Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6600

www.crowncastle.com

April 4, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 876321**
Sprint PCS Site ID: CT03XC040
Located at: 150 North Main Street, Branford, CT 06405

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. James B. Cosgrove, First Selectman of the Town of Branford.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **150 North Main Street, Branford, CT 06405**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint's additional antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

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

Sincerely,

Jeff Barbadora
Real Estate Specialist

Enclosures

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

cc: Mr. James B. Cosgrove, First Selectman
Town of Branford
1019 Main Street
Branford, CT 06405

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	BRANFORD BANM TOWER
SITE CASCADE:	CT03XC040
SITE NUMBER:	876321
SITE ADDRESS:	150 NORTH MAIN ST BRANFORD, CT 06405
SITE TYPE:	MONOPOLE TOWER
MARKET:	SOUTHERN CONNECTICUT

SITE INFORMATION

TOWER OWNER:
CROWN CASTLE
2000 CORPORATE DR
CANONSBURG, PA 15317

LATITUDE (NAD83):
41° 17' 19.1832" N
41.288662°

LONGITUDE (NAD83):
72° 48' 49.896" W
-72.81386°

COUNTY:
NEW HAVEN

ZONING JURISDICTION:
TOWN OF BRANFORD

ZONING DISTRICT:
IG-1

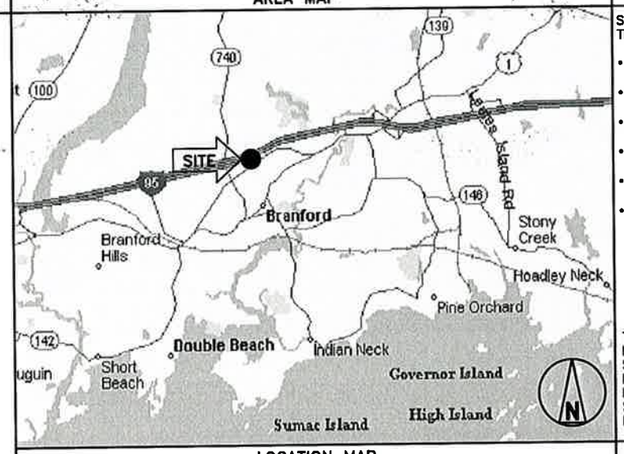
POWER COMPANY:
CONNECTICUT LIGHT & POWER

AAV PROVIDER:
AT&T
(800) 288-2020

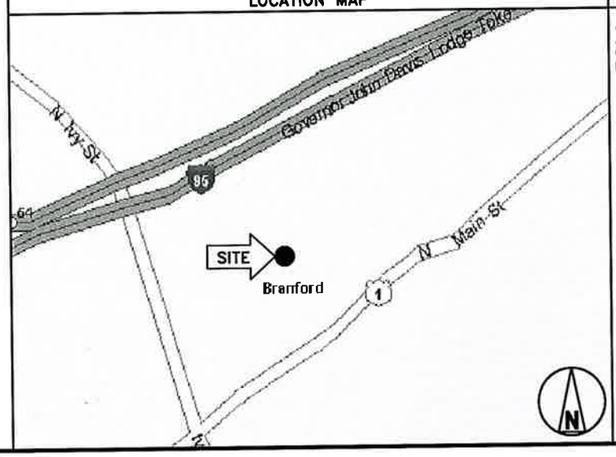
SPRINT CM:
GARY WOOD
GARY.WOOD@SPRINT.COM

CROWN CASTLE CM:
HARRY ATHAN
(518) 380-0041
HTAMANAGEMENT@NYCAP.RR.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
- 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-F OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

811 Know what's **below.** **Call** before you dig. www.call811.com

DRAWING INDEX

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

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

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

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:
BRANFORD BANM TOWER

SITE CASCADE:
CT03XC040

SITE ADDRESS:
150 NORTH MAIN ST
BRANFORD , CT 06405

SHEET DESCRIPTION:
TITLE SHEET & PROJECT DATA

SHEET NUMBER:
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

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

B. COMPANY: SPRINT CORPORATION

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

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

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

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.

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

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

5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED

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

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

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

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

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
NO. 27705
LICENSED PROFESSIONAL ENGINEER

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:
BRANFORD BANM TOWER

SITE CASCADE:
CT03XC040

SITE ADDRESS:
150 NORTH MAIN ST
BRANFORD , CT 06405

SHEET DESCRIPTION:
SPRINT SPECIFICATIONS

SHEET NUMBER:
SP-1

CONTINUE FROM SP-1

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

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

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

1.4 TESTS AND INSPECTIONS:

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

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

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

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

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

3.2 REQUIRED TESTS:

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

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

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:

BRANFORD BANM TOWER

SITE CASCADE:

CT03XC040

SITE ADDRESS:

150 NORTH MAIN ST
BRANFORD , CT 06405

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
11. ALL AVAILABLE JURISDICTIONAL INFORMATION
12. PDF SCAN OF REDLINES PRODUCED IN FIELD

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.

1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
2. STRUCTURAL BACKFILL COMPACTION REPORTS.
3. SITE RESISTANCE TO EARTH TEST.
4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;

1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

1. 1SHELTER AND TOWER OVERVIEW.
2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
5. PHOTOS OF TOWER SECTION STACKING.
6. CONCRETE TESTING / SAMPLES.
7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.
10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
11. COAX CABLE ENTRY INTO SHELTER.
12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
25. ALL BTS GROUND CONNECTIONS.
26. ALL GROUND TEST WELLS.
27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
30. GPS ANTENNAS.
31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
32. DOGHOUSE/CABLE EXIT FROM ROOF.
33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
34. MASTER BUS BAR.
35. TELCO BOARD AND NIU.
36. ELECTRICAL DISTRIBUTION WALL.
37. CABLE ENTRY WITH SURGE SUPPRESSION.
38. ENTRANCE TO EQUIPMENT ROOM.
39. COAX WEATHERPROOFING--TOP AND BOTTOM OF TOWER.
40. COAX GROUNDING --TOP AND BOTTOM OF TOWER.
41. ANTENNA AND MAST GROUNDING.
42. LANDSCAPING – WHERE APPLICABLE.

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

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:

BRANFORD BANM TOWER

SITE CASCADE:

CT03XC040

SITE ADDRESS:

150 NORTH MAIN ST
BRANFORD , CT 06405

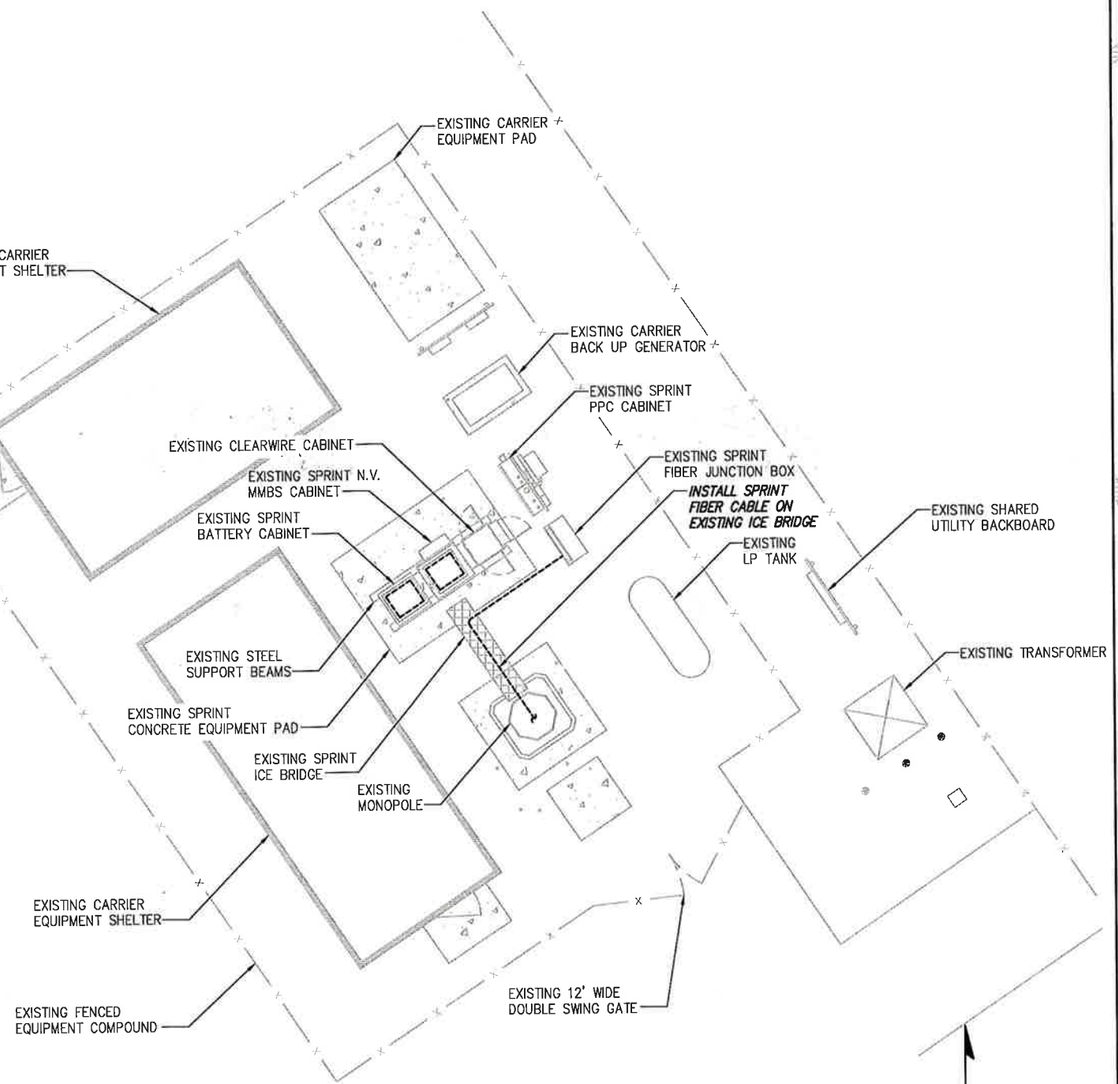
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

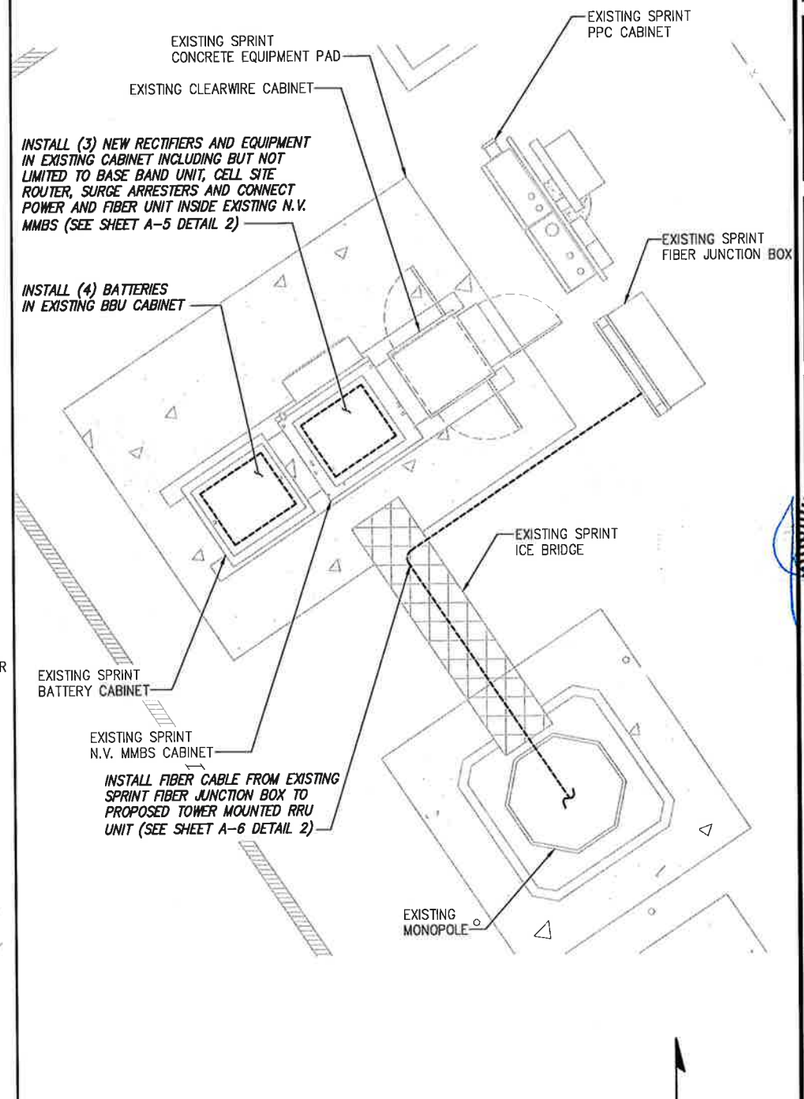
SHEET NUMBER:

SP-3

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



OVERALL SITE PLAN | SCALE: AS NOTED | 1



SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:

BRANFORD BANM TOWER

SITE CASCADE:

CT03XC040

SITE ADDRESS:

150 NORTH MAIN ST
BRANFORD , CT 06405

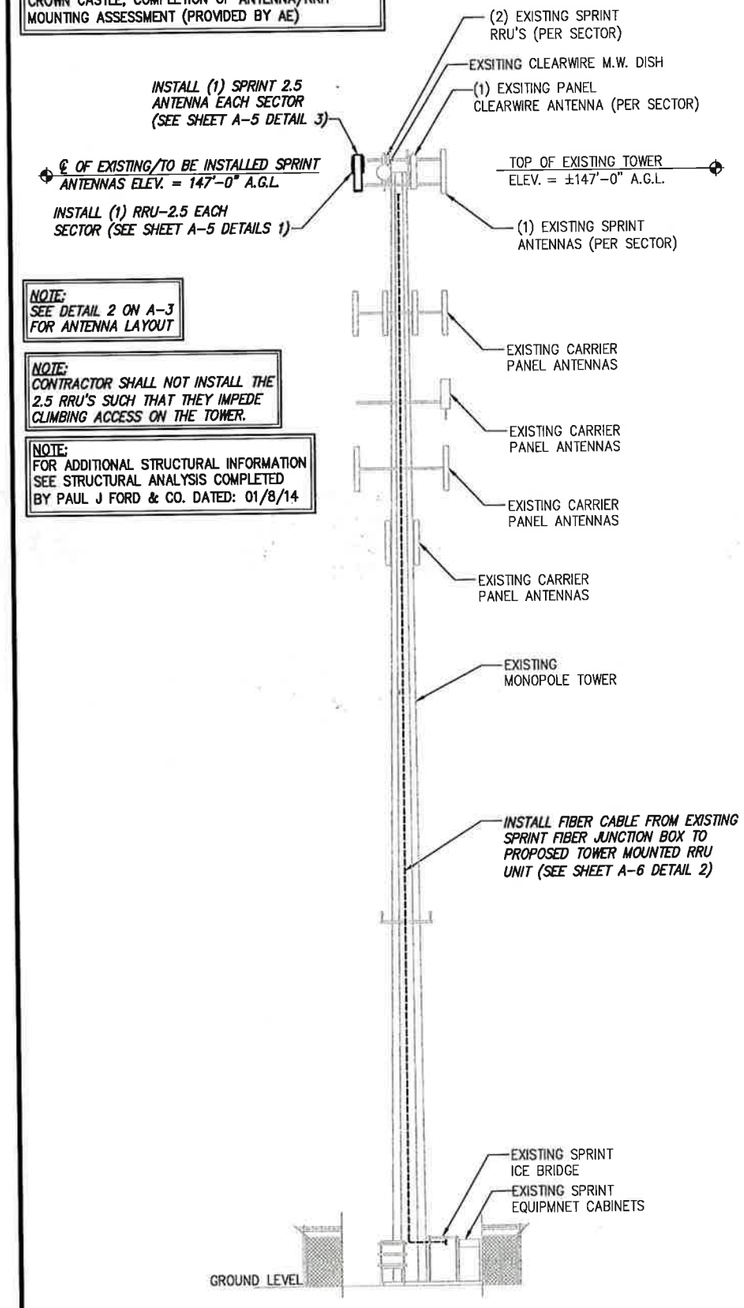
SHEET DESCRIPTION:

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:
SEE DETAIL 2 ON A-3 FOR ANTENNA LAYOUT

NOTE:
CONTRACTOR SHALL NOT INSTALL THE 2.5 RRU'S SUCH THAT THEY IMPEDE CLIMBING ACCESS ON THE TOWER.

NOTE:
FOR ADDITIONAL STRUCTURAL INFORMATION SEE STRUCTURAL ANALYSIS COMPLETED BY PAUL J FORD & CO. DATED: 01/8/14

TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

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Overland Park, Kansas 66251

PLANS PREPARED BY:
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REVISIONS:

DESCRIPTION	DATE	BY	REV
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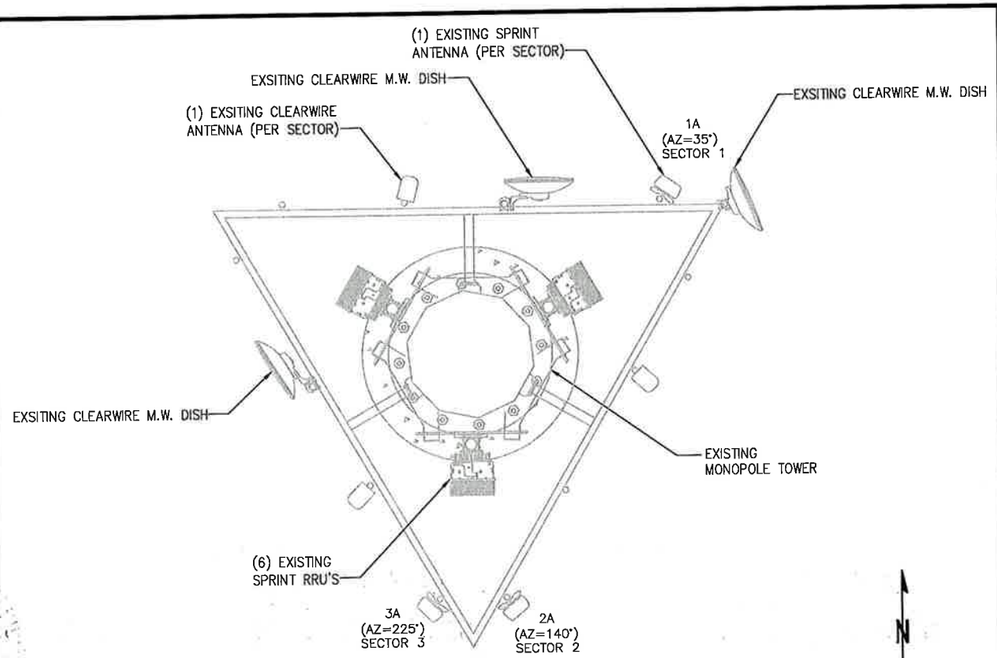
SITE NAME:
BRANFORD BANM TOWER

SITE CASCADE:
CT03XC040

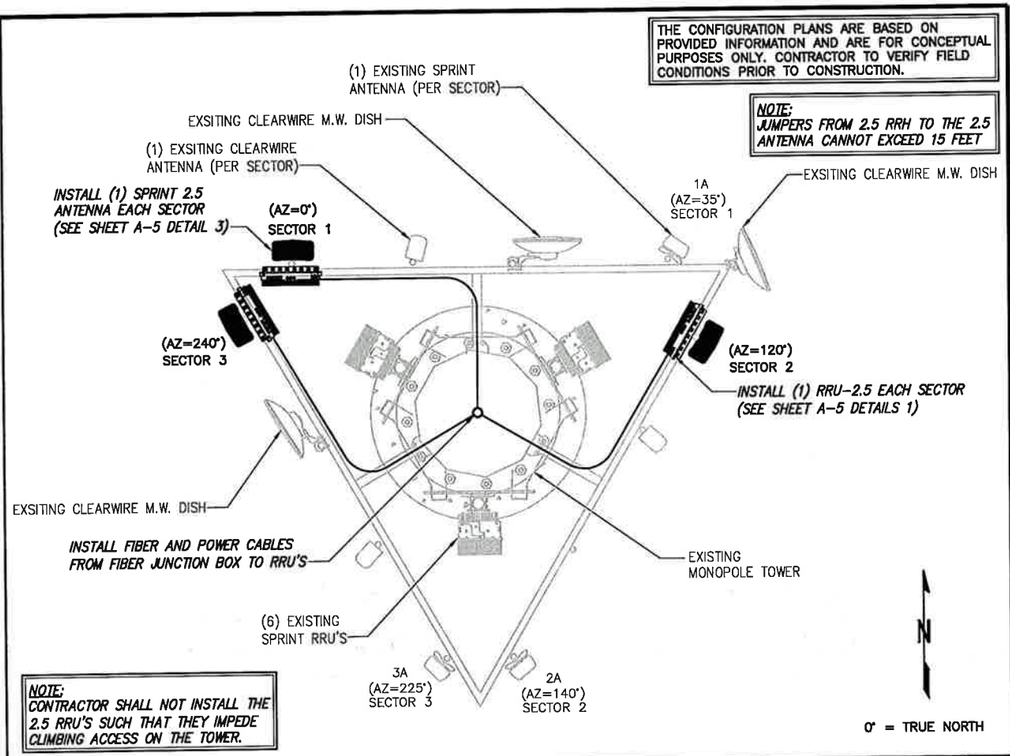
SITE ADDRESS:
150 NORTH MAIN ST
BRANFORD , CT 06405

SHEET DESCRIPTION:
TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:
A-2

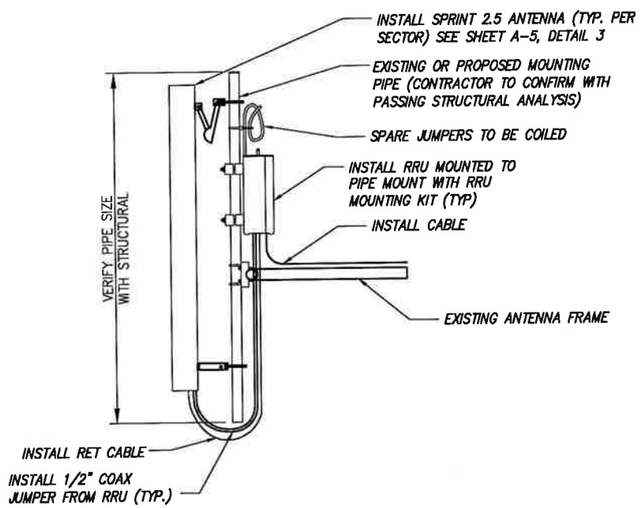


EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1



FINAL ANTENNA LAYOUT | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3



NOTES:

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

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

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

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

TYPICAL ANTENNA & RRU MOUNTING DETAILS | NO SCALE | 4

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:

BRANFORD BANM TOWER

SITE CASCADE:

CT03XC040

SITE ADDRESS:

150 NORTH MAIN ST
BRANFORD , CT 06405

SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

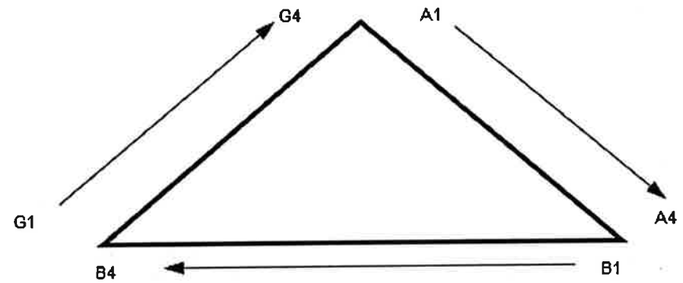
A-3

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

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

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

Figure 1: Antenna Orientation



NOTES:

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER. THERE SHALL BE A 1" SPACE BETWEEN EACH RING FOR THE CABLE IDENTIFIER, AND NO SPACES BETWEEN THE FREQUENCY BANDS.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE NEXT COLOR IN THE SEQUENCE FOR ADDITIONAL CABLES IN EACH SECTOR.
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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

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

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

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

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

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

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CT03XC040

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BRANFORD , CT 06405

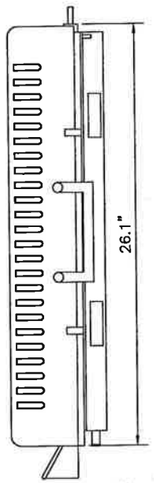
SHEET DESCRIPTION:

COLOR CODING AND NOTES

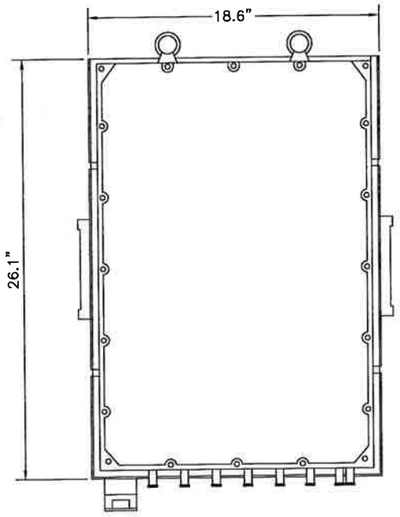
SHEET NUMBER:

A-4

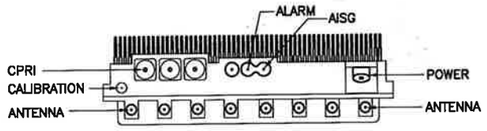
RRU: ALCATEL LUCENT TD-RRH8X20
WIEGHT: 70 LBS
COLOR: LIGHT GRAY



SIDE VIEW



FRONT VIEW

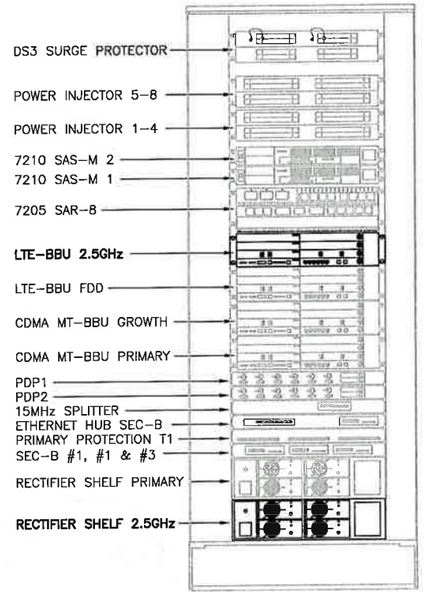


PLAN VIEW

NOTES

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

2.5 RRU	NO SCALE	1

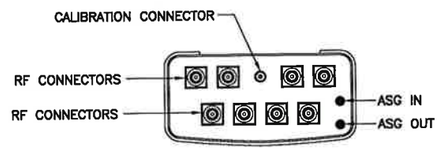


FRONT VIEW

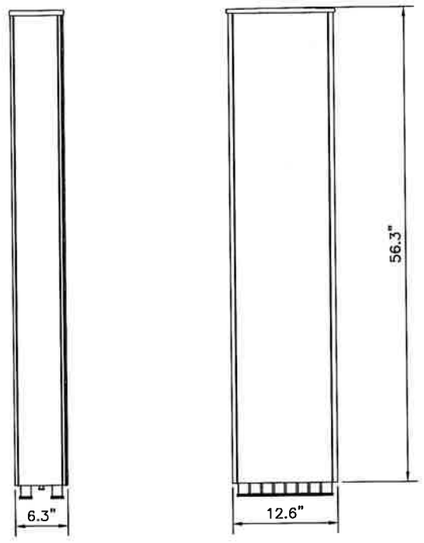
NEW EQUIPMENT IN EXISTING CABINET	NO SCALE	2

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA	NO SCALE	3

DETAIL NOT USED	NO SCALE	4

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Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:
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JOB NUMBER 353-000

MLA PARTNER:
CROWN CASTLE

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

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BRANFORD , CT 06405

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

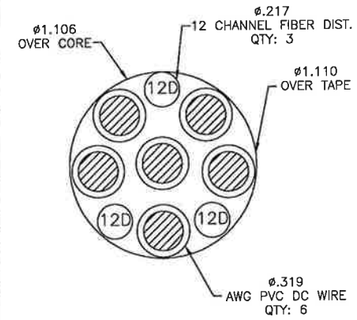
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

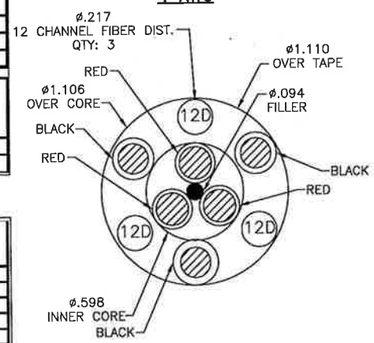
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

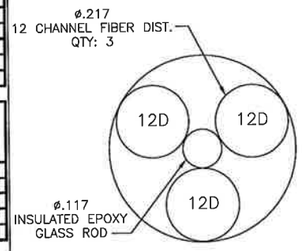
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG

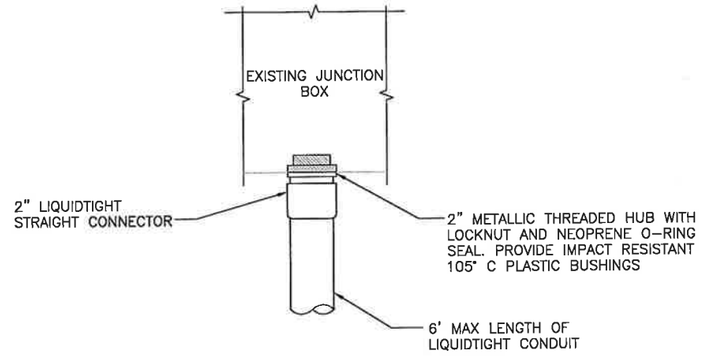


8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 4

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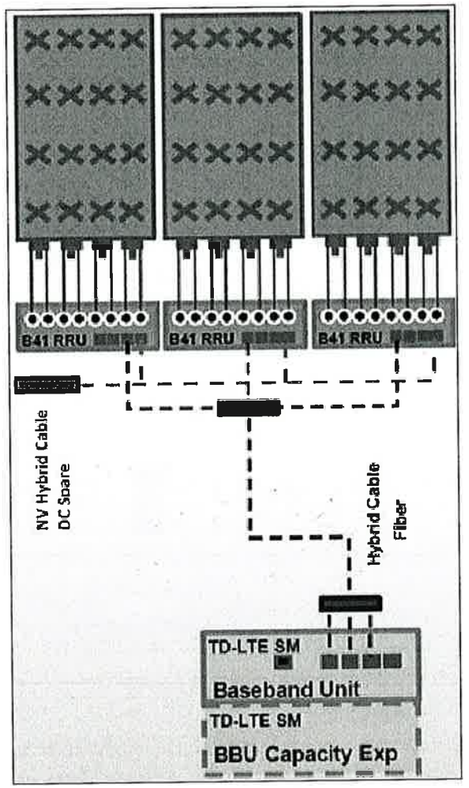
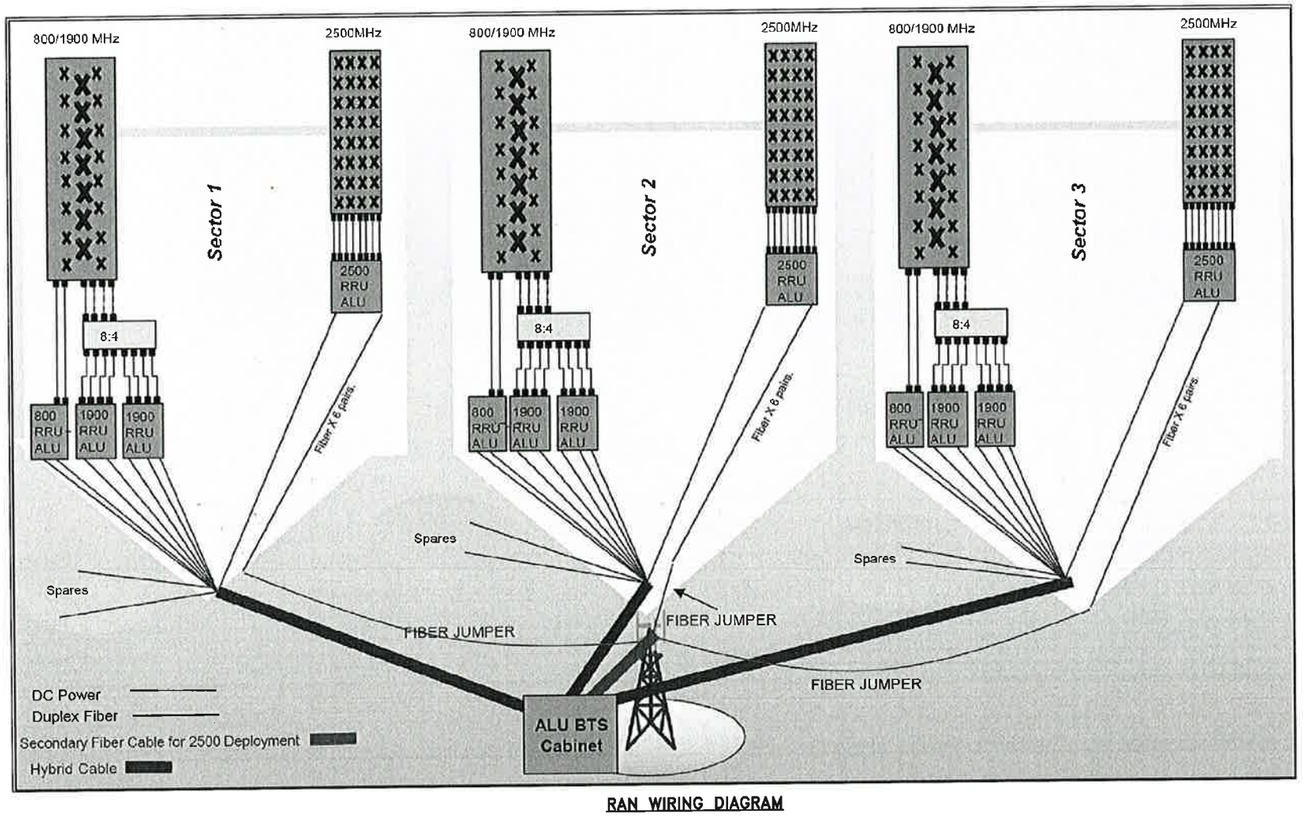
CIVIL DETAILS

SHEET NUMBER:

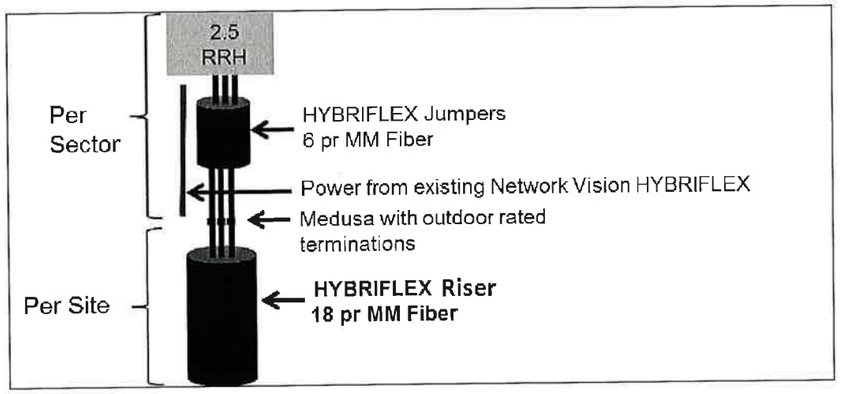
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM | NO SCALE | 1

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SHEET DESCRIPTION:

PLUMBING DIAGRAM

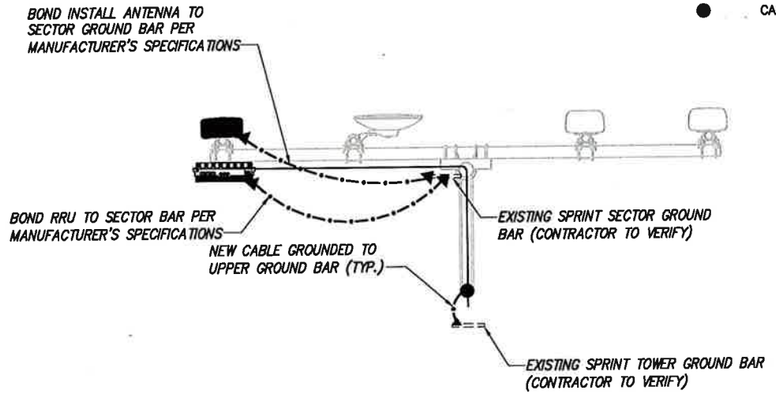
SHEET NUMBER:

A-7

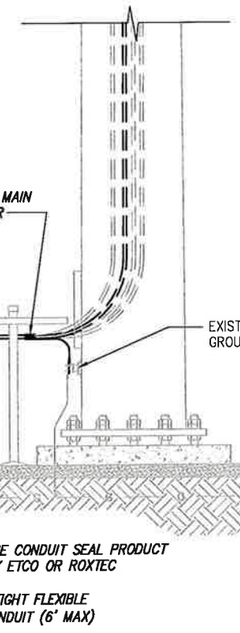
PLAN NOT USED | NO SCALE | 1

LEGEND:

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



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2



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

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

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BRANFORD , CT 06405

SHEET DESCRIPTION:

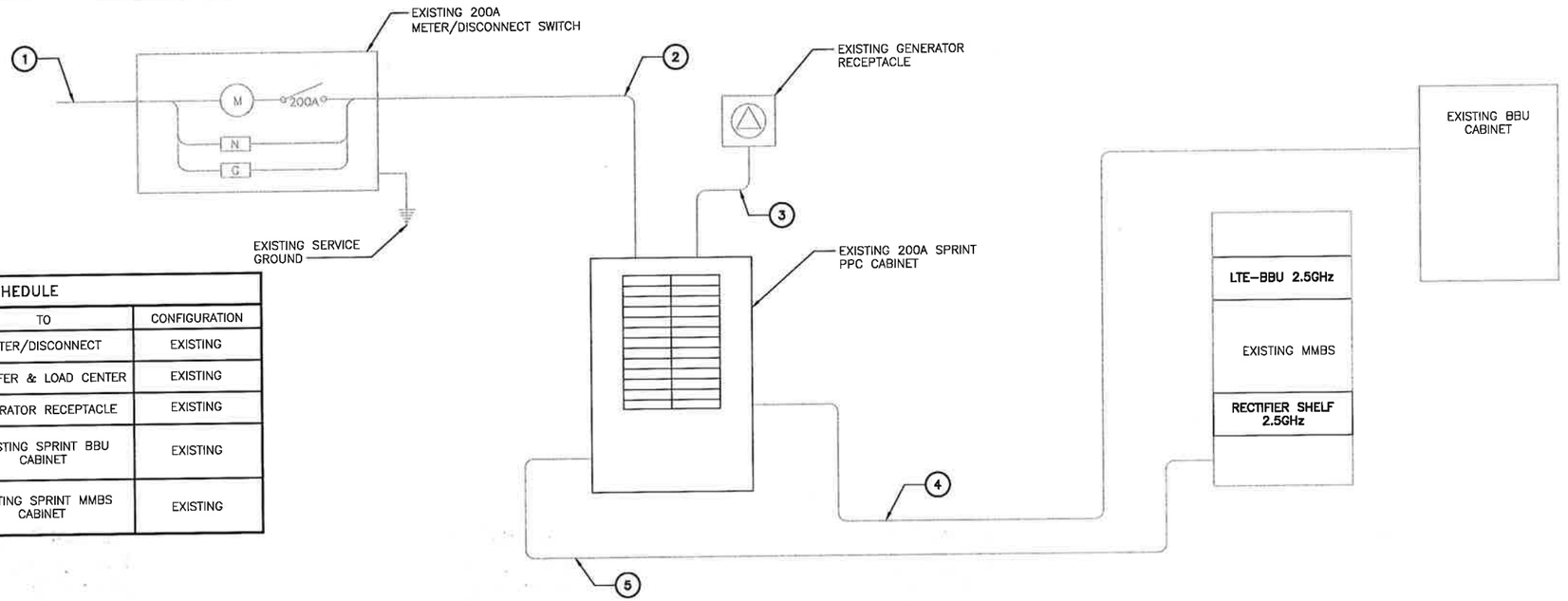
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

NOTES

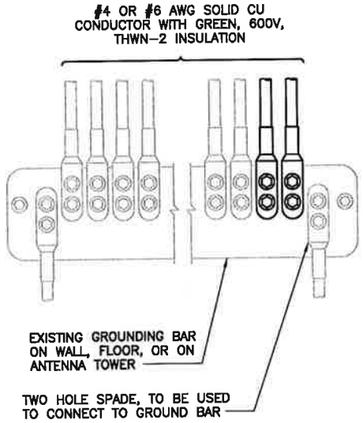
CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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

ELECTRICAL ONE-LINE DIAGRAM

NO SCALE | 1

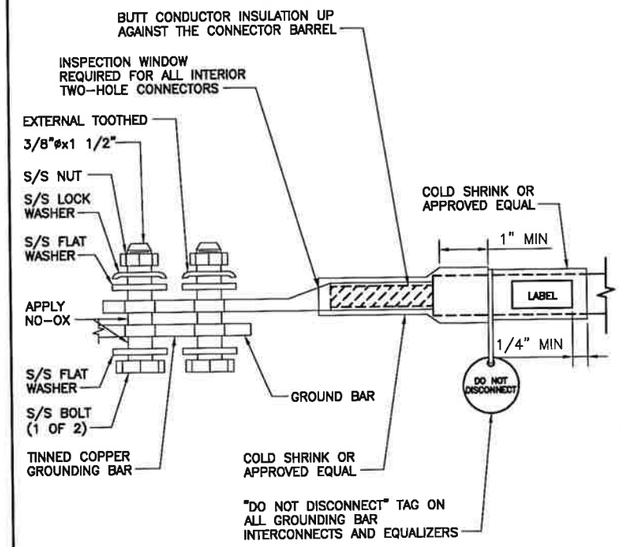


NOTES

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

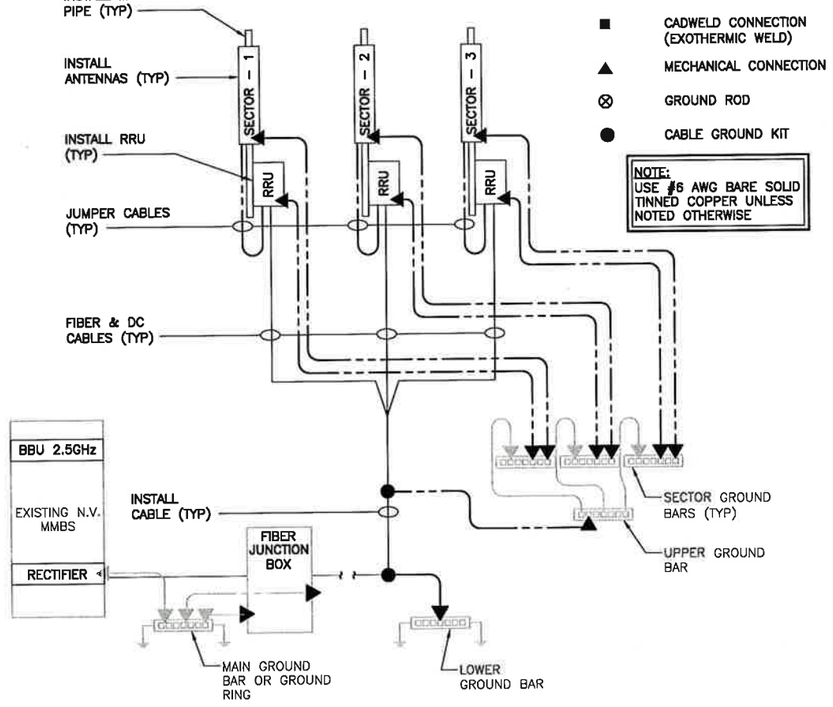
INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

NO SCALE | 2



TWO HOLE LUG

NO SCALE | 3



GROUNDING RISER DIAGRAM

NO SCALE | 4

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

M.L.A PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	SKB	B
ISSUED FOR REVIEW	02/4/14	JLV	A

SITE NAME:

BRANFORD BANM TOWER

SITE CASCADE:

CT03XC040

SITE ADDRESS:

150 NORTH MAIN ST
BRANFORD , CT 06405

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: **January 08, 2014**

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

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5A
	Carrier Site Number:	CT03XC040
	Carrier Site Name:	BRANFORD BANM TOWER
Crown Castle Designation:	**Crown Castle BU Number:**	876321
	Crown Castle Site Name:	BRANFORD BANM TOWER
	Crown Castle JDE Job Number:	252024
	Crown Castle Work Order Number:	694213
	Crown Castle Application Number:	205513 Rev. 1
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37513-2417 R1
Site Data:	**150 North Main Street, BRANFORD, New Haven County, CT** **Latitude *41° 17' 19"*, Longitude *-72° 48' 49.9"*** **147 Foot - Monopole Tower**	

Dear Patrick Byrum,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 606543, in accordance with application 205513, revision 1.

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

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

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

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:

John J. Woolley, E.I.
Structural Designer

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

tnxTower Report - version 6.1.3.1

JAN 0 8 2014

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

Date: **January 08, 2014**

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

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

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5A
	Carrier Site Number:	CT03XC040
	Carrier Site Name:	BRANFORD BANM TOWER
Crown Castle Designation:	**Crown Castle BU Number:**	876321
	Crown Castle Site Name:	BRANFORD BANM TOWER
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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:

John J. Woolley, E.I.
Structural Designer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 147 ft Monopole tower designed by SUMMIT in March of 2009. 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 the 2005 Connecticut State Building Code of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	147.0	3	alcatel lucent	TD-RRH8x20-25	1 3	5/8 1-1/4	-
		1	powerwave technologies	P40-16-XLPP-RR-A w/ Mount Pipe			
		9	rfs celwave	ACU-A20-N			
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
145.0	146.0	3	alcatel lucent	1900MHz RRH (65MHz)	-	-	-
	145.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		1	tower mounts	Side Arm Mount [SO 102-3]			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
147.0	149.0	2	dragonwave	A-ANT-23G-2-C	6 4	5/16 1/2	1
	147.0	3	argus technologies	LLPX310R w/ Mount Pipe			
		2	decibel	950F65T2ZE-M w/ Mount Pipe	6	1-5/8	3
		2	decibel	DB950F40T2E-M w/ Mount Pipe			
		2	decibel	DB980H90E-M w/ Mount Pipe			
		3	samsung telecommunications	FDD_R6_RRH	-	-	1
		1	tower mounts	Platform Mount [LP 712-1]			
131.0	132.0	12	decibel	DB844H90E-XY w/ Mount Pipe	12	1-5/8	3
	131.0	1	tower mounts	Platform Mount [LP 601-1]			
119.0	122.0	6	remec	S20057A-1	1 12	5/16 1-5/8	1
		3	rfs celwave	APX16DWV-16DWVS-C w/ Mount Pipe			
	119.0	1	tower mounts	T-Arm Mount [TA 601-3]			
110.0	112.0	6	ericsson	RRUS-11	-	-	2
		1	raycap	DC6-48-60-18-8F			
		3	kathrein	800 10764 w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe	1 2 12	1/4 7/8 1-1/4	1
		12	powerwave technologies	LGP2140X			
	110.0	1	tower mounts	Platform Mount [LP 712-1]			
100.0	100.0	3	rfs celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
		1	tower mounts	Pipe Mount [PM 601-3]			
60.0	60.0	1	tower mounts	Pipe Mount [PM 501-1]	-	-	1
49.0	50.0	1	lucent	KS24019-L112A	1	1/2	1
	49.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 10/8/96	2135657	CCISITES
4-POST-MODIFICATION INSPECTION	PJF, 41709-0058, 6/15/99	2448190	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PJF, 29299-111, 3/15/99	1613620	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PJF, 29299-111, 3/15/99	1614568	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 128359, 3/6/2013	3890848	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.3.1), 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 has been reinforced in conformance with the referenced modification documents.

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	147 - 99.5	Pole	TP30.313x22x0.25	1	-8.93	1135.99	65.3	Pass
L2	99.5 - 69.5	Pole	TP35.0626x29.1567x0.3125	2	-14.99	1817.84	88.4	Pass
L3	69.5 - 59	Pole	TP36.9x35.0626x0.4301	3	-16.28	2267.58	77.5	Pass
L4	59 - 58	Pole	TP36.45x35.2086x0.375	4	-18.27	2264.58	84.9	Pass
L5	58 - 50.5	Pole	TP37.7624x36.45x0.4272	5	-20.03	2494.67	84.5	Pass
L6	50.5 - 50	Pole	TP37.8499x37.7624x0.5406	6	-20.17	2941.81	72.5	Pass
L7	50 - 29.25	Pole	TP41.481x37.8499x0.479	7	-24.37	2851.53	87.3	Pass
L8	29.25 - 24	Pole	TP41.6499x39.6043x0.5047	8	-28.45	3263.40	85.2	Pass
L9	24 - 0	Pole	TP45.85x41.6499x0.5901	9	-36.73	3978.72	83.6	Pass
							Summary	
						Pole (L2)	88.4	Pass
						Rating =	88.4	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	84.8	Pass
1	Base Plate	0	69.0	Pass
1	Base Foundation Structural Steel	0	80.6	Pass
1	Base Foundation Soil Interaction	0	90.0	Pass

Structure Rating (max from all components) =	90%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

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

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	147.0000-99.5000	47.5000	3.75	12	22.0000	30.3130	0.2500	1.0000	A607-60 (60 ksi)
L2	99.5000-69.5000	33.7500	0.00	12	29.1567	35.0626	0.3125	1.2500	A607-65 (65 ksi)
L3	69.5000-59.0000	10.5000	4.75	12	35.0626	36.9000	0.4301	1.7205	Reinf 57.44 ksi (57 ksi)
L4	59.0000-58.0000	5.7500	0.00	12	35.2086	36.4500	0.3750	1.5000	A607-65 (65 ksi)
L5	58.0000-50.5000	7.5000	0.00	12	36.4500	37.7624	0.4271	1.7086	Reinf 60.74 ksi (61 ksi)
L6	50.5000-50.0000	0.5000	0.00	12	37.7624	37.8499	0.5405	2.1622	Reinf 56.64 ksi (57 ksi)
L7	50.0000-29.2500	20.7500	5.25	12	37.8499	41.4810	0.4790	1.9160	Reinf 57.67 ksi (58 ksi)
L8	29.2500-24.0000	10.5000	0.00	12	39.6043	41.6499	0.5047	2.0188	Reinf 61.02 ksi (61 ksi)
L9	24.0000-	24.0000		12	41.6499	45.8500	0.5900	2.3602	Reinf 57.85 ksi

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
	0.0000								(58 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	31.3823	24.2007	2791.7645	10.7626	15.7021	177.7952	5656.8718	11.9109	7.4539	29.816
L2	30.8646	29.0245	3082.2498	10.3262	15.1032	204.0796	6245.4738	14.2850	6.9765	22.325
	36.2995	34.9673	5389.6479	12.4405	18.1624	296.7470	10920.8879	17.2098	8.5593	27.39
L3	36.2995	47.9655	7343.1536	12.3984	18.1624	404.3045	14879.2200	23.6072	8.2441	19.167
	38.2017	50.5103	8575.0066	13.0562	19.1142	448.6197	17375.2881	24.8596	8.7365	20.312
L4	37.5123	42.0615	6514.2838	12.4704	18.2380	357.1812	13199.7051	20.7014	8.4309	22.482
	37.7358	43.5606	7235.8925	12.9148	18.8811	383.2347	14661.8800	21.4392	8.7636	23.37
L5	37.7358	49.5467	8206.4710	12.8962	18.8811	434.6395	16628.5352	24.3854	8.6238	20.189
	39.0945	51.3518	9136.5129	13.3660	19.5609	467.0795	18513.0521	25.2738	8.9756	21.013
L6	39.0945	64.7873	11457.0447	13.3254	19.5609	585.7104	23215.0787	31.8864	8.6717	16.042
	39.1851	64.9396	11538.0333	13.3568	19.6063	588.4871	23379.1837	31.9613	8.6951	16.086
L7	39.1851	57.6390	10274.7280	13.3788	19.6063	524.0533	20819.3846	28.3682	8.8601	18.497
	42.9443	63.2394	13570.1207	14.6787	21.4872	631.5456	27496.7436	31.1245	9.8332	20.529
L8	42.0603	63.5434	12399.4058	13.9977	20.5150	604.4058	25124.5579	31.2741	9.2613	18.35
	43.1191	66.8677	14449.0629	14.7300	21.5746	669.7248	29277.7188	32.9103	9.8095	19.436
L9	43.1191	78.0120	16787.3228	14.6994	21.5746	778.1049	34015.6674	38.3952	9.5808	16.237
	47.4674	85.9921	22483.9622	16.2031	23.7503	946.6812	45558.6031	42.3227	10.7065	18.145

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 147.0000-99.5000				1	1	1		
L2 99.5000-69.5000				1	1	1		
L3 69.5000-59.0000				1	1	1		
L4 59.0000-58.0000				1	1	1		
L5 58.0000-50.5000				1	1	1		
L6 50.5000-50.0000				1	1	1		
L7 50.0000-29.2500				1	1	1		
L8 29.2500-24.0000				1	1	1		
L9 24.0000-0.0000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7983A(1/2")	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	4	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.74
						1" Ice	0.0000	2.01
						2" Ice	0.0000	6.39
						4" Ice	0.0000	22.47
9207(5/16")	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	6	No Ice	0.0000	0.60
						1/2" Ice	0.0000	1.11
						1" Ice	0.0000	2.22
						2" Ice	0.0000	6.29
						4" Ice	0.0000	21.76
HB114-1-0813U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	2.45
						1" Ice	0.0000	4.30
						2" Ice	0.0000	9.85
						4" Ice	0.0000	28.27
2'' Rigid Conduit	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.2000	2.80
						1/2" Ice	0.3000	4.33
						1" Ice	0.4000	6.47
						2" Ice	0.6000	12.57
						4" Ice	1.0000	32.12
2'' Rigid Conduit	C	No	CaAa (Out Of Face)	147.0000 - 0.0000	1	No Ice	0.0000	2.80
						1/2" Ice	0.0000	4.33
						1" Ice	0.0000	6.47
						2" Ice	0.0000	12.57
						4" Ice	0.0000	32.12
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	131.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
***								
LDF7-50A(1-5/8")	C	No	Inside Pole	119.0000 - 0.0000	12	No Ice	0.0000	0.82
						1/2" Ice	0.0000	0.82
						1" Ice	0.0000	0.82
						2" Ice	0.0000	0.82
						4" Ice	0.0000	0.82
860-10025(5/16)	C	No	Inside Pole	119.0000 - 0.0000	1	No Ice	0.0000	0.00
						1/2" Ice	0.0000	0.00
						1" Ice	0.0000	0.00
						2" Ice	0.0000	0.00
						4" Ice	0.0000	0.00
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	110.0000 - 0.0000	12	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
						2" Ice	0.0000	0.66
						4" Ice	0.0000	0.66
6-8AWG 3 PAIR(7/8")	C	No	Inside Pole	110.0000 - 0.0000	2	No Ice	0.0000	0.68
						1/2" Ice	0.0000	0.68
						1" Ice	0.0000	0.68
						2" Ice	0.0000	0.68
						4" Ice	0.0000	0.68
A-DQZNB2Yn1750 N(1/4")	C	No	Inside Pole	110.0000 - 0.0000	1	No Ice	0.0000	0.03
						1/2" Ice	0.0000	0.03
						1" Ice	0.0000	0.03
						2" Ice	0.0000	0.03
						4" Ice	0.0000	0.03
***								
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	100.0000 - 0.0000	1	No Ice	0.1980	0.83
						1/2" Ice	0.2980	2.34
						1" Ice	0.3980	4.47
						2" Ice	0.5980	10.55
						4" Ice	0.9980	30.05

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	100.0000 - 0.0000	4	No Ice	0.0000	0.83
						1/2" Ice	0.0000	2.34
						1" Ice	0.0000	4.47
						2" Ice	0.0000	10.55
						4" Ice	0.0000	30.05
***								
LDF4-50A(1/2")	C	No	Inside Pole	49.0000 - 0.0000	1	No Ice	0.0000	0.15
						1/2" Ice	0.0000	0.15
						1" Ice	0.0000	0.15
						2" Ice	0.0000	0.15
						4" Ice	0.0000	0.15
***								
Aero MP3-04	C	No	CaAa (Out Of Face)	25.5000 - 0.5000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
						2" Ice	0.7135	0.00
						4" Ice	1.1579	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	52.0000 - 32.0000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
						2" Ice	0.7135	0.00
						4" Ice	1.1579	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	71.0000 - 61.0000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
						2" Ice	0.7135	0.00
						4" Ice	1.1579	0.00
HB058-M12-XXXF(5/8")	C	No	Inside Pole	147.0000 - 0.0000	1	No Ice	0.0000	0.24
						1/2" Ice	0.0000	0.24
						1" Ice	0.0000	0.24
						2" Ice	0.0000	0.24
						4" Ice	0.0000	0.24

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.0000-99.5000	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	9.599	1.24
L2	99.5000-69.5000	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	12.344	1.40
L3	69.5000-59.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.466	0.49
L4	59.0000-58.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.398	0.05
L5	58.0000-50.5000	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	3.389	0.35
L6	50.5000-50.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.334	0.02
L7	50.0000-29.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	13.101	0.97
L8	29.2500-24.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.493	0.24
L9	24.0000-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	15.874	1.12

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	147.0000-99.5000	A	0.878	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.025	2.61
L2	99.5000-69.5000	A	0.839	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	23.168	2.73
L3	69.5000-59.0000	A	0.812	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.412	0.91
L4	59.0000-58.0000	A	0.803	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	0.723	0.09
L5	58.0000-50.5000	A	0.796	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	6.042	0.64
L6	50.5000-50.0000	A	0.789	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	0.579	0.04
L7	50.0000-29.2500	A	0.766	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	22.526	1.74
L8	29.2500-24.0000	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	4.358	0.44
L9	24.0000-0.0000	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	26.991	1.99

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	147.0000-99.5000	-0.2406	0.1389	-0.3978	0.2297
L2	99.5000-69.5000	-0.4650	0.2685	-0.7505	0.4333
L3	69.5000-59.0000	-0.6625	0.3825	-1.0014	0.5782
L4	59.0000-58.0000	-0.4570	0.2638	-0.7317	0.4225
L5	58.0000-50.5000	-0.5130	0.2962	-0.8042	0.4643
L6	50.5000-50.0000	-0.7151	0.4129	-1.0673	0.6162
L7	50.0000-29.2500	-0.6871	0.3967	-1.0294	0.5943
L8	29.2500-24.0000	-0.5426	0.3133	-0.8439	0.4872
L9	24.0000-0.0000	-0.7270	0.4197	-1.0876	0.6279

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LLPX310R w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice 1/2" Ice 1" Ice	4.9623 5.3512 5.7501 6.5777	2.8484 3.3668 3.9019 5.0799	0.04 0.08 0.12 0.23

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	8.3714	7.8368	0.53
						4" Ice			
FDD_R6_RRH	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	1.7889	0.7778	0.03
						1/2" Ice	1.9715	0.9182	0.04
							2.1627	1.0673	0.06
						1" Ice	2.5710	1.3914	0.09
						2" Ice	3.4914	2.1432	0.20
						4" Ice			
1900MHz RRH (65MHz)	A	From Leg	4.0000 0.00 1.00	0.00	145.0000	No Ice	2.6979	2.7708	0.06
						1/2" Ice	2.9362	3.0111	0.08
							3.1832	3.2600	0.11
						1" Ice	3.7030	3.7837	0.18
						2" Ice	4.8463	4.9348	0.35
						4" Ice			
800 EXTERNAL NOTCH FILTER	A	From Leg	4.0000 0.00 0.00	0.00	145.0000	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
							1.0181	0.5634	0.02
						1" Ice	1.3007	0.7868	0.04
						2" Ice	1.9696	1.3372	0.11
						4" Ice			
800MHZ RRH	A	From Leg	4.0000 0.00 0.00	0.00	145.0000	No Ice	2.4899	2.0685	0.05
						1/2" Ice	2.7061	2.2705	0.07
							2.9310	2.4812	0.10
						1" Ice	3.4068	2.9284	0.16
						2" Ice	4.4620	3.9265	0.32
						4" Ice			
(3) ACU-A20-N	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	0.0778	0.1361	0.00
						1/2" Ice	0.1210	0.1890	0.00
							0.1728	0.2506	0.00
						1" Ice	0.3025	0.3997	0.01
						2" Ice	0.6654	0.8015	0.04
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	8.4975	6.9458	0.08
						1/2" Ice	9.1490	8.1266	0.15
							9.7672	9.0212	0.23
						1" Ice	11.0311	10.8440	0.41
						2" Ice	13.6786	14.8507	0.91
						4" Ice			
LLPX310R w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	4.9623	2.8484	0.04
						1/2" Ice	5.3512	3.3668	0.08
							5.7501	3.9019	0.12
						1" Ice	6.5777	5.0799	0.23
						2" Ice	8.3714	7.8368	0.53
						4" Ice			
FDD_R6_RRH	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	1.7889	0.7778	0.03
						1/2" Ice	1.9715	0.9182	0.04
							2.1627	1.0673	0.06
						1" Ice	2.5710	1.3914	0.09
						2" Ice	3.4914	2.1432	0.20
						4" Ice			
1900MHz RRH (65MHz)	B	From Leg	4.0000 0.00 1.00	0.00	145.0000	No Ice	2.6979	2.7708	0.06
						1/2" Ice	2.9362	3.0111	0.08
							3.1832	3.2600	0.11
						1" Ice	3.7030	3.7837	0.18
						2" Ice	4.8463	4.9348	0.35
						4" Ice			
800 EXTERNAL NOTCH FILTER	B	From Leg	4.0000 0.00 0.00	0.00	145.0000	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
							1.0181	0.5634	0.02
						1" Ice	1.3007	0.7868	0.04
						2" Ice	1.9696	1.3372	0.11
						4" Ice			
800MHZ RRH	B	From Leg	4.0000 0.00 0.00	0.00	145.0000	No Ice	2.4899	2.0685	0.05
						1/2" Ice	2.7061	2.2705	0.07
							2.9310	2.4812	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	3.4068	2.9284	0.16
						2" Ice	4.4620	3.9265	0.32
						4" Ice			
P40-16-XLPP-RR-A w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	9.3725	4.8250	0.07
						1/2" Ice	9.9120	5.5706	0.14
						1" Ice	10.4497	6.2654	0.21
						2" Ice	11.5558	7.8034	0.37
						4" Ice	13.8921	11.1071	0.82
(3) ACU-A20-N	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	0.0778	0.1361	0.00
						1/2" Ice	0.1210	0.1890	0.00
						1" Ice	0.1728	0.2506	0.00
						2" Ice	0.3025	0.3997	0.01
						4" Ice	0.6654	0.8015	0.04
LLPX310R w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	4.9623	2.8484	0.04
						1/2" Ice	5.3512	3.3668	0.08
						1" Ice	5.7501	3.9019	0.12
						2" Ice	6.5777	5.0799	0.23
						4" Ice	8.3714	7.8368	0.53
FDD_R6_RRH	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	1.7889	0.7778	0.03
						1/2" Ice	1.9715	0.9182	0.04
						1" Ice	2.1627	1.0673	0.06
						2" Ice	2.5710	1.3914	0.09
						4" Ice	3.4914	2.1432	0.20
1900MHz RRH (65MHz)	C	From Leg	4.0000 0.00 1.00	0.00	145.0000	No Ice	2.6979	2.7708	0.06
						1/2" Ice	2.9362	3.0111	0.08
						1" Ice	3.1832	3.2600	0.11
						2" Ice	3.7030	3.7837	0.18
						4" Ice	4.8463	4.9348	0.35
800 EXTERNAL NOTCH FILTER	C	From Leg	4.0000 0.00 0.00	0.00	145.0000	No Ice	0.7701	0.3747	0.01
						1/2" Ice	0.8898	0.4647	0.02
						1" Ice	1.0181	0.5634	0.02
						2" Ice	1.3007	0.7868	0.04
						4" Ice	1.9696	1.3372	0.11
800MHZ RRH	C	From Leg	4.0000 0.00 0.00	0.00	145.0000	No Ice	2.4899	2.0685	0.05
						1/2" Ice	2.7061	2.2705	0.07
						1" Ice	2.9310	2.4812	0.10
						2" Ice	3.4068	2.9284	0.16
						4" Ice	4.4620	3.9265	0.32
(3) ACU-A20-N	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	0.0778	0.1361	0.00
						1/2" Ice	0.1210	0.1890	0.00
						1" Ice	0.1728	0.2506	0.00
						2" Ice	0.3025	0.3997	0.01
						4" Ice	0.6654	0.8015	0.04
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	8.4975	6.9458	0.08
						1/2" Ice	9.1490	8.1266	0.15
						1" Ice	9.7672	9.0212	0.23
						2" Ice	11.0311	10.8440	0.41
						4" Ice	13.6786	14.8507	0.91
***									
Side Arm Mount [SO 102-3]	C	None		0.00	145.0000	No Ice	3.0000	3.0000	0.08
						1/2" Ice	3.4800	3.4800	0.11
						1" Ice	3.9600	3.9600	0.14
						2" Ice	4.9200	4.9200	0.20
						4" Ice	6.8400	6.8400	0.32
Platform Mount [LP 712-1]	C	None		0.00	147.0000	No Ice	24.5300	24.5300	1.34

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1/2" Ice	29.9400	29.9400	1.65
						1" Ice	35.3500	35.3500	1.96
						2" Ice	46.1700	46.1700	2.58
						4" Ice	67.8100	67.8100	3.82
***									
***									
***									
(2) S20057A-1	A	From Leg	4.0000 0.00 3.00	0.00	119.0000	No Ice	0.8286	0.3942	0.01
						1/2" Ice	0.9610	0.5048	0.01
						1" Ice	1.1019	0.6242	0.02
						2" Ice	1.4098	0.8887	0.04
						4" Ice	2.1292	1.5216	0.11
APX16DWV-16DWVS-C w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.00	119.0000	No Ice	7.4657	3.4938	0.06
						1/2" Ice	7.9944	4.2631	0.11
						1" Ice	8.5176	4.9598	0.16
						2" Ice	9.5949	6.4031	0.30
						4" Ice	11.8728	9.4897	0.68
(2) S20057A-1	B	From Leg	4.0000 0.00 3.00	0.00	119.0000	No Ice	0.8286	0.3942	0.01
						1/2" Ice	0.9610	0.5048	0.01
						1" Ice	1.1019	0.6242	0.02
						2" Ice	1.4098	0.8887	0.04
						4" Ice	2.1292	1.5216	0.11
APX16DWV-16DWVS-C w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.00	119.0000	No Ice	7.4657	3.4938	0.06
						1/2" Ice	7.9944	4.2631	0.11
						1" Ice	8.5176	4.9598	0.16
						2" Ice	9.5949	6.4031	0.30
						4" Ice	11.8728	9.4897	0.68
(2) S20057A-1	C	From Leg	4.0000 0.00 3.00	0.00	119.0000	No Ice	0.8286	0.3942	0.01
						1/2" Ice	0.9610	0.5048	0.01
						1" Ice	1.1019	0.6242	0.02
						2" Ice	1.4098	0.8887	0.04
						4" Ice	2.1292	1.5216	0.11
APX16DWV-16DWVS-C w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.00	119.0000	No Ice	7.4657	3.4938	0.06
						1/2" Ice	7.9944	4.2631	0.11
						1" Ice	8.5176	4.9598	0.16
						2" Ice	9.5949	6.4031	0.30
						4" Ice	11.8728	9.4897	0.68
***									
T-Arm Mount [TA 601-3]	C	None		0.00	119.0000	No Ice	10.9000	10.9000	0.73
						1/2" Ice	14.6500	14.6500	0.93
						1" Ice	18.4000	18.4000	1.13
						2" Ice	25.9000	25.9000	1.52
						4" Ice	40.9000	40.9000	2.32
(2) 6' x 2" Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	119.0000	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
(2) 6' x 2" Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	119.0000	No Ice	1.4250	1.4250	0.02
						1/2" Ice	1.9250	1.9250	0.03
						1" Ice	2.2939	2.2939	0.05
						2" Ice	3.0596	3.0596	0.09
						4" Ice	4.7022	4.7022	0.23
(2) 6' x 2" Mount Pipe	C	From Leg	4.0000 0.00	0.00	119.0000	No Ice	1.4250	1.4250	0.02
						1/2"	1.9250	1.9250	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	2.2939	2.2939	0.05
						1" Ice	3.0596	3.0596	0.09
						2" Ice	4.7022	4.7022	0.23
						4" Ice			
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.1194 6.6258 7.1283 8.1643 10.3599	4.2543 5.0137 5.7109 7.1553 10.4117	0.06 0.10 0.16 0.29 0.66
(4) LGP2140X	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2600 1.4160 1.5806 1.9358 2.7499	0.3780 0.4932 0.6170 0.8905 1.5412	0.01 0.02 0.03 0.05 0.13
(2) RRUS-11	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
800 10764 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2031 6.6897 7.1782 8.1863 10.3284	4.2940 4.9925 5.6620 7.1004 10.3001	0.06 0.11 0.17 0.30 0.67
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.5667 2.7978 3.0377 3.5432 4.6580	2.5667 2.7978 3.0377 3.5432 4.6580	0.02 0.04 0.07 0.13 0.30
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.1194 6.6258 7.1283 8.1643 10.3599	4.2543 5.0137 5.7109 7.1553 10.4117	0.06 0.10 0.16 0.29 0.66
(4) LGP2140X	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2600 1.4160 1.5806 1.9358 2.7499	0.3780 0.4932 0.6170 0.8905 1.5412	0.01 0.02 0.03 0.05 0.13
(2) RRUS-11	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
800 10764 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2031 6.6897 7.1782 8.1863 10.3284	4.2940 4.9925 5.6620 7.1004 10.3001	0.06 0.11 0.17 0.30 0.67
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.1194 6.6258 7.1283 8.1643 10.3599	4.2543 5.0137 5.7109 7.1553 10.4117	0.06 0.10 0.16 0.29 0.66

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(4) LGP2140X	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.2600 1.4160 1.5806 1.9358 2.7499	0.3780 0.4932 0.6170 0.8905 1.5412	0.01 0.02 0.03 0.05 0.13
(2) RRUS-11	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.2486 3.4905 3.7411 4.2682 5.4260	1.3726 1.5510 1.7380 2.1381 3.0418	0.05 0.07 0.09 0.15 0.31
800 10764 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.2031 6.6897 7.1782 8.1863 10.3284	4.2940 4.9925 5.6620 7.1004 10.3001	0.06 0.11 0.17 0.30 0.67
***									
Platform Mount [LP 712-1]	C	None		0.00	110.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.5300 29.9400 35.3500 46.1700 67.8100	24.5300 29.9400 35.3500 46.1700 67.8100	1.34 1.65 1.96 2.58 3.82
***									
APXV18-206517S-C w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4042 5.9597 6.4808 7.5467 9.9193	4.7000 5.8600 6.7338 8.5150 12.2774	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4042 5.9597 6.4808 7.5467 9.9193	4.7000 5.8600 6.7338 8.5150 12.2774	0.05 0.10 0.15 0.28 0.68
APXV18-206517S-C w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.4042 5.9597 6.4808 7.5467 9.9193	4.7000 5.8600 6.7338 8.5150 12.2774	0.05 0.10 0.15 0.28 0.68
***									
Pipe Mount [PM 601-3]	C	None		0.00	100.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.3900 5.4800 6.5700 8.7500 13.1100	4.3900 5.4800 6.5700 8.7500 13.1100	0.20 0.24 0.28 0.36 0.53
***									
Pipe Mount [PM 501-1]	C	None		0.00	60.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.4700 4.4500 5.4300 7.3900 11.3100	1.6700 2.1000 2.5300 3.3900 5.1100	0.05 0.06 0.07 0.08 0.11
***									
KS24019-L112A	A	From Leg	4.0000 0.00 1.00	0.00	49.0000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.1556 0.2247 0.3025 0.4840 0.9506	0.1556 0.2247 0.3025 0.4840 0.9506	0.01 0.01 0.01 0.02 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
***									
Side Arm Mount [SO 701-1]	C	None		0.00	49.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12
						4" Ice	3.1700	7.0300	0.18
****									
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	7.1342	4.9591	0.08
						1/2" Ice	7.6618	5.7544	0.13
						1" Ice	8.1830	6.4723	0.19
						2" Ice	9.2563	8.0099	0.34
						4" Ice	11.5262	11.4120	0.75
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	7.1342	4.9591	0.08
						1/2" Ice	7.6618	5.7544	0.13
						1" Ice	8.1830	6.4723	0.19
						2" Ice	9.2563	8.0099	0.34
						4" Ice	11.5262	11.4120	0.75
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	4.7198	1.7027	0.07
						1/2" Ice	5.0138	1.9196	0.10
						1" Ice	5.3165	2.1453	0.13
						2" Ice	5.9478	2.6224	0.20
						4" Ice	7.3141	3.6805	0.40
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.00	147.0000	No Ice	7.1342	4.9591	0.08
						1/2" Ice	7.6618	5.7544	0.13
						1" Ice	8.1830	6.4723	0.19
						2" Ice	9.2563	8.0099	0.34
						4" Ice	11.5262	11.4120	0.75

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-2-C	A	Paraboloid w/o Radome	From Leg	1.0000 0.00 2.00	0.00		147.0000	2.1750	No Ice	3.7200	0.01
									1/2" Ice	4.0100	0.02
									1" Ice	4.3000	0.03
									2" Ice	4.8800	0.04
									4" Ice	6.0400	0.07
A-ANT-23G-2-C	C	Paraboloid w/o Radome	From Leg	1.0000 0.00	0.00		147.0000	2.1750	No Ice	3.7200	0.01
									1/2" Ice	4.0100	0.02

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter		Aperture Area	Weight
				ft	°	°	ft	ft		ft^2	K
				2.00					1" Ice	4.3000	0.03
									2" Ice	4.8800	0.04
									4" Ice	6.0400	0.07

Tower Pressures - No Ice

G_H = 1.690

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 147.0000-99.5000	122.3179	1.454	26.85	103.536	A	0.000	103.536	103.536	100.00	0.000	0.000
					B	0.000	103.536		100.00	0.000	0.000
					C	0.000	103.536		100.00	0.000	9.599
L2 99.5000-69.5000	84.0954	1.306	24.16	81.094	A	0.000	81.094	81.094	100.00	0.000	0.000
					B	0.000	81.094		100.00	0.000	0.000
					C	0.000	81.094		100.00	0.000	12.344
L3 69.5000-59.0000	64.2053	1.209	22.37	31.484	A	0.000	31.484	31.484	100.00	0.000	0.000
					B	0.000	31.484		100.00	0.000	0.000
					C	0.000	31.484		100.00	0.000	6.466
L4 59.0000-58.0000	58.4995	1.178	21.78	3.029	A	0.000	3.029	3.029	100.00	0.000	0.000
					B	0.000	3.029		100.00	0.000	0.000
					C	0.000	3.029		100.00	0.000	0.398
L5 58.0000-50.5000	54.2279	1.152	21.32	23.191	A	0.000	23.191	23.191	100.00	0.000	0.000
					B	0.000	23.191		100.00	0.000	0.000
					C	0.000	23.191		100.00	0.000	3.389
L6 50.5000-50.0000	50.2499	1.128	20.86	1.575	A	0.000	1.575	1.575	100.00	0.000	0.000
					B	0.000	1.575		100.00	0.000	0.000
					C	0.000	1.575		100.00	0.000	0.334
L7 50.0000-29.2500	39.4667	1.052	19.47	68.588	A	0.000	68.588	68.588	100.00	0.000	0.000
					B	0.000	68.588		100.00	0.000	0.000
					C	0.000	68.588		100.00	0.000	13.101
L8 29.2500-24.0000	26.6141	1	18.50	17.998	A	0.000	17.998	17.998	100.00	0.000	0.000
					B	0.000	17.998		100.00	0.000	0.000
					C	0.000	17.998		100.00	0.000	2.493
L9 24.0000-0.0000	11.8080	1	18.50	87.500	A	0.000	87.500	87.500	100.00	0.000	0.000
					B	0.000	87.500		100.00	0.000	0.000
					C	0.000	87.500		100.00	0.000	15.874

Tower Pressure - With Ice

G_H = 1.690

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 147.0000-99.5000	122.3179	1.454	5.25	0.8777	110.484	A	0.000	110.484	110.484	100.00	0.000	0.000
						B	0.000	110.484		100.00	0.000	0.000
						C	0.000	110.484		100.00	0.000	18.025
L2 99.5000-69.5000	84.0954	1.306	4.73	0.8391	85.483	A	0.000	85.483	85.483	100.00	0.000	0.000
						B	0.000	85.483		100.00	0.000	0.000
						C	0.000	85.483		100.00	0.000	23.168
L3 69.5000-59.0000	64.2053	1.209	4.38	0.8124	32.905	A	0.000	32.905	32.905	100.00	0.000	0.000
						B	0.000	32.905		100.00	0.000	0.000
						C	0.000	32.905		100.00	0.000	11.412
L4 59.0000-58.0000	58.4995	1.178	4.26	0.8033	3.164	A	0.000	3.164	3.164	100.00	0.000	0.000
						B	0.000	3.164		100.00	0.000	0.000
						C	0.000	3.164		100.00	0.000	0.723

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L5 58.0000-50.5000	54.2279	1.152	4.17	0.7961	24.186	A	0.000	24.186	24.186	100.00	0.000	0.000
						B	0.000	24.186		100.00	0.000	0.000
						C	0.000	24.186		100.00	0.000	6.042
L6 50.5000-50.0000	50.2499	1.128	4.08	0.7888	1.641	A	0.000	1.641	1.641	100.00	0.000	0.000
						B	0.000	1.641		100.00	0.000	0.000
						C	0.000	1.641		100.00	0.000	0.579
L7 50.0000-29.2500	39.4667	1.052	3.81	0.7663	71.238	A	0.000	71.238	71.238	100.00	0.000	0.000
						B	0.000	71.238		100.00	0.000	0.000
						C	0.000	71.238		100.00	0.000	22.526
L8 29.2500-24.0000	26.6141	1	3.62	0.7500	18.669	A	0.000	18.669	18.669	100.00	0.000	0.000
						B	0.000	18.669		100.00	0.000	0.000
						C	0.000	18.669		100.00	0.000	4.358
L9 24.0000-0.0000	11.8080	1	3.62	0.7500	90.500	A	0.000	90.500	90.500	100.00	0.000	0.000
						B	0.000	90.500		100.00	0.000	0.000
						C	0.000	90.500		100.00	0.000	26.991

Tower Pressure - Service

G_H = 1.690

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 147.0000-99.5000	122.3179	1.454	9.29	103.536	A	0.000	103.536	103.536	100.00	0.000	0.000
					B	0.000	103.536		100.00	0.000	0.000
					C	0.000	103.536		100.00	0.000	9.599
L2 99.5000-69.5000	84.0954	1.306	8.36	81.094	A	0.000	81.094	81.094	100.00	0.000	0.000
					B	0.000	81.094		100.00	0.000	0.000
					C	0.000	81.094		100.00	0.000	12.344
L3 69.5000-59.0000	64.2053	1.209	7.74	31.484	A	0.000	31.484	31.484	100.00	0.000	0.000
					B	0.000	31.484		100.00	0.000	0.000
					C	0.000	31.484		100.00	0.000	6.466
L4 59.0000-58.0000	58.4995	1.178	7.54	3.029	A	0.000	3.029	3.029	100.00	0.000	0.000
					B	0.000	3.029		100.00	0.000	0.000
					C	0.000	3.029		100.00	0.000	0.398
L5 58.0000-50.5000	54.2279	1.152	7.38	23.191	A	0.000	23.191	23.191	100.00	0.000	0.000
					B	0.000	23.191		100.00	0.000	0.000
					C	0.000	23.191		100.00	0.000	3.389
L6 50.5000-50.0000	50.2499	1.128	7.22	1.575	A	0.000	1.575	1.575	100.00	0.000	0.000
					B	0.000	1.575		100.00	0.000	0.000
					C	0.000	1.575		100.00	0.000	0.334
L7 50.0000-29.2500	39.4667	1.052	6.74	68.588	A	0.000	68.588	68.588	100.00	0.000	0.000
					B	0.000	68.588		100.00	0.000	0.000
					C	0.000	68.588		100.00	0.000	13.101
L8 29.2500-24.0000	26.6141	1	6.40	17.998	A	0.000	17.998	17.998	100.00	0.000	0.000
					B	0.000	17.998		100.00	0.000	0.000
					C	0.000	17.998		100.00	0.000	2.493
L9 24.0000-0.0000	11.8080	1	6.40	87.500	A	0.000	87.500	87.500	100.00	0.000	0.000
					B	0.000	87.500		100.00	0.000	0.000
					C	0.000	87.500		100.00	0.000	15.874

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

Comb. No.	Description
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	147 - 99.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.56	2.00	-0.68
			Max. Mx	5	-8.95	-433.07	3.85
			Max. My	8	-8.94	-0.79	-434.85
			Max. Vy	5	17.33	-433.07	3.85
			Max. Vx	8	17.35	-0.79	-434.85
			Max. Torque	4			1.17
L2	99.5 - 69.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26.44	4.47	-2.09
			Max. Mx	5	-15.00	-1116.54	6.47
			Max. My	8	-14.99	-1.23	-1120.04
			Max. Vy	5	22.56	-1116.54	6.47
			Max. Vx	8	22.58	-1.23	-1120.04
			Max. Torque	4			1.17
L3	69.5 - 59	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.10	4.92	-2.35
			Max. Mx	5	-16.29	-1248.30	6.90
			Max. My	8	-16.29	-1.29	-1252.11
			Max. Vy	5	23.34	-1248.30	6.90
			Max. Vx	8	23.36	-1.29	-1252.11
			Max. Torque	4			1.16
L4	59 - 58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.70	5.37	-2.60
			Max. Mx	5	-18.28	-1385.04	7.33
			Max. My	8	-18.28	-1.35	-1389.16
			Max. Vy	5	24.30	-1385.04	7.33
			Max. Vx	8	24.32	-1.35	-1389.16
			Max. Torque	4			1.16

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	58 - 50.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.92	5.97	-2.94
			Max. Mx	5	-20.04	-1570.50	7.89
			Max. My	8	-20.03	-1.42	-1575.05
			Max. Vy	5	25.22	-1570.50	7.89
			Max. Vx	8	25.24	-1.42	-1575.05
			Max. Torque	4			1.16
L6	50.5 - 50	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33.09	6.01	-2.97
			Max. Mx	5	-20.18	-1583.11	7.93
			Max. My	8	-20.18	-1.42	-1587.69
			Max. Vy	5	25.29	-1583.11	7.93
			Max. Vx	8	25.31	-1.42	-1587.69
			Max. Torque	4			1.16
L7	50 - 29.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.24	7.24	-3.63
			Max. Mx	5	-24.38	-1990.02	9.08
			Max. My	8	-24.37	-1.54	-1995.47
			Max. Vy	5	27.23	-1990.02	9.08
			Max. Vx	8	27.25	-1.54	-1995.47
			Max. Torque	3			1.23
L8	29.25 - 24	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.18	8.06	-4.11
			Max. Mx	5	-28.46	-2282.76	9.83
			Max. My	8	-28.46	-1.62	-2288.83
			Max. Vy	5	28.52	-2282.76	9.83
			Max. Vx	8	28.54	-1.62	-2288.83
			Max. Torque	3			1.27
L9	24 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-52.87	10.06	-5.27
			Max. Mx	5	-36.73	-3000.46	11.49
			Max. My	8	-36.73	-1.75	-3008.01
			Max. Vy	5	31.38	-3000.46	11.49
			Max. Vx	8	31.40	-1.75	-3008.01
			Max. Torque	8			-1.42

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	52.87	-0.00	0.00
	Max. H_x	11	36.74	31.28	0.06
	Max. H_z	2	36.74	-0.17	31.37
	Max. M_x	2	3002.48	-0.17	31.37
	Max. M_z	5	3000.46	-31.36	0.08
	Max. Torsion	3	1.38	-15.79	27.08
	Min. Vert	8	36.74	-0.03	-31.38
	Min. H_x	5	36.74	-31.36	0.08
	Min. H_z	8	36.74	-0.03	-31.38
	Min. M_x	8	-3008.01	-0.03	-31.38
	Min. M_z	11	-2993.83	31.28	0.06
	Min. Torsion	8	-1.42	-0.03	-31.38

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	36.74	0.00	-0.00	1.53	3.00	0.00
Dead+Wind 0 deg - No Ice	36.74	0.17	-31.37	-3002.48	-23.51	-1.22

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 30 deg - No Ice	36.74	15.79	-27.08	-2587.64	-1515.89	-1.38
Dead+Wind 60 deg - No Ice	36.74	27.20	-15.66	-1497.57	-2603.20	-1.19
Dead+Wind 90 deg - No Ice	36.74	31.36	-0.08	-11.49	-3000.46	-0.64
Dead+Wind 120 deg - No Ice	36.74	27.26	15.74	1511.61	-2612.35	0.24
Dead+Wind 150 deg - No Ice	36.74	15.61	27.21	2609.47	-1487.48	1.05
Dead+Wind 180 deg - No Ice	36.74	0.03	31.38	3008.01	-1.75	1.42
Dead+Wind 210 deg - No Ice	36.74	-15.56	27.22	2611.65	1485.92	1.38
Dead+Wind 240 deg - No Ice	36.74	-27.08	15.83	1526.77	2591.59	0.98
Dead+Wind 270 deg - No Ice	36.74	-31.28	-0.06	-6.86	2993.83	0.41
Dead+Wind 300 deg - No Ice	36.74	-27.13	-15.66	-1497.18	2599.02	-0.24
Dead+Wind 330 deg - No Ice	36.74	-15.69	-27.06	-2584.47	1505.90	-0.82
Dead+Ice+Temp	52.87	0.00	-0.00	5.27	10.06	0.00
Dead+Wind 0 deg+Ice+Temp	52.87	0.04	-7.34	-721.96	4.16	-0.39
Dead+Wind 30 deg+Ice+Temp	52.87	3.69	-6.34	-621.64	-357.26	-0.39
Dead+Wind 60 deg+Ice+Temp	52.87	6.36	-3.67	-357.61	-620.65	-0.29
Dead+Wind 90 deg+Ice+Temp	52.87	7.34	-0.02	2.37	-716.95	-0.10
Dead+Wind 120 deg+Ice+Temp	52.87	6.38	3.68	370.84	-622.76	0.14
Dead+Wind 150 deg+Ice+Temp	52.87	3.65	6.37	636.64	-350.75	0.35
Dead+Wind 180 deg+Ice+Temp	52.87	0.01	7.34	733.24	9.15	0.43
Dead+Wind 210 deg+Ice+Temp	52.87	-3.64	6.37	637.14	369.49	0.39
Dead+Wind 240 deg+Ice+Temp	52.87	-6.34	3.70	374.31	637.09	0.25
Dead+Wind 270 deg+Ice+Temp	52.87	-7.32	-0.01	3.43	734.52	0.06
Dead+Wind 300 deg+Ice+Temp	52.87	-6.35	-3.67	-357.52	638.79	-0.14
Dead+Wind 330 deg+Ice+Temp	52.87	-3.67	-6.33	-620.90	374.06	-0.30
Dead+Wind 0 deg - Service	36.74	0.06	-10.85	-1038.89	-6.12	-0.43
Dead+Wind 30 deg - Service	36.74	5.46	-9.37	-895.26	-523.04	-0.49
Dead+Wind 60 deg - Service	36.74	9.41	-5.42	-517.72	-899.71	-0.41
Dead+Wind 90 deg - Service	36.74	10.85	-0.03	-2.95	-1037.19	-0.22
Dead+Wind 120 deg - Service	36.74	9.43	5.44	524.63	-902.85	0.08
Dead+Wind 150 deg - Service	36.74	5.40	9.41	904.89	-513.20	0.36
Dead+Wind 180 deg - Service	36.74	0.01	10.86	1042.87	1.42	0.49
Dead+Wind 210 deg - Service	36.74	-5.38	9.42	905.70	516.74	0.49
Dead+Wind 240 deg - Service	36.74	-9.37	5.48	529.87	899.69	0.35
Dead+Wind 270 deg - Service	36.74	-10.82	-0.02	-1.35	1038.94	0.15
Dead+Wind 300 deg - Service	36.74	-9.39	-5.42	-517.55	902.26	-0.08
Dead+Wind 330 deg - Service	36.74	-5.43	-9.36	-894.15	523.63	-0.29

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-36.74	0.00	-0.00	36.74	0.00	0.001%
2	0.17	-36.74	-31.37	-0.17	36.74	31.37	0.005%
3	15.79	-36.74	-27.08	-15.79	36.74	27.08	0.000%
4	27.20	-36.74	-15.66	-27.20	36.74	15.66	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
5	31.37	-36.74	-0.08	-31.36	36.74	0.08	0.005%
6	27.26	-36.74	15.74	-27.26	36.74	-15.74	0.000%
7	15.61	-36.74	27.21	-15.61	36.74	-27.21	0.000%
8	0.03	-36.74	31.38	-0.03	36.74	-31.38	0.005%
9	-15.56	-36.74	27.22	15.56	36.74	-27.22	0.000%
10	-27.08	-36.74	15.83	27.08	36.74	-15.83	0.000%
11	-31.28	-36.74	-0.06	31.28	36.74	0.06	0.005%
12	-27.13	-36.74	-15.66	27.13	36.74	15.66	0.000%
13	-15.69	-36.74	-27.06	15.69	36.74	27.06	0.000%
14	0.00	-52.87	0.00	-0.00	52.87	0.00	0.002%
15	0.04	-52.87	-7.34	-0.04	52.87	7.34	0.000%
16	3.69	-52.87	-6.34	-3.69	52.87	6.34	0.000%
17	6.36	-52.87	-3.67	-6.36	52.87	3.67	0.000%
18	7.34	-52.87	-0.02	-7.34	52.87	0.02	0.000%
19	6.38	-52.87	3.68	-6.38	52.87	-3.68	0.000%
20	3.65	-52.87	6.37	-3.65	52.87	-6.37	0.000%
21	0.01	-52.87	7.34	-0.01	52.87	-7.34	0.000%
22	-3.64	-52.87	6.37	3.64	52.87	-6.37	0.000%
23	-6.34	-52.87	3.70	6.34	52.87	-3.70	0.000%
24	-7.32	-52.87	-0.01	7.32	52.87	0.01	0.000%
25	-6.35	-52.87	-3.67	6.35	52.87	3.67	0.000%
26	-3.67	-52.87	-6.33	3.67	52.87	6.33	0.000%
27	0.06	-36.74	-10.85	-0.06	36.74	10.85	0.006%
28	5.46	-36.74	-9.37	-5.46	36.74	9.37	0.002%
29	9.41	-36.74	-5.42	-9.41	36.74	5.42	0.001%
30	10.85	-36.74	-0.03	-10.85	36.74	0.03	0.006%
31	9.43	-36.74	5.45	-9.43	36.74	-5.44	0.002%
32	5.40	-36.74	9.41	-5.40	36.74	-9.41	0.002%
33	0.01	-36.74	10.86	-0.01	36.74	-10.86	0.006%
34	-5.38	-36.74	9.42	5.38	36.74	-9.42	0.001%
35	-9.37	-36.74	5.48	9.37	36.74	-5.48	0.002%
36	-10.82	-36.74	-0.02	10.82	36.74	0.02	0.006%
37	-9.39	-36.74	-5.42	9.39	36.74	5.42	0.002%
38	-5.43	-36.74	-9.36	5.43	36.74	9.36	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	13	0.00005490	0.00008173
3	Yes	17	0.00000001	0.00005457
4	Yes	17	0.00000001	0.00005680
5	Yes	13	0.00005491	0.00012426
6	Yes	17	0.00000001	0.00005639
7	Yes	16	0.00000001	0.00014997
8	Yes	13	0.00005489	0.00012498
9	Yes	17	0.00000001	0.00005662
10	Yes	17	0.00000001	0.00005544
11	Yes	13	0.00005493	0.00010012
12	Yes	17	0.00000001	0.00005536
13	Yes	17	0.00000001	0.00005567
14	Yes	8	0.00000001	0.00005550
15	Yes	15	0.00000001	0.00010404
16	Yes	15	0.00000001	0.00011170
17	Yes	15	0.00000001	0.00011180
18	Yes	15	0.00000001	0.00010312
19	Yes	15	0.00000001	0.00011369
20	Yes	15	0.00000001	0.00011314
21	Yes	15	0.00000001	0.00010574
22	Yes	15	0.00000001	0.00011581
23	Yes	15	0.00000001	0.00011626
24	Yes	15	0.00000001	0.00010587
25	Yes	15	0.00000001	0.00011448
26	Yes	15	0.00000001	0.00011380

27	Yes	12	0.00015000	0.00009543
28	Yes	13	0.00000001	0.00013222
29	Yes	14	0.00000001	0.00006436
30	Yes	12	0.00014999	0.00009589
31	Yes	13	0.00000001	0.00014379
32	Yes	13	0.00000001	0.00013480
33	Yes	12	0.00015000	0.00010022
34	Yes	14	0.00000001	0.00006518
35	Yes	13	0.00000001	0.00013756
36	Yes	12	0.00014998	0.00009361
37	Yes	13	0.00000001	0.00014174
38	Yes	13	0.00000001	0.00014483

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 99.5	32.38	31	1.92	0.00
L2	103.25 - 69.5	15.97	31	1.54	0.00
L3	69.5 - 59	6.89	31	0.97	0.00
L4	63.75 - 58	5.78	31	0.88	0.00
L5	58 - 50.5	4.76	31	0.82	0.00
L6	50.5 - 50	3.57	31	0.69	0.00
L7	50 - 29.25	3.50	31	0.68	0.00
L8	34.5 - 24	1.67	31	0.44	0.00
L9	24 - 0	0.80	31	0.32	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.0000	A-ANT-23G-2-C	31	32.38	1.92	0.00	33124
147.0000	LLPX310R w/ Mount Pipe	31	32.38	1.92	0.00	33124
145.0000	1900MHz RRH (65MHz)	31	31.58	1.91	0.00	33124
119.0000	(2) S20057A-1	31	21.50	1.72	0.00	5914
110.0000	(2) 7770.00 w/ Mount Pipe	31	18.26	1.63	0.00	4475
100.0000	APXV18-206517S-C w/ Mount Pipe	31	14.92	1.50	0.00	3663
60.0000	Pipe Mount [PM 501-1]	31	5.11	0.84	0.00	4406
49.0000	KS24019-L112A	31	3.36	0.67	0.00	3412

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	147 - 99.5	93.38	6	5.56	0.01
L2	103.25 - 69.5	46.10	6	4.46	0.01
L3	69.5 - 59	19.91	6	2.79	0.00
L4	63.75 - 58	16.71	6	2.54	0.00
L5	58 - 50.5	13.75	6	2.36	0.00
L6	50.5 - 50	10.32	6	2.00	0.00
L7	50 - 29.25	10.12	6	1.98	0.00
L8	34.5 - 24	4.82	6	1.28	0.00
L9	24 - 0	2.32	6	0.93	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.0000	A-ANT-23G-2-C	6	93.38	5.56	0.01	11678
147.0000	LLPX310R w/ Mount Pipe	6	93.38	5.56	0.01	11678
145.0000	1900MHz RRH (65MHz)	6	91.08	5.52	0.01	11678
119.0000	(2) S20057A-1	6	62.02	4.98	0.01	2082
110.0000	(2) 7770.00 w/ Mount Pipe	6	52.70	4.71	0.01	1573
100.0000	APXV18-206517S-C w/ Mount Pipe	6	43.07	4.32	0.01	1286
60.0000	Pipe Mount [PM 501-1]	6	14.75	2.43	0.00	1531
49.0000	KS24019-L112A	6	9.71	1.94	0.00	1184

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	147 - 99.5 (1)	TP30.313x22x0.25	47.5000	0.0000	0.0	36.00	23.6724	-8.93	852.21	0.010
L2	99.5 - 69.5 (2)	TP35.0626x29.1567x0.3125	33.7500	0.0000	0.0	39.00	34.9673	-14.99	1363.72	0.011
L3	69.5 - 59 (3)	TP36.9x35.0626x0.4301	10.5000	0.0000	0.0	34.46	49.3591	-16.28	1701.11	0.010
L4	59 - 58 (4)	TP36.45x35.2086x0.375	5.7500	0.0000	0.0	39.00	43.5606	-18.27	1698.86	0.011
L5	58 - 50.5 (5)	TP37.7624x36.45x0.4272	7.5000	0.0000	0.0	36.44	51.3518	-20.03	1871.47	0.011
L6	50.5 - 50 (6)	TP37.8499x37.7624x0.5406	0.5000	0.0000	0.0	33.98	64.9396	-20.17	2206.91	0.009
L7	50 - 29.25 (7)	TP41.481x37.8499x0.479	20.7500	0.0000	0.0	34.60	61.8224	-24.37	2139.18	0.011
L8	29.25 - 24 (8)	TP41.6499x39.6043x0.5047	10.5000	0.0000	0.0	36.61	66.8677	-28.45	2448.16	0.012
L9	24 - 0 (9)	TP45.85x41.6499x0.5901	24.0000	0.0000	0.0	34.71	85.9921	-36.73	2984.79	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 $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	147 - 99.5 (1)	TP30.313x22x0.25	438.19	30.92	36.00	0.859	0.00	0.00	36.00	0.000
L2	99.5 - 69.5 (2)	TP35.0626x29.1567x0.3125	1125.77	45.52	39.00	1.167	0.00	0.00	39.00	0.000
L3	69.5 - 59 (3)	TP36.9x35.0626x0.4301	1258.23	35.25	34.46	1.023	0.00	0.00	34.46	0.000
L4	59 - 58 (4)	TP36.45x35.2086x0.375	1395.67	43.70	39.00	1.121	0.00	0.00	39.00	0.000
L5	58 - 50.5 (5)	TP37.7624x36.45x0.4272	1582.06	40.65	36.44	1.115	0.00	0.00	36.44	0.000
L6	50.5 - 50 (6)	TP37.8499x37.7624x0.5406	1594.73	32.52	33.98	0.957	0.00	0.00	33.98	0.000
L7	50 - 29.25 (7)	TP41.481x37.8499x0.479	2003.53	39.84	34.60	1.152	0.00	0.00	34.60	0.000
L8	29.25 - 24 (8)	TP41.6499x39.6043x0.5047	2297.55	41.17	36.61	1.124	0.00	0.00	36.61	0.000
L9	24 - 0 (9)	TP45.85x41.6499x0.5901	3018.17	38.26	34.71	1.102	0.00	0.00	34.71	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	147 - 99.5 (1)	TP30.313x22x0.25	17.44	0.74	24.00	0.062	0.42	0.01	24.00	0.001
L2	99.5 - 69.5 (2)	TP35.0626x29.1567x0.3125	22.67	0.65	26.00	0.051	0.27	0.01	26.00	0.000
L3	69.5 - 59 (3)	TP36.9x35.0626x0.4301	23.45	0.48	22.98	0.042	0.22	0.00	22.98	0.000
L4	59 - 58 (4)	TP36.45x35.2086x0.375	24.42	0.56	26.00	0.044	0.18	0.00	26.00	0.000
L5	58 - 50.5 (5)	TP37.7624x36.45x0.4272	25.34	0.49	24.30	0.041	0.13	0.00	24.30	0.000
L6	50.5 - 50 (6)	TP37.8499x37.7624x0.5406	25.40	0.39	22.66	0.035	0.13	0.00	22.66	0.000
L7	50 - 29.25 (7)	TP41.481x37.8499x0.479	27.34	0.44	23.07	0.039	0.04	0.00	23.07	0.000
L8	29.25 - 24 (8)	TP41.6499x39.6043x0.5047	28.64	0.43	24.41	0.036	0.04	0.00	24.41	0.000
L9	24 - 0 (9)	TP45.85x41.6499x0.5901	31.49	0.37	23.14	0.032	0.24	0.00	23.14	0.000

Pole Interaction Design Data

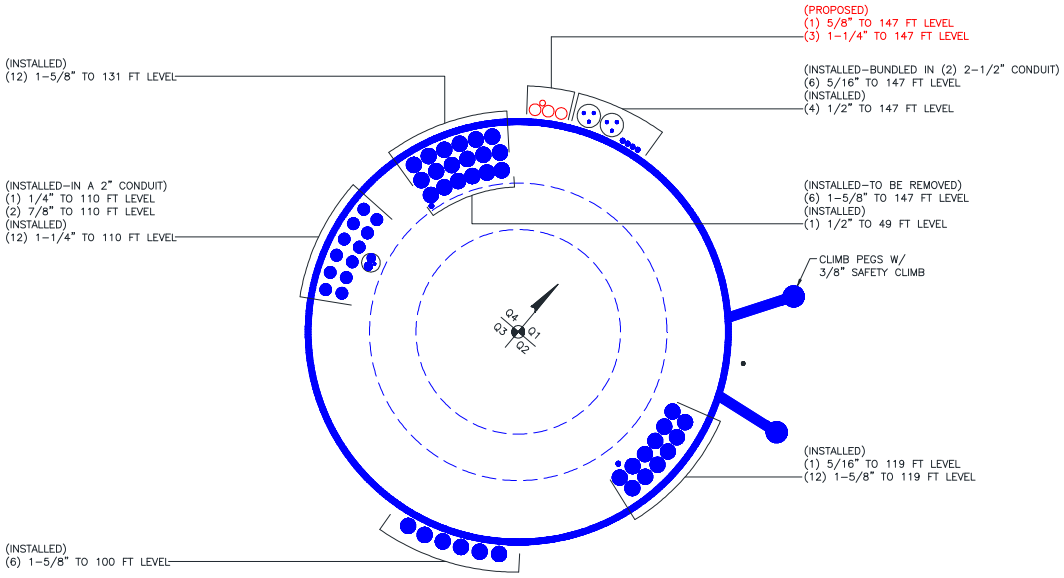
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	147 - 99.5 (1)	0.010	0.859	0.000	0.062	0.001	0.870 ✔	1.333	H1-3+VT ✔
L2	99.5 - 69.5 (2)	0.011	1.167	0.000	0.051	0.000	1.179 ✔	1.333	H1-3+VT ✔
L3	69.5 - 59 (3)	0.010	1.023	0.000	0.042	0.000	1.033 ✔	1.333	H1-3+VT ✔
L4	59 - 58 (4)	0.011	1.121	0.000	0.044	0.000	1.132 ✔	1.333	H1-3+VT ✔
L5	58 - 50.5 (5)	0.011	1.115	0.000	0.041	0.000	1.126 ✔	1.333	H1-3+VT ✔
L6	50.5 - 50 (6)	0.009	0.957	0.000	0.035	0.000	0.966 ✔	1.333	H1-3+VT ✔
L7	50 - 29.25 (7)	0.011	1.152	0.000	0.039	0.000	1.163 ✔	1.333	H1-3+VT ✔
L8	29.25 - 24 (8)	0.012	1.124	0.000	0.036	0.000	1.136 ✔	1.333	H1-3+VT ✔
L9	24 - 0 (9)	0.012	1.102	0.000	0.032	0.000	1.115 ✔	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	147 - 99.5	Pole	TP30.313x22x0.25	1	-8.93	1135.99	65.3	Pass
L2	99.5 - 69.5	Pole	TP35.0626x29.1567x0.3125	2	-14.99	1817.84	88.4	Pass
L3	69.5 - 59	Pole	TP36.9x35.0626x0.4301	3	-16.28	2267.58	77.5	Pass
L4	59 - 58	Pole	TP36.45x35.2086x0.375	4	-18.27	2264.58	84.9	Pass
L5	58 - 50.5	Pole	TP37.7624x36.45x0.4272	5	-20.03	2494.67	84.5	Pass
L6	50.5 - 50	Pole	TP37.8499x37.7624x0.5406	6	-20.17	2941.81	72.5	Pass
L7	50 - 29.25	Pole	TP41.481x37.8499x0.479	7	-24.37	2851.53	87.3	Pass
L8	29.25 - 24	Pole	TP41.6499x39.6043x0.5047	8	-28.45	3263.40	85.2	Pass
L9	24 - 0	Pole	TP45.85x41.6499x0.5901	9	-36.73	3978.72	83.6	Pass
							Summary	
						Pole (L2)	88.4	Pass
						RATING =	**88.4**	**Pass**

APPENDIX B

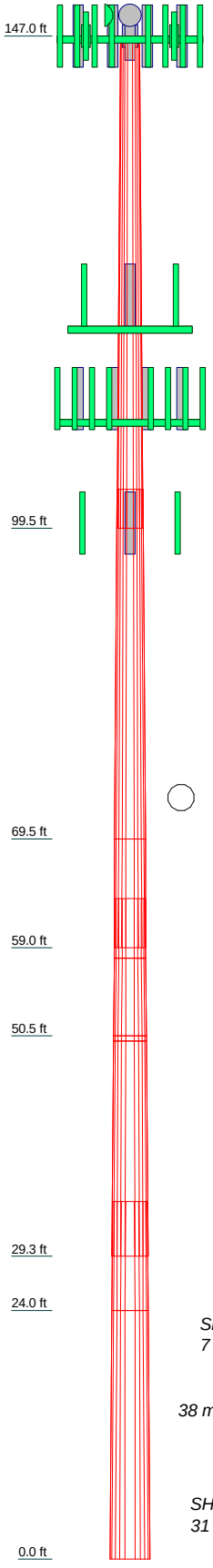
BASE LEVEL DRAWING


(PROPOSED)
(1) 5/8" TO 147 FT LEVEL
(3) 1-1/4" TO 147 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 131 FT LEVEL
(INSTALLED-BUNDLED IN (2) 2-1/2" CONDUIT)
(6) 5/16" TO 147 FT LEVEL
(INSTALLED)
(4) 1/2" TO 147 FT LEVEL
(INSTALLED-IN A 2" CONDUIT)
(1) 1/4" TO 110 FT LEVEL
(2) 7/8" TO 110 FT LEVEL
(INSTALLED)
(12) 1-1/4" TO 110 FT LEVEL
(INSTALLED-TO BE REMOVED)
(6) 1-5/8" TO 147 FT LEVEL
(INSTALLED)
(1) 1/2" TO 49 FT LEVEL
CLIMB PEGS W/
3/8" SAFETY CLIMB
(INSTALLED)
(1) 5/16" TO 119 FT LEVEL
(12) 1-5/8" TO 119 FT LEVEL
(INSTALLED)
(6) 1-5/8" TO 100 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9
Length (ft)	47.5000	33.7500	5.7500	0.5000	7.5000	0.5000	20.7500	10.5000	24.0000
Number of Sides	12	12	12	12	12	12	12	12	12
Thickness (in)	0.2500	0.3125	0.4301	0.3750	0.4271	0.5405	0.4790	0.5047	0.5900
Socket Length (ft)	3.7500		4.7500				5.2500		
Top Dia (in)	22.0000	29.1567	35.0626	35.2086	36.4500	37.7624	37.8499	39.6043	41.6499
Bot Dia (in)	30.3130	35.0626	36.9000	36.4500	37.7624	37.8499	41.4810	41.6499	45.8500
Grade	A607-60	A607-65	Reinf 57.44 ksi	Reinf 57.67 ksi	Reinf 60.74 ksi	Reinf 56.64 ksi	Reinf 57.67 ksi	Reinf 57.67 ksi	Reinf 57.85 ksi / Reinf 61.02 ksi
Weight (K)	3.4	3.7	1.8	0.8	1.3	0.1	4.3	2.3	6.7
									24.3



AXIAL 53 K
SHEAR 7 K
MOMENT 739 kip-ft
TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE

AXIAL 37 K
SHEAR 31 K
MOMENT 3018 kip-ft
TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	147	(2) S20057A-1	119
FDD_R6_RRH	147	APX16DWV-16DWVS-C w/ Mount Pipe	119
(3) ACU-A20-N	147	(2) S20057A-1	119
APXVSPP18-C-A20 w/ Mount Pipe	147	APX16DWV-16DWVS-C w/ Mount Pipe	119
LLPX310R w/ Mount Pipe	147	(2) S20057A-1	119
FDD_R6_RRH	147	APX16DWV-16DWVS-C w/ Mount Pipe	119
P40-16-XLPP-RR-A w/ Mount Pipe	147	T-Arm Mount [TA 601-3]	119
(3) ACU-A20-N	147	(2) 6' x 2" Mount Pipe	119
LLPX310R w/ Mount Pipe	147	800 10764 w/ Mount Pipe	110
FDD_R6_RRH	147	(2) 7770.00 w/ Mount Pipe	110
(3) ACU-A20-N	147	(4) LGP2140X	110
APXVSPP18-C-A20 w/ Mount Pipe	147	(2) RRUS-11	110
Platform Mount [LP 712-1]	147	800 10764 w/ Mount Pipe	110
TD-RRH8x20-25	147	Platform Mount [LP 712-1]	110
APXVTM14-C-120 w/ Mount Pipe	147	(2) 7770.00 w/ Mount Pipe	110
TD-RRH8x20-25	147	(4) LGP2140X	110
APXVTM14-C-120 w/ Mount Pipe	147	(2) RRUS-11	110
TD-RRH8x20-25	147	800 10764 w/ Mount Pipe	110
APXVTM14-C-120 w/ Mount Pipe	147	DC6-48-60-18-8F	110
A-ANT-23G-2-C	147	(2) 7770.00 w/ Mount Pipe	110
A-ANT-23G-2-C	147	(4) LGP2140X	110
Side Arm Mount [SO 102-3]	145	(2) RRUS-11	110
800 EXTERNAL NOTCH FILTER	145	APXV18-206517S-C w/ Mount Pipe	100
800MHZ RRH	145	APXV18-206517S-C w/ Mount Pipe	100
1900MHz RRH (65MHz)	145	Pipe Mount [PM 601-3]	100
1900MHz RRH (65MHz)	145	APXV18-206517S-C w/ Mount Pipe	100
1900MHz RRH (65MHz)	145	Pipe Mount [PM 501-1]	60
800 EXTERNAL NOTCH FILTER	145	Side Arm Mount [SO 701-1]	49
800MHZ RRH	145	KS24019-L112A	49
800 EXTERNAL NOTCH FILTER	145		
800MHZ RRH	145		
(2) 6' x 2" Mount Pipe	119		
(2) 6' x 2" Mount Pipe	119		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 56.64 ksi	57 ksi	71 ksi
A607-65	65 ksi	80 ksi	Reinf 57.67 ksi	58 ksi	73 ksi
Reinf 57.44 ksi	57 ksi	65 ksi	Reinf 61.02 ksi	61 ksi	77 ksi
Reinf 60.74 ksi	61 ksi	76 ksi	Reinf 57.85 ksi	58 ksi	73 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 88.4%

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

Job:	***147' MP; Branford Banm Tower; Branford, CT***		
Project:	***PJF# 37512-1607 (BU# 876321)***		
Client: CCI	Drawn by: John J Woolley	App'd:	
Code: TIA/EIA-222-F	Date: 01/08/14	Scale: NTS	
Path: G:\TOWER\375_Crown_Castle\2013\37513-2417 BU 876321\37513-2417 R1 WO 694213 BU 876321\37513-2417 R1.eri		Dwg No. E-1	

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#: *876321*
Site Name: *Branford Banm*
App #:

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	54	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	54	in
Thick:	3.5	in
Grade:	50	ksi
Clip Distance:	4	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:	45.85	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3018	ft-kips
Unfactored Axial, P:	37	kips
Unfactored Shear, V:	31	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	165.4	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	84.8%	**Pass**

Base Plate Results Flexural Check

Base Plate Stress:	34.5	ksi
Allowable PL Bending Stress:	50.0	ksi
Base Plate Stress Ratio:	69.0%	**Pass**

PL Ref. Data	
Yield Line (in):	30.52
Max PL Length:	30.52

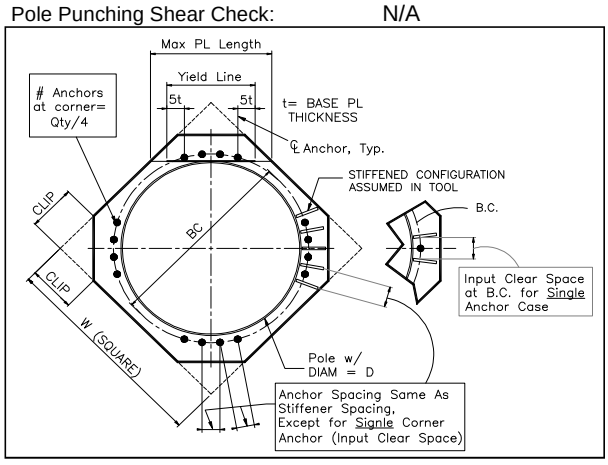
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

Foundation Loads:

Pole weight or tower leg compression =	**37**	(kips)
Horizontal load at top of pier =	**31**	(kips)
Overturning moment at top of pier=	**3018**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	

Soil Properties:

Soil density =	**125**	(pcf)
Allowable soil bearing =	**4**	(ksf)
Depth to water table =	**4.5**	(ft)

Dimensions:

Pier shape (round or square)	**S**	("R" or "S")
Pier width =	**7**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**11**	(ft)
Footing thickness =	**3**	(ft)
Footing width =	**20.5**	(ft)
Footing length =	**20.5**	(ft)

Concrete:

Concrete strength =	**3**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

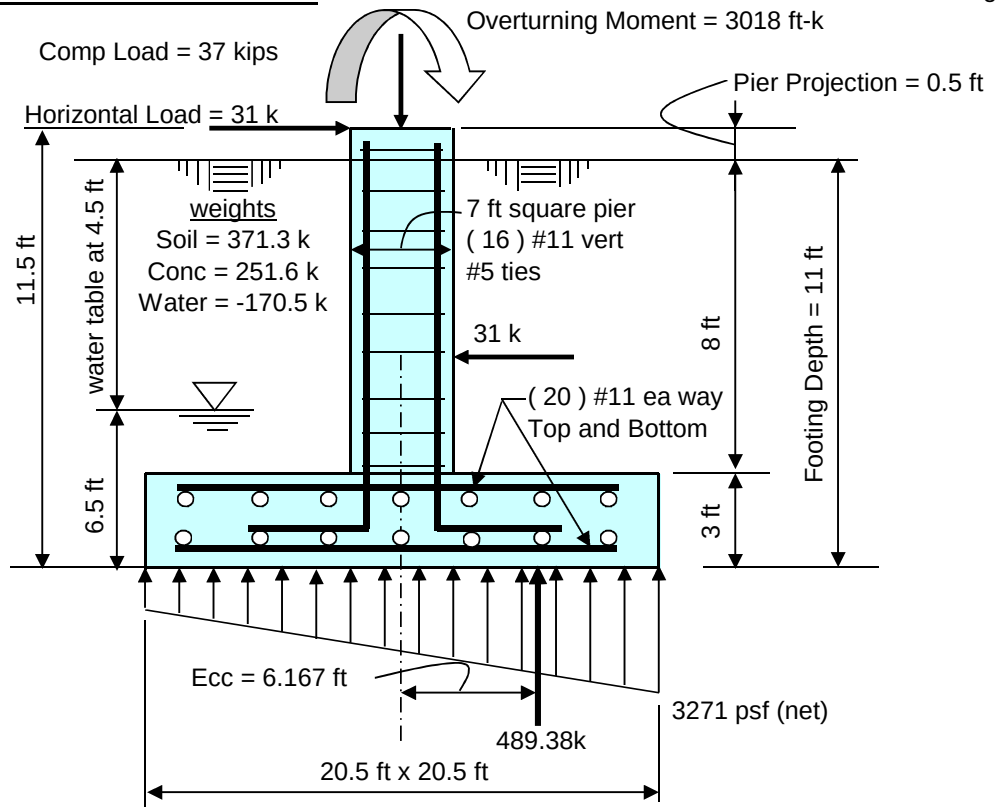
Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#11**	bar
quantity of pad rebar =	**20**	(ea direction)

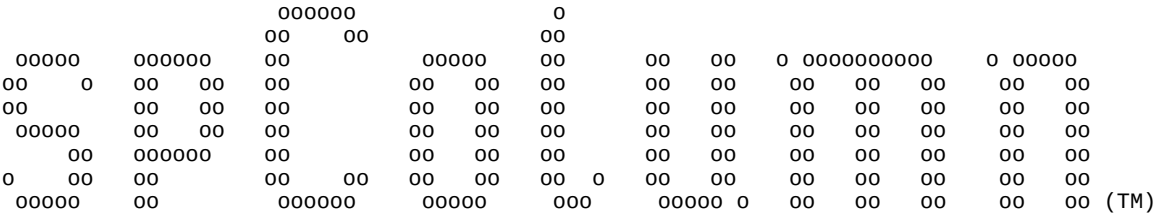
Reinforcing Steel:

	Pier	
size of vert rebar in pier=	**#11**	bar
vertical rebar quantity =	**16**	
size of pier ties =	**#5**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 62.1 cu yd



Summary of analysis results	
Maximum Net Soil Bearing = 3.271 ksf Allowable Net Soil Bearing = 4 ksf **Soil Bearing Stress Ratio = 0.82 Okay**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 45 psi **Bending Shear Stress Ratio = 0.41 Okay**
Ftg Overturning Resistance = 5016 ft-kips Overturning Moment = 3018 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 1.662 **Ratio = 0.9 Okay**	Pad Bending Moment Capacity= 4134 ft-k Pad Bending Moment = 1298 ft-k **Bending Moment Stress Ratio = 0.31 OK**



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

General Information:
==========
File Name: g:\tower\375_crown_castle\2013\37513-2417 bu 876321\37513-2417 r1 wo...\37513-2417 r1.col
Project: 37512-1607
Column: Engineer:
Code: ACI 318-02 Units: English

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

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

Section:
========
Rectangular: Width = 84 in Depth = 84 in

Gross section area, Ag = 7056 in^2
Ix = 4.14893e+006 in^4 Iy = 4.14893e+006 in^4
rx = 24.2487 in ry = 24.2487 in
Xo = 0 in Yo = 0 in

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

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

Confinement: Tied; #5 ties with #11 bars, #5 with larger bars.
phi(a) = 0.8, phi(b) = 0.9, phi(c) = 0.65

Pattern: Irregular
Total steel area: As = 30.21 in^2 at rho = 0.43% (Note: rho < 0.50%)
Minimum clear spacing = 10.31 in

Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)	Area in^2	X (in)	Y (in)
1.56	-37.7	37.7	1.75	16.5	26.1	1.56	-18.8	37.7
1.75	-21.9	21.9	1.56	0.0	37.7	1.75	9.5	-29.4
1.56	18.8	37.7	1.56	37.7	37.7	1.56	-37.7	-37.7
1.56	-18.8	-37.7	1.56	0.0	-37.7	1.56	18.8	-37.7
1.56	37.7	-37.7	1.56	-37.7	18.8	1.56	-37.7	0.0
1.56	-37.7	-18.8	1.56	37.7	18.8	1.56	37.7	0.0
1.56	37.7	-18.8						

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

No.	Pu kip	Mux k-ft	PhiMnx k-ft	PhiMn/Mu	NA depth in	Dt depth in	eps_t	Phi
1	37.00	4265.95	5295.55	1.241	11.36	79.67	0.01804	0.900

*** End of output ***

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC040

Branford BANM Tower

150 North Main Street
Branford, CT 06405

March 7, 2014

EBI Project Number: 62140948

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

EBI Consulting
environmental | engineering | due diligence

March 7, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC040 - Branford BANM Tower

Site Total: 56.862% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 150 North Main Street, Branford, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (µW/cm^2). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 µW/cm^2, and the general population exposure limit for the 1900 MHz and 2500 MHz bands band is 1000 µW/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 150 North Main Street, Branford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

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

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 , the RFS APXVTMM-C-120 and the Powerwave P40-16-XLPP-RR-A. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTMM-C-120 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The Powerwave P40-16-XLPP-RR-A has a 15.9 dBd gain value at its main lobe at 1900 MHz and 14.2 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.
7) The antenna mounting height centerline for the proposed antennas is**147 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	CT03XC040 - Branford BANM Tower
Site Addresss	150 North Main Street, Branford, CT 06405
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 in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Antenna Height Meters	Cable Size	Cable Loss (dB)	Additional Loss (dB)	Gain Factor	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	147	141	42.97732	1/2 "	0.5	3	17.378008	1042.6805	18.85467	1.88547%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147	141	42.97732	1/2 "	0.5	3	9.7723722	195.44744	3.534254	0.62333%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	147	141	42.97732	1/2 "	0.5	3	9.7723722	390.89489	7.068508	1.24665%
																	Sector total Power Density Value:		3.755%

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 in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Antenna Height Meters	Cable Size	Cable Loss (dB)	Additional Loss (dB)	Gain Factor	ERP	Power Density Value	Power Density Percentage
2a	Powerwave	P40-16-XLPP-RR-A	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	147	141	42.97732	1/2 "	0.5	3	17.378008	1042.6805	18.85467	1.88547%
2a	Powerwave	P40-16-XLPP-RR-A	RRH	850 MHz	CDMA / LTE	20	1	20	14.2	147	141	42.97732	1/2 "	0.5	3	11.748976	234.97951	4.249108	0.74940%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	147	141	42.97732	1/2 "	0.5	3	9.7723722	390.89489	7.068508	1.24665%
																	Sector total Power Density Value:		3.882%

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 in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Antenna Height Meters	Cable Size	Cable Loss (dB)	Additional Loss (dB)	Gain Factor	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	15.9	147	141	42.97732	1/2 "	0.5	3	17.378008	1042.6805	18.85467	1.88547%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	147	141	42.97732	1/2 "	0.5	3	9.7723722	195.44744	3.534254	0.62333%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	147	141	42.97732	1/2 "	0.5	3	9.7723722	390.89489	7.068508	1.24665%
																	Sector total Power Density Value:		3.755%

Site Composite MPE %

Carrier	MPE %
Sprint	11.392%
AT&T	30.000%
MetroPCS	4.930%
PageNet	1.000%
Cingular UMTS	1.490%
Nextel	4.170%
Clearwire	0.880%
T-Mobile	3.000%
Total Site MPE %	**56.862%**

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **11.392% (3.755% from sectors 1 and 3 and 3.882% from sector 2)** 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 **57.862%** 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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