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

September 5, 2017

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: 876338**
Sprint PCS Site ID: CT03XC105
41 (a/k/a 43) Manitock Hill Road, Waterford, CT 06385
Latitude: 41° 21' 16.7"/ Longitude: -72° 9' 1.6"

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 137-foot level of the existing 136-foot self-support tower at 41 (aka 43) Manitock Hill Road in Waterford, Connecticut. The tower is owned by Crown Castle. The property is owned by the City of New London. Scprint intends to install (3) antennas and (3) RRUs with (1) hybrid cable.

This facility was approved by the Town of Waterford Planning & Zoning Commission on September 29, 1997.

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 The Honorable Daniel M. Steward, the First Selectman of the Town of Waterford, the Town Planning Director, Abby Piersall, AICP, and to the land owner the City of New London. Crown Castle is the tower owner.

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

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

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

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

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

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

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

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

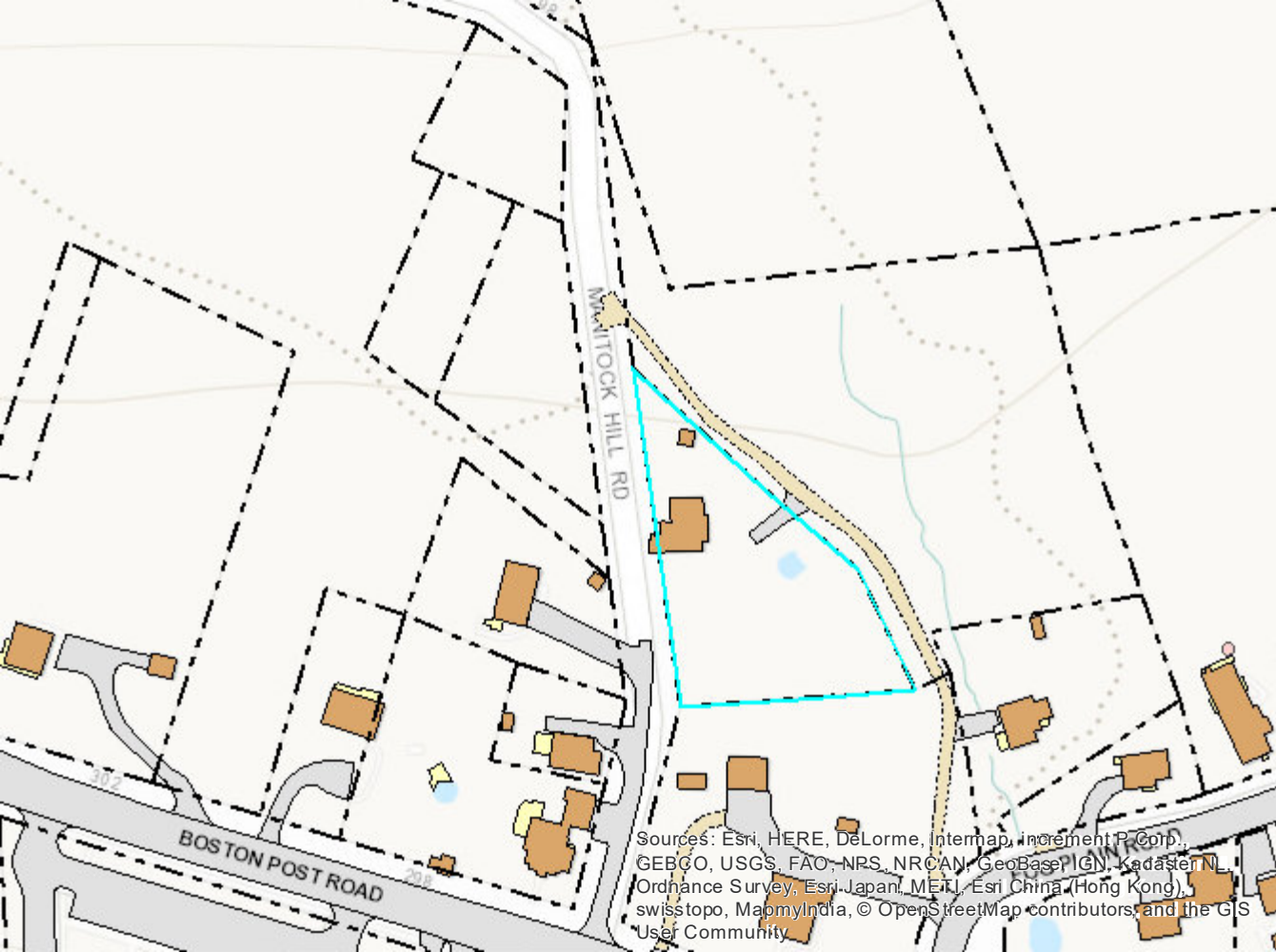
Attachments:

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

cc: Daniel M. Steward, First Selectman
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

Abby Piersall, AICP, Planning Director
Town of Waterford
Town of Madison
15 Rope Ferry Road
Waterford, CT 06385

City of New London
Attn: Donald E. Gray, Jr. Director of Finance
181 State Street
New London, CT 06320


MANITOCK HILL RD
BOSTON POST ROAD
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

41 MANITOCK HILL ROAD

Location	41 MANITOCK HILL ROAD	**Mblu**	117/ / 4376/ /
Acct#	00395800	**Assessment**	$851,550
Appraisal	$1,216,500	**PID**	4376
Building Count	1		

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$1,216,500	$0	$1,216,500

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2013	$851,550	$0	$851,550

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	

Building Photo

(http://images.vgsi.com/photos/WaterfordCTPhotos//default.jp

Building Layout

Building

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

AC Percent	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Num Kitchens	
Fireplace(s)	
Extra Opening(s)	
Gas Fireplace(s)	
% Attic Fin	
LF Dormer	
Foundation	
Bsmt Gar(s)	
Bsmt %	
SF FBM	
Fin Bsmt Qual	
Bsmt Access	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	929
Description	Exempt Comm Vac OB
Zone	R-40
Neighborhood	600
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0
Frontage	0
Depth	0
Assessed Value	$0
Appraised Value	$0

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	Shed	MT	Metal	200 S.F.	$1,500	1
LSUM	Lump Sum			1620000 UNITS	$1,215,000	1

Valuation History

Appraisal

Valuation Year	Improvements	Land	Total
2013	$1,216,500	$0	$1,216,500
2010	$0	$0	$1,217,514
2009	$0	$0	$1,217,514

Assessment			
Valuation Year	Improvements	Land	Total
2013	$851,550	$0	$851,550
2010	$0	$0	$852,260
2009	$0	$0	$852,260

VOL. 496 PAGE 0358

TOWN OF WATERFORD
PLANNING & ZONING COMMISSION

NOTICE OF GRANT OF A SPECIAL PERMIT

This is to certify that on September 29, 1997 the Waterford Planning & Zoning Commission granted Special Permit #97-112/304.

Owner of Record: City of New London

Address: 41 Manitock Hill Road

Description of Premises:

As recorded in Volume 173, Page 256 of the Waterford Land Records.

Nature of Special Permit: Special Permit granted for the construction of a 140 foot lattice design communications tower by Sprint. Co-location for additional carriers is provided for on this tower.

Applicable Zoning Regulations: Section 3.6, 5.2.1, 5.2.3 and 23.

Permit findings, stipulations and conditions are filed in the office of the Town Clerk as stated in the minutes of the Planning & Zoning Commission meeting of September 29, 1997.

PLANNING & ZONING COMMISSION

By: Pam Hagerman
Pamela Hagerman
Recording Secretary
Planning & Zoning Commission

This notice is to be recorded on the land records of the Town of Waterford, indexed in the Grantor's Index under the name of the record owner.

RECEIVED FOR RECORD March 16, 1999
4:02 P M. ATTEST
TOWN CLERK

Sprint

CROWN CASTLE

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	WATERFORD
SITE CASCADE:	CT03XC105
SITE NUMBER:	876338
SITE ADDRESS:	41 MANITOCK HILL RD WATERFORD, CT 06385
SITE TYPE:	SELF SUPPORT TOWER
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

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

LATITUDE (NAD83):
41° 21' 16.42" N
41.354561°

LONGITUDE (NAD83):
72° 9' 3.38" W
-72.150939°

COUNTY:
NEW LONDON

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

ZONING DISTRICT:
R-40

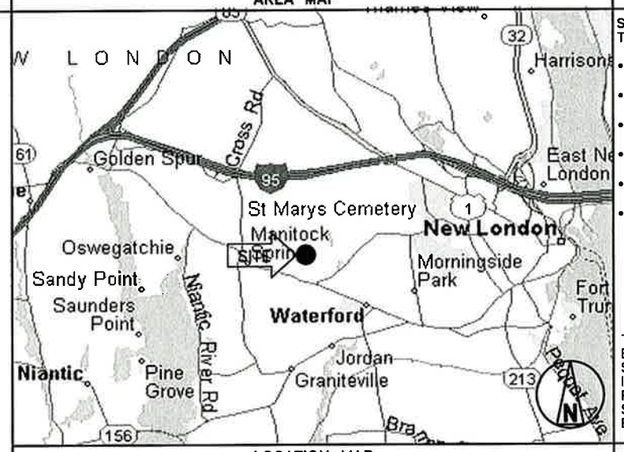
POWER COMPANY:
CL&P
(860) 947-2000

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

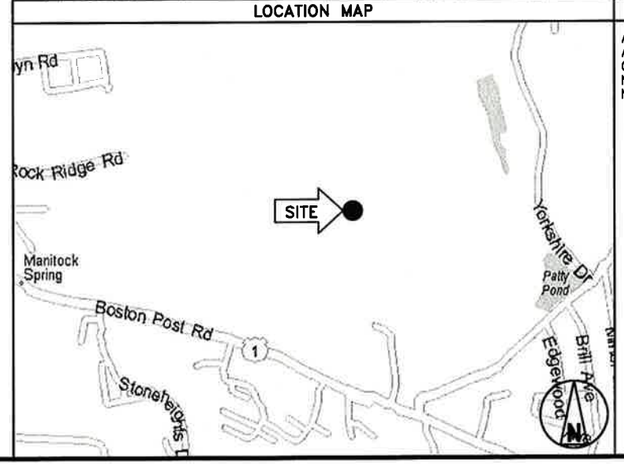
SPRINT CM:
PETER CULBERT
(603) 203-6446
(603) 969-0686
PETER.CULBERT@SPRINT.COM

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

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

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

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

APPLICABLE CODES

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

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

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

DRAWING INDEX

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

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

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

MLA PARTNER:
CROWN CASTLE

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:
WATERFORD

SITE CASCADE:
CT03XC105

SITE ADDRESS:
41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:
TITLE SHEET
& PROJECT DATA

SHEET NUMBER:
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

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

B. COMPANY: SPRINT CORPORATION

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

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

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

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.

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

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

5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED

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

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

WATERFORD

SITE CASCADE:

CT03XC105

SITE ADDRESS:

41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

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

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

1.4 TESTS AND INSPECTIONS:

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

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

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

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

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

3.2 REQUIRED TESTS:

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

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

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

PLANS PREPARED FOR:

Sprint

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PLANS PREPARED BY:

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SPRINT SPECIFICATIONS

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SP-2

CONTINUE FROM SP-2

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

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

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

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

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

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

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

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

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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CT03XC105

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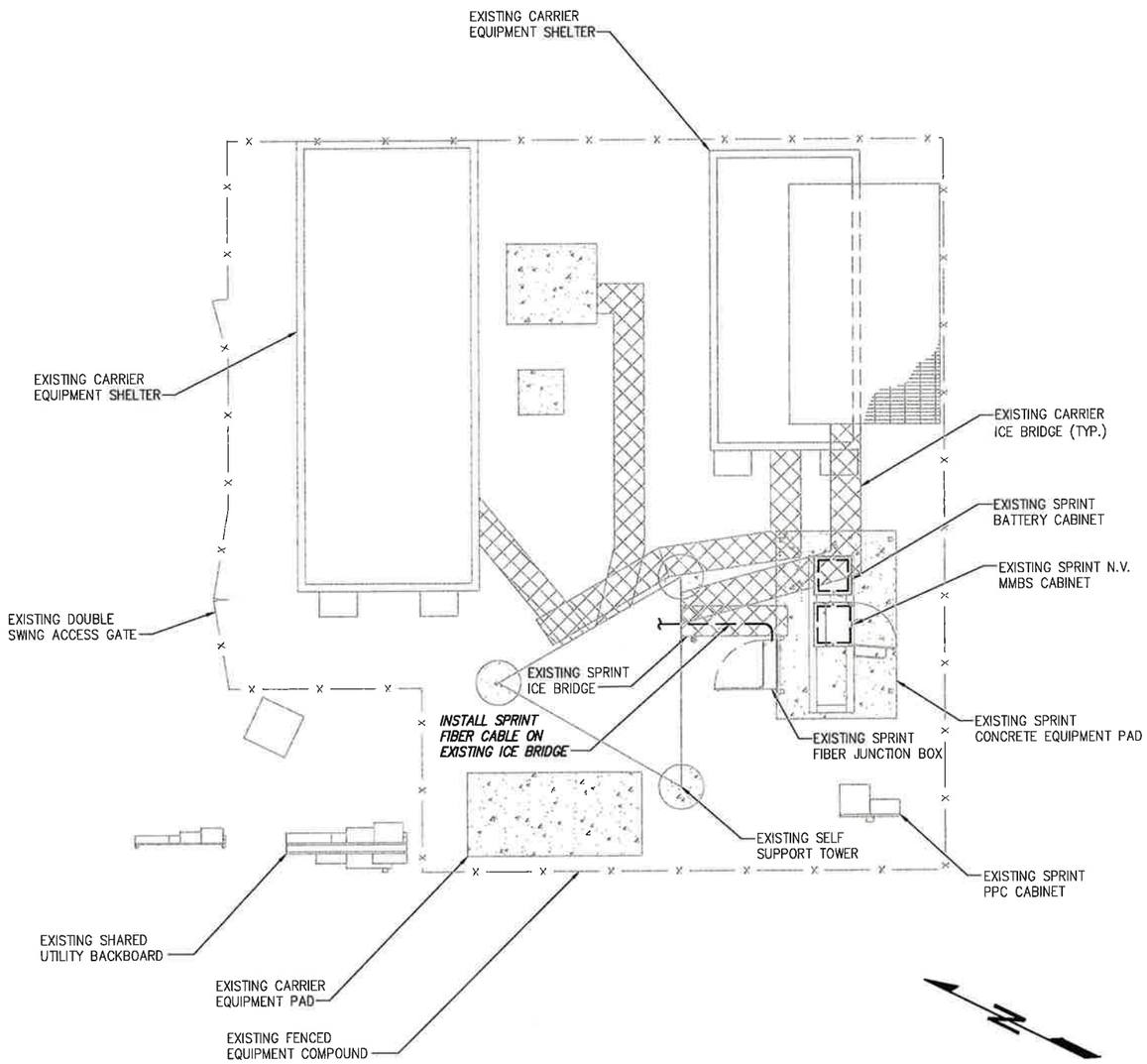
SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

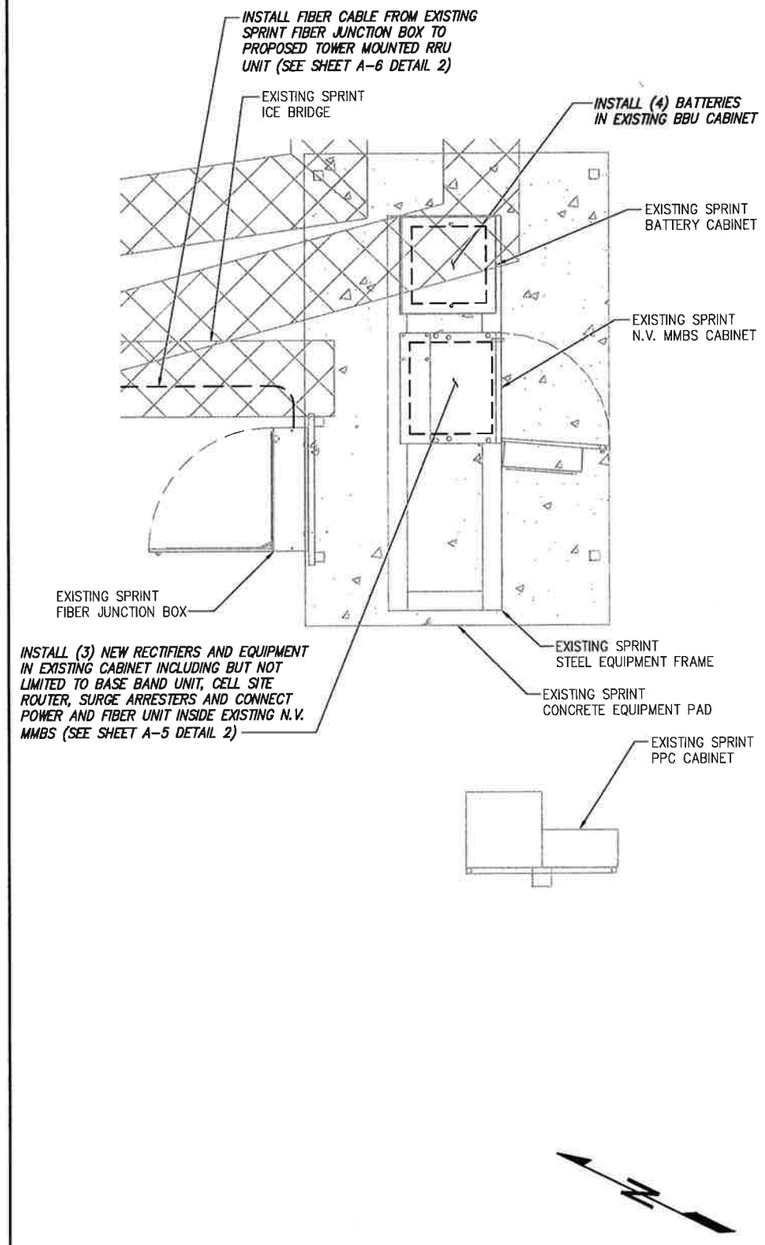
SHEET NUMBER:

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



SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

WATERFORD

SITE CASCADE:

CT03XC105

SITE ADDRESS:

41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:

SITE PLAN

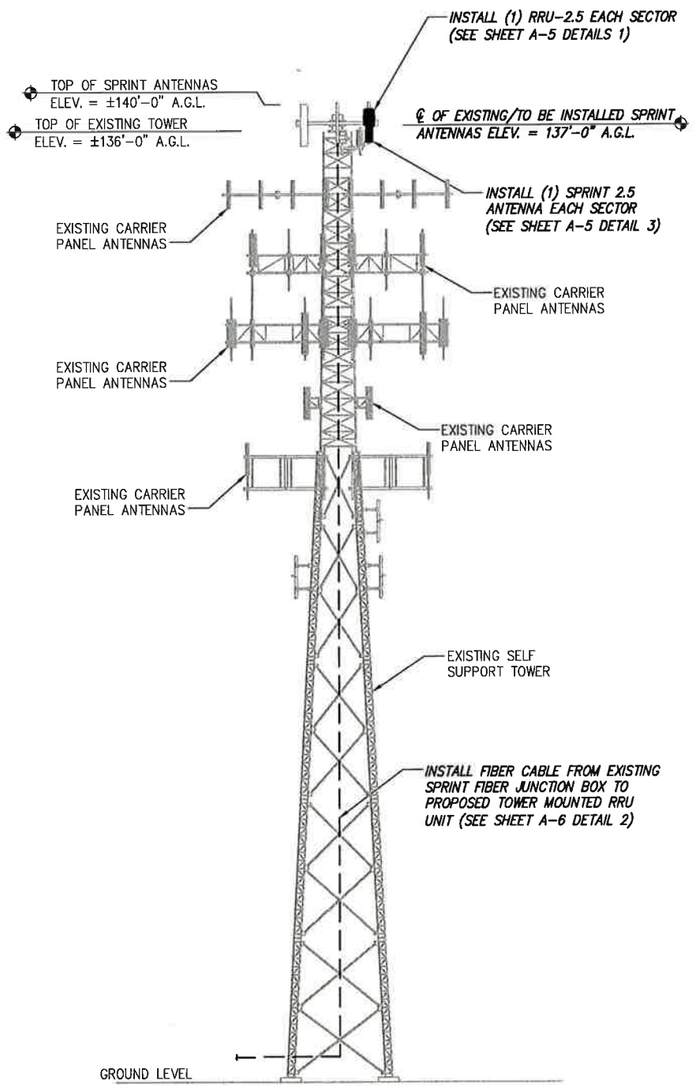
SHEET NUMBER:

A-1

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

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

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



TOWER ELEVATION | NO SCALE | 1

DETAIL NOT USED | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.
1033 Watervliet Shaker Rd
Albany, NY 12205
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41 MANITOCK HILL RD
WATERFORD, CT 06385

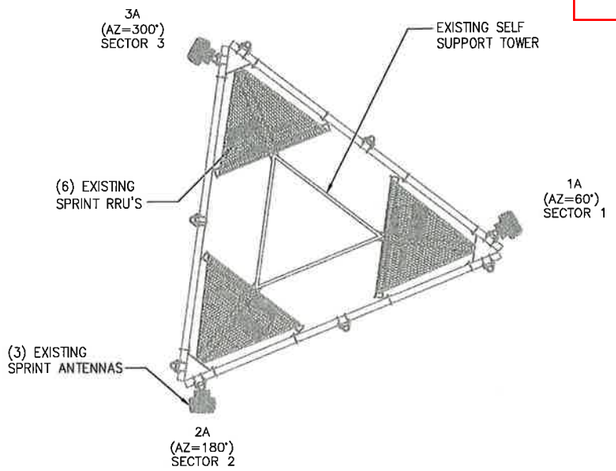
SHEET DESCRIPTION:

TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:

A-2

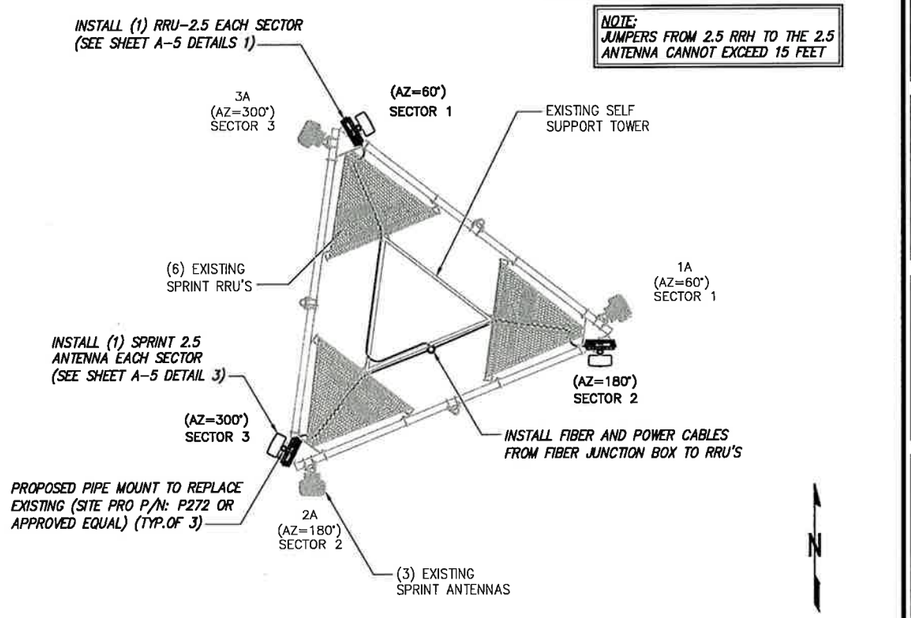
Confirm azimuths with final RFDS - RFDS supersedes CD's



EXISTING ANTENNA & RRU LAYOUT | NO SCALE | 1

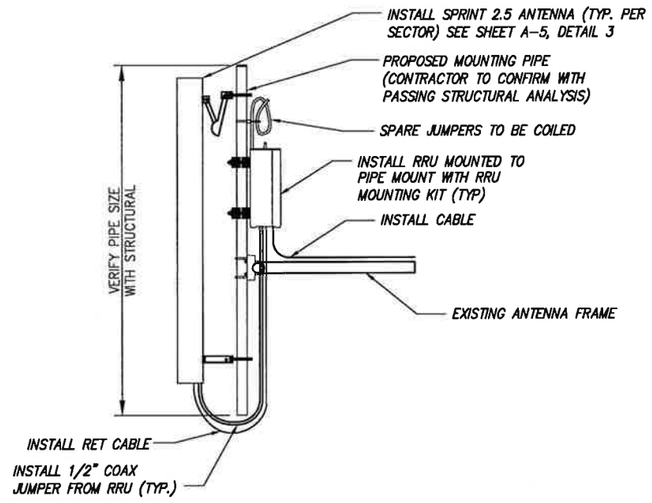
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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



FINAL ANTENNA LAYOUT | NO SCALE | 2

DETAIL NOT USED | NO SCALE | 3



NOTES:

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

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

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

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

TYPICAL ANTENNA & RRU MOUNTING DETAILS | NO SCALE | 4

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CT03XC105

SITE ADDRESS:

41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:

ANTENNA LAYOUT
& MOUNTING DETAILS

SHEET NUMBER:

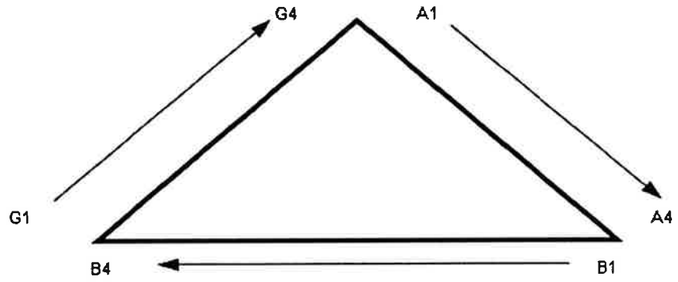
A-3

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

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

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

Figure 1: Antenna Orientation



NOTES:

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.

2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER. THERE SHALL BE A 1" SPACE BETWEEN EACH RING FOR THE CABLE IDENTIFIER, AND NO SPACES BETWEEN THE FREQUENCY BANDS.

3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.

4. THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.

5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE NEXT COLOR IN THE SEQUENCE FOR ADDITIONAL CABLES IN EACH SECTOR.

6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.

7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.

8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

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

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

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

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

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

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

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WATERFORD, CT 06385

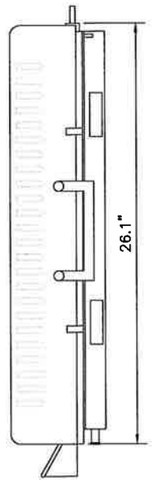
SHEET DESCRIPTION:

COLOR CODING AND NOTES

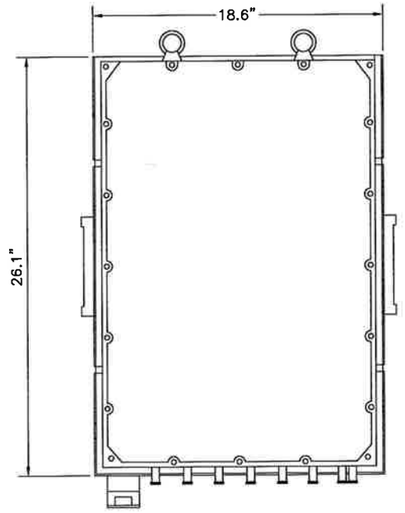
SHEET NUMBER:

A-4

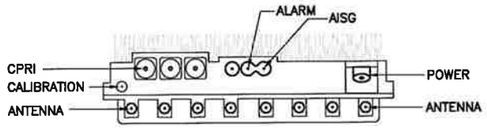
RRU: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW

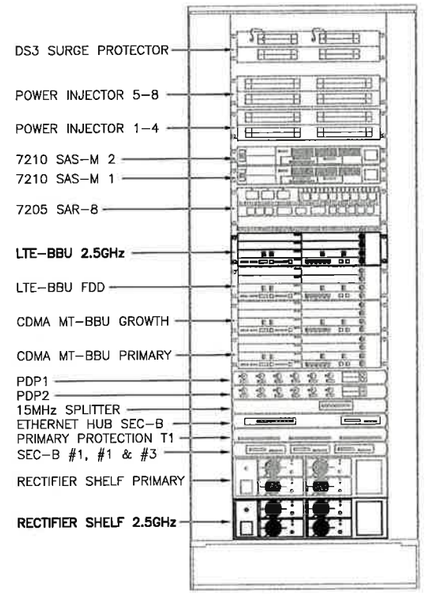


PLAN VIEW

NOTES

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

2.5 RRU | NO SCALE | 1

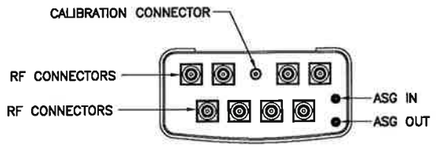


FRONT VIEW

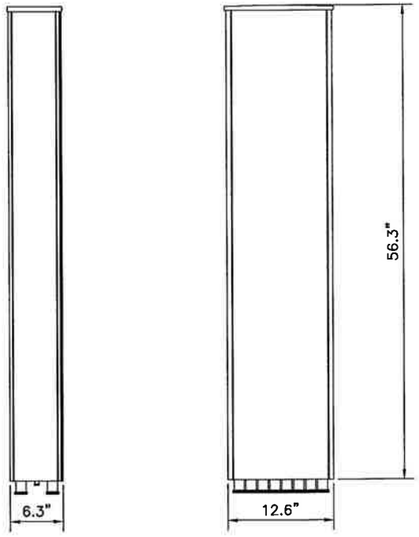
NEW EQUIPMENT IN EXISTING CABINET | NO SCALE | 2

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA | NO SCALE | 3

DETAIL NOT USED | NO SCALE | 4

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

PLANS PREPARED BY:
INFINIGY Design. Build. Deliver.
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SITE CASCADE:
CT03XC105

SITE ADDRESS:
41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

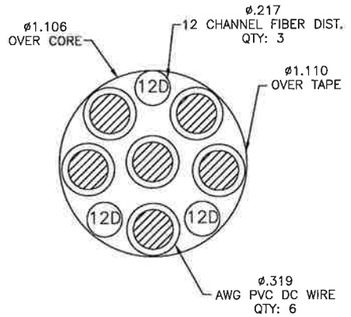
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

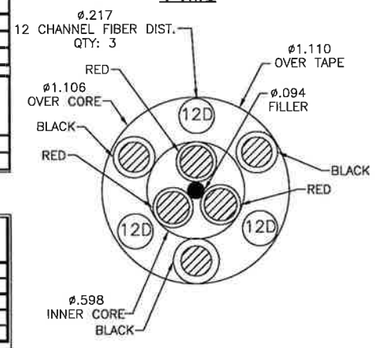
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

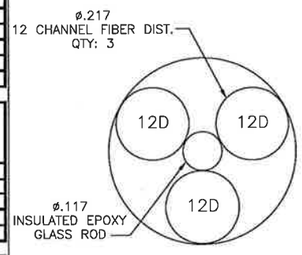
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



4 AWG



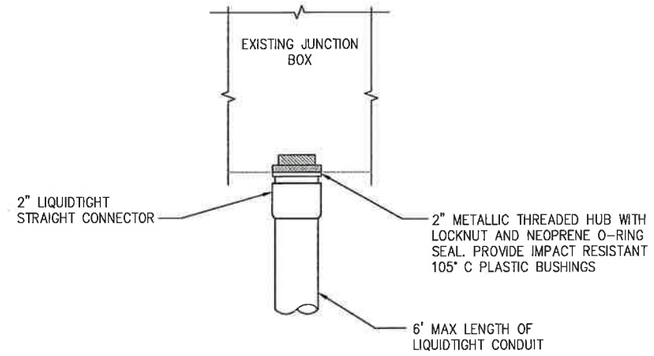
8 & 6 AWG



FIBER ONLY

2.5 CABLE CROSS SECTION DATA

NO SCALE | 1



FIBER JUNCTION BOX PENETRATION

NO SCALE | 2

DETAIL NOT USED

NO SCALE | 3

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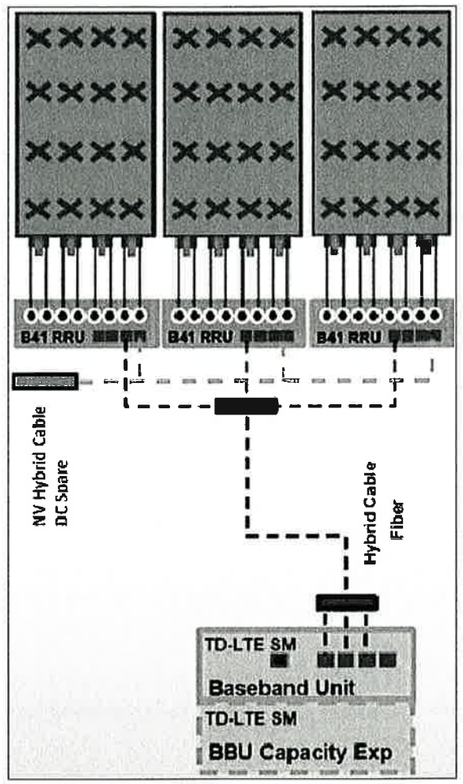
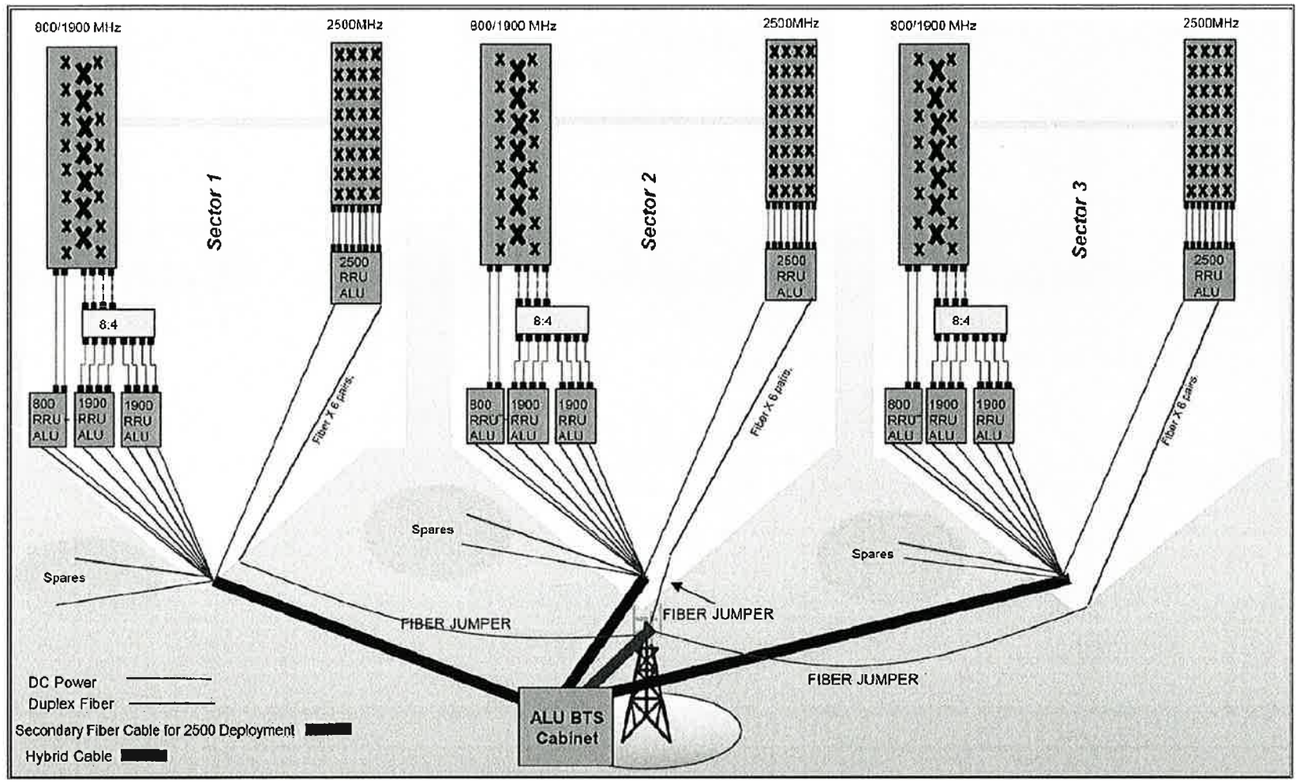
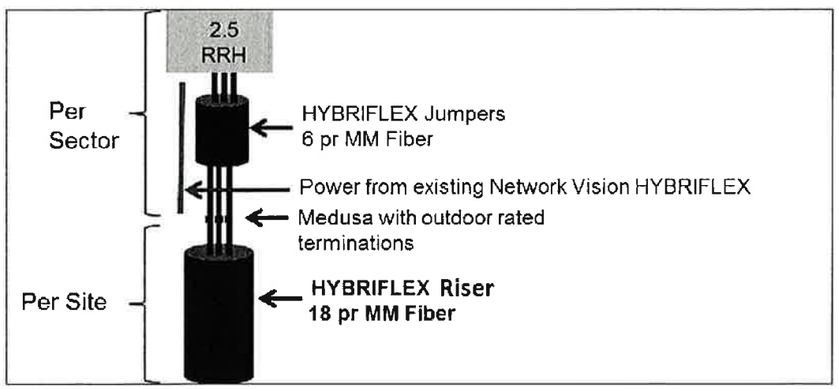
A-6



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

NO SCALE

1

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CIVIL DETAILS

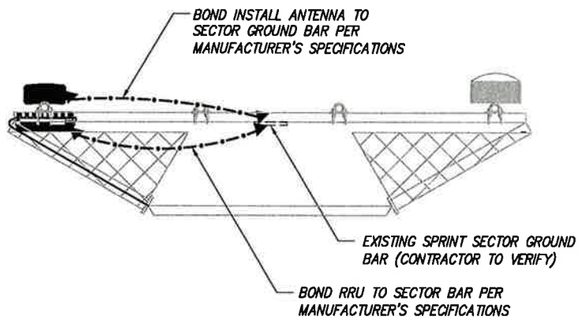
SHEET NUMBER:

A-7

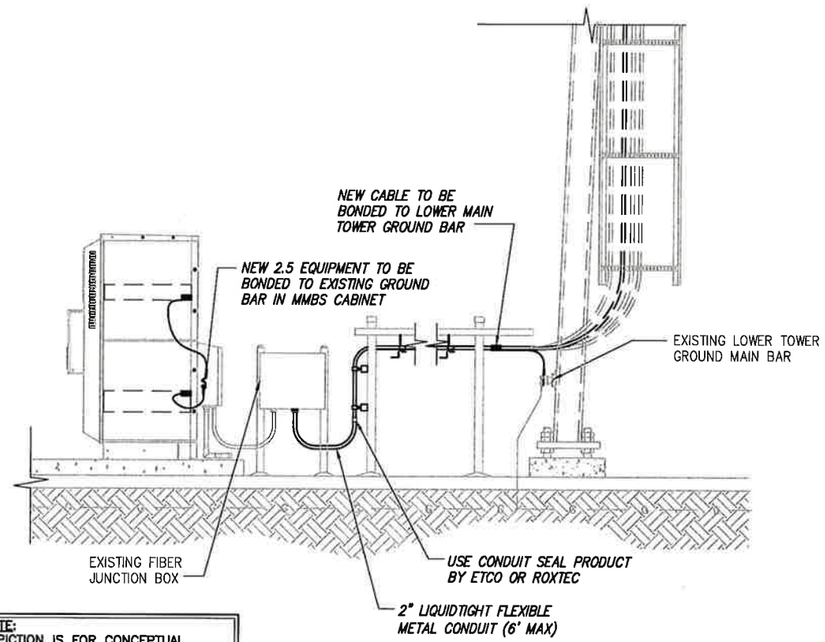
PLAN NOT USED | NO SCALE | 1

LEGEND:

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



TYPICAL ANTENNA GROUNDING PLAN | NO SCALE | 2



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

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

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353-000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

DRAWING NOTICE:

REVISIONS:

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

SITE NAME:

WATERFORD

SITE CASCADE:

CT03XC105

SITE ADDRESS:

41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:

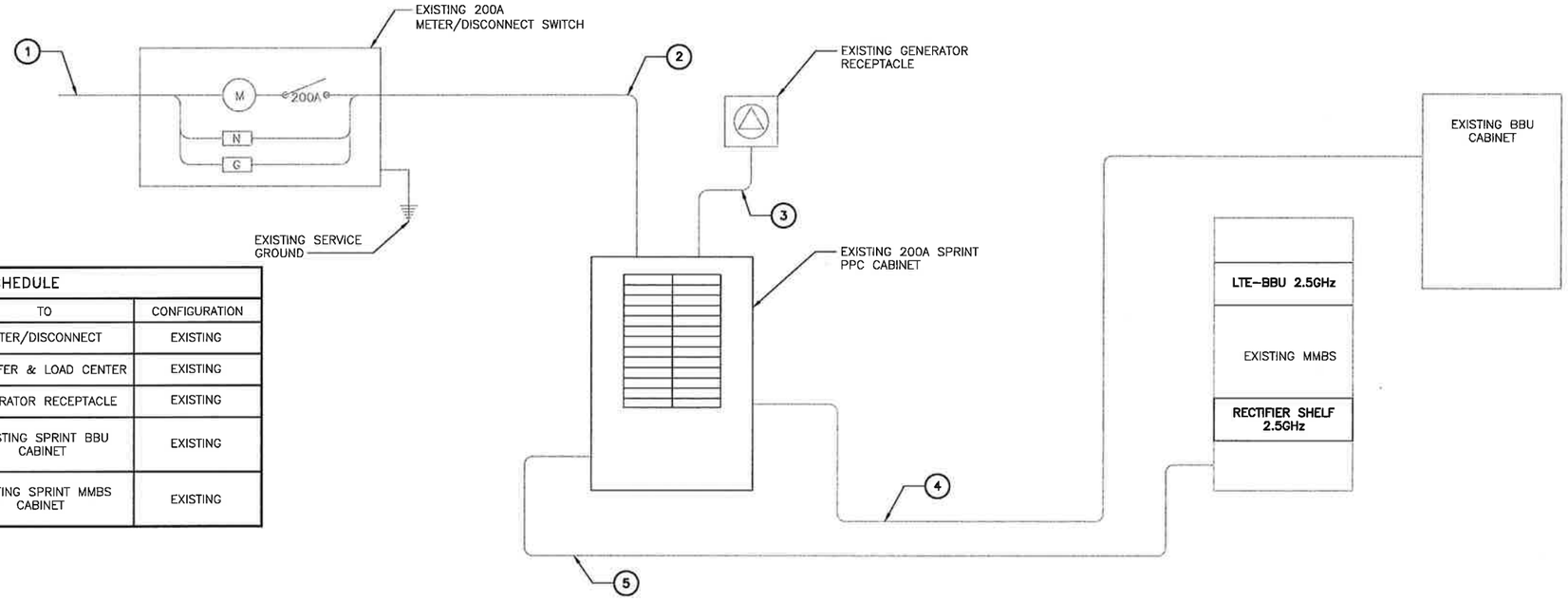
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:

E-1

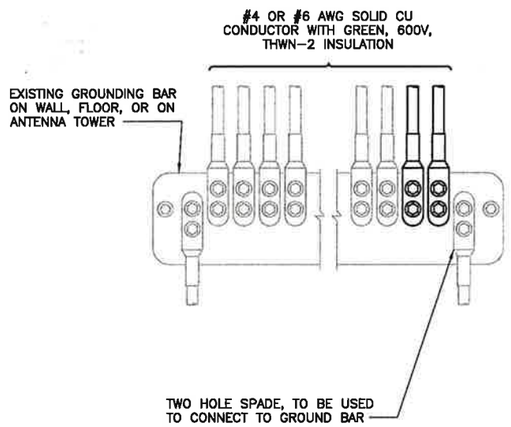
NOTES

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



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

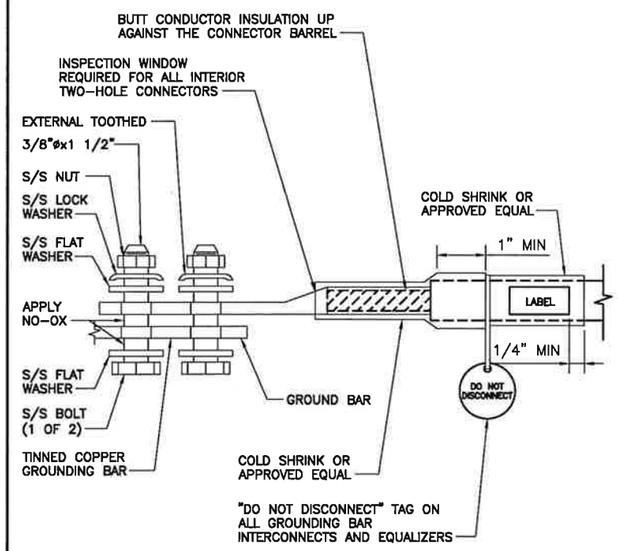
ELECTRICAL ONE–LINE DIAGRAM — NO SCALE — 1



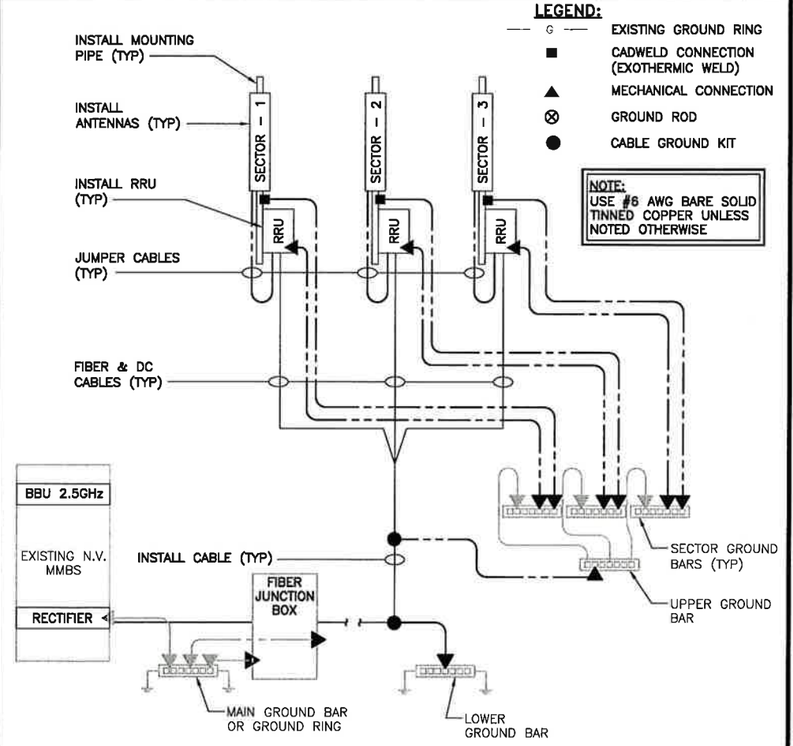
NOTES

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

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



TWO HOLE LUG — NO SCALE — 3



GROUNDING RISER DIAGRAM — NO SCALE — 4

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY Design. Build. Deliver.

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

JOB NUMBER 353–000

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

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

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REVISIONS:

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

SITE NAME:

WATERFORD

SITE CASCADE:

CT03XC105

SITE ADDRESS:

41 MANITOCK HILL RD
WATERFORD, CT 06385

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

Pier Structural Engineering Corp.
55 Northfield Drive E, Suite 198
Waterloo, ON N2K 3T6
Tel: 519-885-3806
Fax: 519-884-3806
www.p-sec.ca

August 1, 2017

Marianne Dunst, Tower Structural Analyst
Crown Castle USA Inc.
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Subject:	**Structural Analysis Report**	
Carrier Designation:	Carrier Co-Locate:	**Sprint PCS**
	Carrier Site Number:	**CT03XC105**
	Carrier Site Name:	**CT03XC105**
Crown Castle Designation:	Crown Castle BU Number:	**876338**
	Crown Castle Site Name:	**WATERFORD**
	Crown Castle JDE Job Number:	**450511**
	Crown Castle WO Number:	**1436021**
	Crown Castle Application Number:	**399282 Rev. 0**
Engineering Firm Designation:	P-SEC Project Number:	**16435**
Site Data:	**41 Manitock Hill Road, Waterford, New London County, CT** **Latitude *41° 21' 16.7"*, Longitude *-72° 9' 1.6"*** **136-ft Self Support Tower**	

Dear Marianne Dunst,

Pier Structural Engineering Corp. (P-SEC) 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 1063375, in accordance with application 399282, 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.

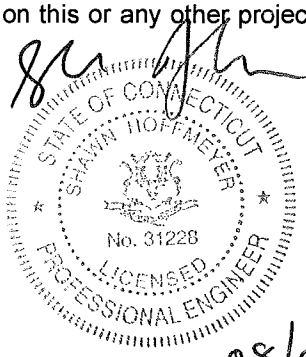
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1 and Risk Category II was/were used in this analysis.

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

Structural analysis prepared by: Jordan Ross, E.I.T.

Respectfully submitted by:

Shawn Hoffmeyer, P.E., P.Eng.
CT PE# 31228



08/01/17

tnxTower Report - version 7.0.5.1

Pier Structural Engineering Corp.
55 Northfield Drive E, Suite 198
Waterloo, ON N2K 3T6
Tel: 519-885-3806
Fax: 519-884-3806
www.p-sec.ca

August 1, 2017

Marianne Dunst, Tower Structural Analyst
Crown Castle USA Inc.
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Subject:	**Structural Analysis Report**	
Carrier Designation:	Carrier Co-Locate:	**Sprint PCS**
	Carrier Site Number:	**CT03XC105**
	Carrier Site Name:	**CT03XC105**
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	Crown Castle Application Number:	**399282 Rev. 0**
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Structural analysis prepared by: Jordan Ross, E.I.T.

Respectfully submitted by:

Shawn Hoffmeyer, P.E., P.Eng.
CT PE# 31228

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
Table 1 - Proposed Antenna and Cable Information
Table 2 - Existing and Reserved Antenna and Cable Information
Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE
Table 4 - Documents Provided
3.1) Analysis Method
3.2) Assumptions

4) ANALYSIS RESULTS
Table 5 - Section Capacity (Summary)
Table 6 - Tower Component Stresses vs. Capacity
4.1) Recommendations

5) APPENDIX A
tnxTower Output

6) APPENDIX B
Base Level Drawing

7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 136-ft Self Support tower originally designed by PIROD MANUFACTURES INC. in February of 1999 for a wind speed of 90 mph per TIA/EIA-222-F. The tower was reinforced per Vertical Structures modification drawings of 2009.

2) ANALYSIS CRITERIA

The following design parameters have been used in our analysis:

Design Standard:		TIA-222-G Standard and 2016 CSBC
County/State:		New London County, CT
Wind Speeds:	*CASE 1*	105 mph (3-second gust; *equivalent to 135 mph Ultimate wind speed*)
	CASE 2	50 mph (3-second gust) with 3/4" radial solid ice *(per ASCE7 ice map)*
	CASE 3	60 mph (3-second gust) for serviceability
Exposure Category:		B
Topographic Category:		1
Structure Classification:		II

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
136	137	3	rfs celwave	APXVTM14-C-120	1	1-1/4	1
		3	alcatel lucent	TD-RRH8x20-25			

Notes:
1) Proposed equipment

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
136	137	3	rfs celwave	APXVSPP18-C-A20	3	1-1/4	1
	136	3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
		1	--	Platform Mount [LP 405-1]			
134	134	3	alcatel lucent	1900MHz RRH (65MHz)	--	--	1
		2	--	Pipe Mount [PM 601-3]			
	133	3	alcatel lucent	800MHz 2X50W RRH W/FILTER			
127	127	12	decibel	DB844H90E-XY	12	1-1/4	3
		1	--	Pipe Mount [PM 601-3]			
		1	--	Sector Mount [SM 410-3]			
117	119	3	ericsson	ERICSSON AIR 21 B2A B4P	12 1	1-5/8 1-1/4	1
		3	ericsson	ERICSSON AIR 21 B4A B2P			
		3	ericsson	KRY 112 144/1			
	117	1	--	Pipe Mount [PM 601-3]			
		1	--	Sector Mount [SM 410-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
107	107	6	commscope	SBNHH-1D65B	1	1-5/8	2
		3	antel	BXA-70063-6CF-2			
		2	commscope	RC2DC-3315-PF-48			
		3	alcatel lucent	B66A RRH4X45			
		3	alcatel lucent	RRH2x60-700			
		3	alcatel lucent	RRH2X60-PCS			
		3	antel	BXA-80063/4CF	13	1-5/8	1
		6	rfs celwave	FD9R6004/2C-3L			
		1	--	Sector Mount [SM 402-3]			
97	97	1	kmw	AM-X-CD-14-65-00T-RET	6 2 1	1-1/4 5/8 3/8	1
		1	kmw	AM-X-CD-16-65-00T-RET			
		1	andrew	SBNH-1D6565C			
		3	powerwave	7770.00			
		6	ericsson	RRUS 11			
		1	raycap	DC6-48-60-18-8F			
		6	powerwave	LGP21401			
		1	--	Pipe Mount [PM 601-3]			
		1	--	T-Arm Mount [TA 702-3]			
87	89	3	kathrein	800 10504	6	7/8	1
	87	3	kathrein	860 10118			
		1	--	Sector Mount [SM 104-3]			
80	81	1	gps	GPS_A	1	1/2	1
	80	1	--	Side Arm Mount [SO 701-1]			
72	72	2	gps	GPS_A	2	1/2	1
		2	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment
2) Reserved equipment
3) Abandoned equipment included in analysis

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)
136	136	12	allgon	7184.05	12	1-5/8
		1	--	Low Profile Platform		
127	127	12	--	ALP9212 antenna	12	1-5/8
		3	--	T-Frame		
117	117	12	--	ALP9212 antenna	12	1-5/8
		3	--	T-Frame		
102	102	2	--	DB810 antenna	2	1-5/8
		2	--	6’-8” rigid side arm		
80	80	2	--	gps antenna	2	1/2

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	SEA, Ref. No. 99034.01-A dated 1/5/1999	2035622	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod, File No. A-115474-Q-81741 dated 2/25/1999	2068030	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod, File No. A-115474-Q-81741 dated 2/25/1999	1441523	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Structures, Proj. No. TA2007004139 dated 10/4/2007	2125417	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Structures, Proj. No. 2007-004-007 dated 1/29/2009	2376132	CCISITES
APPLICATION	Sprint PCS, Revision # 0 dated 7/24/2017	399282	CCISITES

3.1) Analysis Method

tnxTower (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\structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) P-SEC did not analyze antenna supporting mounts as part of this analysis report and assumed they are structurally sufficient. It is the carrier's responsibility to ensure structural compliance of their existing and/or proposed antenna supporting mounts.
5) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package dated 7/27/2017.

This analysis may be affected if any assumptions are not valid or have been made in error. P-SEC 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
T1	136 - 130	Leg	1 1/2	2	-6.077	49.803	12.2	Pass
T2	130 - 110	Leg	2	24	-44.172	111.473	39.6	Pass
T3	110 - 106.917	Leg	2 1/4	89	-52.176	149.269	35.0	Pass
T4	106.917 - 104.583	Leg	2 1/4	101	-59.860	149.269	40.1	Pass
T5	104.583 - 102.25	Leg	2 1/4	110	-67.012	149.269	44.9	Pass
T6	102.25 - 99.9167	Leg	2 1/4	121	-74.738	149.269	50.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T7	99.9167 - 97.5833	Leg	2 1/4	130	-82.217	149.269	55.1	Pass
T8	97.5833 - 95.25	Leg	2 1/4	141	-90.506	149.269	60.6	Pass
T9	95.25 - 92.9167	Leg	2 1/4	150	-98.886	170.908	57.9	Pass
T10	92.9167 - 90	Leg	2 1/4	165	-113.109	176.909	63.9	Pass
T11	90 - 80	Leg	Pirod 105244 + (2) 1.25"	183	-120.627	222.060	54.3	Pass
T12	80 - 60	Leg	Pirod 105217	192	-163.136	214.859	75.9	Pass
T13	60 - 40	Leg	Pirod 105218	207	-199.843	300.681	66.5	Pass
T14	40 - 20	Leg	Pirod 105218	222	-232.409	300.681	77.3	Pass
T15	20 - 0	Leg	Pirod 105219	237	-261.887	399.868	65.5	Pass
T1	136 - 130	Diagonal	3/4	10	-1.694	5.763	29.4	Pass
T2	130 - 110	Diagonal	7/8	35	-4.351	9.300	46.8	Pass
T3	110 - 106.917	Diagonal	1	95	-4.968	15.178	32.7	Pass
T4	106.917 - 104.583	Diagonal	1	106	-4.535	15.088	30.1	Pass
T5	104.583 - 102.25	Diagonal	1	116	-5.006	14.871	33.7	Pass
T6	102.25 - 99.9167	Diagonal	1	125	-4.978	14.594	34.1	Pass
T7	99.9167 - 97.5833	Diagonal	1	136	-4.999	14.334	34.9	Pass
T8	97.5833 - 95.25	Diagonal	1	148	-5.646	14.060	40.2	Pass
T9	95.25 - 92.9167	Diagonal	1	159	-6.134	13.803	44.4	Pass
T10	92.9167 - 90	Diagonal	1	178	-7.154	13.523	52.9	Pass
T11	90 - 80	Diagonal	L 2.5 x 2.5 x 3/16	190	-7.351	12.725	57.8 63.2 (b)	Pass
T12	80 - 60	Diagonal	L 2.5 x 2.5 x 3/16	198	-6.983	10.950	63.8	Pass
T13	60 - 40	Diagonal	L 3 x 3 x 3/16	209	-6.662	14.947	44.6 54.1 (b)	Pass
T14	40 - 20	Diagonal	L 3 x 3 x 3/16	224	-6.742	12.112	55.7	Pass
T15	20 - 0	Diagonal	L 3 x 3 x 5/16	239	-8.262	15.760	52.4	Pass
T1	136 - 130	Horizontal	3/4	16	0.184	19.880	0.9	Pass
T2	130 - 110	Horizontal	3/4	45	-0.474	2.816	16.8	Pass
T4	106.917 - 104.583	Horizontal	7/8	102	-0.954	4.779	20.0	Pass
T5	104.583 - 102.25	Horizontal	7/8	112	-0.462	4.657	9.9	Pass
T6	102.25 - 99.9167	Horizontal	7/8	122	-0.691	4.539	15.2	Pass
T7	99.9167 - 97.5833	Horizontal	7/8	132	-0.813	4.421	18.4	Pass
T8	97.5833 - 95.25	Horizontal	7/8	142	-0.665	4.312	15.4	Pass
T9	95.25 - 92.9167	Horizontal	7/8	152	-0.838	4.202	19.9	Pass
T10	92.9167 - 90	Horizontal	7/8	169	-0.871	4.101	21.2	Pass
T9	95.25 - 92.9167	Secondary Horizontal	1 1/2	161	-1.713	35.230	4.9	Pass
T10	92.9167 - 90	Secondary Horizontal	1 1/2	179	-1.860	34.528	5.4	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	136 - 130	Top Girt	7/8	5	-0.588	6.135	9.6	Pass
T2	130 - 110	Top Girt	7/8	28	-0.710	6.229	11.4	Pass
T3	110 - 106.917	Top Girt	1	91	-1.611	8.377	19.2	Pass
T1	136 - 130	Bottom Girt	7/8	9	-0.647	6.135	10.5	Pass
T2	130 - 110	Bottom Girt	7/8	31	-2.076	4.935	42.1	Pass
T10	92.9167 - 90	Bottom Girt	1	170	-1.004	6.827	14.7	Pass
							Summary	
						Leg (T14)	77.3	Pass
						Diagonal (T12)	63.8	Pass
						Horizontal (T10)	21.2	Pass
						Secondary Horizontal (T10)	5.4	Pass
						Top Girt (T3)	19.2	Pass
						Bottom Girt (T2)	42.1	Pass
						Bolt Checks	66.2	Pass
						RATING =	**77.3**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
2	Anchor Rods	--	49.5	Pass
2	Base Foundation – Soil Interaction	--	79.5	Pass
2	Base Foundation - Structural	--	20.9	Pass

Structure Rating (max from all components) =	**79.5%**

Notes: 1) See full member breakdown and section capacities in Appendix A.
2) See additional documentation in Appendix C for supporting calculations.
3) Stresses up to 105% (steel) and 110% (foundations) are within engineering tolerance and considered acceptable.

4.1) Recommendations

The existing 136-ft self-support tower located in New London County (WATERFORD), CT is structurally acceptable based on the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph with the proposed loading configuration.

No modifications are required at this time.

Should you have any questions, please call us anytime at 519-885-3806.

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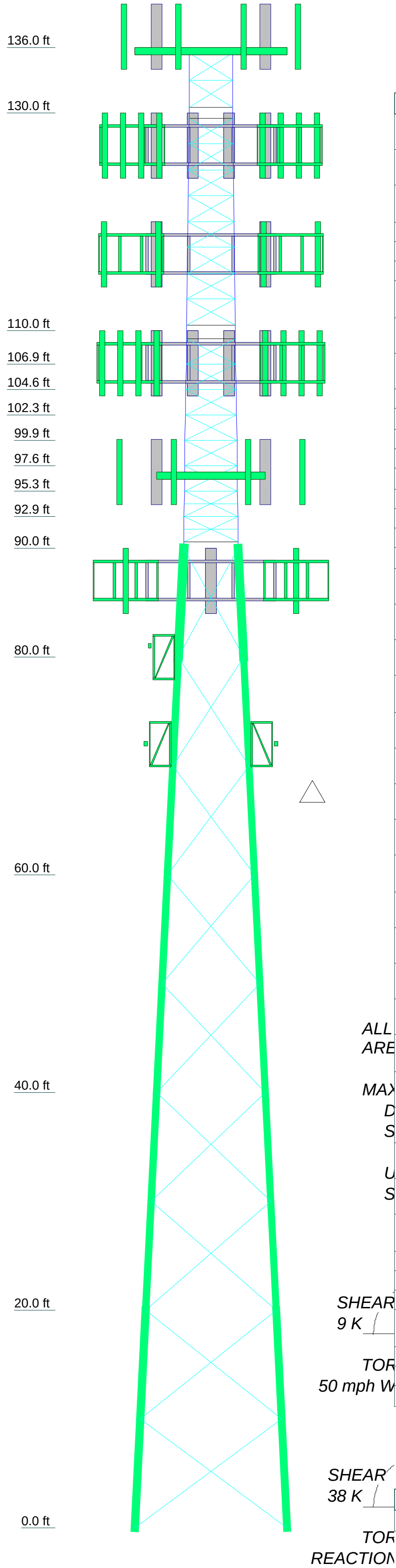
APPENDIX A

TNXTOWER OUTPUT

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	SR 1 1/2		SR 3/4						4	2 @ 2.5	0.2
T2	SR 2		SR 7/8	A572-50	SR 7/8	SR 7/8	SR 3/4	N.A.		8 @ 2.375	1.2
T3	SR 2 1/4		SR 1		SR 1		N.A.		4.5		0.2
T4						N.A.			[illegible]		0.2
T5									[illegible]		0.2
T6							SR 7/8		[illegible]	8 @ 2.33333	0.2
T7									[illegible]		0.2
T8									[illegible]		0.2
T9								SR 1 1/2	[illegible]		0.3
T10						SR 1			[illegible]		0.4
T11	A										1.6
T12	Pirod 105217	A572-50	L 2.5 x 2.5 x 3/16						6		2.2
T13	Pirod 105218			A36	N.A.	N.A.	N.A.	N.A.	8	9 @ 10	2.7
T14			L 3 x 3 x 3/16						10		2.8
T15	Pirod 105219		L 3 x 3 x 5/16						12		4.4
									14		17.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVTM14-C-120 w/ Mount Pipe (Carrier 136' P)	136	(2) SBNHH-1D65B (Carrier 107' R)	107
APXVTM14-C-120 w/ Mount Pipe (Carrier 136' P)	136	BXA-70063-6CF-2 w/ Mount Pipe (Carrier 107' R)	107
APXVTM14-C-120 w/ Mount Pipe (Carrier 136' P)	136	BXA-70063-6CF-2 w/ Mount Pipe (Carrier 107' R)	107
TD-RRH8x20-25 (Carrier 136' P)	136	BXA-70063-6CF-2 w/ Mount Pipe (Carrier 107' R)	107
TD-RRH8x20-25 (Carrier 136' P)	136	B66A RRH4X45 (Carrier 107' R)	107
TD-RRH8x20-25 (Carrier 136' P)	136	B66A RRH4X45 (Carrier 107' R)	107
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 136' E)	136	B66A RRH4X45 (Carrier 107' R)	107
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 136' E)	136	RRH2x60-700 (Carrier 107' R)	107
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 136' E)	136	RRH2x60-700 (Carrier 107' R)	107
IBC1900HG-2A (Carrier 136' E)	136	RRH2x60-700 (Carrier 107' R)	107
IBC1900HG-2A (Carrier 136' E)	136	RRH2X60-PCS (Carrier 107' R)	107
IBC1900HG-2A (Carrier 136' E)	136	RRH2X60-PCS (Carrier 107' R)	107
IBC1900BB-1 (Carrier 136' E)	136	RRH2X60-PCS (Carrier 107' R)	107
IBC1900BB-1 (Carrier 136' E)	136	RC2DC-3315-PF-48 (Carrier 107' R)	107
IBC1900BB-1 (Carrier 136' E)	136	RC2DC-3315-PF-48 (Carrier 107' R)	107
6' x 2" Mount Pipe (Carrier 136' E)	136	BXA-80063/4CF w/ Mount Pipe (Carrier 107' E)	107
6' x 2" Mount Pipe (Carrier 136' E)	136	BXA-80063/4CF w/ Mount Pipe (Carrier 107' E)	107
6' x 2" Mount Pipe (Carrier 136' E)	136	BXA-80063/4CF w/ Mount Pipe (Carrier 107' E)	107
Platform Mount [LP 405-1] (Carrier 136' E)	136	(2) FD9R6004/2C-3L (Carrier 107' E)	107
800MHz 2X50W RRH W/FILTER (Carrier 134' E)	134	(2) FD9R6004/2C-3L (Carrier 107' E)	107
800MHz 2X50W RRH W/FILTER (Carrier 134' E)	134	(2) FD9R6004/2C-3L (Carrier 107' E)	107
800MHz 2X50W RRH W/FILTER (Carrier 134' E)	134	Sector Mount [SM 402-3] (Carrier 107' E)	107
1900MHz RRH (65MHz) (Carrier 134' E)	134	AM-X-CD-16-65-00T-RET w/ Mount Pipe (Carrier 97' E)	97
1900MHz RRH (65MHz) (Carrier 134' E)	134	AM-X-CD-14-65-00T-RET w/ Mount Pipe (Carrier 97' E)	97
1900MHz RRH (65MHz) (Carrier 134' E)	134	SBNH-1D6565C w/ Mount Pipe (Carrier 97' E)	97
(2) Pipe Mount [PM 601-3] (Carrier 134' E)	134	7770.00 w/ Mount Pipe (Carrier 97' E)	97
(4) DB844H90E-XY w/ Mount Pipe (Abandoned 127')	127	7770.00 w/ Mount Pipe (Carrier 97' E)	97
(4) DB844H90E-XY w/ Mount Pipe (Abandoned 127')	127	7770.00 w/ Mount Pipe (Carrier 97' E)	97
(4) DB844H90E-XY w/ Mount Pipe (Abandoned 127')	127	(2) RRUS 11 (Carrier 97' E)	97
Sector Mount [SM 410-3] (Abandoned 127')	127	(2) RRUS 11 (Carrier 97' E)	97
Pipe Mount [PM 601-3] (Abandoned 127')	127	(2) RRUS 11 (Carrier 97' E)	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (Carrier 117' E)	117	(2) LGP21401 (Carrier 97' E)	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (Carrier 117' E)	117	(2) LGP21401 (Carrier 97' E)	97
ERICSSON AIR 21 B2A B4P w/ Mount Pipe (Carrier 117' E)	117	(2) LGP21401 (Carrier 97' E)	97
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (Carrier 117' E)	117	DC6-48-60-18-8F (Carrier 97' E)	97
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (Carrier 117' E)	117	T-Arm Mount [TA 702-3] (Carrier 97' E)	97
ERICSSON AIR 21 B4A B2P w/ Mount Pipe (Carrier 117' E)	117	Pipe Mount [PM 601-3] (Carrier 97' E)	97
KRY 112 144/1 (Carrier 117' E)	117	800 10504 w/ Mount Pipe (Carrier 87' E)	87
KRY 112 144/1 (Carrier 117' E)	117	800 10504 w/ Mount Pipe (Carrier 87' E)	87
KRY 112 144/1 (Carrier 117' E)	117	800 10504 w/ Mount Pipe (Carrier 87' E)	87
Sector Mount [SM 410-3] (Carrier 117' E)	117	860 10118 (Carrier 87' E)	87
Pipe Mount [PM 601-3] (Carrier 117' E)	117	860 10118 (Carrier 87' E)	87
(2) SBNHH-1D65B (Carrier 107' R)	107	860 10118 (Carrier 87' E)	87
(2) SBNHH-1D65B (Carrier 107' R)	107	6' x 2" Mount Pipe (Carrier 87' E)	87
		6' x 2" Mount Pipe (Carrier 87' E)	87
		6' x 2" Mount Pipe (Carrier 87' E)	87
		Sector Mount [SM 104-3] (Carrier 87' E)	87
		GPS_A (Carrier 80' E)	80
		Side Arm Mount [SO 701-1] (Carrier 80' E)	80
		GPS_A (Carrier 72' E)	72
		GPS_A (Carrier 72' E)	72
		Side Arm Mount [SO 701-1] (Carrier 72' E)	72
		Side Arm Mount [SO 701-1] (Carrier 72' E)	72

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244 + (2) 1.25"		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

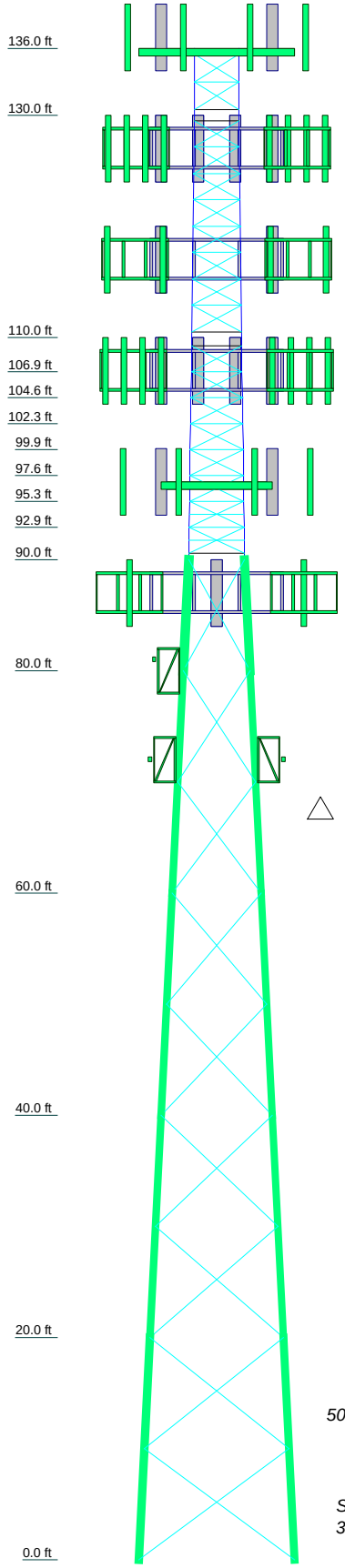
TOWER DESIGN NOTES

1.

Pier Structural Engineering Corp.
55 Northfield Drive E. Suite 198
Waterloo, ON N2K 3T6
Phone: (519) 885-3806
FAX: (519) 884-3806

Job: **PSEC 16435 (for SPRINT PCS)**		
Project: **BU 876338 - WATERFORD**		
Client: Crown Castle	Drawn by: DO	App'd:
Code: TIA-222-G	Date: 08/01/17	Scale: NTS
Path: H:\PROJECTS\JOB 16000 - 16999\16400 - 16499\16435 - CCI - 876338 - WATERFORD\876338_LC7_20170801.eri		Dwg No. E-1

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15
Legs	SR 1 1/2	SR 2	SR 2 1/4								A	Pirod 105217	Pirod 105218	Pirod 105219	
Leg Grade	A572-50														
Diagonals	SR 3/4	SR 7/8	SR 1								L 2.5 x 2.5 x 3/16		L 3 x 3 x 3/16	L 3 x 3 x 5/16	
Diagonal Grade	A572-50												A36		
Top Girts	SR 7/8	SR 1	N.A.												
Bottom Girts	SR 7/8	N.A.	SR 1										N.A.		
Horizontals	SR 3/4	N.A.	SR 7/8										N.A.		
Sec. Horizontals	N.A.	SR 1 1/2											N.A.		
Face Width (ft)	4	4.5	7.813	7.427	7.042	6.656	6.271	5.885	5.499	5.114	6	8	10	12	14
# Panels @ (ft)	2 @ 2.5	8 @ 2.375					8 @ 2.33333						9 @ 10		
Weight (K)	0.2	1.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.4	1.6	2.2	2.7	2.8	4.4	17.1



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244 + (2) 1.25"		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

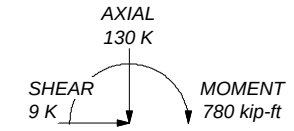
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 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'
8. -
9. E - Existing, R - Reserved, P - Proposed
10. Proposed loading at 136' elevation
11. TOWER RATING: 77.3%

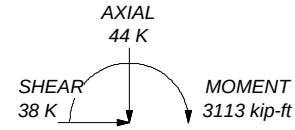
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 271 K
SHEAR: 26 K

UPLIFT: -244 K
SHEAR: 24 K



TORQUE 0 kip-ft
50 mph WIND - 0.750 in ICE



TORQUE 1 kip-ft
REACTIONS - 105 mph WIND

Pier Structural Engineering Corp.
55 Northfield Drive E. Suite 198
Waterloo, ON N2K 3T6
Phone: (519) 885-3806
FAX: (519) 884-3806

Job: **PSEC 16435 (for SPRINT PCS)**		
Project: **BU 876338 - WATERFORD**		
Client: Crown Castle	Drawn by: DO	App'd:
Code: TIA-222-G	Date: 08/01/17	Scale: NTS
Path: H:\PROJECTS\JOB 16000 - 16999\16400 - 16499\16435 - CCI - 876338 - WATERFORD\876338_LC7_20170801.eri		Dwg No. E-1

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 136' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 4' at the top and 14' at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in New London County, Connecticut.
- Basic wind speed of 105 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0'.
- Nominal ice thickness of 0.750 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.000 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50.000 °F.
- Deflections calculated using a wind speed of 60 mph.
- ----------.
- E - Existing, R - Reserved, P - Proposed.
- Proposed loading at 136' elevation.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- 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				

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	136'-130'			4'	1	6'
T2	130'-110'			4'	1	20'
T3	110'-106'11"			4'6"	1	3'1"
T4	106'11"-104'7"			4'6-15/16"	1	2'4"
T5	104'7"-102'3"			4'7-5/8"	1	2'4"
T6	102'3"-99'11"			4'8-5/16"	1	2'4"
T7	99'11"-97'7"			4'9-1/32"	1	2'4"
T8	97'7"-95'3"			4'9-23/32"	1	2'4"
T9	95'3"-92'11"			4'10-7/16"	1	2'4"
T10	92'11"-90'			4'11-1/8"	1	2'11"
T11	90'-80'			5'	1	10'
T12	80'-60'			6'	1	20'
T13	60'-40'			8'	1	20'
T14	40'-20'			10'	1	20'
T15	20'-0'			12'	1	20'

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	136'-130'	2'6"	X Brace	No	Steps	6.000	6.000
T2	130'-110'	2'4-1/2"	X Brace	No	Steps	6.000	6.000
T3	110'-106'11"	2'4"	X Brace	No	Steps	9.000	0.000
T4	106'11"-104'7"	2'4"	X Brace	No	Steps	0.000	0.000
T5	104'7"-102'3"	2'4"	X Brace	No	Steps	0.000	0.000
T6	102'3"-99'11"	2'4"	X Brace	No	Steps	0.000	0.000
T7	99'11"-97'7"	2'4"	X Brace	No	Steps	0.000	0.000
T8	97'7"-95'3"	2'4"	X Brace	No	Steps	0.000	0.000
T9	95'3"-92'11"	2'4"	X Brace	No	Yes	0.000	0.000
T10	92'11"-90'	2'4"	X Brace	No	Yes	0.000	7.000
T11	90'-80'	10'	X Brace	No	No	0.000	0.000
T12	80'-60'	10'	X Brace	No	No	0.000	0.000
T13	60'-40'	10'	X Brace	No	No	0.000	0.000
T14	40'-20'	10'	X Brace	No	No	0.000	0.000
T15	20'-0'	10'	X Brace	No	No	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 136'-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 110'-106'11"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T4 106'11"-104'7"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T5 104'7"-102'3"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T6 102'3"-99'11"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T7 99'11"-97'7"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T8 97'7"-95'3"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T9 95'3"-92'11"	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T10 92'11"-90'	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T11 90'-80'	Truss Leg	Pirod 105244 + (2) 1.25"	A572-50 (50 ksi)	Equal Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T12 80'-60'	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T13 60'-40'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T14 40'-20'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T15 20'-0'	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L 3 x 3 x 5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 136'-130'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 130'-110'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 110'-106'11"	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T10 92'11"-90'	Solid Round		A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 136'-130'	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 130'-110'	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 110'-106'11"	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 106'11"-104'7"	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 104'7"-102'3"	None	Solid Round		A572-50	Solid Round	7/8	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T6 102'3"-99'11"	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)
T7 99'11"-97'7"	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)
T8 97'7"-95'3"	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)
T9 95'3"-92'11"	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)
T10 92'11"-90'	None	Solid Round		(50 ksi) A572-50 (50 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 95'3"-92'11"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T10 92'11"-90'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 136'-130'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T2 130'-110'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T3 110'-106'11"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T4 106'11"-104'7"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T5 104'7"-102'3"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T6 102'3"-99'11"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T7 99'11"-97'7"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T8 97'7"-95'3"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T9 95'3"-92'11"	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T10 92'11"-90'	0.000	0.000	A36 (36 ksi)	1	1	1	0.000	0.000	36.000
T11 90'-80'	0.000	0.375	A36 (36 ksi)	1.025	1.025	1.025	0.000	0.000	36.000
T12 80'-60'	0.000	0.375	A36 (36 ksi)	1.025	1.025	1.025	0.000	0.000	36.000

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
T13 60'-40'	0.000	0.375	A36 (36 ksi)	1.025	1.025	1.025	0.000	0.000	36.000
T14 40'-20'	0.000	0.375	A36 (36 ksi)	1.025	1.025	1.025	0.000	0.000	36.000
T15 20'-0'	0.000	0.375	A36 (36 ksi)	1.025	1.025	1.025	0.000	0.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 136'-130'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 130'-110'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 110'-106'11"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 106'11"-104'7"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 104'7"-102'3"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 102'3"-99'11"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 99'11"-97'7"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 97'7"-95'3"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 95'3"-92'11"	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 92'11"-90'	No	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 90'-80'	Yes	No	1.801	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T12 80'-60'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T13 60'-40'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T14 40'-20'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 20'-0'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T11 90'-80'	1	0.5	0.85	1	0.5	0.85
T12 80'-60'	1	0.5	0.85	1	0.5	0.85
T13 60'-40'	1	0.5	0.85	1	0.5	0.85
T14 40'-20'	1	0.5	0.85	1	0.5	0.85
T15 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 136'-130'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T2 130'-110'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T3 110'-106'11"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T4 106'11"-104'7"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T5 104'7"-102'3"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T6 102'3"-99'11"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T7 99'11"-97'7"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T8 97'7"-95'3"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T9 95'3"-92'11"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T10 92'11"-90'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1	0.000	1
T11 90'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T12 80'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T13 60'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T14 40'-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75
T15 20'-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	1	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 136'-130'	Sleeve DS	0.563 A325N	5	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.000 A325X	0	0.000 A325N	0	0.000 A325X	0
T2 130'-110'	Sleeve DS	0.750 A325N	5	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.000 A325X	0	0.000 A325N	0	0.000 A325X	0
T3 110'-106'11"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T4 106'11"-104'7"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T5 104'7"-102'3"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T6 102'3"-99'11"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T7 99'11"-97'7"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T8 97'7"-95'3"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T9 95'3"-92'11"	Flange	1.000 A325N	0	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T10 92'11"-90'	Flange	1.000 A325N	6	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.500 A325N	0	0.500 A325N	0	0.500 A325N	0
T11 90'-80'	Flange	1.000 A325N	6	1.000 A325N	1	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T12 80'-60'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T13 60'-40'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T14 40'-20'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T15 20'-0'	Flange	1.250 A-687	0	1.250 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
HB114-21U3M12-XXXF(1-1/4) (Carrier 136' P+E)	**B**	**No**	**Ar (CaAa)**	**136' - 97'**	**-5.000**	**0.4**	**4**	**4**	**1.000 0.520**	**1.540**		**0.001**
T-Brackets (Af) (Carrier 136' E) ***	B	No	Af (CaAa)	136' - 10'	-3.000	0.4	1	1	1.000	1.000		0.008
LDF6-50A(1-1/4) (Carrier 127' E)	A	No	Ar (CaAa)	127' - 10'	-4.000	0.4	12	7	1.550	1.550		0.001
T-Brackets (Af) (Carrier 127' E) ***	A	No	Af (CaAa)	127' - 10'	-4.000	0.4	1	1	1.000	1.000		0.008
LDF7-50A(1-5/8") (Carrier 117' E (+1-1/4))	C	No	Ar (CaAa)	117' - 10'	-4.000	0.4	13	7	1.000	1.980		0.001
T-Brackets (Af) (Carrier 117' E) ***	C	No	Af (CaAa)	117' - 10'	-4.000	0.4	1	1	1.000	1.000		0.008
LDF7-50A(1-5/8") (Carrier 107' R+E) ***	B	No	Ar (CaAa)	107' - 10'	-4.000	0.37	14	7	1.000 0.520	1.980		0.001
LDF6-50A(1-1/4) (Carrier 136'P+E + 97' E)	**B**	**No**	**Ar (CaAa)**	**97' - 10'**	**-9.000**	**0.4**	**10**	**6**	**1.000 0.520**	**1.550**		**0.001**
WR-VG82ST-BRD A(5/8") (Carrier 97' E)	B	No	Ar (CaAa)	97' - 10'	-9.000	0.35	2	2	0.645	0.645		0.000
FB-L98-002-XXX(3/8) (Carrier 97' E) ***	B	No	Ar (CaAa)	97' - 10'	-9.000	0.35	1	1	0.394	0.394		0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
FXL 780 PE(7/8) (Carrier 87' E)	A	No	Ar (CaAa)	87' - 10'	0.000	0	6	6	1.550 1.090	1.090		0.000
Feedline Ladder (Af) (Carrier 87' E) ***	A	No	Af (CaAa)	87' - 10'	0.000	0	1	1	3.000	3.000		0.008
FLC 12-50J(1/2") (Carrier 80' E) ***	B	No	Ar (CaAa)	80' - 10'	-8.000	0.42	1	1	0.640	0.640		0.000
LDF4-50A(1/2") (Carrier 72' E) ***	A	No	Ar (CaAa)	72' - 10'	-2.000	0.46	2	2	0.630	0.630		0.000
Safety Line 3/8 (To Top) ***	C	No	Ar (CaAa)	136' - 10'	0.000	0.5	1	1	0.375	0.375		0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVTM14-C-120 w/ Mount Pipe (Carrier 136' P)	**A**	**From Leg**	**4.000 0' 1'**	**0.000**	**136'**	**No Ice 1/2'' Ice 1'' Ice**	**6.580 7.031 7.473**	**4.959 5.754 6.472**	**0.077 0.131 0.193**
APXVTM14-C-120 w/ Mount Pipe (Carrier 136' P)	**B**	**From Leg**	**4.000 0' 1'**	**0.000**	**136'**	**No Ice 1/2'' Ice 1'' Ice**	**6.580 7.031 7.473**	**4.959 5.754 6.472**	**0.077 0.131 0.193**
APXVTM14-C-120 w/ Mount Pipe (Carrier 136' P)	**C**	**From Leg**	**4.000 0' 1'**	**0.000**	**136'**	**No Ice 1/2'' Ice 1'' Ice**	**6.580 7.031 7.473**	**4.959 5.754 6.472**	**0.077 0.131 0.193**
TD-RRH8x20-25 (Carrier 136' P)	**A**	**From Leg**	**4.000 0' 1'**	**0.000**	**136'**	**No Ice 1/2'' Ice 1'' Ice**	**4.045 4.298 4.557**	**1.535 1.714 1.901**	**0.070 0.097 0.128**
TD-RRH8x20-25 (Carrier 136' P)	**B**	**From Leg**	**4.000 0' 1'**	**0.000**	**136'**	**No Ice 1/2'' Ice 1'' Ice**	**4.045 4.298 4.557**	**1.535 1.714 1.901**	**0.070 0.097 0.128**
TD-RRH8x20-25 (Carrier 136' P)	**C**	**From Leg**	**4.000 0' 1'**	**0.000**	**136'**	**No Ice 1/2'' Ice 1'' Ice**	**4.045 4.298 4.557**	**1.535 1.714 1.901**	**0.070 0.097 0.128**
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 136' E)	A	From Leg	4.000 0' 1'	0.000	136'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 136' E)	B	From Leg	4.000 0' 1'	0.000	136'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 136' E)	C	From Leg	4.000 0' 1'	0.000	136'	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
IBC1900HG-2A	A	From Leg	4.000	0.000	136'	No Ice	0.966	0.463	0.022
(Carrier 136' E)			0'			1/2" Ice	1.091	0.558	0.030
			0'			1" Ice	1.223	0.660	0.039
IBC1900HG-2A	B	From Leg	4.000	0.000	136'	No Ice	0.966	0.463	0.022
(Carrier 136' E)			0'			1/2" Ice	1.091	0.558	0.030
			0'			1" Ice	1.223	0.660	0.039
IBC1900HG-2A	C	From Leg	4.000	0.000	136'	No Ice	0.966	0.463	0.022
(Carrier 136' E)			0'			1/2" Ice	1.091	0.558	0.030
			0'			1" Ice	1.223	0.660	0.039
IBC1900BB-1	A	From Leg	4.000	0.000	136'	No Ice	0.966	0.463	0.022
(Carrier 136' E)			0'			1/2" Ice	1.091	0.558	0.030
			0'			1" Ice	1.223	0.660	0.039
IBC1900BB-1	B	From Leg	4.000	0.000	136'	No Ice	0.966	0.463	0.022
(Carrier 136' E)			0'			1/2" Ice	1.091	0.558	0.030
			0'			1" Ice	1.223	0.660	0.039
IBC1900BB-1	C	From Leg	4.000	0.000	136'	No Ice	0.966	0.463	0.022
(Carrier 136' E)			0'			1/2" Ice	1.091	0.558	0.030
			0'			1" Ice	1.223	0.660	0.039
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	136'	No Ice	1.425	1.425	0.022
(Carrier 136' E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	136'	No Ice	1.425	1.425	0.022
(Carrier 136' E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	136'	No Ice	1.425	1.425	0.022
(Carrier 136' E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
Platform Mount [LP 405-1]	C	None		0.000	136'	No Ice	20.800	20.800	1.800
(Carrier 136' E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
***									
800MHz 2X50W RRH	A	From Leg	4.000	0.000	134'	No Ice	2.058	1.932	0.064
W/FILTER			0'			1/2" Ice	2.240	2.109	0.086
(Carrier 134' E)			-1'			1" Ice	2.429	2.293	0.111
800MHz 2X50W RRH	B	From Leg	4.000	0.000	134'	No Ice	2.058	1.932	0.064
W/FILTER			0'			1/2" Ice	2.240	2.109	0.086
(Carrier 134' E)			-1'			1" Ice	2.429	2.293	0.111
800MHz 2X50W RRH	C	From Leg	4.000	0.000	134'	No Ice	2.058	1.932	0.064
W/FILTER			0'			1/2" Ice	2.240	2.109	0.086
(Carrier 134' E)			-1'			1" Ice	2.429	2.293	0.111
1900MHz RRH (65MHz)	A	From Leg	4.000	0.000	134'	No Ice	2.313	2.375	0.060
(Carrier 134' E)			0'			1/2" Ice	2.517	2.581	0.084
			0'			1" Ice	2.728	2.794	0.111
1900MHz RRH (65MHz)	B	From Leg	4.000	0.000	134'	No Ice	2.313	2.375	0.060
(Carrier 134' E)			0'			1/2" Ice	2.517	2.581	0.084
			0'			1" Ice	2.728	2.794	0.111
1900MHz RRH (65MHz)	C	From Leg	4.000	0.000	134'	No Ice	2.313	2.375	0.060
(Carrier 134' E)			0'			1/2" Ice	2.517	2.581	0.084
			0'			1" Ice	2.728	2.794	0.111
(2) Pipe Mount [PM 601-3]	C	None		0.000	134'	No Ice	4.390	4.390	0.195
(Carrier 134' E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
***									
(4) DB844H90E-XY w/	A	From Leg	4.000	0.000	127'	No Ice	3.299	4.802	0.032
Mount Pipe			0'			1/2" Ice	3.667	5.416	0.072
(Abandoned 127')			0'			1" Ice	4.035	6.040	0.117
(4) DB844H90E-XY w/	B	From Leg	4.000	0.000	127'	No Ice	3.299	4.802	0.032

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
Mount Pipe			0'			1/2" Ice	3.667	5.416	0.072
(Abandoned 127')			0'			1" Ice	4.035	6.040	0.117
(4) DB844H90E-XY w/	C	From Leg	4.000	0.000	127'	No Ice	3.299	4.802	0.032
Mount Pipe			0'			1/2" Ice	3.667	5.416	0.072
(Abandoned 127')			0'			1" Ice	4.035	6.040	0.117
Sector Mount [SM 410-3]	C	None		0.000	127'	No Ice	23.960	23.960	1.100
(Abandoned 127')						1/2" Ice	34.060	34.060	1.600
						1" Ice	44.160	44.160	2.099
Pipe Mount [PM 601-3]	C	None		0.000	127'	No Ice	4.390	4.390	0.195
(Abandoned 127')						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
***									
ERICSSON AIR 21 B2A B4P	A	From Leg	4.000	0.000	117'	No Ice	6.329	5.642	0.112
w/ Mount Pipe			0'			1/2" Ice	6.775	6.426	0.169
(Carrier 117' E)			2'			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B2A B4P	B	From Leg	4.000	0.000	117'	No Ice	6.329	5.642	0.112
w/ Mount Pipe			0'			1/2" Ice	6.775	6.426	0.169
(Carrier 117' E)			2'			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B2A B4P	C	From Leg	4.000	0.000	117'	No Ice	6.329	5.642	0.112
w/ Mount Pipe			0'			1/2" Ice	6.775	6.426	0.169
(Carrier 117' E)			2'			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B4A B2P	A	From Leg	4.000	0.000	117'	No Ice	6.329	5.642	0.112
w/ Mount Pipe			0'			1/2" Ice	6.775	6.426	0.169
(Carrier 117' E)			2'			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B4A B2P	B	From Leg	4.000	0.000	117'	No Ice	6.329	5.642	0.112
w/ Mount Pipe			0'			1/2" Ice	6.775	6.426	0.169
(Carrier 117' E)			2'			1" Ice	7.214	7.131	0.233
ERICSSON AIR 21 B4A B2P	C	From Leg	4.000	0.000	117'	No Ice	6.329	5.642	0.112
w/ Mount Pipe			0'			1/2" Ice	6.775	6.426	0.169
(Carrier 117' E)			2'			1" Ice	7.214	7.131	0.233
KRY 112 144/1	A	From Leg	4.000	0.000	117'	No Ice	0.350	0.175	0.011
(Carrier 117' E)			0'			1/2" Ice	0.426	0.234	0.014
			2'			1" Ice	0.509	0.301	0.019
KRY 112 144/1	B	From Leg	4.000	0.000	117'	No Ice	0.350	0.175	0.011
(Carrier 117' E)			0'			1/2" Ice	0.426	0.234	0.014
			2'			1" Ice	0.509	0.301	0.019
KRY 112 144/1	C	From Leg	4.000	0.000	117'	No Ice	0.350	0.175	0.011
(Carrier 117' E)			0'			1/2" Ice	0.426	0.234	0.014
			2'			1" Ice	0.509	0.301	0.019
Sector Mount [SM 410-3]	C	None		0.000	117'	No Ice	23.960	23.960	1.100
(Carrier 117' E)						1/2" Ice	34.060	34.060	1.600
						1" Ice	44.160	44.160	2.099
Pipe Mount [PM 601-3]	C	None		0.000	117'	No Ice	4.390	4.390	0.195
(Carrier 117' E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
***									
(2) SBNHH-1D65B	A	From Leg	4.000	0.000	107'	No Ice	8.079	5.342	0.041
(Carrier 107' R)			0'			1/2" Ice	8.535	5.795	0.091
			0'			1" Ice	8.998	6.255	0.147
(2) SBNHH-1D65B	B	From Leg	4.000	0.000	107'	No Ice	8.079	5.342	0.041
(Carrier 107' R)			0'			1/2" Ice	8.535	5.795	0.091
			0'			1" Ice	8.998	6.255	0.147
(2) SBNHH-1D65B	C	From Leg	4.000	0.000	107'	No Ice	8.079	5.342	0.041
(Carrier 107' R)			0'			1/2" Ice	8.535	5.795	0.091
			0'			1" Ice	8.998	6.255	0.147
BXA-70063-6CF-2 w/ Mount	A	From Leg	4.000	0.000	107'	No Ice	7.806	5.801	0.042
Pipe			0'			1/2" Ice	8.357	6.953	0.103

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
(Carrier 107' R)			0'			1" Ice	8.872	7.819	0.171
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	7.806 8.357	5.801 6.953	0.042 0.103
(Carrier 107' R)			0'			1" Ice	8.872	7.819	0.171
BXA-70063-6CF-2 w/ Mount Pipe	C	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	7.806 8.357	5.801 6.953	0.042 0.103
(Carrier 107' R)			0'			1" Ice	8.872	7.819	0.171
B66A RRH4X45	A	From Leg	4.000	0.000	107'	No Ice	2.580	1.630	0.057
(Carrier 107' R)			0'			1/2" Ice	2.794	1.811	0.077
			0'			1" Ice	3.015	1.999	0.101
B66A RRH4X45	B	From Leg	4.000	0.000	107'	No Ice	2.580	1.630	0.057
(Carrier 107' R)			0'			1/2" Ice	2.794	1.811	0.077
			0'			1" Ice	3.015	1.999	0.101
B66A RRH4X45	C	From Leg	4.000	0.000	107'	No Ice	2.580	1.630	0.057
(Carrier 107' R)			0'			1/2" Ice	2.794	1.811	0.077
			0'			1" Ice	3.015	1.999	0.101
RRH2x60-700	A	From Leg	4.000	0.000	107'	No Ice	3.500	1.816	0.060
(Carrier 107' R)			0'			1/2" Ice	3.761	2.052	0.083
			0'			1" Ice	4.029	2.289	0.109
RRH2x60-700	B	From Leg	4.000	0.000	107'	No Ice	3.500	1.816	0.060
(Carrier 107' R)			0'			1/2" Ice	3.761	2.052	0.083
			0'			1" Ice	4.029	2.289	0.109
RRH2x60-700	C	From Leg	4.000	0.000	107'	No Ice	3.500	1.816	0.060
(Carrier 107' R)			0'			1/2" Ice	3.761	2.052	0.083
			0'			1" Ice	4.029	2.289	0.109
RRH2X60-PCS	A	From Leg	4.000	0.000	107'	No Ice	2.200	1.723	0.055
(Carrier 107' R)			0'			1/2" Ice	2.393	1.901	0.075
			0'			1" Ice	2.593	2.087	0.099
RRH2X60-PCS	B	From Leg	4.000	0.000	107'	No Ice	2.200	1.723	0.055
(Carrier 107' R)			0'			1/2" Ice	2.393	1.901	0.075
			0'			1" Ice	2.593	2.087	0.099
RRH2X60-PCS	C	From Leg	4.000	0.000	107'	No Ice	2.200	1.723	0.055
(Carrier 107' R)			0'			1/2" Ice	2.393	1.901	0.075
			0'			1" Ice	2.593	2.087	0.099
RC2DC-3315-PF-48	A	From Leg	4.000	0.000	107'	No Ice	3.792	2.512	0.032
(Carrier 107' R)			0'			1/2" Ice	4.044	2.725	0.063
			0'			1" Ice	4.303	2.945	0.099
RC2DC-3315-PF-48	B	From Leg	4.000	0.000	107'	No Ice	3.792	2.512	0.032
(Carrier 107' R)			0'			1/2" Ice	4.044	2.725	0.063
			0'			1" Ice	4.303	2.945	0.099
BXA-80063/4CF w/ Mount Pipe	A	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	4.945 5.324	3.424 4.022	0.028 0.069
(Carrier 107' E)			0'			1" Ice	5.712	4.637	0.116
BXA-80063/4CF w/ Mount Pipe	B	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	4.945 5.324	3.424 4.022	0.028 0.069
(Carrier 107' E)			0'			1" Ice	5.712	4.637	0.116
BXA-80063/4CF w/ Mount Pipe	C	From Leg	4.000 0'	0.000	107'	No Ice 1/2" Ice	4.945 5.324	3.424 4.022	0.028 0.069
(Carrier 107' E)			0'			1" Ice	5.712	4.637	0.116
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	107'	No Ice	0.314	0.076	0.003
(Carrier 107' E)			0'			1/2" Ice	0.386	0.119	0.005
			0'			1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	107'	No Ice	0.314	0.076	0.003
(Carrier 107' E)			0'			1/2" Ice	0.386	0.119	0.005
			0'			1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	107'	No Ice	0.314	0.076	0.003
(Carrier 107' E)			0'			1/2" Ice	0.386	0.119	0.005

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	0.466	0.169	0.009
Sector Mount [SM 402-3]	C	None		0.000	107'	No Ice	18.910	18.910	0.851
(Carrier 107' E)						1/2" Ice	26.780	26.780	1.233
						1" Ice	34.650	34.650	1.616
***									
AM-X-CD-16-65-00T-RET	A	From Leg	4.000	0.000	97'	No Ice	8.262	6.304	0.074
w/ Mount Pipe			0'			1/2" Ice	8.822	7.479	0.139
(Carrier 97' E)			0'			1" Ice	9.346	8.368	0.212
AM-X-CD-14-65-00T-RET	B	From Leg	4.000	0.000	97'	No Ice	5.232	4.015	0.055
w/ Mount Pipe			0'			1/2" Ice	5.618	4.633	0.100
(Carrier 97' E)			0'			1" Ice	6.012	5.257	0.151
SBNH-1D6565C w/ Mount	C	From Leg	4.000	0.000	97'	No Ice	11.683	9.842	0.094
Pipe			0'			1/2" Ice	12.404	11.366	0.183
(Carrier 97' E)			0'			1" Ice	13.135	12.914	0.283
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	97'	No Ice	5.746	4.254	0.055
(Carrier 97' E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	97'	No Ice	5.746	4.254	0.055
(Carrier 97' E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	97'	No Ice	5.746	4.254	0.055
(Carrier 97' E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
(2) RRUS 11	A	From Leg	4.000	0.000	97'	No Ice	2.784	1.187	0.051
(Carrier 97' E)			0'			1/2" Ice	2.992	1.334	0.071
			0'			1" Ice	3.207	1.490	0.095
(2) RRUS 11	B	From Leg	4.000	0.000	97'	No Ice	2.784	1.187	0.051
(Carrier 97' E)			0'			1/2" Ice	2.992	1.334	0.071
			0'			1" Ice	3.207	1.490	0.095
(2) RRUS 11	C	From Leg	4.000	0.000	97'	No Ice	2.784	1.187	0.051
(Carrier 97' E)			0'			1/2" Ice	2.992	1.334	0.071
			0'			1" Ice	3.207	1.490	0.095
(2) LGP21401	A	From Leg	4.000	0.000	97'	No Ice	1.104	0.207	0.014
(Carrier 97' E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
(2) LGP21401	B	From Leg	4.000	0.000	97'	No Ice	1.104	0.207	0.014
(Carrier 97' E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
(2) LGP21401	C	From Leg	4.000	0.000	97'	No Ice	1.104	0.207	0.014
(Carrier 97' E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
DC6-48-60-18-8F	A	From Leg	4.000	0.000	97'	No Ice	2.200	2.200	0.019
(Carrier 97' E)			0'			1/2" Ice	2.398	2.398	0.041
			0'			1" Ice	2.604	2.604	0.067
T-Arm Mount [TA 702-3]	C	None		0.000	97'	No Ice	5.640	5.640	0.339
(Carrier 97' E)						1/2" Ice	6.550	6.550	0.429
						1" Ice	7.460	7.460	0.519
Pipe Mount [PM 601-3]	C	None		0.000	97'	No Ice	4.390	4.390	0.195
(Carrier 97' E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
***									
800 10504 w/ Mount Pipe	A	From Leg	4.000	0.000	87'	No Ice	3.589	3.178	0.038
(Carrier 87' E)			0'			1/2" Ice	4.007	3.905	0.070
			2'			1" Ice	4.422	4.581	0.109
800 10504 w/ Mount Pipe	B	From Leg	4.000	0.000	87'	No Ice	3.589	3.178	0.038
(Carrier 87' E)			0'			1/2" Ice	4.007	3.905	0.070
			2'			1" Ice	4.422	4.581	0.109

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 10504 w/ Mount Pipe	C	From Leg	4.000	0.000	87'	No Ice	3.589	3.178	0.038
(Carrier 87' E)			0'			1/2" Ice	4.007	3.905	0.070
			2'			1" Ice	4.422	4.581	0.109
860 10118	A	From Leg	4.000	0.000	87'	No Ice	0.150	0.127	0.001
(Carrier 87' E)			0'			1/2" Ice	0.207	0.182	0.003
			0'			1" Ice	0.270	0.243	0.005
860 10118	B	From Leg	4.000	0.000	87'	No Ice	0.150	0.127	0.001
(Carrier 87' E)			0'			1/2" Ice	0.207	0.182	0.003
			0'			1" Ice	0.270	0.243	0.005
860 10118	C	From Leg	4.000	0.000	87'	No Ice	0.150	0.127	0.001
(Carrier 87' E)			0'			1/2" Ice	0.207	0.182	0.003
			0'			1" Ice	0.270	0.243	0.005
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	87'	No Ice	1.425	1.425	0.022
(Carrier 87' E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	87'	No Ice	1.425	1.425	0.022
(Carrier 87' E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	87'	No Ice	1.425	1.425	0.022
(Carrier 87' E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
Sector Mount [SM 104-3]	C	None		0.000	87'	No Ice	30.020	30.020	0.953
(Carrier 87' E)						1/2" Ice	40.480	40.480	1.405
						1" Ice	50.940	50.940	1.857
***									
GPS_A	C	From Leg	3.000	0.000	80'	No Ice	0.255	0.255	0.001
(Carrier 80' E)			0'			1/2" Ice	0.320	0.320	0.005
			1'			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	80'	No Ice	0.850	1.670	0.065
(Carrier 80' E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
***									
GPS_A	B	From Leg	3.000	0.000	72'	No Ice	0.255	0.255	0.001
(Carrier 72' E)			0'			1/2" Ice	0.320	0.320	0.005
			0'			1" Ice	0.393	0.393	0.010
GPS_A	C	From Leg	3.000	0.000	72'	No Ice	0.255	0.255	0.001
(Carrier 72' E)			0'			1/2" Ice	0.320	0.320	0.005
			0'			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	72'	No Ice	0.850	1.670	0.065
(Carrier 72' E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	72'	No Ice	0.850	1.670	0.065
(Carrier 72' E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
***									

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244 + (2) 1.25"	1409.692	2781.804	0.949	0.771	9.790	19.318	6.136

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 105217	2296.236	6131.576	0.573	2.116	7.973	21.290	5.301
Pirod 105218	2425.314	6165.515	0.705	2.123	8.421	21.408	7.216
Pirod 105218	2425.314	6110.124	0.705	2.070	8.421	21.216	7.216
Pirod 105219	2597.910	6072.164	1.060	2.022	9.021	21.084	9.425

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
48	Dead+Wind 270 deg - Service

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	136 - 130	3.901	44	0.257	0.001
T2	130 - 110	3.558	44	0.255	0.002
T3	110 - 106.917	2.489	44	0.232	0.002
T4	106.917 - 104.583	2.321	44	0.227	0.002
T5	104.583 - 102.25	2.209	44	0.222	0.002
T6	102.25 - 99.9167	2.098	44	0.217	0.002
T7	99.9167 - 97.5833	1.991	44	0.211	0.002
T8	97.5833 - 95.25	1.887	44	0.204	0.002
T9	95.25 - 92.9167	1.785	44	0.197	0.002
T10	92.9167 - 90	1.687	44	0.189	0.002
T11	90 - 80	1.568	44	0.179	0.002
T12	80 - 60	1.201	43	0.156	0.001
T13	60 - 40	0.640	43	0.102	0.001
T14	40 - 20	0.275	43	0.064	0.001
T15	20 - 0	0.066	43	0.027	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
136'	APXVTM14-C-120 w/ Mount Pipe	44	3.901	0.257	0.001	23240
134'	800MHz 2X50W RRH W/FILTER	44	3.785	0.256	0.002	23240
127'	(4) DB844H90E-XY w/ Mount Pipe	44	3.393	0.253	0.002	24438
117'	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	44	2.866	0.242	0.002	52605
107'	(2) SBNHH-1D65B	44	2.325	0.227	0.002	8356
97'	AM-X-CD-16-65-00T-RET w/ Mount Pipe	44	1.861	0.202	0.002	21092
87'	800 10504 w/ Mount Pipe	44	1.451	0.170	0.002	18707
80'	GPS_A	43	1.201	0.156	0.001	20606
72'	GPS_A	43	0.951	0.135	0.001	21867

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	136	Leg	A325N	0.563	5	1.520	20.129	0.076 ✔	1	Bolt DS
T2	130	Leg	A325N	0.750	5	9.567	35.785	0.267 ✔	1	Bolt DS
T10	92.9167	Leg	A325N	1.000	6	17.003	53.014	0.321 ✔	1	Bolt Tension
T11	90	Leg	A325N	1.000	6	18.209	53.014	0.343 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	6.738	10.663	0.632 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T12	80	Leg	A325N	1.000	6	24.724	53.014	0.466 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	6.702	10.663	0.629 ✔	1	Member Block Shear
T13	60	Leg	A325N	1.000	6	30.248	53.014	0.571 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	6.318	11.682	0.541 ✔	1	Member Block Shear
T14	40	Leg	A325N	1.000	6	35.093	53.014	0.662 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	6.251	11.682	0.535 ✔	1	Member Block Shear
T15	20	Diagonal	A325N	1.250	1	7.483	20.303	0.369 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	1 1/2	6'	2'6"	80.0 K=1.00	1.767	-6.077	49.803	0.122 [1] ✔
T2	130 - 110	2	20'1/32"	2'4-1/2"	57.0 K=1.00	3.142	-44.172	111.473	0.396 [1] ✔
T3	110 - 106.917	2 1/4	3'1"	2'4"	49.8 K=1.00	3.976	-52.176	149.269	0.350 [1] ✔
T4	106.917 - 104.583	2 1/4	2'4"	2'4"	49.8 K=1.00	3.976	-59.860	149.269	0.401 [1] ✔
T5	104.583 - 102.25	2 1/4	2'4"	2'4"	49.8 K=1.00	3.976	-67.012	149.269	0.449 [1] ✔
T6	102.25 - 99.9167	2 1/4	2'4"	2'4"	49.8 K=1.00	3.976	-74.738	149.269	0.501 [1] ✔
T7	99.9167 - 97.5833	2 1/4	2'4"	2'4"	49.8 K=1.00	3.976	-82.217	149.269	0.551 [1] ✔
T8	97.5833 - 95.25	2 1/4	2'4"	2'4"	49.8 K=1.00	3.976	-90.506	149.269	0.606 [1] ✔
T9	95.25 - 92.9167	2 1/4	2'4"	1'2-3/32"	25.0 K=1.00	3.976	-98.886	170.908	0.579 [1] ✔
T10	92.9167 - 90	2 1/4	2'11"	7"	12.4 K=1.00	3.976	-113.109	176.909	0.639 [1] ✔
T11	90 - 80	Pirod 105244 + (2) 1.25"	10'7/32"	10'7/32"	54.6 K=1.80	6.136	-120.627	222.060	0.543 [1] ✔
T12	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8 K=1.00	5.301	-163.136	214.859	0.759 [1] ✔
T13	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	7.216	-199.843	300.681	0.665 [1] ✔
T14	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	7.216	-232.409	300.681	0.773 [1] ✔
T15	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4 K=1.00	9.425	-261.887	399.868	0.655 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T11	90 - 80	0.5	1'4-5/16"	110.9	276.116	0.196	0.925	3.506	0.265 ✔
T12	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.310	3.335	0.093 ✔
T13	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.171	3.378	0.051 ✔
T14	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.423	3.378	0.125 ✔
T15	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.081	6.958	0.156 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	3/4	4'8-19/32"	2'3-13/32"	131.6 K=0.90	0.442	-1.694	5.763	0.294 [1] ✔
T2	130 - 110	7/8	5'5/8"	2'5-3/8"	120.9 K=0.90	0.601	-4.351	9.300	0.468 [1] ✔
T3	110 - 106.917	1	5'1-11/32"	2'5-19/32"	107.5 K=0.91	0.785	-4.968	15.178	0.327 [1] ✔
T4	106.917 - 104.583	1	5'1-31/32"	2'5-29/32"	107.9 K=0.90	0.785	-4.535	15.088	0.301 [1] ✔
T5	104.583 - 102.25	1	5'2-19/32"	2'6-7/32"	108.8 K=0.90	0.785	-5.006	14.871	0.337 [1] ✔
T6	102.25 - 99.9167	1	5'3-7/32"	2'6-9/16"	110.0 K=0.90	0.785	-4.978	14.594	0.341 [1] ✔
T7	99.9167 - 97.5833	1	5'3-27/32"	2'6-7/8"	111.1 K=0.90	0.785	-4.999	14.334	0.349 [1] ✔
T8	97.5833 - 95.25	1	5'4-15/32"	2'7-3/16"	112.3 K=0.90	0.785	-5.646	14.060	0.402 [1] ✔
T9	95.25 - 92.9167	1	5'5-1/8"	2'7-1/2"	113.4 K=0.90	0.785	-6.134	13.803	0.444 [1] ✔
T10	92.9167 - 90	1	5'5-3/4"	2'7-13/16"	114.5 K=0.90	0.785	-7.154	13.523	0.529 [1] ✔
T11	90 - 80	L 2.5 x 2.5 x 3/16	11'5"	5'2-7/32"	125.7 K=1.00	0.902	-7.351	12.725	0.578 [1] ✔
T12	80 - 60	L 2.5 x 2.5 x 3/16	12'6-1/32"	5'7-17/32"	136.4 K=1.00	0.902	-6.983	10.950	0.638 [1] ✔
T13	60 - 40	L 3 x 3 x 3/16	13'9-9/16"	6'3-15/16"	127.4 K=1.00	1.090	-6.662	14.947	0.446 [1] ✔

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T14	40 - 20	L 3 x 3 x 3/16	15'2-29/32"	7'31/32"	142.6 K=1.00	1.090	-6.742	12.112	0.557 [1] ✔
T15	20 - 0	L 3 x 3 x 5/16	16'9-5/8"	7'10-3/32"	159.7 K=1.00	1.780	-8.262	15.760	0.524 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T2	130 - 110	3/4	4'4-7/16"	4'2-7/16"	188.3 K=0.70	0.442	-0.474	2.816	0.168 [1] ✔
T4	106.917 - 104.583	7/8	4'6-15/16"	4'4-11/16"	168.6 K=0.70	0.601	-0.954	4.779	0.200 [1] ✔
T5	104.583 - 102.25	7/8	4'7-5/8"	4'5-3/8"	170.8 K=0.70	0.601	-0.462	4.657	0.099 [1] ✔
T6	102.25 - 99.9167	7/8	4'8-5/16"	4'6-1/16"	173.0 K=0.70	0.601	-0.691	4.539	0.152 [1] ✔
T7	99.9167 - 97.5833	7/8	4'9-1/32"	4'6-25/32"	175.3 K=0.70	0.601	-0.813	4.421	0.184 [1] ✔
T8	97.5833 - 95.25	7/8	4'9-23/32"	4'7-15/32"	177.5 K=0.70	0.601	-0.665	4.312	0.154 [1] ✔
T9	95.25 - 92.9167	7/8	4'10-7/16"	4'8-3/16"	179.8 K=0.70	0.601	-0.838	4.202	0.199 [1] ✔
T10	92.9167 - 90	7/8	4'11-1/8"	4'8-7/8"	182.0 K=0.70	0.601	-0.871	4.101	0.212 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T9	95.25 - 92.9167	1 1/2	4'10-25/32"	4'8-17/32"	105.5 K=0.70	1.767	-1.713	35.230	0.049 [1] ✔
T10	92.9167 - 90	1 1/2	4'11-15/32"	4'9-7/32"	106.8 K=0.70	1.767	-1.860	34.528	0.054 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	7/8	4'	3'10-1/2"	148.8 K=0.70	0.601	-0.588	6.135	0.096 [1] ✔
T2	130 - 110	7/8	4'5/32"	3'10-5/32"	147.7 K=0.70	0.601	-0.710	6.229	0.114 [1] ✔
T3	110 - 106.917	1	4'6-7/32"	4'3-31/32"	145.5 K=0.70	0.785	-1.611	8.377	0.192 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	7/8	4'	3'10-1/2"	148.8 K=0.70	0.601	-0.647	6.135	0.105 [1] ✔
T2	130 - 110	7/8	4'5-27/32"	4'3-27/32"	165.9 K=0.70	0.601	-2.076	4.935	0.421 [1] ✔
T10	92.9167 - 90	1	4'11-13/16"	4'9-9/16"	161.2 K=0.70	0.785	-1.004	6.827	0.147 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	1 1/2	6'	6"	16.0	1.767	4.969	79.522	0.062 [1] ✔
T2	130 - 110	2	20'1/32"	6"	12.0	2.188	41.265	106.689	0.387 [1 #] ✔
T3	110 - 106.917	2 1/4	3'1"	2'4"	49.8	3.976	44.719	178.924	0.250 [1] ✔
T4	106.917 - 104.583	2 1/4	2'4"	2'4"	49.8	3.976	51.489	178.924	0.288 [1] ✔
T5	104.583 - 102.25	2 1/4	2'4"	2'4"	49.8	3.976	58.424	178.924	0.327 [1] ✔
T6	102.25 - 99.9167	2 1/4	2'4"	2'4"	49.8	3.976	65.938	178.924	0.369 [1] ✔
T7	99.9167 - 97.5833	2 1/4	2'4"	2'4"	49.8	3.976	73.121	178.924	0.409 [1] ✔
T8	97.5833 - 95.25	2 1/4	2'4"	2'4"	49.8	3.976	80.736	178.924	0.451 [1] ✔
T9	95.25 - 92.9167	2 1/4	2'4"	1'1-29/32"	24.7	3.976	88.388	178.924	0.494 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	92.9167 - 90	2 1/4	2'11"	7"	12.4	3.976	102.016	178.924	0.570 [1]
T11	90 - 80	Pirod 105244 + (2) 1.25"	10'7/32"	10'7/32"	35.2	6.136	109.251	276.116	0.396 [1]
T12	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8	5.301	148.345	238.565	0.622 [1]
T13	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4	7.216	181.487	324.713	0.559 [1]
T14	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4	7.216	210.557	324.713	0.648 [1]
T15	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4	9.425	235.849	424.115	0.556 [1]

[1] P_u / ϕP_n controls
[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T11	90 - 80	0.5	1'4-5/16"	110.9	276.116	0.196	0.925	3.506	0.265
T12	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.310	3.335	0.093
T13	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.171	3.378	0.051
T14	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.423	3.378	0.125
T15	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.081	6.958	0.156

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	3/4	4'8-19/32"	2'3-13/32"	146.2	0.442	1.629	19.880	0.082 [1]
T2	130 - 110	7/8	5'5/8"	2'5-3/8"	134.3	0.601	4.390	27.059	0.162 [1]
T3	110 - 106.917	1	5'1-11/32"	2'5-19/32"	118.4	0.785	4.797	35.343	0.136 [1]
T4	106.917 - 104.583	1	5'1-31/32"	2'5-29/32"	119.7	0.785	4.582	35.343	0.130 [1]
T5	104.583 - 102.25	1	5'2-19/32"	2'6-7/32"	120.9	0.785	4.952	35.343	0.140 [1]
T6	102.25 - 99.9167	1	5'3-7/32"	2'6-9/16"	122.2	0.785	4.944	35.343	0.140 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	99.9167 - 97.5833	1	5'3-27/32"	2'6-7/8"	123.4	0.785	4.981	35.343	0.141 [1]
T8	97.5833 - 95.25	1	5'4-15/32"	2'7-3/16"	124.8	0.785	5.561	35.343	0.157 [1]
T9	95.25 - 92.9167	1	5'5-1/8"	2'7-1/2"	126.0	0.785	5.894	35.343	0.167 [1]
T10	92.9167 - 90	1	5'5-3/4"	2'7-13/16"	127.3	0.785	6.840	35.343	0.194 [1]
T11	90 - 80	L 2.5 x 2.5 x 3/16	11'5"	5'2-7/32"	83.2	0.518	6.738	22.546	0.299 [1]
T12	80 - 60	L 2.5 x 2.5 x 3/16	11'11-5/32"	5'4-19/32"	86.2	0.518	6.702	22.546	0.297 [1]
T13	60 - 40	L 3 x 3 x 3/16	13'1-17/32"	6'3/16"	79.5	0.659	6.318	28.679	0.220 [1]
T14	40 - 20	L 3 x 3 x 3/16	14'6-1/32"	6'8-23/32"	88.6	0.659	6.251	28.679	0.218 [1]
T15	20 - 0	L 3 x 3 x 5/16	16'9-5/8"	7'10-3/32"	105.3	1.013	7.483	44.054	0.170 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	3/4	4'	3'10-1/2"	248.0	0.442	0.184	19.880	0.009 [1]
T2	130 - 110	3/4	4'4-7/16"	4'2-7/16"	268.9	0.442	0.639	19.880	0.032 [1]
T4	106.917 - 104.583	7/8	4'6-15/16"	4'4-11/16"	240.9	0.601	1.171	27.059	0.043 [1]
T5	104.583 - 102.25	7/8	4'7-5/8"	4'5-3/8"	244.0	0.601	0.658	27.059	0.024 [1]
T6	102.25 - 99.9167	7/8	4'8-5/16"	4'6-1/16"	247.1	0.601	0.917	27.059	0.034 [1]
T7	99.9167 - 97.5833	7/8	4'9-1/32"	4'6-25/32"	250.4	0.601	1.023	27.059	0.038 [1]
T8	97.5833 - 95.25	7/8	4'9-23/32"	4'7-15/32"	253.6	0.601	0.902	27.059	0.033 [1]
T9	95.25 - 92.9167	7/8	4'10-7/16"	4'8-3/16"	256.9	0.601	1.048	27.059	0.039 [1]
T10	92.9167 - 90	7/8	4'11-1/8"	4'8-7/8"	260.0	0.601	1.144	27.059	0.042 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	95.25 - 92.9167	1 1/2	4'10-25/32"	4'8-17/32"	150.7	1.767	1.713	79.522	0.022 [1] ✔
T10	92.9167 - 90	1 1/2	4'11-15/32"	4'9-7/32"	152.6	1.767	1.860	79.522	0.023 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	7/8	4'	3'10-1/2"	212.6	0.601	0.579	27.059	0.021 [1] ✔
T2	130 - 110	7/8	4'5/32"	3'10-5/32"	211.0	0.601	0.718	27.059	0.027 [1] ✔
T3	110 - 106.917	1	4'6-7/32"	4'3-31/32"	207.9	0.785	1.750	35.343	0.050 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	136 - 130	7/8	4'	3'10-1/2"	212.6	0.601	0.710	27.059	0.026 [1] ✔
T2	130 - 110	7/8	4'5-27/32"	4'3-27/32"	237.0	0.601	2.022	27.059	0.075 [1] ✔
T10	92.9167 - 90	1	4'11-13/16"	4'9-9/16"	230.3	0.785	1.139	35.343	0.032 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	136 - 130	Leg	1 1/2	2	-6.077	49.803	12.2	Pass
T2	130 - 110	Leg	2	24	-44.172	111.473	39.6	Pass
T3	110 - 106.917	Leg	2 1/4	89	-52.176	149.269	35.0	Pass
T4	106.917 - 104.583	Leg	2 1/4	101	-59.860	149.269	40.1	Pass
T5	104.583 - 102.25	Leg	2 1/4	110	-67.012	149.269	44.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T6	102.25 - 99.9167	Leg	2 1/4	121	-74.738	149.269	50.1	Pass
T7	99.9167 - 97.5833	Leg	2 1/4	130	-82.217	149.269	55.1	Pass
T8	97.5833 - 95.25	Leg	2 1/4	141	-90.506	149.269	60.6	Pass
T9	95.25 - 92.9167	Leg	2 1/4	150	-98.886	170.908	57.9	Pass
T10	92.9167 - 90	Leg	2 1/4	165	-113.109	176.909	63.9	Pass
T11	90 - 80	Leg	Pirod 105244 + (2) 1.25"	183	-120.627	222.060	54.3	Pass
T12	80 - 60	Leg	Pirod 105217	192	-163.136	214.859	75.9	Pass
T13	60 - 40	Leg	Pirod 105218	207	-199.843	300.681	66.5	Pass
T14	40 - 20	Leg	Pirod 105218	222	-232.409	300.681	77.3	Pass
T15	20 - 0	Leg	Pirod 105219	237	-261.887	399.868	65.5	Pass
T1	136 - 130	Diagonal	3/4	10	-1.694	5.763	29.4	Pass
T2	130 - 110	Diagonal	7/8	35	-4.351	9.300	46.8	Pass
T3	110 - 106.917	Diagonal	1	95	-4.968	15.178	32.7	Pass
T4	106.917 - 104.583	Diagonal	1	106	-4.535	15.088	30.1	Pass
T5	104.583 - 102.25	Diagonal	1	116	-5.006	14.871	33.7	Pass
T6	102.25 - 99.9167	Diagonal	1	125	-4.978	14.594	34.1	Pass
T7	99.9167 - 97.5833	Diagonal	1	136	-4.999	14.334	34.9	Pass
T8	97.5833 - 95.25	Diagonal	1	148	-5.646	14.060	40.2	Pass
T9	95.25 - 92.9167	Diagonal	1	159	-6.134	13.803	44.4	Pass
T10	92.9167 - 90	Diagonal	1	178	-7.154	13.523	52.9	Pass
T11	90 - 80	Diagonal	L 2.5 x 2.5 x 3/16	190	-7.351	12.725	57.8 63.2 (b)	Pass
T12	80 - 60	Diagonal	L 2.5 x 2.5 x 3/16	198	-6.983	10.950	63.8	Pass
T13	60 - 40	Diagonal	L 3 x 3 x 3/16	209	-6.662	14.947	44.6 54.1 (b)	Pass
T14	40 - 20	Diagonal	L 3 x 3 x 3/16	224	-6.742	12.112	55.7	Pass
T15	20 - 0	Diagonal	L 3 x 3 x 5/16	239	-8.262	15.760	52.4	Pass
T1	136 - 130	Horizontal	3/4	16	0.184	19.880	0.9	Pass
T2	130 - 110	Horizontal	3/4	45	-0.474	2.816	16.8	Pass
T4	106.917 - 104.583	Horizontal	7/8	102	-0.954	4.779	20.0	Pass
T5	104.583 - 102.25	Horizontal	7/8	112	-0.462	4.657	9.9	Pass
T6	102.25 - 99.9167	Horizontal	7/8	122	-0.691	4.539	15.2	Pass
T7	99.9167 - 97.5833	Horizontal	7/8	132	-0.813	4.421	18.4	Pass
T8	97.5833 - 95.25	Horizontal	7/8	142	-0.665	4.312	15.4	Pass
T9	95.25 - 92.9167	Horizontal	7/8	152	-0.838	4.202	19.9	Pass
T10	92.9167 - 90	Horizontal	7/8	169	-0.871	4.101	21.2	Pass
T9	95.25 - 92.9167	Secondary Horizontal	1 1/2	161	-1.713	35.230	4.9	Pass
T10	92.9167 - 90	Secondary Horizontal	1 1/2	179	-1.860	34.528	5.4	Pass
T1	136 - 130	Top Girt	7/8	5	-0.588	6.135	9.6	Pass
T2	130 - 110	Top Girt	7/8	28	-0.710	6.229	11.4	Pass
T3	110 - 106.917	Top Girt	1	91	-1.611	8.377	19.2	Pass
T1	136 - 130	Bottom Girt	7/8	9	-0.647	6.135	10.5	Pass
T2	130 - 110	Bottom Girt	7/8	31	-2.076	4.935	42.1	Pass
T10	92.9167 - 90	Bottom Girt	1	170	-1.004	6.827	14.7	Pass
						Summary		
						Leg (T14)	77.3	Pass
						Diagonal (T12)	63.8	Pass
						Horizontal (T10)	21.2	Pass
						Secondary Horizontal (T10)	5.4	Pass
						Top Girt (T3)	19.2	Pass
						Bottom Girt	42.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T2) Bolt Checks	66.2	Pass
						RATING =	**77.3**	**Pass**

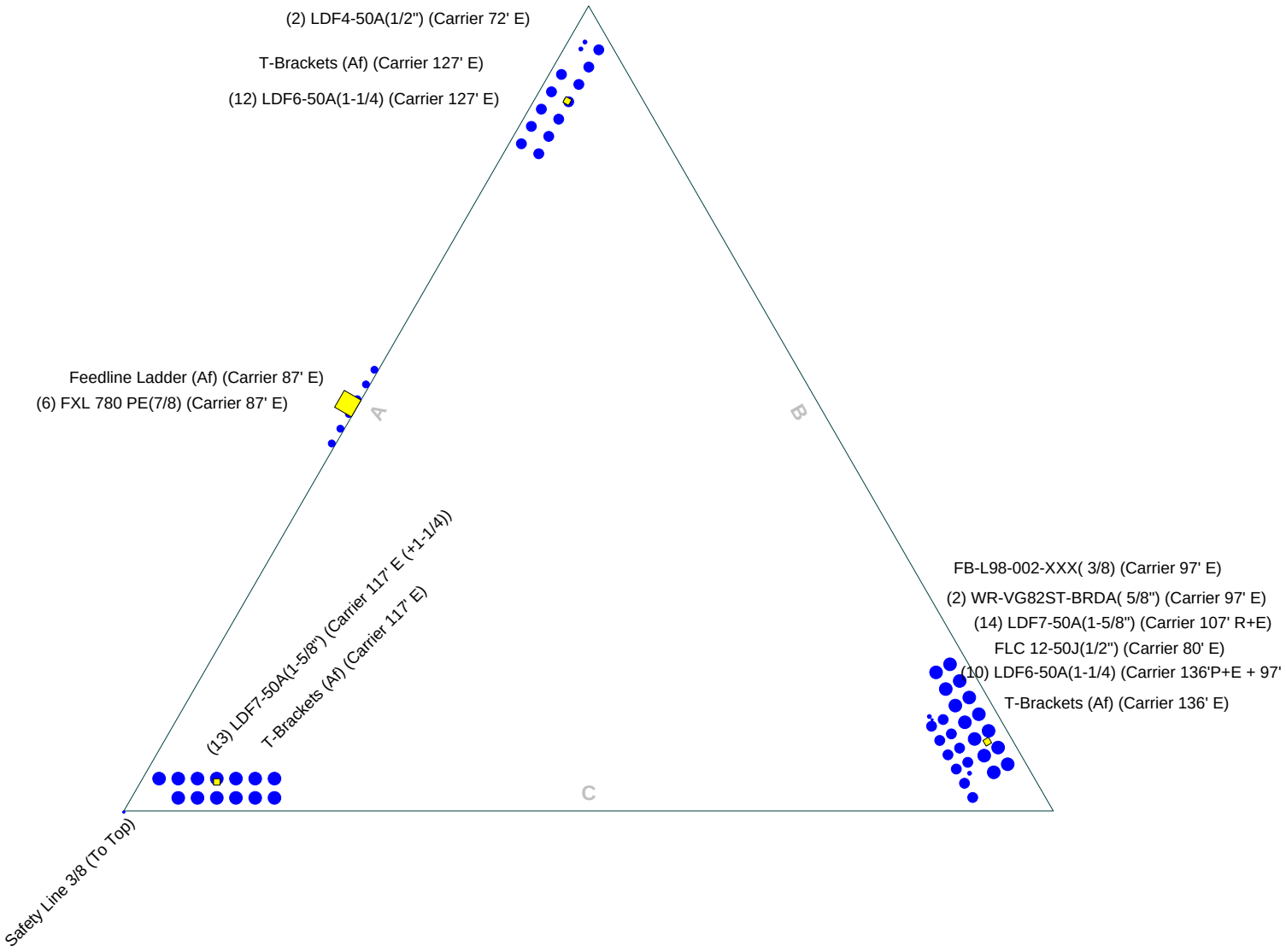
APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face Truss-Leg

LEG A (340°)



Pier Structural Engineering Corp
198-55 Northfield Drive East
Waterloo, ON N2K 3T6
Phone: (519) 885-3806
FAX: (519) 884-3806

Job: ***PSEC 16435 (for SPRINT PCS)***			
Project: ***BU 876338 - WATERFORD***			
Client: Crown Castle	Drawn by: JAR	App'd:	
Code: TIA-222-G	Date: 07/31/17	Scale: NTS	
Path: H:\PROJECTS\JOB 16000 - 16999\16400 - 16499\16435 - CCI - 876338 - WATERFORD\876338_LC7_20170728.dwl		Dwg No. E-7	

APPENDIX C

ADDITIONAL CALCULATIONS

PIER STRUCTURAL ENGINEERING CORP.

STRUCTURAL REVIEW OF ANCHOR RODS PER TIA-222-G CLAUSE 4.9.9

Site ID # 876338
Site Name WATERFORD
PSEC # 16435
Date 1-Aug-2017
Pg 1 of 1

ANCHOR ROD EVALUATION

Fill in blue text only — *Per ANSI/TIA-222-G*

A) TOWER REACTIONS

		LRFD	
Download	=	271.0	kips
Shear	=	26.0	kips
Uplift	=	244.0	kips
Shear	=	24.0	kips

Anchor Rod Capacity

49.5%

B) ANCHOR ROD PARAMETERS

Quantity	=	6	
Diameter	=	1.250	in *(OD)*
Type	=	A687	
Grade Fu	=	125.0	ksi
Grade Fy	=	105.0	ksi
Threads	=	7	#/in *(per UNC)*
Area An	=	0.969	in²
Detail Type	=	(c)	
η	=	0.55	

Distance from top of concrete to bottom of base plate in field

Pick Detail type from list: *(see fig 4-4 for further info)*

(a) Countersunk in concrete
(b) Flush with concrete
(c) Grouted above concrete
(d) Above Concrete (no grout)

C) ANCHOR ROD CALCULATIONS

i. Cl. 4.9.9 Anchor Rods

The following interaction equation shall be satisfied:

$$\frac{Pu + Vu/\eta}{\phi Rnt} \leq 1$$

where:

ϕ	=	0.80	
(Pu based on uplift force) Pu	=	40.67	kips/rod
Vu	=	4.00	kips/rod
ϕRnt	=	96.91	kips (cl.4.9.6.1)

Formula 1 = 0.495 *49.5%* ***Pass per Clause 4.9.9***

ii. Cross Check to How tnxTower Calculates capacity (based on AISC 13th Ed)

Pu = 40.67 kips/rod *(Tension only check)*

Formula 2 = ϕ Rn = ϕ Fnt Ab = 0.75 x (0.75 x 125.0ksi) x 1.227in² = 86.3 ksi

= 0.471 *47.1%* ***Pass per AISC Tension Check***

PROJECT No:	16435	**ENG:**	DO
PROJECT NAME:	876338 - WATERFORD Crown Castle	**CHK:**	SH
DATE:	8/1/2017 12:27	**PAGE:**	of

TIA-222-G

SINGLE GLOBAL FOUNDATION WITH PIER(s) CHECKS - SELF SUPPORT

Global Tower Reactions	*Factored Loads*		*Calculated Reactions*		**Factored Resistance**					**SF=2.52**
Code Rev TIA-G	Maximum Moment	**3,113.00**	k-ft	Disturbing Moment	**3,448.9**	**4,338.4**	k-ft	**PASS**	**79.5%**	**[GOVERNS]**
	Axial Load	**44.00**	kips	Maximum Bearing	**2.80**	**6.56**	kips	**PASS**	**42.7%**	
	Shear Load	**38.00**	kips	Lateral (Sliding)	**38.0**	**225.1**	kips	**PASS**	**16.9%**	
				Pad Shear	**229.1**	**778.1**	kips	**PASS**	**29.4%**	
				Punching Shear	**275.1**	**1,245.4**	kips	**PASS**	**22.1%**	
Individual Leg Reactions										
	Download	**271.00**	kips	Shear	**26.00**	kips				
	Uplift	**244.00**	kips	Shear	**24.00**	kips				
	Pier Rebar Check (Comp)	**84.5**	k-ft	Flexural Capacity		**860.2**	k-ft	**PASS**	**9.8%**	
	Pier Rebar Check (Ten)	**78.0**	k-ft	Flexural Capacity		**480.0**	k-ft	**PASS**	**16.3%**	
	Pad Rebar Required	**(12) # 9 @ 24.00 in**		Actual Pad Rebar		**(46) # 9 bars**		**PASS**	**20.9%**	

Soil Parameters	**Soils Report**		**Pier Geometry**			**Pad Geometry**	
Cohesion	**0.0** psf	(0.0 kPa)	Qty of Piers	**3**		Width (Bm)	**23.00** ft
ϕ	**36.0** °		Width (Bp)	**3.00** ft		Width (Wm)	**23.00** ft
Frost/Ignored depth	**3.30** ft	(1.01 m)	Piers c/c	**14.00** ft		Height (Hm)	**3.25** ft
Water Level	**35.00** ft	(10.67 m)	Height (Hp)	**3.25** ft		Depth (D)	**6.00** ft
Soil Dry Density (γ_{dry})	**0.125** kcf	(19.6 kN/m^3)	Pier above grade	**0.50** ft		CofG Diff.	**2.02** ft
Soil Sub Density (γ_{sub})	**0.063** kcf	(9.83 kN/m^3)	Pier Type	**R**	(Rnd or Sq)	☐ Check if Mat is a Square Bell	
All. Bearing Pressure	**4.375** ksf	(209.5 kPa)	☐ (use equivalent square for pad flexure)			(This is for small foundations)	
Bearing Safety Factor	**2**		**Rebar**	**Pier**			**Pad**
Concrete Parameters			Rebar Type	**ASTM**			**ASTM**
f'c	**3.000** ksi	(20.7 MPa)	Cover to Tie	**3.00** inches		Bar Size	**9**
fy	**60.00** ksi	(413.7 MPa)	Pier Tie Size	**4**		Bar Qty	**46**
Dry Density (γ_{dry})	**0.150** kcf	(23.6k kN/m^3)	Pier Vertical Size	**8**		Pad bar qty is one layer in one direction	
Sub Density (γ_{sub})	0.088 kcf	(13.8 kN/m^3)	Pier Vertical Qty	**15**	1.16%		

Volume of Concrete/Soil	**Concrete (66.2cuyd)** 3 Piers	Mat	Soil	
Depth (above)	0.50	--	--	ft
Depth (dry)	2.75	3.25	2.75	ft
Depth (submerged)	0.00	0.00	0.00	ft
Volume (above)	10.60	--	--	ft^3
Volume (dry)	58.32	1,719.25	1663.82	ft^3
Volume (submerged)	0.00	0	0.00	ft^3
Total	**69**	**1719**	**1664**	ft^3

Calculations		*TIA-G Method*	*EIA-F Method*	
Axial Download	(factored)	44.0	--	kips
Wgt of Concrete	(not factored)	268.2	--	kips
Wgt of Soil	(not factored)	174.6	--	kips
Total Download (P_1)	(1.2D No wdg)	**575.3**	--	kips
Total Download (P_2)	(0.9D No wdg)	**431.5**	--	kips
Passive Force Moment		**30.9**	--	k-ft

Pad Flexure				
Distance *(edge to pier)*	7.979	ft		
B' = 3/2(B-2e)	10.522	ft		
Force	266.0	kips		
Disturbing Moment	**1399.56**	kip-ft		
Ku	51.68		**Wgt of Rebar**	
ρ	0.00097		**14,813**	**lbs**
4/3•ρ if ρ < ρ min	0.00129			
ρ min ≥ 0.0018	0.00180		**12**	Qty
As Required (based on ρ)	12.209	in²	**24.00**	in c/c
As Actual	46.000	in² ϕMn=	**6,697**	kip-ft
			20.9%	

Note: The moment is derived from a moment diagram that considers the ortho qmax trapezoidal distribution underneath the pad to edge of square pier.

Bearing Capacity Check			
Calculate ecc e = M/P_1 (1.2D+1.6W)	5.75	--	ft
1) q_{max} = Ortho Direction	**2.18**	--	ksf
2) q_{max} = Diagonal Direction	**2.60**	--	ksf
Calculate ecc e = M/P_1 (0.9D+1.6W)	7.32	--	ft
1) q_{max} = Ortho Direction	**2.33**	--	ksf
2) q_{max} = Diagonal Direction	**2.80**	--	ksf
q factored	6.56	--	ksf
	(2 • 0.75)		

Overturning Stability Check			
a) Resisting Moment Arm (d)	**11.5**	--	ft
a) Moment Resistance = P_2 x d	**5344.4**	--	k-ft
a) Disturbing Moment (about edge)	**3448.9**	--	k-ft
b) Moment Resistance (ortho)	**4338.4**	--	k-ft
b) Moment Resistance (diagonal)	**4596.3**	--	k-ft
b) Disturbing Moment (about center)	**3448.9**	--	k-ft

Check for 1-Way Shear			
Shear Area (b x d) =	65.77	--	ft²
Factored shear force =	229.07	--	kips
Factored shear resistance	**778.1**	--	kips

Check for 2-Way Shear (Punching)			
Shear Area (b_o x d)	52.63	--	ft²
Factored Shear Force	275.14	--	kips
Factored Shear Resistance	**1245.4**	--	kips
Check for 2-way Shear	**0.22**	--	

PIER STRUCTURAL ENGINEERING CORP.

BUILT-UP "TRUSS LEG" CHECKS (Both ASD & LRFD)

Site ID # 876338
Site Name WATERFORD
PSEC # 16435
Date 1-Aug-2017
Pg 1 of 1

BUILT-UP "TRUSS LEG" CHECKS

Reviewed to ANSI/TIA/EIA-222-F and AISC Section H (ASD method)
Reviewed to ANSI/TIA-222-G, Section 4.8 (LRFD method)

STANDARD	Rev G		
ELEVATION	80' - 90'	Leg	
FORCE	Pu = 120.63	kips - LRFD	
INCLUDE MOMENT?	No	Exclude the built up eccentricity in results	

54.3%

Existing Truss Leg Member			Added Truss Leg System			Combined Member		
Desciption	PIROD 10544		Desciption	(2) 1.25" SR		Desciption	PIROD 10544 + (2) 1.25" SR	
Size	(3) 1.25" (12x15)		Size	(2) 1.25" SR				
Type	Truss Leg		Type	Solid Round		Type	Solid Round	
F_{yp}	50.0	ksi	F_{ysp}	50.0	ksi	F_{yavg}	50.0	ksi
w_p / t_p	1.2500	in	w_p / t_p	1.2500	in	w_{avg} / t_{avg}	1.6137	in
Area	3.68155	in²	Area	2.45437	in²	Area	6.13592	in²
PH (Internal)	14.1875	in	rxx	0.31250	in	rxx	3.96574	in
FW (Internal)	12.0000	in	ryy	3.93259	in	ryy	4.54364	in
r (Internal)	0.3125	in	Ixx	0.23968	in⁴ *(from ACAD)*	Ixx	96.50005	in⁴ *(from ACAD)*
			Iyy	37.95743	in⁴ *(from ACAD)*	Iyy	126.67425	in⁴ *(from ACAD)*
r (global)	4.9089	in	h (c/c)	2.26330	in *(from ACAD)*	e	0.90532	in *(from ACAD)*
I (global)	88.7168	in⁴	Conn.Type	Snug-Tight				
				Mid Span	*At Gusset*			
Lx	120.22	in	Lx	14.1875	13.0000 in	Lx	120.22	in
Ly	120.22	in	Ly	14.1875	13.0000 in	Ly	120.22	in
								x-check KL/r
(KL/r)local	45.400		(a/r)x	45.400	13.1139	(KL/r)ox	30.314	*a/rx TOLERABLE*
(KL/r)y	24.490		(a/r)y	3.608	$(\alpha i^2)x$	(KL/r)oy	26.459	*a/ry PASS*
						(KL/r)m	54.591	
			*FIX X SPACING LENGTH **			K modified	1.801	*(TNX Input)*

** Note, we considered PIROD designed system adequate*

ASD AXIAL CAPACITIES:

	Existing Truss Leg Member		Added Truss Leg System		Combined Member			
					Combined Axial Values			
	S/R		*S/Rreinf*		*S/R*	*S/Rreinf*	*Total*	*Calculated*
F'y	50.00 ksi		50.00 ksi		50.00	50.00	50.00	50.00
	AISC 13th	*AISC 9th*					*AISC 13th*	*AISC 9th*
Fcr / Ωc	25.75	25.05 ksi	25.75 ksi		24.08	24.08	24.08	23.62 ksi
Pa	94.81	92.23 kips	63.20 kips		88.64	59.10	147.74	144.93 kips
4/3 Pa	126.41	122.97 kips	84.27 kips		118.19	78.80	196.99	193.24 kips

LRFD AXIAL CAPACITIES:

	Existing Truss Leg Member	Added Truss Leg System	Combined Member			
	S/R	*S/Rreinf*	*S/R*	*S/Rreinf*	*Total*	*Calculated*
F'y	50.00 ksi	50.00 ksi	50.00	50.00	50.00	50.00
	AISC 13th					
φFcr	38.70 ksi	38.70 ksi	36.19	36.19	36.19	
			Built-up	*Built-up*	*Built-up*	
φPn	142.49 kips	φPn *mid* 94.99 kips	φPn	133.23	88.82	222.05
	84.7%	φPn *guss* 97.32 kips				54.3%
Pu *leg*	72.38 kips	Pu *reinf* 48.25 kips				
	50.8%	49.6%			*Original Leg Governs*	54.3%

ADD MOMENT CAPACITIES (LRFD):

Check Combine Axial + Moment Capacity:

Mu	109.21 k-in	φMn	9032 k-in
Pu / φPn	0.543	*Use cl. 4.8.1.1 a*	
Mu / φMn	0.012		
B1	1.069		54.3%
			LRFD

Revised 9/25/2014

PiROD 105244 c/w (2) 1–1/4" SR

(3) 1.25" (12" TRUSS)

---------- REGIONS ----------

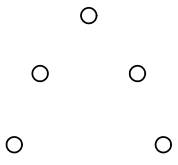
Area: 3.68155 sq in
Perimeter: 11.78097 in
Bounding box: X: −6.62500 -- 6.62500 in
Y: −4.08910 -- 7.55320 in
Centroid: X: 0.00000 in
Y: 0.00000 in
Moments of inertia: X: 88.71682 sq in sq in
Y: 88.71682 sq in sq in
Product of inertia: XY: 0.00000 sq in sq in
Radii of gyration: X: 4.90894 in
Y: 4.90894 in
Principal moments (sq in sq in) and X–Y directions about centroid:
I: 88.71682 along [1.00000 0.00000]
J: 88.71682 along [0.00000 1.00000]

(2) 1.25"
(h = 2.26330")

---------- REGIONS ----------

Area: 2.45437 sq in
Perimeter: 7.85398 in
Bounding box: X: −4.54515 -- 4.54515 in
Y: −0.62500 -- 0.62500 in
Centroid: X: 0.00000 in
Y: 0.00000 in
Moments of inertia: X: 0.23968 sq in sq in
Y: 37.95743 sq in sq in
Product of inertia: XY: 0.00000 sq in sq in
Radii of gyration: X: 0.31250 in
Y: 3.93259 in
Principal moments (sq in sq in) and X–Y directions about centroid:
I: 0.23968 along [1.00000 0.00000]
J: 37.95743 along [0.00000 1.00000]

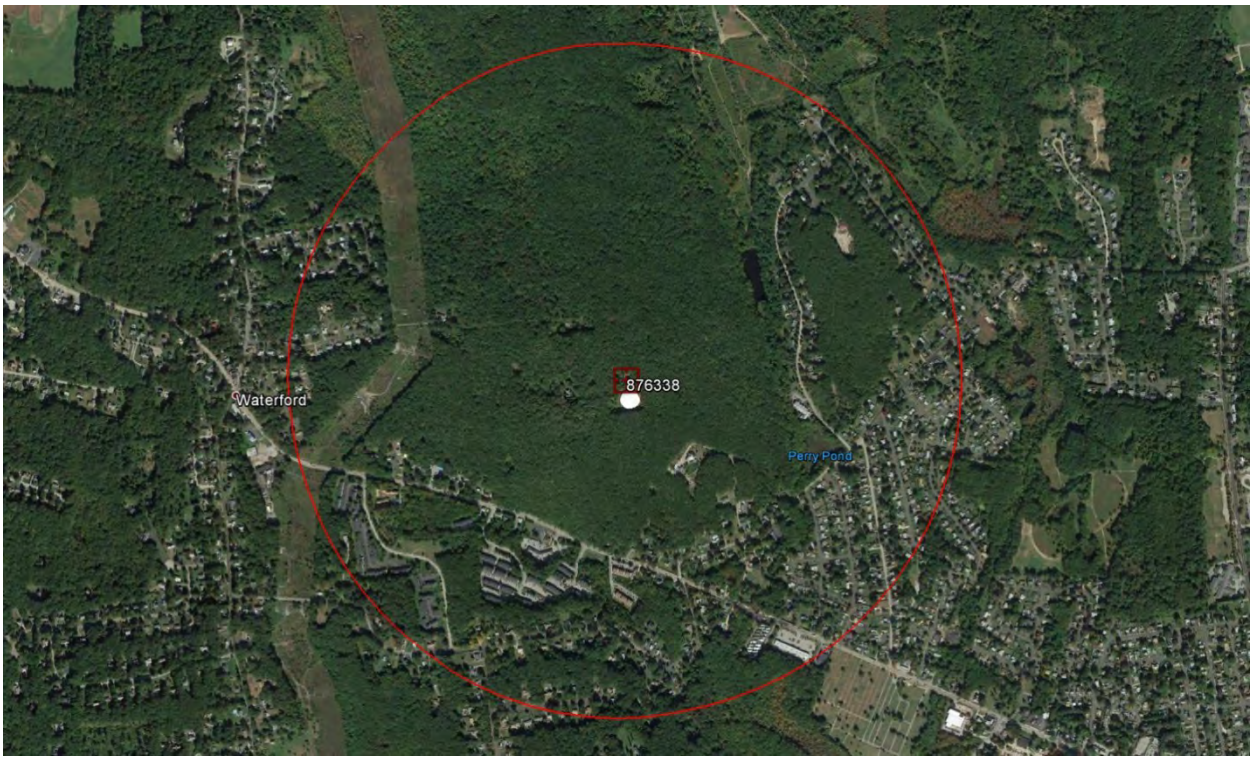
(3) 1.75" (12" TRUSS)
+ (2) 1.50"
(e = 0.90532")



---------- REGIONS ----------

Area: 6.13592 sq in
Perimeter: 19.63495 in
Bounding box: X: −6.62500 -- 6.62500 in
Y: −4.99442 -- 6.64788 in
Centroid: X: 0.00000 in
Y: 0.00000 in
Moments of inertia: X: 96.50005 sq in sq in
Y: 126.67425 sq in sq in
Product of inertia: XY: 0.00000 sq in sq in
Radii of gyration: X: 3.96574 in
Y: 4.54364 in
Principal moments (sq in sq in) and X–Y directions about centroid:
I: 96.50005 along [1.00000 0.00000]
J: 126.67425 along [0.00000 1.00000]

876338 – WATERFORD
Exposure Category B, Topographic Category 1



BU: 876338
WATERFORD
50mph c/w 0.75" Ice

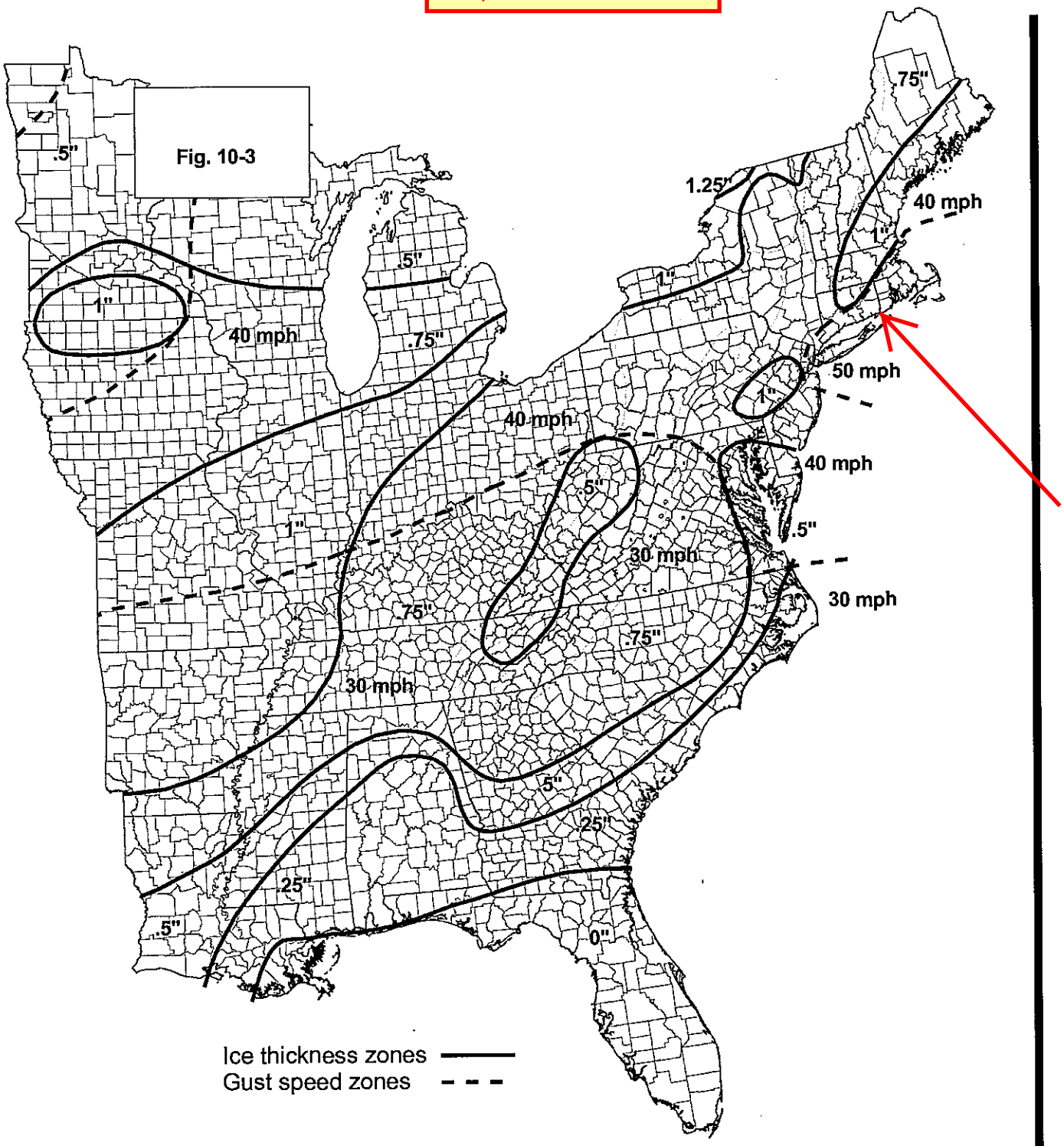


FIGURE 10-2 (continued) 50-YEAR MEAN RECURRENCE INTERVAL UNIFORM ICE THICKNESSES DUE TO FREEZING RAIN WITH CONCURRENT 3-SECOND GUST SPEEDS: CONTIGUOUS 48 STATES.

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT03XC105

Waterford
41 Manitock Hill Road
Waterford, CT 06385

August 21, 2017

EBI Project Number: 6217003716

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**13.20 %**

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

EBI Consulting
environmental | engineering | due diligence

August 21, 2017

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

Emissions Analysis for Site: **CT03XC105 – Waterford**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **41 Manitock Hill Road, Waterford, 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.

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 **41 Manitock Hill Road, Waterford, 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, 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 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **137 feet** above ground level (AGL) for **Sector A**, **137 feet** above ground level (AGL) for **Sector B** and **137 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

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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:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**137 feet**	Height (AGL):	**137 feet**	Height (AGL):	**137 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):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**1.79 %**	Antenna B1 MPE%	**1.79 %**	Antenna C1 MPE%	**1.79 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**137 feet**	Height (AGL):	**137 feet**	Height (AGL):	**137 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%	**1.30 %**	Antenna B2 MPE%	**1.30 %**	Antenna C2 MPE%	**1.30 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.09 %**
Nextel	0.39 %
MetroPCS	0.69 %
AT&T	2.42 %
Verizon Wireless	6.58 %
T-Mobile	0.03 %
Site Total MPE %:	**13.20 %**

SPRINT Sector A Total:	3.09 %
SPRINT Sector B Total:	3.09 %
SPRINT Sector C Total:	3.09 %
Site Total:	13.20 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	137	0.92	850 MHz	567	0.16%
Sprint 850 MHz LTE	2	437.55	137	1.83	850 MHz	567	0.32%
Sprint 1900 MHz (PCS) CDMA	5	622.47	137	6.52	1900 MHz (PCS)	1000	0.65%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	137	6.52	1900 MHz (PCS)	1000	0.65%
Sprint 2500 MHz (BRS) LTE	8	778.09	137	13.04	2500 MHz (BRS)	1000	1.30%
						Total*:	**3.09%**

*NOTE: Totals may vary by 0.01% due to summing of remainders

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:	3.09 %
Sector B:	3.09 %
Sector C:	3.09 %
SPRINT Maximum Total (per sector):	3.09 %
Site Total:	13.20 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.20 %** 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.