Pass
L5	75 - 68.25	Pole	TP31.1447x28.6489x0.3125	5	-13.43	1612.89	81.2	Pass
L6	68.25 - 37.75	Pole	TP36.941x31.1447x0.5336	6	-19.42	2858.07	66.4	Pass
L7	37.75 - 0	Pole	TP43.49x34.9711x0.5544	7	-32.25	3615.20	77.8	Pass
							Summary	
						Pole (L5)	81.2	Pass
						Rating =	81.2	Pass

Table 5 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	88.1	Pass
1	Base Plate	0	66.7	Pass
1	Base Foundation Steel	0	56.5	Pass
1,2	Base Foundation Soil Interaction	0	77.9	Pass
1	Flange Connection	119	55.0	Pass

Structure Rating (max from all components) =	88.1%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report’s recommendation, the frost depth of the site or half of the caisson diameter.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

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

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys ✓ Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area ✓ Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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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	133.50-121.50	12.00	0.00	Round	10.7500	10.7500	0.3650		A53-B-35 (35 ksi)
L2	121.50-119.00	2.50	0.00	Round	10.7500	22.0000	0.3650		A53-B-35 (35 ksi)
L3	119.00-85.25	33.75	0.00	12	22.0000	28.4140	0.2500	1.0000	A572-65 (65 ksi)
L4	85.25-75.00	10.25	3.75	12	28.4140	30.3620	0.5002	2.0008	Reinf 52.37 ksi (52 ksi)
L5	75.00-68.25	10.50	0.00	12	28.6489	31.1447	0.3125	1.2500	A572-65 (65 ksi)
L6	68.25-37.75	30.50	4.75	12	31.1447	36.9410	0.5336	2.1343	Reinf 58.58 ksi (59 ksi)
L7	37.75-0.00	42.50		12	34.9711	43.4900	0.5544	2.2177	Reinf 58.97 ksi (59 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	10.7500	11.9083	160.7342	3.6739	5.3750	29.9040	321.4685	5.9506	0.0000	0
	10.7500	11.9083	160.7342	3.6739	5.3750	29.9040	321.4685	5.9506	0.0000	0
L2	10.7500	11.9083	160.7342	3.6739	5.3750	29.9040	321.4685	5.9506	0.0000	0
	22.0000	24.8085	1451.9346	7.6502	11.0000	131.9941	2903.8691	12.3968	0.0000	0
L3	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	29.4164	22.6720	2295.4415	10.0827	14.7185	155.9566	4651.1868	11.1585	6.9450	27.78
L4	29.4164	44.9592	4471.4028	9.9932	14.7185	303.7954	9060.2744	22.1276	6.2744	12.544
	31.4331	48.0967	5474.3613	10.6905	15.7275	348.0754	11092.540	23.6717	6.7965	13.588
L5	30.5824	28.5135	2922.3159	10.1444	14.8401	196.9196	5921.4042	14.0335	6.8404	21.889
	32.2434	31.0249	3764.4981	11.0379	16.1330	233.3418	7627.8937	15.2695	7.5093	24.03
L6	32.2434	52.5939	6290.4357	10.9588	16.1330	389.9117	12746.128	25.8851	6.9168	12.963
	38.2441	62.5526	10583.055	13.0339	19.1354	553.0605	21444.139	30.7865	8.4702	15.874
L7	37.1905	61.4429	9289.5942	12.3212	18.1151	512.8108	18823.236	30.2403	7.8864	14.224
	45.0242	76.6514	18036.000	15.3709	22.5278	800.6101	36545.827	37.7255	10.1694	18.342

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L1 133.50-121.50				1	1	1		
L2 121.50-119.00				1	1	1		
L3 119.00-85.25				1	1	1		
L4 85.25-75.00				1	1	1		
L5 75.00-68.25				1	1	1		
L6 68.25-37.75				1	1	1		
L7 37.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C _A A _A	Weight
				ft		ft ² /ft	klf
LCF114-50J(1-1/4")	C	No	Inside Pole	131.00 - 0.00	12	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
						4" Ice	0.00
2" Conduit (1 1/2")	C	No	Inside Pole	131.00 - 0.00	1	No Ice	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		CA _A A ft ² /ft	Weight klf
EMT)						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
FB-L98B-002-50000(3/8)	C	No	Inside Pole	131.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	131.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
**								
HB114-1-08U4-M5J(1/4")	C	No	CaAa (Out Of Face)	119.00 - 0.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.03
HB114-1-08U4-M5J(1/4")	C	No	CaAa (Out Of Face)	119.00 - 0.00	1	No Ice	0.15	0.00
						1/2" Ice	0.25	0.00
						1" Ice	0.35	0.00
						2" Ice	0.55	0.01
						4" Ice	0.95	0.03
HB114-21U3M12-XXXF(1-1/4")	C	No	CaAa (Out Of Face)	119.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.01
						4" Ice	0.00	0.03
**								
LDF6-50A(1-1/4")	C	No	Inside Pole	101.00 - 0.00	12	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	101.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
**								
AVA7-50(1-5/8")	C	No	Inside Pole	95.00 - 0.00	6	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
**								
LDF4-50A(1/2")	C	No	Inside Pole	60.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
**								
LDF4-50A(1/2")	C	No	Inside Pole	50.00 - 0.00	1	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
**								
Aero MP3-05	C	No	CaAa (Out Of Face)	70.50 - 0.00	2	No Ice	0.35	0.00
						1/2" Ice	0.40	0.00
						1" Ice	0.66	0.00
						2" Ice	0.88	0.00
						4" Ice	1.32	0.00
Aero MP3-08	C	No	CaAa (Out Of Face)	87.00 - 77.00	2	No Ice	0.47	0.00
						1/2" Ice	0.58	0.00
						1" Ice	0.69	0.00
						2" Ice	0.91	0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _{AA} A ft ² /ft	Weight klf
**					4" Ice	1.36	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	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	133.50-121.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.10
L2	121.50-119.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L3	119.00-85.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.831	0.70
L4	85.25-75.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.278	0.29
L5	75.00-68.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.605	0.19
L6	68.25-37.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	25.912	0.88
L7	37.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	32.072	1.09

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Sectio n	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	133.50-121.50	A	0.882	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.10
L2	121.50-119.00	A	0.876	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L3	119.00-85.25	A	0.858	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	13.292	1.05
L4	85.25-75.00	A	0.834	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	14.047	0.39
L5	75.00-68.25	A	0.823	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.737	0.26
L6	68.25-37.75	A	0.794	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	43.132	1.16
L7	37.75-0.00	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	53.385	1.44

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	133.50-121.50	0.0000	0.0000	0.0000	0.0000
L2	121.50-119.00	0.0000	0.0000	0.0000	0.0000
L3	119.00-85.25	-0.2467	0.1424	-0.4160	0.2402
L4	85.25-75.00	-0.8540	0.4930	-1.0959	0.6327
L5	75.00-68.25	-0.4395	0.2537	-0.6907	0.3988
L6	68.25-37.75	-0.8493	0.4903	-1.1889	0.6864
L7	37.75-0.00	-0.8782	0.5070	-1.2519	0.7228

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						ft
(2) P65-15-XLH-RR w/ Mount Pipe	A	From Face	4.00	0.00	0.00	131.00	No Ice	6.07	4.19	0.06
			0.00	1/2"			6.51	4.80	0.11	
			1.00	Ice			6.96	5.44	0.16	
				1" Ice			7.90	6.84	0.29	
				2" Ice			9.89	9.95	0.65	
(2) P65-15-XLH-RR w/ Mount Pipe	B	From Face	4.00	0.00	0.00	131.00	No Ice	6.07	4.19	0.06
			0.00	1/2"			6.51	4.80	0.11	
			1.00	Ice			6.96	5.44	0.16	
				1" Ice			7.90	6.84	0.29	
				2" Ice			9.89	9.95	0.65	
(3) P65-15-XLH-RR w/ Mount Pipe	C	From Face	4.00	0.00	0.00	131.00	No Ice	6.07	4.19	0.06
			0.00	1/2"			6.51	4.80	0.11	
			1.00	Ice			6.96	5.44	0.16	
				1" Ice			7.90	6.84	0.29	
				2" Ice			9.89	9.95	0.65	
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Face	4.00	0.00	0.00	131.00	No Ice	8.50	6.30	0.07
			0.00	1/2"			9.15	7.48	0.14	
			1.00	Ice			9.77	8.37	0.21	
				1" Ice			11.03	10.18	0.38	
				2" Ice			13.68	14.02	0.87	
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Face	4.00	0.00	0.00	131.00	No Ice	8.50	6.30	0.07
			0.00	1/2"			9.15	7.48	0.14	
			1.00	Ice			9.77	8.37	0.21	
				1" Ice			11.03	10.18	0.38	
				2" Ice			13.68	14.02	0.87	
(2) TT19-08BP111-001	A	From Face	4.00	0.00	0.00	131.00	No Ice	0.64	0.52	0.02
			0.00	1/2"			0.76	0.62	0.02	
			1.00	Ice			0.88	0.74	0.03	
				1" Ice			1.14	0.99	0.05	
				2" Ice			1.78	1.59	0.12	
(2) TT19-08BP111-001	B	From Face	4.00	0.00	0.00	131.00	No Ice	0.64	0.52	0.02
			0.00	1/2"			0.76	0.62	0.02	
			1.00	Ice			0.88	0.74	0.03	
				1" Ice			1.14	0.99	0.05	
				2" Ice			1.78	1.59	0.12	
(2) TT19-08BP111-001	C	From Face	4.00	0.00	0.00	131.00	No Ice	0.64	0.52	0.02
			0.00	1/2"			0.76	0.62	0.02	
			1.00	Ice			0.88	0.74	0.03	
				1" Ice			1.14	0.99	0.05	
				2" Ice			1.78	1.59	0.12	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
(2) RRUS-11	A	From Face	4.00	0.00	0.00	131.00	No Ice	3.25	1.37	0.05
			0.00				1/2"	3.49	1.55	0.07
			1.00				Ice	3.74	1.74	0.09
							1" Ice	4.27	2.14	0.15
							2" Ice	5.43	3.04	0.31
(2) RRUS-11	B	From Face	4.00	0.00	0.00	131.00	No Ice	3.25	1.37	0.05
			0.00				1/2"	3.49	1.55	0.07
			1.00				Ice	3.74	1.74	0.09
							1" Ice	4.27	2.14	0.15
							2" Ice	5.43	3.04	0.31
(2) RRUS-11	C	From Face	4.00	0.00	0.00	131.00	No Ice	3.25	1.37	0.05
			0.00				1/2"	3.49	1.55	0.07
			1.00				Ice	3.74	1.74	0.09
							1" Ice	4.27	2.14	0.15
							2" Ice	5.43	3.04	0.31
DC6-48-60-18-8F	A	From Face	4.00	0.00	0.00	131.00	No Ice	2.22	2.22	0.02
			0.00				1/2"	2.44	2.44	0.04
			1.00				Ice	2.66	2.66	0.06
							1" Ice	3.15	3.15	0.12
							2" Ice	4.21	4.21	0.27
Platform Mount [LP 712-1]	C	None			0.00	131.00	No Ice	24.53	24.53	1.34
							1/2"	29.94	29.94	1.65
							Ice	35.35	35.35	1.96
							1" Ice	46.17	46.17	2.58
							2" Ice	67.81	67.81	3.82
** APXVSP18-C-A20 w/ Mount Pipe	A	From Face	4.00	0.00	0.00	119.00	No Ice	8.50	6.95	0.08
			0.00				1/2"	9.15	8.13	0.15
			2.00				Ice	9.77	9.02	0.23
							1" Ice	11.03	10.84	0.41
							2" Ice	13.68	14.85	0.91
APXVSP18-C-A20 w/ Mount Pipe	B	From Face	4.00	0.00	0.00	119.00	No Ice	8.50	6.95	0.08
			0.00				1/2"	9.15	8.13	0.15
			2.00				Ice	9.77	9.02	0.23
							1" Ice	11.03	10.84	0.41
							2" Ice	13.68	14.85	0.91
P40-16-XLPP-RR-A w/ Mount Pipe	C	From Face	4.00	0.00	0.00	119.00	No Ice	9.37	4.83	0.07
			0.00				1/2"	9.91	5.57	0.14
			2.00				Ice	10.45	6.27	0.21
							1" Ice	11.56	7.80	0.37
							2" Ice	13.89	11.11	0.82
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.00	0.00	0.00	119.00	No Ice	7.13	4.96	0.08
			0.00				1/2"	7.66	5.75	0.13
			2.00				Ice	8.18	6.47	0.19
							1" Ice	9.26	8.01	0.34
							2" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.00	0.00	0.00	119.00	No Ice	7.13	4.96	0.08
			0.00				1/2"	7.66	5.75	0.13
			2.00				Ice	8.18	6.47	0.19
							1" Ice	9.26	8.01	0.34
							2" Ice	11.53	11.41	0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Face	4.00	0.00	0.00	119.00	No Ice	7.13	4.96	0.08
			0.00				1/2"	7.66	5.75	0.13
			2.00				Ice	8.18	6.47	0.19
							1" Ice	9.26	8.01	0.34
							2" Ice	11.53	11.41	0.75

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz ft	Lateral ft						Vert ft
TD-RRH8x20-25	A	From Face	4.00	0.00	0.00	119.00	2" Ice	11.53	11.41	0.75
							4" Ice	4.72	1.70	0.07
							No Ice	5.01	1.92	0.10
							1/2" Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
TD-RRH8x20-25	B	From Face	4.00	0.00	0.00	119.00	2" Ice	7.31	3.68	0.40
							4" Ice	4.72	1.70	0.07
							No Ice	5.01	1.92	0.10
							1/2" Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
TD-RRH8x20-25	C	From Face	4.00	0.00	0.00	119.00	2" Ice	7.31	3.68	0.40
							4" Ice	4.72	1.70	0.07
							No Ice	5.01	1.92	0.10
							1/2" Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
Platform Mount [LP 712-1]	C	None			0.00	119.00	2" Ice	7.31	3.68	0.40
							4" Ice	4.72	1.70	0.07
							No Ice	5.01	1.92	0.10
							1/2" Ice	5.32	2.15	0.13
							1" Ice	5.95	2.62	0.20
*** 800MHz 2X50W RRH W/FILTER	A	From Face	4.00	0.00	0.00	117.00	No Ice	24.53	24.53	1.34
							1/2" Ice	29.94	29.94	1.65
							Ice	35.35	35.35	1.96
							1" Ice	46.17	46.17	2.58
							2" Ice	67.81	67.81	3.82
800MHz 2X50W RRH W/FILTER	B	From Face	4.00	0.00	0.00	117.00	2" Ice	4.34	4.15	0.34
							4" Ice	2.40	2.25	0.06
							No Ice	2.61	2.46	0.09
							1/2" Ice	2.83	2.68	0.11
							1" Ice	3.30	3.13	0.17
800MHz 2X50W RRH W/FILTER	C	From Face	4.00	0.00	0.00	117.00	2" Ice	4.34	4.15	0.34
							4" Ice	2.40	2.25	0.06
							No Ice	2.61	2.46	0.09
							1/2" Ice	2.83	2.68	0.11
							1" Ice	3.30	3.13	0.17
PCS 1900MHz 4x45W- 65MHz	A	From Face	4.00	0.00	0.00	117.00	2" Ice	4.86	4.74	0.35
							4" Ice	2.71	2.61	0.06
							No Ice	2.95	2.85	0.08
							1/2" Ice	3.20	3.09	0.11
							1" Ice	3.72	3.61	0.17
PCS 1900MHz 4x45W- 65MHz	B	From Face	4.00	0.00	0.00	117.00	2" Ice	4.86	4.74	0.35
							4" Ice	2.71	2.61	0.06
							No Ice	2.95	2.85	0.08
							1/2" Ice	3.20	3.09	0.11
							1" Ice	3.72	3.61	0.17
PCS 1900MHz 4x45W- 65MHz	C	From Face	4.00	0.00	0.00	117.00	2" Ice	4.86	4.74	0.35
							4" Ice	2.71	2.61	0.06
							No Ice	2.95	2.85	0.08
							1/2" Ice	3.20	3.09	0.11
							1" Ice	3.72	3.61	0.17
Side Arm Mount [SO 102- 3]	C	None			0.00	117.00	No Ice	3.00	3.00	0.08
							1/2" Ice	3.48	3.48	0.11

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K
							Ice	3.96	3.96	0.14
							1" Ice	4.92	4.92	0.20
							2" Ice	6.84	6.84	0.32
							4" Ice			
**										
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Face	4.00	0.00	101.00		No Ice	6.83	5.64	0.11
			0.00				1/2"	7.35	6.48	0.17
			3.00				Ice	7.86	7.26	0.23
							1" Ice	8.93	8.86	0.38
							2" Ice	11.18	12.29	0.81
							4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Face	4.00	0.00	101.00		No Ice	6.83	5.64	0.11
			0.00				1/2"	7.35	6.48	0.17
			3.00				Ice	7.86	7.26	0.23
							1" Ice	8.93	8.86	0.38
							2" Ice	11.18	12.29	0.81
							4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Face	4.00	0.00	101.00		No Ice	6.83	5.64	0.11
			0.00				1/2"	7.35	6.48	0.17
			3.00				Ice	7.86	7.26	0.23
							1" Ice	8.93	8.86	0.38
							2" Ice	11.18	12.29	0.81
							4" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Face	4.00	0.00	101.00		No Ice	6.82	5.63	0.11
			0.00				1/2"	7.34	6.47	0.17
			3.00				Ice	7.85	7.25	0.23
							1" Ice	8.92	8.85	0.38
							2" Ice	11.17	12.28	0.81
							4" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Face	4.00	0.00	101.00		No Ice	6.82	5.63	0.11
			0.00				1/2"	7.34	6.47	0.17
			3.00				Ice	7.85	7.25	0.23
							1" Ice	8.92	8.85	0.38
							2" Ice	11.17	12.28	0.81
							4" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Face	4.00	0.00	101.00		No Ice	6.82	5.63	0.11
			0.00				1/2"	7.34	6.47	0.17
			3.00				Ice	7.85	7.25	0.23
							1" Ice	8.92	8.85	0.38
							2" Ice	11.17	12.28	0.81
							4" Ice			
KRY 112 144/1	A	From Face	4.00	0.00	101.00		No Ice	0.41	0.20	0.01
			0.00				1/2"	0.50	0.27	0.01
			3.00				Ice	0.59	0.35	0.02
							1" Ice	0.81	0.53	0.03
							2" Ice	1.36	1.00	0.08
							4" Ice			
KRY 112 144/1	B	From Face	4.00	0.00	101.00		No Ice	0.41	0.20	0.01
			0.00				1/2"	0.50	0.27	0.01
			3.00				Ice	0.59	0.35	0.02
							1" Ice	0.81	0.53	0.03
							2" Ice	1.36	1.00	0.08
							4" Ice			
KRY 112 144/1	C	From Face	4.00	0.00	101.00		No Ice	0.41	0.20	0.01
			0.00				1/2"	0.50	0.27	0.01
			3.00				Ice	0.59	0.35	0.02
							1" Ice	0.81	0.53	0.03
							2" Ice	1.36	1.00	0.08
							4" Ice			
Platform Mount [LP 713-1]	C	None		0.00	101.00		No Ice	31.27	31.27	1.51
							1/2"	39.68	39.68	1.93
							Ice	48.09	48.09	2.35
							1" Ice	64.91	64.91	3.19
							2" Ice	98.55	98.55	4.86
							4" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					

APXV18-206517S-ACU w/ Mount Pipe	A	From Face	4.00	0.00	0.00	95.00	No Ice	5.40	4.70	0.05
			0.00				1/2"	5.96	5.86	0.10
			0.00				Ice	6.48	6.73	0.15
							1" Ice	7.55	8.51	0.28
							2" Ice	9.92	12.28	0.68
APXV18-206517S-ACU w/ Mount Pipe	B	From Face	4.00	0.00	0.00	95.00	No Ice	5.40	4.70	0.05
			0.00				1/2"	5.96	5.86	0.10
			0.00				Ice	6.48	6.73	0.15
							1" Ice	7.55	8.51	0.28
							2" Ice	9.92	12.28	0.68
APXV18-206517S-ACU w/ Mount Pipe	C	From Face	4.00	0.00	0.00	95.00	No Ice	5.40	4.70	0.05
			0.00				1/2"	5.96	5.86	0.10
			0.00				Ice	6.48	6.73	0.15
							1" Ice	7.55	8.51	0.28
							2" Ice	9.92	12.28	0.68
Pipe Mount [PM 601-3]	C	None		0.00	95.00	No Ice	4.39	4.39	0.20	
						1/2"	5.48	5.48	0.24	
						Ice	6.57	6.57	0.28	
						1" Ice	8.75	8.75	0.36	
						2" Ice	13.11	13.11	0.53	

58532A	A	From Face	4.00	0.00	0.00	60.00	No Ice	0.22	0.22	0.00
			0.00				1/2"	0.29	0.29	0.00
			1.00				Ice	0.37	0.37	0.01
							1" Ice	0.55	0.55	0.02
							2" Ice	1.01	1.01	0.06
Side Arm Mount [SO 304-1]	A	None		0.00	60.00	No Ice	0.63	0.94	0.02	
						1/2"	1.00	1.45	0.03	
						Ice	1.37	1.96	0.04	
						1" Ice	2.11	2.98	0.06	
						2" Ice	3.59	5.02	0.09	

KS24019-L112A	A	From Face	4.00	0.00	0.00	50.00	No Ice	0.16	0.16	0.01
			0.00				1/2"	0.22	0.22	0.01
			1.00				Ice	0.30	0.30	0.01
							1" Ice	0.48	0.48	0.02
							2" Ice	0.95	0.95	0.06
Side Arm Mount [SO 102-1]	A	None		0.00	50.00	No Ice	1.50	1.50	0.03	
						1/2"	1.74	1.75	0.04	
						Ice	1.98	2.00	0.04	
						1" Ice	2.46	2.50	0.07	
						2" Ice	3.42	3.50	0.11	
**										

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z ksf	A_G ft^2	Face A B C	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2
L1 133.50-121.50	127.50	1.471	0.03	10.750	A	0.000	10.750	10.750	100.00	0.000	0.000
					B	0.000	10.750	10.750	100.00	0.000	0.000
					C	0.000	10.750	10.750	100.00	0.000	0.000
L2 121.50-119.00	120.11	1.446	0.03	3.411	A	0.000	3.411	3.411	100.00	0.000	0.000
					B	0.000	3.411	3.411	100.00	0.000	0.000
					C	0.000	3.411	3.411	100.00	0.000	0.000
L3 119.00-85.25	101.61	1.379	0.03	70.895	A	0.000	70.895	70.895	100.00	0.000	0.000
					B	0.000	70.895	70.895	100.00	0.000	0.000
					C	0.000	70.895	70.895	100.00	0.000	6.831
L4 85.25-75.00	80.07	1.288	0.02	25.102	A	0.000	25.102	25.102	100.00	0.000	0.000
					B	0.000	25.102	25.102	100.00	0.000	0.000
					C	0.000	25.102	25.102	100.00	0.000	9.278
L5 75.00-68.25	71.60	1.248	0.02	17.068	A	0.000	17.068	17.068	100.00	0.000	0.000
					B	0.000	17.068	17.068	100.00	0.000	0.000
					C	0.000	17.068	17.068	100.00	0.000	2.605
L6 68.25-37.75	52.88	1.144	0.02	86.526	A	0.000	86.526	86.526	100.00	0.000	0.000
					B	0.000	86.526	86.526	100.00	0.000	0.000
					C	0.000	86.526	86.526	100.00	0.000	25.912
L7 37.75-0.00	18.28	1	0.02	124.910	A	0.000	124.910	124.910	100.00	0.000	0.000
					B	0.000	124.910	124.910	100.00	0.000	0.000
					C	0.000	124.910	124.910	100.00	0.000	32.072

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z ksf	t_z in	A_G ft^2	Face A B C	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2
L1 133.50-121.50	127.50	1.471	0.01	0.8821	12.514	A	0.000	12.514	12.514	100.00	0.000	0.000
						B	0.000	12.514	12.514	100.00	0.000	0.000
						C	0.000	12.514	12.514	100.00	0.000	0.000
L2 121.50-119.00	120.11	1.446	0.01	0.8758	3.776	A	0.000	3.776	3.776	100.00	0.000	0.000
						B	0.000	3.776	3.776	100.00	0.000	0.000
						C	0.000	3.776	3.776	100.00	0.000	0.000
L3 119.00-85.25	101.61	1.379	0.00	0.8584	75.723	A	0.000	75.723	75.723	100.00	0.000	0.000
						B	0.000	75.723	75.723	100.00	0.000	0.000
						C	0.000	75.723	75.723	100.00	0.000	13.292
L4 85.25-75.00	80.07	1.288	0.00	0.8342	26.527	A	0.000	26.527	26.527	100.00	0.000	0.000
						B	0.000	26.527	26.527	100.00	0.000	0.000
						C	0.000	26.527	26.527	100.00	0.000	14.047
L5 75.00-68.25	71.60	1.248	0.00	0.8230	18.006	A	0.000	18.006	18.006	100.00	0.000	0.000
						B	0.000	18.006	18.006	100.00	0.000	0.000
						C	0.000	18.006	18.006	100.00	0.000	4.737
L6 68.25-37.75	52.88	1.144	0.00	0.7937	90.560	A	0.000	90.560	90.560	100.00	0.000	0.000
						B	0.000	90.560	90.560	100.00	0.000	0.000
						C	0.000	90.560	90.560	100.00	0.000	43.132
L7 37.75-0.00	18.28	1	0.00	0.7500	129.904	A	0.000	129.904	129.904	100.00	0.000	0.000
						B	0.000	129.904	129.904	100.00	0.000	0.000
						C	0.000	129.904	129.904	100.00	0.000	53.385

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z ksf	A_G ft^2	Face A B C	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	$C_A A_A$ In Face ft^2	$C_A A_A$ Out Face ft^2
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Section Elevation ft	z ft	K _z	q _z ksf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 133.50- 121.50	127.50	1.471	0.01	10.750	A	0.000	10.750	10.750	100.00	0.000	0.000
					B	0.000	10.750	10.750	100.00	0.000	0.000
					C	0.000	10.750	10.750	100.00	0.000	0.000
L2 121.50- 119.00	120.11	1.446	0.01	3.411	A	0.000	3.411	3.411	100.00	0.000	0.000
					B	0.000	3.411	3.411	100.00	0.000	0.000
					C	0.000	3.411	3.411	100.00	0.000	0.000
L3 119.00- 85.25	101.61	1.379	0.01	70.895	A	0.000	70.895	70.895	100.00	0.000	0.000
					B	0.000	70.895	70.895	100.00	0.000	0.000
					C	0.000	70.895	70.895	100.00	0.000	6.831
L4 85.25- 75.00	80.07	1.288	0.01	25.102	A	0.000	25.102	25.102	100.00	0.000	0.000
					B	0.000	25.102	25.102	100.00	0.000	0.000
					C	0.000	25.102	25.102	100.00	0.000	9.278
L5 75.00- 68.25	71.60	1.248	0.01	17.068	A	0.000	17.068	17.068	100.00	0.000	0.000
					B	0.000	17.068	17.068	100.00	0.000	0.000
					C	0.000	17.068	17.068	100.00	0.000	2.605
L6 68.25- 37.75	52.88	1.144	0.01	86.526	A	0.000	86.526	86.526	100.00	0.000	0.000
					B	0.000	86.526	86.526	100.00	0.000	0.000
					C	0.000	86.526	86.526	100.00	0.000	25.912
L7 37.75-0.00	18.28	1	0.01	124.910	A	0.000	124.910	124.910	100.00	0.000	0.000
					B	0.000	124.910	124.910	100.00	0.000	0.000
					C	0.000	124.910	124.910	100.00	0.000	32.072

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	133.5 - 121.5	Pole	Max Tension	8	0.00	-0.00	0.00
			Max. Compression	14	-4.78	0.22	0.35
			Max. Mx	11	-2.52	49.04	0.05
			Max. My	2	-2.52	0.05	48.91
			Max. Vy	11	-4.93	49.04	0.05
			Max. Vx	2	-4.91	0.05	48.91
L2	121.5 - 119	Pole	Max. Torque	4			0.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-5.01	0.22	0.35
			Max. Mx	11	-2.70	61.47	0.05
			Max. My	2	-2.70	0.05	61.31
			Max. Vy	11	-5.03	61.47	0.05
L3	119 - 85.25	Pole	Max. Vx	2	-5.02	0.05	61.31
			Max. Torque	4			0.77
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.68	0.68	0.18
			Max. Mx	11	-10.16	499.98	0.02
			Max. My	2	-10.14	0.22	504.13
L4	85.25 - 75	Pole	Max. Vy	11	-16.80	499.98	0.02
			Max. Vx	8	16.93	0.22	-504.01
			Max. Torque	4			1.19
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.15	0.78	0.12
			Max. Mx	11	-11.38	612.11	0.01
L5	75 - 68.25	Pole	Max. My	2	-11.37	0.25	617.02
			Max. Vy	11	-17.71	612.11	0.01
			Max. Vx	8	17.83	0.25	-616.93
			Max. Torque	4			1.18
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-21.68	0.94	0.03
L6	68.25 - 37.75	Pole	Max. Mx	11	-13.44	805.41	-0.01
			Max. My	2	-13.43	0.31	811.55
			Max. Vy	11	-19.02	805.41	-0.01
			Max. Vx	8	19.14	0.31	-811.52
			Max. Torque	4			1.18
			Max Tension	1	0.00	0.00	0.00
L7	37.75 - 0	Pole	Max. Compression	14	-28.62	1.43	-0.19
			Max. Mx	11	-19.43	1339.77	-0.06
			Max. My	8	-19.42	0.48	-1349.00
			Max. Vy	11	-22.49	1339.77	-0.06
			Max. Vx	8	22.62	0.48	-1349.00
			Max. Torque	4			1.25
L7	37.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.00	2.25	-0.67
			Max. Mx	11	-32.25	2405.11	-0.22
			Max. My	8	-32.25	0.75	-2419.46
			Max. Vy	11	-27.63	2405.11	-0.22
			Max. Vx	8	27.75	0.75	-2419.46
			Max. Torque	3			1.48

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	43.00	-0.00	-0.00
	Max. H _x	11	32.27	27.61	0.00
	Max. H _z	2	32.27	0.00	27.73
	Max. M _x	2	2419.04	0.00	27.73

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. M _z	5	2403.61	-27.61	0.00
	Max. Torsion	3	1.48	-13.81	24.02
	Min. Vert	2	32.27	0.00	27.73
	Min. H _x	5	32.27	-27.61	0.00
	Min. H _z	8	32.27	0.00	-27.73
	Min. M _x	8	-2419.46	0.00	-27.73
	Min. M _z	11	-2405.11	27.61	0.00
	Min. Torsion	9	-1.46	13.81	-24.02

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	32.27	-0.00	0.00	0.21	0.73	0.00
Dead+Wind 0 deg - No Ice	32.27	-0.00	-27.73	-2419.04	0.75	-1.31
Dead+Wind 30 deg - No Ice	32.27	13.81	-24.02	-2095.13	-1201.54	-1.48
Dead+Wind 60 deg - No Ice	32.27	23.91	-13.87	-1209.54	-2081.68	-1.24
Dead+Wind 90 deg - No Ice	32.27	27.61	-0.00	0.22	-2403.61	-0.67
Dead+Wind 120 deg - No Ice	32.27	23.91	13.87	1209.97	-2081.67	0.08
Dead+Wind 150 deg - No Ice	32.27	13.81	24.02	2095.55	-1201.53	0.81
Dead+Wind 180 deg - No Ice	32.27	-0.00	27.73	2419.46	0.75	1.31
Dead+Wind 210 deg - No Ice	32.27	-13.81	24.02	2095.55	1203.03	1.46
Dead+Wind 240 deg - No Ice	32.27	-23.91	13.87	1209.97	2083.17	1.23
Dead+Wind 270 deg - No Ice	32.27	-27.61	-0.00	0.22	2405.11	0.67
Dead+Wind 300 deg - No Ice	32.27	-23.91	-13.87	-1209.54	2083.18	-0.06
Dead+Wind 330 deg - No Ice	32.27	-13.81	-24.02	-2095.13	1203.03	-0.79
Dead+Ice+Temp	43.00	0.00	0.00	0.67	2.25	-0.00
Dead+Wind 0 deg+Ice+Temp	43.00	0.00	-6.61	-593.69	2.37	-0.39
Dead+Wind 30 deg+Ice+Temp	43.00	3.29	-5.73	-514.06	-292.83	-0.40
Dead+Wind 60 deg+Ice+Temp	43.00	5.70	-3.31	-296.51	-508.93	-0.31
Dead+Wind 90 deg+Ice+Temp	43.00	6.58	-0.00	0.67	-588.03	-0.13
Dead+Wind 120 deg+Ice+Temp	43.00	5.70	3.31	297.86	-508.93	0.08
Dead+Wind 150 deg+Ice+Temp	43.00	3.29	5.73	515.41	-292.83	0.27
Dead+Wind 180 deg+Ice+Temp	43.00	0.00	6.61	595.04	2.37	0.39
Dead+Wind 210 deg+Ice+Temp	43.00	-3.29	5.73	515.41	297.57	0.40
Dead+Wind 240 deg+Ice+Temp	43.00	-5.70	3.31	297.86	513.67	0.31
Dead+Wind 270 deg+Ice+Temp	43.00	-6.58	-0.00	0.67	592.77	0.13
Dead+Wind 300 deg+Ice+Temp	43.00	-5.70	-3.31	-296.51	513.67	-0.08
Dead+Wind 330 deg+Ice+Temp	43.00	-3.29	-5.73	-514.06	297.57	-0.27
Dead+Wind 0 deg - Service	32.27	0.00	-9.62	-840.46	0.75	-0.45
Dead+Wind 30 deg - Service	32.27	4.79	-8.33	-727.93	-417.05	-0.51
Dead+Wind 60 deg - Service	32.27	8.29	-4.81	-420.18	-722.91	-0.43
Dead+Wind 90 deg - Service	32.27	9.58	-0.00	0.21	-834.75	-0.23
Dead+Wind 120 deg - Service	32.27	8.29	4.81	420.60	-722.91	0.03
Dead+Wind 150 deg - Service	32.27	4.79	8.33	728.35	-417.05	0.28
Dead+Wind 180 deg - Service	32.27	0.00	9.62	840.88	0.75	0.45
Dead+Wind 210 deg - Service	32.27	-4.79	8.33	728.35	418.56	0.51
Dead+Wind 240 deg - Service	32.27	-8.29	4.81	420.60	724.41	0.43

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						
Dead+Wind 270 deg - Service	32.27	-9.58	-0.00	0.21	836.25	0.23
Dead+Wind 300 deg - Service	32.27	-8.29	-4.81	-420.18	724.41	-0.02
Dead+Wind 330 deg - Service	32.27	-4.79	-8.33	-727.93	418.56	-0.28

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-32.27	0.00	0.00	32.27	0.00	0.000%
2	0.00	-32.27	-27.73	0.00	32.27	27.73	0.005%
3	13.81	-32.27	-24.02	-13.81	32.27	24.02	0.000%
4	23.91	-32.27	-13.87	-23.91	32.27	13.87	0.000%
5	27.61	-32.27	0.00	-27.61	32.27	0.00	0.005%
6	23.91	-32.27	13.87	-23.91	32.27	-13.87	0.000%
7	13.81	-32.27	24.02	-13.81	32.27	-24.02	0.000%
8	0.00	-32.27	27.73	0.00	32.27	-27.73	0.005%
9	-13.81	-32.27	24.02	13.81	32.27	-24.02	0.000%
10	-23.91	-32.27	13.87	23.91	32.27	-13.87	0.000%
11	-27.61	-32.27	0.00	27.61	32.27	0.00	0.005%
12	-23.91	-32.27	-13.87	23.91	32.27	13.87	0.000%
13	-13.81	-32.27	-24.02	13.81	32.27	24.02	0.000%
14	0.00	-43.00	0.00	-0.00	43.00	-0.00	0.000%
15	0.00	-43.00	-6.62	-0.00	43.00	6.61	0.001%
16	3.29	-43.00	-5.73	-3.29	43.00	5.73	0.001%
17	5.70	-43.00	-3.31	-5.70	43.00	3.31	0.001%
18	6.58	-43.00	0.00	-6.58	43.00	0.00	0.001%
19	5.70	-43.00	3.31	-5.70	43.00	-3.31	0.001%
20	3.29	-43.00	5.73	-3.29	43.00	-5.73	0.001%
21	0.00	-43.00	6.62	-0.00	43.00	-6.61	0.001%
22	-3.29	-43.00	5.73	3.29	43.00	-5.73	0.001%
23	-5.70	-43.00	3.31	5.70	43.00	-3.31	0.001%
24	-6.58	-43.00	0.00	6.58	43.00	0.00	0.001%
25	-5.70	-43.00	-3.31	5.70	43.00	3.31	0.001%
26	-3.29	-43.00	-5.73	3.29	43.00	5.73	0.001%
27	0.00	-32.27	-9.62	-0.00	32.27	9.62	0.005%
28	4.79	-32.27	-8.33	-4.79	32.27	8.33	0.002%
29	8.29	-32.27	-4.81	-8.29	32.27	4.81	0.002%
30	9.58	-32.27	0.00	-9.58	32.27	0.00	0.005%
31	8.29	-32.27	4.81	-8.29	32.27	-4.81	0.002%
32	4.79	-32.27	8.33	-4.79	32.27	-8.33	0.002%
33	0.00	-32.27	9.62	-0.00	32.27	-9.62	0.005%
34	-4.79	-32.27	8.33	4.79	32.27	-8.33	0.002%
35	-8.29	-32.27	4.81	8.29	32.27	-4.81	0.002%
36	-9.58	-32.27	0.00	9.58	32.27	0.00	0.005%
37	-8.29	-32.27	-4.81	8.29	32.27	4.81	0.002%
38	-4.79	-32.27	-8.33	4.79	32.27	8.33	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00006095	0.00011076
3	Yes	18	0.00000001	0.00006509
4	Yes	18	0.00000001	0.00006924
5	Yes	14	0.00006099	0.00012255
6	Yes	18	0.00000001	0.00006621

7	Yes	18	0.0000001	0.00006673
8	Yes	14	0.00006095	0.00011077
9	Yes	18	0.0000001	0.00006938
10	Yes	18	0.0000001	0.00006503
11	Yes	14	0.00006099	0.00012263
12	Yes	18	0.0000001	0.00006786
13	Yes	18	0.0000001	0.00006755
14	Yes	6	0.0000001	0.00000736
15	Yes	15	0.0000001	0.00010905
16	Yes	15	0.0000001	0.00012706
17	Yes	15	0.0000001	0.00012771
18	Yes	15	0.0000001	0.00010768
19	Yes	15	0.0000001	0.00012693
20	Yes	15	0.0000001	0.00012733
21	Yes	15	0.0000001	0.00010901
22	Yes	15	0.0000001	0.00012925
23	Yes	15	0.0000001	0.00012786
24	Yes	15	0.0000001	0.00010873
25	Yes	15	0.0000001	0.00012843
26	Yes	15	0.0000001	0.00012875
27	Yes	13	0.00014486	0.00009469
28	Yes	14	0.0000001	0.00008490
29	Yes	14	0.0000001	0.00010607
30	Yes	13	0.00014485	0.00009579
31	Yes	14	0.0000001	0.00009006
32	Yes	14	0.0000001	0.00009253
33	Yes	13	0.00014485	0.00009469
34	Yes	14	0.0000001	0.00010648
35	Yes	14	0.0000001	0.00008476
36	Yes	13	0.00014486	0.00009600
37	Yes	14	0.0000001	0.00009850
38	Yes	14	0.0000001	0.00009659

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133.5 - 121.5	25.75	27	1.83	0.01
L2	121.5 - 119	21.27	33	1.67	0.01
L3	119 - 85.25	20.40	33	1.65	0.00
L4	85.25 - 75	10.22	33	1.15	0.00
L5	78.75 - 68.25	8.71	33	1.07	0.00
L6	68.25 - 37.75	6.51	33	0.90	0.00
L7	42.5 - 0	2.58	33	0.56	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
131.00	(2) P65-15-XLH-RR w/ Mount Pipe	27	24.79	1.79	0.01	5433
119.00	APXVSP18-C-A20 w/ Mount Pipe	33	20.40	1.65	0.00	4502
117.00	800MHz 2X50W RRH W/FILTER	33	19.72	1.63	0.00	6004
101.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	33	14.55	1.39	0.00	3951
95.00	APXV18-206517S-ACU w/ Mount Pipe	33	12.79	1.29	0.00	3397
60.00	58532A	33	5.01	0.77	0.00	3674
50.00	KS24019-L112A	33	3.49	0.65	0.00	3563

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	133.5 - 121.5	73.90	2	5.23	0.03
L2	121.5 - 119	61.07	8	4.80	0.01
L3	119 - 85.25	58.58	8	4.73	0.01
L4	85.25 - 75	29.38	8	3.30	0.00
L5	78.75 - 68.25	25.04	8	3.08	0.00
L6	68.25 - 37.75	18.71	8	2.58	0.00
L7	42.5 - 0	7.41	8	1.60	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
131.00	(2) P65-15-XLH-RR w/ Mount Pipe	2	71.16	5.13	0.03	1939
119.00	APXVSP18-C-A20 w/ Mount Pipe	8	58.58	4.73	0.01	1603
117.00	800MHz 2X50W RRH W/FILTER	8	56.62	4.67	0.01	2133
101.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	8	41.80	3.98	0.01	1393
95.00	APXV18-206517S-ACU w/ Mount Pipe	8	36.76	3.69	0.01	1196
60.00	58532A	8	14.41	2.22	0.00	1283
50.00	KS24019-L112A	8	10.05	1.86	0.00	1242

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	133.5 - 121.5	TP10.75x10.75x0.365	12.00	0.00	0.0	21.00	11.9083	-2.52	250.07	0.010
L2	121.5 - 119 (2)	TP22x10.75x0.365	2.50	0.00	0.0	21.00	11.9083	-2.53	250.07	0.010
L3	119 - 85.25 (3)	TP28.414x22x0.25	33.75	0.00	0.0	39.00	22.6720	-10.14	884.21	0.011
L4	85.25 - 75 (4)	TP30.362x28.414x0.5002	10.25	0.00	0.0	31.42	46.9489	-11.37	1475.23	0.008
L5	75 - 68.25 (5)	TP31.1447x28.6489x0.3125	10.50	0.00	0.0	39.00	31.0249	-13.43	1209.97	0.011
L6	68.25 - 37.75 (6)	TP36.941x31.1447x0.5336	30.50	0.00	0.0	35.15	61.0016	-19.42	2144.09	0.009
L7	37.75 - 0 (7)	TP43.49x34.9711x0.5544	42.50	0.00	0.0	35.38	76.6514	-32.25	2712.08	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	133.5 - 121.5	TP10.75x10.75x0.365	49.04	19.68	23.10	0.852	0.00	0.00	23.10	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L2	121.5 - 119 (1)	TP22x10.75x0.365	49.04	19.68	23.10	0.852	0.00	0.00	23.10	0.000
L3	119 - 85.25 (2)	TP28.414x22x0.25	504.13	38.79	39.00	0.995	0.00	0.00	39.00	0.000
L4	85.25 - 75 (4) (3)	TP30.362x28.414x0.5002	617.02	22.33	31.42	0.711	0.00	0.00	31.42	0.000
L5	75 - 68.25 (5)	TP31.1447x28.6489x0.3125	811.55	41.74	39.00	1.070	0.00	0.00	39.00	0.000
L6	68.25 - 37.75 (6)	TP36.941x31.1447x0.5336	1349.00	30.79	35.15	0.876	0.00	0.00	35.15	0.000
L7	37.75 - 0 (7)	TP43.49x34.9711x0.5544	2419.46	36.26	35.38	1.025	0.00	0.00	35.38	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	133.5 - 121.5 (1)	TP10.75x10.75x0.365	4.93	0.41	14.00	0.059	0.66	0.13	14.00	0.009
L2	121.5 - 119 (2)	TP22x10.75x0.365	4.97	0.42	14.00	0.039	0.66	0.13	14.00	0.009
L3	119 - 85.25 (3)	TP28.414x22x0.25	16.93	0.75	26.00	0.058	0.46	0.02	26.00	0.001
L4	85.25 - 75 (4) (3)	TP30.362x28.414x0.5002	17.83	0.38	20.95	0.037	0.52	0.01	20.95	0.000
L5	75 - 68.25 (5)	TP31.1447x28.6489x0.3125	19.14	0.62	26.00	0.048	0.59	0.01	26.00	0.001
L6	68.25 - 37.75 (6)	TP36.941x31.1447x0.5336	22.62	0.37	23.43	0.032	0.90	0.01	23.43	0.000
L7	37.75 - 0 (7)	TP43.49x34.9711x0.5544	27.75	0.36	23.59	0.031	1.31	0.01	23.59	0.000

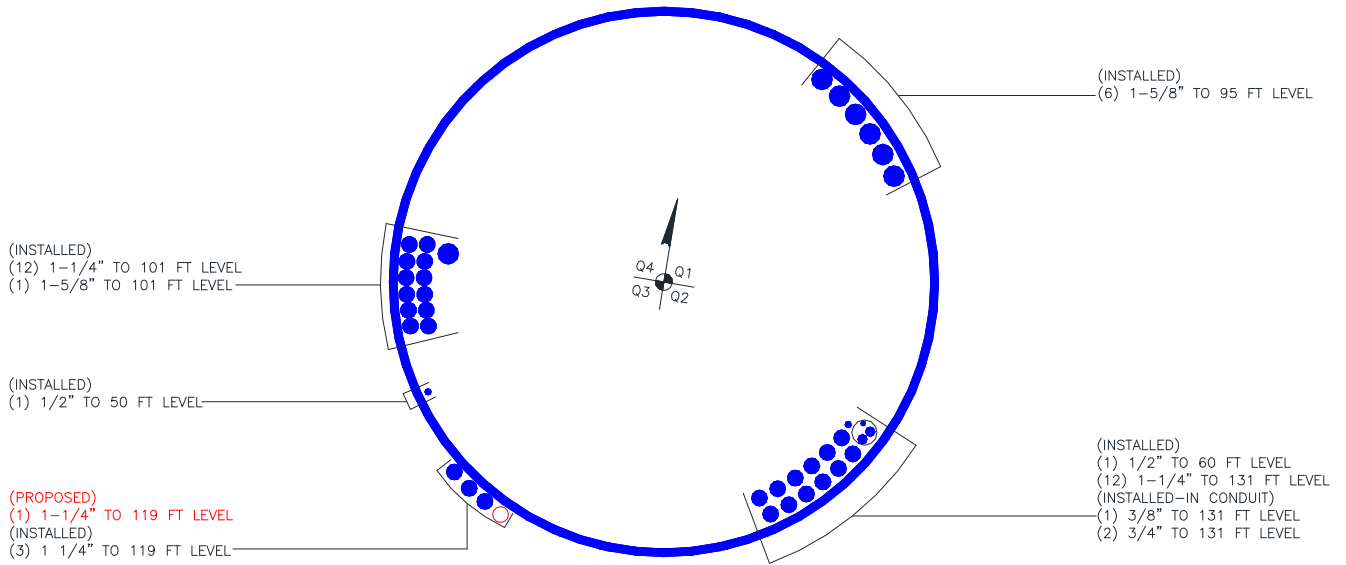
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	133.5 - 121.5 (1)	0.010	0.852	0.000	0.059	0.009	0.863	1.333	H1-3+VT ✓
L2	121.5 - 119 (2)	0.010	0.852	0.000	0.039	0.009	0.864	1.333	H1-3+VT ✓
L3	119 - 85.25 (3)	0.011	0.995	0.000	0.058	0.001	1.007	1.333	H1-3+VT ✓
L4	85.25 - 75 (4) (3)	0.008	0.711	0.000	0.037	0.000	0.719	1.333	H1-3+VT ✓
L5	75 - 68.25 (5)	0.011	1.070	0.000	0.048	0.001	1.082	1.333	H1-3+VT ✓
L6	68.25 - 37.75 (6)	0.009	0.876	0.000	0.032	0.000	0.885	1.333	H1-3+VT ✓
L7	37.75 - 0 (7)	0.012	1.025	0.000	0.031	0.000	1.037	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L1	133.5 - 121.5	Pole	TP10.75x10.75x0.365	1	-2.52	333.35	64.8	Pass	
L2	121.5 - 119	Pole	TP22x10.75x0.365	2	-2.53	333.35	64.8	Pass	
L3	119 - 85.25	Pole	TP28.414x22x0.25	3	-10.14	1178.65	75.5	Pass	
L4	85.25 - 75	Pole	TP30.362x28.414x0.5002	4	-11.37	1966.48	53.9	Pass	
L5	75 - 68.25	Pole	TP31.1447x28.6489x0.3125	5	-13.43	1612.89	81.2	Pass	
L6	68.25 - 37.75	Pole	TP36.941x31.1447x0.5336	6	-19.42	2858.07	66.4	Pass	
L7	37.75 - 0	Pole	TP43.49x34.9711x0.5544	7	-32.25	3615.20	77.8	Pass	
							Summary		
							Pole (L5)	81.2	Pass
							RATING =	81.2	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) P65-15-XLH-RR w/ Mount Pipe	131	PCS 1900MHz 4x45W-65MHz	117
(2) P65-15-XLH-RR w/ Mount Pipe	131	PCS 1900MHz 4x45W-65MHz	117
(3) P65-15-XLH-RR w/ Mount Pipe	131	PCS 1900MHz 4x45W-65MHz	117
AM-X-CD-16-65-00T-RET w/ Mount Pipe	131	Side Arm Mount [SO 102-3]	117
AM-X-CD-16-65-00T-RET w/ Mount Pipe	131	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	101
(2) TT19-08BP111-001	131	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	101
(2) TT19-08BP111-001	131	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	101
(2) RRUS-11	131	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	101
(2) RRUS-11	131	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	101
(2) RRUS-11	131	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	101
DC6-48-60-18-8F	131	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	101
Platform Mount [LP 712-1]	131	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	101
APXVSPP18-C-A20 w/ Mount Pipe	119	KRY 112 144/1	101
APXVSPP18-C-A20 w/ Mount Pipe	119	KRY 112 144/1	101
P40-16-XLPP-RR-A w/ Mount Pipe	119	KRY 112 144/1	101
APXVTM14-C-120 w/ Mount Pipe	119	Platform Mount [LP 713-1]	101
APXVTM14-C-120 w/ Mount Pipe	119	APXV18-206517S-ACU w/ Mount Pipe	95
APXVTM14-C-120 w/ Mount Pipe	119	APXV18-206517S-ACU w/ Mount Pipe	95
TD-RRH8x20-25	119	APXV18-206517S-ACU w/ Mount Pipe	95
TD-RRH8x20-25	119	Pipe Mount [PM 601-3]	95
TD-RRH8x20-25	119	58532A	60
Platform Mount [LP 712-1]	119	Side Arm Mount [SO 304-1]	60
800MHz 2X50W RRH W/FILTER	117	KS24019-L112A	50
800MHz 2X50W RRH W/FILTER	117	Side Arm Mount [SO 102-1]	50
800MHz 2X50W RRH W/FILTER	117		

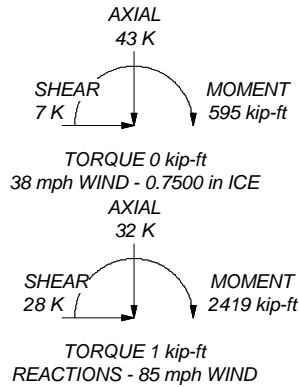
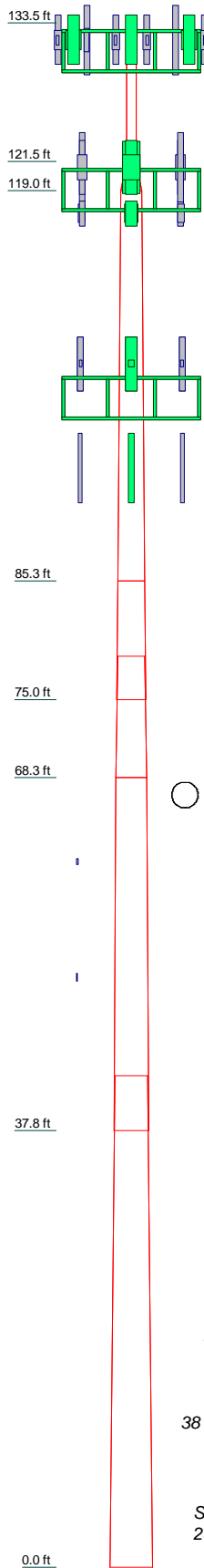
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	Reinf 58.58 ksi	59 ksi	74 ksi
A572-65	65 ksi	80 ksi	Reinf 58.97 ksi	59 ksi	74 ksi
Reinf 52.37 ksi	52 ksi	66 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.750 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 81.2%

Section	1	2	3	4	5	6	7
Length (ft)	12.00	2.50	33.75	10.25	10.50	30.50	42.50
Number of Sides	1	1	12	12	12	12	12
Thickness (in)	0.3650	0.3650	0.2500	0.5002	0.3125	0.5336	0.5544
Socket Length (ft)				3.75		4.75	
Top Dia (in)	10.7500	10.7500	22.0000	28.4140	28.6489	31.1447	34.9711
Bot Dia (in)	10.7500	22.0000	28.4140	30.3620	31.1447	36.9410	43.4900
Grade	A53-B-35	A53-B-35	A572-65	A572-65	Reinf 52.37 ksi	Reinf 56.58 ksi	Reinf 58.97 ksi
Weight (K)	0.5	0.2	2.3	1.6	1.1	6.0	10.0



Paul J Ford and Company
250 E. Broad Street Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.44105

Job: 133' Pole (Coe Hill / Middlefield, CT)		
Project: PJF #37513-1268 / BU #876340		
Client: CCI	Drawn by: Robert Koors	App'd:
Code: TIA/EIA-222-F	Date: 06/05/14	Scale: NTS
Path:		Dwg No. E-1



Rev. Date: 3/22/2014

Tube Bypass Analysis

Revision = **ASD** Passing = **100%** Design/Analysis = **Analysis** @ **119** ft - **0** in elevation

TNX Tower Output @ Connection:		
Moment	=	49.04 k-ft
Axial	=	2.53 kips
Shear	=	4.97 kips
Design Capacity	=	100.0%

Analysis Reactions		
Moment	Axial	Shear
k-ft	kips	kips
49.04	2.53	4.97

Load Distribution		
Moment of Inertia, I	My / I	Axial / Leg
in ²	kips	kips
555.84	20.380	0.843

Extension Geometry:		
Diameter	=	10.75 in
Thickness	=	23/63 in
Height	=	10 ft
Fu	=	60 ksi
Gap Height	=	102 in

Member Forces		
Tension	Comp.	Moment @ 0°
kips	kips	k-in
19.54	21.22	268.38

Flexural Strength			
Mn	Mn/Ωb	Mr	Capacity
k-in	k-in	k-in	
910.8	546.723	268.38	49.1%

Pole Geometry:		
Diameter	=	22 in
Thickness	=	1/4 in
Fu	=	80 ksi
Flange Diameter	=	in

Tensial Strength				
P _{n1}	P _{n2}	Pnt/Ωt	P _{rt}	Capacity
kips	kips	kips	kips	
448.04	496.05	357.72	19.54	5.5%

Tube Bypass Information:		
Number of Legs	=	3
Unbraced Length	=	108 in
Tube Circle	=	38.5 in
K	=	2.10
Type	HSS 6x6x1/2	

Compression Strength						
4.71* √(E/F _y)	KL/r	F _e	F _{cr}	Pnc/Ωc	P _{rc}	Capacity
		ksi	ksi	kips	kips	
118.26	101.70	27.67	22.94	178.38	21.22	11.9%

	Extension	Pole
Bolt Type	M20 AJAX	M20 AJAX
Bolt Qty.	6	6
Spacing (in)	3	3
End Dist. (in)	3	3

Combined Strength							
Flexure + Tension (H1-1b)				Flexure + Compression (H1-1b)			
Prt / Pnt	Prt / 2*Pnt	Mr / Mn	Capacity	Prc / Pnc	Prc / 2*Pnc	Mr / Mn	Capacity
0.055	0.027	0.491	51.8%	0.119	0.059	0.491	55.0%

Tube Properties	
Width in	Thick. in
6.00	0.500
r in	Area in ²
2.23	9.740
Z in ³	Fy ksi
19.80	46.00
Fu ksi	E ksi
58.00	29000

Bolt Check								
Location	Tube Comp. kips	e in	Shear on Bolt kips	Tension on Bolt kips	Shear Capacity kips	Tension Capacity kips	Bearing Capacity kips	Limit Capacity
Top	21.2	13.875	3.54	10.91	31.00	25.00	25.00	43.6%
Bottom	21.2	8.25	3.54	6.48	31.00	25.00	25.00	25.9%

- All equations based on AISC 13th Edition



v4.0 - Effective 1-12-12

Asymmetric Anchor Rod Analysis

Moment =	2419	k-ft	TIA Ref.	F	Location =	Base Plate
Axial =	32.0	kips	ASIF =	1.3333	η =	N/A for BP, Rev. G Sect. 4.9.9
Shear =	28.0	kips	Max Ratio =	105.0%	Threads =	N/A for FP, Rev. G
Anchor Qty =	16					

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

Item	Nominal Anchor Dia, in	Anchor Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	0.0	58.99	0.00	3.98	153.77	149.77	149.77	170.00	170.00	88.1%
2	2.250	#18J A615 Gr 75	75	100	90.0	58.99	0.00	3.98	153.77	149.77	149.77	170.00	170.00	88.1%
3	2.250	#18J A615 Gr 75	75	100	180.0	58.99	0.00	3.98	153.77	149.77	149.77	170.00	170.00	88.1%
4	2.250	#18J A615 Gr 75	75	100	270.0	58.99	0.00	3.98	153.77	149.77	149.77	170.00	170.00	88.1%
5	2.250	#18J A615 Gr 75	75	100	11.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
6	2.250	#18J A615 Gr 75	75	100	25.0	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
7	2.250	#18J A615 Gr 75	75	100	38.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
8	2.250	#18J A615 Gr 75	75	100	101.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
9	2.250	#18J A615 Gr 75	75	100	115.0	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
10	2.250	#18J A615 Gr 75	75	100	128.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
11	2.250	#18J A615 Gr 75	75	100	191.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
12	2.250	#18J A615 Gr 75	75	100	205.0	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
13	2.250	#18J A615 Gr 75	75	100	218.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
14	2.250	#18J A615 Gr 75	75	100	281.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
15	2.250	#18J A615 Gr 75	75	100	295.0	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%
16	2.250	#18J A615 Gr 75	75	100	308.5	51.00	0.00	3.98	133.21	129.21	129.21	0.00	195.00	66.3%

63.68

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

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

Site Data

BU#: _____
 Site Name: _____
 App #: _____

Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	51	in
Anchor Spacing:	6	in

Plate Data

W=Side:	49	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	0	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:	43.49	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor

ASD ASIF:	1.333	
-----------	-------	--

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

Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	1672.9	ft-kips
Unfactored Axial, P:	24	kips
Unfactored Shear, V:	21	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension 129.2 Kips

See asymmetric spreadsheet

Base Plate Results

Base Plate Stress: 33.3 ksi
 Allowable PL Bending Stress: 50.0 ksi
 Base Plate Stress Ratio: 66.7% **Pass**

Flexural Check

PL Ref. Data

Yield Line (in):	25.81
Max PL Length:	25.81

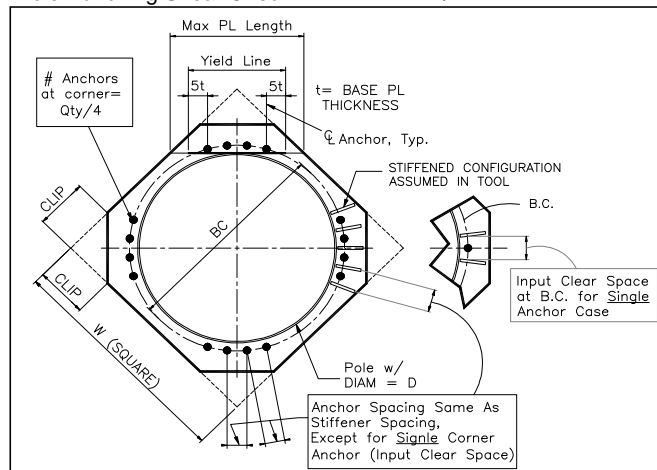
N/A - Unstiffened

Stiffener Results

Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

Pole Punching Shear Check: N/A





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

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	2419.0		k-ft
Shear, V =	28.0		kips
Axial Load, P =	32.0		kips
OTM =	2433.0	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

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

Drilled Pier Parameters

Diameter =	7	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	21	ft
fc' =	3	ksi
εc =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

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

Load Combinations Checked per TIA/EIA-222-F

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

Steel Parameters

Number of Bars =	24	
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 =	20.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	
<i>Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)</i>		
<i>Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)</i>		

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 =	110.0%
Maximum Steel Ratio =	105.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = 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	2	100		30	Sand				2
2	4	120		30	Sand				6
3	29	125		35	Sand	15000			35
4	5	135		36	Sand	15000			40
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	15.47	ft, from Grade
Bending Moment, M =	2866.11	k-ft, from COR
Resisting Moment, Ma =	3680.37	k-ft, from COR

MOMENT RATIO = 77.9% OK

Shear, V =	28.00	kips
Resisting Shear, Va =	35.95	kips

SHEAR RATIO = 77.9% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	97.37	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	32.00	kips
Allowable Comp. Cap., Ca =	262.85	kips

COMPRESSION RATIO = 12.2% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	37.44	sq in

Allowable Min Axial, Pa =	-1555.20	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	6512.98	kips, Where Ma = 0 k-ft

Axial Load, P =	65.19	kips @ 5.25 ft Below Grade
Moment, M =	2563.10	k-ft @ 5.25 ft Below Grade
Allowable Moment, Ma =	4532.95	k-ft

MOMENT RATIO = 56.5% 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#: BU 876340
Site Name: Coe Hill
App #:

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

Pier Properties	
Concrete:	
Pier Diameter =	7.0 ft
Concrete Area =	5541.8 in ²
Reinforcement:	
Clear Cover to Tie=	4.00 in
Horiz. Tie Bar Size=	5
Vert. Cage Diameter =	6.11 ft
Vert. Cage Diameter =	73.34 in
Vertical Bar Size =	11
Bar Diameter =	1.41 in
Bar Area =	1.56 in ²
Number of Bars =	24
As Total=	37.44 in ²
A s/ Aconc, Rho:	0.0068 0.68%

ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{Sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.68%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = ($\phi=0.65$) Pn.		
Pn per ACI 318 (10-2)	8466.87	kips
at Mu=($\phi=0.65$)Mn=	5122.02	ft-kips
Max Tu, ($\phi=0.9$) Tn =	2021.76	kips
at Mu= $\phi=(0.90)$ Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	2563.1	ft-kips (* Note)
Max. Service Shaft P:	65.19	kips
Max Axial Force Type:	Comp.	

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

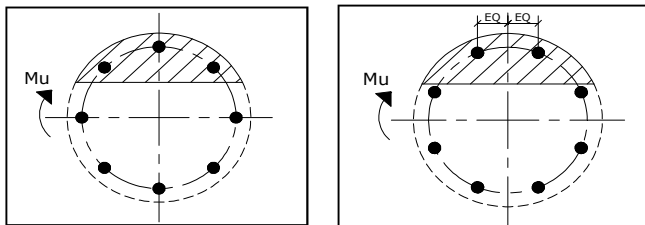
Load Factor	Shaft Factored Loads	
1.30	Mu:	3332.03 ft-kips
1.30	Pu:	84.747 kips

Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2002	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	High	

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

Results:

Governing Orientation Case: 1



Case 1

Case 2

Dist. From Edge to Neutral Axis: 15.08 in

Extreme Steel Strain, ϵ_t : 0.0127

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ Pn = Pu: 84.75 kips
 Drilled Shaft Moment Capacity, ϕ Mn: 5892.82 ft-kips
 Drilled Shaft Superimposed Mu: 3332.03 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 56.5%

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

Sprint Existing Facility

Site ID: CT03XC160

Coe Hill

238 Meriden Road
Middlefield, CT 06457

July 3, 2014

EBI Project Number: 62143751

July 3, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC160 - Coe Hill

Site Total: 44.60% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 238 Meriden Road, Middlefield, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 238 Meriden Road, Middlefield, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20, POWERWAVE P40-16-XLPP-RR-A and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The POWERWAVE P40-16-XLPP-RR-A has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerline for the proposed antennas is **121 feet** above ground level (AGL).
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

Site ID	CT03XC160 - Coe Hill
Site Address	238 Meriden Road, Middlefield, CT, 06457
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.38%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	121	115	1/2 "	0.5	0	39.00	0.19%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.66%
Sector total Power Density Value:																1.23%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.38%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	121	115	1/2 "	0.5	0	39.00	0.19%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.66%
Sector total Power Density Value:																1.23%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	Powerwave	P40-16-XLPP-RR-A	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.38%
3a	Powerwave	P40-16-XLPP-RR-A	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	121	115	1/2 "	0.5	0	39.00	0.19%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	121	115	1/2 "	0.5	0	138.69	0.66%
Sector total Power Density Value:																1.23%

Site Composite MPE %	
Carrier	MPE %
Sprint	3.69%
AT&T	22.41%
MetroPCS	13.47%
Nextel	4.71%
T-Mobile	0.32%
Total Site MPE %	44.60%

Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **3.69%** (**1.23% from sector 1, 1.23% from sector 2 and 1.23% from sector 3**) of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **44.60%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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



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