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

June 29, 2018

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

RE: **Notice of Exempt Modification for Sprint Crown Site BU: 881534**
Sprint Site ID: CT52XC061
670 Captain Neville Drive, Waterbury, New Haven County, CT 06705
Latitude: 41° 32′ 3.60″/ **Longitude:** -72° 58′ 8.40″

Dear Ms. Bachman:

Sprint currently maintains (3) antennas at the 140-foot level of the existing 150-foot monopole at 670 Captain Neville Drive, Waterbury, Connecticut 06705. The tower is owned by Global Signal Acquisitions (Crown Castle) and the property is owned by MW Cell REIT 1, LLC (Crown Castle). Sprint intends to replace (3) antennas, install (3) antennas, add (12) RRHs, and add (4) lines.

The Connecticut Siting Council's Telecommunications Database provides the Council approved SCLP's use of the telecommunications facility located at 670 Captain Neville Drive, Waterbury, Connecticut on April 12, 2000. A diligent search of available records was not fruitful for obtaining a copy of the original tower approval.

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 The Honorable Robert Congdon, First Selectman for the Town of Preston, as well as the property owner.

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

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

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

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

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

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

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

Sincerely,

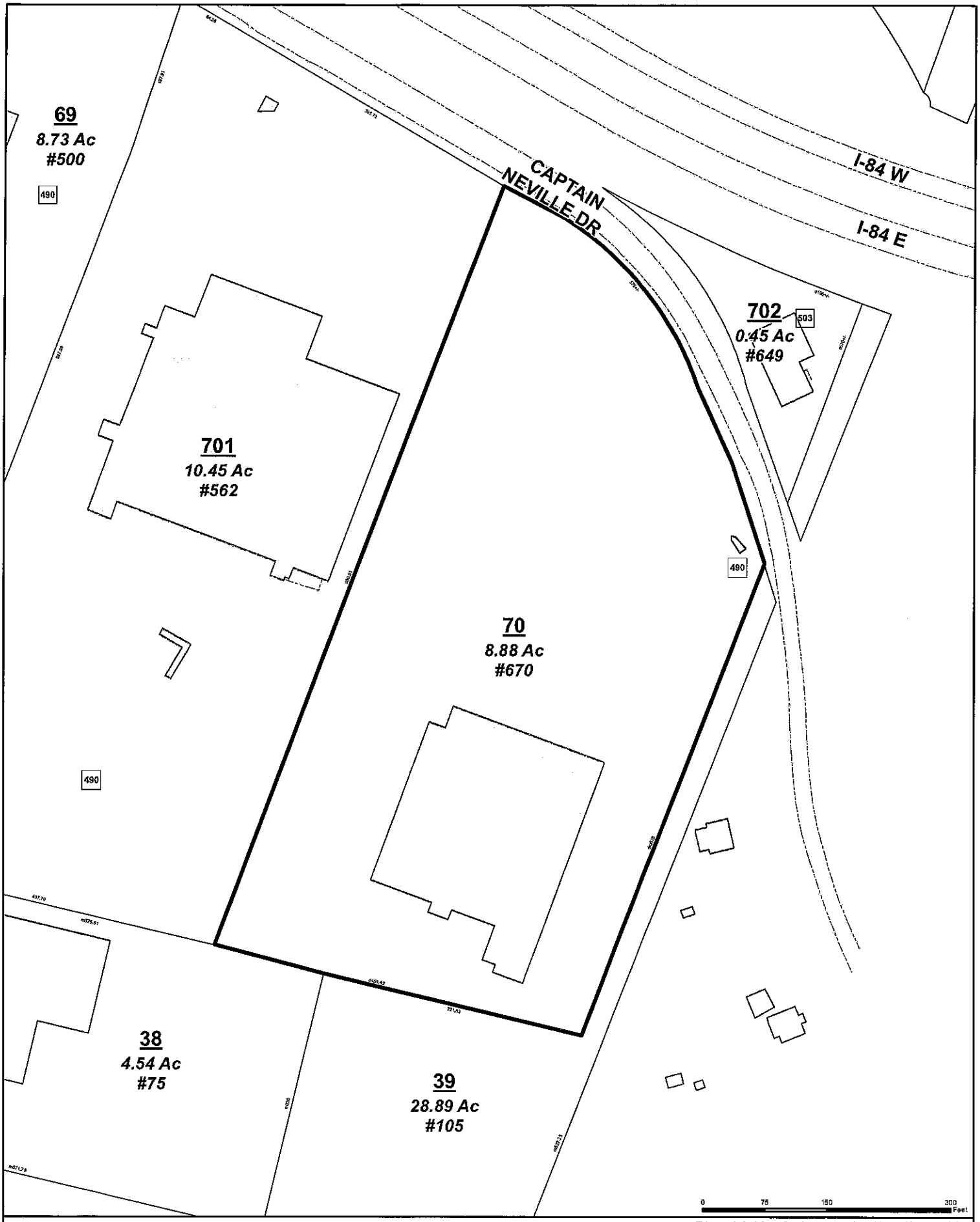
Anne Marie Zsamba, Esq.
Real Estate Specialist
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
(518) 350-3639
annemarie.zsamba.contractor@crowncastle.com

Attachments:

Tab A: Exhibit-1: Compound Plan and Elevation Depicting the Planned Changes
Tab B: Exhibit-2: Structural Modification Report
Tab C: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Neil M. O'Leary, Mayor
City of Waterbury – City Hall
235 Grand Street
Waterbury, CT 06702
(203) 597-3444

Mr. James A. Sequin, AICP, City Planner
185 South Main St., 5th Floor
(1 Jefferson Square)
Waterbury, CT 06706
(203) 346-3949



City of Waterbury
Public Works Department

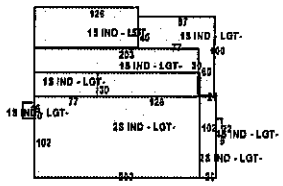
MBL: **0450-0490-0070**

ADDRESS: 670 CAPT NEVILLE DR

This map is for informational purposes only and has not been prepared for, or suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to verify the usability of the information. The City of Waterbury makes no warranties, express or implied, as to the use of the information obtained herein.

N

Location: 670 CAPT NEVILLE DR **Owner:** M B REALTY LLC



Property Information:

Map Block Lot:	0450-0490-0070	**Acres:**	8.88
Primary Use:	Light Industrial	**Zone:**	IP
Neighborhood:	85000-Industrial Park	**Vol/Page:**	3298
Mailing Address:	M B REALTY LLC 670 CAPTAIN NEVILLE DR WATERBURY CT 067050000		

Property Values:

	Appraised Value	Assessed Value (70%)
Building	2298424	1608900
Land	477464	334220
OutBuilding	48610	34030
Total	2824498	1977150

Sales Information:

Sale Date	Sale Price	Sale Type	Valid sale
1/17/1996	475000		No

Building Information:

Bldg Style:		**Living Area:**	69700sq.ft
Construction:	Average	**Year Built:**	1990
Exterior Wall:	Concrete Precast Panel	**Stories:**	2
Roof Cover:		**Heating:**	Space Heater
Condition:	Good	**Heat Fuel:**	Gas
Rooms:	0	**Bedrooms:**	0
Full Baths:	0	**Half Baths:**	0

Outbuilding Information:

Type	Area (sq.ft)	Year Built	Condition
Canopy Canopy	400sq.ft	2001	Average
Concrete Paving	340sq.ft	1996	Average

Alex Padilla
California Secretary of State

Business Search - Entity Detail

The California Business Search is updated daily and reflects work processed through Tuesday, June 26, 2018. Please refer to document **Processing Times** for the received dates of filings currently being processed. The data provided is not a complete or certified record of an entity. Not all images are available online.

201227810202 MW CELL REIT 1 LLC

Registration Date:	10/04/2012
Jurisdiction:	DELAWARE
Entity Type:	FOREIGN
Status:	ACTIVE
Agent for Service of Process:	**CT CORPORATION SYSTEM (C0168406)** To find the most current California registered Corporate Agent for Service of Process address and authorized employee(s) information, click the link above and then select the most current 1505 Certificate.
Entity Address:	1220 AUGUSTA DR STE 600 HOUSTON TX 77057
Entity Mailing Address:	1220 AUGUSTA DR STE 600 HOUSTON TX 77057
LLC Management	*

A Statement of Information is due EVERY EVEN-NUMBERED year beginning five months before and through the end of October.

Document Type	File Date	PDF
SI-NO CHANGE	10/06/2017	
SI-COMPLETE	11/17/2014	
REGISTRATION	10/04/2012	

* Indicates the information is not contained in the California Secretary of State's database.

Note: If the agent for service of process is a corporation, the address of the agent may be requested by ordering a status report.

- For information on checking or reserving a name, refer to **Name Availability**.
- If the image is not available online, for information on ordering a copy refer to **Information Requests**.
- For information on ordering certificates, status reports, certified copies of documents and copies of documents not currently available in the Business Search or to request a more extensive search for records, refer to **Information Requests**.
- For help with searching an entity name, refer to **Search Tips**.
- For descriptions of the various fields and status types, refer to **Frequently Asked Questions**.

Modify Search | **New Search** | **Back to Search Results**

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	WATERBURY TOWER
SITE CASCADE:	CT52XC061
SITE NUMBER:	881534
SITE ADDRESS:	670 CAPTAIN NEVILLE DRIVE WATERBURY, CT 06705
SITE TYPE:	MONOPOLE
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

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

LATITUDE (NAD83):
41° 32' 3.60" N
41.534333°

LONGITUDE (NAD83):
-72° 58' 8.40" W
-72.969°

COUNTY:
NEW HAVEN

ZONING JURISDICTION:
CITY OF WATERBURY

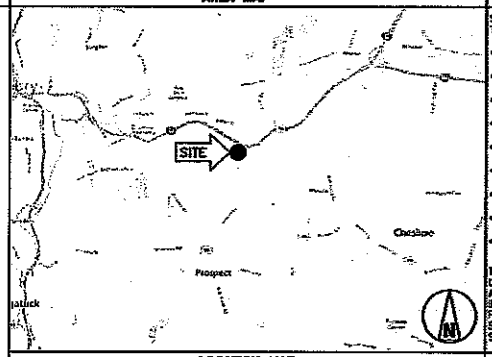
ZONING DISTRICT:
IP

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

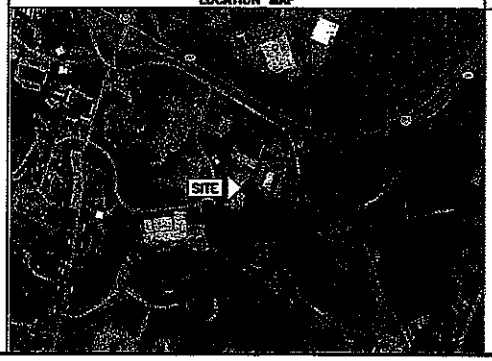
SPRINT CONSTRUCTION:
TBD

CROWN PM:
SCOTT WATROSKI
(201) 236-9228

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL 2.5 EQUIPMENT INSIDE EXISTING M.M. MODS CABINET
- REMOVE (3) EXISTING LLP2530R PANEL ANTENNAS FROM TOWER
- INSTALL (3) RMV-65B-R4 PANEL ANTENNAS ON TOWER
- INSTALL (3) APXVTM14-ALU-I20 PANEL ANTENNAS ON TOWER
- INSTALL (3) 1900MHz 4x45W-65MHz RRHs ON TOWER
- INSTALL (6) RRH 2x50-800MHz RRHs ON TOWER
- INSTALL (3) TD-RRHx20-25 RRHs ON TOWER
- INSTALL (4) HYBRID CABLES
- REMOVE (3) COAX

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

APPLICABLE CODES

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

1. INTERNATIONAL BUILDING CODE (2015 IBC)
2. TIA-222-G OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. LOCAL BUILDING CODE
7. CITY/COUNTY ORDINANCES

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

DRAWING INDEX

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

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

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0795
www.infinigy.com
JOB NUMBER: 525-001

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
MAY 3, 2018
No. 24705
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/30/18	SL	0
CLIENT COMMENTS	05/23/18	SL	B
ISSUED FOR REVIEW	04/30/18	SL	A

SITE NAME:
WATERBURY TOWER

SITE CASCADE:
CT52XC061

SITE ADDRESS:
670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

SHEET DESCRIPTION:
TITLE SHEET
& PROJECT DATA

SHEET NUMBER:
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

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

B. COMPANY: SPRINT CORPORATION

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

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

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

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETEMESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED

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

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 520-103

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT · JOHN S. STEVENS · No. 24709 · LICENSED · PROFESSIONAL ENGINEER
MAY 31 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/30/18	SL	0
CLIENT COMMENTS	05/22/18	SL	B
ISSUED FOR REVIEW	04/30/18	SL	A

SITE NAME: WATERBURY TOWER

SITE CASCADE: CT52XC061

SITE ADDRESS: 670 CAPTAIN NEVILLE DRIVE, WATERBURY, CT 06705

SHEET DESCRIPTION: SPRINT SPECIFICATIONS

SHEET NUMBER: SP-1

CONTINUE FROM SP-1

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITALS:

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

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

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

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

1.4 TESTS AND INSPECTIONS:

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

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

1. COAX SWEEPS AND FIBER TESTS PER CURRENT VERSION OF SPRINT'S TS-0200 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 485. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCRIBBLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

3.2 REQUIRED TESTS:

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

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

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY

FROM ZERO TO INFINIGY
the solutions are endless

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Phone: 518-690-0790 | Fax: 518-690-0793
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JOB NUMBER: 630-180

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
THOMAS J. STEVENS
MAY 31 2010
No. 24705
LICENSED PROFESSIONAL ENGINEER

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CT52XC061

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670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

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SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.

8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.

9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.

10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

11. ALL AVAILABLE JURISDICTIONAL INFORMATION

12. PDF SCAN OF REDLINES PRODUCED IN FIELD

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

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

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

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

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

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

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

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0792
www.infinigy.com
JOB NUMBER: 326-163

M.A. PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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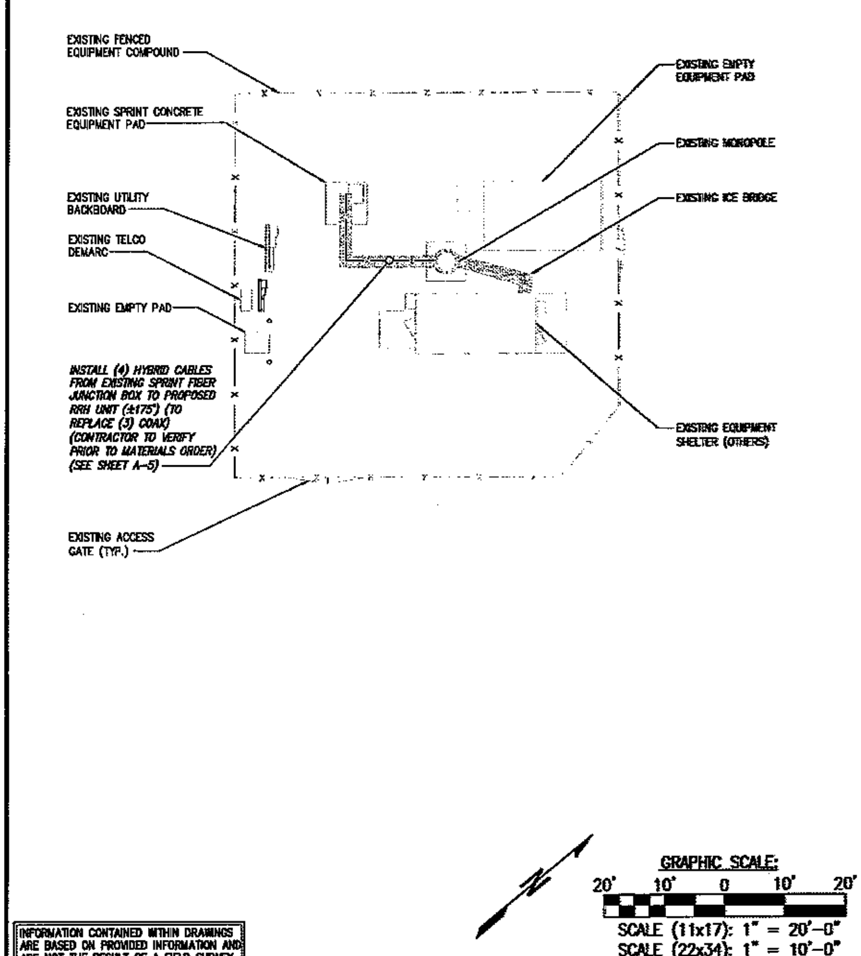
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

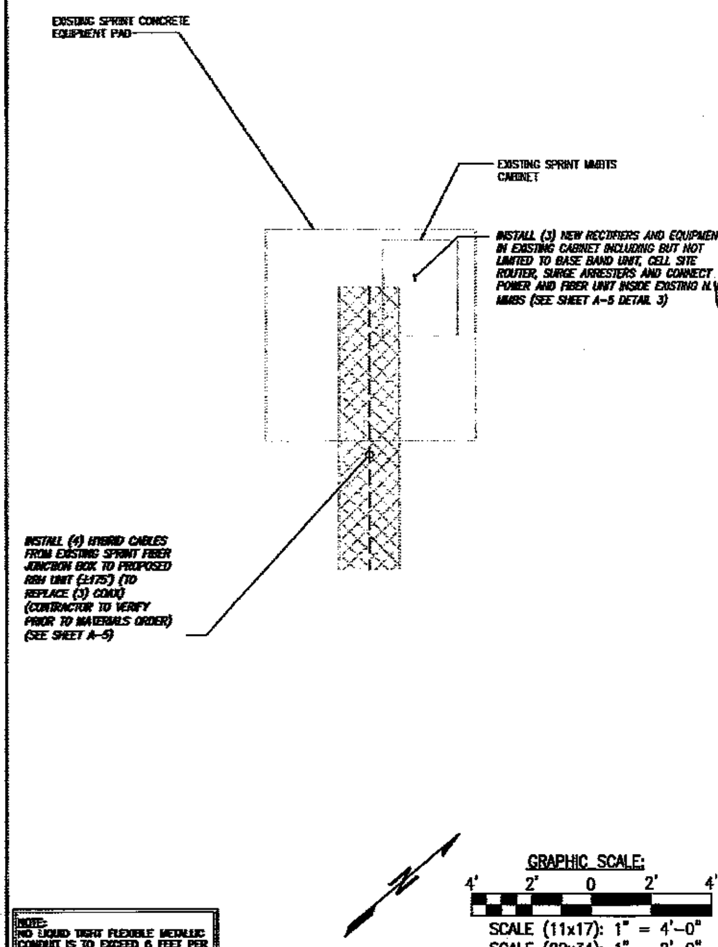
SHEET NUMBER:

SP-3



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

OVERALL SITE PLAN | SCALE: AS NOTED | 1



NOTE:
NO LIQUID TIGHT FLEXIBLE METALLIC CONDUIT IS TO EXCEED 6 FEET PER SP-2 SECTION 26 200 ITEM E.

SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

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

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MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT — JOHN S. STEVENS — No. 24705 — LICENSED PROFESSIONAL ENGINEER — MAY 31 2018

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/31/18	SL	0
CLIENT COMMENTS	05/22/18	SL	B
ISSUED FOR REVIEW	04/25/18	SL	A

SITE NAME:
WATERBURY TOWER

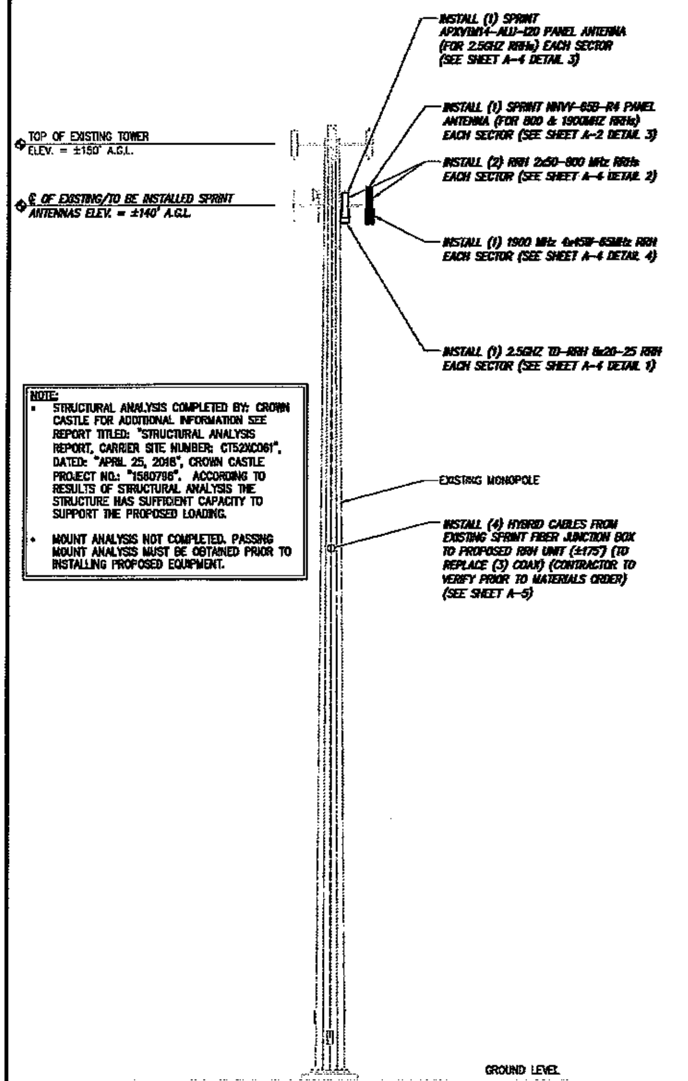
SITE CASCADE:
CT52XC061

SITE ADDRESS:
670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

SHEET DESCRIPTION:
SITE PLAN

SHEET NUMBER:
A-1

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

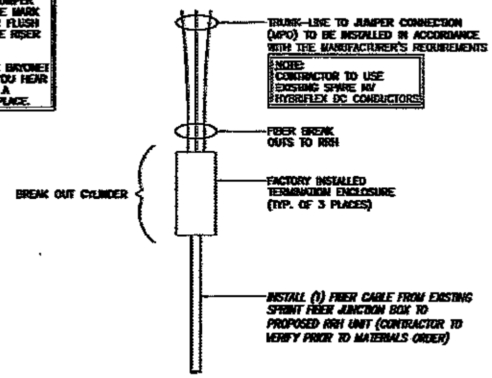


NOTE:
- STRUCTURAL ANALYSIS COMPLETED BY: CROWN CASTLE FOR ADDITIONAL INFORMATION SEE REPORT TITLED: "STRUCTURAL ANALYSIS REPORT, CARRIER SITE NUMBER: CT52XC061", DATED: "APRIL 25, 2018", CROWN CASTLE PROJECT NO.: "1580798". ACCORDING TO RESULTS OF STRUCTURAL ANALYSIS THE STRUCTURE HAS SUFFICIENT CAPACITY TO SUPPORT THE PROPOSED LOADING.
- MOUNT ANALYSIS NOT COMPLETED. PASSING MOUNT ANALYSIS MUST BE OBTAINED PRIOR TO INSTALLING PROPOSED EQUIPMENT.

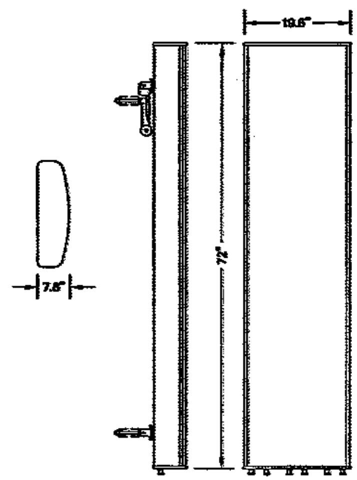
TOWER ELEVATION | NO SCALE | 1

NOTE:
CONTRACTOR TO LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.

CONTRACTOR TO ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND TO ENSURE A PROPER CONNECTION IS IN PLACE.



HYBRID BREAKOUT DETAIL | NO SCALE | 2



ANTENNA COMMSCOPE NNVV-65B-R4

RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD,in(mm):	72"x19.6"x7.6"
WEIGHT:	77.4 lbs
CONNECTORS:	(8) 4.3-10 DIN FEMALE

SPRINT PANEL ANTENNA | NO SCALE | 3

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MAY 01 2018

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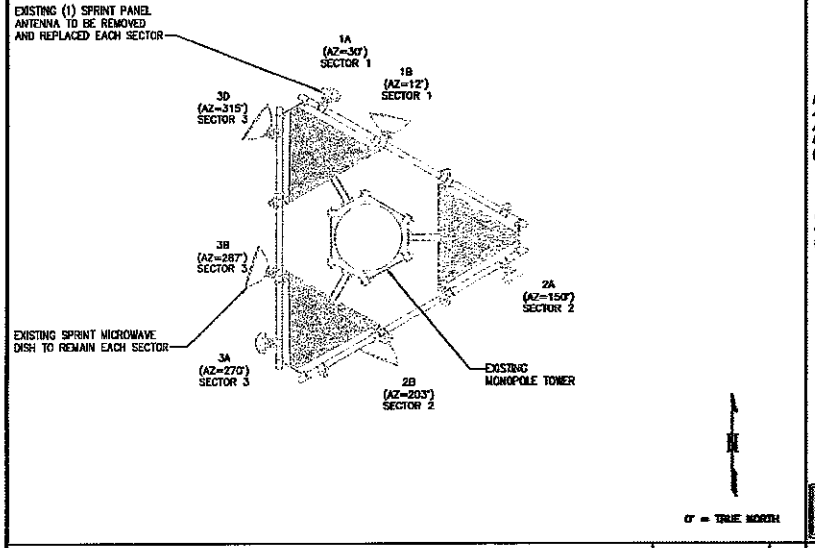
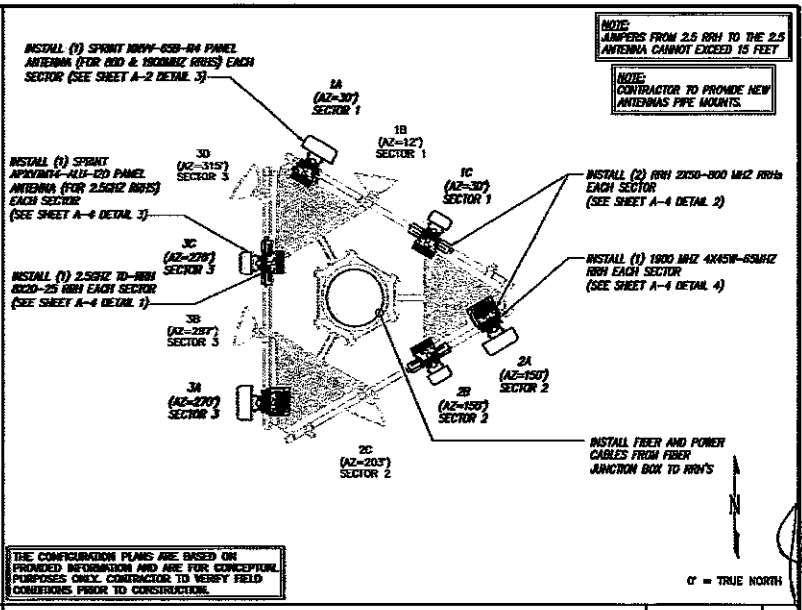
SITE ADDRESS:
670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

SHEET DESCRIPTION:
TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:
A-2



EXISTING ANTENNA LAYOUT | NO SCALE | 1

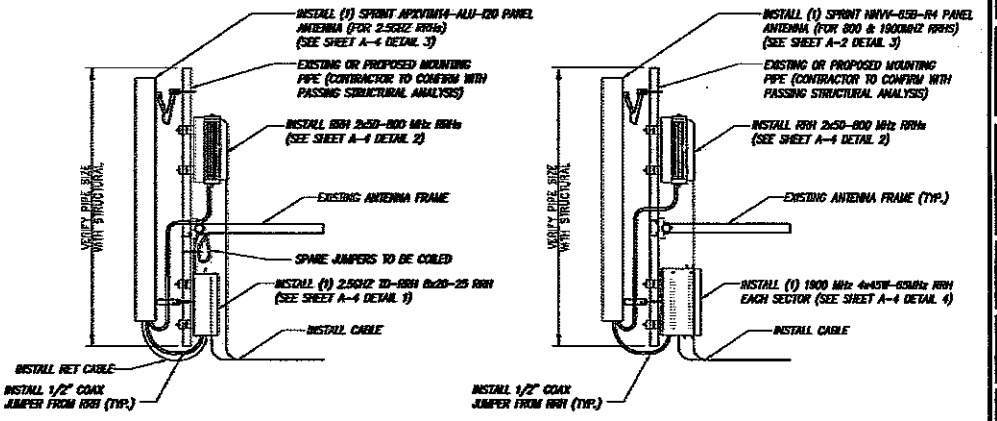


FINAL ANTENNA & RRH LAYOUT | NO SCALE | 2

NOTES:

1. ALL ANTENNA HEIGHTS ARE TO CENTER OF HORIZONTAL ANTENNA.
2. VERIFY AZIMUTH AND CL HEIGHT WITH AS-BUILT DRAWINGS IF AVAILABLE.
3. NO OBJECT IS TO BE WITHIN 45 DEGREES OF BORE-SIGHT OF 2.5G OR ANY OTHER TOWER ANTENNA. IF NECESSARY, 2.5G ANTENNA CAN BE PLACED AT FAR EDGE OF HORIZONTAL ANTENNA MOUNT MEMBER FOR CLEAR LINE OF SITE OR EVEN ON ANOTHER SECTOR FOR CLEAR LINE OF SITE.
4. 2.5G ANTENNA MUST BE AT LEAST 6" FROM 1900MHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30MHZ FROM DUAL BAND 1900MHZ AND 800MHZ ANTENNA.
5. IF ANTENNAS ARE MOUNTED ON A FACE SURFACE SUCH AS A BUILDING WALL, PARAPET WALL, OR WATER TOWER WALL, THE RFDS MUST BE ACCOMPANIED BY A SKETCH PROVIDED BY ITS ORIGINATING RF ENGINEER CALLING OUT THE EXACT LOCATION OF WHERE ANTENNA IS TO BE LOCATED. CONTACT SPRINT RF ENGINEER IF THE SKETCH IS MISSING.
6. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND CL HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5G ANTENNA AT SAME CL HEIGHT AS 1.9G ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900 MHZ AND 800 MHZ ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
7. AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5G. TEST INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
8. GENERAL CONTRACTOR MUST INSURE THAT NO OBJECT IS LOCATED IN FRONT OF ANTENNA. THIS MEANS NO OBJECT IS TO BE LOCATED 45 DEGREES LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5G ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
9. GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREES. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL. HTTP://WWW.3ZTELECOM.COM/ANTENNA-ALIGNMENT-TOOL/

NOTES | NO SCALE | 3



NOTES:

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

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

NOTE: SPARE DC CABLES ARE COILED UP ON MY RRHS AT SPRINT MARKET. THESE ARE TO BE USED TO POWER UP THE 2.5 RRHS AND RED BIRD EXISTING DC BREAKERS INSIDE THE FIBER JUNCTION BOX LOCATED AT EQUIPMENT.

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

TYPICAL ANTENNA & RRH MOUNTING DETAILS | NO SCALE | 4

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JOHN S. STEVENS
No. 24795
LICENSED PROFESSIONAL ENGINEER
MAY 21 2018

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670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

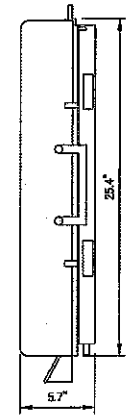
SHEET DESCRIPTION:

ANTENNA LAYOUT & MOUNTING DETAILS

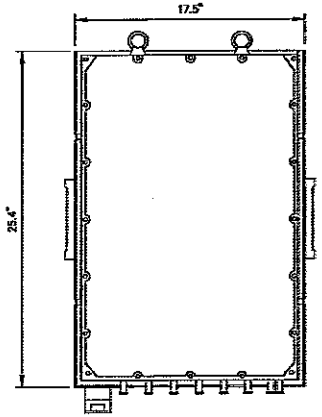
SHEET NUMBER:

A-3

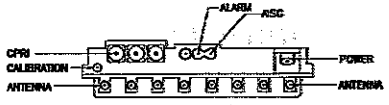
RRH: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW



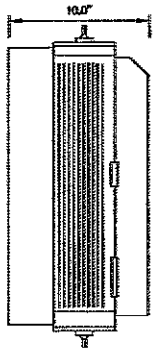
PLAN VIEW

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

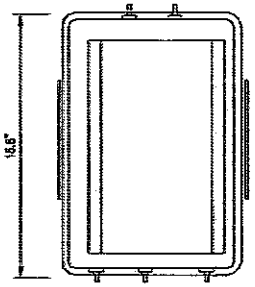
2.5 RRH'S | NO SCALE | 1

RRH: ALCATEL LUCENT RRH 800 MHz 2x50W
COLOR: LIGHT GREY
WEIGHT: 53 LBS.

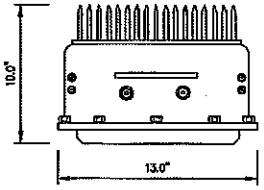
NOTES
COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.



SIDE VIEW



FRONT VIEW

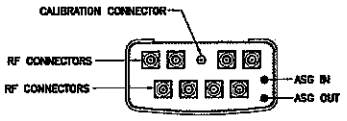


PLAN VIEW

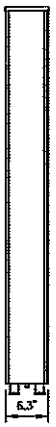
800 MHz RRH | NO SCALE | 2

ANTENNA RFS APXVTM14-ALU-I20

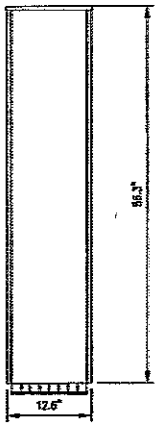
RADOME MATERIAL:	ASA
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD,in(mm):	56.3"x12.6"x6.3" (1430x320x160mm)
WEIGHT:	56.2 lbs
CONNECTORS:	(8) 4.1/9.5 DIN FEMALE (1) NF – CALIBRATION CONNECTOR



PLAN VIEW



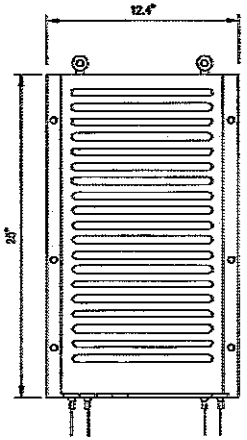
SIDE VIEW



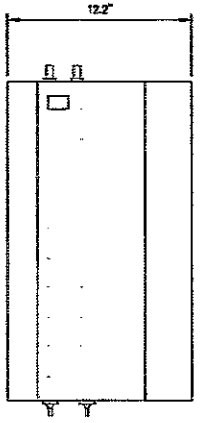
FRONT VIEW

TRIBAND ANTENNA | NO SCALE | 3

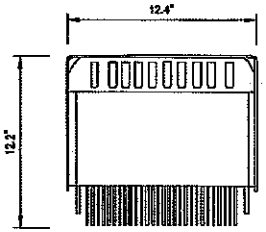
RRH: ALCATEL LUCENT 1900 MHz
COLOR: LIGHT GREY
WEIGHT: 70 LBS.
(INCLUDING OPTIONAL SOLAR SHIELD)



FRONT VIEW



SIDE VIEW



TOP VIEW

1900 MHz RRH | NO SCALE | 4

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JOB NUMBER 328-163

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JOHN S. STEVENS
No. 24705
MAY 31, 2018
PROFESSIONAL ENGINEER

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EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-4

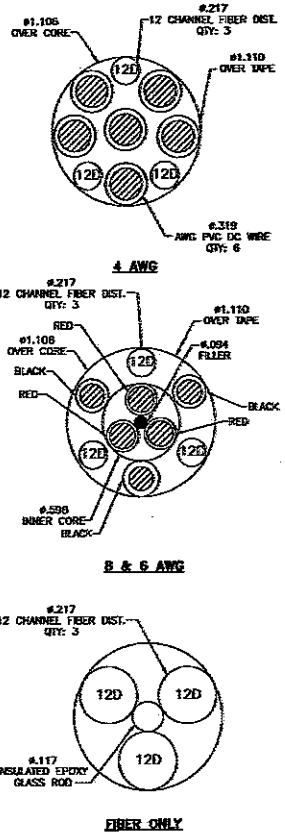
RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: HBO50-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HBO50-M12-075F	75 ft
	MN: HBO50-M12-100F	100 ft
	MN: HBO50-M12-125F	125 ft
	MN: HBO50-M12-150F	150 ft
	MN: HBO50-M12-175F	175 ft
	MN: HBO50-M12-200F	200 ft
8 AWG Power	Hybrid cable MN: HB814-08U3M12-050F 1x 8 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB814-08U3M12-075F	75 ft
	MN: HB814-08U3M12-100F	100 ft
	MN: HB814-08U3M12-125F	125 ft
	MN: HB814-08U3M12-150F	150 ft
	MN: HB814-08U3M12-175F	175 ft
	MN: HB814-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN: HB134-06U3M12-225F 1x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB134-06U3M12-250F	250 ft
	MN: HB134-06U3M12-275F	275 ft
	MN: HB134-06U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: HB134-04U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB134-04U3M12-350F	350 ft
	MN: HB134-04U3M12-375F	375 ft

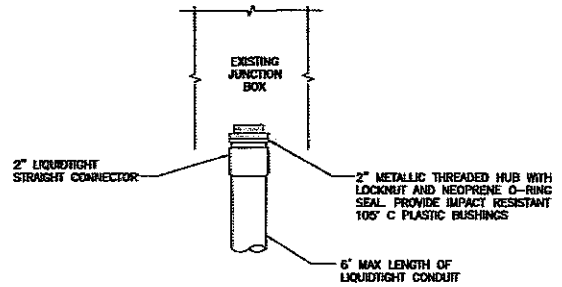
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	Hybrid jumper cable MN: HBF012-M3-5F1 5 ft, 2x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	Hybrid jumper cable MN: HBF058-08U3M3-5F1 5 ft, 3x 8 AWG power pair, 2x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U3M3-10F1	10 ft
	MN: HBF058-08U3M3-15F1	15 ft
	MN: HBF058-08U3M3-20F1	20 ft
	MN: HBF058-08U3M3-25F1	25 ft
	MN: HBF058-08U3M3-30F1	30 ft
6 AWG Power	Hybrid jumper cable MN: HBF058-12U3M3-5F1 5 ft, 3x 6 AWG power pair, 2x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-12U3M3-10F1	10 ft
	MN: HBF058-12U3M3-15F1	15 ft
	MN: HBF058-12U3M3-20F1	20 ft
	MN: HBF058-12U3M3-25F1	25 ft
	MN: HBF058-12U3M3-30F1	30 ft
4 AWG Power	Hybrid jumper cable MN: HBF078-23U3M3-5F1 5 ft, 3x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-23U3M3-10F1	10 ft
	MN: HBF078-23U3M3-15F1	15 ft
	MN: HBF078-23U3M3-20F1	20 ft
	MN: HBF078-23U3M3-25F1	25 ft
	MN: HBF078-23U3M3-30F1	30 ft

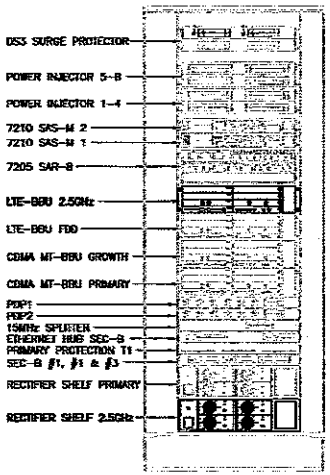
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2



CABINET LAYOUT | NO SCALE | 3

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CIVIL DETAILS

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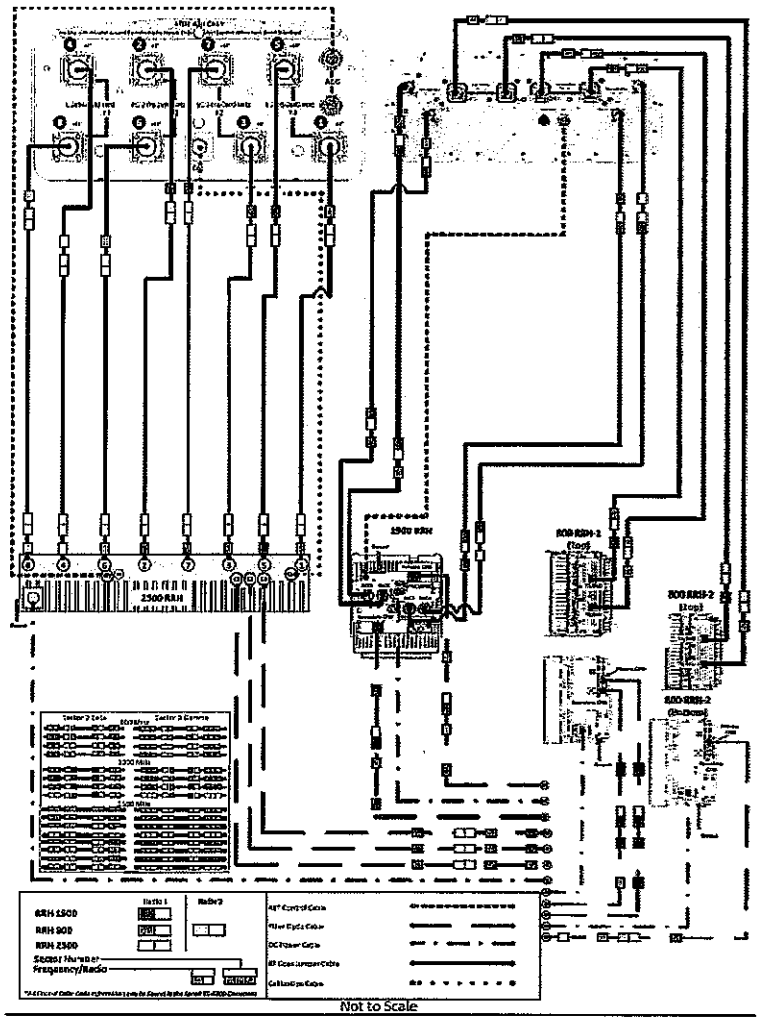
A-5

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



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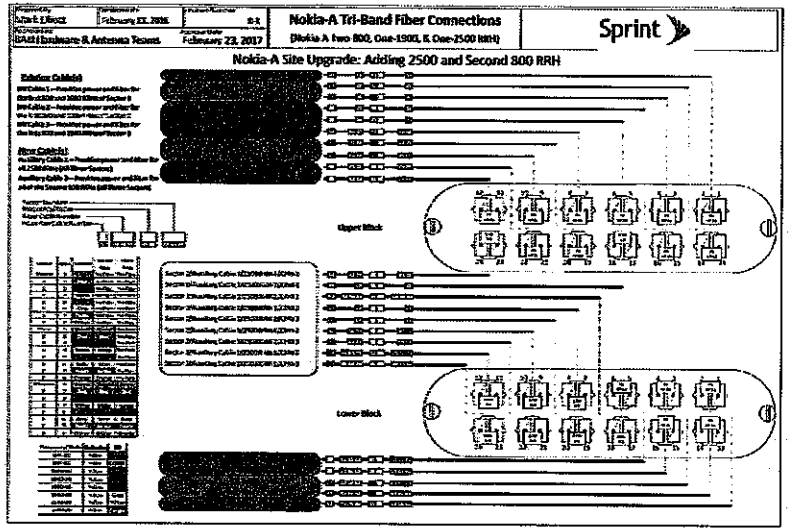

PLUMBING DIAGRAM | NO SCALE | 1

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY
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1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED
PROFESSIONAL ENGINEER
MAY 21 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/30/18	SL	0
CLIENT COMMENTS	05/23/18	SL	B
ISSUED FOR REVIEW	04/30/18	SL	A

SITE NAME:

WATERBURY TOWER

SITE CASCADE:

CT52XC061

SITE ADDRESS:

670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

SHEET DESCRIPTION:

PLUMBING DIAGRAM

SHEET NUMBER:

A-6

FINAL EQUIPMENT CONFIGURATION

SECTOR	ANTENNA MANUFACTURER	ANTENNA MODEL	RAD CENTER	AZIMUTH	RRH MAKE AND MODEL
1	RFS	APXV18I4-ALU-I2D	140'	30°	(1) ALU 2.5GHZ RRH8X20-25
	COMMSCOPE	NNVV-65B-R4	140'	30°	(2) ALU 2x50-800 (1) ALU 1900MHZ 4X45W-65MHZ
2	RFS	APXV18I4-ALU-I2D	140'	150°	(1) ALU 1900MHz 4x45W-65MHz
	COMMSCOPE	NNVV-65B-R4	140'	150°	(2) ALU 800MHZ 2X50-800 (1) ALU 1900MHZ 4X45W-65MHZ
3	RFS	APXVTM14-ALU-I2D	140'	270°	(1) ALU 1900MHz 4x45W-65MHz
	COMMSCOPE	NNVV-65B-R4	140'	270°	(2) ALU 800MHZ 2X50-800 (1) ALU 1900MHZ 4X45W-65MHZ

FEEDER CABLES

MANUFACTURER	MODEL	LENGTH	QTY
RFS	HB114-13U3M12-175F	175±	(3)
RFS	HB114-21U3M12-175F	175±	(1)

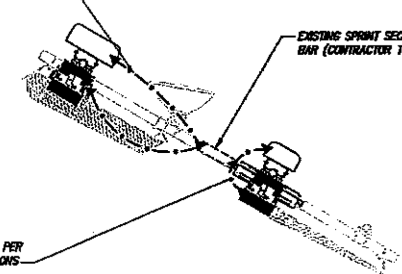
LEGEND
EXISTING
PROPOSED

NOTES:
1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT DATA AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS PRIOR TO CONSTRUCTION.

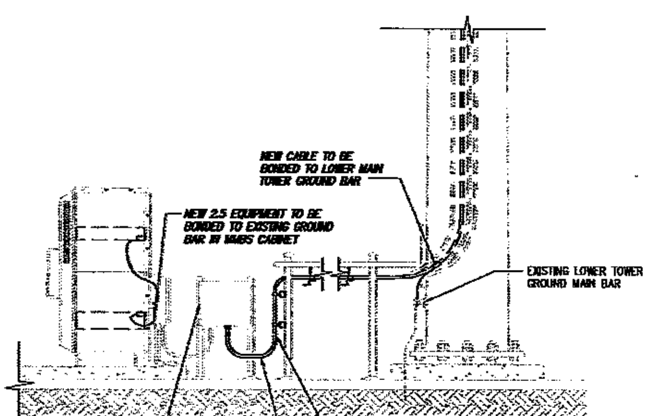
ANTENNA/CABLE SCHEDULE — NO SCALE — 1

LEGEND:

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



TYPICAL ANTENNA GROUNDING PLAN — NO SCALE — 2



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

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

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JOB NUMBER 526-105

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT — JOHN S. STEVENS — No. 24705 — LICENSED PROFESSIONAL ENGINEER — MAY 31 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/30/18	SL	0
CLIENT COMMENTS	05/22/18	SL	B
ISSUED FOR REVIEW	04/30/18	SL	A

SITE NAME: WATERBURY TOWER

SITE CASCADE: CT52XC061

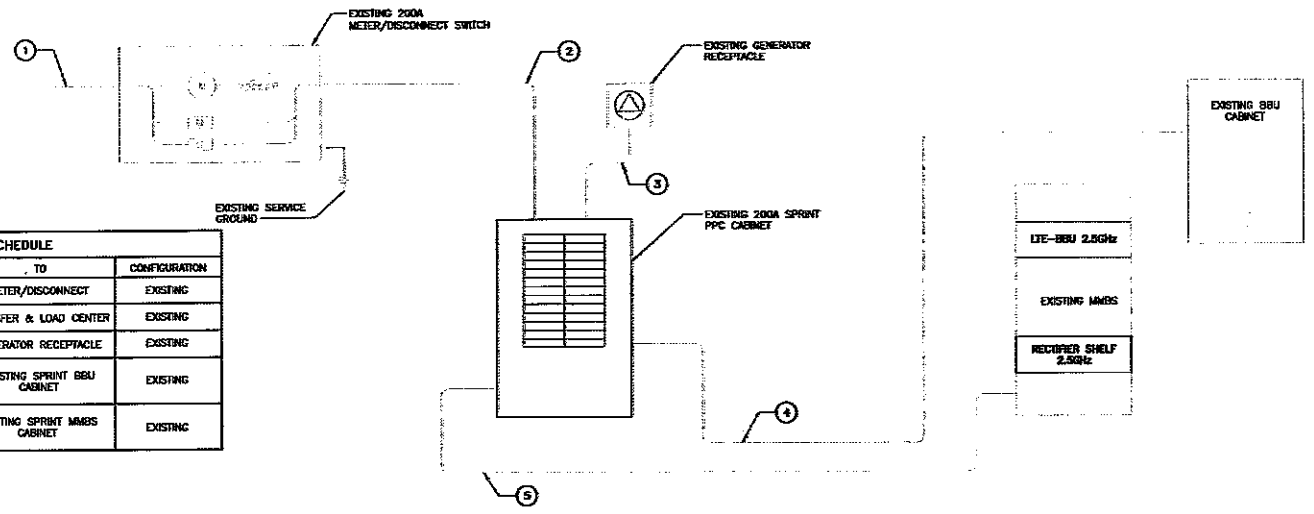
SITE ADDRESS: 670 CAPTAIN NEVILLE DRIVE WATERBURY, CT 06705

SHEET DESCRIPTION: ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER: E-1

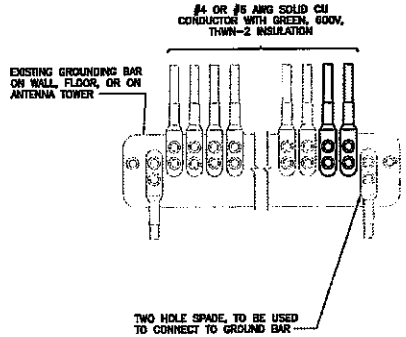
NOTES

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



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

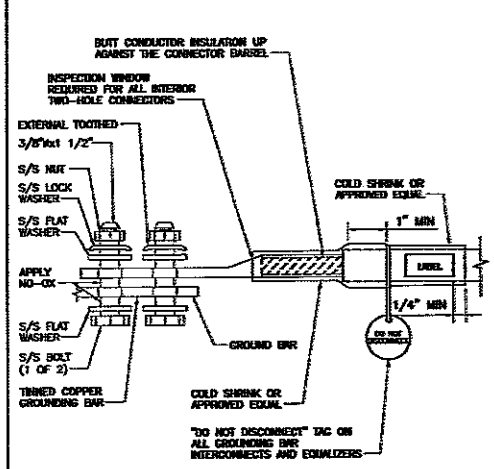
ELECTRICAL ONE-LINE DIAGRAM — NO SCALE — 1



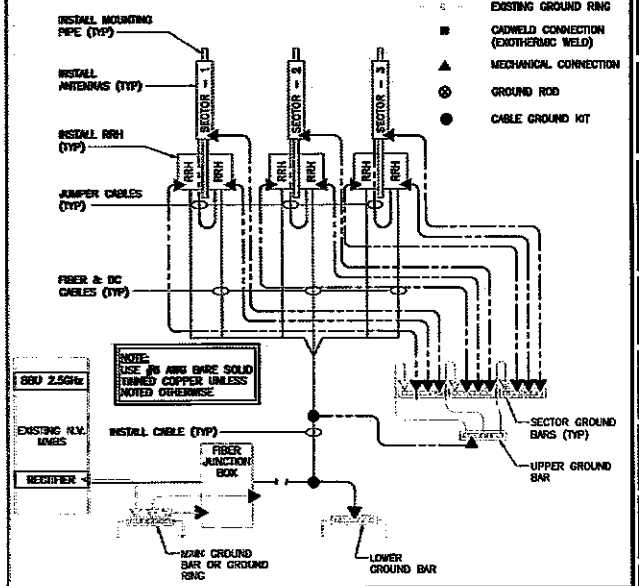
NOTES

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

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



TWO HOLE LUG — NO SCALE — 3



GROUNDING RISER DIAGRAM — NO SCALE — 4

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Overland Park, Kansas 66251

PLANS PREPARED BY:

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JOB NUMBER: 328-001

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT — JOHN STEVEN — LICENSED PROFESSIONAL ENGINEER — MAY 31 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	05/30/18	SL	C
CLIENT COMMENTS	05/22/18	SL	B
ISSUED FOR REVIEW	04/30/18	SL	A

SITE NAME:

WATERBURY TOWER

SITE CASCADE:

CT52XC061

SITE ADDRESS:

670 CAPTAIN NEVILLE DRIVE
WATERBURY, CT 06705

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

Date: **April 25, 2018**

Chanhdara Ratsavong
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Clearwire Corp* Co-Locate**	
	Carrier Site Number:	CT52XC061
	Carrier Site Name:	CT52XC061
Crown Castle Designation:	**Crown Castle BU Number:**	881534
	Crown Castle Site Name:	WATERBURY TOWER
	Crown Castle JDE Job Number:	499050
	Crown Castle Work Order Number:	1560796
	Crown Castle Order Number:	436930 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1560796
Site Data:	**670 Captain Neville Drive, Waterbury, New Haven County, CT**	
	Latitude *41° 32' 3.6"*, Longitude *-72° 58' 8.4"*	
	150 Foot - Monopole Tower	

Dear Chanhdara Ratsavong,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1560796, in accordance with order 436930, revision 0.

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

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Structural analysis prepared by: Steven Hu / SCK

Respectfully submitted by:

Terry P. Styran, P.E.
Senior Project Engineer

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED
PROFESSIONAL ENGINEER

4/26/2018

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in February of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

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 97 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C.

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
140.0	140.0	3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ	4	1-1/4	-
		6	alcatel lucent	RRH2X50-800			
		3	alcatel lucent	TD-RRH8X20-25			
		3	commscope	NNVV-65B-R4 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	151.0	2	cci antennas	TPA-65R-LCUUUU-H8	1 2	3/8 3/4	2
		1	quintel technology	QS66512-2			
		6	cci antennas	TPX-070821			
		3	ericsson	RRUS 32			
		1	raycap	DC6-48-60-18-8F			
		3	cci antennas	DTMABP7819VG12A	1 1 2 12	conduit 3/8 3/4 1-5/8	1
		3	cci antennas	OPA-65R-LCUU-H6			
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 12 W/O SOLAR SHIELD			
		3	ericsson	RRUS A2 MODULE			
		3	kathrein	800 10121			
		3	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
	150.0	1	tower mounts	Platform Mount [LP 1301-1]			
140.0	142.0	4	andrew	VHLP2-11	-	-	1
		1	motorola	TIMING 2000			
	140.0	3	argus technologies	LLPX310R w/ Mount Pipe	3	1/4	3

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	samsung telecommunications	WIMAX DAP HEAD	3 1	5/16 conduit	
		4	dragonwave	HORIZON COMPACT	3	1/2 conduit	1
		1	tower mounts	Platform Mount [LP 712-1]	1		

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)
150.0	150.0	12	allgon	A-800-110 Panel Antennas	-	-
140.0	140.0	12	allgon	A-800-110 Panel Antennas	-	-
130.0	130.0	12	allgon	A-800-110 Panel Antennas	-	-
120.0	120.0	9	allgon	A-800-110 Panel Antennas	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Assoc., Inc.	1405752	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Candid Communications	1406237	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavros Incorporated	1405785	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	150 - 123.29	Pole	TP23.17x17x0.1875	1	-7.48	936.21	73.6	Pass
L2	123.29 - 87.79	Pole	TP30.86x22.005x0.3125	2	-12.71	2176.98	70.5	Pass
L3	87.79 - 43.21	Pole	TP40.4x29.2294x0.375	3	-22.33	3398.73	68.2	Pass
L4	43.21 - 0	Pole	TP49.5x38.3779x0.4375	4	-37.64	4908.34	61.8	Pass
							Summary	
						Pole (L1)	73.6	Pass
						Rating =	73.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	62.2	Pass
1	Base Plate	0	78.0	Pass
1	Base Foundation Structure	0	75.9	Pass
1	Base Foundation Soil Interaction	0	45.1	Pass

Structure Rating (max from all components) =	78%

4.1) Recommendations

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

As requested, the results of the tilt and twist values for a 60 mph 3-second gust service wind speed per the TIA-222-G standard are given below:

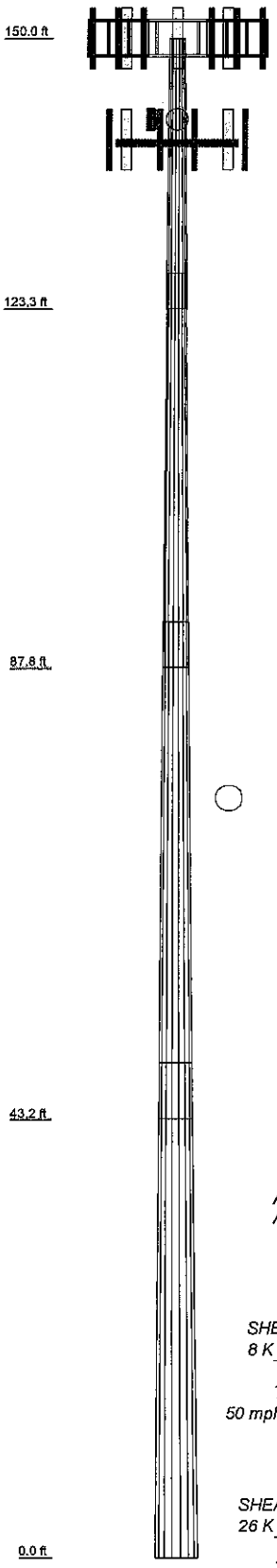
Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	*Appurtenance*	*Gov. Load Comb.*	*Deflection* in	*Tilt* °	*Twist* °	*Radius of Curvature* ft
142.00	VHLP2-11	45	24.613	1.8141	0.0028	8433

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	26.71	38.92	49.00	48.79
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3125	0.3750	0.4375
Socket Length (ft)	3.42	4.42	5.58	
Top Dia (in)	17.0000	22.0050	29.2294	38.3779
Bot Dia (in)	23.1700	30.8600	40.4000	49.5000
Grade			A572-65	
Weight (K)	1.1	3.4	6.8	10.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
800 10121	150	(2) TPX-070821	150
800 10121	150	DC6-48-60-18-8F	150
800 10121	150	Platform Mount [LP 1301-1]	150
OPA-65R-LCUU-H6	150	HORIZON COMPACT	140
OPA-65R-LCUU-H6	150	HORIZON COMPACT	140
OPA-65R-LCUU-H6	150	(2) HORIZON COMPACT	140
DTMABP7819VG12A	150	TIMING 2000	140
DTMABP7819VG12A	150	APXVTM14-ALU-I20 w/ Mount Pipe	140
DTMABP7819VG12A	150	APXVTM14-ALU-I20 w/ Mount Pipe	140
LGP21401	150	APXVTM14-ALU-I20 w/ Mount Pipe	140
LGP21401	150	NNVV-65B-R4 w/ Mount Pipe	140
LGP21401	150	NNVV-65B-R4 w/ Mount Pipe	140
RRUS A2 MODULE	150	NNVV-65B-R4 w/ Mount Pipe	140
RRUS A2 MODULE	150	(2) RRH2X50-800	140
RRUS A2 MODULE	150	(2) RRH2X50-800	140
RRUS 11	150	(2) RRH2X50-800	140
RRUS 11	150	PCS 1900MHZ 4X45W-65MHZ	140
RRUS 11	150	PCS 1900MHZ 4X45W-65MHZ	140
RRUS 12 W/O SOLAR SHIELD	150	PCS 1900MHZ 4X45W-65MHZ	140
RRUS 12 W/O SOLAR SHIELD	150	TD-RRH8X20-25	140
RRUS 12 W/O SOLAR SHIELD	150	TD-RRH8X20-25	140
DC6-48-60-18-8F	150	TD-RRH8X20-25	140
TPA-65R-LCUUUU-H8	150	Platform Mount [LP 712-1]	140
TPA-65R-LCUUUU-H8	150	(2) 6' x 2" Mount Pipe	140
QS66512-2	150	(2) 6' x 2" Mount Pipe	140
RRUS 32	150	(2) 6' x 2" Mount Pipe	140
RRUS 32	150	VHLP2-11	140
RRUS 32	150	VHLP2-11	140
(2) TPX-070821	150	VHLP2-11	140
(2) TPX-070821	150	VHLP2-11	140

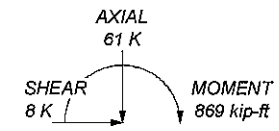
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

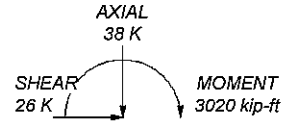
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 73.6%

ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 1 kip-ft
REACTIONS - 97 mph WIND

CROWN CASTLE
The Foundation for a Wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-4623

Job: 881534			
Project:			
Client: Crown Castle	Drawn by: Steven Hu	App'd:	
Code: TIA-222-G	Date: 04/23/18	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\Shu\1. WP\881534 WO 1560796\881534.eri		Dwg No. E-	

Tower Input Data

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

4) Tower is located in New Haven County, Connecticut.
5) Basic wind speed of 97 mph.
6) Structure Class II.
7) Exposure Category C.
8) Topographic Category 1.
9) Crest Height 0.00 ft.
10) Nominal ice thickness of 0.7500 in.
11) Ice thickness is considered to increase with height.
12) Ice density of 56 pcf.
13) A wind speed of 50 mph is used in combination with ice.
14) Temperature drop of 50 °F.
15) Deflections calculated using a wind speed of 60 mph.
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.
19) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-123.29	26.71	3.42	18	17.0000	23.1700	0.1875	0.7500	A572-65 (65 ksi)
L2	123.29-87.79	38.92	4.42	18	22.0050	30.8600	0.3125	1.2500	A572-65 (65 ksi)
L3	87.79-43.21	49.00	5.58	18	29.2294	40.4000	0.3750	1.5000	A572-65 (65 ksi)
L4	43.21-0.00	48.79		18	38.3779	49.5000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	17.2623	10.0055	357.3078	5.9684	8.6360	41.3742	715.0858	5.0037	2.6620	14.197
	23.5274	13.6775	912.7198	8.1588	11.7704	77.5439	1826.6405	6.8400	3.7479	19.989
L2	23.1346	21.5162	1279.1518	7.7008	11.1785	114.4293	2559.9868	10.7602	3.3229	10.633
	31.3361	30.2993	3572.0820	10.8444	15.6769	227.8567	7148.8642	15.1525	4.8814	15.62
L3	30.7035	34.3439	3612.5208	10.2433	14.8485	243.2917	7229.7951	17.1752	4.4844	11.958
	41.0232	47.6398	9642.0563	14.2089	20.5232	469.8125	19296.7998	23.8244	6.4504	17.201
L4	40.2616	52.6850	9581.3938	13.4688	19.4960	491.4548	19175.3950	26.3475	5.9845	13.679
	50.2636	68.1294	20719.1270	17.4172	25.1460	823.9532	41465.5167	34.0712	7.9420	18.153

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-123.29				1	1	1			
L2 123.29-87.79				1	1	1			
L3 87.79-43.21				1	1	1			
L4 43.21-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
HB114-1-0813U4-M5J(1-1/4)	C	Surface Ar (CaAa)	140.00 - 0.00	4	4	0.300 0.400	1.5400		1.20

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
CR 50 1873(1-5/8)	C	No	Inside Pole	150.00 - 0.00	12	No Ice	0.00	0.83
						1/2" Ice	0.00	0.83
						1" Ice	0.00	0.83
FB-L98B-002-75000(3/8)	C	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	150.00 - 0.00	2	No Ice	0.00	0.58
						1/2" Ice	0.00	0.58
						1" Ice	0.00	0.58
2" Rigid Conduit	C	No	Inside Pole	150.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
EC4-50(1/2)	C	No	Inside Pole	140.00 - 0.00	3	No Ice	0.00	0.16
						1/2" Ice	0.00	0.16
						1" Ice	0.00	0.16
2" Rigid Conduit	C	No	Inside Pole	140.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.29	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.293	0.000	0.54
L2	123.29-87.79	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	21.868	0.000	0.83
L3	87.79-43.21	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	27.461	0.000	1.04
L4	43.21-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	26.617	0.000	1.01

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.00-123.29	A	1.728	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	20.086	0.000	0.77
L2	123.29-87.79	A	1.684	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	42.672	0.000	1.31
L3	87.79-43.21	A	1.605	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	53.092	0.000	1.63
L4	43.21-0.00	A	1.438	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	50.608	0.000	1.55

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.00-123.29	-0.3522	0.3911	-0.4577	0.5084
L2	123.29-87.79	-0.5064	0.5624	-0.6504	0.7223
L3	87.79-43.21	-0.5268	0.5851	-0.7237	0.8037
L4	43.21-0.00	-0.5415	0.6014	-0.7783	0.8644

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	11	HB114-1-0813U4-M5J(1-1/4)	123.29 - 140.00	1.0000	1.0000
L2	11	HB114-1-0813U4-M5J(1-1/4)	87.79 - 123.29	1.0000	1.0000
L3	11	HB114-1-0813U4-M5J(1-1/4)	43.21 - 87.79	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
800 10121	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.15 5.50 5.86	3.29 3.63 3.99	0.05 0.08 0.12
800 10121	B	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.15 5.50 5.86	3.29 3.63 3.99	0.05 0.08 0.12
800 10121	C	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	5.15 5.50 5.86	3.29 3.63 3.99	0.05 0.08 0.12
OPA-65R-LCUU-H6	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	5.52 5.97 6.43	0.07 0.13 0.20
OPA-65R-LCUU-H6	B	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	5.52 5.97 6.43	0.07 0.13 0.20
OPA-65R-LCUU-H6	C	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	5.52 5.97 6.43	0.07 0.13 0.20
DTMABP7819VG12A	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23	0.34 0.42 0.51	0.02 0.03 0.04
DTMABP7819VG12A	B	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23	0.34 0.42 0.51	0.02 0.03 0.04
DTMABP7819VG12A	C	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.98 1.10 1.23	0.34 0.42 0.51	0.02 0.03 0.04
LGP21401	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
LGP21401	B	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
LGP21401	C	From Leg	4.00	0.0000	150.00	No Ice	1.10	0.21	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2"	1.24	0.27	0.02
			1.00				Ice	1.38	0.35	0.03
							1" Ice			
RRUS A2 MODULE	A	From Leg	4.00		0.0000	150.00	No Ice	1.84	1.06	0.06
			0.00				1/2"	2.01	1.20	0.08
			1.00				Ice	2.19	1.34	0.09
							1" Ice			
RRUS A2 MODULE	B	From Leg	4.00		0.0000	150.00	No Ice	1.84	1.06	0.06
			0.00				1/2"	2.01	1.20	0.08
			1.00				Ice	2.19	1.34	0.09
							1" Ice			
RRUS A2 MODULE	C	From Leg	4.00		0.0000	150.00	No Ice	1.84	1.06	0.06
			0.00				1/2"	2.01	1.20	0.08
			1.00				Ice	2.19	1.34	0.09
							1" Ice			
RRUS 11	A	From Leg	4.00		0.0000	150.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	0.07
			1.00				Ice	3.21	1.49	0.09
							1" Ice			
RRUS 11	B	From Leg	4.00		0.0000	150.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	0.07
			1.00				Ice	3.21	1.49	0.09
							1" Ice			
RRUS 11	C	From Leg	4.00		0.0000	150.00	No Ice	2.78	1.19	0.05
			0.00				1/2"	2.99	1.33	0.07
			1.00				Ice	3.21	1.49	0.09
							1" Ice			
RRUS 12 W/O SOLAR SHIELD	A	From Leg	4.00		0.0000	150.00	No Ice	2.47	0.86	0.06
			0.00				1/2"	2.67	0.99	0.08
			1.00				Ice	2.87	1.13	0.10
							1" Ice			
RRUS 12 W/O SOLAR SHIELD	B	From Leg	4.00		0.0000	150.00	No Ice	2.47	0.86	0.06
			0.00				1/2"	2.67	0.99	0.08
			1.00				Ice	2.87	1.13	0.10
							1" Ice			
RRUS 12 W/O SOLAR SHIELD	C	From Leg	4.00		0.0000	150.00	No Ice	2.47	0.86	0.06
			0.00				1/2"	2.67	0.99	0.08
			1.00				Ice	2.87	1.13	0.10
							1" Ice			
DC6-48-60-18-8F	C	From Leg	4.00		0.0000	150.00	No Ice	0.79	0.79	0.02
			0.00				1/2"	1.27	1.27	0.04
			1.00				Ice	1.45	1.45	0.05
							1" Ice			
TPA-65R-LCUUUU-H8	A	From Leg	4.00		0.0000	150.00	No Ice	13.30	8.82	0.08
			0.00				1/2"	13.90	9.42	0.16
			1.00				Ice	14.50	10.03	0.25
							1" Ice			
TPA-65R-LCUUUU-H8	B	From Leg	4.00		0.0000	150.00	No Ice	13.30	8.82	0.08
			0.00				1/2"	13.90	9.42	0.16
			1.00				Ice	14.50	10.03	0.25
							1" Ice			
QS66512-2	C	From Leg	4.00		0.0000	150.00	No Ice	8.13	6.80	0.11
			0.00				1/2"	8.59	7.27	0.17
			1.00				Ice	9.05	7.72	0.23
							1" Ice			
RRUS 32	A	From Leg	4.00		0.0000	150.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.08	1.97	0.08
			1.00				Ice	3.32	2.17	0.10
							1" Ice			
RRUS 32	B	From Leg	4.00		0.0000	150.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.08	1.97	0.08
			1.00				Ice	3.32	2.17	0.10
							1" Ice			
RRUS 32	C	From Leg	4.00		0.0000	150.00	No Ice	2.86	1.78	0.06
			0.00				1/2"	3.08	1.97	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft ft	Azimuth Adjustment ∠ °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			1.00			Ice 1" Ice	3.32	2.17	0.10
(2) TPX-070821	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	0.01 0.01 0.02
(2) TPX-070821	B	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	0.01 0.01 0.02
(2) TPX-070821	C	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	0.01 0.01 0.02
DC6-48-60-18-8F	A	From Leg	4.00 0.00 1.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
Platform Mount [LP 1301-1]	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice	51.70 62.70 73.70	51.70 62.70 73.70	2.26 2.94 3.61
**									
HORIZON COMPACT	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.72 0.83 0.94	0.37 0.45 0.54	0.01 0.02 0.03
HORIZON COMPACT	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.72 0.83 0.94	0.37 0.45 0.54	0.01 0.02 0.03
(2) HORIZON COMPACT	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.72 0.83 0.94	0.37 0.45 0.54	0.01 0.02 0.03
TIMING 2000	C	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	0.11 0.15 0.20	0.11 0.15 0.20	0.00 0.00 0.01
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	12.51 13.11 13.67	7.41 8.60 9.50	0.10 0.19 0.29
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	12.51 13.11 13.67	7.41 8.60 9.50	0.10 0.19 0.29
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	12.51 13.11 13.67	7.41 8.60 9.50	0.10 0.19 0.29
(2) RRH2X50-800	A	From Leg	4.00 0.00	0.0000	140.00	No Ice 1/2"	1.70 1.86	1.28 1.43	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				Ice	2.03	1.58	0.09
							1" Ice			
(2) RRH2X50-800	B	From Leg	4.00	0.0000		140.00	No Ice	1.70	1.28	0.05
			0.00				1/2"	1.86	1.43	0.07
			0.00				Ice	2.03	1.58	0.09
							1" Ice			
(2) RRH2X50-800	C	From Leg	4.00	0.0000		140.00	No Ice	1.70	1.28	0.05
			0.00				1/2"	1.86	1.43	0.07
			0.00				Ice	2.03	1.58	0.09
							1" Ice			
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.00	0.0000		140.00	No Ice	2.32	2.24	0.06
			0.00				1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
							1" Ice			
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.00	0.0000		140.00	No Ice	2.32	2.24	0.06
			0.00				1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
							1" Ice			
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	4.00	0.0000		140.00	No Ice	2.32	2.24	0.06
			0.00				1/2"	2.53	2.44	0.08
			0.00				Ice	2.74	2.65	0.11
							1" Ice			
TD-RRH8X20-25	A	From Leg	4.00	0.0000		140.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice			
TD-RRH8X20-25	B	From Leg	4.00	0.0000		140.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice			
TD-RRH8X20-25	C	From Leg	4.00	0.0000		140.00	No Ice	4.05	1.53	0.07
			0.00				1/2"	4.30	1.71	0.10
			0.00				Ice	4.56	1.90	0.13
							1" Ice			
Platform Mount [LP 712-1]	C	None		0.0000		140.00	No Ice	24.53	24.53	1.34
							1/2"	29.94	29.94	1.65
							Ice	35.35	35.35	1.96
							1" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.00	0.0000		140.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice			
(2) 6' x 2" Mount Pipe	B	From Leg	4.00	0.0000		140.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice			
(2) 6' x 2" Mount Pipe	C	From Leg	4.00	0.0000		140.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice			
**										

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft^2	Weight K

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
VHLP2-11	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 2.00	0.0000		140.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
VHLP2-11	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 2.00	0.0000		140.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
VHLP2-11	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 2.00	0.0000		140.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07
VHLP2-11	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 2.00	0.0000		140.00	2.17	No Ice 1/2" Ice 1" Ice	3.72 4.01 4.30	0.03 0.05 0.07

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service

Comb. No.	Description
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 123.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.27	1.01	0.16
			Max. Mx	8	-7.53	-306.50	1.47
			Max. My	14	-7.48	1.28	-310.49
			Max. Vy	8	16.25	-306.50	1.47
			Max. Vx	14	16.43	1.28	-310.49
			Max. Torque	9			0.76
L2	123.29 - 87.79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.65	1.66	-0.46
			Max. Mx	8	-12.74	-911.31	6.45
			Max. My	14	-12.71	4.86	-921.60
			Max. Vy	8	18.84	-911.31	6.45
			Max. Vx	14	19.02	4.86	-921.60
			Max. Torque	9			0.70
L3	87.79 - 43.21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-41.55	2.56	-1.42
			Max. Mx	8	-22.35	-1807.00	12.58
			Max. My	14	-22.33	9.40	-1825.35
			Max. Vy	8	22.41	-1807.00	12.58
			Max. Vx	14	22.58	9.40	-1825.35
			Max. Torque	9			0.70
L4	43.21 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.03	3.68	-2.67
			Max. Mx	8	-37.64	-2992.68	19.20
			Max. My	14	-37.64	14.43	-3019.99
			Max. Vy	8	26.02	-2992.68	19.20
			Max. Vx	14	26.18	14.43	-3019.99
			Max. Torque	9			0.69

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	61.03	0.02	-7.51
	Max. H_x	21	28.25	25.89	-0.02
	Max. H_z	2	37.66	-0.19	26.07
	Max. M_x	2	3006.65	-0.19	26.07
	Max. M_z	8	2992.68	-25.99	0.14
	Max. Torsion	9	0.69	-25.99	0.14
	Min. Vert	19	28.25	22.35	-13.20
	Min. H_x	8	37.66	-25.99	0.14
	Min. H_z	14	37.66	0.09	-26.15
	Min. M_x	14	-3019.99	0.09	-26.15
	Min. M_z	20	-2980.16	25.89	-0.02
	Min. Torsion	21	-0.66	25.89	-0.02

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	31.39	0.00	0.00	0.74	1.02	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	37.66	0.19	-26.07	-3006.65	-26.36	-0.11
0.9 Dead+1.6 Wind 0 deg - No Ice	28.25	0.19	-26.07	-2969.34	-26.33	-0.11
1.2 Dead+1.6 Wind 30 deg - No Ice	37.66	13.02	-22.63	-2610.43	-1498.97	-0.32
0.9 Dead+1.6 Wind 30 deg - No Ice	28.25	13.02	-22.63	-2578.07	-1480.60	-0.32
1.2 Dead+1.6 Wind 60 deg - No Ice	37.66	22.46	-13.16	-1520.05	-2584.75	-0.57
0.9 Dead+1.6 Wind 60 deg - No Ice	28.25	22.46	-13.16	-1501.29	-2552.83	-0.57
1.2 Dead+1.6 Wind 90 deg - No Ice	37.66	25.99	-0.14	-19.20	-2992.68	-0.69
0.9 Dead+1.6 Wind 90 deg - No Ice	28.25	25.99	-0.14	-19.18	-2955.67	-0.69
1.2 Dead+1.6 Wind 120 deg - No Ice	37.66	22.47	13.05	1507.50	-2586.02	-0.33
0.9 Dead+1.6 Wind 120 deg - No Ice	28.25	22.47	13.05	1488.43	-2554.08	-0.34
1.2 Dead+1.6 Wind 150 deg - No Ice	37.66	12.87	22.71	2625.85	-1478.18	0.11
0.9 Dead+1.6 Wind 150 deg - No Ice	28.25	12.87	22.71	2592.82	-1460.07	0.11
1.2 Dead+1.6 Wind 180 deg - No Ice	37.66	-0.09	26.15	3019.99	14.43	0.23
0.9 Dead+1.6 Wind 180 deg - No Ice	28.25	-0.09	26.15	2982.06	13.92	0.22
1.2 Dead+1.6 Wind 210 deg - No Ice	37.66	-12.97	22.66	2616.92	1493.50	0.31
0.9 Dead+1.6 Wind 210 deg - No Ice	28.25	-12.97	22.66	2584.02	1474.56	0.30
1.2 Dead+1.6 Wind 240 deg - No Ice	37.66	-22.35	13.20	1528.74	2570.09	0.44
0.9 Dead+1.6 Wind 240 deg - No Ice	28.25	-22.35	13.20	1509.40	2537.74	0.44
1.2 Dead+1.6 Wind 270 deg - No Ice	37.66	-25.89	0.02	3.11	2980.16	0.66
0.9 Dead+1.6 Wind 270 deg - No Ice	28.25	-25.89	0.02	2.84	2942.67	0.66
1.2 Dead+1.6 Wind 300 deg - No Ice	37.66	-22.43	-13.03	-1502.21	2582.70	0.35
0.9 Dead+1.6 Wind 300 deg - No Ice	28.25	-22.43	-13.03	-1483.67	2550.16	0.35
1.2 Dead+1.6 Wind 330 deg - No Ice	37.66	-12.93	-22.57	-2601.93	1488.79	-0.07
0.9 Dead+1.6 Wind 330 deg - No Ice	28.25	-12.93	-22.57	-2569.68	1469.90	-0.06
1.2 Dead+1.0 Ice+1.0 Temp	61.03	-0.00	0.00	2.67	3.68	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	61.03	0.04	-7.49	-860.39	-2.97	-0.06
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	61.03	3.75	-6.50	-746.57	-427.81	-0.11
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	61.03	6.47	-3.77	-433.17	-740.39	-0.16
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	61.03	7.48	-0.03	-2.33	-856.93	-0.17
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	61.03	6.47	3.75	434.46	-740.10	-0.07
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	61.03	3.71	6.52	754.56	-422.16	0.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	61.03	-0.02	7.51	868.49	7.32	0.09
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	61.03	-3.74	6.51	753.12	433.62	0.11
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	61.03	-6.44	3.78	440.21	744.13	0.13
1.2 Dead+1.0 Wind 270	61.03	-7.46	0.01	3.81	861.13	0.16

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 300	61.03	-6.46	-3.74	-428.18	746.38	0.07
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 330	61.03	-3.72	-6.48	-744.08	431.57	-0.03
deg+1.0 Ice+1.0 Temp Dead+Wind 0 deg - Service	31.39	0.04	-5.58	-639.17	-4.81	-0.02
Dead+Wind 30 deg - Service	31.39	2.79	-4.84	-554.87	-318.15	-0.07
Dead+Wind 60 deg - Service	31.39	4.81	-2.82	-322.85	-549.17	-0.13
Dead+Wind 90 deg - Service	31.39	5.56	-0.03	-3.51	-635.95	-0.15
Dead+Wind 120 deg - Service	31.39	4.81	2.79	321.32	-549.43	-0.07
Dead+Wind 150 deg - Service	31.39	2.75	4.86	559.30	-313.73	0.03
Dead+Wind 180 deg - Service	31.39	-0.02	5.60	643.17	3.87	0.05
Dead+Wind 210 deg - Service	31.39	-2.77	4.85	557.40	318.58	0.07
Dead+Wind 240 deg - Service	31.39	-4.78	2.82	325.84	547.63	0.10
Dead+Wind 270 deg - Service	31.39	-5.54	0.00	1.23	634.87	0.14
Dead+Wind 300 deg - Service	31.39	-4.80	-2.79	-319.05	550.31	0.08
Dead+Wind 330 deg - Service	31.39	-2.77	-4.83	-553.05	317.57	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-31.39	0.00	0.00	31.39	0.00	0.000%
2	0.19	-37.66	-26.07	-0.19	37.66	26.07	0.000%
3	0.19	-28.25	-26.07	-0.19	28.25	26.07	0.000%
4	13.02	-37.66	-22.63	-13.02	37.66	22.63	0.000%
5	13.02	-28.25	-22.63	-13.02	28.25	22.63	0.000%
6	22.46	-37.66	-13.16	-22.46	37.66	13.16	0.000%
7	22.46	-28.25	-13.16	-22.46	28.25	13.16	0.000%
8	25.99	-37.66	-0.14	-25.99	37.66	0.14	0.000%
9	25.99	-28.25	-0.14	-25.99	28.25	0.14	0.000%
10	22.47	-37.66	13.05	-22.47	37.66	-13.05	0.000%
11	22.47	-28.25	13.05	-22.47	28.25	-13.05	0.000%
12	12.87	-37.66	22.71	-12.87	37.66	-22.71	0.000%
13	12.87	-28.25	22.71	-12.87	28.25	-22.71	0.000%
14	-0.09	-37.66	26.15	0.09	37.66	-26.15	0.000%
15	-0.09	-28.25	26.15	0.09	28.25	-26.15	0.000%
16	-12.97	-37.66	22.66	12.97	37.66	-22.66	0.000%
17	-12.97	-28.25	22.66	12.97	28.25	-22.66	0.000%
18	-22.35	-37.66	13.20	22.35	37.66	-13.20	0.000%
19	-22.35	-28.25	13.20	22.35	28.25	-13.20	0.000%
20	-25.89	-37.66	0.02	25.89	37.66	-0.02	0.000%
21	-25.89	-28.25	0.02	25.89	28.25	-0.02	0.000%
22	-22.43	-37.66	-13.03	22.43	37.66	13.03	0.000%
23	-22.43	-28.25	-13.03	22.43	28.25	13.03	0.000%
24	-12.93	-37.66	-22.57	12.93	37.66	22.57	0.000%
25	-12.93	-28.25	-22.57	12.93	28.25	22.57	0.000%
26	0.00	-61.03	0.00	0.00	61.03	-0.00	0.000%
27	0.04	-61.03	-7.49	-0.04	61.03	7.49	0.000%
28	3.75	-61.03	-6.50	-3.75	61.03	6.50	0.000%
29	6.47	-61.03	-3.77	-6.47	61.03	3.77	0.000%
30	7.48	-61.03	-0.03	-7.48	61.03	0.03	0.000%
31	6.47	-61.03	3.75	-6.47	61.03	-3.75	0.000%
32	3.71	-61.03	6.52	-3.71	61.03	-6.52	0.000%
33	-0.02	-61.03	7.51	0.02	61.03	-7.51	0.000%
34	-3.74	-61.03	6.51	3.74	61.03	-6.51	0.000%
35	-6.44	-61.03	3.78	6.44	61.03	-3.78	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
36	-7.46	-61.03	0.01	7.46	61.03	-0.01	0.000%
37	-6.46	-61.03	-3.74	6.46	61.03	3.74	0.000%
38	-3.72	-61.03	-6.48	3.72	61.03	6.48	0.000%
39	0.04	-31.39	-5.58	-0.04	31.39	5.58	0.000%
40	2.79	-31.39	-4.84	-2.79	31.39	4.84	0.000%
41	4.81	-31.39	-2.82	-4.81	31.39	2.82	0.000%
42	5.56	-31.39	-0.03	-5.56	31.39	0.03	0.000%
43	4.81	-31.39	2.79	-4.81	31.39	-2.79	0.000%
44	2.75	-31.39	4.86	-2.75	31.39	-4.86	0.000%
45	-0.02	-31.39	5.60	0.02	31.39	-5.60	0.000%
46	-2.77	-31.39	4.85	2.77	31.39	-4.85	0.000%
47	-4.78	-31.39	2.82	4.78	31.39	-2.82	0.000%
48	-5.54	-31.39	0.00	5.54	31.39	-0.00	0.000%
49	-4.80	-31.39	-2.79	4.80	31.39	2.79	0.000%
50	-2.77	-31.39	-4.83	2.77	31.39	4.83	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00009773
3	Yes	5	0.00000001	0.00004116
4	Yes	6	0.00000001	0.00022024
5	Yes	6	0.00000001	0.00005941
6	Yes	6	0.00000001	0.00022476
7	Yes	6	0.00000001	0.00006088
8	Yes	5	0.00000001	0.00017729
9	Yes	5	0.00000001	0.00007501
10	Yes	6	0.00000001	0.00021938
11	Yes	6	0.00000001	0.00005917
12	Yes	6	0.00000001	0.00022099
13	Yes	6	0.00000001	0.00005982
14	Yes	5	0.00000001	0.00009182
15	Yes	5	0.00000001	0.00003694
16	Yes	6	0.00000001	0.00022367
17	Yes	6	0.00000001	0.00006057
18	Yes	6	0.00000001	0.00021954
19	Yes	6	0.00000001	0.00005905
20	Yes	5	0.00000001	0.00008401
21	Yes	4	0.00000001	0.00099689
22	Yes	6	0.00000001	0.00022286
23	Yes	6	0.00000001	0.00006050
24	Yes	6	0.00000001	0.00022134
25	Yes	6	0.00000001	0.00005998
26	Yes	4	0.00000001	0.00003693
27	Yes	5	0.00000001	0.00080156
28	Yes	6	0.00000001	0.00023545
29	Yes	6	0.00000001	0.00023982
30	Yes	5	0.00000001	0.00079890
31	Yes	6	0.00000001	0.00023601
32	Yes	6	0.00000001	0.00023568
33	Yes	5	0.00000001	0.00080969
34	Yes	6	0.00000001	0.00024457
35	Yes	6	0.00000001	0.00024091
36	Yes	5	0.00000001	0.00080319
37	Yes	6	0.00000001	0.00023957
38	Yes	6	0.00000001	0.00023978
39	Yes	4	0.00000001	0.00007705
40	Yes	5	0.00000001	0.00006842
41	Yes	5	0.00000001	0.00007226
42	Yes	4	0.00000001	0.00015143
43	Yes	5	0.00000001	0.00006804
44	Yes	5	0.00000001	0.00006916
45	Yes	4	0.00000001	0.00009521

46	Yes	5	0.00000001	0.00007200
47	Yes	5	0.00000001	0.00006876
48	Yes	4	0.00000001	0.00012682
49	Yes	5	0.00000001	0.00007100
50	Yes	5	0.00000001	0.00006980

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.29	27.749	45	1.9140	0.0032
L2	126.71 - 87.79	18.951	45	1.6069	0.0014
L3	92.21 - 43.21	9.270	45	1.0424	0.0006
L4	48.79 - 0	2.390	45	0.4627	0.0002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	800 10121	45	27.749	1.9140	0.0035	13493
142.00	VHLP2-11	45	24.613	1.8141	0.0028	8433
140.00	HORIZON COMPACT	45	23.840	1.7886	0.0026	6746

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 123.29	130.126	14	8.9887	0.0142
L2	126.71 - 87.79	88.946	14	7.5498	0.0063
L3	92.21 - 43.21	43.540	14	4.8994	0.0025
L4	48.79 - 0	11.227	14	2.1742	0.0008

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	800 10121	14	130.126	8.9887	0.0170	3000
142.00	VHLP2-11	14	115.452	8.5211	0.0131	1874
140.00	HORIZON COMPACT	14	111.834	8.4016	0.0121	1498

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 123.29 (1)	TP23.17x17x0.1875	26.71	0.00	0.0	13.207 3	-7.48	936.21	0.008
L2	123.29 - 87.79 (2)	TP30.86x22.005x0.3125	38.92	0.00	0.0	29.301 8	-12.71	2176.98	0.006
L3	87.79 - 43.21 (3)	TP40.4x29.2294x0.375	49.00	0.00	0.0	46.125 7	-22.33	3398.73	0.007
L4	43.21 - 0 (4)	TP49.5x38.3779x0.4375	48.79	0.00	0.0	68.129 4	-37.64	4908.34	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 123.29 (1)	TP23.17x17x0.1875	310.49	426.99	0.727	0.00	426.99	0.000
L2	123.29 - 87.79 (2)	TP30.86x22.005x0.3125	921.62	1318.91	0.699	0.00	1318.91	0.000
L3	87.79 - 43.21 (3)	TP40.4x29.2294x0.375	1825.38	2703.53	0.675	0.00	2703.53	0.000
L4	43.21 - 0 (4)	TP49.5x38.3779x0.4375	3020.03	4946.76	0.611	0.00	4946.76	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 123.29 (1)	TP23.17x17x0.1875	16.43	468.11	0.035	0.23	855.02	0.000
L2	123.29 - 87.79 (2)	TP30.86x22.005x0.3125	19.02	1088.49	0.017	0.23	2641.04	0.000
L3	87.79 - 43.21 (3)	TP40.4x29.2294x0.375	22.58	1699.36	0.013	0.23	5413.67	0.000
L4	43.21 - 0 (4)	TP49.5x38.3779x0.4375	26.18	2454.17	0.011	0.23	9905.58	0.000

Pole Interaction Design Data

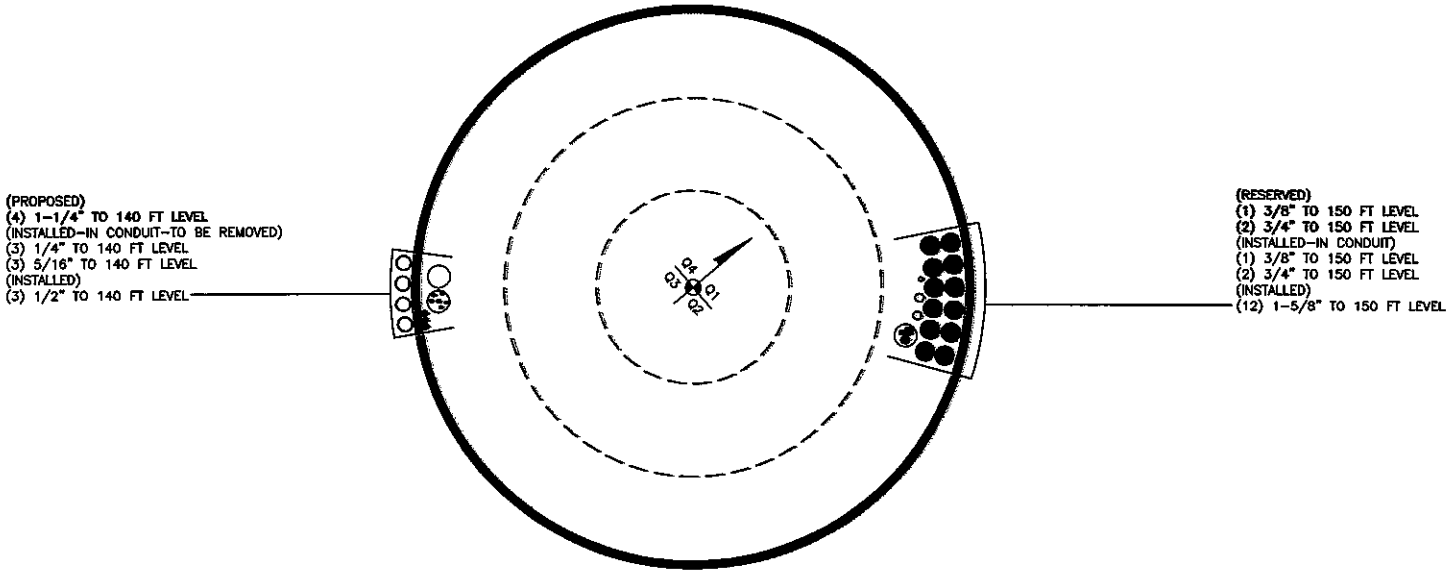
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 123.29 (1)	0.008	0.727	0.000	0.035	0.000	0.736	1.000	4.8.2
L2	123.29 - 87.79 (2)	0.006	0.699	0.000	0.017	0.000	0.705	1.000	4.8.2
L3	87.79 - 43.21 (3)	0.007	0.675	0.000	0.013	0.000	0.682	1.000	4.8.2
L4	43.21 - 0 (4)	0.008	0.611	0.000	0.011	0.000	0.618	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 123.29	Pole	TP23.17x17x0.1875	1	-7.48	936.21	73.6	Pass
L2	123.29 - 87.79	Pole	TP30.86x22.005x0.3125	2	-12.71	2176.98	70.5	Pass
L3	87.79 - 43.21	Pole	TP40.4x29.2294x0.375	3	-22.33	3398.73	68.2	Pass
L4	43.21 - 0	Pole	TP49.5x38.3779x0.4375	4	-37.64	4908.34	61.8	Pass
							Summary	
						Pole (L1)	73.6	Pass
						RATING =	**73.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 881534 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *881534*
Site Name: *WATERBURY TOWER*
App #: *436930 Rev. 0*

Pole Manufacturer:	*Other*

Reactions		
Mu:	3020	ft-kips
Axial, Pu:	38	kips
Shear, Vu:	26	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	58	in

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

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ń):	161.8 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	62.2% **Pass**	

Plate Data		
Diam:	64	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	9.82	in

Base Plate Results Flexural Check

		Rigid
Base Plate Stress:	42.1 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	78.0% **Pass**	Y.L. Length: 30.23

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

n/a

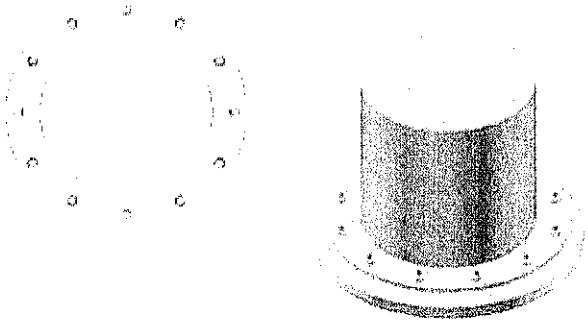
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a

Pole Data		
Diam:	49.5	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None



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

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

Anchor Rods - Shear, Axial and Bending Interaction Check

TIA-222-G Section 4.9.9

Description:

Applies to detail type (d) anchors when the clear distance from the top of the concrete to the bottom leveling nut exceeds 1.0 times the diameter of the anchor rod.

Assumptions:

1. *The tower is a monopole.*
2. *The anchor rods are evenly spaced in a circular pattern.*

1. INPUTS

Tower Reactions (from tnxTower)

Base Moment:	$M := 3020kip \cdot ft$
Axial Force:	$P := 37kip$
Base Shear:	$V := 26kip$

Anchor Rods Properties

Number of Anchors:	$N := 16$
Bolt Circle Diameter:	$BC := 58in$
Yield Strength of Rods:	$F_y := 75ksi$
Ultimate Strength of Rods:	$F_{ub} := 100ksi$
Distance from Bottom Nut to Concrete:	$l_{ar} := 3 \cdot in$
Rod Diameter:	2-1/4"
Per photos, are the bolts threaded at the top of the concrete?:	○ Not Threaded [Section 4.9.6.3(a) applies] ◉ Threaded [Section 4.9.6.3(b) applies]
Gross Area:	$A_b := \frac{1}{4} \cdot \pi \cdot d^2 = 3.98 \cdot in^2$
Net Area:	$A_n = 3.25 \cdot in^2$
Moment of Inertia of Group:	$I := \frac{1}{8} \cdot N \cdot A_n \cdot BC^2 = 21866 \cdot in^4$

2. CALCULATIONS

Shear Force per Anchor

$$V_u := \frac{V}{N} = 1.63 \cdot kip$$

Maximum Axial Force per Anchor

$$P_u := \frac{M \cdot (0.5 \cdot BC)}{I} \cdot A_n + \frac{P}{N} = 158.52 \cdot kip$$

Bending Moment (due to Shear) [TIA-222-G Section 4.9.9]

$$M_u := 0.65 \cdot l_{ar} \cdot V_u = 3.17 \cdot kip \cdot in$$

Shear Strength [TIA-222-G Section 4.9.6.3]

Thread Factor: $t_h = 0.45$

Strength: $\phi R_{nv} := 0.75 \cdot (t_h) \cdot F_{ub} \cdot A_b = 134.19 \cdot kip$

Tensile Strength [TIA-222-G Section 4.9.6.1]

$$\phi R_{nt} := 0.8 \cdot F_{ub} \cdot A_n = 260 \cdot kip$$

Flexural Strength [TIA-222-G Section 4.7.1]

Per Section 4.9.9, calculate "Z" based on the tensile root diameter of the rod:

Tensile Root Diameter: (back-calculated) $d_{tr} := \sqrt{\frac{4 \cdot A_n}{\pi}} = 2.03 \cdot in$

Plastic Modulus: $Z := \frac{1}{6} \cdot d_{tr}^{\ 3} = 1.4 \cdot in^3$

Strength: $\phi R_{nm} := 0.9 \cdot F_y \cdot Z = 94.7 \cdot kip \cdot in$

Capacity Check [TIA-222-G Section 4.9.9]

Interaction Equation: $Capacity := \left(\frac{V_u}{\phi R_{nv}}\right)^2 + \left[\left(\frac{P_u}{\phi R_{nt}}\right) + \left(\frac{M_u}{\phi R_{nm}}\right)\right]^2$

Capacity = 74.4%

Check = "Okay"

SUMMARY

1. Inputs

1.1 Tower Reactions

Base Moment:	$M = 3020 \cdot kip \cdot ft$
Axial Shear:	$P = 37 \cdot kip$
Base Shear:	$V = 26 \cdot kip$

1.2 Anchor Rods Properties

Number of Anchors:	$N = 16$
Rod Diameter:	$d = 2.25 \cdot in$
Yield Strength:	$F_y = 75 \cdot ksi$

2. Calculations

Shear Force per Anchor:	$V_u = 1.63 \cdot kip$
Axial Force per Anchor:	$P_u = 158.52 \cdot kip$
Bending Moment per Anchor:	$M_u = 3.17 \cdot kip \cdot in$
Shear Strength:	$\phi R_{nv} = 134.19 \cdot kip$
Tensile Strength:	$\phi R_{nt} = 260 \cdot kip$
Flexural Strength:	$\phi R_{nm} = 94.7 \cdot kip \cdot in$
Capacity:	Capacity = 41.38%
Capacity Check:	Check = "Okay"

Pier and Pad Foundation

BU # :	881534
Site Name:	WATERBURY TOV
App. Number:	436930 Rev. 0

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	38	kips
Base Shear, Vu_comp:	26	kips
Moment, M_u:	3020	ft-kips
Tower Height, H:	150	ft
BP Dist. Above Fdn, bp_{dist}:	5.25	in

Pier Properties		
Pier Shape:	Square	
Pier Diameter, dpier:	6.5	ft
Ext. Above Grade, E:	1.00	ft
Pier Rebar Size, Sc:	8	
Pier Rebar Quantity, mc:	36	
Pier Tie/Spiral Size, St:	5	
Pier Tie/Spiral Quantity, mt:	4	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties		
Depth, D:	8.0	ft
Pad Width, W:	25.0	ft
Pad Thickness, T:	4.5	ft
Pad Rebar Size, Sp:	7	
Pad Rebar Quantity, mp:	50	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, Fy:	60000	psi
Concrete Compressive Strength, F'c:	3000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	125	pcf
Ultimate Gross Bearing, Qult:	8.000	ksf
Cohesion, Cu:	0.000	ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, N_{blows}:	63	
Base Friction, μ:	0.6	
Neglected Depth, N:	3.50	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, gw:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	513.00	26.00	**5.1%**	**Pass**
Bearing Pressure (ksf)	6.00	2.29	**38.2%**	**Pass**
*Overturning (kip*ft)*	7235.50	3265.38	**45.1%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	4133.00	3137.00	**75.9%**	**Pass**
Pier Compression (kip)	20168.46	72.22	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	6548.99	1095.92	**16.7%**	**Pass**
Pad Shear - 1-way (kips)	1224.67	137.66	**11.2%**	**Pass**
Pad Shear - 2-way (ksi)	0.16	0.02	**9.8%**	**Pass**

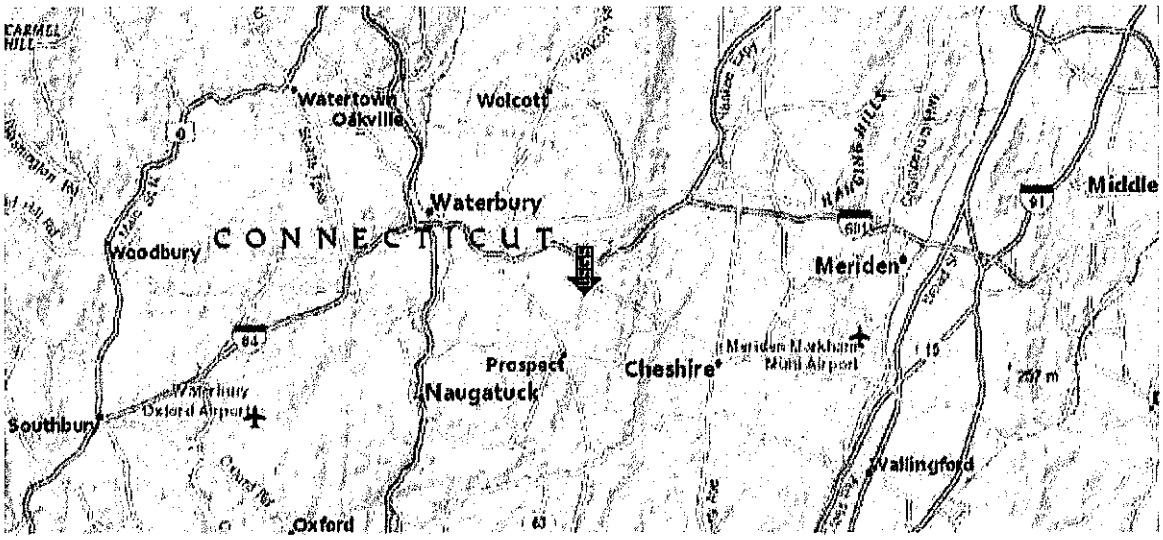
Soil Rating:	**45.1%**
Structural Rating:	**75.9%**

Version 2.5.5

USGS Design Maps Summary Report

User-Specified Input

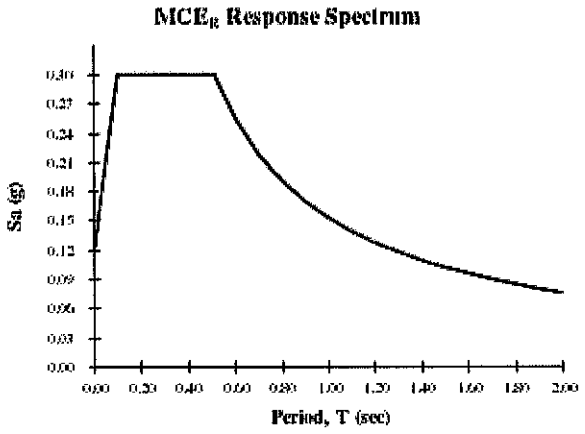
Report Title	881534 Wed April 25, 2018 13:15:53 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.53433°N, 72.969°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

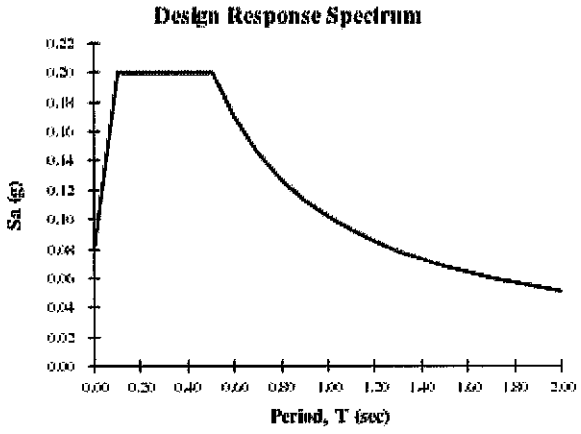


USGS-Provided Output

S_S =	0.187 g	S_{MS} =	0.300 g	S_{DS} =	0.200 g
S_1 =	0.064 g	S_{M1} =	0.153 g	S_{D1} =	0.102 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU:	881534
Work Order:	1560796
Application:	436930 Rev. 0

	Degrees	Minutes	Seconds		
Site Latitude =	41	32	3.59	41.5343	degrees
Site Longitude =	-72	58	8.39	-72.9690	degrees
Ground Supported Structure =	Yes				
Structure Class =	II			*(Table 2-1)*	
Site Class =	D - Stiff Soil			*(Table 2-11)*	

Spectral response acceleration short periods, S_S =	0.189	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.064	

Importance Factor, I =	1.0	*(Table 2-3)*
Acceleration-based site coefficient, F_a =	1.6	*(Table 2-12)*
Velocity-based site coefficient, F_v =	2.4	*(Table 2-13)*

Design spectral response acceleration short period, S_{DS} =	0.202	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.102	*(2.7.6)*

Seismic Design Category - Short Period Response =	B	*ASCE 7-05 Table 11.6-1*
Seismic Design Category - 1s Period Response =	B	*ASCE 7-05 Table 11.6-2*

Worst Case Seismic Design Category =	B	*ASCE 7-05 Tables 11.6-1 and 6-2*

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

SPRINT Existing Facility

Site ID: CT52XC061

Waterbury Tower
670 Captain Neville Drive
Waterbury, CT 06705

June 21, 2018

EBI Project Number: 6218004577

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**4.70 %**

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

EBI Consulting

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June 21, 2018

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

Emissions Analysis for Site: **CT52XC061 – Waterbury Tower**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **670 Captain Neville Drive, Waterbury, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **670 Captain Neville Drive, Waterbury, 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 and 20 dB for parabolic microwave dishes, 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) 1 microwave backhaul (11 GHz) channel was considered for Sectors A & B and 2 microwave backhaul (11 GHz) channels were considered for Sector C. These channels have a transmit power of 1 Watt per Channel.

7) 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.

8) 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 and 20 dB for parabolic microwave dishes, 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.

9) 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 and the **Commscope VHLP2-11** microwave dish for the proposed 11 GHz microwave backhaul. 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 and 20 dB for parabolic microwave dishes, 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.

10) The antenna mounting height centerlines of the proposed panel antennas and microwave dishes are **140 feet** above ground level (AGL) for **Sector A, 140 feet** above ground level (AGL) for **Sector B** and **140 feet** above ground level (AGL) for Sector C.

11) 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.

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SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #	1	Antenna #	1	Antenna #	1
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):	**140 feet**	Height (AGL):	**140 feet**	Height (AGL):	**140 feet**
Frequency Bands:	850 MHz / 1900 MHz (PCS)	Frequency Bands:	850 MHz / 1900 MHz (PCS)	Frequency Bands:	850 MHz / 1900 MHz (PCS)
Channel Count:	10	Channel Count:	10	Channel Count:	10
Total TX Power(W):	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%:	**1.83 %**	Antenna B1 MPE%:	**1.83 %**	Antenna C1 MPE%:	**1.83 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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):	**140 feet**	Height (AGL):	**140 feet**	Height (AGL):	**140 feet**
Frequency Bands:	2500 MHz (BRS)	Frequency Bands:	2500 MHz (BRS)	Frequency Bands:	2500 MHz (BRS)
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%:	**1.25 %**	Antenna B2 MPE%:	**1.25 %**	Antenna C2 MPE%:	**1.25 %**

Microwave Backhaul Data

Antenna Type:	Gain (dBd)	Height (feet AGL):	Frequency Bands	Channel Count	Total TX Power(W)	ERP (W)	MPE %	Sector
Commscope VHLP2-11	32.35 dBd	140	11 GHz	1	1	1,717.91	**0.03**	A
Commscope VHLP2-11	32.35 dBd	140	11 GHz	1	1	1,717.91	**0.03**	B
Commscope VHLP2-11	32.35 dBd	140	11 GHz	1	1	1,717.91	**0.03**	C
Commscope VHLP2-11	32.35 dBd	140	11 GHz	1	1	1,717.91	**0.03**	C

Site Composite MPE%	
Carrier	MPE%
SPRINT - Sector C	3.14 %
AT&T	1.27 %
Clearwire	0.06 %
Clearwire MW	0.13 %
XM Satellite Radio	0.10 %
Site Total MPE %:	**4.70 %**

SPRINT Sector A Total:	3.10 %
SPRINT Sector B Total:	3.10 %
SPRINT Sector C Total:	3.14 %
Site Total:	4.70 %

SPRINT - Frequency Band / Technology Max Power Values (Sector C)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	376.73	140	0.75	850 MHz	567	0.14%
Sprint 850 MHz LTE	2	941.82	140	3.77	850 MHz	567	0.67%
Sprint 1900 MHz (PCS) CDMA	5	511.82	140	5.12	1900 MHz (PCS)	1000	0.51%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	140	5.12	1900 MHz (PCS)	1000	0.51%
Sprint 2500 MHz (BRS) LTE	8	778.09	140	12.46	2500 MHz (BRS)	1000	1.25%
Sprint 11 GHz Microwave	1	1,717.91	140	0.34	11 GHz	1000	0.03%
Sprint 11 GHz Microwave	1	1,717.91	140	0.34	11 GHz	1000	0.03%
						Total:	**3.14%**

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:	3.10 %
Sector B:	3.10 %
Sector C:	3.14 %
SPRINT Maximum Total (per sector):	3.14 %
Site Total:	4.70 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.70 %** 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.

Zsamba, Anne Marie (Contractor)

From: TrackingUpdates@fedex.com
Sent: Friday, June 29, 2018 10:24 AM
To: Zsamba, Anne Marie (Contractor)
Subject: FedEx Shipment 772588620432 Delivered

Your package has been delivered

Tracking # 772588620432

Ship date:
Thu, 6/28/2018

Rebecca Alescio
Crown Castle
Clifton Park, NY 12065
US

Delivered

Delivery date:
Fri, 6/29/2018 10:14 am

Mr. James A. Sequin, City Planner
Crown Castle
185 South Main Street, 5th Floor
WATERBURY, CT 06706
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772588620432
Status:	Delivered: 06/29/2018 10:14 AM Signed for By: D.FARRELL
Reference:	1734.7680
Signed for by:	D.FARRELL
Delivery location:	WATERBURY, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight
Packaging type:	FedEx Pak
Number of pieces:	1
Weight:	2.00 lb.
Special handling/Services:	Adult Signature Required Deliver Weekday
Standard transit:	6/29/2018 by 10:30 am

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 9:24 AM CDT on 06/29/2018.

Zsamba, Anne Marie (Contractor)

From: TrackingUpdates@fedex.com
Sent: Friday, June 29, 2018 10:49 AM
To: Zsamba, Anne Marie (Contractor)
Subject: FedEx Shipment 772588601047 Delivered

Your package has been delivered

Tracking # 772588601047

Ship date:
Thu, 6/28/2018

Rebecca Alescio
Crown Castle
Clifton Park, NY 12065
US

Delivered

Delivery date:
Fri, 6/29/2018 10:47 am

The Honorable Neil. M. O'Leary
Crown Castle
235 Grand Street, 2nd Floor
City Of Waterbury - City Hall
WATERBURY, CT 06702
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772588601047
Status:	Delivered: 06/29/2018 10:47 AM Signed for By: M.ACETO
Reference:	1734.7680
Signed for by:	M.ACETO
Delivery location:	WATERBURY, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight
Packaging type:	FedEx Pak
Number of pieces:	1
Weight:	2.00 lb.
Special handling/Services:	Adult Signature Required Deliver Weekday
Standard transit:	6/29/2018 by 10:30 am

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 9:49 AM CDT on 06/29/2018.

All weights are estimated.