



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

October 2, 2018

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

**RE: Notice of Exempt Modification for Sprint DO Macro: 876375**  
**Sprint Site ID: CT33XC084**  
**53 Westminster Rd. Canterbury, Connecticut 06331**  
**Latitude: 41° 42' 7.15"/Longitude: 71° 58' 50.11"**

Dear Ms. Bachman:

Sprint currently maintains six (6) antennas at the 180-foot level of the existing 180-foot monopole tower at 53 Westminster Rd. Canterbury, CT. 06331. The tower is owned by Crown Castle. John R. Lemire owns the property. Sprint now intends to replace six (6) antennas with six (6) new antennas. These antennas would be installed at the 180-foot level of the tower. Sprint also intends to install nine (9) RRHs, two (2) handrail kits, one (1) handrail reinforcement kit and swap six (6) existing coax cables with four (4) hybrid cables.

**This facility was approved by the Town of Canterbury Planning and Zoning Commission on April 18, 2000. This approval was given with conditions that were met.**

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to First Selectman Christopher Lippke, Town of Canterbury, Robert P. Kerr, Building Official, Town of Canterbury, as well as the property owner, and Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

**The Foundation for a Wireless World.**

CrownCastle.com

Melanie A. Bachman

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4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Jeffrey Barbadora  
Real Estate Specialist  
12 Gill Street, Suite 5800, Woburn, MA 01801  
781-729-0053  
[Jeff.Barbadora@crowncastle.com](mailto:Jeff.Barbadora@crowncastle.com)

Attachments:

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

cc: The Honorable Christopher Lippke  
Municipal Drive  
Canterbury, CT 06331

Robert P. Kerr, Building Official  
1 Municipal Drive  
Canterbury, CT 06331

John R. Lemire  
142 Hanover Versailles Rd.  
Apt. 1  
Baltic, CT 06330

### 53 WESTMINSTER RD

**Location** 53 WESTMINSTER RD

**Mblu** 46/ 32/ / /

**Acct#** 00144000

**Owner** LEMIRE JOHN R

**Assessment** \$185,300

**Appraisal** \$302,010

**PID** 1715

**Building Count** 1

**Current Value**

Appraisal			
Valuation Year	Improvements	Land	Total
2015	\$21,300	\$280,710	\$302,010

Assessment			
Valuation Year	Improvements	Land	Total
2015	\$15,000	\$170,300	\$185,300

**Owner of Record**

**Owner** LEMIRE JOHN R

**Sale Price** \$0

**Co-Owner**

**Certificate**

**Address** 142 HANOVER VERSAILLES RD

**Book & Page** 85/ 331

APT 1

**Sale Date** 07/27/1988

BALTIC, CT 06330

**Ownership History**

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
LEMIRE JOHN R	\$0		85/ 331	07/27/1988

**Building Information**

**Building 1 : Section 1**

**Year Built:** 1971

**Living Area:** 544

**Replacement Cost:** \$40,721

**Building Percent** 38

**Good:**

**Replacement Cost**

**Less Depreciation:** \$15,500

**Building Photo**

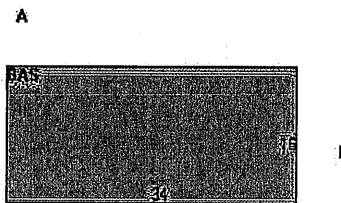
Building Attributes	
Field	Description
Style	Manufactured Home
Model	Residential

Grade:	D
Stories	1 Story
Occupancy	1
Exterior Wall 1	Pre-Fab Wood
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	Panelling
Interior Flr 1	Carpet
Interior Flr 2	Linoleum
Heat Fuel	Oil
Heat Type:	Forced Hot Air
AC Type:	None
Total Bedrooms:	1 Bedroom
Total Bthrms:	1
Total Half Baths:	0
Extra Fixtures	
Total Rooms:	2 Rooms
Bath Style:	Average
Kitchen Style:	Average
Fireplaces	0
Xtra Openings	0
Gas Fireplaces	0
Woodstove	
SF Fin Bsmt	
Fin Bsmt Qual	
Bsmt Gar	
Blocked FPL	0



(http://images.vgsi.com/photos/CanterburyCTPhotos//\00\00\42\67.jpg)

**Building Layout**



(http://images.vgsi.com/photos/CanterburyCTPhotos//Sketches/:

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	544	544
		544	544

**Extra Features**

Extra Features	Legend
No Data for Extra Features	

**Land**

**Land Use**

<b>Use Code</b>	1030
<b>Description</b>	Manufactured Home
<b>Zone</b>	RD
<b>Neighborhood</b>	
<b>Alt Land Appr Category</b>	No

**Land Line Valuation**

<b>Size (Acres)</b>	35.43
<b>Frontage</b>	0
<b>Depth</b>	0
<b>Assessed Value</b>	\$170,300
<b>Appraised Value</b>	\$280,710

**Outbuildings**

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
SHP2	Work Shop - Good			384 S.F	\$5,800	1
SHDN	Shed N/V			96 S.F.	\$0	1

**Valuation History**

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$21,300	\$280,710	\$302,010
2016	\$21,300	\$280,710	\$302,010
2015	\$21,300	\$280,710	\$302,010


Assessment			
Valuation Year	Improvements	Land	Total
2017	\$15,000	\$170,300	\$185,300
2016	\$15,000	\$170,300	\$185,300
2015	\$15,000	\$170,300	\$185,300



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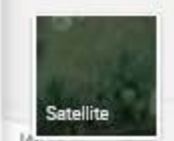


53 Westminster Rd  
Canterbury, CT 06331

[Directions](#)

 SAVE  NEARBY  SEND TO YOUR PHONE  SHARE

-  P229+6P Canterbury, Connecticut
-  Add a missing place
-  Add a label



**SPECIAL CONSTRUCTION NOTE:**  
 SPRINT WORK IS CONTINGENT ON THE FOLLOWING:  
 \* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.  
 \* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.  
 \* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.



**PROJECT:** DO MACRO UPGRADE (800 3G/4G & 2.5)  
**SITE NAME:** CANTERBURY/ LEMIRE  
**SITE CASCADE:** CT33XC084  
**MARKET:** NE  
**SITE ADDRESS:** 53 WESTMINSTER RD  
 CANTERBURY, CT 06331  
**SITE TYPE:** MONOPOLE



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

**NOTE:**  
 OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

**STRUCTURAL NOTE:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS AND MODIFICATION PLAN PROVIDED BY VERTICAL STRUCTURES INC, DATED 08/21/18 AND MOUNT ANALYSIS BY HUDSON DESIGN GROUP DATED JUNE 15, 2018 (REV 1) TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

**CROWN CASTLE SITE #: 876375**  
**CROWN CASTLE SITE NAME: CANTERBURY/ LEMIRE**

**VICINITY MAP**  
 N.T.S.



**PROJECT INFORMATION**

**SITE INFORMATION:**  
 SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND SPECTRUM LICENSE FOR DO\_MACRO UPGRADE, INCLUDING INSTALLATION OF:  
 GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF:  
 \* NO CHANGES  
 TOWER EQUIPMENT, INCLUDING INSTALLATION OF:  
 \* (6) PANEL ANTENNAS (REPLACE 6 EXISTING ANTENNAS)  
 \* (9) REMOTE RADIO HEADS (RRH) (RELOCATE 3 GROUND MOUNTED RRH TO ANTENNA LEVEL)  
 \* (4) HYBRID CABLES (REMOVE 6 COAX LINES)  
 \* (2) HANDRAIL KITS (UPPER AND LOWER)  
 \* (1) HANDRAIL REINFORCEMENT KIT  
 \* TOWER REINFORCEMENT MODIFICATIONS (TO BE DONE BY OTHERS ON SEPARATE BUILDING PERMIT)  
 LATITUDE: N 41° 42' 7.15"  
 LONGITUDE: W 71° 58' 50.11"  
 GROUND ELEVATION 353± AMSL (PER GOOGLE EARTH)  
 STRUCTURE HEIGHT 180± AGL (TYPE: MONOPOLE)  
 ZONING JURISDICTION CANTERBURY

**APPLICANT:**  
 SPRINT  
 1 INTERNATIONAL BLVD, SUITE 800  
 MAHWAH, NJ 07495

**PROPERTY OWNER:**  
 UNKNOWN

**TOWER OWNER:**  
 CROWN CASTLE  
 12 GILL STREET  
 SUITE 5800  
 WOBURN, MA 01801

**SPRINT CONSTRUCTION MANAGER:**  
 MIKE DURKIN  
 PHONE: 401-363-9923  
 michael.durkin@sprint.com

**CROWN CASTLE PROJECT MANAGER:**  
 WILL STONE  
 PHONE: 518-373-3543  
 william.stone@crowncastle.com

**SPRINT MARKET MANAGER:**  
 RONALD HIBBARD  
 PHONE: 774-269-8812  
 ronald.hibbard@sprint.com

**DRAWING INDEX**

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
SP-1	OUTLINE SPECIFICATIONS	2
SP-2	OUTLINE SPECIFICATIONS	2
SP-3	OUTLINE SPECIFICATIONS	2
A-1	COMPOUND PLAN & EQUIPMENT PLAN	2
A-2	ANTENNA PLANS & ELEVATION	2
A-3	EQUIPMENT DETAILS	2
A-4	MOUNTING DETAILS	2
A-5	RF DATA SHEET	2
A-6	WIRING DIAGRAMS	2
G-1	ONE LINE DIAGRAM, GROUNDING DETAILS & NOTES	2

**SPECIAL ZONING NOTE**

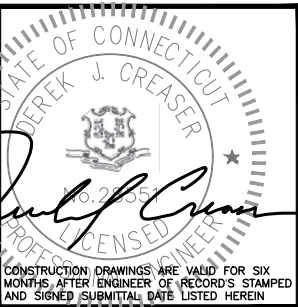
BASED ON INFORMATION PROVIDED BY SPRINT REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

**GENERAL NOTES**

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:  
 - ADA COMPLIANCE NOT REQUIRED.  
 - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.  
 - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
- CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
- CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.
- NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.  
 BUILDING CODE: INTERNATIONAL BUILDING CODE 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS  
 ELECTRICAL CODE: NFPA 70 2014 - NATIONAL ELECTRIC CODE  
 STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

**APPROVALS**

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE



CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
 CT33XC084  
 SITE NAME:  
 CANTERBURY/ LEMIRE  
 CROWN BU NUMBER:  
 876375  
 SITE ADDRESS:  
 53 WESTMINSTER RD  
 CANTERBURY, CT 06331  
 WINDHAM COUNTY

SHEET TITLE  
 TITLE SHEET  
 (MIMO REDESIGN)

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-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
  - 2. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
  - 3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
  - 4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
  - 5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
  - 6. AMERICAN CONCRETE INSTITUTE (ACI)
  - 7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
  - 8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
  - 9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
  - 10. PORTLAND CEMENT ASSOCIATION (PCA)
  - 11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
  - 12. BRICK INDUSTRY ASSOCIATION (BIA)
  - 13. AMERICAN WELDING SOCIETY (AWS)
  - 14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
  - 15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
  - 16. DOOR AND HARDWARE INSTITUTE (DHI)
  - 17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
  - 18. 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.
  - A. TOP HAT
  - B. HOW TO INSTALL A NEW CABINET
  - C. BASE BAND UNIT IN EXISTING UNIT
  - D. INSTALLATION OF BATTERIES
  - E. INSTALLATION OF HYBRID CABLE
  - F. INSTALLATION OF RRH'S
  - G. CABLING
  - H. SPRINT TS-0200 (CURRENT VERSION) – ANTENNA LINE ACCEPTANCE STANDARDS
  - I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.
  - J. COMMISSIONING MOPS
  - K. SPRINT CELL SITE ENGINEERING NOTICE – EN-2013-002
  - L. SPRINT ENGINEERING LETTER – EL-0504
  - M. SPRINT ENGINEERING LETTER – EL-0568
  - N. SPRINT TECHNICAL SPECIFICATION – TS-0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

- A. CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT 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. 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

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.

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:

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

3.2 GENERAL REQUIREMENTS FOR 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. **CONTINUE SHEET SP-2**



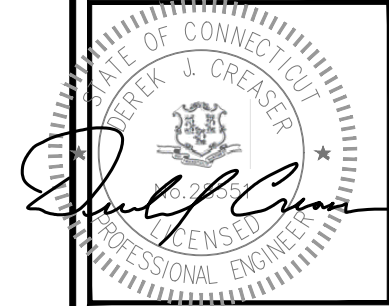
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



CROWN CASTLE  
12 GILL STREET, SUITE 5800  
WOBRURN, MA 01801



45 BEECHWOOD DRIVE TEL: (978) 557-5553  
N. ANDOVER, MA 01845 FAX: (978) 336-5866



CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
**CT33XC084**  
SITE NAME:  
CANTERBURY/ LEMIRE  
CROWN BU NUMBER:  
876375  
SITE ADDRESS:  
53 WESTMINSTER RD  
CANTERBURY, CT 06331  
WINDHAM COUNTY

SHEET TITLE

OUTLINE  
SPECIFICATIONS  
(MIMO REDESIGN)

SHEET NUMBER

**SP-1**



CONTINUED FROM SP-1:

SECTION 01 400 – SUBMITTALS, TESTS, AND INSPECTIONS

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.
C. 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.

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 SPRINT TS-0200 (CURRENT VERSION) 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.
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.
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

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: 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.
1. 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.
2. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
3. 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)
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
E. 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.
F. 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 01 500 – PROJECT REPORTING

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

SECTION 07 500 – ROOF CUTTING, PATCHING AND REPAIR

SUMMARY:

THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE CONDUIT OR CABLES EXIT THE BUILDING ONTO THE ROOF OR BUILDING-MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERTIGHT PERFORMANCE. ROOFTOP ENTRY OPENINGS IN MEMBRANE ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS.

1.4 SUBMITTALS:

A. PRE-CONSTRUCTION ROOF PHOTOS: COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.

B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)

C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

CONTINUE SHEET SP-3



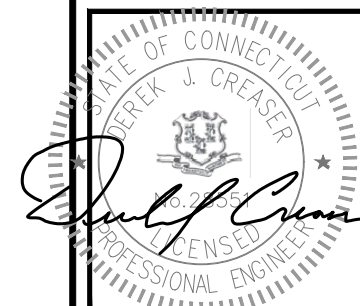
1 INTERNATIONAL BLVD, SUITE 800 MAHWAH, NJ 07495 TEL: (800) 357-7641



CROWN CASTLE 12 GILL STREET, SUITE 5800 WOBURN, MA 01801



45 BEECHWOOD DRIVE N. ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586



CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

Table with 4 columns: REV., DATE, DESCRIPTION, BY. Contains 3 rows of data.

SITE NUMBER: CT33XC084
SITE NAME: CANTERBURY/ LEMIRE
CROWN BU NUMBER: 876375
SITE ADDRESS: 53 WESTMINSTER RD CANTERBURY, CT 06331 WINDHAM COUNTY

SHEET TITLE: OUTLINE SPECIFICATIONS (MIMO REDESIGN)

SHEET NUMBER: SP-2

CONTINUED FROM SP-2:

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL. PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.

B. ROOF TOP CONSTRUCTION: TOUCH UP - PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

- 1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

- 1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT."
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO HEADS AND CABLE INSTALLATION

SUMMARY:

THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRH'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRH'S:

THE NUMBER AND TYPE OF ANTENNAS AND RRH'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:

HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRH'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRH'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. DO NOT USE SUPERFLEX OUTDOORS. JUMPERS SHALL BE FACTORY FABRICATED IN APPROPRIATE LENGTHS WITH A MAXIMUM OF 4 FEET EXCESS PER JUMPER AND HAVE CONNECTORS AT EACH END, MANUFACTURED BY SUPPLIER. IF JUMPERS ARE FIELD FABRICATED, FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION OF CONNECTORS

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:

THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

- A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.
B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLES INSTALLATION:

- A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADI.
C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.

- 5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 REV 4.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

- A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
B. WEATHERPROOFING USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

- A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

- A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE TRANSCIEVER STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

- A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

- A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT
2. B-LINE SYSTEM
3. UNISTRUT DIVERSIFIED PRODUCTS
4. THOMAS & BETTS
B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

- A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.
B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.
C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:
D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

- A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.
B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

- A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.
B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.
C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.
E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6- FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.
F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

- A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
B. CABLE TERMINATION FITTINGS FOR CONDUIT
1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.
C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.
D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.
E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

- A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.
B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.
C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

- A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

- A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.



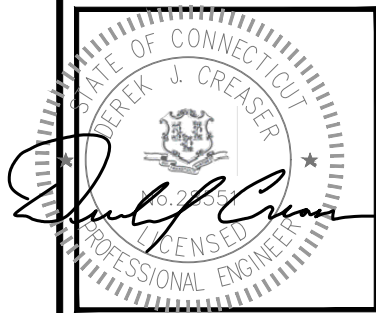
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MAHWAH, NJ 07495
TEL: (800) 357-7641



CROWN CASTLE
12 GILL STREET, SUITE 5800
WOBBURN, MA 01801



45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

Table with columns: REV, DATE, DESCRIPTION, BY. Includes entries for construction final, redesign, and issued for construction.

SITE NUMBER: CT33XC084
SITE NAME: CANTERBURY/ LEMIRE
CROWN BU NUMBER: 876375
SITE ADDRESS: 53 WESTMINSTER RD, CANTERBURY, CT 06331, WINDHAM COUNTY

SHEET TITLE: OUTLINE SPECIFICATIONS (MIMO REDESIGN)


SHEET NUMBER: SP-3

**STRUCTURAL NOTE:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS AND MODIFICATION PLAN PROVIDED BY VERTICAL STRUCTURES INC, DATED 08/21/18 AND MOUNT ANALYSIS BY HUDSON DESIGN GROUP DATED JUNE 15, 2018 (REV 1) TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

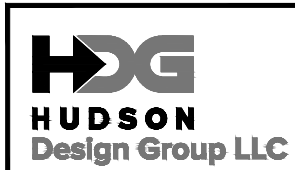
**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



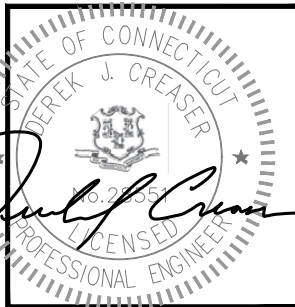
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 TEL: (800) 357-7641



CROWN CASTLE  
 12 GILL STREET, SUITE 5800  
 WOBURN, MA 01801



45 BEECHWOOD DRIVE  
 N. ANDOVER, MA 01845  
 TEL: (978) 557-5553  
 FAX: (978) 336-5586



STATE OF CONNECTICUT  
 DEREK J. CREASER  
 LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

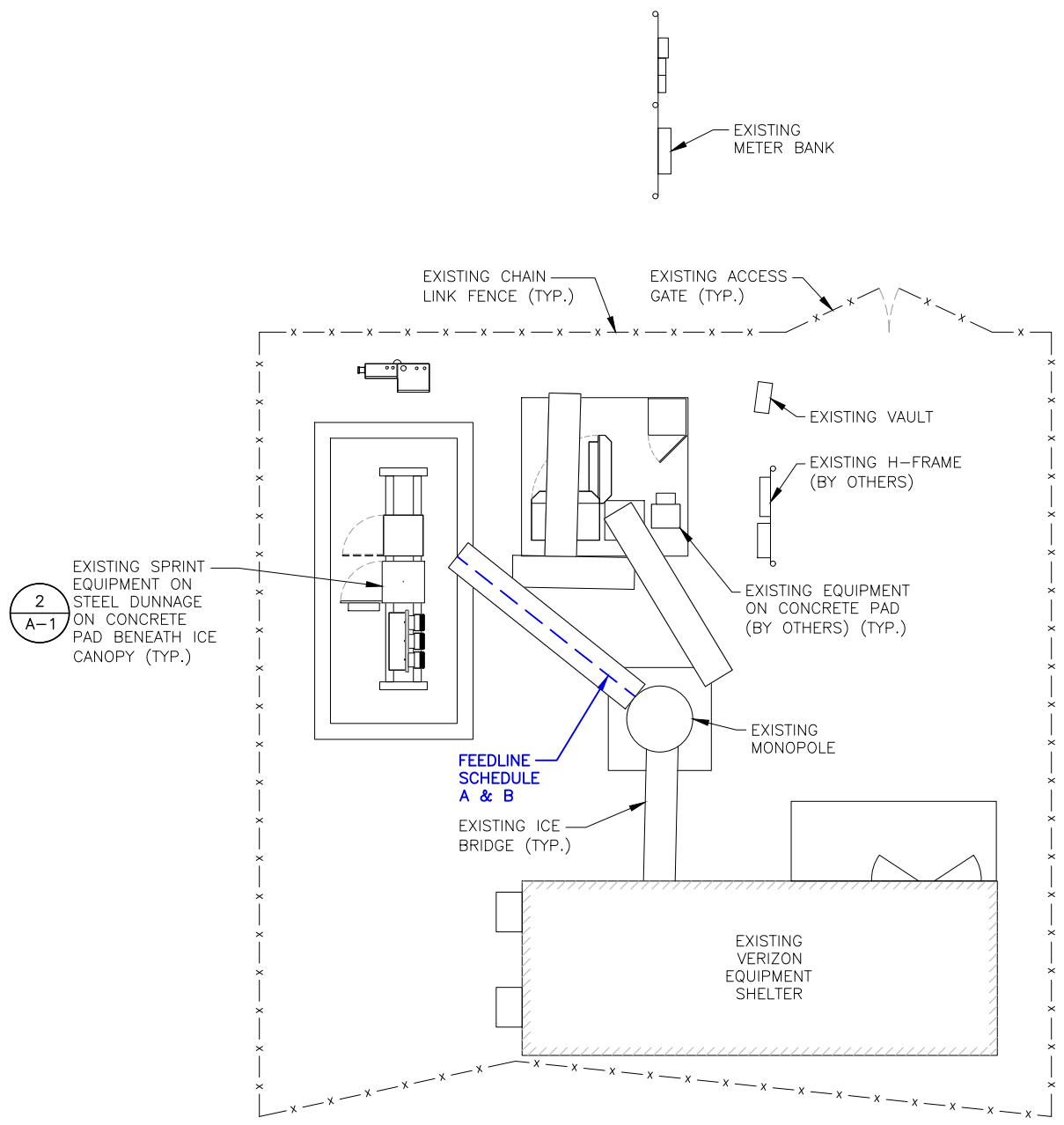
**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

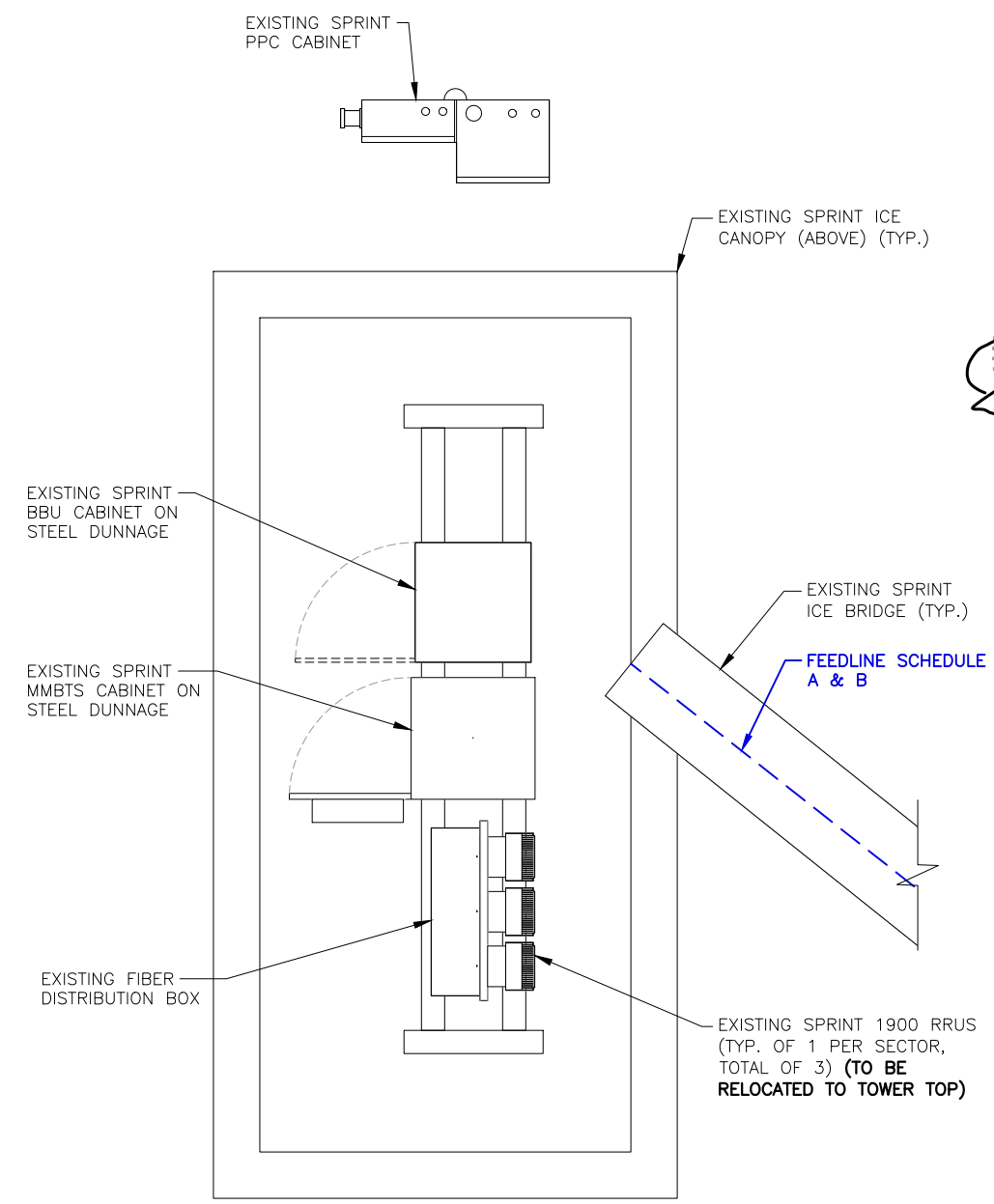
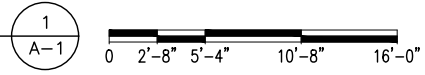
SITE NUMBER:  
 CT33XC084  
 SITE NAME:  
 CANTERBURY/ LEMIRE  
 CROWN BU NUMBER:  
 876375  
 SITE ADDRESS:  
 53 WESTMINSTER RD  
 CANTERBURY, CT 06331  
 WINDHAM COUNTY

SHEET TITLE  
 COMPOUND PLAN &  
 EQUIPMENT PLAN  
 (MIMO REDESIGN)

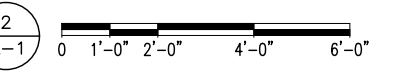
SHEET NUMBER  
**A-1**



**COMPOUND PLAN**  
 22x34 SCALE: 3/16"=1'-0"  
 11x17 SCALE: 3/32"=1'-0"



**EQUIPMENT PLAN**  
 22x34 SCALE: 1/2"=1'-0"  
 11x17 SCALE: 1/4"=1'-0"



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**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**SCOPE NOTE:**  
 PROPOSED DESIGN IS BASED OFF OF CROWN APPLICATION REVO DATED 05/21/18

5 ALL  
A-3 A-4

2 ALL  
A-3 A-4

3 ALL  
A-3 A-4

7 ALL  
A-3 A-4

INSTALL SPRINT 2500 RRH (ALU TD-RRH8x20-25) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON NEW PIPE MAST BEHIND ANTENNA

REMOVE AND REPLACE EXISTING ANTENNA: INSTALL SPRINT ANTENNA (RFS APXVTM14-ALU-I20) (TYP. OF 1 PER SECTOR, TOTAL OF 3) ON NEW PIPE MAST

INSTALL SPRINT 800 RRH (ALU RRH2X50-800) STACK MOUNTED TO NEW PIPE MAST (TYP. OF 2 PER SECTOR, TOTAL OF 6)

FURNISH AND INSTALL HANDRAIL REINFORCEMENT KIT (SITE PRO1 PART# PRK-SFS-L (TOTAL OF 1) PER MOUNT STRUCTURAL ANALYSIS

FURNISH AND INSTALL HANDRAIL KIT (SITEPRO1 PART #HRK-12 (OR APPROVED EQUAL) (TOTAL OF 2) UPPER AND LOWER (CONTRACTOR TO VERIFY PLATFORM WIDTH PRIOR TO ORDERING)

EXISTING RELOCATED SPRINT 1900 RRHS (ALU 1900MHz 4x45W-65MHz) (TYP. OF 1 PER SECTOR, TOTAL OF 3) ON NEW RRH DUAL SWIVEL MOUNT, MOUNTED TO NEW MOUNTING PIPE

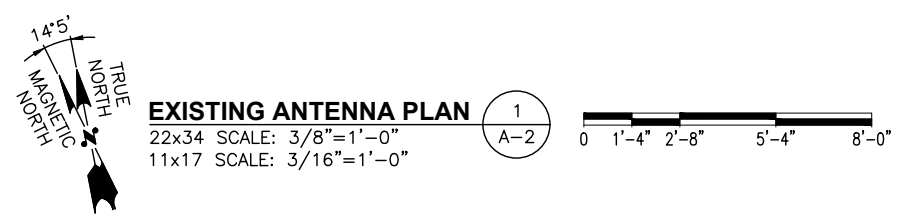
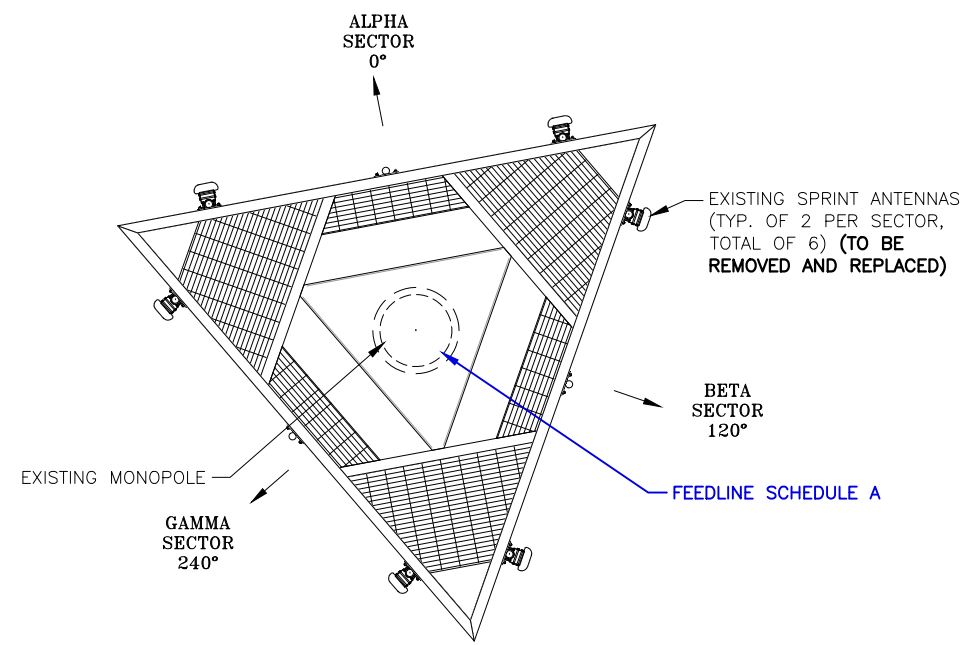
REMOVE AND REPLACE EXISTING ANTENNA: INSTALL SPRINT ANTENNA (COMMSCOPE NNW-65B-R4) (TYP. OF 1 PER SECTOR, TOTAL OF 3) ON NEW PIPE MAST

EXISTING ANTENNAS (BY OTHERS) (TYP.)

6 ALL  
A-3 A-4

4 ALL  
A-3 A-4

1 ALL  
A-3 A-4



FEEDLINES			
FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION	LENGTH
A	EXISTING TO BE REMOVED: (6) 1-5/8" COAX EXISTING TO REMAIN: (1) 1/2" COAX	ROUTED WITHIN MONOPOLE	ALPHA: 230'± BETA: 230'± GAMMA: 230'±
B	PROPOSED (4) 1-1/4" HYBRID TRUNKS		

**NOTE:**  
 EXISTING SPRINT EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS, RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

EXISTING SPRINT GPS ANTENNA  
 ELEV. 78'-0"± (AGL)

**STRUCTURAL NOTE:**  
 DESIGN LIMITATIONS AND ASSUMPTIONS:  
 1. EQUIPMENT AND LOCATIONS SHOULD NOT DEVIATE FROM THE CONSTRUCTION DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ENGINEER.  
 2. HDG IS NOT RESPONSIBLE FOR ANY MODIFICATIONS COMPLETED PRIOR TO AND HEREAFTER WHICH HDG WAS NOT INVOLVED.  
 3. ALL STRUCTURAL MEMBERS AND THEIR CONNECTIONS ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES. CONTRACTOR IS TO PERFORM A PRE-INSPECTION TO CONFIRM.  
 4. ALL ANTENNAS, COAX CABLES AND WAVEGUIDE CABLES ARE ASSUMED TO BE PROPERLY INSTALLED AND SUPPORTED AS PER THE MANUFACTURER'S REQUIREMENTS.  
 5. ALL COMPONENTS SUPPORTING THE SPRINT EQUIPMENT ARE ASSUMED TO BE DESIGNED TO ALL APPLICABLE CODES AND DESIGNED FOR IDENTICAL TO OR GREATER THAN THE CURRENT LOADS.

**NOTE:**  
 REINFORCE THE MONOPOLE SHAFT FROM ELEVATION 0'-45' AND 90'-100' PER TOWER STRUCTURAL ANALYSIS (BY OTHERS)

GROUND LEVEL  
 ELEV. 0'-0"± (AGL)

**ELEVATION**  
 22x34 SCALE: 3/32"=1'-0"  
 11x17 SCALE: 3/64"=1'-0"

**Sprint**  
 1 INTERNATIONAL BLVD, SUITE 800  
 MAHWAH, NJ 07495  
 TEL: (800) 357-7641

**CROWN CASTLE**  
 CROWN CASTLE  
 12 GILL STREET, SUITE 5800  
 WOBURN, MA 01801

**HDG HUDSON Design Group LLC**  
 45 BEECHWOOD DRIVE TEL: (978) 557-5553  
 N. ANDOVER, MA 01845 FAX: (978) 336-5886

STATE OF CONNECTICUT  
 DEREK J. CREASER  
 LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

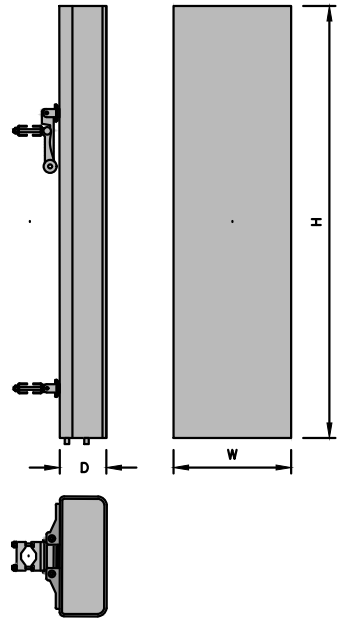
SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
 CT33XC084  
 SITE NAME:  
 CANTERBURY/ LEMIRE  
 CROWN BU NUMBER:  
 876375  
 SITE ADDRESS:  
 53 WESTMINSTER RD  
 CANTERBURY, CT 06331  
 WINDHAM COUNTY

SHEET TITLE  
 ANTENNA PLANS &  
 ELEVATION  
 (MIMO REDESIGN)

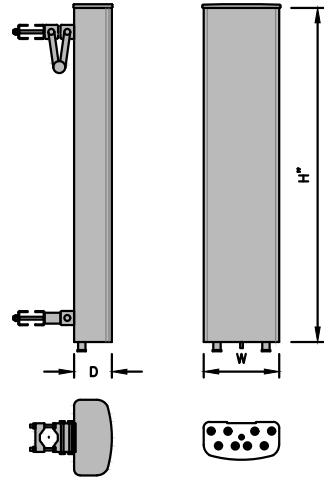
SHEET NUMBER  
**A-2**

1900 MHZ ANTENNA DIMENSIONS	
MODEL #	NNW-65B-R4
MANUF.	COMMSCOPE
HEIGHT	72.0"
WIDTH	19.6"
DEPTH	7.8"
WEIGHT	77.4 LBS



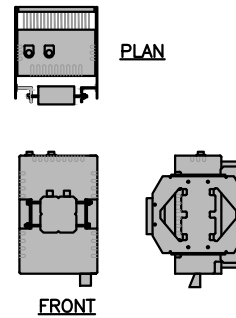
**2.5MHz ANTENNA DETAIL** 1  
SCALE: N.T.S. A-3

2500MHZ ANTENNA DIMENSIONS	
MODEL #	APXVTM14-ALU-120
MANUF.	RFS
HEIGHT	56.3"
WIDTH	12.6"
DEPTH	6.3"
WEIGHT	56.2 LBS



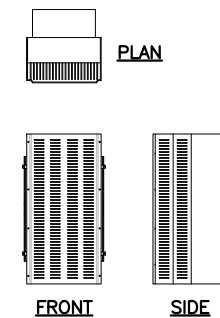
**2500 MHz ANTENNA DETAIL** 2  
SCALE: N.T.S. A-3

800MHZ RRH DIMENSIONS	
MODEL #	RRH 2X50-800
MANUF.	ALCATEL-LUCENT
LENGTH	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53 LBS



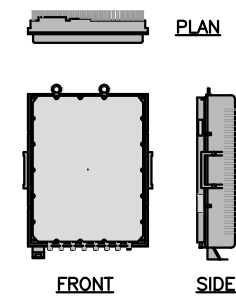
**800 MHZ RRH DETAIL** 3  
SCALE: N.T.S. A-3

1900MHZ RRH DIMENSIONS	
MODEL #	1900MHZ RRH 4X45W 65MHZ
MANUF.	ALCATEL-LUCENT
LENGTH	25"
WIDTH	11.1"
DEPTH	11.4"
WEIGHT	60 LBS



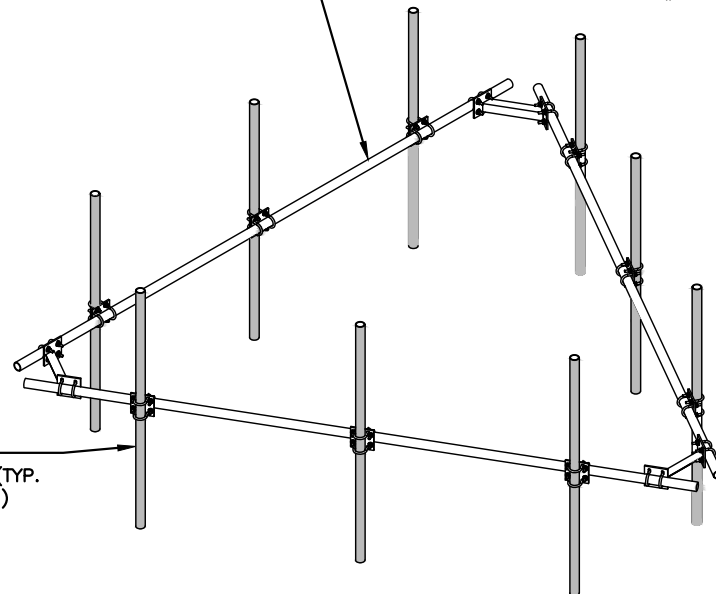
**1900 MHZ RRH DETAIL** 4  
SCALE: N.T.S. A-3

2500MHZ RRH DIMENSIONS	
MODEL #	TD-RRH8X20-25
MANUF.	ALCATEL-LUCENT
LENGTH	26.1"
WIDTH	18.6"
DEPTH	6.7"
WEIGHT	70 LBS



**2500 MHz RRH DETAIL** 5  
SCALE: N.T.S. A-3

FURNISH AND INSTALL HANDRAIL KIT (SITEPRO1 PART #HRK-12 (OR APPROVED EQUAL) (TOTAL OF 2) UPPER AND LOWER (CONTRACTOR TO VERIFY PLATFORM WIDTH PRIOR TO ORDERING)

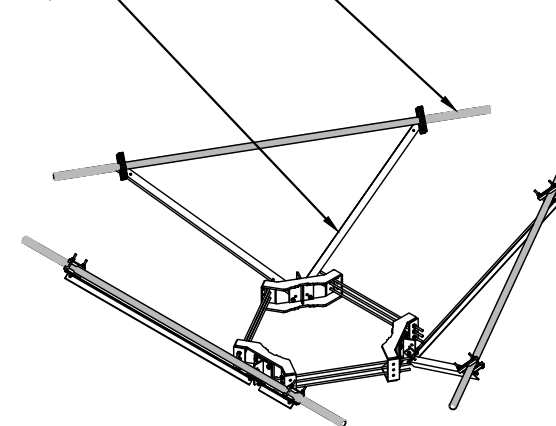


FURNISH AND INSTALL 2" STD (2-3/8" O.D.)x96" PIPE MAST (TYP. OF 3 PER SECTOR, TOTAL OF 9)

**HANDRAIL KIT DETAIL** 6  
SCALE: N.T.S. A-3

FURNISH AND INSTALL HANDRAIL KIT (SITEPRO1 PART #HRK-12 (OR APPROVED EQUAL) (TOTAL OF 2) UPPER AND LOWER (CONTRACTOR TO VERIFY PLATFORM WIDTH PRIOR TO ORDERING)

FURNISH AND INSTALL HANDRAIL REINFORCEMENT KIT (SITE PRO1 PART# PRK-SFS-L (TOTAL OF 1)



**PLATFORM REINFORCEMENT KIT DETAIL** 7  
SCALE: N.T.S. A-3

**Sprint**

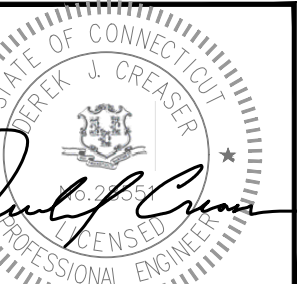
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641

**CROWN CASTLE**

CROWN CASTLE  
12 GILL STREET, SUITE 5800  
WOBURN, MA 01801

**HG HUDSON Design Group LLC**

45 BEECHWOOD DRIVE TEL: (978) 557-5553  
N. ANDOVER, MA 01845 FAX: (978) 336-5886



CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
CT33XC084  
SITE NAME:  
CANTERBURY/ LEMIRE  
CROWN BU NUMBER:  
876375  
SITE ADDRESS:  
53 WESTMINSTER RD  
CANTERBURY, CT 06331  
WINDHAM COUNTY

SHEET TITLE  
EQUIPMENT DETAILS  
(MIMO REDESIGN)

SHEET NUMBER  
**A-3**

**STRUCTURAL NOTE:**  
 DESIGN LIMITATIONS AND ASSUMPTIONS:  
 1. EQUIPMENT AND LOCATIONS SHOULD NOT DEVIATE FROM THE CONSTRUCTION DRAWINGS WITHOUT WRITTEN APPROVAL OF THE ENGINEER.  
 2. HDG IS NOT RESPONSIBLE FOR ANY MODIFICATIONS COMPLETED PRIOR TO AND HEREAFTER WHICH HDG WAS NOT INVOLVED.  
 3. ALL STRUCTURAL MEMBERS AND THEIR CONNECTIONS ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES. CONTRACTOR IS TO PERFORM A PRE-INSPECTION TO CONFIRM.  
 4. ALL ANTENNAS, COAX CABLES AND WAVEGUIDE CABLES ARE ASSUMED TO BE PROPERLY INSTALLED AND SUPPORTED AS PER THE MANUFACTURER'S REQUIREMENTS.  
 5. ALL COMPONENTS SUPPORTING THE SPRINT EQUIPMENT ARE ASSUMED TO BE DESIGNED TO ALL APPLICABLE CODES AND DESIGNED FOR IDENTICAL TO OR GREATER THAN THE CURRENT LOADS.

**STRUCTURAL NOTE:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO TOWER STRUCTURAL ANALYSIS AND MODIFICATION PLAN PROVIDED BY VERTICAL STRUCTURES INC, DATED 08/21/18 AND MOUNT ANALYSIS BY HUDSON DESIGN GROUP DATED JUNE 15, 2018 (REV 1) TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**SCOPE NOTE:**  
 PROPOSED DESIGN IS BASED OFF OF CROWN APPLICATION REVO DATED 05/21/18

2 5  
A-2 A-3

INSTALL SPRINT 2500 RRH (ALU TD-RRH8x20-25) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON NEW PIPE MAST BEHIND ANTENNAS

FURNISH AND INSTALL HANDRAIL KIT (SITEPRO1 PART #HRK-12 (OR APPROVED EQUAL) (TOTAL OF 2) (UPPER AND LOWER) (CONTRACTOR TO VERIFY PLATFORM WIDTH PRIOR TO ORDERING)

2 6  
A-2 A-3

INSTALL SPRINT 800 RRH (RRH2X50W-800) STACK MOUNTED TO NEW PIPE MAST @ POSITION 2 (TYP. OF 2 PER SECTOR, TOTAL OF 6)

2 4  
A-2 A-3

EXISTING RELOCATED SPRINT 1900 RRHS (ALU 1900MHZ 4x45-65MHZ) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO NEW PIPE MAST

2 2  
A-2 A-3

REMOVE AND REPLACE EXISTING ANTENNA: INSTALL SPRINT ANTENNA (RFS APXVTM14-ALU-120) (TYP. OF 1 PER SECTOR, TOTAL OF 3) ON NEW PIPE MAST

2 3  
A-2 A-3

2  
A-2

INSTALL SPRINT 2500 RRH (ALU TD-RRH8x20-25) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON NEW PIPE MAST BEHIND ANTENNA

5  
A-3

FURNISH AND INSTALL (2) NEW L4"x4"x3/8"x6" LONG ANGLES BOLTED DIRECTLY TO PLATFORM CHANNEL FACE FRAME IN TWO LOCATIONS (TOP/BOTTOM) (FIELD DRILL AND GALVANIZE SPRAY TO ACCOMMODATE EXISTING AVAILABLE FACE FRAME HOLES)

7  
A-3

FURNISH AND INSTALL HANDRAIL REINFORCEMENT KIT (SITE PRO1 PART# PRK-SFS-L (TOTAL OF 1)

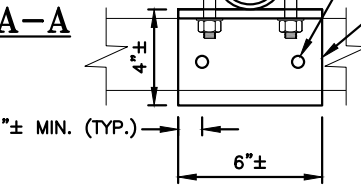


EQ. OF SPRINT ANTENNAS  
 ELEV. = 180'-0" ± A.G.L.

FURNISH AND INSTALL 1/2" U-BOLT (TYP. OF 2 PER PIPE MAST CONNECTION)

FURNISH AND INSTALL 1/2" A325 BOLT (TYP. OF 2 PER CONNECTION)

FURNISH AND INSTALL (2) NEW L4"x4"x3/8"x6" LONG ANGLES BOLTED DIRECTLY TO PLATFORM CHANNEL FACE FRAME IN TWO LOCATIONS (TOP/BOTTOM) (FIELD DRILL AND GALVANIZE SPRAY TO ACCOMMODATE EXISTING AVAILABLE FACE FRAME HOLES)



REMOVE AND REPLACE EXISTING ANTENNA: INSTALL SPRINT ANTENNA (TYP. OF 2 PER SECTOR, TOTAL OF 6) ON NEW PIPE MAST @ POSITION 1 AND 3

2 1,2  
A-2 A-3

EXISTING RELOCATED SPRINT 1900 RRHS (ALU 1900MHZ 4x45-65MHZ) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO NEW PIPE MAST BEHIND ANTENNA

2 4  
A-2 A-3

FURNISH AND INSTALL HANDRAIL KIT (SITEPRO1 PART #HRK-12 (OR APPROVED EQUAL) (TOTAL OF 2) (UPPER AND LOWER) (CONTRACTOR TO VERIFY PLATFORM WIDTH PRIOR TO ORDERING)

6  
A-3

REMOVE AND REPLACE EXISTING ANTENNA: INSTALL SPRINT ANTENNA (COMMSCOPE NNW-65B-R4) (TYP. OF 1 PER SECTOR, TOTAL OF 3) ON NEW PIPE MAST

2 1  
A-2 A-3

**ANTENNA & RRH MOUNT PHOTO DETAIL**  
 SCALE: N.T.S

2  
A-4

FURNISH AND INSTALL HANDRAIL REINFORCEMENT KIT (SITE PRO1 PART# PRK-SFS-L (TOTAL OF 1)

7  
A-3

**ANTENNA INSTALLATION SPECIAL WORK NOTE:**  
 ANTENNA INSTALLATION WORKING POINT IS THE VERTICAL CENTERLINE OF THE EXISTING PLATFORM. UNLESS NOTED OTHERWISE, VERTICALLY CENTER ALL PIPE MASTS AND ALL ANTENNAS ON THIS WORKING POINT.

INSTALL SPRINT 800 RRH (ALU RRH2X50-800) STACK MOUNTED TO NEW PIPE MAST @ POSITION 2 (TYP. OF 2 PER SECTOR, TOTAL OF 6)

3 ALL  
A-3 A-4

**PROPOSED ANTENNA & RRH MOUNTING ELEVATION**  
 22x34 SCALE: 1"=1'-0"  
 11x17 SCALE: 1/2"=1'-0"

1  
A-4



MAJOR RF EQUIPMENT LIST				
(GC SHALL FURNISH AND INSTALL ALL OTHER MATERIALS AND EQUIPMENT NOT SUPPLIED BY SPRINT)				
DESCRIPTION	QUANTITY	UNITS	MAKE/MODEL/MATERIAL	PROVIDED BY
ANTENNA	3	EA	COMMSCOPE NNW-65B-R4	SPRINT
ANTENNA	3	EA	RFS APXVTM14-ALU-120	SPRINT
800 RRH	6 @ TOWER MOUNT	EA	ALCATEL LUCENT RRH2X50-800	SPRINT
1900 RRH	3 @ TOWER MOUNT	EA	ALCATEL LUCENT/PCS 1900MHZ 4X45W-65MHZ	EXISTING TO REMAIN
2500 RRH	3 @ TOWER MOUNT	EA	ALCATEL LUCENT TD-RRH8X20-25	SPRINT
COAX CABLE	(1) @ 1-1/4"	230 LF ±	HB114-13U3M12-XXXF	SPRINT
COAX CABLE	(4) @ 1-1/4"	230 LF ±	HB114-1-0813U4-M5J	SPRINT

**SPRINT-PROVIDED EQUIPMENT SCHEDULE**  
 SCALE: N.T.S

3  
A-3

**Sprint**  
 1 INTERNATIONAL BLVD, SUITE 800  
 MAHWAH, NJ 07495  
 TEL: (800) 357-7641

**CROWN CASTLE**  
 CROWN CASTLE  
 12 GILL STREET, SUITE 5800  
 WOBURN, MA 01801

**HDG HUDSON Design Group LLC**  
 45 BEECHWOOD DRIVE  
 N. ANDOVER, MA 01845  
 TEL: (978) 557-5553  
 FAX: (978) 336-5586

STATE OF CONNECTICUT  
 DEREK J. CREASER  
 LICENSED PROFESSIONAL ENGINEER  
 06-205-0000

CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
 CT33XC084  
 SITE NAME:  
 CANTERBURY/ LEMIRE  
 CROWN BU NUMBER:  
 876375  
 SITE ADDRESS:  
 53 WESTMINSTER RD  
 CANTERBURY, CT 06331  
 WINDHAM COUNTY

SHEET TITLE  
 MOUNTING DETAILS  
 (MIMO REDESIGN)

SHEET NUMBER  
**A-4**



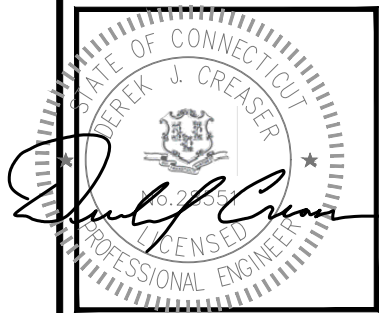
1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



CROWN CASTLE  
12 GILL STREET, SUITE 5800  
WOBURN, MA 01801



45 BEECHWOOD DRIVE TEL: (978) 557-5553  
N. ANDOVER, MA 01845 FAX: (978) 336-5886



CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
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SITE NUMBER:  
CT33XC084  
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876375  
SITE ADDRESS:  
53 WESTMINSTER RD  
CANTERBURY, CT 06331  
WINDHAM COUNTY

SHEET TITLE

RF DATA SHEET  
(MIMO REDESIGN)

SHEET NUMBER

A-5

**NOTE:**  
RFDS HAS NOT BEEN PROVIDED BY CROWN CASTLE,  
REFER TO CROWN APP REV #0 DATED 05/21/18

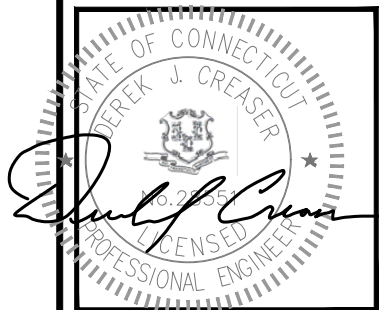
**NOTE:**  
SPRINT CM SHALL CONFIRM HYBRID CABLE LENGTH,  
COAX JUMPER LENGTH AND AISG CABLE LENGTH BEFORE  
PREPARING BOM. A&E RECOMMENDED HYBRID CABLE  
LENGTH BASED ON NV 2.5 EQUIPMENT AUDIT PLUS 20  
FEET FOR (2) 10-FOOT COILS AT EACH END OF THE  
FIBER TRUNK.

**NOTE:**  
GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT  
THE LATEST RF DATA SHEET IS USED FOR EQUIPMENT  
INSTALLATION.

**SPECIAL WORK NOTE:**  
JUMPERS (COAX/AISG) FROM THE 2.5 RRH TO THE 2.5  
ANTENNA CANNOT EXCEED 15'. NOTIFY SPRINT  
CONSTRUCTION MANAGER OF ANY DISCREPANCY.

**RF DATA SHEET**  
SCALE: N.T.S





CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
**CT33XC084**  
SITE NAME:  
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CROWN BU NUMBER:  
**876375**  
SITE ADDRESS:  
**53 WESTMINSTER RD  
CANTERBURY, CT 06331  
WINDHAM COUNTY**

SHEET TITLE

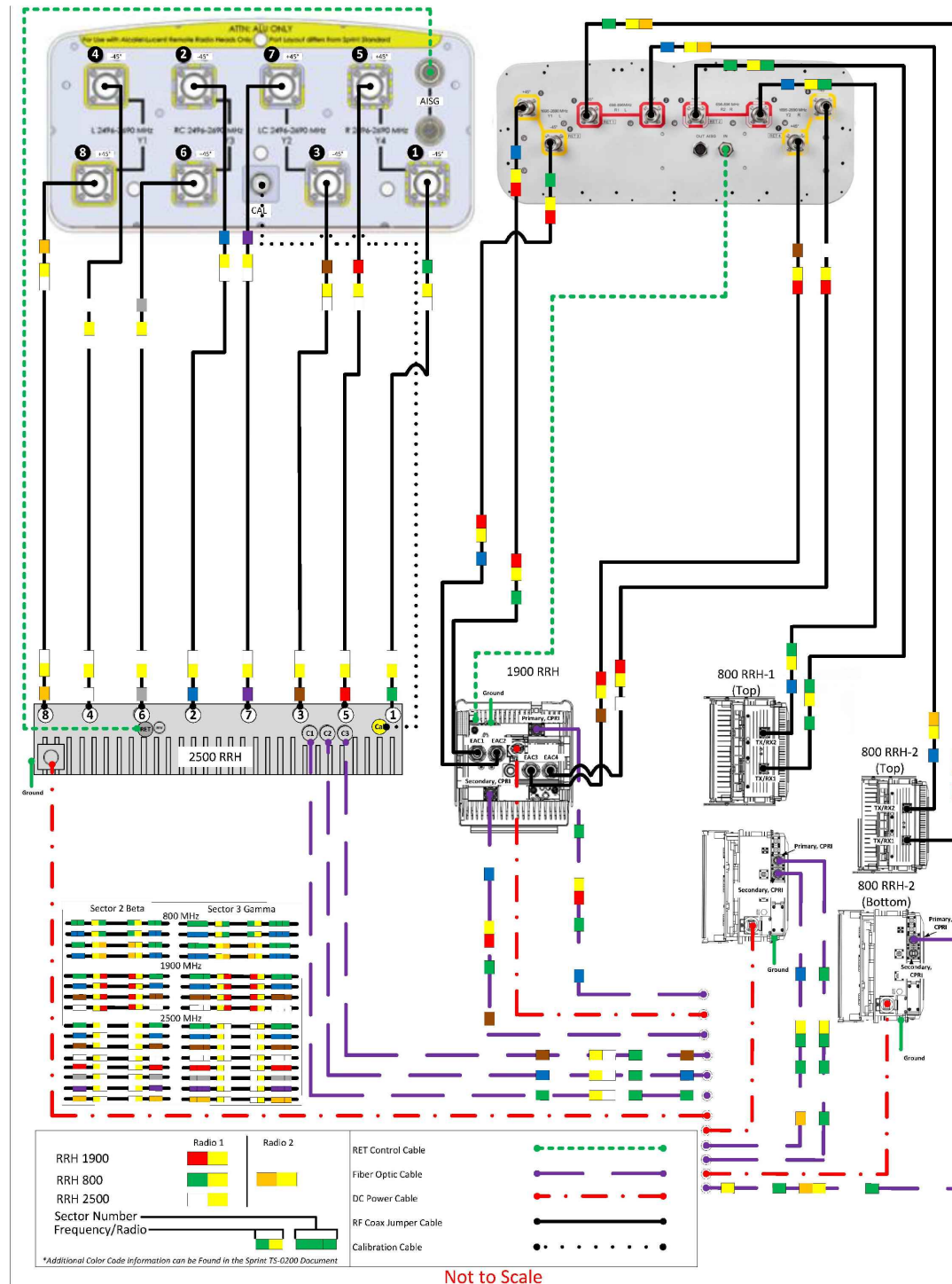
**WIRING DIAGRAM  
(MIMO REDESIGN)**

SHEET NUMBER

**A-6**

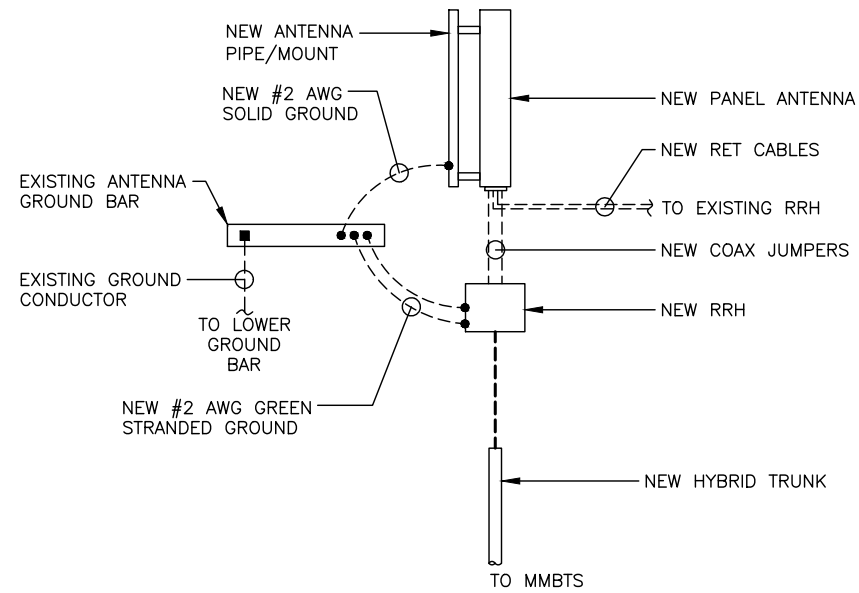
Prepared By <b>Mark Elliott</b>	Revision Date <b>March 13, 2018</b>	Revision Number <b>R1</b>	
Approved By <b>RAN Hardware &amp; Antenna Teams</b>	Approval Date <b>Final-Macro Generated</b>		

**ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters**



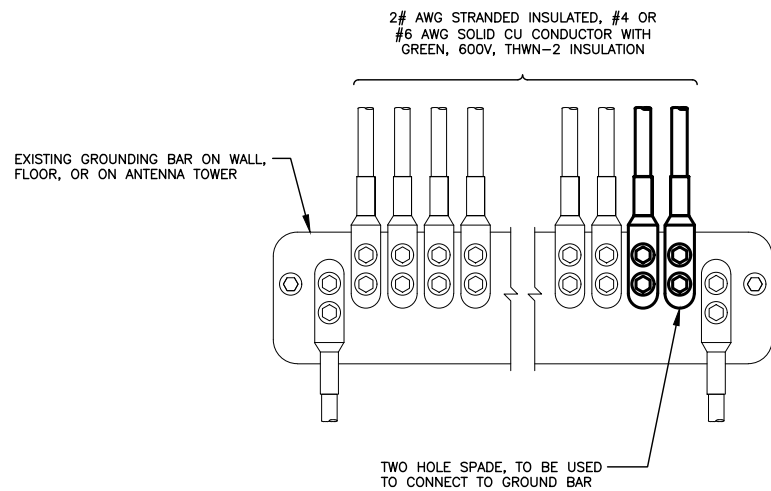
**CABLE COLOR CODING SCHEMATIC**  
SCALE: N.T.S.





**TYPICAL GROUNDING RISER DIAGRAM**  
SCALE: N.T.S

1  
G-1



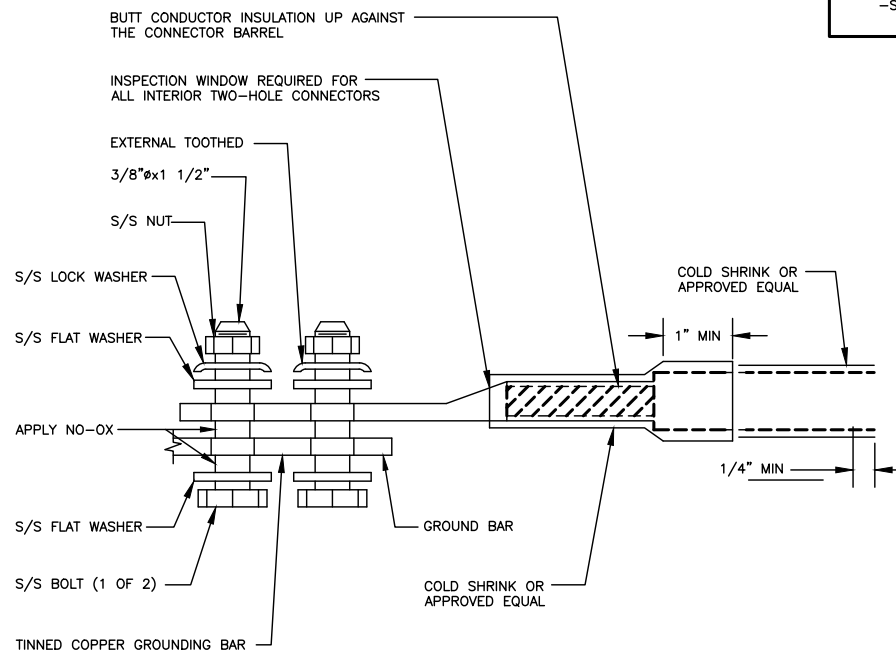
**NOTES**

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**

SCALE: N.T.S

2  
G-1



**TWO HOLE LUG**  
SCALE: N.T.S

3  
G-1

**PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:**

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250—GROUNDING AND BONDING.
2. GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
3. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
4. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX" OR EQUAL.
5. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
6. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
7. ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
8. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
9. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
10. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
11. GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
12. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
13. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
14. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING, CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
15. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
16. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
17. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
18. FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):  
-ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED: 08-24-12 (OR CURRENT VERSION)  
-SPRINT ENGINEERING LETTER EL-0504 DATED: 04-20-12 (OR CURRENT VERSION)



1 INTERNATIONAL BLVD, SUITE 800  
MAHWAH, NJ 07495  
TEL: (800) 357-7641



CROWN CASTLE  
12 GILL STREET, SUITE 5800  
WOBBURN, MA 01801



45 BEECHWOOD DRIVE  
N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5886



CHECKED BY: BB

APPROVED BY: DJC

**SUBMITTALS**

REV.	DATE	DESCRIPTION	BY
2	09/07/18	CONSTRUCTION FINAL	GA
1	08/02/18	CONSTRUCTION REDESIGN	TR
0	01/25/18	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:  
CT33XC084  
SITE NAME:  
CANTERBURY/ LEMIRE  
CROWN BU NUMBER:  
876375  
SITE ADDRESS:  
53 WESTMINSTER RD  
CANTERBURY, CT 06331  
WINDHAM COUNTY

SHEET TITLE  
ONE LINE DIAGRAM,  
GROUNDING DETAILS  
& NOTES  
(MIMO REDESIGN)

SHEET NUMBER

G-1

### Town of Canterbury Notice of Action

Appeal: <input type="checkbox"/>	Site Plan: <input checked="" type="checkbox"/>	Special Exception: <input checked="" type="checkbox"/>	Special Use Permit: <input type="checkbox"/>
Subdivision: <input type="checkbox"/>	Variance: <input type="checkbox"/>	Wetlands: <input type="checkbox"/>	Zone Change: <input type="checkbox"/>
Zoning Regulation: _____		Section: _____	

Applicant: Sprint Spectrum

Name of Record Owner (if different): \_\_\_\_\_

Street Address of Property: 53 Westminster Road Map#: 41e Lot(s)#: 32

Deed Reference: Volume: 85 Page: 331

Description of Property: (Should be attached)

Description of Action: Approved Application #99-8-SE,  
Special Exception with stipulations, submitted  
by Sprint Spectrum for a Telecommunications  
Tower on 53 Westminster Road, Map 41e Lot 32

Date Approved: \_\_\_\_\_  
 Date Notice of Action Published: \_\_\_\_\_  
 Date of Decision: \_\_\_\_\_

Conditions, if any: 1) An 8 foot fence shall be substituted for the  
proposed 6 foot fence; 2) proper signage shall be posted as per plans  
and shall include "No Trespassing" signs; 3) emergency access keys shall be  
given to the Town Fire Company; and 4) a \$30,000 bond shall be posted  
to ensure proper removal of the tower due to abandonment.

Patricia J. Grassi  
Town Clerk  
Date: 4/26/00

Lee W. Nugley  
Chairman  
Planning + Zoning Commission  
Commission/Board  
Date: 4/18/00

Date: \_\_\_\_\_  
Time: 4:00 pm

This Notice of Action must be recorded with the Canterbury Town Clerk  
by the applicant within 90 days of the effective date.

RECEIVED FOR RECORD  
THIS 26<sup>th</sup> DAY OF April 20 00 AT 4:00 P.M.

Patricia J. Grassi  
TOWN CLERK OF CANTERBURY

Date: **August 21, 2018**



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

Vertical Structures, Inc.  
309 Spangler Drive, Suite E  
Richmond, KY 40475  
(859) 624-8360

**Subject: Structural Modification Report**

**Carrier Designation:** *Sprint PCS Change-Out*  
**Carrier Site Number:** CT33XC084  
**Carrier Site Name:** CT33XC084

**Crown Castle Designation:**  
**Crown Castle BU Number:** 876375  
**Crown Castle Site Name:** Canterbury/Lemire  
**Crown Castle JDE Job Number:** 505920  
**Crown Castle Work Order Number:** 1604476  
**Crown Castle Order Number:** 441436 Rev. 0

**Engineering Firm Designation:** **Vertical Structures, Inc. Project Number:** 2018-090-015

**Site Data:** **53 Westminster Road, Canterbury, CT, Windham County**  
**Latitude 41° 42' 7.15", Longitude -71° 58' 50.11"**  
**180 Foot - Monopole Tower**

Dear Rebecca Klein,

Vertical Structures, Inc. is pleased to submit this "**Structural Modification 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 1222644.

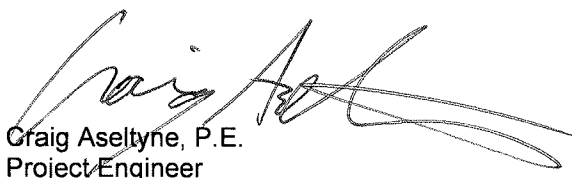
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

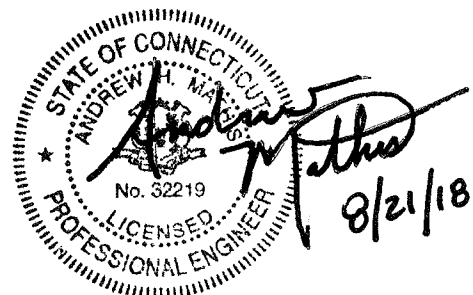
LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**  
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 mph per section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a topographic category 1 and crest height of 0 feet, and Risk Category II were used in this analysis.

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

Respectfully submitted by:

  
Craig Aseltyne, P.E.  
Project Engineer



Date: **August 21, 2018**



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

Vertical Structures, Inc.  
309 Spangler Drive, Suite E  
Richmond, KY 40475  
(859) 624-8360

**Subject: Structural Modification Report**

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Respectfully submitted by:

Craig Aseltyne, P.E.  
Project Engineer

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## 1) INTRODUCTION

This tower is a 180 ft Monopole tower, mapped by FDH Engineering in May of 2009. The original design standard and wind speed are unavailable. The tower was modified in 2009 and 2013 per reinforcement drawings prepared by Paul J. Ford and Company to accommodate additional loading. However, a portion of this modification is considered to be ineffective. For the purpose of this analysis, the modifications detailed in Appendix D are considered to be complete.

## 2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 101 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

**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
180.0	183.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz BTS	4	1 1/4	
		6	alcatel lucent	RRH2X50-800 BTS			
		3	alcatel lucent	TD-RRH8X20-25 BTS			
		3	celwave	APXVTM14-ALU-I20 w/ Mount Pipe			
		3	commscope	NNVV-65B-R4 w/ Mount Pipe			
	180.0	2	sitepro1	Handrail Kit (HRK12)			
		1	sitepro1	Platform Kicker (PRK-1245) (3)			
		1	sitepro1	SFS-V Stabilizer Kit (3)			

**Table 2 - Existing and Reserved Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	183.0	6	decibel	DB980H90E-M w/ Mount Pipe	6	1 5/8	3
	180.0	1		Platform Mount [LP 601-1]			1
170.0	170.0	1		Side Arm Mount [SO 102-3]			1
		1	rfs celwave	TMA-DB-T1-6Z-8AB-0Z			
168.0	170.0	3	alcatel lucent	B66A RRH4X45 BTS	12	1 5/8	2
		3	alcatel lucent	RRH2X60-PCS BTS			
		3	alcatel lucent	RRH2x60-700 BTS			
		1	celwave	DB-T1-6Z-8AB-0Z Splitter			
	6	commscope	SBNHH-1D65B w/ Mount Pipe	2	1 5/8	1	
	3	antel	BXA-171063-12CF-EDIN-X w/ Mount Pipe				
	3	antel	BXA-70063-6CF-EDIN-4 w/ Mount Pipe				
168.0	1		Platform Mount [LP 303-1]			1	
160.0	161.0	3	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe	12	1 1/4	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401 TMA			
		6	powerwave technologies	LGP21901Splitter			
	160.0	1		Platform Mount [LP 303-1]			
158.0	159.0	3	ericsson	RRUS 11 B12 BTS	2	7/16	1
		1	raycap	DC6-48-60-18-8F	1	3/8	
	158.0	1		Side Arm Mount [SO 104-3]	1	2" Conduit	
78.0	79.0	1	spectracom	8225	1	1/2	1
	78.0	1		3' Side Arm Mount			

- Notes:  
 1) Existing Equipment  
 2) Reserved Equipment  
 3) 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)
Unknown						

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
Online Application	Sprint PCS Change-Out Revision #0	441436	CCIsites
Tower Information	FDH Job No. 09-04023T T1	2428368	CCIsites
Foundation Investigation	FDH Project No. 09-04033E N1	1615408	CCIsites
Geotechnical Report	Clarence Welti Associates Project Dated 'January 24, 2000'	1615348	CCIsites
Geotechnical Report	FDH Velocitel Project No. 15CBGM1600	1615348	CCIsites
Exposure/Topographic Category Determination	Crown Castle ESP Dated 'October 24, 2015'	6524742	CCIsites
Rework Drawings	Paul J. Ford and Company Job No. 37509-0930	2435769	CCIsites
Post Modification Inspection	Paul J. Ford and Company Job No. 37509-0930	2464622	CCIsites
Rework Drawings	Paul J. Ford and Company Project No. 37512-2172	3363917	CCIsites
Modification Inspection	TEP Project No. 131001.876375	3841077	CCIsites
Rework Drawings	Vertical Structures Job No. 2018-090-015	N/A	Appendix D

#### 3.1) Analysis Method

tnxTower (version 8.0.2.1), 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. Crown Castle's CCIplate 3.0.1 analysis tool was used to evaluate the anchor bolts, base plate, and any flange splices. Crown Castle's CCIpole v4.0.1 analysis tool was used to evaluate the pole shaft reinforcement capacity.

#### 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) Base plate steel is 50 KSI.
- 5) Anchor rods are grade A615-75.

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



#### 4) ANALYSIS RESULTS

**Table 5 - Section Capacity (Summary)**

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
180 - 175	Pole	TP18.572x17.62x0.25	Pole	13.0%	Pass
175 - 170	Pole	TP19.523x18.572x0.25	Pole	21.1%	Pass
170 - 165	Pole	TP20.475x19.523x0.25	Pole	33.6%	Pass
165 - 160	Pole	TP21.426x20.475x0.25	Pole	44.5%	Pass
160 - 155	Pole	TP22.378x21.426x0.25	Pole	57.9%	Pass
155 - 150	Pole	TP23.329x22.378x0.25	Pole	68.9%	Pass
150 - 145	Pole	TP24.281x23.329x0.25	Pole	78.2%	Pass
145 - 140	Pole	TP25.232x24.281x0.25	Pole	86.2%	Pass
140 - 137.25	Pole	TP26.374x25.232x0.25	Pole	90.5%	Pass
137.25 - 132.25	Pole	TP26.207x25.256x0.3125	Pole	80.6%	Pass
132.25 - 127.25	Pole	TP27.159x26.207x0.3125	Pole	84.9%	Pass
127.25 - 122.25	Pole	TP28.11x27.159x0.3125	Pole	88.6%	Pass
122.25 - 120.58	Pole	TP28.427x28.11x0.3125	Pole	89.8%	Pass
120.58 - 120.33	Pole	TP28.475x28.427x0.3125	Pole	89.9%	Pass
120.33 - 115.33	Pole	TP29.426x28.475x0.3125	Pole	92.9%	Pass
115.33 - 112.5	Pole	TP29.966x29.426x0.3125	Pole	94.4%	Pass
112.5 - 112.25	Pole + Reinf.	TP30.013x29.966x0.6375	Reinf. 10 Tension Rupture	75.4%	Pass
112.25 - 107.82	Pole + Reinf.	TP30.857x30.013x0.675	Reinf. 10 Tension Rupture	73.2%	Pass
107.82 - 107.57	Pole + Reinf.	TP30.904x30.857x0.675	Reinf. 10 Tension Rupture	73.4%	Pass
107.57 - 102.57	Pole + Reinf.	TP31.856x30.904x0.6625	Reinf. 10 Tension Rupture	76.2%	Pass
102.57 - 97.57	Pole + Reinf.	TP32.807x31.856x0.65	Reinf. 10 Tension Rupture	78.8%	Pass
97.57 - 92.75	Pole + Reinf.	TP34.533x32.807x0.6375	Reinf. 10 Tension Rupture	81.2%	Pass
92.75 - 87.75	Pole + Reinf.	TP34.051x33.099x0.7	Reinf. 10 Tension Rupture	78.2%	Pass
87.75 - 87.5	Pole + Reinf.	TP34.098x34.051x0.7	Reinf. 10 Tension Rupture	78.3%	Pass
87.5 - 87.25	Pole	TP34.146x34.098x0.375	Pole	90.2%	Pass
87.25 - 82.25	Pole	TP35.097x34.146x0.375	Pole	91.1%	Pass
82.25 - 80.83	Pole	TP35.367x35.097x0.375	Pole	91.4%	Pass
80.83 - 80.57	Pole	TP35.418x35.367x0.375	Pole	91.4%	Pass
80.57 - 80.42	Pole	TP35.446x35.418x0.375	Pole	91.4%	Pass
80.42 - 75.42	Pole	TP36.398x35.446x0.375	Pole	92.2%	Pass

75.42 - 70.42	Pole	TP37.349x36.398x0.375	Pole	92.8%	Pass
70.42 - 65.42	Pole	TP38.301x37.349x0.375	Pole	93.5%	Pass
65.42 - 60.42	Pole	TP39.252x38.301x0.375	Pole	94.5%	Pass
60.42 - 55.42	Pole	TP40.204x39.252x0.375	Pole	95.4%	Pass
55.42 - 53.57	Pole	TP40.556x40.204x0.375	Pole	95.7%	Pass
53.57 - 53.32	Pole	TP40.603x40.556x0.375	Pole	95.7%	Pass
53.32 - 48.53	Pole	TP41.514x40.603x0.375	Pole	96.5%	Pass
48.53 - 48.28	Pole + Reinf.	TP41.561x41.514x0.7	Reinf. 9 Tension Rupture	77.8%	Pass
48.28 - 48.25	Pole + Reinf.	TP42.567x41.561x0.7	Reinf. 9 Tension Rupture	77.8%	Pass
48.25 - 42	Pole + Reinf.	TP42.007x40.818x0.7	Reinf. 9 Tension Rupture	81.1%	Pass
42 - 38.42	Pole + Reinf.	TP42.689x42.007x0.6875	Reinf. 9 Tension Rupture	81.7%	Pass
38.42 - 38.07	Pole + Reinf.	TP42.755x42.689x0.6875	Reinf. 9 Tension Rupture	81.8%	Pass
38.07 - 37.82	Pole + Reinf.	TP42.803x42.755x0.6875	Reinf. 9 Tension Rupture	81.8%	Pass
37.82 - 32.82	Pole + Reinf.	TP43.755x42.803x0.675	Reinf. 9 Tension Rupture	82.6%	Pass
32.82 - 27.82	Pole + Reinf.	TP44.706x43.755x0.675	Reinf. 9 Tension Rupture	83.3%	Pass
27.82 - 22.82	Pole + Reinf.	TP45.658x44.706x0.6625	Reinf. 9 Tension Rupture	84.0%	Pass
22.82 - 17.82	Pole + Reinf.	TP46.609x45.658x0.65	Reinf. 9 Tension Rupture	84.6%	Pass
17.82 - 12.82	Pole + Reinf.	TP47.561x46.609x0.65	Reinf. 9 Tension Rupture	85.2%	Pass
12.82 - 7.92	Pole + Reinf.	TP48.493x47.561x0.65	Reinf. 9 Tension Rupture	85.7%	Pass
7.92 - 7.67	Pole + Reinf.	TP48.541x48.493x0.725	Reinf. 1 Tension Rupture	79.8%	Pass
7.67 - 5.5	Pole + Reinf.	TP48.953x48.541x0.75	Reinf. 9 Tension Rupture	80.0%	Pass
5.5 - 5.25	Pole + Reinf.	TP49.001x48.953x0.4438	Pole	95.0%	Pass
5.25 - 3	Pole + Reinf.	TP49.429x49.001x0.4438	Pole	95.2%	Pass
3 - 2.75	Pole + Reinf.	TP49.476x49.429x0.675	Reinf. 7 Compression	78.0%	Pass
2.75 - 0	Pole + Reinf.	TP50x49.476x0.675	Reinf. 7 Compression	78.2%	Pass
				Summary	
			Pole	96.5%	Pass
			Reinforcement	91.5%	Pass
			Overall	96.5%	Pass

**Table 6 - Tower Component Stresses vs. Capacity - LC4.7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	84.5	Pass
1	Base Plate	0	70.9	Pass
1	Base Foundation	0	95.7	Pass
1	Base Foundation Soil Interaction	0	73.7	Pass
<b>Structure Rating (max from all components) =</b>				<b>96.5%</b>

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.
- 2) A structure rating of 105% or less is within engineering tolerances and considered acceptable.
- 3) A foundation-soil interaction rating of 110% or less is within engineering tolerances for foundations and is considered acceptable.

**4.1) Recommendations**

Perform the modifications detailed in "Appendix D" to remedy the deficiencies identified in Paul J. Ford and Company Project No. 37518-2405.001.7805 (Crown Castle Work Order No. 1595079).



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

SPRINT Existing Facility

Site ID: CT33XC084

Canterbury/ Lemire  
53 Westminster Road  
Canterbury, CT 06331

**September 25, 2018**

**EBI Project Number: 6218006243**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>6.24 %</b>



September 25, 2018

SPRINT

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

## Emissions Analysis for Site: **CT33XC084 – Canterbury/ Lemire**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **53 Westminster Road, Canterbury, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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



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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **53 Westminster Road, Canterbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.
- 2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.
- 3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.
- 4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.
- 5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.



- 6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 8) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antenna mounting height centerlines of the proposed panel antennas are **183 feet** above ground level (AGL) for **Sector A**, **183 feet** above ground level (AGL) for **Sector B** and **183 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



## SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	<b>1</b>	Antenna #:	<b>1</b>	Antenna #:	<b>1</b>
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	<b>183 feet</b>	Height (AGL):	<b>183 feet</b>	Height (AGL):	<b>183 feet</b>
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	<b>1.05 %</b>	Antenna B1 MPE%	<b>1.05 %</b>	Antenna C1 MPE%	<b>1.05 %</b>
Antenna #:	<b>2</b>	Antenna #:	<b>2</b>	Antenna #:	<b>2</b>
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	<b>183 feet</b>	Height (AGL):	<b>183 feet</b>	Height (AGL):	<b>183 feet</b>
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	<b>0.71 %</b>	Antenna B2 MPE%	<b>0.71 %</b>	Antenna C2 MPE%	<b>0.71 %</b>

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	<b>1.76 %</b>
Verizon Wireless	3.00 %
AT&T	1.48 %
<b>Site Total MPE %:</b>	<b>6.24 %</b>

SPRINT Sector A Total:	1.76 %
SPRINT Sector B Total:	1.76 %
SPRINT Sector C Total:	1.76 %
<b>Site Total:</b>	<b>6.24 %</b>

SPRINT _ Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	183	0.48	850 MHz	567	0.09%
Sprint 850 MHz LTE	2	941.82	183	2.16	850 MHz	567	0.38%
Sprint 1900 MHz (PCS) CDMA	5	511.82	183	2.94	1900 MHz (PCS)	1000	0.29%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	183	2.94	1900 MHz (PCS)	1000	0.29%
Sprint 2500 MHz (BRS) LTE	8	778.09	183	7.14	2500 MHz (BRS)	1000	0.71%
						<b>Total:</b>	<b>1.76%</b>





## Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	1.76 %
Sector B:	1.76 %
Sector C:	1.76 %
SPRINT Maximum MPE % (per sector):	1.76 %
Site Total:	6.24 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **6.24 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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