Crown Castle
3530 Toringdon Way
Suite 300
Charlotte, NC 28277

Tel: 704-405-6600

www.crowncastle.com

March 24, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 876326**
Sprint PCS Site ID: CT03XC065
Located at: 440 Hayden Station Road, Windsor, CT 06095

Dear Ms. Bachman:

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

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **440 Hayden Station Road, Windsor, CT 06095**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

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

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

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

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

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

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

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

Sincerely,

Jeff Barbadora
Real Estate Specialist

Enclosures

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

cc: The Honorable Donald S. Trinks, Mayor
Town of Windsor
275 Broad Street
Windsor, CT 06095

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	HAYDEN STATION
SITE CASCADE:	CT03XC065
SITE NUMBER:	876326
SITE ADDRESS:	440 HAYDEN STATION ROAD WINDSOR, CT 06095
SITE TYPE:	MONOPOLE TOWER
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

TOWER OWNER:
CROWN ATLANTIC COMPANY LLC
2000 CORPORATE DRIVE
CANONSBURG, PA 15317

LATITUDE (NAD83):
41° 53' 52.2" N
41.89784°

LONGITUDE (NAD83):
72° 38' 38.7" W
-72.64409°

COUNTY:
HARTFORD

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
TBD

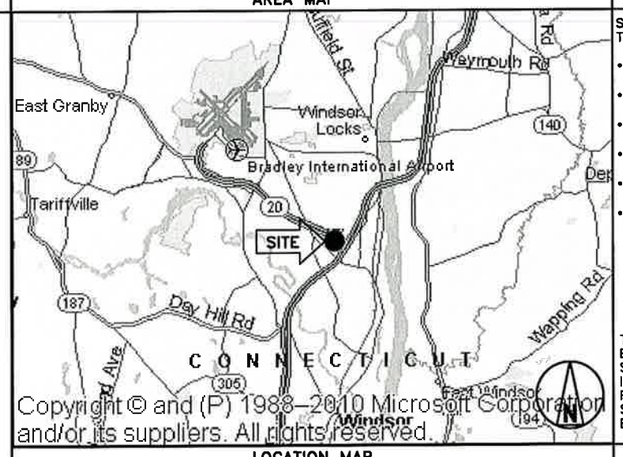
POWER COMPANY:
CONNECTICUT LIGHT & POWER
(860) 947-2000

AAV PROVIDER:
TBD

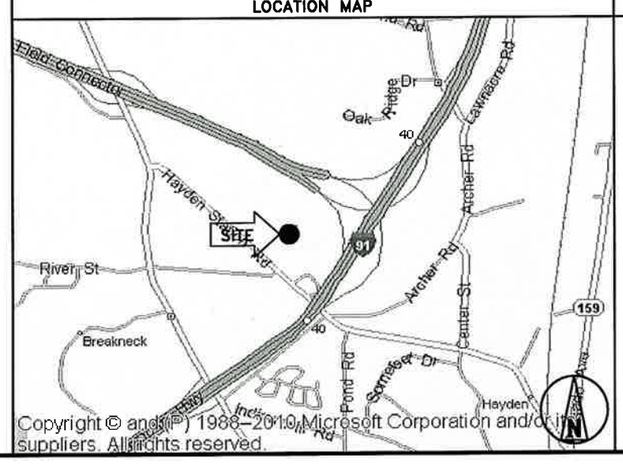
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
peter.culbert@sprint.com

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

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL 2.5 EQUIPMENT IN EXISTING N.V. MMBS
- 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	0
SP-1	SPRINT SPECIFICATIONS	0
SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION & CABLE PLAN	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	COLOR CODING & NOTES	0
A-5	EQUIPMENT & MOUNTING DETAILS	0
A-6	CIVIL DETAILS	0
A-7	PLUMBING DIAGRAM	0
E-1	ELECTRICAL & GROUNDING PLAN	0
E-2	ELECTRICAL & GROUNDING DETAILS	0

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

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

MLA PARTNER:
CROWN CASTLE

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

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:
HAYDEN STATION

SITE CASCADE:
CT03XC065

SITE ADDRESS:
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:
TITLE SHEET
& PROJECT DATA

SHEET NUMBER:
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

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

B. COMPANY: SPRINT CORPORATION

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

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

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

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.

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

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

5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED

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

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

440 HAYDEN STATION ROAD
WINDSOR, CT 06095

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

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:
HAYDEN STATION

SITE CASCADE:
CT03XC065

SITE ADDRESS:
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

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	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

440 HAYDEN STATION ROAD
WINDSOR, CT 06095

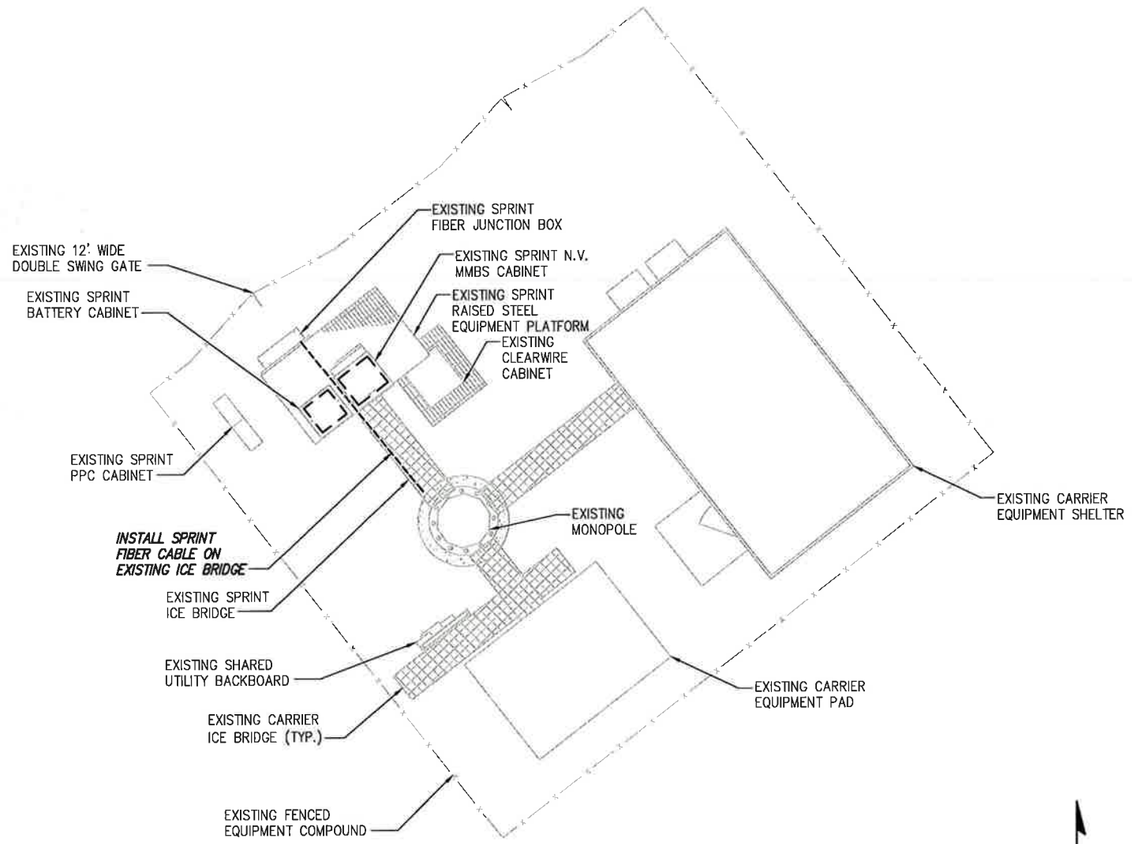
SHEET DESCRIPTION:

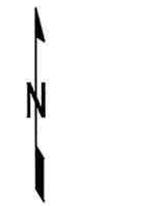
SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-3

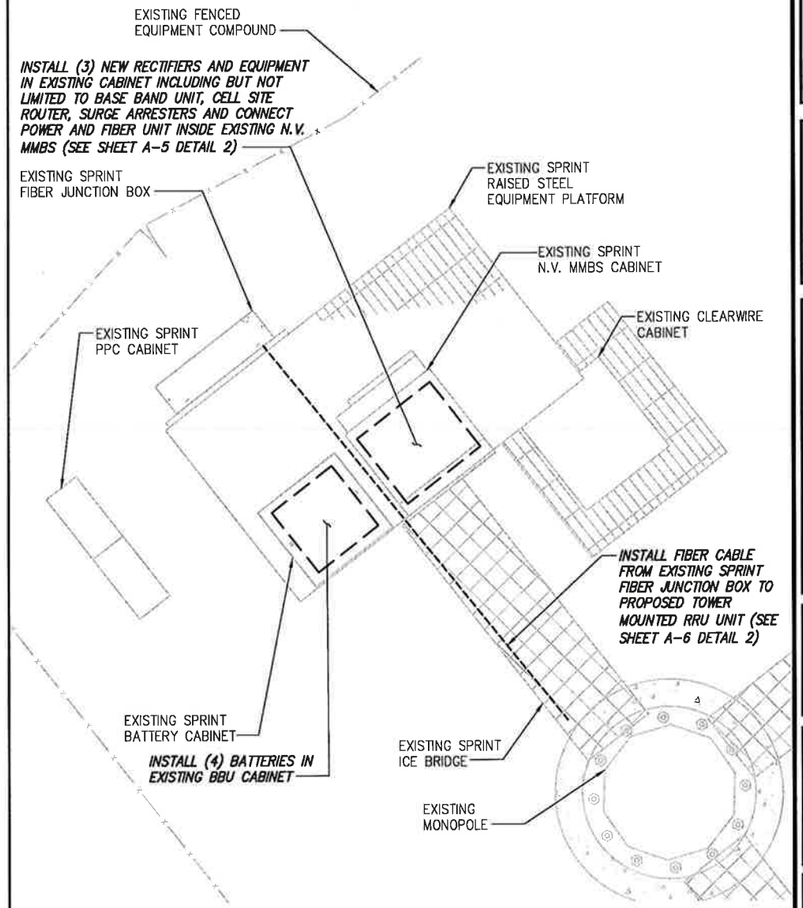
INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION AND ARE NOT THE RESULT OF A FIELD SURVEY.





2.5' 0 2.5' 5' 10'
(IN FEET)
SCALE: 24"x36" SHEET 1" = 5'-0"
SCALE: 11"x17" SHEET 1" = 10'-0"

OVERALL SITE PLAN | SCALE: AS NOTED | 1



1' 0 1' 2' 4'
(IN FEET)
SCALE: 24"x36" SHEET 1" = 2'-0"
SCALE: 11"x17" SHEET 1" = 4'-0"

SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

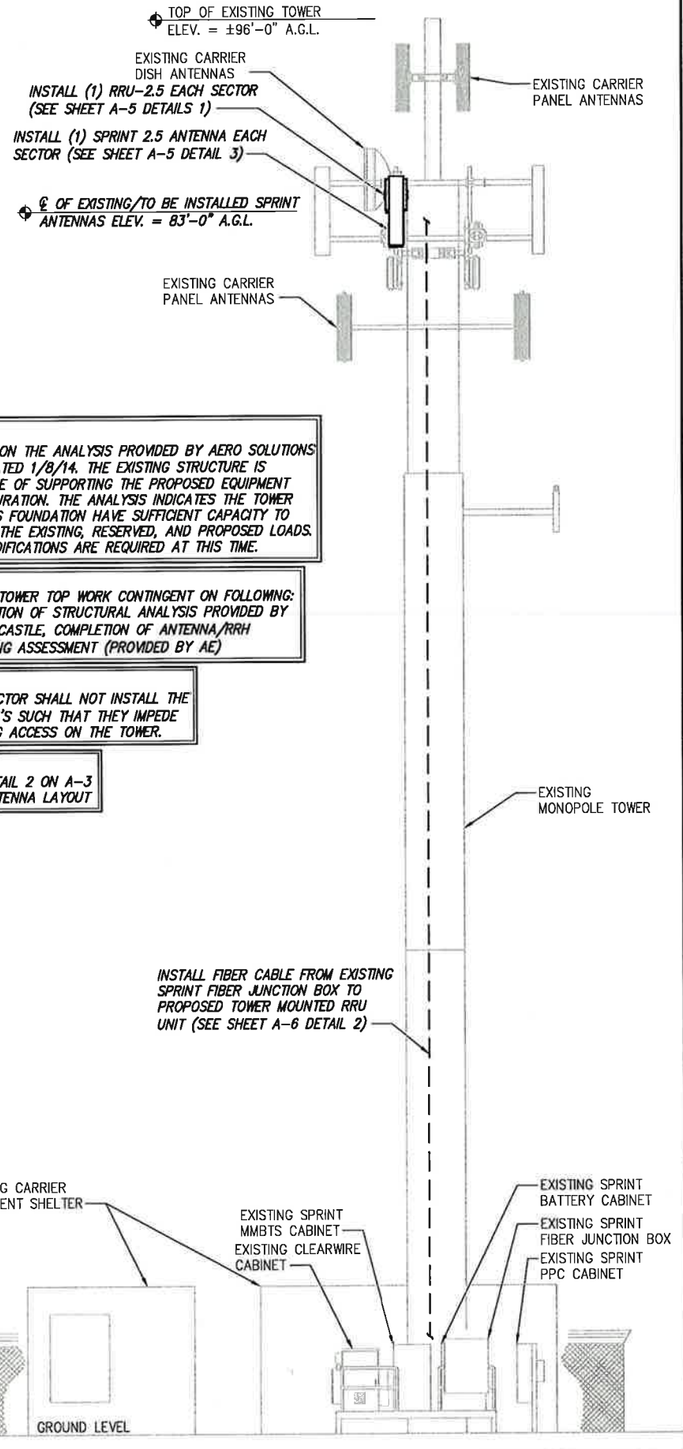
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

A-1



NOTE:
BASED ON THE ANALYSIS PROVIDED BY AERO SOLUTIONS LLC, DATED 1/8/14, THE EXISTING STRUCTURE IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION. THE ANALYSIS INDICATES THE TOWER AND ITS FOUNDATION HAVE SUFFICIENT CAPACITY TO CARRY THE EXISTING, RESERVED, AND PROPOSED LOADS. NO MODIFICATIONS ARE REQUIRED AT THIS TIME.

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

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

TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

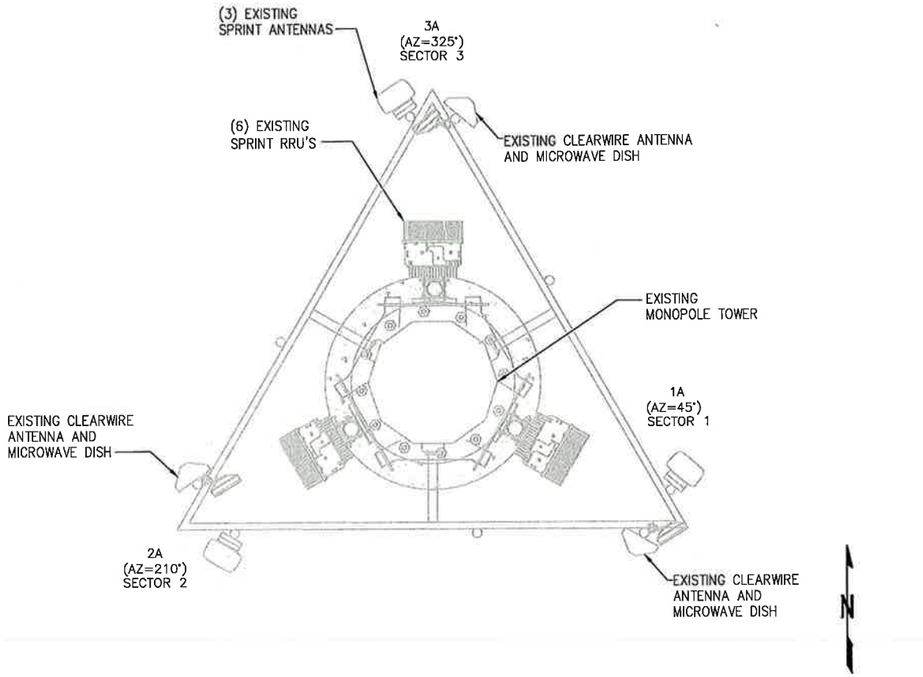
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:

TOWER ELEVATION
& CABLE PLAN

SHEET NUMBER:

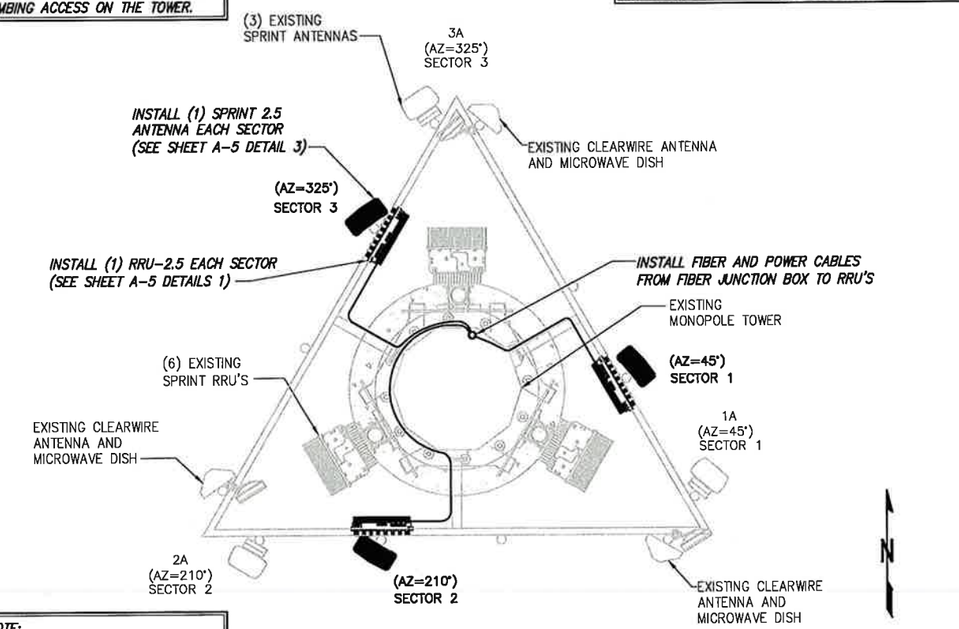
A-2



EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1

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

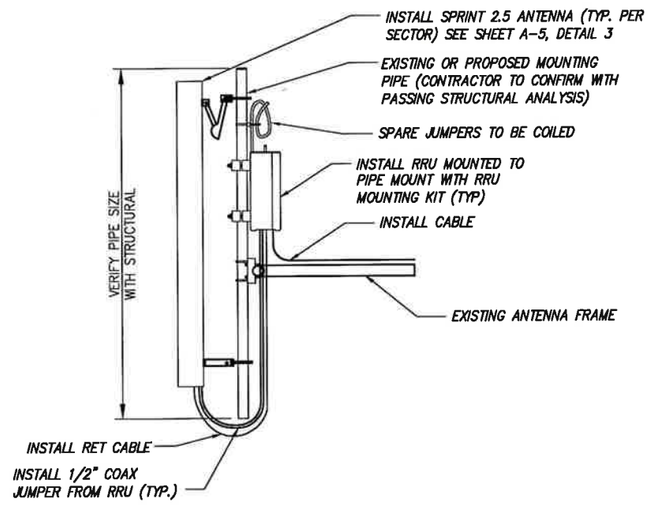
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.



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

FINAL ANTENNA LAYOUT | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3



NOTES:

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

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

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

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

TYPICAL ANTENNA & RRU MOUNTING DETAILS | NO SCALE | 4

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

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

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:
HAYDEN STATION

SITE CASCADE:
CT03XC065

SITE ADDRESS:
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:
ANTENNA LAYOUT & MOUNTING DETAILS

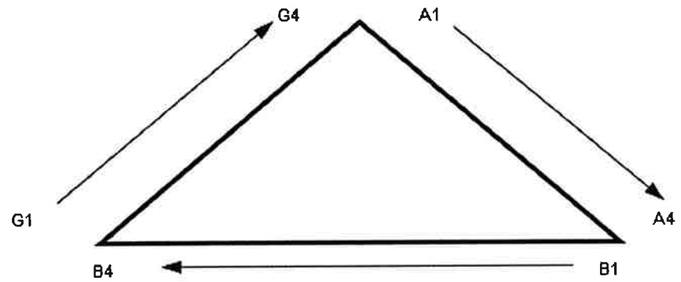
SHEET NUMBER:
A-3

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.

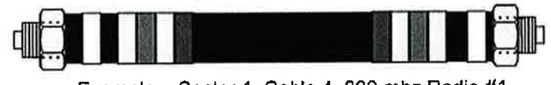
Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Yellow	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Yellow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

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	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

440 HAYDEN STATION ROAD
WINDSOR, CT 06095

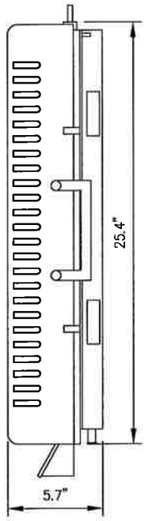
SHEET DESCRIPTION:

COLOR CODING AND NOTES

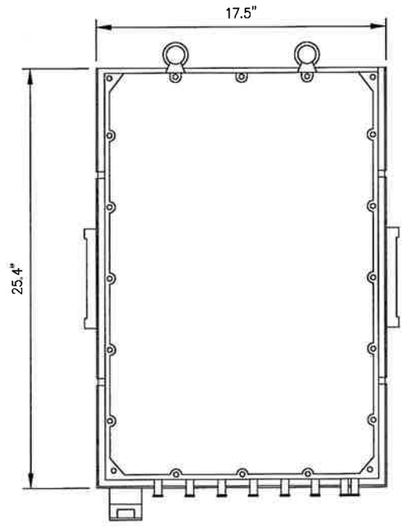
SHEET NUMBER:

A-4

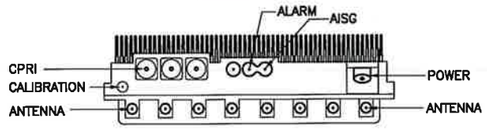
RRU: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

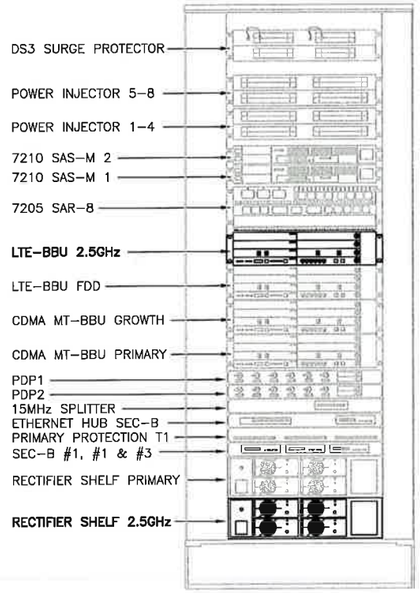


PLAN VIEW

NOTES

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

2.5 RRU'S	NO SCALE	1

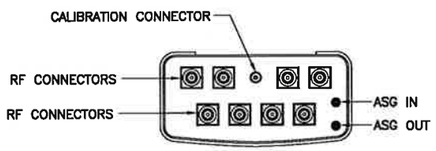


FRONT VIEW

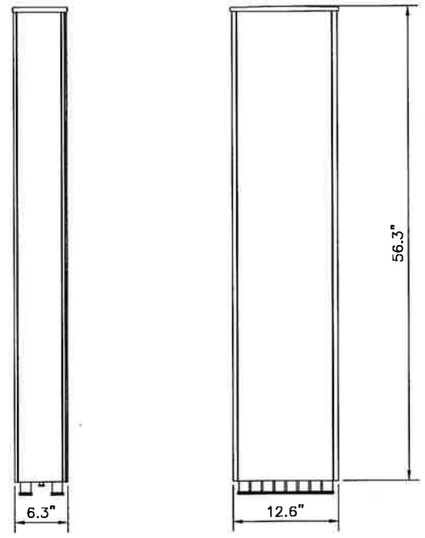
NEW EQUIPMENT IN EXISTING CABINET	NO SCALE	2

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA	NO SCALE	3

DETAIL NOT USED	NO SCALE	4

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

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

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:
HAYDEN STATION

SITE CASCADE:
CT03XC065

SITE ADDRESS:
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

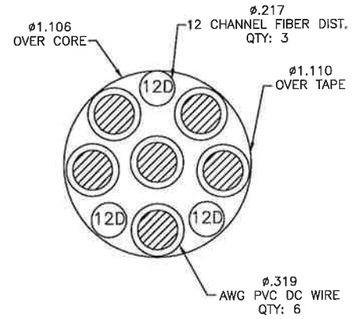
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

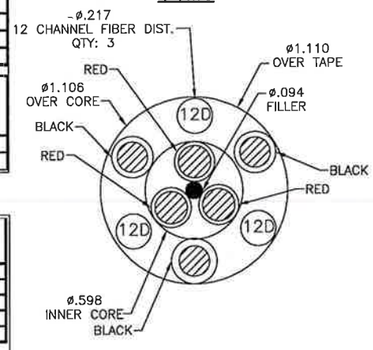
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

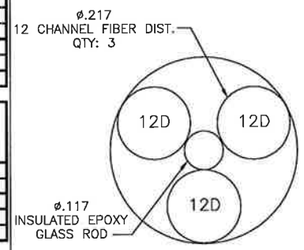
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG

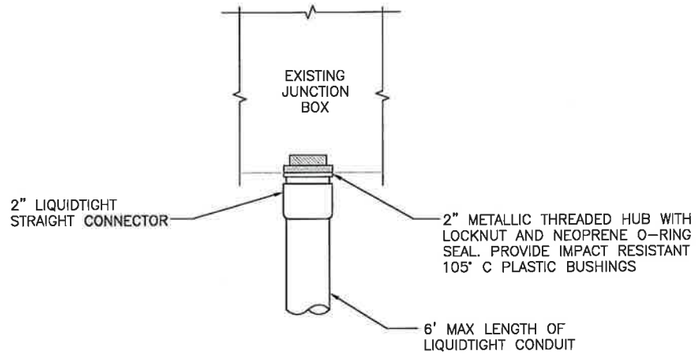


8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

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	3/3/14	MAP	0

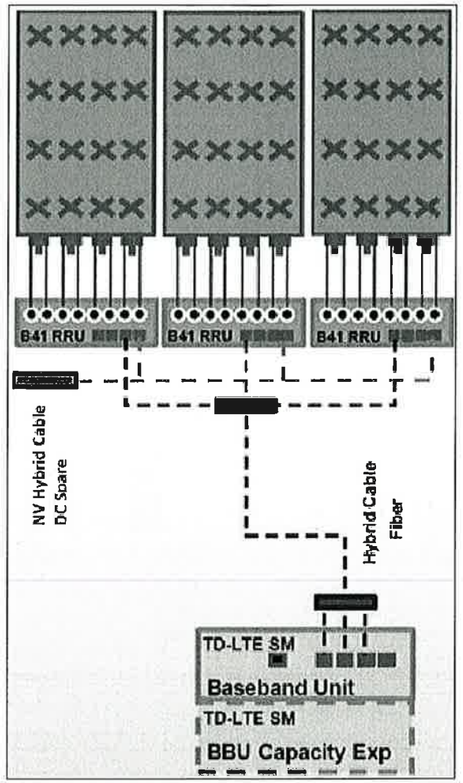
SITE NAME:
HAYDEN STATION

SITE CASCADE:
CT03XC065

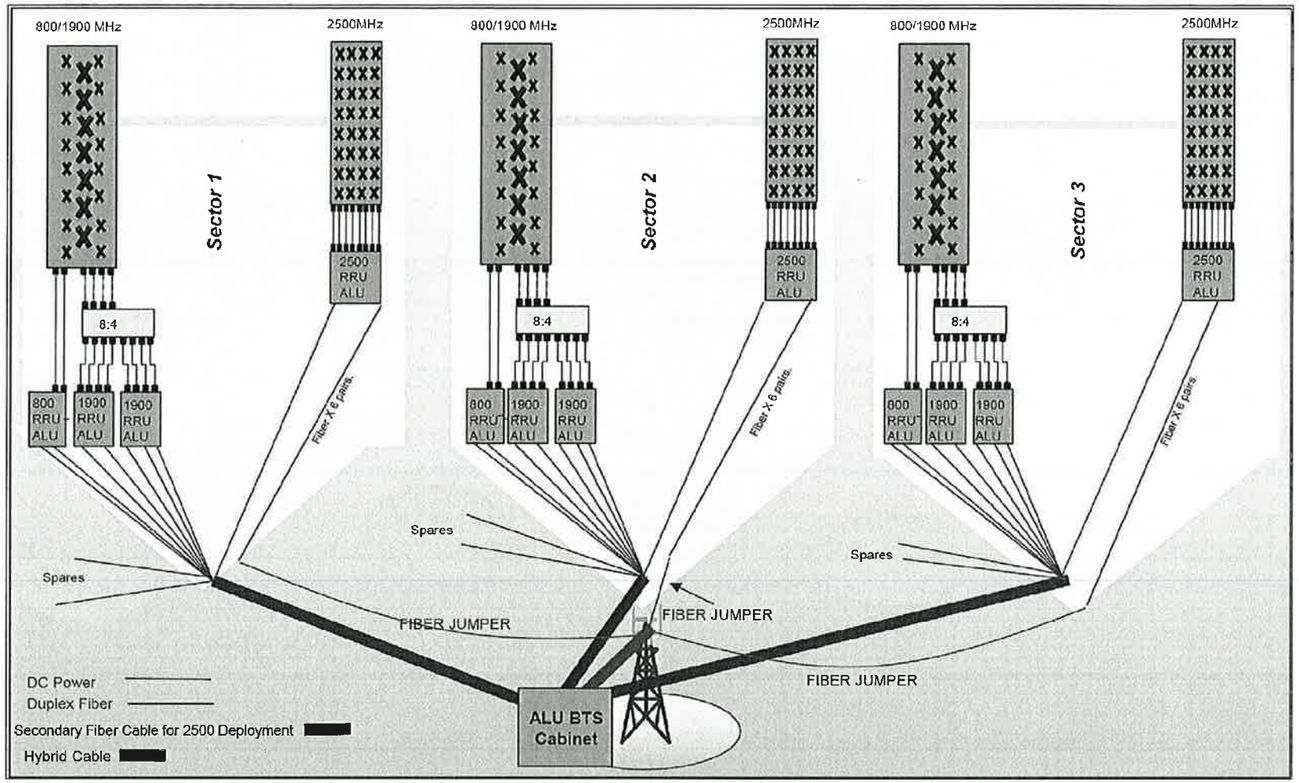
SITE ADDRESS:
440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:
CIVIL DETAILS

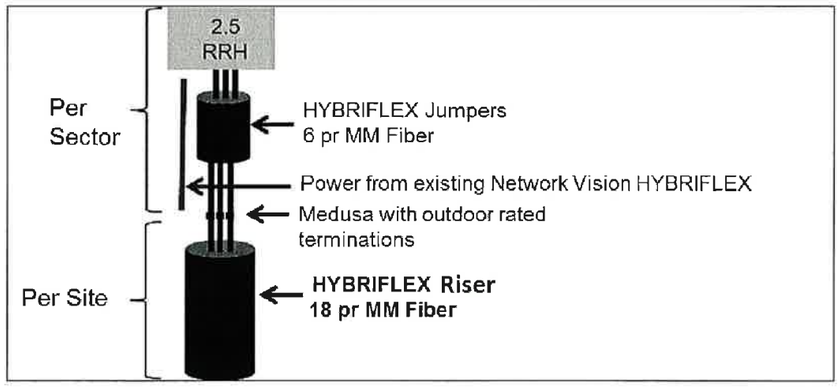
SHEET NUMBER:
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM | NO SCALE | 1

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:

PLUMBING DIAGRAM

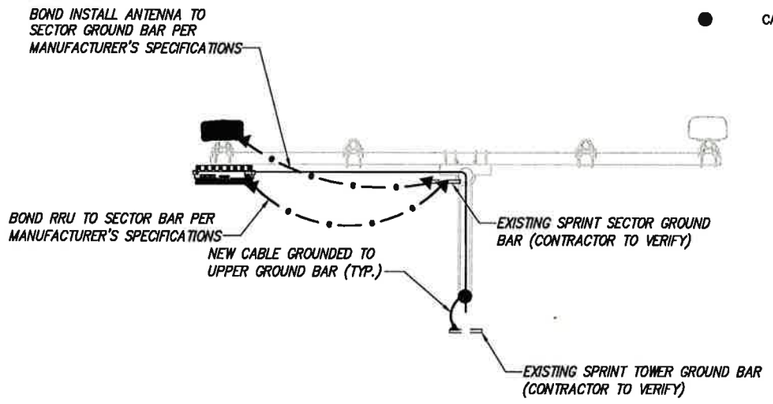
SHEET NUMBER:

A-7

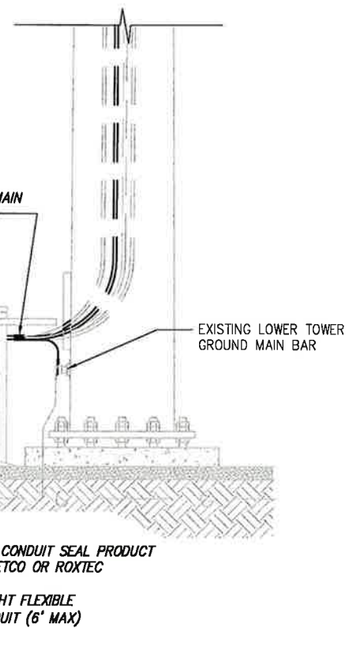
PLAN NOT USED | NO SCALE | 1

LEGEND:

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



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2



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

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

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:

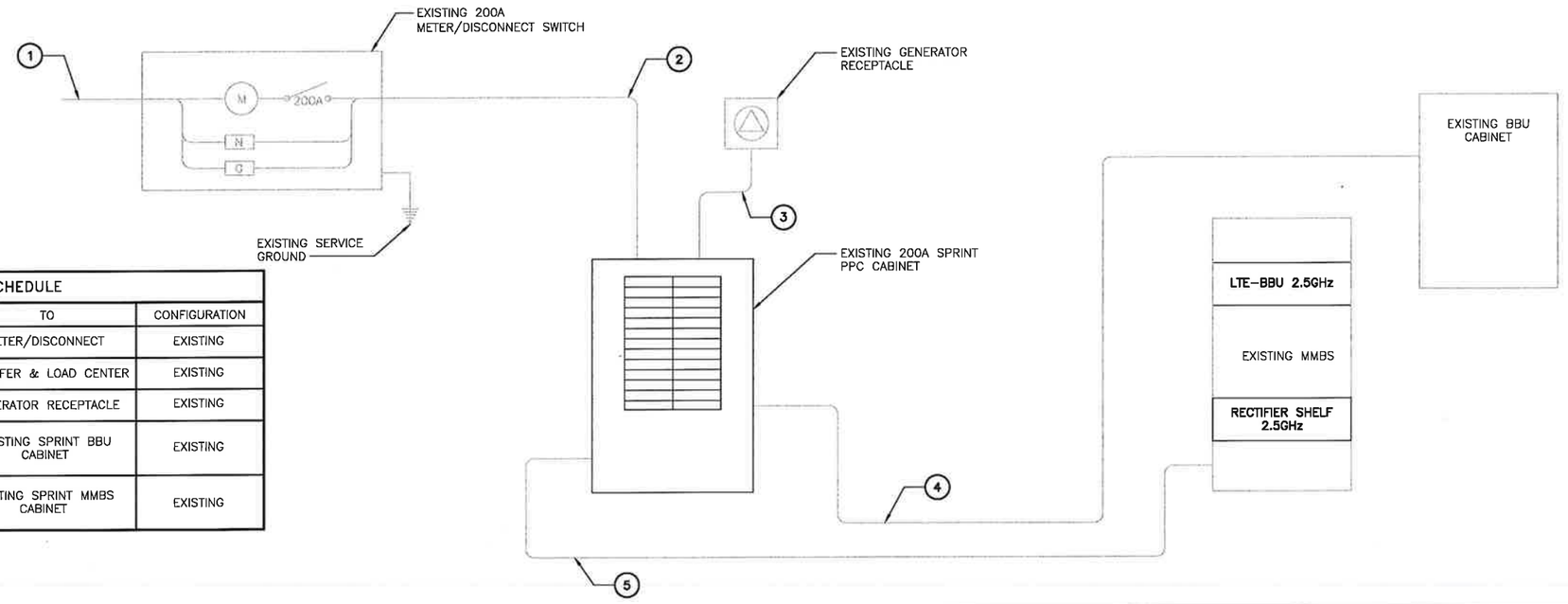
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

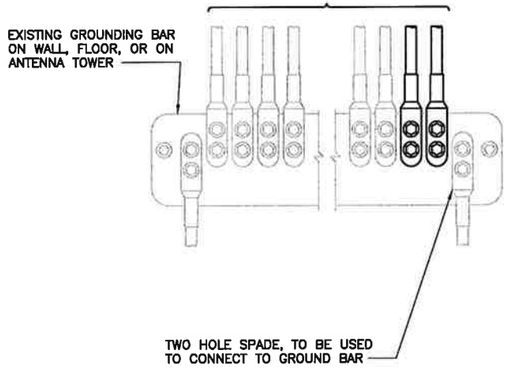
NOTES

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



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

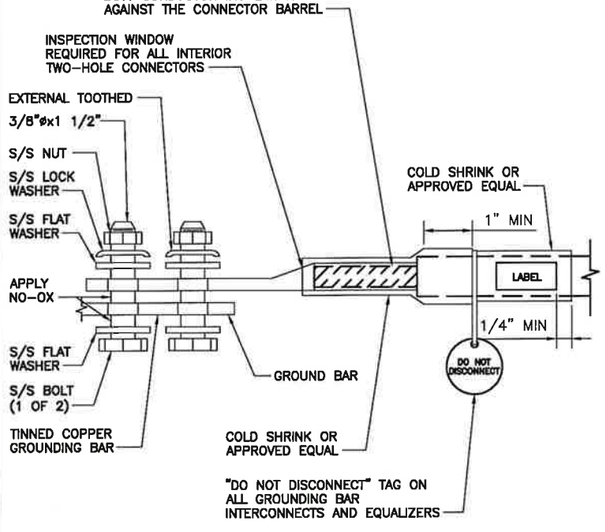
ELECTRICAL ONE–LINE DIAGRAM — NO SCALE — 1



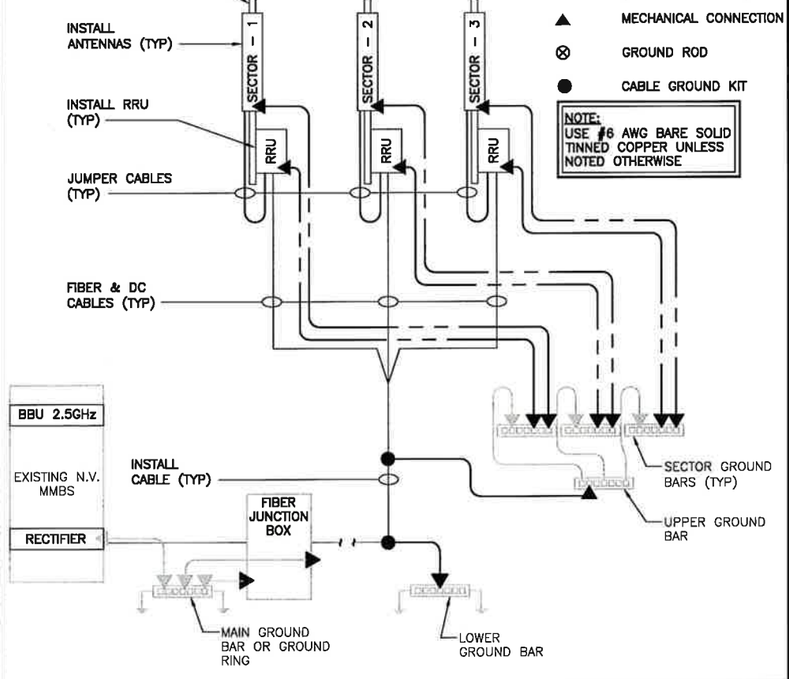
NOTES

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

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



TWO HOLE LUG — NO SCALE — 3



GROUNDING RISER DIAGRAM — NO SCALE — 4

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353–000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	3/3/14	MAP	0

SITE NAME:

HAYDEN STATION

SITE CASCADE:

CT03XC065

SITE ADDRESS:

440 HAYDEN STATION ROAD
WINDSOR, CT 06095

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

Date: **January 08, 2014**

AeroSolutions LLC
Optimizing Your Tower Infrastructure

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

Aero Solutions, LLC
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
(720) 304-6882

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5B
	Carrier Site Number:	CT03XC065
	Carrier Site Name:	HAYDEN STATION
Crown Castle Designation:	**Crown Castle BU Number:**	876326
	Crown Castle Site Name:	HAYDEN STATION
	Crown Castle JDE Job Number:	253008
	Crown Castle Work Order Number:	695785
	Crown Castle Application Number:	208252 Rev. 3
Engineering Firm Designation:	**Aero Solutions, LLC Project Number:**	003-14-0016
Site Data:	**440 Hayden Station Road, WINDSOR, Hartford County, CT** **Latitude *41° 53' 52.2"*, Longitude *-72° 38' 38.7"*** **96 Foot - Monopole Tower**	

Dear Patrick Byrum,

Aero Solutions, LLC 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 606844, in accordance with application 208252, revision 3.

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

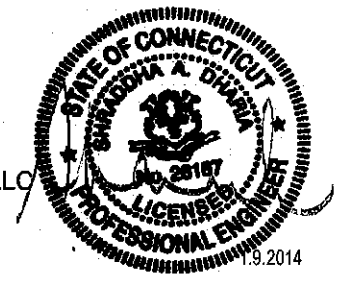
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

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

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

Structural analysis prepared by: Joseph R. Sullivan, E.I.

Respectfully submitted by:



Shraddha Dharia, P.E.
Principal/Owner - AWS Consulting Engineers, LLC
CT PE#: PEN0028187
Expires: 1/31/2014

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 96 ft Monopole tower designed by ROHN in January of 1997. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

A tower has been modified by a 11 ft extension. The extension geometry was taken from a previous analysis done FDH Engineering, Inc., dated 10/26/2012.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 1 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
83.0	83.0	3	alcatel lucent	TD-RRH8x20-25	1	5/8"	
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
92.0	92.0	6	ericsson	RRUS-11	6 1 2	1-5/8" 3/8" 3/4"	1
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		3	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	T-Arm Mount [TA 702-3]			
83.0	86.0	3	dragonwave	A-ANT-11G-4-C	3 6 3	1-1/4" 5/16" 1/2"	1
		3	dragonwave	Horizon DUO			
	84.0	1	miscl	Junction Box			
	83.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 502-1]			
	82.0	3	kathrein	840 10045 w/ Mount Pipe			
		3	samsung telecommunications	WIMAX DAP HEAD			
79.0	80.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			1
	79.0	1	tower mounts	Side Arm Mount [SO 102-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
	77.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
75.0	77.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	18	7/8"	1
		3	ems wireless	DR65-18-00DPL2Q w/ Mount Pipe			
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
	75.0	1	tower mounts	Platform Mount [LP 304-1]			

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

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
85	85	12	swedcom	ALP9212	12	1 5/8
75	75	12	swedcom	ALP9212	12	1 5/8
60	60	12	swedcom	ALP9212	12	1 5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clough, Harbor, & Associates LLP	1530918	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, Inc.	1640630	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, Inc.	1639483	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	FDH Engineering, Inc.	3357566	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

5) Existing equipment elevations have been adjusted from the CAD Pack based on recent tower photos. Please update CAD Pack as required.
6) Tower extension geometry was taken from a previous structural analysis.
7) The flange connection details at 85' are unknown; this connection was not included in this analysis.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	96 - 85	Pole	P12x.5	1	-2.30	538.65	15.8	Pass
L2	85 - 65	Pole	P42x3/8	2	-10.02	1484.55	19.1	Pass
L3	65 - 32.5	Pole	P48x3/8	3	-16.96	1643.28	44.9	Pass
L4	32.5 - 0	Pole	P48x1/2	4	-25.96	2356.76	56.6	Pass
							Summary	
						Pole (L4)	56.6	Pass
						Rating =	56.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	57.7	Pass
1	Base Plate	0	57.7	Pass
1	Base Foundation	0	38.3	Pass
1	Base Foundation Soil Interaction	0	16.6	Pass
1	Flange Plate	32.5	29.8	Pass
1	Flange Plate	65	9.6	Pass
1	Flange Plate	85	Unknown	Unknown

Structure Rating (max from all components) =	57.7%

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

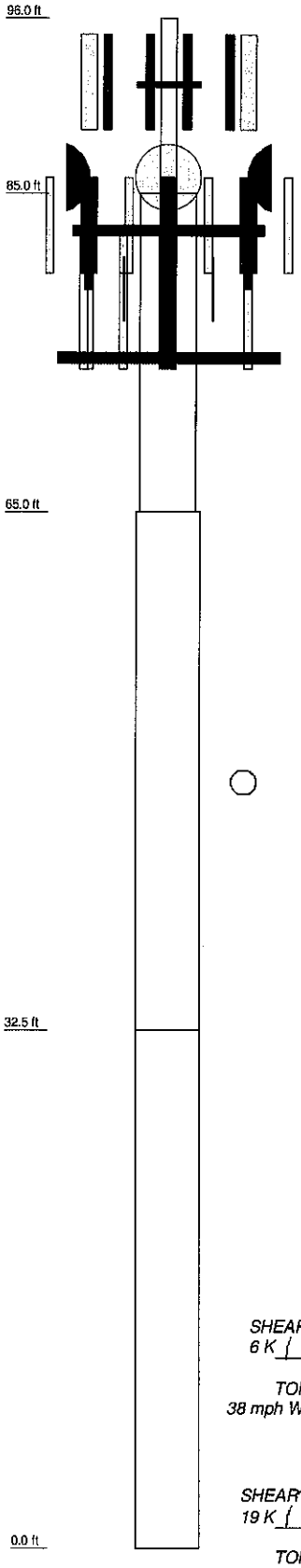
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Size	Length (ft)	Grade	Weight (K)
1	P12x.5	11.00	A53-B-35	0.7
2	P42x3/8	20.00		3.3
3	P48x3/8	32.50	A53-B-42	6.2
4	P48x1/2	32.50		8.3
				18.5



DESIGNED APPURTENANCE LOADING

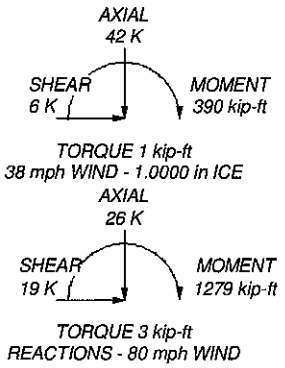
TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ Mount Pipe	92	APXVTM14-C-120 w/ Mount Pipe	83
7770.00 w/ Mount Pipe	92	TD-RRH8x20-25	83
7770.00 w/ Mount Pipe	92	TD-RRH8x20-25	83
(2) LGP21401	92	TD-RRH8x20-25	83
(2) LGP21401	92	Platform Mount [LP 502-1]	83
(2) LGP21401	92	A-ANT-11G-4-C	83
P65-17-XLH-RR w/ Mount Pipe	92	A-ANT-11G-4-C	83
P65-17-XLH-RR w/ Mount Pipe	92	A-ANT-11G-4-C	83
P65-17-XLH-RR w/ Mount Pipe	92	PCS 1900MHz 4x45W-65MHz	79
DC6-48-60-18-8F	92	PCS 1900MHz 4x45W-65MHz	79
(2) RRUS-11	92	PCS 1900MHz 4x45W-65MHz	79
(2) RRUS-11	92	Pipe Mount 2 x 4'	79
(2) RRUS-11	92	Pipe Mount 2 x 4'	79
T-Arm Mount [TA 702-3]	92	Pipe Mount 2 x 4'	79
840 10045 w/ Mount Pipe	83	Side Arm Mount [SO 102-3]	79
840 10045 w/ Mount Pipe	83	800MHz 2X50W RRH W/FILTER	79
840 10045 w/ Mount Pipe	83	800MHz 2X50W RRH W/FILTER	79
WIMAX DAP HEAD	83	800MHz 2X50W RRH W/FILTER	79
WIMAX DAP HEAD	83	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	75
WIMAX DAP HEAD	83	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	75
Horizon DUO	83	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	75
Horizon DUO	83	DR65-18-00DPL2Q w/ Mount Pipe	75
Horizon DUO	83	DR65-18-00DPL2Q w/ Mount Pipe	75
12"x12"x6" Junction Box	83	DR65-18-00DPL2Q w/ Mount Pipe	75
Pipe Mount 2 x 6'	83	Platform Mount [LP 304-1]	75
Pipe Mount 2 x 6'	83	ONEBASE TWIN DUAL DUPLEX TMA	75
Pipe Mount 2 x 6'	83	ONEBASE TWIN DUAL DUPLEX TMA	75
APXVSPP18-C-A20 w/ Mount Pipe	83	ONEBASE TWIN DUAL DUPLEX TMA	75
APXVSPP18-C-A20 w/ Mount Pipe	83		
APXVSPP18-C-A20 w/ Mount Pipe	83		
APXVTM14-C-120 w/ Mount Pipe	83		
APXVTM14-C-120 w/ Mount Pipe	83		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A53-B-42	42 ksi	63 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 56.6%



Aero Solutions, LLC
5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
Phone: (720) 304-6882
FAX: (720) 304-6883

Job: ***BU# 876326***		
Project: ***Existing 95' Monopole***		
Client: Crown Castle	Drawn by: JRS	App'd:
Code: TIA/EIA-222-F	Date: 01/08/14	Scale: NTS
Path: P:\004 CCI Sites\876326 HAYDEN STATION\2013-14-0016 Engineering\Aero Calculations\Working\RISA\876326 HAYDEN STATION.r		Dwg No. E-1

Tower Input Data

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

3) Tower is located in Hartford County, Connecticut.
4) Basic wind speed of 80 mph.
5) Nominal ice thickness of 1.0000 in.
6) Ice thickness is considered to increase with height.
7) Ice density of 56 pcf.
8) A wind speed of 38 mph is used in combination with ice.
9) Temperature drop of 50 °F.
10) Deflections calculated using a wind speed of 50 mph.
11) A non-linear (P-delta) analysis was used.
12) Pressures are calculated at each section.
13) Stress ratio used in pole design is 1.333.
14) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	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	

Pole Section Geometry

Section	Elevation	Section Length	Pole Size	Pole Grade	Socket Length
	ft	ft			ft
L1	96.00-85.00	11.00	P12x.5	A53-B-35 (35 ksi)	
L2	85.00-65.00	20.00	P42x3/8	A53-B-42 (42 ksi)	
L3	65.00-32.50	32.50	P48x3/8	A53-B-42 (42 ksi)	
L4	32.50-0.00	32.50	P48x1/2	A53-B-42 (42 ksi)	

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1 96.00-				1	1	1		

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
85.00								
L2 85.00-65.00				1	1	1		
L3 65.00-32.50				1	1	1		
L4 32.50-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	B	No	Inside Pole	92.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	92.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	B	No	Inside Pole	92.00 - 8.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
						2" Ice	0.00	0.58
						4" Ice	0.00	0.58
*								
ATCB-B01-001(5/16)	A	No	CaAa (Out Of Face)	83.00 - 2.00	4	No Ice	0.00	0.07
						1/2" Ice	0.00	0.57
						1" Ice	0.00	1.68
						2" Ice	0.00	5.73
						4" Ice	0.00	21.16
ATCB-B01-001(5/16)	A	No	CaAa (Out Of Face)	83.00 - 2.00	2	No Ice	0.00	0.07
						1/2" Ice	0.00	0.57
						1" Ice	0.00	1.68
						2" Ice	0.00	5.73
						4" Ice	0.00	21.16
FSJ4-50B(1/2")	A	No	CaAa (Out Of Face)	83.00 - 2.00	3	No Ice	0.00	0.14
						1/2" Ice	0.00	0.76
						1" Ice	0.00	2.00
						2" Ice	0.00	6.30
						4" Ice	0.00	22.23
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	83.00 - 2.00	3	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
						2" Ice	0.00	9.73
						4" Ice	0.00	28.15
HB058-M12-XXXF(5/8")	C	No	CaAa (Out Of Face)	83.00 - 2.00	1	No Ice	0.00	0.24
						1/2" Ice	0.00	1.06
						1" Ice	0.00	2.49
						2" Ice	0.00	7.18
						4" Ice	0.00	23.89

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
2" Rigid Conduit	A	No	CaAa (Out Of Face)	83.00 - 2.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	4.33
						1" Ice	0.00	6.47
						2" Ice	0.00	12.57
						4" Ice	0.00	32.12
2" Rigid Conduit	A	No	CaAa (Out Of Face)	83.00 - 2.00	1	No Ice	0.20	2.80
						1/2" Ice	0.30	4.33
						1" Ice	0.40	6.47
						2" Ice	0.60	12.57
						4" Ice	1.00	32.12
*								
AL5-50(7/8)	C	No	CaAa (Out Of Face)	75.00 - 1.00	6	No Ice	0.11	0.26
						1/2" Ice	0.21	1.24
						1" Ice	0.31	2.83
						2" Ice	0.51	7.83
						4" Ice	0.91	25.18
LDF5-50A(7/8")	C	No	Inside Pole	75.00 - 2.00	12	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33
						4" Ice	0.00	0.33
*								

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	96.00-85.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
L2	85.00-65.00	A	0.000	0.000	0.000	3.600	0.12
		B	0.000	0.000	0.000	0.000	0.12
		C	0.000	0.000	0.000	6.600	0.12
L3	65.00-32.50	A	0.000	0.000	0.000	6.500	0.21
		B	0.000	0.000	0.000	0.000	0.20
		C	0.000	0.000	0.000	21.450	0.29
L4	32.50-0.00	A	0.000	0.000	0.000	6.100	0.20
		B	0.000	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	20.790	0.28

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	96.00-85.00	A	1.129	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.04
		C		0.000	0.000	0.000	0.000	0.00
L2	85.00-65.00	A	1.104	0.000	0.000	0.000	7.573	0.61
		B		0.000	0.000	0.000	0.000	0.12
		C		0.000	0.000	0.000	19.842	0.55
L3	65.00-32.50	A	1.049	0.000	0.000	0.000	13.318	1.02
		B		0.000	0.000	0.000	0.000	0.20
		C		0.000	0.000	0.000	62.358	1.25
L4	32.50-0.00	A	1.000	0.000	0.000	0.000	12.200	0.88
		B		0.000	0.000	0.000	0.000	0.15
		C		0.000	0.000	0.000	58.589	1.11

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	96.00-85.00	0.0000	0.0000	0.0000	0.0000
L2	85.00-65.00	-0.3742	-0.0196	-0.8924	0.1220
L3	65.00-32.50	-0.7056	0.1605	-1.5330	0.5070
L4	32.50-0.00	-0.6886	0.1643	-1.4764	0.4974

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
7770.00 w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	5.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP21401	A	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Leg	1.00 0.00 0.00	5.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	5.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13

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
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13
DC6-48-60-18-8F	A	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	2.57 2.80 3.04 3.54 4.66	0.03 0.06 0.08 0.14 0.31
(2) RRUS-11	A	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	B	From Leg	1.00 0.00 0.00	5.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	C	From Leg	1.00 0.00 0.00	10.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
T-Arm Mount [TA 702-3]	C	None		0.0000	92.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.64 6.55 7.46 9.28 12.92	5.64 6.55 7.46 9.28 12.92	0.34 0.43 0.52 0.70 1.06
***									
***									
840 10045 w/ Mount Pipe	A	From Leg	4.00 0.00 -1.00	40.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.41 5.83 6.26 7.16 9.09	2.39 2.92 3.47 4.61 7.32	0.05 0.09 0.13 0.23 0.53
840 10045 w/ Mount Pipe	B	From Leg	4.00 0.00 -1.00	40.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.41 5.83 6.26 7.16 9.09	2.39 2.92 3.47 4.61 7.32	0.05 0.09 0.13 0.23 0.53
840 10045 w/ Mount Pipe	C	From Leg	4.00 0.00 -1.00	40.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.41 5.83 6.26 7.16 9.09	2.39 2.92 3.47 4.61 7.32	0.05 0.09 0.13 0.23 0.53
WIMAX DAP HEAD	A	From Leg	4.00 0.00 -1.00	40.0000	83.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.80 1.99 2.18 2.59 3.51	0.78 0.92 1.07 1.39 2.14	0.03 0.04 0.06 0.09 0.20
WIMAX DAP HEAD	B	From Leg	4.00 0.00 -1.00	40.0000	83.00	No Ice 1/2" Ice	1.80 1.99 2.18	0.78 0.92 1.07	0.03 0.04 0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
WIMAX DAP HEAD	C	From Leg	4.00	40.0000	83.00	No Ice	1.80	0.78	0.03
			0.00			1/2"	1.99	0.92	0.04
			-1.00			Ice	2.18	1.07	0.06
						1" Ice	2.59	1.39	0.09
						2" Ice	3.51	2.14	0.20
						4" Ice			
Horizon DUO	A	From Leg	4.00	40.0000	83.00	No Ice	0.55	0.34	0.01
			0.00			1/2"	0.65	0.43	0.01
			3.00			Ice	0.75	0.52	0.01
						1" Ice	0.95	0.70	0.01
						2" Ice	1.35	1.06	0.01
						4" Ice			
Horizon DUO	B	From Leg	4.00	40.0000	83.00	No Ice	0.55	0.34	0.01
			0.00			1/2"	0.65	0.43	0.01
			3.00			Ice	0.75	0.52	0.01
						1" Ice	0.95	0.70	0.01
						2" Ice	1.35	1.06	0.01
						4" Ice			
Horizon DUO	C	From Leg	4.00	40.0000	83.00	No Ice	0.55	0.34	0.01
			0.00			1/2"	0.65	0.43	0.01
			3.00			Ice	0.75	0.52	0.01
						1" Ice	0.95	0.70	0.01
						2" Ice	1.35	1.06	0.01
						4" Ice			
12"x12"x6" Junction Box	A	From Leg	0.50	0.0000	83.00	No Ice	1.40	0.70	0.03
			0.00			1/2"	1.56	0.82	0.04
			1.00			Ice	1.73	0.95	0.05
						1" Ice	2.09	1.24	0.08
						2" Ice	2.92	1.91	0.18
						4" Ice			
Pipe Mount 2 x 6'	A	From Leg	4.00	40.0000	83.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
Pipe Mount 2 x 6'	B	From Leg	4.00	40.0000	83.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
Pipe Mount 2 x 6'	C	From Leg	4.00	40.0000	83.00	No Ice	1.43	1.43	0.02
			0.00			1/2"	1.92	1.92	0.03
			0.00			Ice	2.29	2.29	0.05
						1" Ice	3.06	3.06	0.09
						2" Ice	4.70	4.70	0.23
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	A	From Face	4.00	25.0000	83.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	B	From Face	4.00	-15.0000	83.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Face	4.00	30.0000	83.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			Ice	9.77	9.02	0.23
						1" Ice	11.03	10.84	0.41
						2" Ice	13.68	14.85	0.91
						4" Ice			
APXVTM14-C-120 w/ Mount Pipe	A	From Face	4.00	25.0000	83.00	No Ice	7.13	4.96	0.08
			0.00			1/2"	7.66	5.75	0.13
			0.00			Ice	8.18	6.47	0.19
						1" Ice	9.26	8.01	0.34
						2" Ice	11.53	11.41	0.75
						4" Ice			
APXVTM14-C-120 w/ Mount Pipe	B	From Face	4.00	-15.0000	83.00	No Ice	7.13	4.96	0.08
			0.00			1/2"	7.66	5.75	0.13
			0.00			Ice	8.18	6.47	0.19
						1" Ice	9.26	8.01	0.34
						2" Ice	11.53	11.41	0.75
						4" Ice			
APXVTM14-C-120 w/ Mount Pipe	C	From Face	4.00	30.0000	83.00	No Ice	7.13	4.96	0.08
			0.00			1/2"	7.66	5.75	0.13
			0.00			Ice	8.18	6.47	0.19
						1" Ice	9.26	8.01	0.34
						2" Ice	11.53	11.41	0.75
						4" Ice			
TD-RRH8x20-25	A	From Face	4.00	25.0000	83.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			0.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
TD-RRH8x20-25	B	From Face	4.00	-15.0000	83.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			0.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
TD-RRH8x20-25	C	From Face	4.00	30.0000	83.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			0.00			Ice	5.32	2.15	0.13
						1" Ice	5.95	2.62	0.20
						2" Ice	7.31	3.68	0.40
						4" Ice			
Platform Mount [LP 502-1]	C	None		0.0000	83.00	No Ice	32.35	32.35	0.93
						1/2"	45.67	45.67	1.19
						Ice	58.99	58.99	1.46
						1" Ice	85.63	85.63	2.00
						2" Ice	138.91	138.91	3.07
						4" Ice			
***									
800MHz 2X50W RRH W/FILTER	A	From Face	1.50	25.0000	79.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			1.00			Ice	2.83	2.68	0.11
						1" Ice	3.30	3.13	0.17
						2" Ice	4.34	4.15	0.34
						4" Ice			
800MHz 2X50W RRH W/FILTER	B	From Face	1.50	-15.0000	79.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			1.00			Ice	2.83	2.68	0.11
						1" Ice	3.30	3.13	0.17
						2" Ice	4.34	4.15	0.34
						4" Ice			
800MHz 2X50W RRH W/FILTER	C	From Face	1.50	30.0000	79.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			1.00			Ice	2.83	2.68	0.11
						1" Ice	3.30	3.13	0.17
						2" Ice	4.34	4.15	0.34
						4" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
PCS 1900MHz 4x45W-65MHz	A	From Face	1.50 0.00 -2.00	25.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	B	From Face	1.50 0.00 -2.00	-15.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
PCS 1900MHz 4x45W-65MHz	C	From Face	1.50 0.00 -2.00	30.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.09 3.61 4.74	0.06 0.08 0.11 0.17 0.35
Pipe Mount 2 x 4'	A	From Leg	1.50 0.00 0.00	25.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
Pipe Mount 2 x 4'	B	From Leg	1.50 0.00 0.00	-15.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
Pipe Mount 2 x 4'	C	From Leg	1.50 0.00 0.00	30.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.87 1.11 1.36 1.90 3.23	0.87 1.11 1.36 1.90 3.23	0.01 0.02 0.03 0.06 0.16
Side Arm Mount [SO 102-3)	C	None		0.0000	79.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
***									
ONEBASE TWIN DUAL DUPLEX TMA	A	From Face	4.00 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.67 0.79 0.91 1.18 1.82	0.31 0.39 0.49 0.70 1.23	0.01 0.02 0.02 0.04 0.10
ONEBASE TWIN DUAL DUPLEX TMA	B	From Face	4.00 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.67 0.79 0.91 1.18 1.82	0.31 0.39 0.49 0.70 1.23	0.01 0.02 0.02 0.04 0.10
ONEBASE TWIN DUAL DUPLEX TMA	C	From Face	4.00 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.67 0.79 0.91 1.18 1.82	0.31 0.39 0.49 0.70 1.23	0.01 0.02 0.02 0.04 0.10
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	75.00	No Ice 1/2" Ice 1" Ice	6.94 7.44 7.94 8.98	3.29 4.00 4.66 6.04	0.06 0.11 0.16 0.28

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
							2" Ice	11.17	9.02	0.65
							4" Ice			
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	75.00	No Ice	6.94	3.29	0.06
			0.00				1/2" Ice	7.44	4.00	0.11
			2.00				1" Ice	7.94	4.66	0.16
							2" Ice	8.98	6.04	0.28
							4" Ice	11.17	9.02	0.65
APX16DWV-16DWV-S-E-ACU w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	75.00	No Ice	6.94	3.29	0.06
			0.00				1/2" Ice	7.44	4.00	0.11
			2.00				1" Ice	7.94	4.66	0.16
							2" Ice	8.98	6.04	0.28
							4" Ice	11.17	9.02	0.65
DR65-18-00DPL2Q w/ Mount Pipe	A	From Face	4.00	0.00	0.0000	75.00	No Ice	6.54	3.73	0.04
			0.00				1/2" Ice	7.04	4.46	0.09
			2.00				1" Ice	7.54	5.14	0.14
							2" Ice	8.58	6.56	0.27
							4" Ice	10.78	9.66	0.64
DR65-18-00DPL2Q w/ Mount Pipe	B	From Face	4.00	0.00	0.0000	75.00	No Ice	6.54	3.73	0.04
			0.00				1/2" Ice	7.04	4.46	0.09
			2.00				1" Ice	7.54	5.14	0.14
							2" Ice	8.58	6.56	0.27
							4" Ice	10.78	9.66	0.64
DR65-18-00DPL2Q w/ Mount Pipe	C	From Face	4.00	0.00	0.0000	75.00	No Ice	6.54	3.73	0.04
			0.00				1/2" Ice	7.04	4.46	0.09
			2.00				1" Ice	7.54	5.14	0.14
							2" Ice	8.58	6.56	0.27
							4" Ice	10.78	9.66	0.64
Platform Mount [LP 304-1]	C	None			0.0000	75.00	No Ice	17.46	17.46	1.35
							1/2" Ice	22.44	22.44	1.62
							1" Ice	27.42	27.42	1.90
							2" Ice	37.38	37.38	2.45
							4" Ice	57.30	57.30	3.55
***										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-11G-4-C	A	Paraboloid w/o Radome	From Leg	4.00	0.00	31.0000		83.00	4.23	No Ice	14.08	0.12
				0.00						1/2" Ice	14.63	0.20
				3.00						1" Ice	15.19	0.27
										2" Ice	16.31	0.42
										4" Ice	18.55	0.72
A-ANT-11G-4-C	B	Paraboloid w/o Radome	From Leg	4.00	0.00	-10.0000		83.00	4.23	No Ice	14.08	0.12
				0.00						1/2" Ice	14.63	0.20
				3.00						1" Ice	15.19	0.27
										2" Ice	16.31	0.42
										4" Ice	18.55	0.72
A-ANT-11G-4-C	C	Paraboloid w/o Radome	From Leg	4.00	0.00	-23.0000		83.00	4.23	No Ice	14.08	0.12
										1/2" Ice	14.63	0.20

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
				3.00					1" Ice	15.19	0.27
									2" Ice	16.31	0.42
									4" Ice	18.55	0.72

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	96 - 85	Pole	Max Tension	2	0.00	-0.00	-0.00
			Max. Compression	14	-4.72	0.00	0.14
			Max. Mx	11	-2.30	22.07	-0.45
			Max. My	2	-2.30	-0.01	21.61
			Max. Vy	11	-4.59	22.07	-0.45
			Max. Vx	2	-4.46	-0.01	21.61
			Max. Torque	8			-2.76
L2	85 - 65	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-18.62	0.77	1.09

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-10.03	228.73	-10.78
			Max. My	2	-10.03	-0.86	230.20
			Max. Vy	11	-12.64	228.73	-10.78
			Max. Vx	2	-12.75	-0.86	230.20
			Max. Torque	8			-2.77
L3	65 - 32.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-29.34	2.72	2.01
			Max. Mx	11	-16.97	694.04	-28.29
			Max. My	2	-16.97	-2.58	699.10
			Max. Vy	11	-15.88	694.04	-28.29
			Max. Vx	2	-15.99	-2.58	699.10
			Max. Torque	8			-2.62
L4	32.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.69	4.44	2.79
			Max. Mx	11	-25.96	1255.46	-45.74
			Max. My	2	-25.96	-4.31	1264.09
			Max. Vy	11	-18.62	1255.46	-45.74
			Max. Vx	2	-18.74	-4.31	1264.09
			Max. Torque	8			-2.78

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	41.69	0.00	0.00
	Max. H_x	11	25.96	18.62	-0.54
	Max. H_z	2	25.96	-0.06	18.73
	Max. M_x	2	1264.09	-0.06	18.73
	Max. M_z	5	1232.78	-18.37	0.83
	Max. Torsion	13	2.61	8.96	16.14
	Min. Vert	2	25.96	-0.06	18.73
	Min. H_x	5	25.96	-18.37	0.83
	Min. H_z	8	25.96	0.42	-18.54
	Min. M_x	8	-1245.78	0.42	-18.54
	Min. M_z	11	-1255.46	18.62	-0.54
	Min. Torsion	8	-2.78	0.42	-18.54

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	25.96	0.00	-0.00	-0.85	0.67	0.00
Dead+Wind 0 deg - No Ice	25.96	0.06	-18.73	-1264.09	-4.31	-0.78
Dead+Wind 30 deg - No Ice	25.96	9.63	-16.15	-1088.23	-654.63	-0.84
Dead+Wind 60 deg - No Ice	25.96	15.94	-9.74	-664.51	-1069.73	-1.28
Dead+Wind 90 deg - No Ice	25.96	18.37	-0.83	-72.65	-1232.78	-1.16
Dead+Wind 120 deg - No Ice	25.96	15.58	8.69	572.34	-1039.19	0.16
Dead+Wind 150 deg - No Ice	25.96	8.32	16.24	1094.98	-541.09	2.58
Dead+Wind 180 deg - No Ice	25.96	-0.42	18.54	1245.78	36.68	2.78
Dead+Wind 210 deg - No Ice	25.96	-9.72	16.11	1083.27	663.39	1.32
Dead+Wind 240 deg - No Ice	25.96	-16.40	9.39	632.64	1111.14	0.20
Dead+Wind 270 deg - No Ice	25.96	-18.62	0.54	45.74	1255.46	0.14
Dead+Wind 300 deg - No Ice	25.96	-15.83	-8.79	-583.26	1062.12	-1.26
Dead+Wind 330 deg - No Ice	25.96	-8.96	-16.14	-1088.24	597.73	-2.61
Dead+Ice+Temp	41.69	-0.00	-0.00	-2.79	4.44	0.00
Dead+Wind 0 deg+Ice+Temp	41.69	0.01	-5.74	-386.17	3.90	-0.40
Dead+Wind 30 deg+Ice+Temp	41.69	2.93	-4.95	-332.90	-192.72	-0.39

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 60 deg+Ice+Temp	41.69	4.91	-2.95	-201.72	-322.06	-0.42
Dead+Wind 90 deg+Ice+Temp	41.69	5.66	-0.19	-19.59	-372.32	-0.28
Dead+Wind 120 deg+Ice+Temp	41.69	4.83	2.71	175.22	-315.28	0.14
Dead+Wind 150 deg+Ice+Temp	41.69	2.63	4.98	329.89	-166.30	0.80
Dead+Wind 180 deg+Ice+Temp	41.69	-0.09	5.70	376.48	12.60	0.88
Dead+Wind 210 deg+Ice+Temp	41.69	-2.95	4.94	326.45	203.50	0.50
Dead+Wind 240 deg+Ice+Temp	41.69	-5.02	2.87	188.76	340.75	0.16
Dead+Wind 270 deg+Ice+Temp	41.69	-5.72	0.12	7.84	386.48	0.04
Dead+Wind 300 deg+Ice+Temp	41.69	-4.89	-2.74	-183.11	329.49	-0.41
Dead+Wind 330 deg+Ice+Temp	41.69	-2.78	-4.96	-333.50	188.67	-0.81
Dead+Wind 0 deg - Service	25.96	0.02	-7.32	-494.72	-1.27	-0.30
Dead+Wind 30 deg - Service	25.96	3.77	-6.31	-425.95	-255.50	-0.33
Dead+Wind 60 deg - Service	25.96	6.23	-3.81	-260.29	-417.79	-0.50
Dead+Wind 90 deg - Service	25.96	7.18	-0.32	-28.90	-481.53	-0.45
Dead+Wind 120 deg - Service	25.96	6.09	3.40	223.24	-405.86	0.06
Dead+Wind 150 deg - Service	25.96	3.25	6.35	427.54	-211.15	1.01
Dead+Wind 180 deg - Service	25.96	-0.16	7.25	486.50	14.74	1.09
Dead+Wind 210 deg - Service	25.96	-3.80	6.30	422.97	259.74	0.52
Dead+Wind 240 deg - Service	25.96	-6.41	3.67	246.80	434.79	0.08
Dead+Wind 270 deg - Service	25.96	-7.28	0.21	17.35	491.24	0.06
Dead+Wind 300 deg - Service	25.96	-6.19	-3.44	-228.55	415.64	-0.49
Dead+Wind 330 deg - Service	25.96	-3.50	-6.31	-425.95	234.09	-1.02

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	-25.96	0.00	0.00	25.96	0.00	0.000%
2	0.06	-25.96	-18.73	-0.06	25.96	18.73	0.003%
3	9.63	-25.96	-16.15	-9.63	25.96	16.15	0.001%
4	15.94	-25.96	-9.74	-15.94	25.96	9.74	0.001%
5	18.37	-25.96	-0.83	-18.37	25.96	0.83	0.001%
6	15.58	-25.96	8.69	-15.58	25.96	-8.69	0.001%
7	8.32	-25.96	16.24	-8.32	25.96	-16.24	0.001%
8	-0.42	-25.96	18.54	0.42	25.96	-18.54	0.001%
9	-9.72	-25.96	16.11	9.72	25.96	-16.11	0.001%
10	-16.40	-25.96	9.39	16.40	25.96	-9.39	0.001%
11	-18.62	-25.96	0.54	18.62	25.96	-0.54	0.003%
12	-15.83	-25.96	-8.79	15.83	25.96	8.79	0.001%
13	-8.96	-25.96	-16.14	8.96	25.96	16.14	0.000%
14	0.00	-41.69	0.00	0.00	41.69	0.00	0.000%
15	0.01	-41.69	-5.74	-0.01	41.69	5.74	0.000%
16	2.93	-41.69	-4.95	-2.93	41.69	4.95	0.000%
17	4.91	-41.69	-2.95	-4.91	41.69	2.95	0.000%
18	5.66	-41.69	-0.19	-5.66	41.69	0.19	0.000%
19	4.83	-41.69	2.71	-4.83	41.69	-2.71	0.000%
20	2.63	-41.69	4.98	-2.63	41.69	-4.98	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
21	-0.09	-41.69	5.70	0.09	41.69	-5.70	0.000%
22	-2.95	-41.69	4.94	2.95	41.69	-4.94	0.000%
23	-5.02	-41.69	2.87	5.02	41.69	-2.87	0.000%
24	-5.72	-41.69	0.12	5.72	41.69	-0.12	0.000%
25	-4.89	-41.69	-2.74	4.89	41.69	2.74	0.000%
26	-2.78	-41.69	-4.96	2.78	41.69	4.96	0.000%
27	0.02	-25.96	-7.32	-0.02	25.96	7.32	0.001%
28	3.77	-25.96	-6.31	-3.77	25.96	6.31	0.001%
29	6.23	-25.96	-3.81	-6.23	25.96	3.81	0.001%
30	7.18	-25.96	-0.33	-7.18	25.96	0.32	0.001%
31	6.09	-25.96	3.40	-6.09	25.96	-3.40	0.001%
32	3.25	-25.96	6.35	-3.25	25.96	-6.35	0.001%
33	-0.16	-25.96	7.25	0.16	25.96	-7.25	0.001%
34	-3.80	-25.96	6.30	3.80	25.96	-6.30	0.001%
35	-6.41	-25.96	3.67	6.41	25.96	-3.67	0.001%
36	-7.28	-25.96	0.21	7.28	25.96	-0.21	0.001%
37	-6.19	-25.96	-3.44	6.19	25.96	3.44	0.001%
38	-3.50	-25.96	-6.31	3.50	25.96	6.31	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	8	0.00000001	0.00013598
3	Yes	9	0.00000001	0.00009439
4	Yes	9	0.00000001	0.00013812
5	Yes	9	0.00000001	0.00007150
6	Yes	9	0.00000001	0.00008264
7	Yes	9	0.00000001	0.00008022
8	Yes	9	0.00000001	0.00012249
9	Yes	9	0.00000001	0.00013835
10	Yes	9	0.00000001	0.00010141
11	Yes	8	0.00000001	0.00011379
12	Yes	9	0.00000001	0.00007215
13	Yes	10	0.00000001	0.00004329
14	Yes	6	0.00000001	0.00000001
15	Yes	10	0.00000001	0.00005741
16	Yes	10	0.00000001	0.00005805
17	Yes	10	0.00000001	0.00005738
18	Yes	10	0.00000001	0.00005528
19	Yes	10	0.00000001	0.00005395
20	Yes	10	0.00000001	0.00005533
21	Yes	10	0.00000001	0.00005586
22	Yes	10	0.00000001	0.00005803
23	Yes	10	0.00000001	0.00005871
24	Yes	10	0.00000001	0.00005740
25	Yes	10	0.00000001	0.00005672
26	Yes	10	0.00000001	0.00005789
27	Yes	8	0.00000001	0.00005962
28	Yes	8	0.00000001	0.00005190
29	Yes	8	0.00000001	0.00006701
30	Yes	8	0.00000001	0.00006610
31	Yes	8	0.00000001	0.00004992
32	Yes	8	0.00000001	0.00006936
33	Yes	8	0.00000001	0.00008899
34	Yes	8	0.00000001	0.00006667
35	Yes	8	0.00000001	0.00005286
36	Yes	8	0.00000001	0.00005747
37	Yes	8	0.00000001	0.00005245
38	Yes	8	0.00000001	0.00009049

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96 - 85	4.149	35	0.3208	0.0032
L2	85 - 65	3.420	35	0.2986	0.0020
L3	65 - 32.5	2.204	35	0.2745	0.0013
L4	32.5 - 0	0.632	35	0.1694	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	7770.00 w/ Mount Pipe	35	3.881	0.3120	0.0027	58748
86.00	A-ANT-11G-4-C	35	3.485	0.3002	0.0021	31064
83.00	840 10045 w/ Mount Pipe	35	3.292	0.2956	0.0019	28742
79.00	800MHz 2X50W RRH W/FILTER	35	3.041	0.2907	0.0016	31373
75.00	ONEBASE TWIN DUAL DUPLEX TMA	35	2.795	0.2866	0.0015	35375

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	96 - 85	10.609	10	0.8206	0.0082
L2	85 - 65	8.746	10	0.7636	0.0051
L3	65 - 32.5	5.636	10	0.7019	0.0034
L4	32.5 - 0	1.617	10	0.4332	0.0015

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	7770.00 w/ Mount Pipe	10	9.924	0.7980	0.0069	23042
86.00	A-ANT-11G-4-C	10	8.912	0.7679	0.0053	12184
83.00	840 10045 w/ Mount Pipe	10	8.418	0.7560	0.0047	11259
79.00	800MHz 2X50W RRH W/FILTER	10	7.775	0.7435	0.0042	12262
75.00	ONEBASE TWIN DUAL DUPLEX TMA	10	7.148	0.7329	0.0039	13828

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	96 - 95	P12x.5	11.00	0.00	0.0	21.000	19.2423	-0.09	404.09	0.000

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
	95 - 94					21.000	19.2423	-0.14	404.09	0.000
	94 - 93					21.000	19.2423	-0.21	404.09	0.001
	93 - 92					21.000	19.2423	-0.28	404.09	0.001
	92 - 91					21.000	19.2423	-1.55	404.09	0.004
	91 - 90					21.000	19.2423	-1.62	404.09	0.004
	90 - 89					21.000	19.2423	-1.68	404.09	0.004
	89 - 88					21.000	19.2423	-1.75	404.09	0.004
	88 - 87					21.000	19.2423	-1.82	404.09	0.005
	87 - 86					21.000	19.2423	-1.89	404.09	0.005
	86 - 85					21.000	19.2423	-2.30	404.09	0.006
L2	85 - 84	P42x3/8	20.00	0.00	0.0	22.711	49.0383	-2.48	1113.69	0.002
	84 - 83					22.711	49.0383	-2.67	1113.69	0.002
	83 - 82					22.711	49.0383	-4.77	1113.69	0.004
	82 - 81					22.711	49.0383	-4.96	1113.69	0.004
	81 - 80					22.711	49.0383	-5.14	1113.69	0.005
	80 - 79					22.711	49.0383	-5.33	1113.69	0.005
	79 - 78					22.711	49.0383	-5.97	1113.69	0.005
	78 - 77					22.711	49.0383	-6.15	1113.69	0.006
	77 - 76					22.711	49.0383	-6.34	1113.69	0.006
	76 - 75					22.711	49.0383	-6.52	1113.69	0.006
	75 - 74					22.711	49.0383	-8.36	1113.69	0.008
	74 - 73					22.711	49.0383	-8.55	1113.69	0.008
	73 - 72					22.711	49.0383	-8.73	1113.69	0.008
	72 - 71					22.711	49.0383	-8.92	1113.69	0.008
	71 - 70					22.711	49.0383	-9.10	1113.69	0.008
	70 - 69					22.711	49.0383	-9.28	1113.69	0.008
	69 - 68					22.711	49.0383	-9.47	1113.69	0.009
	68 - 67					22.711	49.0383	-9.65	1113.69	0.009
	67 - 66					22.711	49.0383	-9.84	1113.69	0.009
	66 - 65					22.711	49.0383	-10.02	1113.69	0.009
L3	65 - 63.375	P48x3/8	32.50	0.00	0.0	21.972	56.1069	-10.37	1232.77	0.008
	63.375 - 61.75					21.972	56.1069	-10.71	1232.77	0.009
	61.75 - 60.125					21.972	56.1069	-11.06	1232.77	0.009
	60.125 - 58.5					21.972	56.1069	-11.40	1232.77	0.009
	58.5 - 56.875					21.972	56.1069	-11.75	1232.77	0.010
	56.875 - 55.25					21.972	56.1069	-12.10	1232.77	0.010
	55.25 - 53.625					21.972	56.1069	-12.44	1232.77	0.010
	53.625 - 52					21.972	56.1069	-12.79	1232.77	0.010
	52 - 50.375					21.972	56.1069	-13.13	1232.77	0.011
	50.375 - 48.75					21.972	56.1069	-13.48	1232.77	0.011
	48.75 - 47.125					21.972	56.1069	-13.83	1232.77	0.011
	47.125 - 45.5					21.972	56.1069	-14.18	1232.77	0.011
	45.5 - 43.875					21.972	56.1069	-14.52	1232.77	0.012
	43.875 - 42.25					21.972	56.1069	-14.87	1232.77	0.012
	42.25 - 40.625					21.972	56.1069	-15.22	1232.77	0.012
	40.625 - 39					21.972	56.1069	-15.57	1232.77	0.013
	39 - 37.375					21.972	56.1069	-15.92	1232.77	0.013
	37.375 - 35.75					21.972	56.1069	-16.27	1232.77	0.013
	35.75 - 34.125					21.972	56.1069	-16.62	1232.77	0.013
	34.125 - 32.5					21.972	56.1069	-16.96	1232.77	0.014
L4	32.5 - 30.875	P48x1/2	32.50	0.00	0.0	23.696	74.6128	-17.41	1768.01	0.010
	30.875 - 29.25					23.696	74.6128	-17.86	1768.01	0.010
	29.25 - 27.625					23.696	74.6128	-18.31	1768.01	0.010
	27.625 - 26					23.696	74.6128	-18.76	1768.01	0.011
	26 - 24.375					23.696	74.6128	-19.20	1768.01	0.011
	24.375 - 22.75					23.696	74.6128	-19.65	1768.01	0.011
	22.75 - 21.125					23.696	74.6128	-20.10	1768.01	0.011
	21.125 - 19.5					23.696	74.6128	-20.55	1768.01	0.012
	19.5 - 17.875					23.696	74.6128	-21.00	1768.01	0.012
	17.875 - 16.25					23.696	74.6128	-21.45	1768.01	0.012
	16.25 - 14.625					23.696	74.6128	-21.90	1768.01	0.012
	14.625 - 13					23.696	74.6128	-22.35	1768.01	0.013
	13 - 11.375					23.696	74.6128	-22.80	1768.01	0.013
	11.375 - 9.75					23.696	74.6128	-23.25	1768.01	0.013
	9.75 - 8.125					23.696	74.6128	-23.70	1768.01	0.013
	8.125 - 6.5					23.696	74.6128	-24.15	1768.01	0.014
	6.5 - 4.875					23.696	74.6128	-24.60	1768.01	0.014
	4.875 - 3.25					23.696	74.6128	-25.06	1768.01	0.014
	3.25 - 1.625					23.696	74.6128	-25.51	1768.01	0.014

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 $\frac{P}{P_a}$
	1.625 - 0					23.696	74.6128	-25.96	1768.01	0.015

* DL controls

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	96 - 95	P12x.5	0.00	0.000	23.100	0.000	0.00	0.000	23.100	0.000
	95 - 94		0.05	0.010	23.100	0.000	0.00	0.000	23.100	0.000
	94 - 93		0.11	0.023	23.100	0.001	0.00	0.000	23.100	0.000
	93 - 92		0.19	0.041	23.100	0.002	0.00	0.000	23.100	0.000
	92 - 91		3.03	0.642	23.100	0.028	0.00	0.000	23.100	0.000
	91 - 90		5.87	1.242	23.100	0.054	0.00	0.000	23.100	0.000
	90 - 89		8.74	1.849	23.100	0.080	0.00	0.000	23.100	0.000
	89 - 88		11.63	2.461	23.100	0.107	0.00	0.000	23.100	0.000
	88 - 87		14.55	3.079	23.100	0.133	0.00	0.000	23.100	0.000
	87 - 86		17.50	3.702	23.100	0.160	0.00	0.000	23.100	0.000
	86 - 85		22.13	4.682	23.100	0.203	0.00	0.000	23.100	0.000
L2	85 - 84	P42x3/8	26.89	0.638	22.711	0.028	0.00	0.000	22.711	0.000
	84 - 83		31.74	0.753	22.711	0.033	0.00	0.000	22.711	0.000
	83 - 82		40.08	0.951	22.711	0.042	0.00	0.000	22.711	0.000
	82 - 81		48.98	1.162	22.711	0.051	0.00	0.000	22.711	0.000
	81 - 80		57.98	1.375	22.711	0.061	0.00	0.000	22.711	0.000
	80 - 79		67.06	1.591	22.711	0.070	0.00	0.000	22.711	0.000
	79 - 78		76.66	1.819	22.711	0.080	0.00	0.000	22.711	0.000
	78 - 77		86.67	2.056	22.711	0.091	0.00	0.000	22.711	0.000
	77 - 76		96.77	2.296	22.711	0.101	0.00	0.000	22.711	0.000
	76 - 75		106.96	2.538	22.711	0.112	0.00	0.000	22.711	0.000
	75 - 74		121.29	2.878	22.711	0.127	0.00	0.000	22.711	0.000
	74 - 73		133.43	3.166	22.711	0.139	0.00	0.000	22.711	0.000
	73 - 72		145.67	3.456	22.711	0.152	0.00	0.000	22.711	0.000
	72 - 71		158.00	3.749	22.711	0.165	0.00	0.000	22.711	0.000
	71 - 70		170.42	4.043	22.711	0.178	0.00	0.000	22.711	0.000
	70 - 69		182.94	4.340	22.711	0.191	0.00	0.000	22.711	0.000
	69 - 68		195.54	4.639	22.711	0.204	0.00	0.000	22.711	0.000
	68 - 67		208.24	4.940	22.711	0.218	0.00	0.000	22.711	0.000
	67 - 66		221.03	5.244	22.711	0.231	0.00	0.000	22.711	0.000
	66 - 65		233.91	5.549	22.711	0.244	0.00	0.000	22.711	0.000
L3	65 - 63.375	P48x3/8	255.05	4.617	21.972	0.210	0.00	0.000	21.972	0.000
	63.375 - 61.75		276.49	5.005	21.972	0.228	0.00	0.000	21.972	0.000
	61.75 - 60.125		298.20	5.399	21.972	0.246	0.00	0.000	21.972	0.000
	60.125 - 58.5		320.20	5.797	21.972	0.264	0.00	0.000	21.972	0.000
	58.5 - 56.875		342.47	6.200	21.972	0.282	0.00	0.000	21.972	0.000
	56.875 - 55.25		365.02	6.608	21.972	0.301	0.00	0.000	21.972	0.000
	55.25 - 53.625		387.84	7.021	21.972	0.320	0.00	0.000	21.972	0.000
	53.625 - 52		410.93	7.439	21.972	0.339	0.00	0.000	21.972	0.000
	52 - 50.375		434.29	7.862	21.972	0.358	0.00	0.000	21.972	0.000
	50.375 - 48.75		457.91	8.290	21.972	0.377	0.00	0.000	21.972	0.000
	48.75 - 47.125		481.80	8.722	21.972	0.397	0.00	0.000	21.972	0.000
	47.125 - 45.5		505.94	9.159	21.972	0.417	0.00	0.000	21.972	0.000
	45.5 - 43.875		530.35	9.601	21.972	0.437	0.00	0.000	21.972	0.000
	43.875 - 42.25		555.01	10.048	21.972	0.457	0.00	0.000	21.972	0.000
	42.25 - 40.625		579.93	10.499	21.972	0.478	0.00	0.000	21.972	0.000
	40.625 - 39		605.09	10.954	21.972	0.499	0.00	0.000	21.972	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	39 - 37.375		630.51	11.415	21.972	0.520	0.00	0.000	21.972	0.000
	37.375 - 35.75		656.17	11.879	21.972	0.541	0.00	0.000	21.972	0.000
	35.75 - 34.125		682.07	12.348	21.972	0.562	0.00	0.000	21.972	0.000
	34.125 - 32.5		708.22	12.821	21.972	0.584	0.00	0.000	21.972	0.000
L4	32.5 - 30.875	P48x1/2	734.60	10.053	23.696	0.424	0.00	0.000	23.696	0.000
	30.875 - 29.25		761.21	10.417	23.696	0.440	0.00	0.000	23.696	0.000
	29.25 - 27.625		788.04	10.784	23.696	0.455	0.00	0.000	23.696	0.000
	27.625 - 26		815.11	11.155	23.696	0.471	0.00	0.000	23.696	0.000
	26 - 24.375		842.41	11.528	23.696	0.487	0.00	0.000	23.696	0.000
	24.375 - 22.75		869.93	11.905	23.696	0.502	0.00	0.000	23.696	0.000
	22.75 - 21.125		897.67	12.284	23.696	0.518	0.00	0.000	23.696	0.000
	21.125 - 19.5		925.66	12.667	23.696	0.535	0.00	0.000	23.696	0.000
	19.5 - 17.875		953.86	13.053	23.696	0.551	0.00	0.000	23.696	0.000
	17.875 - 16.25		982.27	13.442	23.696	0.567	0.00	0.000	23.696	0.000
	16.25 - 14.625		1010.93	13.834	23.696	0.584	0.00	0.000	23.696	0.000
	14.625 - 13		1039.79	14.229	23.696	0.600	0.00	0.000	23.696	0.000
	13 - 11.375		1068.88	14.627	23.696	0.617	0.00	0.000	23.696	0.000
	11.375 - 9.75		1098.19	15.028	23.696	0.634	0.00	0.000	23.696	0.000
	9.75 - 8.125		1127.72	15.432	23.696	0.651	0.00	0.000	23.696	0.000
	8.125 - 6.5		1157.47	15.840	23.696	0.668	0.00	0.000	23.696	0.000
	6.5 - 4.875		1187.43	16.250	23.696	0.686	0.00	0.000	23.696	0.000
	4.875 - 3.25		1217.62	16.663	23.696	0.703	0.00	0.000	23.696	0.000
	3.25 - 1.625		1248.01	17.079	23.696	0.721	0.00	0.000	23.696	0.000
	1.625 - 0		1278.62	17.497	23.696	0.738	0.00	0.000	23.696	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	96 - 95	P12x.5	0.00	0.000	14.000	0.000	0.00	0.000	14.000	0.000
	95 - 94		0.05	0.005	14.000	0.000	0.00	0.000	14.000	0.000
	94 - 93		0.07	0.008	14.000	0.001	0.00	0.000	14.000	0.000
	93 - 92		0.10	0.010	14.000	0.001	0.00	0.000	14.000	0.000
	92 - 91		2.83	0.294	14.000	0.021	0.11	0.012	14.000	0.001
	91 - 90		2.85	0.296	14.000	0.021	0.11	0.012	14.000	0.001
	90 - 89		2.88	0.300	14.000	0.021	0.11	0.012	14.000	0.001
	89 - 88		2.91	0.302	14.000	0.022	0.11	0.012	14.000	0.001
	88 - 87		2.93	0.305	14.000	0.022	0.11	0.012	14.000	0.001
	87 - 86		2.96	0.307	14.000	0.022	0.11	0.012	14.000	0.001
	86 - 85		4.71	0.490	14.000	0.035	0.96	0.102	14.000	0.007
L2	85 - 84	P42x3/8	4.81	0.196	16.800	0.012	0.97	0.011	12.473	0.001
	84 - 83		4.90	0.200	16.800	0.012	0.97	0.011	12.473	0.001
	83 - 82		8.85	0.361	16.800	0.021	0.09	0.001	12.473	0.000
	82 - 81		8.95	0.365	16.800	0.022	0.09	0.001	12.473	0.000
	81 - 80		9.04	0.369	16.800	0.022	0.09	0.001	12.473	0.000
	80 - 79		9.13	0.372	16.800	0.022	0.10	0.001	12.473	0.000
	79 - 78		9.96	0.406	16.800	0.024	0.08	0.001	12.473	0.000

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 $\frac{f_{vt}}{F_{vt}}$
	78 - 77		10.05	0.410	16.800	0.024	0.08	0.001	12.473	0.000
	77 - 76		10.15	0.414	16.800	0.025	0.08	0.001	12.473	0.000
	76 - 75		10.24	0.418	16.800	0.025	0.08	0.001	12.473	0.000
	75 - 74		12.10	0.493	16.800	0.029	0.08	0.001	12.473	0.000
	74 - 73		12.19	0.497	16.800	0.030	0.08	0.001	12.473	0.000
	73 - 72		12.28	0.501	16.800	0.030	0.09	0.001	12.473	0.000
	72 - 71		12.38	0.505	16.800	0.030	0.09	0.001	12.473	0.000
	71 - 70		12.47	0.508	16.800	0.030	0.09	0.001	12.473	0.000
	70 - 69		12.56	0.512	16.800	0.030	0.09	0.001	12.473	0.000
	69 - 68		12.65	0.516	16.800	0.031	0.09	0.001	12.473	0.000
	68 - 67		12.74	0.520	16.800	0.031	0.09	0.001	12.473	0.000
	67 - 66		12.83	0.523	16.800	0.031	0.09	0.001	12.473	0.000
	66 - 65		12.93	0.527	16.800	0.031	0.10	0.001	12.473	0.000
L3	65 - 63.375	P48x3/8	13.10	0.467	16.800	0.028	0.10	0.001	11.284	0.000
	63.375 - 61.75		13.27	0.473	16.800	0.028	0.10	0.001	11.284	0.000
	61.75 - 60.125		13.45	0.479	16.800	0.029	0.11	0.001	11.284	0.000
	60.125 - 58.5		13.62	0.485	16.800	0.029	0.11	0.001	11.284	0.000
	58.5 - 56.875		13.79	0.492	16.800	0.029	0.11	0.001	11.284	0.000
	56.875 - 55.25		13.96	0.498	16.800	0.030	0.11	0.001	11.284	0.000
	55.25 - 53.625		14.12	0.503	16.800	0.030	0.12	0.001	11.284	0.000
	53.625 - 52		14.29	0.509	16.800	0.030	0.12	0.001	11.284	0.000
	52 - 50.375		14.45	0.515	16.800	0.031	0.12	0.001	11.284	0.000
	50.375 - 48.75		14.62	0.521	16.800	0.031	0.13	0.001	11.284	0.000
	48.75 - 47.125		14.78	0.527	16.800	0.031	0.13	0.001	11.284	0.000
	47.125 - 45.5		14.94	0.533	16.800	0.032	0.13	0.001	11.284	0.000
	45.5 - 43.875		15.10	0.538	16.800	0.032	0.13	0.001	11.284	0.000
	43.875 - 42.25		15.25	0.544	16.800	0.032	0.14	0.001	11.284	0.000
	42.25 - 40.625		15.41	0.549	16.800	0.033	0.14	0.001	11.284	0.000
	40.625 - 39		15.56	0.555	16.800	0.033	0.14	0.001	11.284	0.000
	39 - 37.375		15.71	0.560	16.800	0.033	0.15	0.001	11.284	0.000
	37.375 - 35.75		15.87	0.566	16.800	0.034	0.15	0.001	11.284	0.000
	35.75 - 34.125		16.01	0.571	16.800	0.034	0.15	0.001	11.284	0.000
	34.125 - 32.5		16.16	0.576	16.800	0.034	0.15	0.001	11.284	0.000
L4	32.5 - 30.875	P48x1/2	16.30	0.437	16.800	0.026	0.16	0.001	16.167	0.000
	30.875 - 29.25		16.44	0.441	16.800	0.026	0.16	0.001	16.167	0.000
	29.25 - 27.625		16.59	0.445	16.800	0.026	0.16	0.001	16.167	0.000
	27.625 - 26		16.73	0.448	16.800	0.027	0.16	0.001	16.167	0.000
	26 - 24.375		16.87	0.452	16.800	0.027	0.17	0.001	16.167	0.000
	24.375 - 22.75		17.01	0.456	16.800	0.027	0.17	0.001	16.167	0.000
	22.75 - 21.125		17.15	0.460	16.800	0.027	0.17	0.001	16.167	0.000
	21.125 - 19.5		17.29	0.463	16.800	0.028	0.17	0.001	16.167	0.000
	19.5 - 17.875		17.42	0.467	16.800	0.028	0.18	0.001	16.167	0.000
	17.875 - 16.25		17.56	0.471	16.800	0.028	0.18	0.001	16.167	0.000
	16.25 - 14.625		17.70	0.474	16.800	0.028	0.18	0.001	16.167	0.000
	14.625 - 13		17.83	0.478	16.800	0.028	0.18	0.001	16.167	0.000
	13 - 11.375		17.97	0.482	16.800	0.029	0.19	0.001	16.167	0.000
	11.375 - 9.75		18.11	0.485	16.800	0.029	0.19	0.001	16.167	0.000
	9.75 - 8.125		18.24	0.489	16.800	0.029	0.19	0.001	16.167	0.000
	8.125 - 6.5		18.37	0.493	16.800	0.029	0.19	0.001	16.167	0.000
	6.5 - 4.875		18.51	0.496	16.800	0.030	0.19	0.001	16.167	0.000
	4.875 - 3.25		18.64	0.500	16.800	0.030	0.20	0.001	16.167	0.000
	3.25 - 1.625		18.77	0.503	16.800	0.030	0.20	0.001	16.167	0.000
	1.625 - 0		18.90	0.507	16.800	0.030	0.20	0.001	16.167	0.000

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 $\frac{f_{vt}}{F_{vt}}$

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	96 - 95	0.000	0.000	0.000	0.000	0.000	0.000	1.000	H1-3+VT ✔
	95 - 94	0.000	0.000	0.000	0.000	0.000	0.001	1.333	H1-3+VT ✔
	94 - 93	0.001	0.001	0.000	0.001	0.000	0.002	1.333	H1-3+VT ✔
	93 - 92	0.001	0.002	0.000	0.001	0.000	0.002	1.333	H1-3+VT ✔
	92 - 91	0.004	0.028	0.000	0.021	0.001	0.032	1.333	H1-3+VT ✔
	91 - 90	0.004	0.054	0.000	0.021	0.001	0.058	1.333	H1-3+VT ✔
	90 - 89	0.004	0.080	0.000	0.021	0.001	0.085	1.333	H1-3+VT ✔
	89 - 88	0.004	0.107	0.000	0.022	0.001	0.111	1.333	H1-3+VT ✔
	88 - 87	0.005	0.133	0.000	0.022	0.001	0.138	1.333	H1-3+VT ✔
	87 - 86	0.005	0.160	0.000	0.022	0.001	0.165	1.333	H1-3+VT ✔
	86 - 85	0.006	0.203	0.000	0.035	0.007	0.210	1.333	H1-3+VT ✔
L2	85 - 84	0.002	0.028	0.000	0.012	0.001	0.030	1.333	H1-3+VT ✔
	84 - 83	0.002	0.033	0.000	0.012	0.001	0.036	1.333	H1-3+VT ✔
	83 - 82	0.004	0.042	0.000	0.021	0.000	0.047	1.333	H1-3+VT ✔
	82 - 81	0.004	0.051	0.000	0.022	0.000	0.056	1.333	H1-3+VT ✔
	81 - 80	0.005	0.061	0.000	0.022	0.000	0.066	1.333	H1-3+VT ✔
	80 - 79	0.005	0.070	0.000	0.022	0.000	0.075	1.333	H1-3+VT ✔
	79 - 78	0.005	0.080	0.000	0.024	0.000	0.086	1.333	H1-3+VT ✔
	78 - 77	0.006	0.091	0.000	0.024	0.000	0.097	1.333	H1-3+VT ✔
	77 - 76	0.006	0.101	0.000	0.025	0.000	0.107	1.333	H1-3+VT ✔
	76 - 75	0.006	0.112	0.000	0.025	0.000	0.118	1.333	H1-3+VT ✔
	75 - 74	0.008	0.127	0.000	0.029	0.000	0.135	1.333	H1-3+VT ✔
	74 - 73	0.008	0.139	0.000	0.030	0.000	0.148	1.333	H1-3+VT ✔
	73 - 72	0.008	0.152	0.000	0.030	0.000	0.161	1.333	H1-3+VT ✔
	72 - 71	0.008	0.165	0.000	0.030	0.000	0.174	1.333	H1-3+VT ✔

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
	71 - 70	0.008	0.178	0.000	0.030	0.000	0.187 ✔	1.333	H1-3+VT ✔
	70 - 69	0.008	0.191	0.000	0.030	0.000	0.200 ✔	1.333	H1-3+VT ✔
	69 - 68	0.009	0.204	0.000	0.031	0.000	0.214 ✔	1.333	H1-3+VT ✔
	68 - 67	0.009	0.218	0.000	0.031	0.000	0.227 ✔	1.333	H1-3+VT ✔
	67 - 66	0.009	0.231	0.000	0.031	0.000	0.241 ✔	1.333	H1-3+VT ✔
	66 - 65	0.009	0.244	0.000	0.031	0.000	0.254 ✔	1.333	H1-3+VT ✔
L3	65 - 63.375	0.008	0.210	0.000	0.028	0.000	0.219 ✔	1.333	H1-3+VT ✔
	63.375 - 61.75	0.009	0.228	0.000	0.028	0.000	0.237 ✔	1.333	H1-3+VT ✔
	61.75 - 60.125	0.009	0.246	0.000	0.029	0.000	0.255 ✔	1.333	H1-3+VT ✔
	60.125 - 58.5	0.009	0.264	0.000	0.029	0.000	0.274 ✔	1.333	H1-3+VT ✔
	58.5 - 56.875	0.010	0.282	0.000	0.029	0.000	0.293 ✔	1.333	H1-3+VT ✔
	56.875 - 55.25	0.010	0.301	0.000	0.030	0.000	0.311 ✔	1.333	H1-3+VT ✔
	55.25 - 53.625	0.010	0.320	0.000	0.030	0.000	0.331 ✔	1.333	H1-3+VT ✔
	53.625 - 52	0.010	0.339	0.000	0.030	0.000	0.350 ✔	1.333	H1-3+VT ✔
	52 - 50.375	0.011	0.358	0.000	0.031	0.000	0.369 ✔	1.333	H1-3+VT ✔
	50.375 - 48.75	0.011	0.377	0.000	0.031	0.000	0.389 ✔	1.333	H1-3+VT ✔
	48.75 - 47.125	0.011	0.397	0.000	0.031	0.000	0.409 ✔	1.333	H1-3+VT ✔
	47.125 - 45.5	0.011	0.417	0.000	0.032	0.000	0.429 ✔	1.333	H1-3+VT ✔
	45.5 - 43.875	0.012	0.437	0.000	0.032	0.000	0.450 ✔	1.333	H1-3+VT ✔
	43.875 - 42.25	0.012	0.457	0.000	0.032	0.000	0.470 ✔	1.333	H1-3+VT ✔
	42.25 - 40.625	0.012	0.478	0.000	0.033	0.000	0.491 ✔	1.333	H1-3+VT ✔
	40.625 - 39	0.013	0.499	0.000	0.033	0.000	0.512 ✔	1.333	H1-3+VT ✔
	39 - 37.375	0.013	0.520	0.000	0.033	0.000	0.534 ✔	1.333	H1-3+VT ✔
	37.375 - 35.75	0.013	0.541	0.000	0.034	0.000	0.555 ✔	1.333	H1-3+VT ✔
	35.75 - 34.125	0.013	0.562	0.000	0.034	0.000	0.577 ✔	1.333	H1-3+VT ✔
	34.125 - 32.5	0.014	0.584	0.000	0.034	0.000	0.598 ✔	1.333	H1-3+VT ✔
L4	32.5 - 30.875	0.010	0.424	0.000	0.026	0.000	0.435 ✔	1.333	H1-3+VT ✔
	30.875 - 29.25	0.010	0.440	0.000	0.026	0.000	0.450 ✔	1.333	H1-3+VT ✔
	29.25 - 27.625	0.010	0.455	0.000	0.026	0.000	0.466 ✔	1.333	H1-3+VT ✔
	27.625 - 26	0.011	0.471	0.000	0.027	0.000	0.482 ✔	1.333	H1-3+VT ✔

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
	26 - 24.375	0.011	0.487	0.000	0.027	0.000	0.498 ✔	1.333	H1-3+VT ✔
	24.375 - 22.75	0.011	0.502	0.000	0.027	0.000	0.514 ✔	1.333	H1-3+VT ✔
	22.75 - 21.125	0.011	0.518	0.000	0.027	0.000	0.531 ✔	1.333	H1-3+VT ✔
	21.125 - 19.5	0.012	0.535	0.000	0.028	0.000	0.547 ✔	1.333	H1-3+VT ✔
	19.5 - 17.875	0.012	0.551	0.000	0.028	0.000	0.564 ✔	1.333	H1-3+VT ✔
	17.875 - 16.25	0.012	0.567	0.000	0.028	0.000	0.580 ✔	1.333	H1-3+VT ✔
	16.25 - 14.625	0.012	0.584	0.000	0.028	0.000	0.597 ✔	1.333	H1-3+VT ✔
	14.625 - 13	0.013	0.600	0.000	0.028	0.000	0.614 ✔	1.333	H1-3+VT ✔
	13 - 11.375	0.013	0.617	0.000	0.029	0.000	0.631 ✔	1.333	H1-3+VT ✔
	11.375 - 9.75	0.013	0.634	0.000	0.029	0.000	0.648 ✔	1.333	H1-3+VT ✔
	9.75 - 8.125	0.013	0.651	0.000	0.029	0.000	0.666 ✔	1.333	H1-3+VT ✔
	8.125 - 6.5	0.014	0.668	0.000	0.029	0.000	0.683 ✔	1.333	H1-3+VT ✔
	6.5 - 4.875	0.014	0.686	0.000	0.030	0.000	0.701 ✔	1.333	H1-3+VT ✔
	4.875 - 3.25	0.014	0.703	0.000	0.030	0.000	0.718 ✔	1.333	H1-3+VT ✔
	3.25 - 1.625	0.014	0.721	0.000	0.030	0.000	0.736 ✔	1.333	H1-3+VT ✔
	1.625 - 0	0.015	0.738	0.000	0.030	0.000	0.754 ✔	1.333	H1-3+VT ✔

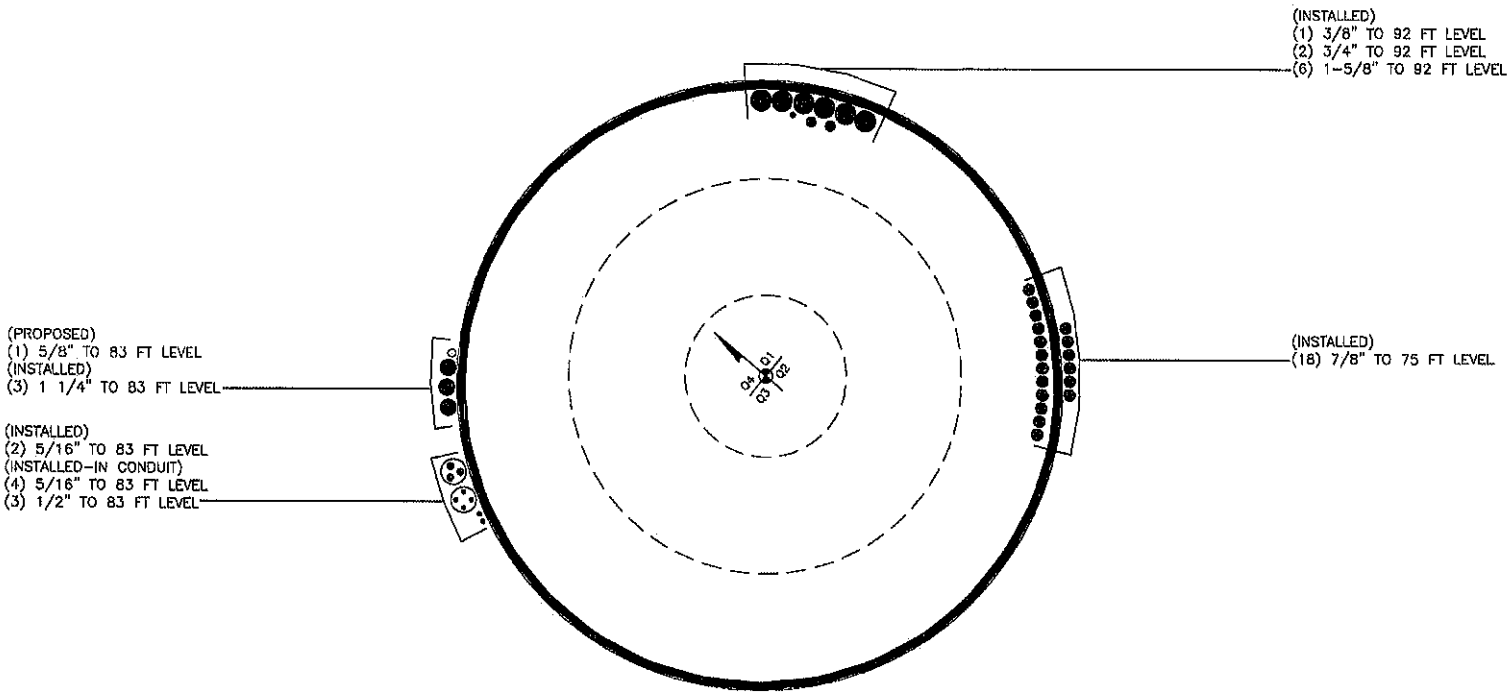
* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	96 - 85	Pole	P12x.5	1	-2.30	538.65	15.8	Pass
L2	85 - 65	Pole	P42x3/8	2	-10.02	1484.55	19.1	Pass
L3	65 - 32.5	Pole	P48x3/8	3	-16.96	1643.28	44.9	Pass
L4	32.5 - 0	Pole	P48x1/2	4	-25.96	2356.76	56.6	Pass
							Summary	
						Pole (L4)	56.6	Pass
						RATING =	**56.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(1) 3/8" TO 92 FT LEVEL
(2) 3/4" TO 92 FT LEVEL
(6) 1-5/8" TO 92 FT LEVEL
(PROPOSED)
(1) 5/8" TO 83 FT LEVEL
(INSTALLED)
(3) 1 1/4" TO 83 FT LEVEL
(INSTALLED)
(2) 5/16" TO 83 FT LEVEL
(INSTALLED-IN CONDUIT)
(4) 5/16" TO 83 FT LEVEL
(3) 1/2" TO 83 FT LEVEL
(INSTALLED)
(18) 7/8" TO 75 FT LEVEL
D1
D2
D3
D4

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Re

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *208252 R3*

Pole Manufacturer:	Rohn

Reactions		
Moment:	233.90466	ft-kips
Axial:	10.0236	kips
Shear:	12.924983	kips
Elevation:	65	feet

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

Bolt Data			
Qty:	20		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty: 44.00
N/A:	75	<-- Disregard	
Circle (in.):	53.5		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.54	in

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

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

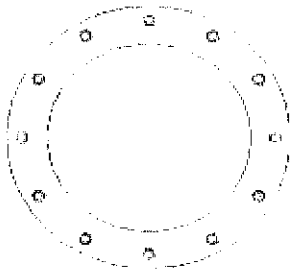
Flange Bolt Results

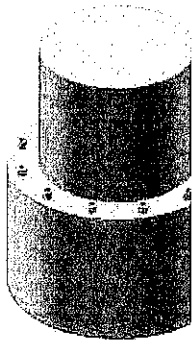
Bolt Tension Capacity, B:	103.65 kips
Max Bolt directly applied T:	9.99 Kips
Min. PL "tc" for B cap. w/o Pry:	2.141 in
Min PL "treq" for actual T w/ Pry:	0.496 in
Min PL "t1" for actual T w/o Pry:	0.665 in
T allowable with Prying:	98.85 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	9.99 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	9.6% **Pass**

Exterior Flange Plate Results	Flexural Check
Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	6.2% **Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





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

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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Re

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *208252 R3*

Pole Manufacturer:	Rohn

Bolt Data			
Qty:	20		
Diameter (in.):	1.5	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	53.5		

Plate Data		
Diam:	59	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	7.54	in

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

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	708.21696	ft-kips
Axial:	16.9648	kips
Shear:	16.161726	kips
Elevation:	32.5	feet

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

Flange Bolt Results

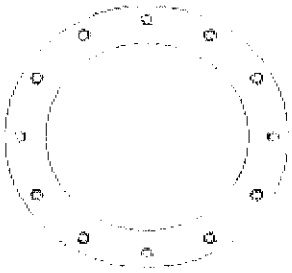
Bolt Tension Capacity, B:	103.65 kips
Max Bolt directly applied T:	30.92 Kips
Min. PL "tc" for B cap. w/o Pry:	2.141 in
Min PL "treq" for actual T w/ Pry:	0.873 in
Min PL "t1" for actual T w/o Pry:	1.169 in
T allowable with Prying:	98.85 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	30.92 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	29.8% **Pass**

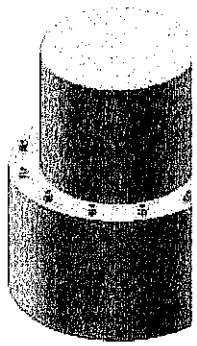
Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	19.1% **Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





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

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

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

TIA Rev F

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *208252 R3*

Pole Manufacturer:	*Rohn*

Reactions		
Moment:	1278.6207	ft-kips
Axial:	25.9603	kips
Shear:	18.904338	kips

Anchor Rod Data		
Qty:	20	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	53.5	in

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

Anchor Rod Results

		Rigid
Maximum Rod Tension:	56.1 Kips	Service, ASD
Allowable Tension:	97.2 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	57.7% Pass	

Plate Data		
Diam:	59	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.54	in

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	Rohn/Pirod, OK	Service ASD
Allowable Plate Stress:	36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	Rohn/Pirod, OK	Y.L. Length: 23.63

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

n/a

Stiffener Results N/A for Rohn / Pirod

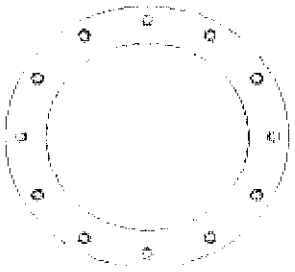
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

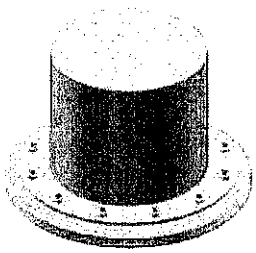
Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Diam:	48	in
Thick:	0.5	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	





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

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

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

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

Site Data

BU#: *876326*
Site Name: *HAYDEN STATION*
App #: *208252 R3*

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	1404.965	ft-kips **(* Note)**
Max. Service Shaft P:	25.9603	kips
Max Axial Force Type:	Comp.	

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

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

Load Factor	Shaft Factored Loads		
1.30	Mu:	1826.455	ft-kips
1.30	Pu:	33.74839	kips

Pier Properties		
Concrete:		
Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2
Reinforcement:		
Clear Cover to **Tie**=	4.74	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.00	ft
Vert. Cage Diameter =	72.00	in
Vertical Bar Size =	10	
Bar Diameter =	1.27	in
Bar Area =	1.27	in^2
Number of Bars =	24	
As Total=	30.48	in^2
A s/ Aconc, Rho:	0.0055	0.55%

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

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

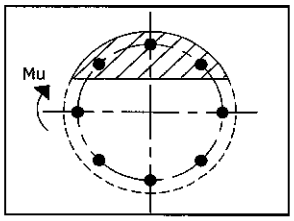
ACI 10.5 , ACI 21.10.4, and IBC 1810.

Min As for Flexural, Tension Controlled, Shafts:

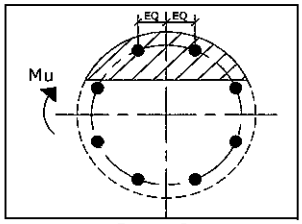
(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis: **13.61** in

Extreme Steel Strain, εt: **0.0141**

εt > 0.0050, Tension Controlled

Reduction Factor,φ: **0.900**

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.55%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8258.95	kips
at Mu=(ϕ=0.65)Mn=	4988.31	ft-kips
Max Tu, (φ=0.9) Tn =	1645.92	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	33.75	kips
Drilled Shaft Moment Capacity, φMn:	**4772.38**	ft-kips
Drilled Shaft Superimposed Mu:	**1826.45**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**38.3%**

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Site Number	876326
Site Name	HAYDEN STATION

Caisson Analysis

Pier Properties		
Moment	1279	kip-ft
Shear	19	kip
Pier Diameter	7.0	ft
Height Above Grade	0.50	ft
Depth Below Grade	30.00	ft
Donut Diameter		ft
Donut Depth		ft

Analysis Properties	
TIA Code	F
Soil Safety Factor	2.00
Water Table Depth	26.0 ft
Ignored Soil Depth	3.5 ft
Cohesion Based on	PLS Caisson
Max Soil Capacity	100%

Soil Properties

Layer	Top of Soil Layer (ft)	Layer Thickness (ft)	Bottom of Soil Layer (ft)	Soil Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Soil.Layer	*Soil.Top*	*Soil.Thick*	*Soil.Bottom*	*Soil.Weight*	*Soil.Cohesion*	*Soil.Phi*
1	0.00	43.5	43.50	120	0	32
2						
3						
4						
5						
6						
7						
8						
9						
10						

Critical Depths Below Grade		Results		
Rotation Axis	21.90 ft	Soil Capacity	16.6%	OK
Zero Shear	8.23 ft	Max Pier Moment	1405	kip-ft

Moment At User Defined Depths Below Grade			
	kip-ft		kip-ft
	kip-ft		kip-ft

V1.0

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC065

Hayden Station

440 Hayden Station Road
Windsor, CT 06095

March 21, 2014

EBI Project Number: 62141424

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

EBI Consulting
environmental | engineering | due diligence

March 21, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC065 – Hayden Station

Site Total: 97.826% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 440 Hayden Station Road, Windsor, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 440 Hayden Station Road, Windsor, 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) 2 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications was used in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTMM-C-120. 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. 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 **83 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	CT03XC065 - Hayden Station
Site Addresss	440 Hayden Station Road, Windsor, CT 06095
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	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	83	77	1/2 "	0.5	3	695.12033	4.21487%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	83	77	1/2 "	0.5	3	195.44744	2.09012%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	83	77	1/2 "	0.5	3	390.89489	4.18024%
														Sector total Power Density Value:		10.485%

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	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	83	77	1/2 "	0.5	3	695.12033	4.21487%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	83	77	1/2 "	0.5	3	195.44744	2.09012%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	83	77	1/2 "	0.5	3	390.89489	4.18024%
														Sector total Power Density Value:		10.485%

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	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	83	77	1/2 "	0.5	3	695.12033	4.21487%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	83	77	1/2 "	0.5	3	195.44744	2.09012%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	83	77	1/2 "	0.5	3	390.89489	4.18024%
														Sector total Power Density Value:		10.485%

Site Composite MPE %	
Carrier	MPE %
Sprint	31.456%
AT&T	44.300%
T-Mobile	19.410%
Clearwire	2.660%
Total Site MPE %	**97.826%**

EBI Consulting
environmental | engineering | due diligence

Summary

All calculations performed for this analysis yielded results that were 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 **31.456% (10.485% from each sector)** 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 **97.826%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803