



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

August 10, 2017

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

**RE: Notice of Exempt Modification for Sprint 2.5 Rework Crown Site BU: 876309**  
**Sprint Site ID: CT03XC004**  
**311 Old Gate Lane, Milford, CT 06460**  
**Latitude: 41° 14' 2.59"/ Longitude: -73° 1' 22.40"**

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 120-foot level of the existing 120-foot monopole at 311 Old Gate Lane in Milford, CT. The tower is owned by Crown Castle. The property is owned by BVS Jai Alai LLC. Sprint intends to install three (3) antennas, three (3) RRHs, and one (1) hybrid cable.

A request for original zoning documents was sent to the City of Milford but has not been answered.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Benjamin G. Blake, Mayor, City of Milford, the Planning & Zoning Commission, as well as the property owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

**The Foundation for a Wireless World.**

CrownCastle.com

Melanie A. Bachman

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

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

Sincerely,

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

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Benjamin G. Blake, Mayor  
110 River Street  
Milford, CT 06460

Planning & Zoning  
70 West River St  
Milford, CT 06460

BVS Jai Alai LLC  
1720 Post Road  
Fairfield, CT 06824



Property Information

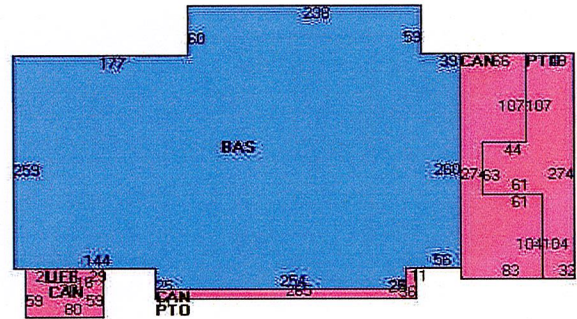
Property Location	311 OLD GATE LN #UNIT 1
Owner	BVS JAI ALAI LLC
Co-Owner	
Mailing Address	1720 POST RD FAIRFIELD CT 06824
Land Use	3210 HRDWARE ST
Land Class	C
Zoning Code	ID
Census Tract	1511

Neighborhood	F
Acreage	15.29
Utilities	All Public,Public Sewer
Lot Setting/Desc	Level
Additional Info	

Photo



Sketch



Primary Construction Details

Year Built	2007
Stories	1
Building Style	Store
Building Use	Commercial
Building Condition	AVERAGE
Floors	Concr-Finished
Total Rooms	

Bedrooms	
Full Bathrooms	2.5
Half Bathrooms	
Bath Style	n/a
Kitchen Style	n/a
Roof Style	Flat
Roof Cover	Tar & Gravel

Exterior Walls	Stucco/Masonry
Interior Walls	Minim/Masonry
Heating Type	Forced Air-Duc
Heating Fuel	Gas
AC Type	Central
Gross Bldg Area	180865
Total Living Area	138255



Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	4507760	3155430
Extras	202660	141860
Improvements		
Outbuildings	624380	437070
Land	12232000	8562400
Total	17566800	12296760

Outbuilding and Extra Items

Type	Description
PAVING-ASPHALT	450000 S.F.
SPRINKLERS-WET	138255 S.F.
LOAD LEVELERS	3 UNITS
EXTRA PLUM FIX	7 1

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	138255	138255
Canopy	24510	0
Patio	17620	0
First Floor, Unfinished	480	0
Total Area	180865	138255

Sales History

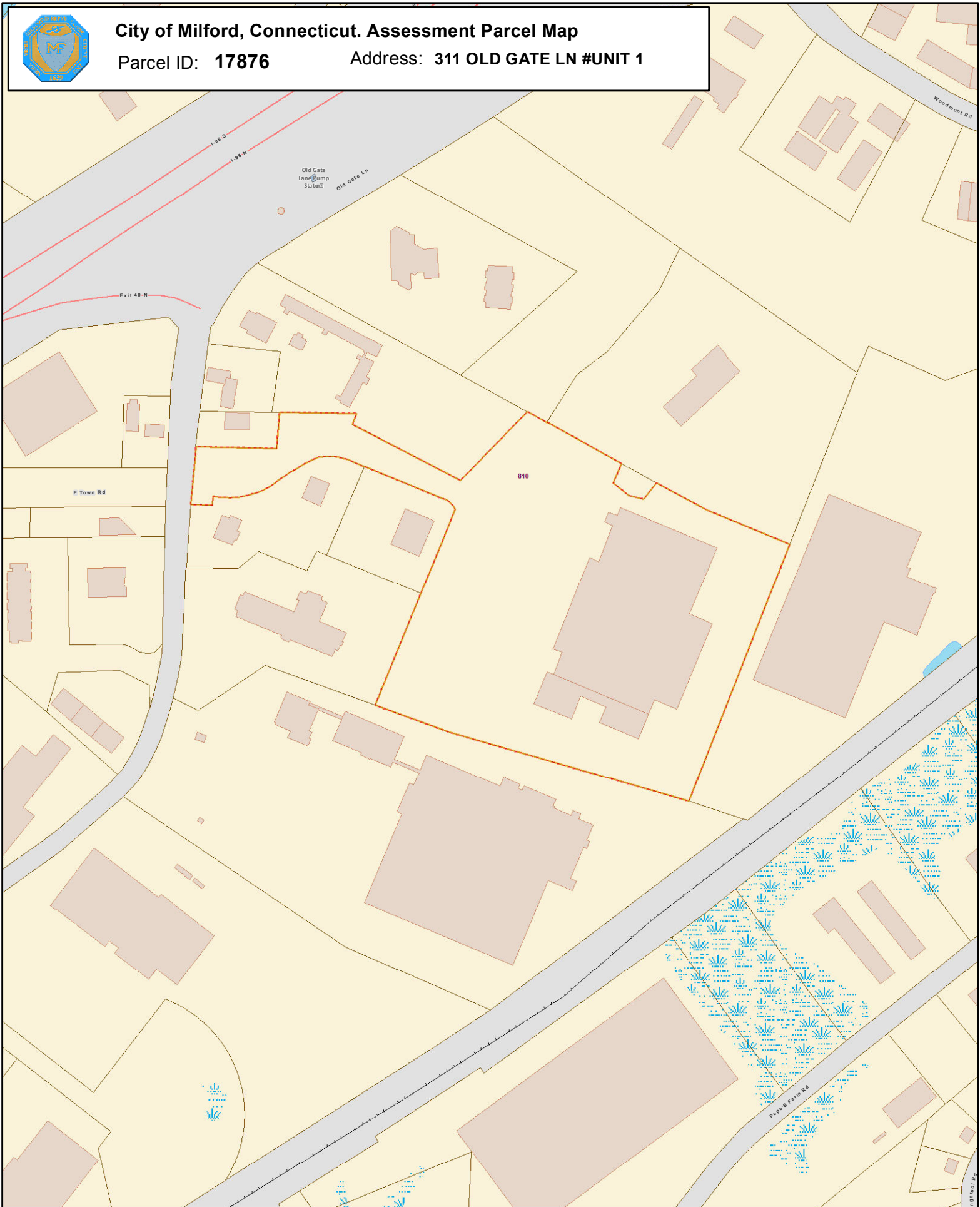
Owner of Record	Book/ Page	Sale Date	Sale Price
BVS JAI ALAI LLC	03138/0001	12/19/2006	14000000
CITY OF MILFORD	02955/0591	1/20/2005	
JAI ALAI ASSOCIATES LLC	02407/0500	5/22/2000	
JAI ALAI ASSOCIATES LIMITED PA	01191/0215	2/8/1983	0



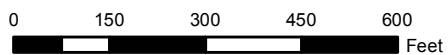
# City of Milford, Connecticut. Assessment Parcel Map

Parcel ID: **17876**

Address: **311 OLD GATE LN #UNIT 1**



**1 inch = 300 feet**



Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The City of Milford and its mapping contractors assume no legal responsibility for the information contained herein.

Map Produced: July 2016

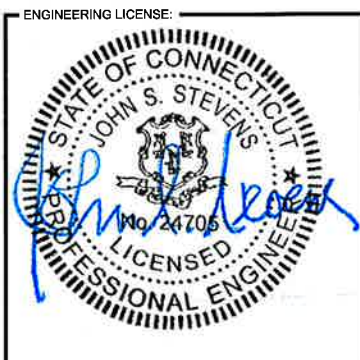


**PROJECT:** 2.5 EQUIPMENT DEPLOYMENT  
**SITE NAME:** (R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI  
**SITE CASCADE:** CT03XC004  
**SITE NUMBER:** 876309  
**SITE ADDRESS:** 311 OLD GATE LANE MILFORD, CT 06460  
**SITE TYPE:** MONOPOLE TOWER  
**MARKET:** SOUTHERN CONNECTICUT

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**



DRAWING NOTICE:  
 THESE DOCUMENTS ARE CONFIDENTIAL AND ARE THE SOLE PROPERTY OF SPRINT AND MAY NOT BE REPRODUCED, DISSEMINATED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPRINT.

REVISIONS:	DESCRIPTION	DATE	BY	REV
	ISSUED FOR CONSTRUCTION	1/9/15	AHS	1
	ISSUED FOR PERMIT	12/10/14	JLM	0

SITE NAME:  
 (R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI

SITE CASCADE:  
 CT03XC004

SITE ADDRESS:  
 311 OLD GATE LANE MILFORD, CT 06460

SHEET DESCRIPTION:  
 TITLE SHEET & PROJECT DATA

SHEET NUMBER:  
**T-1**

**SITE INFORMATION**

**TOWER OWNER:**  
 CROWN ATLANTIC COMPANY LLC  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317  
 (704) 405-6555  
  
**LATITUDE (NAD83):**  
 41° 14' 2.59" N  
 41.234053°  
  
**LONGITUDE (NAD83):**  
 73° 01' 22.4" W  
 -73.022889°  
  
**COUNTY:**  
 NEW HAVEN  
  
**ZONING JURISDICTION:**  
 CITY OF NEW HAVEN  
  
**ZONING DISTRICT:**  
 TBD  
  
**POWER COMPANY:**  
 CONNECTICUT LIGHT & POWER  
 (860) 947-2000  
  
**SPRINT PM:**  
 PETER GIARD  
 (508) 801-0074  
 peter.giard@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
- INSTALL (3) PANEL ANTENNAS
- INSTALL (3) RRU'S TO TOWER
- INSTALL (27) JUMPER CABLES
- INSTALL (1) FIBER CABLE
- INSTALL (4) BATTERIES IN EXISTING BATTERY 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

**DRAWING INDEX**

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SP-3	SPRINT SPECIFICATIONS	1
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A-2	TOWER ELEVATION & CABLE PLAN	1
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	1
A-4	COLOR CODING & NOTES	1
A-5	EQUIPMENT & MOUNTING DETAILS	1
A-6	CIVIL DETAILS	1
A-7	PLUMBING DIAGRAM	1
E-1	ELECTRICAL & GROUNDING PLAN	1
E-2	ELECTRICAL & GROUNDING DETAILS	1



**APPROVED**  
 By Susan Vale at 8:52 am, Jan 20, 2015

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. OFC: 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:



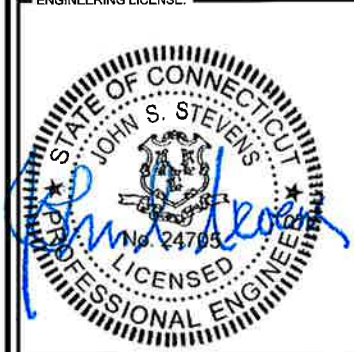
PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	1/9/15	AHS	1
ISSUED FOR PERMIT	12/10/14	JLM	0

SITE NAME:

(R2E) CT2961 TO  
 CT03XC004 MILFORD  
 JAI-ALAI

SITE CASCADE:

CT03XC004

SITE ADDRESS:

311 OLD GATE LANE  
 MILFORD, CT 06460

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 ANTENNA AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND-OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

- A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
- B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
- C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
  1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
  2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
- D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION
- E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

- A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER
- B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
  1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
  2. PROJECT PROGRESS REPORTS.
  3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
  4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).

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

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 485. 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, AASHTO, AND OTHER METHODS IS NEEDED.
  4. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASHTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

- A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
  2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
  3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
  4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
  5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
  6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
  7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
  8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
  9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS

- A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.
- B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
  2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
  3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
  4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
  5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
  6. ANTENNA AZIMUTH, DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS - ANTENNA ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:



6580 Sprint Parkway  
Overland Park, Kansas 66251

PLANS PREPARED BY:



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

MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	1/9/15	AHS	1
ISSUED FOR PERMIT	12/10/14	JLM	0

SITE NAME:  
**(R2E) CT2961 TO  
CT03XC004 MILFORD  
JAI-ALAI**

SITE CASCADE:  
**CT03XC004**

SITE ADDRESS:  
**311 OLD GATE LANE  
MILFORD, CT 06460**

SHEET DESCRIPTION:  
**SPRINT SPECIFICATIONS**

SHEET NUMBER:  
**SP-2**



CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
  8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
  9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
  10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
  11. ALL AVAILABLE JURISDICTIONAL INFORMATION
  12. PDF SCAN OF REDLINES PRODUCED IN FIELD
- C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
- D. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.
- 3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.
- A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
  2. STRUCTURAL BACKFILL COMPACTION REPORTS.
  3. SITE RESISTANCE TO EARTH TEST.
  4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
  5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
  6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".
- B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING:
1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
  2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
  3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS - PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
  4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
  5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
  6. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
  7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
  8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
  9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 400 - SUBMITTALS & TESTS

PART 1 - GENERAL

- 1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.
- 1.2 RELATED DOCUMENTS:
  - A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
  - B. SPRINT 'STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES' ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- 3.1 WEEKLY REPORTS:
  - A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.
  - B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED, THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.
- 3.2 PROJECT CONFERENCE CALLS:
  - A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.
- 3.3 PROJECT TRACKING IN SMS:
  - A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.
- 3.4 ADDITIONAL REPORTING:
  - A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.
- 3.5 PROJECT PHOTOGRAPHS:
  - A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:
    1. SHELTER AND TOWER OVERVIEW.
    2. TOWER FOUNDATION(S) - FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
    3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
    4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
    5. PHOTOS OF TOWER SECTION STACKING.
    6. CONCRETE TESTING / SAMPLES.
    7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
    8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
    9. SHELTER FOUNDATION--FORMS AND STEEL BEFORE POURING.
    10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
    11. COAX CABLE ENTRY INTO SHELTER.
    12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
    14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
    15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
    16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
    17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
    18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
    19. ELECTRICAL TRENCH(S) WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
    20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
    21. TELCO TRENCH WITH FOIL-BACKED TAPE BEFORE FURTHER BACKFILL.
    22. SHELTER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
    23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).

24. FENCE GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
  25. ALL BTS GROUND CONNECTIONS.
  26. ALL GROUND TEST WELLS.
  27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
  28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
  29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
  30. GPS ANTENNAS.
  31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
  32. DOGHOUSE/CABLE EXIT FROM ROOF.
  33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
  34. MASTER BUS BAR.
  35. TELCO BOARD AND NIU.
  36. ELECTRICAL DISTRIBUTION WALL.
  37. CABLE ENTRY WITH SURGE SUPPRESSION.
  38. ENTRANCE TO EQUIPMENT ROOM.
  39. COAX WEATHERPROOFING--TOP AND BOTTOM OF TOWER.
  40. COAX GROUNDING --TOP AND BOTTOM OF TOWER.
  41. ANTENNA AND MAST GROUNDING.
  42. LANDSCAPING - WHERE APPLICABLE.
- 3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	1/9/15	AHS	1
ISSUED FOR PERMIT	12/10/14	JLN	0

SITE NAME:

(R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI

SITE CASCADE:

CT03XC004

SITE ADDRESS:

311 OLD GATE LANE MILFORD, CT 06460

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.

**NOTE:**  
THE POST NV INSTALLATION AUDIT WAS NOT AVAILABLE UPON ISSUANCE OF THESE PLANS. CONTRACTOR TO CONFIRM LOCATIONS OF EQUIPMENT PRIOR TO CONSTRUCTION.

PLANS PREPARED FOR:



6580 Sprint Parkway  
Overland Park, Kansas 66251

PLANS PREPARED BY:



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

MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	1/9/15	AHS	1
ISSUED FOR PERMIT	12/10/14	JUN	0

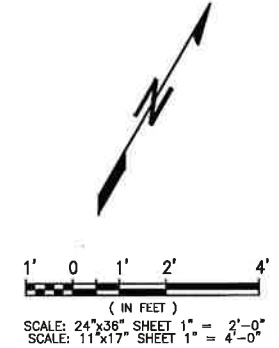
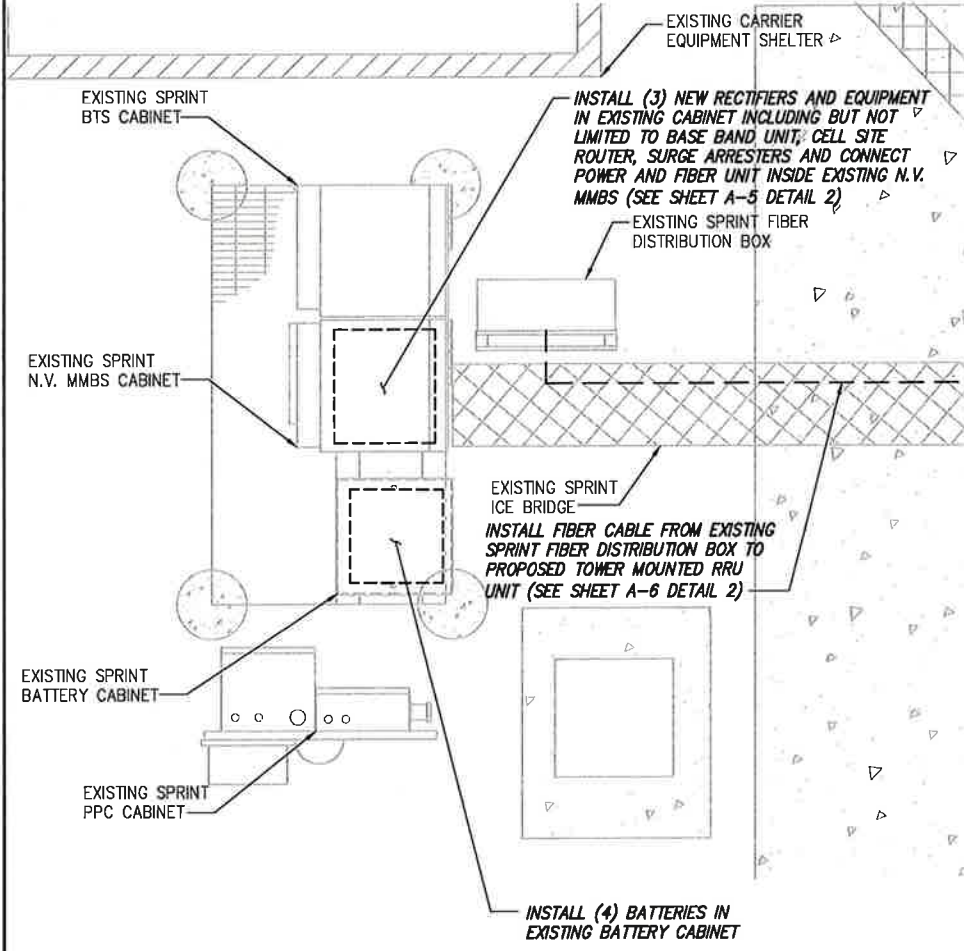
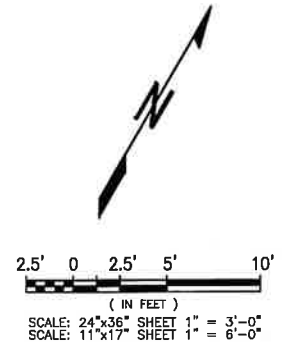
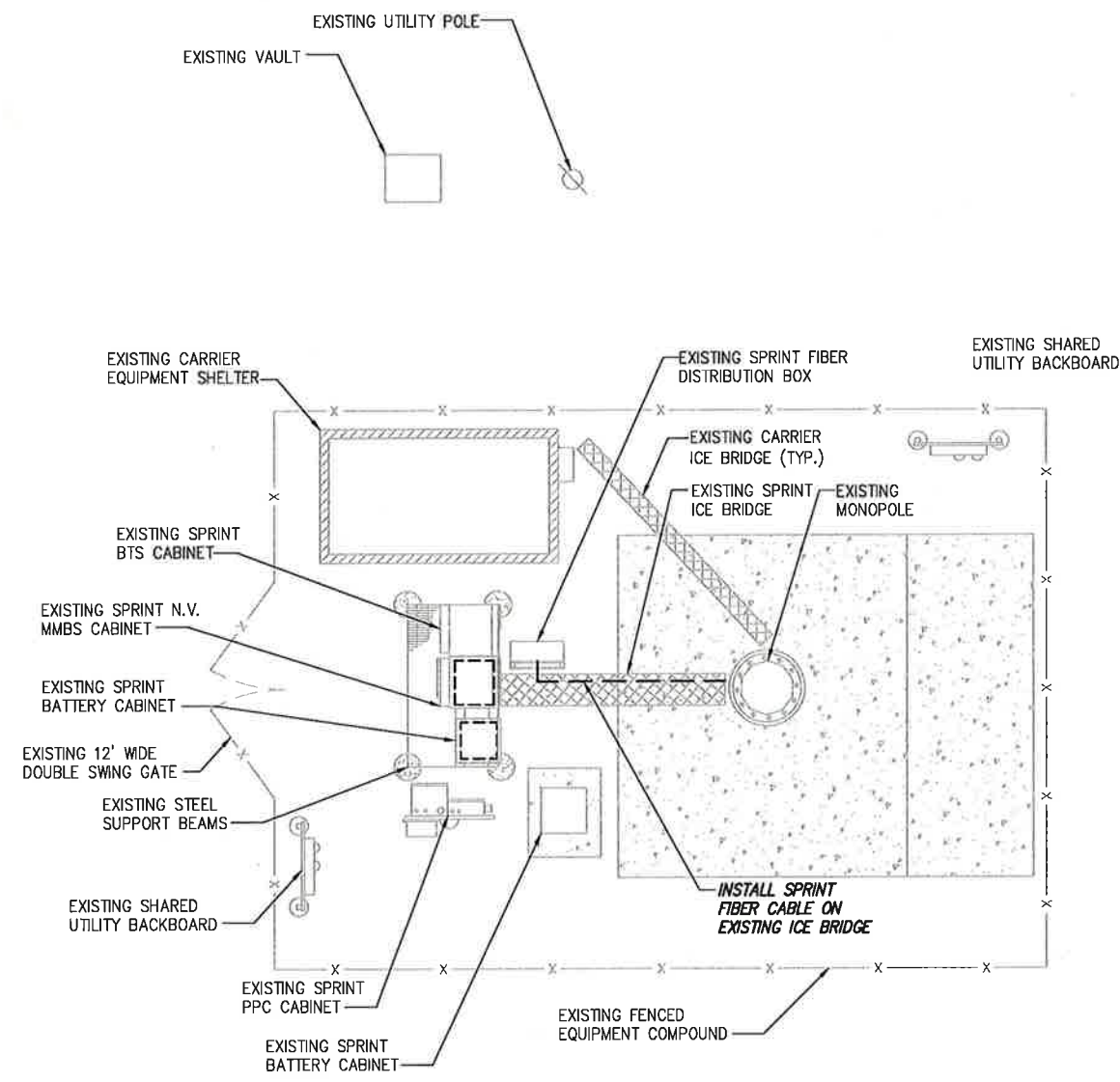
SITE NAME:  
**(R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI**

SITE CASCADE:  
**CT03XC004**

SITE ADDRESS:  
**311 OLD GATE LANE  
MILFORD, CT 06460**

SHEET DESCRIPTION:  
**SITE PLAN**

SHEET NUMBER:  
**A-1**

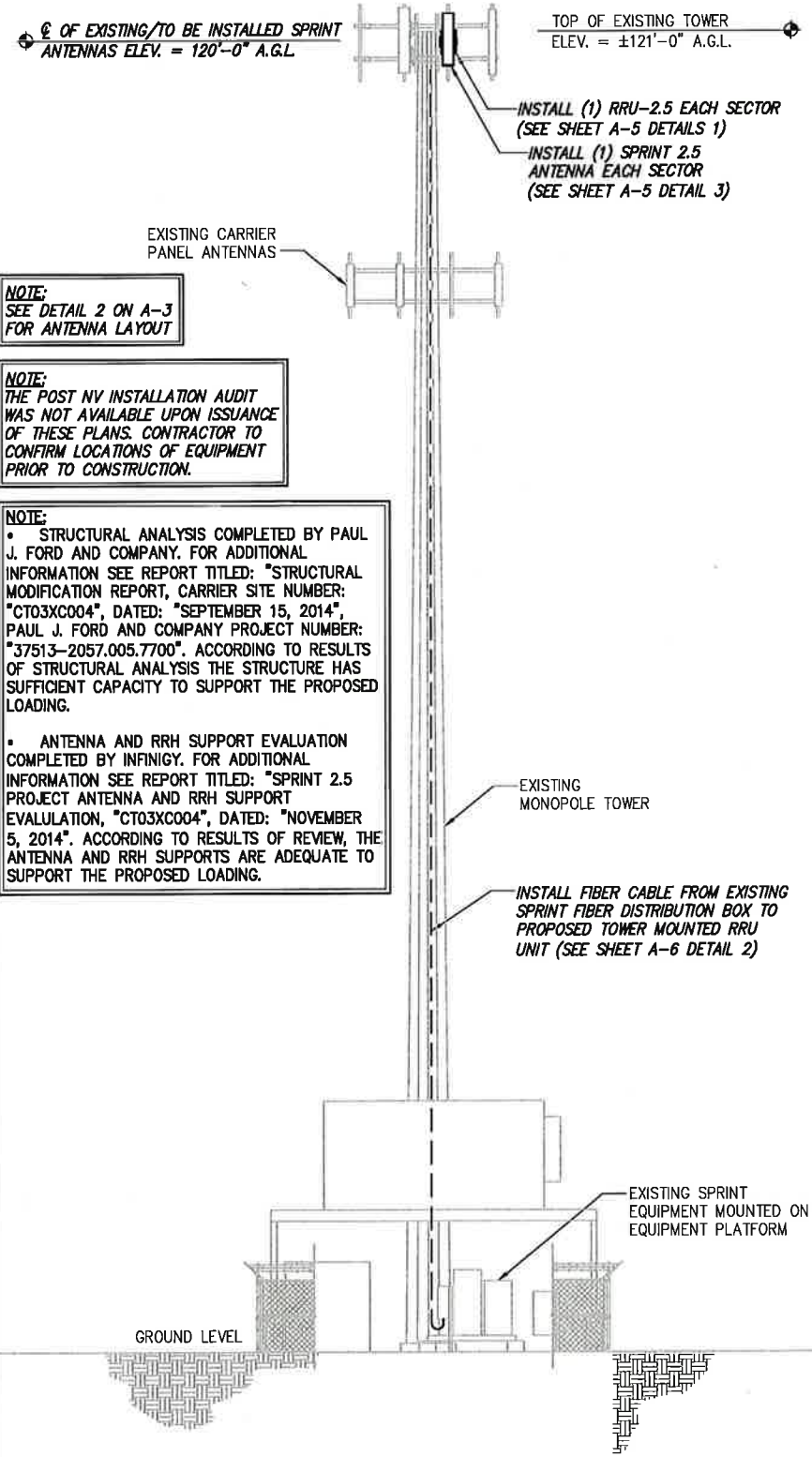


OVERALL SITE PLAN

SCALE: AS NOTED 1

SPRINT EQUIPMENT PLAN

SCALE: AS NOTED 2



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

**NOTE:**  
THE POST NV INSTALLATION AUDIT  
WAS NOT AVAILABLE UPON ISSUANCE  
OF THESE PLANS. CONTRACTOR TO  
CONFIRM LOCATIONS OF EQUIPMENT  
PRIOR TO CONSTRUCTION.

**NOTE:**  
• STRUCTURAL ANALYSIS COMPLETED BY PAUL  
J. FORD AND COMPANY. FOR ADDITIONAL  
INFORMATION SEE REPORT TITLED: "STRUCTURAL  
MODIFICATION REPORT, CARRIER SITE NUMBER:  
"CT03XC004", DATED: "SEPTEMBER 15, 2014",  
PAUL J. FORD AND COMPANY PROJECT NUMBER:  
"37513-2057.005.7700". ACCORDING TO RESULTS  
OF STRUCTURAL ANALYSIS THE STRUCTURE HAS  
SUFFICIENT CAPACITY TO SUPPORT THE PROPOSED  
LOADING.

• ANTENNA AND RRH SUPPORT EVALUATION  
COMPLETED BY INFINIGY. FOR ADDITIONAL  
INFORMATION SEE REPORT TITLED: "SPRINT 2.5  
PROJECT ANTENNA AND RRH SUPPORT  
EVALUATION, "CT03XC004", DATED: "NOVEMBER  
5, 2014". ACCORDING TO RESULTS OF REVIEW, THE  
ANTENNA AND RRH SUPPORTS ARE ADEQUATE TO  
SUPPORT THE PROPOSED LOADING.

DETAIL NOT USED      NO SCALE      2

DETAIL NOT USED      NO SCALE      3

DETAIL NOT USED      NO SCALE      4

PLANS PREPARED FOR:



6580 Sprint Parkway  
Overland Park, Kansas 66251

PLANS PREPARED BY:




Design.  
Build.  
Deliver.


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

JOB NUMBER 353-000

MLA PARTNER:



ENGINEERING LICENSE:



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ISSUED FOR PERMIT	12/10/14	JLM	0

**SITE NAME:**  
(R2E) CT2961 TO  
CT03XC004 MILFORD  
JAI-ALAI

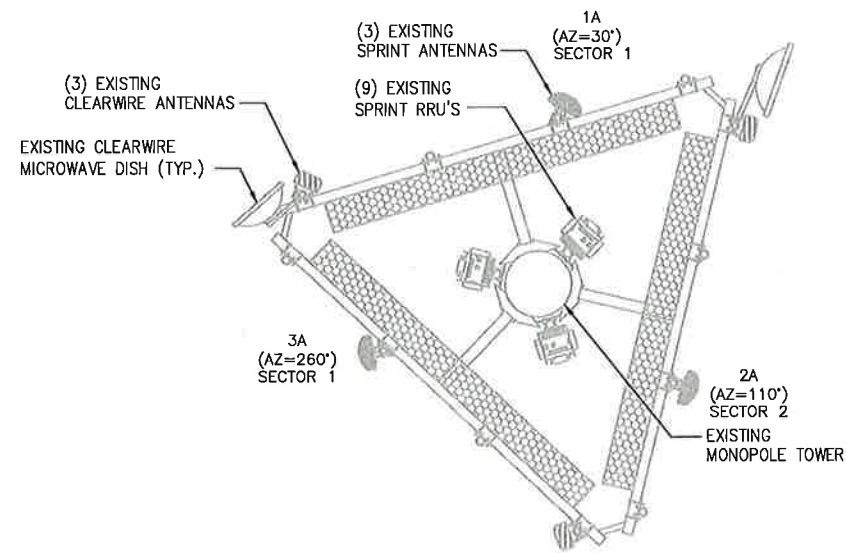
**SITE CASCADE:**  
CT03XC004

**SITE ADDRESS:**  
311 OLD GATE LANE  
MILFORD, CT 06460

**SHEET DESCRIPTION:**  
TOWER ELEVATION  
& CABLE PLAN

**SHEET NUMBER:**  
A-2

TOWER ELEVATION      NO SCALE      1

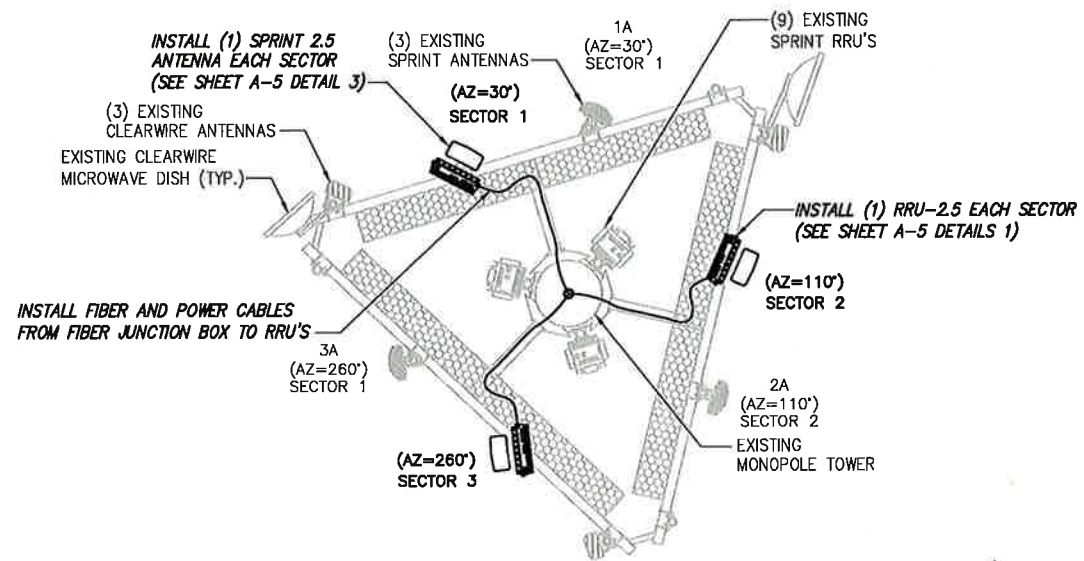


0' = TRUE NORTH

EXISTING ANTENNA & RRU LAYOUT

NO SCALE

1



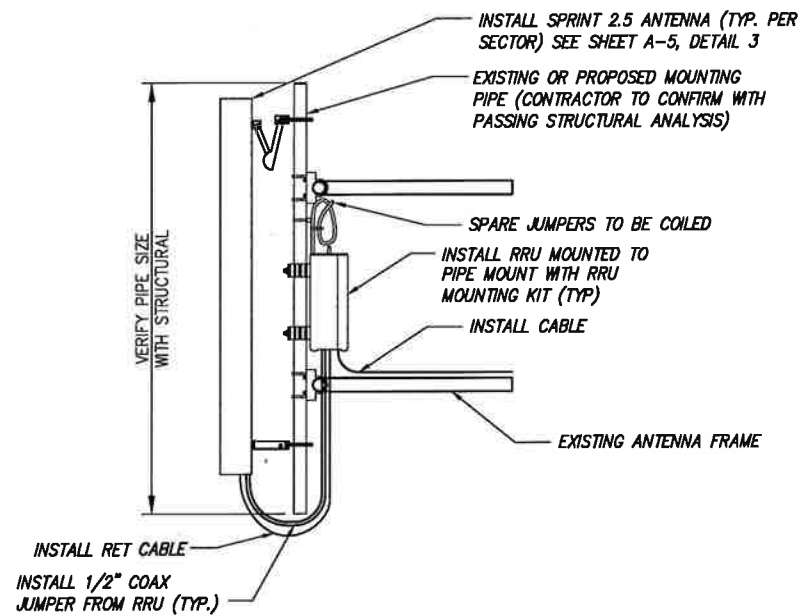
0' = TRUE NORTH

FINAL ANTENNA LAYOUT

NO SCALE

2

**NOTE:**  
THE POST NV INSTALLATION AUDIT WAS NOT AVAILABLE UPON ISSUANCE OF THESE PLANS. CONTRACTOR TO CONFIRM LOCATIONS OF EQUIPMENT PRIOR TO CONSTRUCTION.



- NOTES:**
1. CUT DC CONDUCTORS TO LENGTH.
  2. COIL FIBER CABLE AND SECURE AT SIDE OF RRU.
  3. DO NOT 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.

DETAIL NOT USED

NO SCALE

3

TYPICAL ANTENNA & RRU MOUNTING DETAILS

NO SCALE

4

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

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:



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ISSUED FOR PERMIT	12/10/14	JLM	0

SITE NAME:

(R2E) CT2961 TO  
CT03XC004 MILFORD  
JAI-ALAI

SITE CASCADE:

CT03XC004

SITE ADDRESS:

311 OLD GATE LANE  
MILFORD, CT 06460

SHEET DESCRIPTION:

ANTENNA LAYOUT  
& MOUNTING DETAILS

SHEET NUMBER:

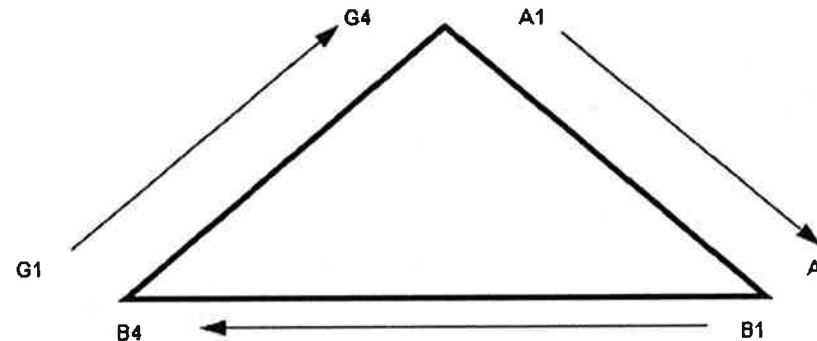
A-3

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



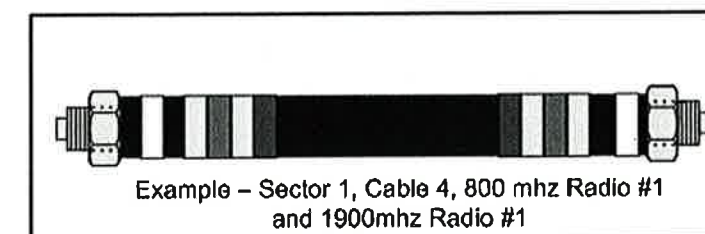
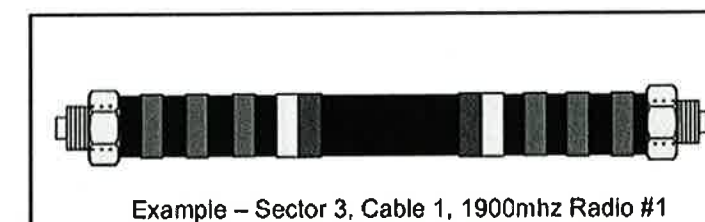
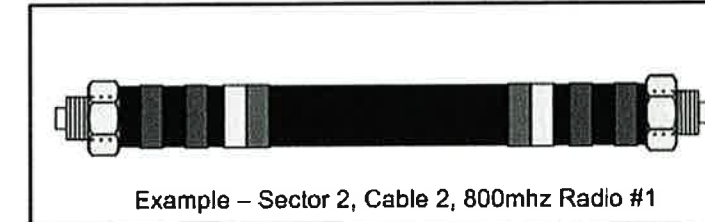
NOTES:

- ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
- 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.
- 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.
- 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.
- 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.
- 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.
- HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
- 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
	2		No Tape	No Tape
	3	Brown	No Tape	No Tape
	4	White	No Tape	No Tape
	5	Red	No Tape	No Tape
	6	Grey	No Tape	No Tape
	7	Purple	No Tape	No Tape
	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
	2			No Tape
	3	Brown	Brown	No Tape
	4	White	White	No Tape
	5	Red	Red	No Tape
	6	Grey	Grey	No Tape
	7	Purple	Purple	No Tape
	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
	2			
	3	Brown	Brown	Brown
	4	White	White	White
	5	Red	Red	Red
	6	Grey	Grey	Grey
	7	Purple	Purple	Purple
	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



PLANS PREPARED FOR:

6580 Sprint Parkway  
Overland Park, Kansas 66251

PLANS PREPARED BY:

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

MLA PARTNER:

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REVISIONS:	DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION		1/9/15	AHS	1
ISSUED FOR PERMIT		12/10/14	JM	0

SITE NAME:  
**(R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI**

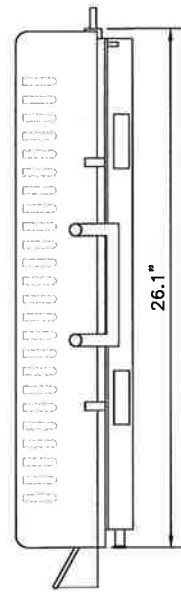
SITE CASCADE:  
**CT03XC004**

SITE ADDRESS:  
**311 OLD GATE LANE  
MILFORD, CT 06460**

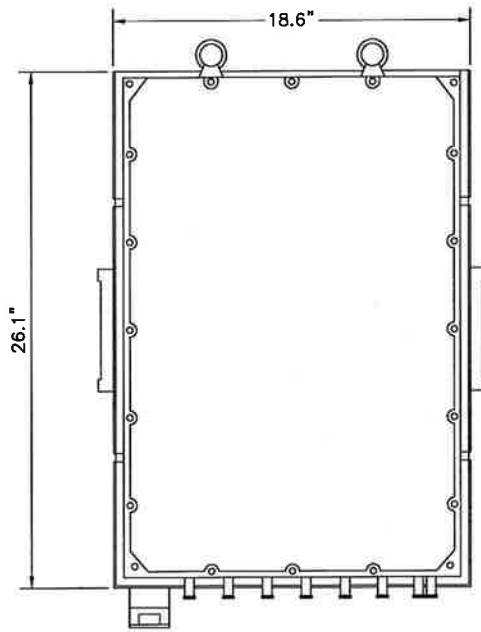
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**COLOR CODING AND NOTES**

SHEET NUMBER:  
**A-4**

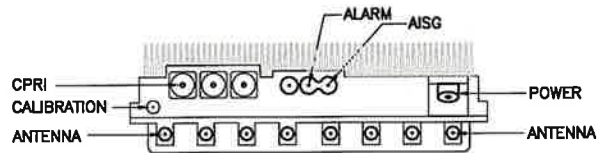
RRU: ALCATEL LUCENT TD-RRH8X20



SIDE VIEW



FRONT VIEW



PLAN VIEW

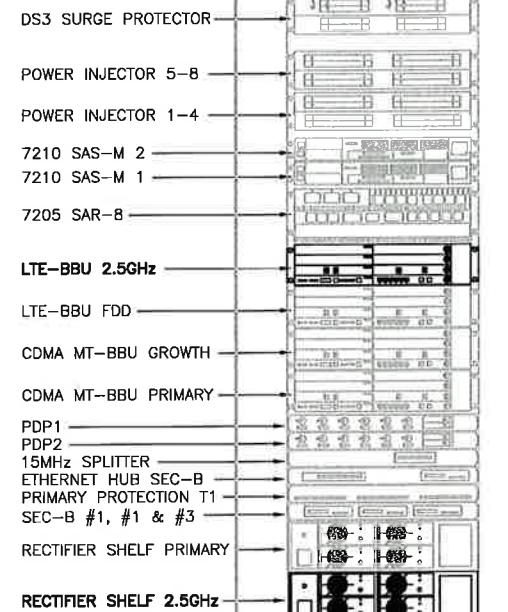
NOTES

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

2.5 RRU'S

NO SCALE

1



FRONT VIEW

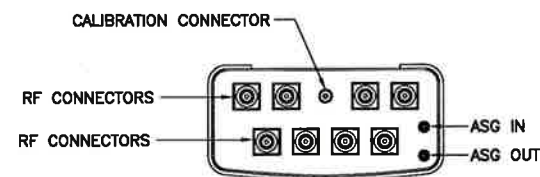
NEW EQUIPMENT IN EXISTING CABINET

NO SCALE

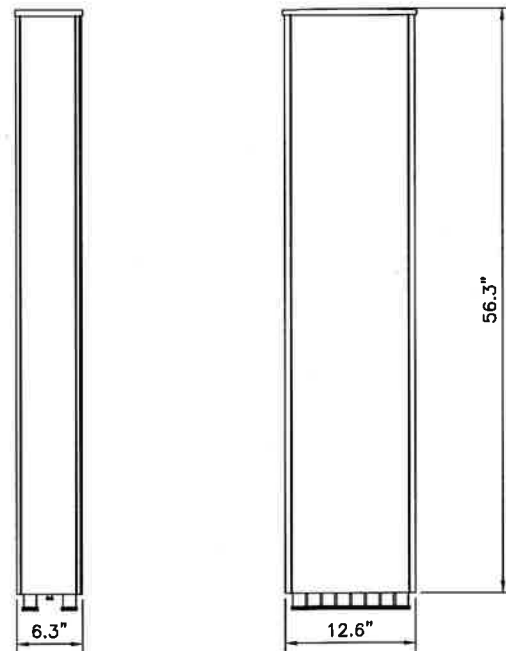
2

ANTENNA: RFS APXVTM14-C-120

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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 Albany, NY 12205  
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SITE NAME:

(R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI

SITE CASCADE:

CT03XC004

SITE ADDRESS:

311 OLD GATE LANE  
 MILFORD, CT 06460

SHEET DESCRIPTION:

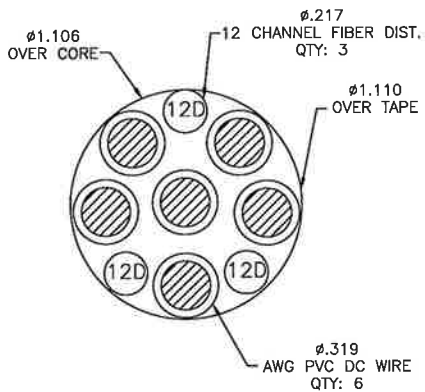
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:

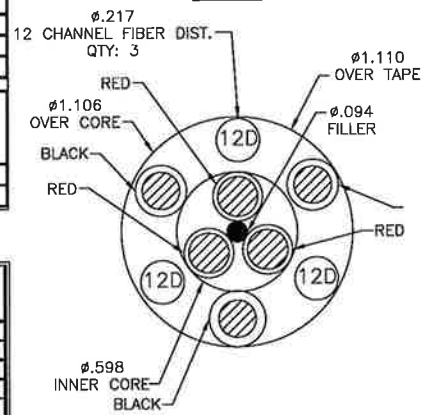
A-5

**RFS HYBRIFLEX RISER CABLE SCHEDULE**

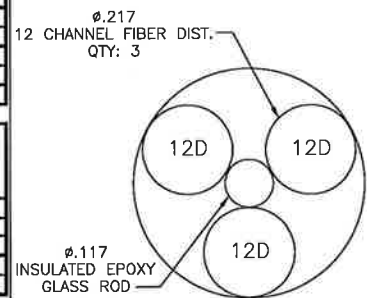
Fiber Only (Existing DC Power)	Hybrid cable MN: H8058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: H8058-M12-075F	75 ft
	MN: H8058-M12-100F	100 ft
	MN: H8058-M12-125F	125 ft
	MN: H8058-M12-150F	150 ft
	MN: H8058-M12-175F	175 ft
	MN: H8058-M12-200F	200 ft
8 AWG Power	Hybrid cable MN: H8114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: H8114-08U3M12-075F	75 ft
	MN: H8114-08U3M12-100F	100 ft
	MN: H8114-08U3M12-125F	125 ft
	MN: H8114-08U3M12-150F	150 ft
	MN: H8114-08U3M12-175F	125 ft
	MN: H8114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN: H8114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: H8114-13U3M12-250F	250 ft
	MN: H8114-13U3M12-275F	275 ft
	MN: H8114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: H8114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: H8114-21U3M12-350F	350 ft
	MN: H8114-21U3M12-375F	375 ft



**4 AWG**



**8 & 6 AWG**



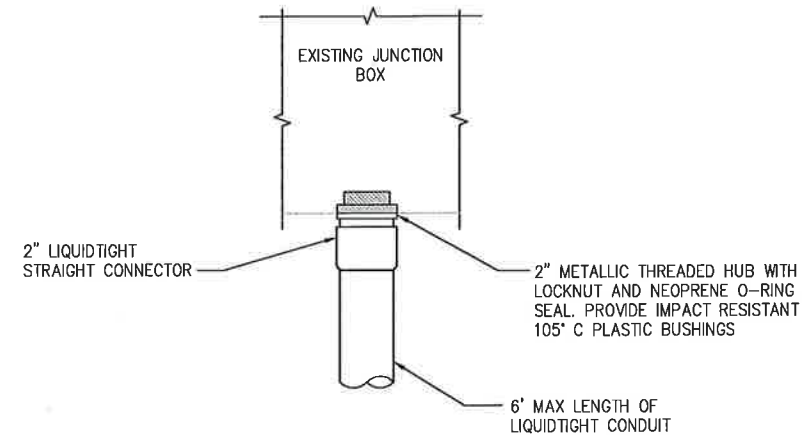
**FIBER ONLY**

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

**2.5 CABLE CROSS SECTION DATA**

NO SCALE

1



**FIBER JUNCTION BOX PENETRATION**

NO SCALE

2

**DETAIL NOT USED**

NO SCALE

3

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



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SITE NAME:

(R2E) CT2961 TO  
CT03XC004 MILFORD  
JAI-ALAI

SITE CASCADE:

CT03XC004

SITE ADDRESS:

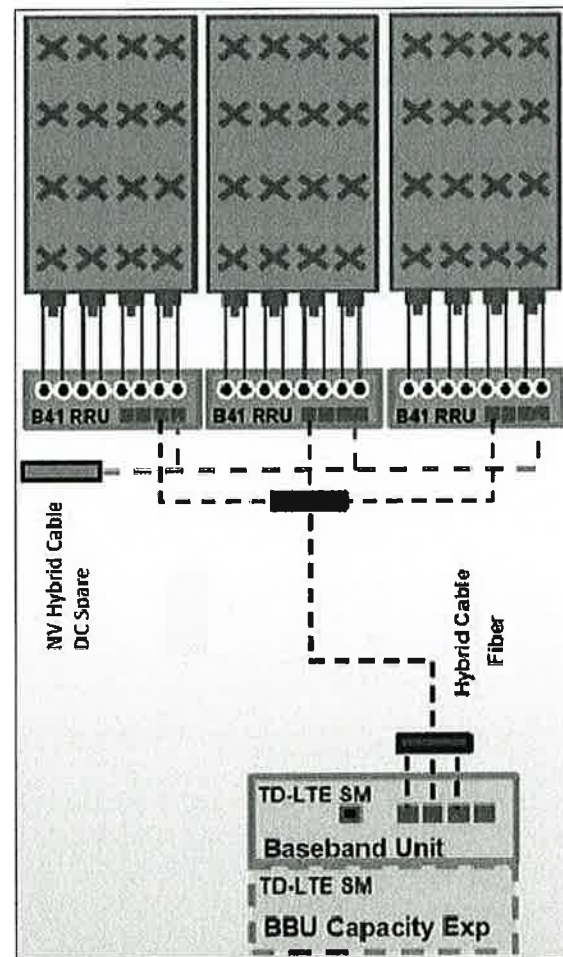
311 OLD GATE LANE  
MILFORD, CT 06460

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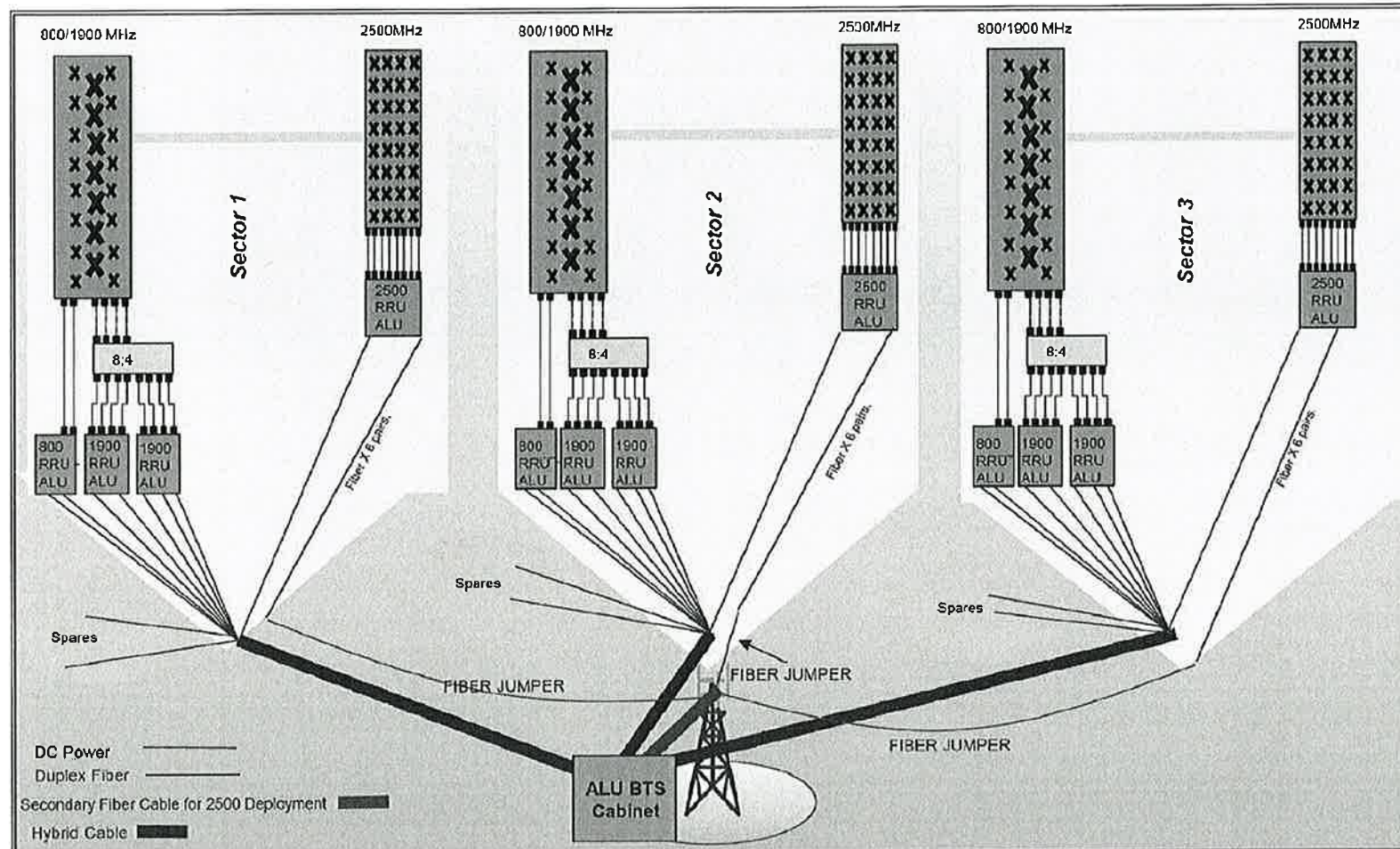
CIVIL DETAILS

SHEET NUMBER:

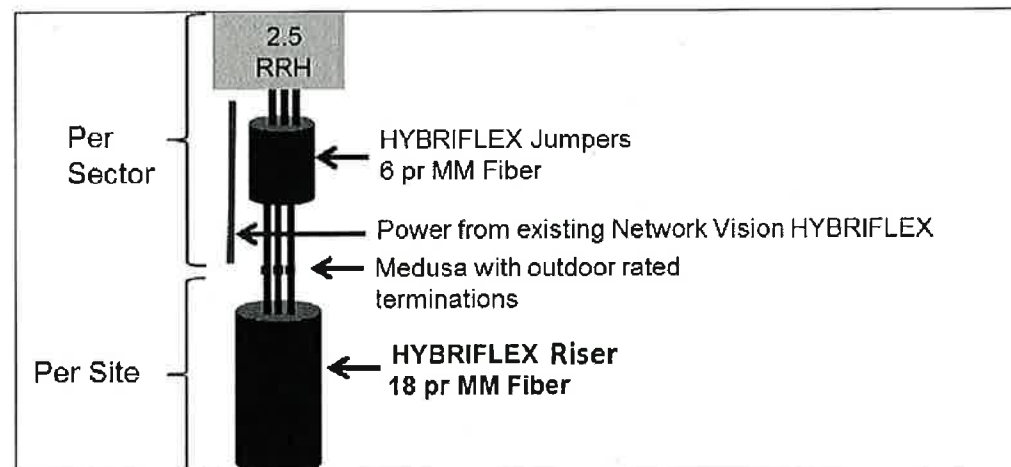
**A-6**



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

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

PLANS PREPARED BY:  
**INFINIGY** Design. Build. Deliver.  
 1033 Watervliet Shaker Rd  
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MLA PARTNER:  
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REVISIONS:	DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION		1/9/15	AHS	1
ISSUED FOR PERMIT		12/10/14	JJM	0

SITE NAME:  
 (R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI

SITE CASCADE:  
 CT03XC004

SITE ADDRESS:  
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 MILFORD, CT 06460

SHEET DESCRIPTION:  
 CIVIL DETAILS

SHEET NUMBER:  
**A-7**



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SITE NAME:  
**(R2E) CT2961 TO  
CT03XC004 MILFORD  
JAI-ALAI**

SITE CASCADE:  
**CT03XC004**

SITE ADDRESS:  
**311 OLD GATE LANE  
MILFORD, CT 06460**

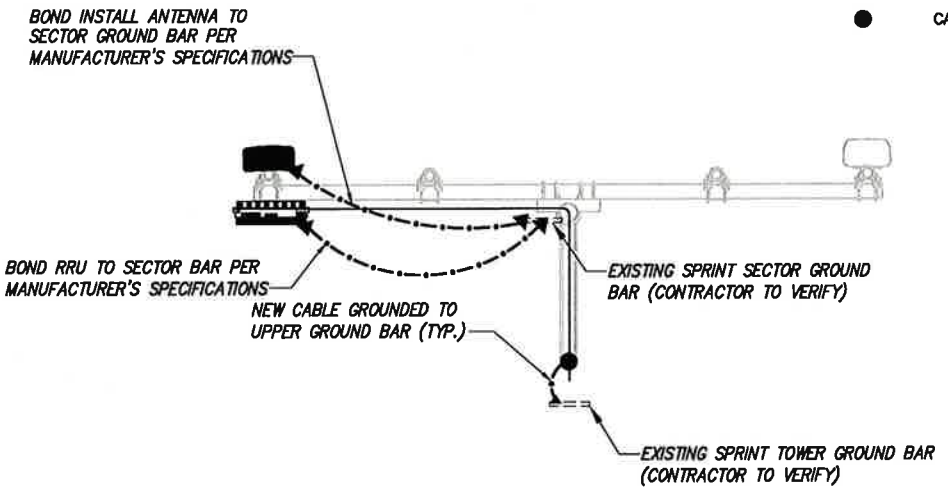
SHEET DESCRIPTION:  
**ELECTRICAL &  
GROUNDING PLAN**

SHEET NUMBER:  
**E-1**

PLAN NOT USED

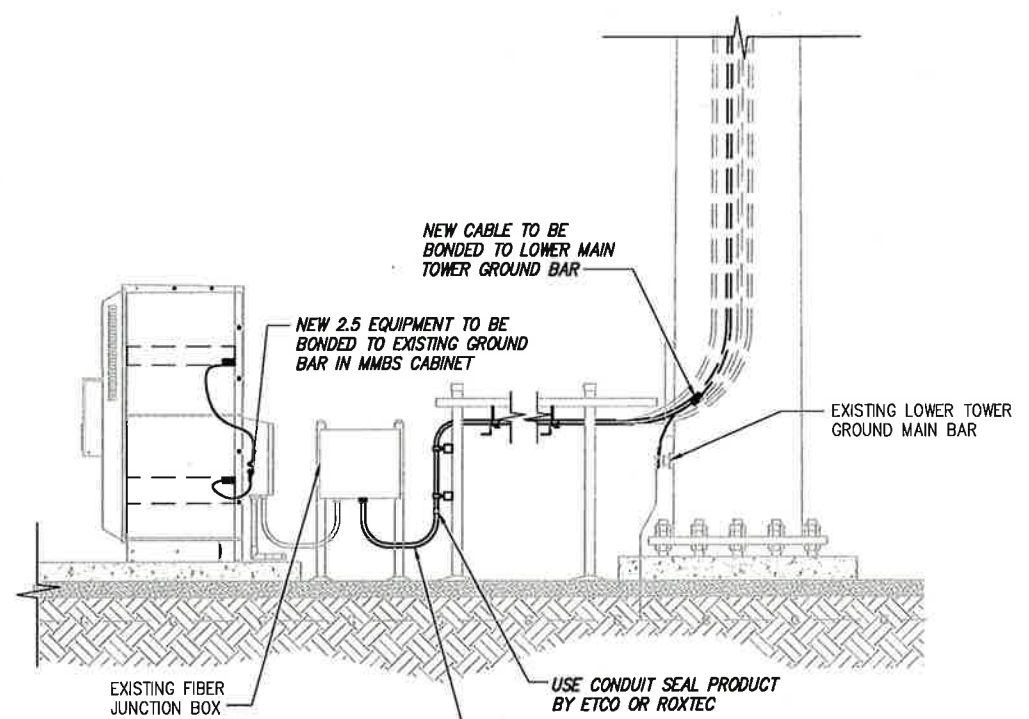
NO SCALE 1

- LEGEND:**
- ⊖ EXISTING GROUND RING
  - CADWELD CONNECTION (EXOTHERMIC WELD)
  - ▲ MECHANICAL CONNECTION
  - ⊗ GROUND ROD
  - CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE 2

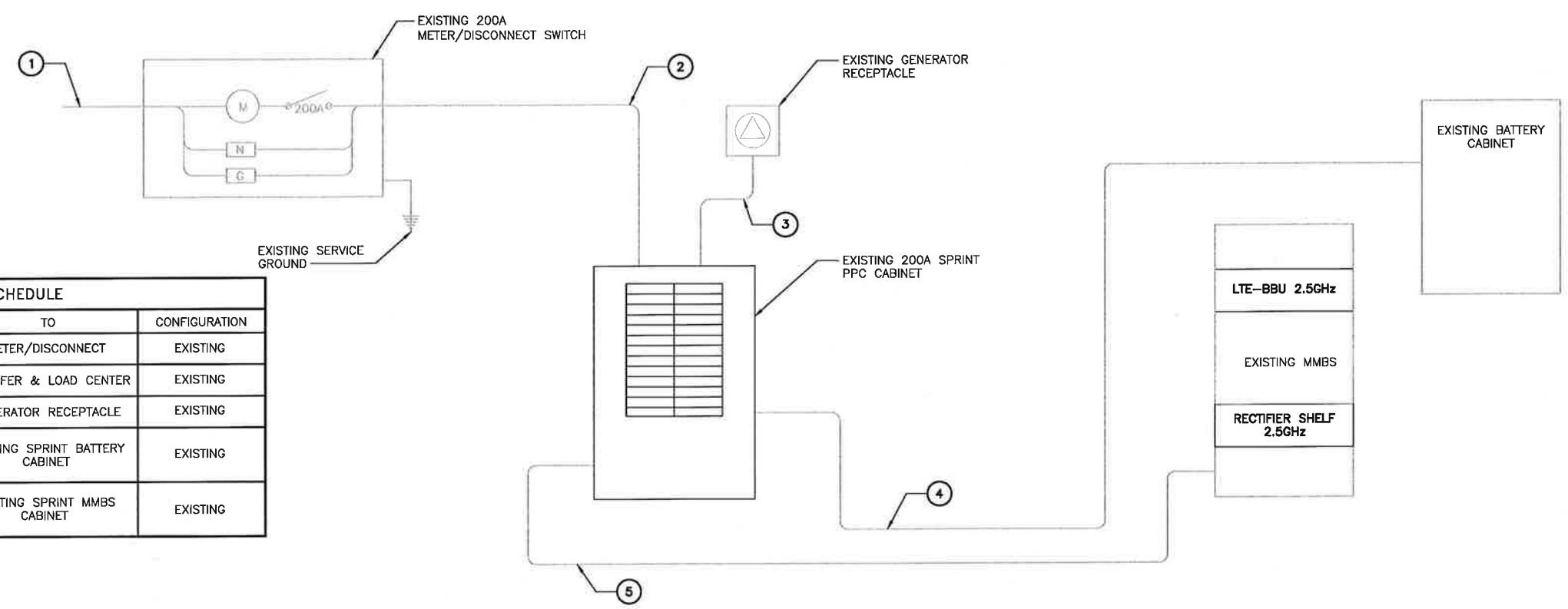


NOTE:  
DEPICTION IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO FIELD VERIFY PRIOR TO CONSTRUCTION.

TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION)

NO SCALE 3

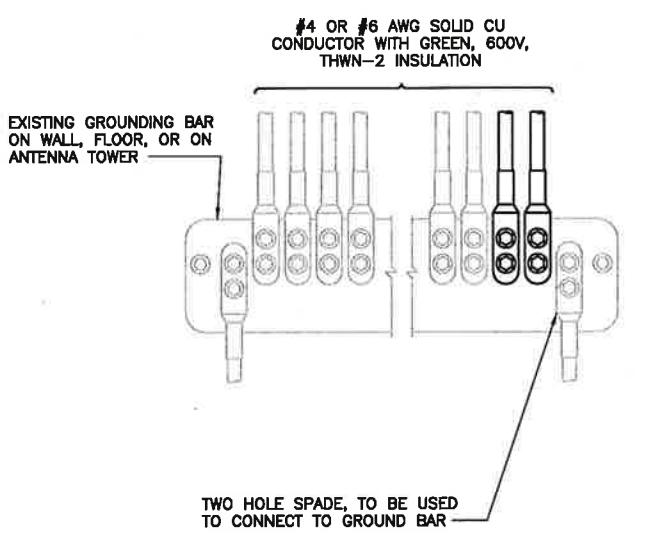
**NOTES**  
 CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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 BATTERY CABINET	EXISTING
⑤	TRANSFER & LOAD CENTER	EXISTING SPRINT MMBS CABINET	EXISTING

**ELECTRICAL ONE-LINE DIAGRAM**

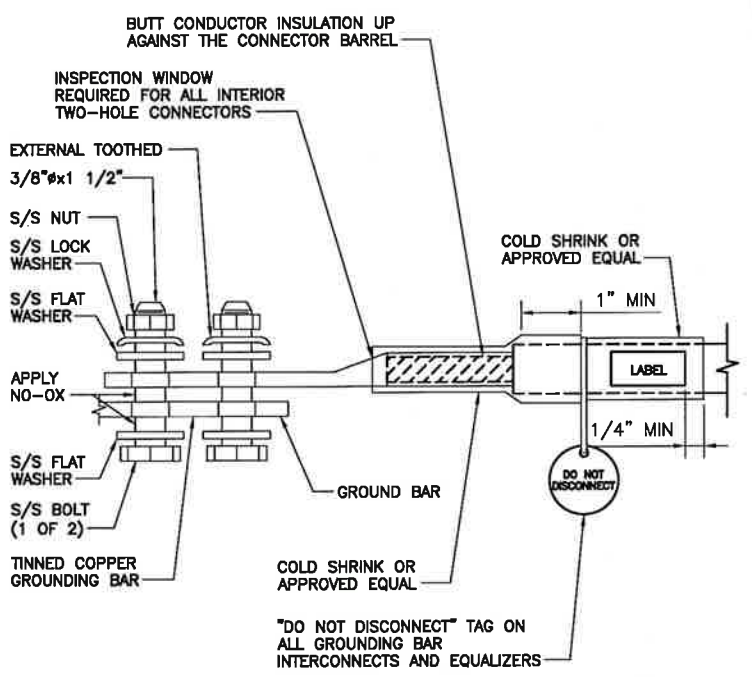
NO SCALE 1



**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.

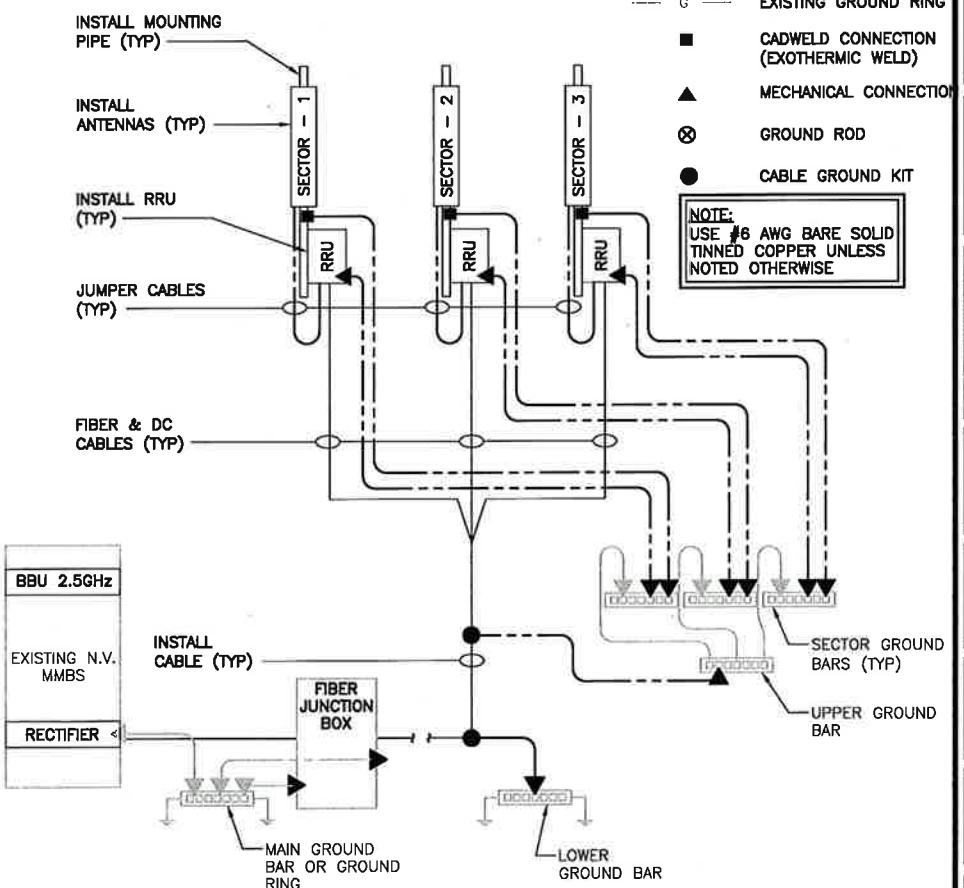
**INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR**

NO SCALE 2



**TWO HOLE LUG**

NO SCALE 3



**GROUNDING RISER DIAGRAM**

NO SCALE 4



ENGINEERING INNOVATION

Velocitel, Inc., d.b.a. FDH Velocitel  
6521 Meridien Drive, Suite 107  
Raleigh, North Carolina 27616  
9197551012

Date: **June 21, 2017**

Marianne Dunst  
Crown Castle  
3530 Toringdon Way Suite 300  
Charlotte, NC 28277

**Subject: Structural Analysis Report**

**Carrier Designation:** **Sprint Co-Locate**  
**Carrier Site Number:** CT03XC004  
**Carrier Site Name:** Old Gate, CT

**Crown Castle Designation:** **Crown Castle BU Number:** 876309  
**Crown Castle Site Name:** MILFORD JAI-ALAI  
**Crown Castle JDE Job Number:** 441741  
**Crown Castle Work Order Number:** 1417420  
**Crown Castle Application Number:** 393387 Rev. 0

**Engineering Firm Designation:** **FDH Velocitel Project Number:** 17QGOI1400

**Site Data:** **311 Old Gate Lane, Milford, New Haven County, CT**  
**Latitude 41° 14' 2.59", Longitude -73° 1' 22.4"**  
**120 Foot - Monopole Tower**

Dear Marianne Dunst,

FDH Velocitel 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 1046906, in accordance with application 393387, revision 0.

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

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1.000 and Risk Category II were used in this analysis.

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

Respectfully submitted by:

Chaitanya Shetti  
Project Engineer I

Reviewed by:

Dennis D. Abel, PE  
Director of Engineering  
CT PE License No. 23247



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## 1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by ROHN in December of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

## 2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 with a maximum Topographic Factor, Kzt, of 1.0 were used in this analysis

**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
117.0	120.0	3	rfs celwave	APXVTM14-ALU-I20	4	1-1/4	-
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		9	tms	ACU-A20-N			
		6	alcatel lucent	1900MHz RRH (65MHz)			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	TD-RRH8x20-25			
		3	rfs celwave	IBC1900HB-2			

**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
117.0	124.0	1	andrew	VHLP1-18	2 3 3 1 3 2	Conduit 1/4 5/16 1/2 1-1/4 7983A	1
		1	dragonwave	HORIZON COMPACT			
	123.0	1	lucent	KS24019-L112A			
		1	andrew	VHLP1-18			
	121.0	1	dragonwave	HORIZON COMPACT			
		1	rfs celwave	APXV9ERR18-C-A20			
	120.0	2	rfs celwave	APXVSP18-C-A20			
		117.0	3	argus technologies			
	3		samsung telecomm	FDD_R6_RRH			
	1		tower mounts	Platform Mount [LP 502-1]			
100.0	102.0	3	alcatel lucent	B25 RRH4X30	1	1-5/8	2
		3	alcatel lucent	B66A RRH4X45			
		9	commscope	SBNHH-1D45A			
		1	raycap	RXXDC-3315-PF-48			
		12	rfs/celwave	FD9R6004/2C-3L			
	3	antel	BXA-70063-6BF-EDIN-0	12	1-5/8	1	
	100.0	1	crown mounts	Platform Mount [LP 303-1]			

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

**Table 3 - Design Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
120	120	12	-	ALP9212 Antennas	12	1-5/8
		1	-	Platform		
100	100	12	-	ALP9212 Antennas	12	1-5/8
		1	-	Platform		

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Engineering, Inc.	2221322	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn	2068407	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	2068406	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, Inc.	2217524	CCISITES
4-POST-MODIFICATION INSPECTION	Vertical Solutions, Inc.	2217525	CCISITES
4-POST-MODIFICATION INSPECTION	GPD Assocaites	2638363	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Assocaites	2638364	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3088811	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3139251	CCISITES
4-POST-MODIFICATION INSPECTION	Paul J. Ford and Company	3158394	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	3265183	CCISITES
4-POST-MODIFICATION INSPECTION	Paul J. Ford and Company	3334396	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Paul J. Ford and Company	5461972	CCISITES
4-POST-MODIFICATION INSPECTION	Engineered Tower Solutions, Inc.	6078054	CCISITES

#### 3.1) Analysis Method

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

### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) The vertical jump plates installed as per Doc ID: 2217524, at 30ft and 90ft elevation are considered to be removed and hence not considered in the analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Velocitel 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	% Capacity	Pass / Fail
L1	120 - 115	Pole	TP24x24x0.25	Pole	6.8%	Pass
L2	115 - 110	Pole	TP24x24x0.25	Pole	15.2%	Pass
L3	110 - 105	Pole	TP24x24x0.25	Pole	24.1%	Pass
L4	105 - 100	Pole	TP24x24x0.25	Pole	35.7%	Pass
L5	100 - 98.5	Pole	TP24x24x0.25	Pole	40.3%	Pass
L6	98.5 - 98.25	Pole + Reinf.	TP24x24x0.3875	Reinf. 12 Tension Rupture	29.0%	Pass
L7	98.25 - 93.25	Pole + Reinf.	TP24x24x0.3875	Reinf. 12 Tension Rupture	40.3%	Pass
L8	93.25 - 90	Pole + Reinf.	TP24x24x0.3875	Reinf. 12 Tension Rupture	47.8%	Pass
L9	90 - 89.75	Pole	TP24x24x0.375	Pole	43.4%	Pass
L10	89.75 - 84.75	Pole	TP24x24x0.375	Pole	54.1%	Pass
L11	84.75 - 79.75	Pole	TP24x24x0.375	Pole	65.0%	Pass
L12	79.75 - 78.25	Pole	TP24x24x0.375	Pole	68.3%	Pass
L13	78.25 - 78	Pole + Reinf.	TP24x24x0.5188	Reinf. 11 Tension Rupture	58.5%	Pass
L14	78 - 75.04	Pole + Reinf.	TP24x24x0.5188	Reinf. 11 Tension Rupture	64.2%	Pass
L15	75.04 - 74.79	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	51.2%	Pass
L16	74.79 - 69.79	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	59.2%	Pass
L17	69.79 - 64.79	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	67.6%	Pass
L18	64.79 - 60	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	76.0%	Pass
L19	60 - 59.75	Pole + Reinf.	TP30x30x0.5313	Pole	53.8%	Pass
L20	59.75 - 54.75	Pole + Reinf.	TP30x30x0.5313	Pole	60.3%	Pass
L21	54.75 - 49.75	Pole + Reinf.	TP30x30x0.5313	Pole	67.0%	Pass
L22	49.75 - 49.25	Pole + Reinf.	TP30x30x0.5313	Pole	67.7%	Pass
L23	49.25 - 49	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	62.7%	Pass
L24	49 - 44	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	69.1%	Pass
L25	44 - 43	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	70.4%	Pass
L26	43 - 42.75	Pole + Reinf.	TP30x30x0.8125	Reinf. 2 Tension Rupture	67.1%	Pass
L27	42.75 - 39	Pole + Reinf.	TP30x30x0.8125	Reinf. 2 Tension Rupture	71.9%	Pass
L28	39 - 38.75	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	76.1%	Pass
L29	38.75 - 33.75	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	83.1%	Pass
L30	33.75 - 30	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	88.5%	Pass
L31	30 - 29.75	Pole + Reinf.	TP36x36x0.55	Pole	66.0%	Pass
L32	29.75 - 26	Pole + Reinf.	TP36x36x0.55	Pole	70.2%	Pass
L33	26 - 25.75	Pole + Reinf.	TP36x36x0.65	Reinf. 9 Tension Rupture	65.4%	Pass
L34	25.75 - 20.75	Pole + Reinf.	TP36x36x0.65	Reinf. 9 Tension Rupture	70.7%	Pass
L35	20.75 - 20.5	Pole + Reinf.	TP36x36x0.7875	Reinf. 1 Tension Rupture	65.6%	Pass
L36	20.5 - 18	Pole + Reinf.	TP36x36x0.7875	Reinf. 1 Tension Rupture	68.1%	Pass
L37	18 - 17.75	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	77.1%	Pass
L38	17.75 - 13.46	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	82.0%	Pass
L39	13.46 - 13.21	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	82.9%	Pass
L40	13.21 - 8.21	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	88.9%	Pass
L41	8.21 - 6.08	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	91.5%	Pass



Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L42	6.08 - 5.83	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	91.2%	Pass
L43	5.83 - 0.83	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	97.4%	Pass
L44	0.83 - 0	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	98.5%	Pass
					Summary	
				Pole	82.5%	Pass
				Reinforcement	98.5%	Pass
				<b>Overall</b>	<b>98.5%</b>	<b>Pass</b>

**Table 6 - Tower Component Stresses vs. Capacity - LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	50.3	Pass
1	Base Foundation	0	21.5	Pass
1	Base Foundation Soil Interaction	0	67.0	Pass
1	Flange Connection	30	86.3	Pass
1	Flange Connection	60	53.7	Pass
1	Flange Connection	90	43.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>98.5%</b>
---	--------------

Notes:

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

#### 4.1) Recommendations

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

**APPENDIX A**  
**TNXTOWER OUTPUT**

**DESIGNED APPURTENANCE LOADING**

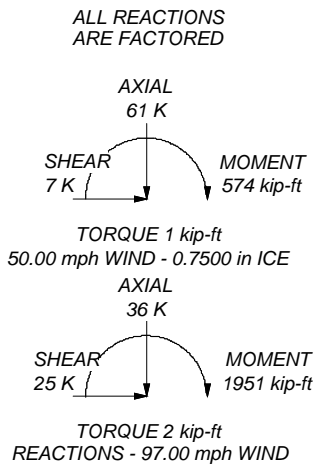
TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	117	Platform Mount [LP 502-1]	117
(2) LLPX310R w/ Mount Pipe	117	VHLP1-18	117
(2) FDD_R6_RRH	117	VHLP1-18	117
FDD_R6_RRH	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
HORIZON COMPACT	117	(2) FD9R6004/2C-3L	100
HORIZON COMPACT	117	(2) FD9R6004/2C-3L	100
APXV9ERR18-C-A20 w/ Mount Pipe	117	(4) FD9R6004/2C-3L	100
KS24019-L112A	117	(2) FD9R6004/2C-3L	100
APXVSP18-C-A20 w/ Mount Pipe	117	(2) FD9R6004/2C-3L	100
APXVSP18-C-A20 w/ Mount Pipe	117	(3) SBNHH-1D45A w/ Mount Pipe	100
APXVTM14-ALU-I20 w/ Mount Pipe	117	(3) SBNHH-1D45A w/ Mount Pipe	100
APXVTM14-ALU-I20 w/ Mount Pipe	117	(3) SBNHH-1D45A w/ Mount Pipe	100
APXVTM14-ALU-I20 w/ Mount Pipe	117	RXXDC-3315-PF-48	100
TD-RRH8x20-25	117	B25 RRH4X30	100
TD-RRH8x20-25	117	B25 RRH4X30	100
TD-RRH8x20-25	117	B25 RRH4X30	100
800MHZ RRH	117	B66A RRH4X45	100
800MHZ RRH	117	B66A RRH4X45	100
800MHZ RRH	117	B66A RRH4X45	100
(2) 1900MHz RRH (65MHz)	117	B66A RRH4X45	100
(2) 1900MHz RRH (65MHz)	117	Platform Mount [LP 303-1]	100
(2) 1900MHz RRH (65MHz)	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
(3) ACU-A20-N	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
(3) ACU-A20-N	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
(3) ACU-A20-N	117	Bridge Stiffener (58" x 14" x 1.25")	60
800 EXTERNAL NOTCH FILTER	117	Bridge Stiffener (58" x 14" x 1.25")	60
800 EXTERNAL NOTCH FILTER	117	Bridge Stiffener (58" x 14" x 1.25")	60
800 EXTERNAL NOTCH FILTER	117	Bridge Stiffener (58" x 14" x 1.25")	30
IBC1900HB-2	117	Bridge Stiffener (93" x 16" x 1.25")	30
IBC1900HB-2	117	Bridge Stiffener (93" x 16" x 1.25")	30
IBC1900HB-2	117	Bridge Stiffener (93" x 16" x 1.25")	30
(2) Pipe Mount	117	Bridge Stiffener (58" x 14" x 1.25")	30
(2) Pipe Mount	117	Bridge Stiffener (58" x 14" x 1.25")	30
(2) Pipe Mount	117	Bridge Stiffener (58" x 14" x 1.25")	30

**MATERIAL STRENGTH**

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

**TOWER DESIGN NOTES**

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97.00 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.00 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft



Section	Size	Length (ft)	Grade	Weight (K)
1	P24x0.25	5.0000	A53-B-42	0.3
2	P24x0.25	5.0000	A53-B-42	0.3
3	P24x0.25	5.0000	A53-B-42	0.3
4	P24x0.25	5.0000	A53-B-42	0.3
5	P24x0.25	5.0000	A53-B-42	0.3
6	P24x0.25	5.0000	A53-B-42	0.3
7	P24x0.25	5.0000	A53-B-42	0.5
8	P24x0.25	5.0000	A53-B-42	0.3
9	P24x0.25	5.0000	A53-B-42	0.3
10	P24x0.25	5.0000	A53-B-42	0.5
11	P24x0.25	5.0000	A53-B-42	0.5
12	P24x0.25	5.0000	A53-B-42	0.1
13	P24x0.25	5.0000	A53-B-42	0.1
14	P24x0.25	5.0000	A53-B-42	0.4
15	P24x0.25	5.0000	A53-B-42	0.1
16	P24x0.25	5.0000	A53-B-42	0.8
17	P24x0.25	5.0000	A53-B-42	0.8
18	P24x0.25	5.0000	A53-B-42	0.7
19	P24x0.25	5.0000	A53-B-42	0.7
20	P24x0.25	5.0000	A53-B-42	0.8
21	P24x0.25	5.0000	A53-B-42	0.8
22	P24x0.25	5.0000	A53-B-42	0.8
23	P24x0.25	5.0000	A53-B-42	1.0
24	P24x0.25	5.0000	A53-B-42	1.0
25	P24x0.25	5.0000	A53-B-42	1.0
26	P24x0.25	5.0000	A53-B-42	0.9
27	P24x0.25	5.0000	A53-B-42	0.9
28	P24x0.25	5.0000	A53-B-42	0.9
29	P24x0.25	5.0000	A53-B-42	1.0
30	P24x0.25	5.0000	A53-B-42	1.0
31	P24x0.25	5.0000	A53-B-42	1.0
32	P24x0.25	5.0000	A53-B-42	1.1
33	P24x0.25	5.0000	A53-B-42	1.1
34	P24x0.25	5.0000	A53-B-42	1.2
35	P24x0.25	5.0000	A53-B-42	1.2
36	P24x0.25	5.0000	A53-B-42	1.0
37	P24x0.25	5.0000	A53-B-42	1.1
38	P24x0.25	5.0000	A53-B-42	1.1
39	P24x0.25	5.0000	A53-B-42	1.1
40	P24x0.25	5.0000	A53-B-42	1.3
41	P24x0.25	5.0000	A53-B-42	1.3
42	P24x0.25	5.0000	A53-B-42	1.0
43	P24x0.25	5.0000	A53-B-42	1.2
44	P24x0.25	5.0000	A53-B-42	1.2

**FDH Velocitel**  
 6521 Meridien Drive, Suite 107  
 Raleigh, North Carolina 27616  
 Phone: 9197551012  
 FAX: 9197551031

Job: **120 ft Monopole / Jai-Alai**  
 Project: **17QG011400**  
 Client: CCI  
 Code: TIA-222-G  
 Path:  
 Drawn by: CShetti  
 Date: 06/21/17  
 App'd:  
 Scale: NTS  
 Dwg No. E-1

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 1 of 50
	<b>Project</b> 17QGOI1400	<b>Date</b> 17:29:33 06/21/17
	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

## Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 97.00 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.0000 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56.00 pcf.
- A wind speed of 50.00 mph is used in combination with ice.
- Temperature drop of 50.00 °F.
- Deflections calculated using a wind speed of 60.00 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retention Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-G Bracing Resist. Exemption</li> <li>Use TIA-222-G Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul> |
|--|--|---|

## Pole Section Geometry

Section	Elevation	Section Length	Pole Size	Pole Grade	Socket Length
	ft	ft			ft
L1	120.0000-115.0000	5.0000	P24x0.25	A53-B-42	
	0			(42 ksi)	
L2	115.0000-110.0000	5.0000	P24x0.25	A53-B-42	

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Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
	0			(42 ksi)	
L3	110.0000-105.0000	5.0000	P24x0.25	A53-B-42	
	0			(42 ksi)	
L4	105.0000-100.0000	5.0000	P24x0.25	A53-B-42	
	0			(42 ksi)	
L5	100.0000-98.5000	1.5000	P24x0.25	A53-B-42	
				(42 ksi)	
L6	98.5000-98.2500	0.2500	P24x0.3875	A53-B-42	
				(42 ksi)	
L7	98.2500-93.2500	5.0000	P24x0.3875	A53-B-42	
				(42 ksi)	
L8	93.2500-90.0000	3.2500	P24x0.3875	A53-B-42	
				(42 ksi)	
L9	90.0000-89.7500	0.2500	P24x0.375	A53-B-42	
				(42 ksi)	
L10	89.7500-84.7500	5.0000	P24x0.375	A53-B-42	
				(42 ksi)	
L11	84.7500-79.7500	5.0000	P24x0.375	A53-B-42	
				(42 ksi)	
L12	79.7500-78.2500	1.5000	P24x0.375	A53-B-42	
				(42 ksi)	
L13	78.2500-78.0000	0.2500	P24x0.51875	A53-B-42	
				(42 ksi)	
L14	78.0000-75.0400	2.9600	P24x0.51875	A53-B-42	
				(42 ksi)	
L15	75.0400-74.7900	0.2500	P24x0.675	A53-B-42	
				(42 ksi)	
L16	74.7900-69.7900	5.0000	P24x0.675	A53-B-42	
				(42 ksi)	
L17	69.7900-64.7900	5.0000	P24x0.675	A53-B-42	
				(42 ksi)	
L18	64.7900-60.0000	4.7900	P24x0.675	A53-B-42	
				(42 ksi)	
L19	60.0000-59.7500	0.2500	P30x0.53125	A53-B-42	
				(42 ksi)	
L20	59.7500-54.7500	5.0000	P30x0.53125	A53-B-42	
				(42 ksi)	
L21	54.7500-49.7500	5.0000	P30x0.53125	A53-B-42	
				(42 ksi)	
L22	49.7500-49.2500	0.5000	P30x0.53125	A53-B-42	
				(42 ksi)	
L23	49.2500-49.0000	0.2500	P30x0.65	A53-B-42	
				(42 ksi)	
L24	49.0000-44.0000	5.0000	P30x0.65	A53-B-42	
				(42 ksi)	
L25	44.0000-43.0000	1.0000	P30x0.65	A53-B-42	
				(42 ksi)	
L26	43.0000-42.7500	0.2500	P30x0.8125	A53-B-42	
				(42 ksi)	
L27	42.7500-39.0000	3.7500	P30x0.8125	A53-B-42	
				(42 ksi)	
L28	39.0000-38.7500	0.2500	P30x0.65	A53-B-42	
				(42 ksi)	
L29	38.7500-33.7500	5.0000	P30x0.65	A53-B-42	
				(42 ksi)	
L30	33.7500-30.0000	3.7500	P30x0.65	A53-B-42	
				(42 ksi)	
L31	30.0000-29.7500	0.2500	P36x0.55	A53-B-42	
				(42 ksi)	
L32	29.7500-26.0000	3.7500	P36x0.55	A53-B-42	
				(42 ksi)	

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Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L33	26.0000-25.7500	0.2500	P36x0.65	A53-B-42 (42 ksi)	
L34	25.7500-20.7500	5.0000	P36x0.65	A53-B-42 (42 ksi)	
L35	20.7500-20.5000	0.2500	P36x0.7875	A53-B-42 (42 ksi)	
L36	20.5000-18.0000	2.5000	P36x0.7875	A53-B-42 (42 ksi)	
L37	18.0000-17.7500	0.2500	P36x0.6875	A53-B-42 (42 ksi)	
L38	17.7500-13.4600	4.2900	P36x0.6875	A53-B-42 (42 ksi)	
L39	13.4600-13.2100	0.2500	P36x0.7	A53-B-42 (42 ksi)	
L40	13.2100-8.2100	5.0000	P36x0.7	A53-B-42 (42 ksi)	
L41	8.2100-6.0800	2.1300	P36x0.7	A53-B-42 (42 ksi)	
L42	6.0800-5.8300	0.2500	P36x0.6875	A53-B-42 (42 ksi)	
L43	5.8300-0.8300	5.0000	P36x0.6875	A53-B-42 (42 ksi)	
L44	0.8300-0.0000	0.8300	P36x0.6875	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.0000-115.0000				1	1	1			
L2 115.0000-110.0000				1	1	1			
L3 110.0000-105.0000				1	1	1			
L4 105.0000-100.0000				1	1	1			
L5 100.0000-98.5000				1	1	1			
L6 98.5000-98.2500				1	1	0.962015			
L7 98.2500-93.2500				1	1	0.962015			
L8 93.2500-90.0000				1	1	0.962015			
L9 90.0000-89.7500				1	1	1			
L10				1	1	1			



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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
L30				1	1	0.939223			
33.7500-30.0000									
L31				1	1	0.961904			
30.0000-29.7500									
L32				1	1	0.961904			
29.7500-26.0000									
L33				1	1	0.940899			
26.0000-25.7500									
L34				1	1	0.940899			
25.7500-20.7500									
L35				1	1	0.930309			
20.7500-20.5000									
L36				1	1	0.930309			
20.5000-18.0000									
L37				1	1	0.944607			
18.0000-17.7500									
L38				1	1	0.944607			
17.7500-13.4600									
L39				1	1	0.961689			
13.4600-13.2100									
L40				1	1	0.961689			
13.2100-8.2100									
L41				1	1	0.961689			
8.2100-6.0800									
L42				1	1	0.944607			
6.0800-5.8300									
L43				1	1	0.944607			
5.8300-0.8300									
L44				1	1	0.944607			
0.8300-0.0000									

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
			ft						
7983A(1/2")	C	Surface Ar (CaAa)	117.0000 - 0.0000	2	2	0.070 0.100	0.5800		0.08
2" (Nominal) Conduit	C	Surface Ar (CaAa)	117.0000 - 0.0000	2	2	0.100 0.200	2.3750		0.72
HB158-1-08U8-S8J18(1-5/8)	C	Surface Ar (CaAa)	100.0000 - 0.0000	1	1	0.210 0.210	1.9800		1.30
***									
Safety Line 3/8	A	Surface Ar	120.0000 - 0.0000	1	1	0.000	0.3750		0.22



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Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
***		(CaAa)				0.000			
***									
***									
3.5" x 1.25" Flat Plate (G)	B	Surface Af (CaAa)	22.0000 - 0.0000	1	1	0.167 0.167	3.5000	9.5000	0.00
3.5" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	22.0000 - 0.0000	1	1	0.167 0.167	3.5000	9.5000	0.00
3.5" x 1.25" Flat Plate (G)	C	Surface Af (CaAa)	22.0000 - 0.0000	1	1	0.167 0.167	3.5000	9.5000	0.00
***									
3.25" x 1.25" Flat Plate (G)	B	Surface Af (CaAa)	44.0000 - 32.0000	1	1	0.167 0.167	3.2500	9.0000	0.00
3.25" x 1.25" Flat Plate (G)	A	Surface Af (CaAa)	44.0000 - 32.0000	1	1	0.167 0.167	3.2500	9.0000	0.00
3.25" x 1.25" Flat Plate (G)	C	Surface Af (CaAa)	44.0000 - 32.0000	1	1	0.167 0.167	3.2500	9.0000	0.00
***									
Aero MP305	A	Surface Af (CaAa)	8.5000 - 0.5000	1	1	-0.250 -0.250	5.3300	14.8400	0.00
***									
Aero MP304	A	Surface Af (CaAa)	14.8800 - 4.8800	1	1	0.000 0.000	4.7800	12.7800	0.00
Aero MP304	C	Surface Af (CaAa)	14.8800 - 4.8800	1	1	0.500 0.500	4.7800	12.7800	0.00
***									
Aero MP305	A	Surface Af (CaAa)	29.2500 - 11.2500	1	1	-0.250 -0.250	5.3300	14.8400	0.00
***									
Aero MP305	C	Surface Af (CaAa)	29.2500 - 0.5000	1	1	-0.250 -0.250	5.3300	14.8400	0.00
Aero MP305	B	Surface Af (CaAa)	29.2500 - 0.5000	1	1	-0.250 -0.250	5.3300	14.8400	0.00
***									
Aero MP304	C	Surface Af (CaAa)	59.2300 - 30.2300	1	1	-0.250 -0.250	4.7800	12.7800	0.00
Aero MP304	B	Surface Af (CaAa)	59.2300 - 30.2300	1	1	-0.250 -0.250	4.7800	12.7800	0.00
Aero MP304	A	Surface Af (CaAa)	59.2300 - 30.2300	1	1	-0.250 -0.250	4.7800	12.7800	0.00
***									
Aero MP303	C	Surface Af (CaAa)	75.2100 - 60.2100	1	1	-0.250 -0.250	4.0600	11.2600	0.00
Aero MP303	B	Surface Af (CaAa)	75.2100 - 60.2100	1	1	-0.250 -0.250	4.0600	11.2600	0.00
Aero MP303	A	Surface Af (CaAa)	75.2100 - 60.2100	1	1	-0.250 -0.250	4.0600	11.2600	0.00
***									
4" x 0.75" Flat Plate (G)	C	Surface Af (CaAa)	26.5800 - 16.5800	1	1	0.330 0.330	4.0000	9.5000	0.00
4" x 0.75" Flat Plate (G)	B	Surface Af (CaAa)	26.5800 - 16.5800	1	1	0.330 0.330	4.0000	9.5000	0.00
4" x 0.75" Flat Plate (G)	A	Surface Af (CaAa)	26.5800 - 16.5800	1	1	0.330 0.330	4.0000	9.5000	0.00
***									
4" x 0.75" Flat Plate (G)	C	Surface Af (CaAa)	48.8800 - 29.8000	1	1	0.330 0.330	4.0000	9.5000	0.00
4" x 0.75" Flat Plate (G)	B	Surface Af (CaAa)	48.8800 - 29.8000	1	1	0.330 0.330	4.0000	9.5000	0.00
4" x 0.75" Flat Plate (G)	A	Surface Af (CaAa)	48.8800 - 29.8000	1	1	0.330 0.330	4.0000	9.5000	0.00



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### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	$A_R$	$A_F$	$C_{AA}$ In Face	$C_{AA}$ Out Face	Weight K
			$ft^2$	$ft^2$	$ft^2$	$ft^2$	
L1	120.0000-115.0000 0	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.182	0.000	0.02
L2	115.0000-110.0000 0	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.955	0.000	0.04
L3	110.0000-105.0000 0	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.955	0.000	0.04
L4	105.0000-100.0000 0	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.955	0.000	0.04
L5	100.0000-98.5000	A	0.000	0.000	1.056	0.000	0.00
		B	0.000	0.000	1.000	0.000	0.00
		C	0.000	0.000	2.184	0.000	0.04
L6	98.5000-98.2500	A	0.000	0.000	0.176	0.000	0.00
		B	0.000	0.000	0.167	0.000	0.00
		C	0.000	0.000	0.364	0.000	0.01
L7	98.2500-93.2500	A	0.000	0.000	3.521	0.000	0.00
		B	0.000	0.000	3.333	0.000	0.00
		C	0.000	0.000	7.278	0.000	0.13
L8	93.2500-90.0000	A	0.000	0.000	2.289	0.000	0.00
		B	0.000	0.000	2.167	0.000	0.00
		C	0.000	0.000	4.731	0.000	0.08
L9	90.0000-89.7500	A	0.000	0.000	0.009	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.197	0.000	0.01
L10	89.7500-84.7500	A	0.000	0.000	0.188	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	3.945	0.000	0.13
L11	84.7500-79.7500	A	0.000	0.000	0.354	0.000	0.00
		B	0.000	0.000	0.167	0.000	0.00
		C	0.000	0.000	4.112	0.000	0.13
L12	79.7500-78.2500	A	0.000	0.000	1.056	0.000	0.00
		B	0.000	0.000	1.000	0.000	0.00
		C	0.000	0.000	2.184	0.000	0.04
L13	78.2500-78.0000	A	0.000	0.000	0.176	0.000	0.00
		B	0.000	0.000	0.167	0.000	0.00
		C	0.000	0.000	0.364	0.000	0.01
L14	78.0000-75.0400	A	0.000	0.000	2.199	0.000	0.00
		B	0.000	0.000	2.088	0.000	0.00
		C	0.000	0.000	4.424	0.000	0.08
L15	75.0400-74.7900	A	0.000	0.000	0.345	0.000	0.00
		B	0.000	0.000	0.336	0.000	0.00
		C	0.000	0.000	0.533	0.000	0.01
L16	74.7900-69.7900	A	0.000	0.000	6.904	0.000	0.00
		B	0.000	0.000	6.717	0.000	0.00
		C	0.000	0.000	10.662	0.000	0.13
L17	69.7900-64.7900	A	0.000	0.000	6.904	0.000	0.00
		B	0.000	0.000	6.717	0.000	0.00
		C	0.000	0.000	10.662	0.000	0.13
L18	64.7900-60.0000	A	0.000	0.000	6.472	0.000	0.00
		B	0.000	0.000	6.292	0.000	0.00
		C	0.000	0.000	10.072	0.000	0.12
L19	60.0000-59.7500	A	0.000	0.000	0.009	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L20	59.7500-54.7500	C	0.000	0.000	0.197	0.000	0.01
		A	0.000	0.000	3.757	0.000	0.00
		B	0.000	0.000	3.569	0.000	0.00
L21	54.7500-49.7500	C	0.000	0.000	7.514	0.000	0.13
		A	0.000	0.000	4.171	0.000	0.00
		B	0.000	0.000	3.983	0.000	0.00
L22	49.7500-49.2500	C	0.000	0.000	7.928	0.000	0.13
		A	0.000	0.000	0.417	0.000	0.00
		B	0.000	0.000	0.398	0.000	0.00
L23	49.2500-49.0000	C	0.000	0.000	0.793	0.000	0.01
		A	0.000	0.000	0.209	0.000	0.00
		B	0.000	0.000	0.199	0.000	0.00
L24	49.0000-44.0000	C	0.000	0.000	0.396	0.000	0.01
		A	0.000	0.000	7.424	0.000	0.00
		B	0.000	0.000	7.237	0.000	0.00
L25	44.0000-43.0000	C	0.000	0.000	11.182	0.000	0.13
		A	0.000	0.000	2.043	0.000	0.00
		B	0.000	0.000	2.005	0.000	0.00
L26	43.0000-42.7500	C	0.000	0.000	2.794	0.000	0.03
		A	0.000	0.000	0.511	0.000	0.00
		B	0.000	0.000	0.501	0.000	0.00
L27	42.7500-39.0000	C	0.000	0.000	0.699	0.000	0.01
		A	0.000	0.000	7.659	0.000	0.00
		B	0.000	0.000	7.519	0.000	0.00
L28	39.0000-38.7500	C	0.000	0.000	10.477	0.000	0.10
		A	0.000	0.000	0.511	0.000	0.00
		B	0.000	0.000	0.501	0.000	0.00
L29	38.7500-33.7500	C	0.000	0.000	0.699	0.000	0.01
		A	0.000	0.000	10.213	0.000	0.00
		B	0.000	0.000	10.025	0.000	0.00
L30	33.7500-30.0000	C	0.000	0.000	13.970	0.000	0.13
		A	0.000	0.000	6.393	0.000	0.00
		B	0.000	0.000	6.252	0.000	0.00
L31	30.0000-29.7500	C	0.000	0.000	9.211	0.000	0.10
		A	0.000	0.000	0.143	0.000	0.00
		B	0.000	0.000	0.133	0.000	0.00
L32	29.7500-26.0000	C	0.000	0.000	0.331	0.000	0.01
		A	0.000	0.000	3.414	0.000	0.00
		B	0.000	0.000	3.274	0.000	0.00
L33	26.0000-25.7500	C	0.000	0.000	6.232	0.000	0.10
		A	0.000	0.000	0.398	0.000	0.00
		B	0.000	0.000	0.389	0.000	0.00
L34	25.7500-20.7500	C	0.000	0.000	0.586	0.000	0.01
		A	0.000	0.000	8.692	0.000	0.00
		B	0.000	0.000	8.504	0.000	0.00
L35	20.7500-20.5000	C	0.000	0.000	12.449	0.000	0.13
		A	0.000	0.000	0.544	0.000	0.00
		B	0.000	0.000	0.535	0.000	0.00
L36	20.5000-18.0000	C	0.000	0.000	0.732	0.000	0.01
		A	0.000	0.000	5.440	0.000	0.00
		B	0.000	0.000	5.346	0.000	0.00
L37	18.0000-17.7500	C	0.000	0.000	7.318	0.000	0.06
		A	0.000	0.000	0.544	0.000	0.00
		B	0.000	0.000	0.535	0.000	0.00
L38	17.7500-13.4600	C	0.000	0.000	0.732	0.000	0.01
		A	0.000	0.000	8.386	0.000	0.00
		B	0.000	0.000	7.093	0.000	0.00
L39	13.4600-13.2100	C	0.000	0.000	11.610	0.000	0.11
		A	0.000	0.000	0.576	0.000	0.00
		B	0.000	0.000	0.368	0.000	0.00
		C	0.000	0.000	0.764	0.000	0.01

<p><b>tnxTower</b></p> <p><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	10 of 50
	<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L40	13.2100-8.2100	A	0.000	0.000	9.086	0.000	0.00
		B	0.000	0.000	7.358	0.000	0.00
		C	0.000	0.000	15.287	0.000	0.13
L41	8.2100-6.0800	A	0.000	0.000	4.911	0.000	0.00
		B	0.000	0.000	3.135	0.000	0.00
		C	0.000	0.000	6.512	0.000	0.05
L42	6.0800-5.8300	A	0.000	0.000	0.576	0.000	0.00
		B	0.000	0.000	0.368	0.000	0.00
		C	0.000	0.000	0.764	0.000	0.01
L43	5.8300-0.8300	A	0.000	0.000	8.303	0.000	0.00
		B	0.000	0.000	7.358	0.000	0.00
		C	0.000	0.000	12.060	0.000	0.13
L44	0.8300-0.0000	A	0.000	0.000	0.808	0.000	0.00
		B	0.000	0.000	0.777	0.000	0.00
		C	0.000	0.000	1.432	0.000	0.02

**Feed Line/Linear Appurtenances Section Areas - With Ice**

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	120.0000-115.0000 0	A	1.703	0.000	0.000	1.891	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	3.181	0.000	0.05
L2	115.0000-110.0000 0	A	1.696	0.000	0.000	1.883	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	7.933	0.000	0.13
L3	110.0000-105.0000 0	A	1.688	0.000	0.000	1.876	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	7.914	0.000	0.13
L4	105.0000-100.0000 0	A	1.680	0.000	0.000	1.868	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	7.894	0.000	0.13
L5	100.0000-98.5000	A	1.675	0.000	0.000	1.895	0.000	0.02
		B		0.000	0.000	1.336	0.000	0.02
		C		0.000	0.000	4.500	0.000	0.09
L6	98.5000-98.2500	A	1.673	0.000	0.000	0.316	0.000	0.00
		B		0.000	0.000	0.223	0.000	0.00
		C		0.000	0.000	0.750	0.000	0.02
L7	98.2500-93.2500	A	1.669	0.000	0.000	6.307	0.000	0.07
		B		0.000	0.000	4.451	0.000	0.05
		C		0.000	0.000	14.975	0.000	0.30
L8	93.2500-90.0000	A	1.661	0.000	0.000	4.092	0.000	0.05
		B		0.000	0.000	2.891	0.000	0.03
		C		0.000	0.000	9.715	0.000	0.20
L9	90.0000-89.7500	A	1.658	0.000	0.000	0.092	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.524	0.000	0.01
L10	89.7500-84.7500	A	1.653	0.000	0.000	1.841	0.000	0.02
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	10.470	0.000	0.25
L11	84.7500-79.7500	A	1.643	0.000	0.000	2.080	0.000	0.02
		B		0.000	0.000	0.249	0.000	0.00
		C		0.000	0.000	10.685	0.000	0.25
L12	79.7500-78.2500	A	1.637	0.000	0.000	2.038	0.000	0.02
		B		0.000	0.000	1.491	0.000	0.01
		C		0.000	0.000	4.615	0.000	0.09
L13	78.2500-78.0000	A	1.635	0.000	0.000	0.340	0.000	0.00

**tnxTower**

**FDH Velocitel**  
 6521 Meridien Drive, Suite 107  
 Raleigh, North Carolina 27616  
 Phone: 9197551012  
 FAX: 9197551031

<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	11 of 50
<b>Project</b>	17QGO1400	<b>Date</b>	17:29:33 06/21/17
<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
		B		0.000	0.000	0.248	0.000	0.00
		C		0.000	0.000	0.769	0.000	0.01
L14	78.0000-75.0400	A	1.632	0.000	0.000	4.187	0.000	0.04
		B		0.000	0.000	3.110	0.000	0.03
		C		0.000	0.000	9.263	0.000	0.18
L15	75.0400-74.7900	A	1.628	0.000	0.000	0.589	0.000	0.01
		B		0.000	0.000	0.499	0.000	0.01
		C		0.000	0.000	1.018	0.000	0.02
L16	74.7900-69.7900	A	1.622	0.000	0.000	11.771	0.000	0.13
		B		0.000	0.000	9.961	0.000	0.10
		C		0.000	0.000	20.323	0.000	0.35
L17	69.7900-64.7900	A	1.611	0.000	0.000	11.736	0.000	0.12
		B		0.000	0.000	9.938	0.000	0.10
		C		0.000	0.000	20.260	0.000	0.35
L18	64.7900-60.0000	A	1.599	0.000	0.000	10.999	0.000	0.12
		B		0.000	0.000	9.288	0.000	0.10
		C		0.000	0.000	19.136	0.000	0.33
L19	60.0000-59.7500	A	1.592	0.000	0.000	0.089	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.513	0.000	0.01
L20	59.7500-54.7500	A	1.585	0.000	0.000	6.762	0.000	0.07
		B		0.000	0.000	4.989	0.000	0.05
		C		0.000	0.000	15.220	0.000	0.30
L21	54.7500-49.7500	A	1.571	0.000	0.000	7.312	0.000	0.08
		B		0.000	0.000	5.554	0.000	0.06
		C		0.000	0.000	15.735	0.000	0.30
L22	49.7500-49.2500	A	1.562	0.000	0.000	0.729	0.000	0.01
		B		0.000	0.000	0.555	0.000	0.01
		C		0.000	0.000	1.570	0.000	0.03
L23	49.2500-49.0000	A	1.561	0.000	0.000	0.365	0.000	0.00
		B		0.000	0.000	0.277	0.000	0.00
		C		0.000	0.000	0.785	0.000	0.01
L24	49.0000-44.0000	A	1.552	0.000	0.000	12.044	0.000	0.12
		B		0.000	0.000	10.304	0.000	0.10
		C		0.000	0.000	20.421	0.000	0.34
L25	44.0000-43.0000	A	1.542	0.000	0.000	3.266	0.000	0.03
		B		0.000	0.000	2.920	0.000	0.03
		C		0.000	0.000	4.936	0.000	0.08
L26	43.0000-42.7500	A	1.540	0.000	0.000	0.816	0.000	0.01
		B		0.000	0.000	0.730	0.000	0.01
		C		0.000	0.000	1.233	0.000	0.02
L27	42.7500-39.0000	A	1.532	0.000	0.000	12.220	0.000	0.12
		B		0.000	0.000	10.930	0.000	0.11
		C		0.000	0.000	18.466	0.000	0.29
L28	39.0000-38.7500	A	1.525	0.000	0.000	0.813	0.000	0.01
		B		0.000	0.000	0.728	0.000	0.01
		C		0.000	0.000	1.229	0.000	0.02
L29	38.7500-33.7500	A	1.514	0.000	0.000	16.225	0.000	0.16
		B		0.000	0.000	14.523	0.000	0.14
		C		0.000	0.000	24.506	0.000	0.38
L30	33.7500-30.0000	A	1.495	0.000	0.000	10.197	0.000	0.10
		B		0.000	0.000	8.935	0.000	0.09
		C		0.000	0.000	16.372	0.000	0.26
L31	30.0000-29.7500	A	1.485	0.000	0.000	0.276	0.000	0.00
		B		0.000	0.000	0.193	0.000	0.00
		C		0.000	0.000	0.687	0.000	0.01
L32	29.7500-26.0000	A	1.475	0.000	0.000	5.598	0.000	0.06
		B		0.000	0.000	4.351	0.000	0.04
		C		0.000	0.000	11.735	0.000	0.22
L33	26.0000-25.7500	A	1.464	0.000	0.000	0.595	0.000	0.01
		B		0.000	0.000	0.513	0.000	0.01

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	12 of 50
	<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L34	25.7500-20.7500	C		0.000	0.000	1.003	0.000	0.02
		A	1.448	0.000	0.000	12.960	0.000	0.13
		B		0.000	0.000	11.324	0.000	0.11
		C		0.000	0.000	21.077	0.000	0.34
L35	20.7500-20.5000	A	1.431	0.000	0.000	0.809	0.000	0.01
		B		0.000	0.000	0.728	0.000	0.01
		C		0.000	0.000	1.212	0.000	0.02
L36	20.5000-18.0000	A	1.421	0.000	0.000	8.069	0.000	0.08
		B		0.000	0.000	7.265	0.000	0.07
		C		0.000	0.000	12.094	0.000	0.18
L37	18.0000-17.7500	A	1.411	0.000	0.000	0.805	0.000	0.01
		B		0.000	0.000	0.725	0.000	0.01
		C		0.000	0.000	1.206	0.000	0.02
L38	17.7500-13.4600	A	1.392	0.000	0.000	12.404	0.000	0.12
		B		0.000	0.000	9.711	0.000	0.09
		C		0.000	0.000	19.247	0.000	0.30
L39	13.4600-13.2100	A	1.370	0.000	0.000	0.818	0.000	0.01
		B		0.000	0.000	0.505	0.000	0.00
		C		0.000	0.000	1.214	0.000	0.02
L40	13.2100-8.2100	A	1.340	0.000	0.000	13.003	0.000	0.12
		B		0.000	0.000	10.039	0.000	0.09
		C		0.000	0.000	24.097	0.000	0.36
L41	8.2100-6.0800	A	1.287	0.000	0.000	6.365	0.000	0.06
		B		0.000	0.000	4.231	0.000	0.04
		C		0.000	0.000	10.129	0.000	0.15
L42	6.0800-5.8300	A	1.264	0.000	0.000	0.744	0.000	0.01
		B		0.000	0.000	0.494	0.000	0.00
		C		0.000	0.000	1.182	0.000	0.02
L43	5.8300-0.8300	A	1.193	0.000	0.000	10.922	0.000	0.10
		B		0.000	0.000	9.743	0.000	0.08
		C		0.000	0.000	19.477	0.000	0.29
L44	0.8300-0.0000	A	0.968	0.000	0.000	1.130	0.000	0.01
		B		0.000	0.000	1.002	0.000	0.01
		C		0.000	0.000	2.342	0.000	0.04

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	120.0000-115.0000	-0.1397	0.2986	-0.4060	0.3679
L2	115.0000-110.0000	-0.2458	0.6783	-0.4284	0.7940
L3	110.0000-105.0000	-0.2458	0.6783	-0.4279	0.7938
L4	105.0000-100.0000	-0.2458	0.6783	-0.4274	0.7935
L5	100.0000-98.5000	-0.1906	0.4900	-0.3539	0.6803
L6	98.5000-98.2500	-0.1906	0.4900	-0.3538	0.6802
L7	98.2500-93.2500	-0.1906	0.4900	-0.3535	0.6799
L8	93.2500-90.0000	-0.1906	0.4900	-0.3531	0.6794
L9	90.0000-89.7500	-0.3254	0.8367	-0.5113	0.9842
L10	89.7500-84.7500	-0.3254	0.8367	-0.5110	0.9840
L11	84.7500-79.7500	-0.3143	0.8081	-0.4978	0.9593
L12	79.7500-78.2500	-0.1906	0.4900	-0.3389	0.6534
L13	78.2500-78.0000	-0.1906	0.4900	-0.3388	0.6533
L14	78.0000-75.0400	-0.1861	0.4784	-0.3321	0.6407
L15	75.0400-74.7900	-0.1341	0.3449	-0.2527	0.4877
L16	74.7900-69.7900	-0.1341	0.3449	-0.2525	0.4874
L17	69.7900-64.7900	-0.1341	0.3449	-0.2520	0.4870

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	13 of 50
	<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub>	CP <sub>z</sub>
	ft	in	in	Ice in	Ice in
L18	64.7900-60.0000	-0.1359	0.3494	-0.2543	0.4920
L19	60.0000-59.7500	-0.3406	0.8747	-0.5770	1.1127
L20	59.7500-54.7500	-0.2072	0.5321	-0.3913	0.7549
L21	54.7500-49.7500	-0.1982	0.5090	-0.3762	0.7268
L22	49.7500-49.2500	-0.1982	0.5090	-0.3756	0.7262
L23	49.2500-49.0000	-0.1982	0.5090	-0.3755	0.7261
L24	49.0000-44.0000	-0.1477	0.3794	-0.2888	0.5589
L25	44.0000-43.0000	-0.1213	0.3115	-0.2386	0.4620
L26	43.0000-42.7500	-0.1213	0.3115	-0.2385	0.4619
L27	42.7500-39.0000	-0.1213	0.3115	-0.2381	0.4616
L28	39.0000-38.7500	-0.1213	0.3115	-0.2377	0.4612
L29	38.7500-33.7500	-0.1213	0.3115	-0.2372	0.4606
L30	33.7500-30.0000	-0.1360	0.3494	-0.2635	0.5125
L31	30.0000-29.7500	-0.2480	0.6366	-0.4638	0.9008
L32	29.7500-26.0000	-0.2088	0.5359	-0.4093	0.7957
L33	26.0000-25.7500	-0.1585	0.4068	-0.3228	0.6282
L34	25.7500-20.7500	-0.1507	0.3869	-0.3059	0.5962
L35	20.7500-20.5000	-0.1314	0.3373	-0.2658	0.5188
L36	20.5000-18.0000	-0.1314	0.3373	-0.2652	0.5181
L37	18.0000-17.7500	-0.1314	0.3373	-0.2645	0.5174
L38	17.7500-13.4600	-0.4387	0.2605	-0.5195	0.4755
L39	13.4600-13.2100	-0.9787	0.0355	-0.9515	0.2858
L40	13.2100-8.2100	-0.7810	-0.0802	-0.7708	0.1895
L41	8.2100-6.0800	-0.9787	0.0355	-0.8902	0.2457
L42	6.0800-5.8300	-0.9787	0.0355	-0.8906	0.2434
L43	5.8300-0.8300	-0.3416	0.3352	-0.3645	0.5039
L44	0.8300-0.0000	-0.2028	0.5205	-0.3070	0.6952

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	1	7983A(1/2")	115.00 - 117.00	1.0000	1.0000
L1	4	2" (Nominal) Conduit	115.00 - 117.00	1.0000	1.0000
L1	14	Safety Line 3/8	115.00 - 120.00	1.0000	1.0000
L2	1	7983A(1/2")	110.00 - 115.00	1.0000	1.0000
L2	4	2" (Nominal) Conduit	110.00 - 115.00	1.0000	1.0000
L2	14	Safety Line 3/8	110.00 - 115.00	1.0000	1.0000
L3	1	7983A(1/2")	105.00 - 110.00	1.0000	1.0000
L3	4	2" (Nominal) Conduit	105.00 - 110.00	1.0000	1.0000
L3	14	Safety Line 3/8	105.00 - 110.00	1.0000	1.0000
L4	1	7983A(1/2")	100.00 - 105.00	1.0000	1.0000
L4	4	2" (Nominal) Conduit	100.00 - 105.00	1.0000	1.0000
L4	14	Safety Line 3/8	100.00 -	1.0000	1.0000



# tnxTower

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<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	14 of 50
<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
			105.00		
L5	1	7983A(1/2")	98.50 - 100.00	1.0000	1.0000
L5	4	2" (Nominal) Conduit	98.50 - 100.00	1.0000	1.0000
L5	12	HB158-1-08U8-S8J18(1-5/8)	98.50 - 100.00	1.0000	1.0000
L5	14	Safety Line 3/8	98.50 - 100.00	1.0000	1.0000
L5	56	4" x 0.75" Flat Plate (G)	98.50 - 100.00	1.0000	1.0000
L5	57	4" x 0.75" Flat Plate (G)	98.50 - 100.00	1.0000	1.0000
L5	58	4" x 0.75" Flat Plate (G)	98.50 - 100.00	1.0000	1.0000
L6	1	7983A(1/2")	98.25 - 98.50	1.0000	1.0000
L6	4	2" (Nominal) Conduit	98.25 - 98.50	1.0000	1.0000
L6	12	HB158-1-08U8-S8J18(1-5/8)	98.25 - 98.50	1.0000	1.0000
L6	14	Safety Line 3/8	98.25 - 98.50	1.0000	1.0000
L6	56	4" x 0.75" Flat Plate (G)	98.25 - 98.50	1.0000	1.0000
L6	57	4" x 0.75" Flat Plate (G)	98.25 - 98.50	1.0000	1.0000
L6	58	4" x 0.75" Flat Plate (G)	98.25 - 98.50	1.0000	1.0000
L7	1	7983A(1/2")	93.25 - 98.25	1.0000	1.0000
L7	4	2" (Nominal) Conduit	93.25 - 98.25	1.0000	1.0000
L7	12	HB158-1-08U8-S8J18(1-5/8)	93.25 - 98.25	1.0000	1.0000
L7	14	Safety Line 3/8	93.25 - 98.25	1.0000	1.0000
L7	56	4" x 0.75" Flat Plate (G)	93.25 - 98.25	1.0000	1.0000
L7	57	4" x 0.75" Flat Plate (G)	93.25 - 98.25	1.0000	1.0000
L7	58	4" x 0.75" Flat Plate (G)	93.25 - 98.25	1.0000	1.0000
L8	1	7983A(1/2")	90.00 - 93.25	1.0000	1.0000
L8	4	2" (Nominal) Conduit	90.00 - 93.25	1.0000	1.0000
L8	12	HB158-1-08U8-S8J18(1-5/8)	90.00 - 93.25	1.0000	1.0000
L8	14	Safety Line 3/8	90.00 - 93.25	1.0000	1.0000
L8	56	4" x 0.75" Flat Plate (G)	90.00 - 93.25	1.0000	1.0000
L8	57	4" x 0.75" Flat Plate (G)	90.00 - 93.25	1.0000	1.0000
L8	58	4" x 0.75" Flat Plate (G)	90.00 - 93.25	1.0000	1.0000
L9	1	7983A(1/2")	89.75 - 90.00	1.0000	1.0000
L9	4	2" (Nominal) Conduit	89.75 - 90.00	1.0000	1.0000
L9	12	HB158-1-08U8-S8J18(1-5/8)	89.75 - 90.00	1.0000	1.0000
L9	14	Safety Line 3/8	89.75 - 90.00	1.0000	1.0000
L10	1	7983A(1/2")	84.75 - 89.75	1.0000	1.0000
L10	4	2" (Nominal) Conduit	84.75 - 89.75	1.0000	1.0000
L10	12	HB158-1-08U8-S8J18(1-5/8)	84.75 - 89.75	1.0000	1.0000
L10	14	Safety Line 3/8	84.75 - 89.75	1.0000	1.0000
L11	1	7983A(1/2")	79.75 - 84.75	1.0000	1.0000
L11	4	2" (Nominal) Conduit	79.75 - 84.75	1.0000	1.0000
L11	12	HB158-1-08U8-S8J18(1-5/8)	79.75 - 84.75	1.0000	1.0000
L11	14	Safety Line 3/8	79.75 - 84.75	1.0000	1.0000
L11	52	4" x 0.75" Flat Plate (G)	79.75 - 80.00	1.0000	1.0000
L11	53	4" x 0.75" Flat Plate (G)	79.75 - 80.00	1.0000	1.0000
L11	54	4" x 0.75" Flat Plate (G)	79.75 - 80.00	1.0000	1.0000
L12	1	7983A(1/2")	78.25 - 79.75	1.0000	1.0000
L12	4	2" (Nominal) Conduit	78.25 - 79.75	1.0000	1.0000
L12	12	HB158-1-08U8-S8J18(1-5/8)	78.25 - 79.75	1.0000	1.0000
L12	14	Safety Line 3/8	78.25 - 79.75	1.0000	1.0000
L12	52	4" x 0.75" Flat Plate (G)	78.25 - 79.75	1.0000	1.0000
L12	53	4" x 0.75" Flat Plate (G)	78.25 - 79.75	1.0000	1.0000
L12	54	4" x 0.75" Flat Plate (G)	78.25 - 79.75	1.0000	1.0000
L13	1	7983A(1/2")	78.00 - 78.25	1.0000	1.0000
L13	4	2" (Nominal) Conduit	78.00 - 78.25	1.0000	1.0000
L13	12	HB158-1-08U8-S8J18(1-5/8)	78.00 - 78.25	1.0000	1.0000
L13	14	Safety Line 3/8	78.00 - 78.25	1.0000	1.0000
L13	52	4" x 0.75" Flat Plate (G)	78.00 - 78.25	1.0000	1.0000
L13	53	4" x 0.75" Flat Plate (G)	78.00 - 78.25	1.0000	1.0000
L13	54	4" x 0.75" Flat Plate (G)	78.00 - 78.25	1.0000	1.0000
L14	1	7983A(1/2")	75.04 - 78.00	1.0000	1.0000
L14	4	2" (Nominal) Conduit	75.04 - 78.00	1.0000	1.0000
L14	12	HB158-1-08U8-S8J18(1-5/8)	75.04 - 78.00	1.0000	1.0000
L14	14	Safety Line 3/8	75.04 - 78.00	1.0000	1.0000

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<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	15 of 50
<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L14	40	Aero MP303	75.04 - 75.21	1.0000	1.0000
L14	41	Aero MP303	75.04 - 75.21	1.0000	1.0000
L14	42	Aero MP303	75.04 - 75.21	1.0000	1.0000
L14	52	4" x 0.75" Flat Plate (G)	75.04 - 78.00	1.0000	1.0000
L14	53	4" x 0.75" Flat Plate (G)	75.04 - 78.00	1.0000	1.0000
L14	54	4" x 0.75" Flat Plate (G)	75.04 - 78.00	1.0000	1.0000
L15	1	7983A(1/2")	74.79 - 75.04	1.0000	1.0000
L15	4	2" (Nominal) Conduit	74.79 - 75.04	1.0000	1.0000
L15	12	HB158-1-08U8-S8J18(1-5/8)	74.79 - 75.04	1.0000	1.0000
L15	14	Safety Line 3/8	74.79 - 75.04	1.0000	1.0000
L15	40	Aero MP303	74.79 - 75.04	1.0000	1.0000
L15	41	Aero MP303	74.79 - 75.04	1.0000	1.0000
L15	42	Aero MP303	74.79 - 75.04	1.0000	1.0000
L15	52	4" x 0.75" Flat Plate (G)	74.79 - 75.04	1.0000	1.0000
L15	53	4" x 0.75" Flat Plate (G)	74.79 - 75.04	1.0000	1.0000
L15	54	4" x 0.75" Flat Plate (G)	74.79 - 75.04	1.0000	1.0000
L16	1	7983A(1/2")	69.79 - 74.79	1.0000	1.0000
L16	4	2" (Nominal) Conduit	69.79 - 74.79	1.0000	1.0000
L16	12	HB158-1-08U8-S8J18(1-5/8)	69.79 - 74.79	1.0000	1.0000
L16	14	Safety Line 3/8	69.79 - 74.79	1.0000	1.0000
L16	40	Aero MP303	69.79 - 74.79	1.0000	1.0000
L16	41	Aero MP303	69.79 - 74.79	1.0000	1.0000
L16	42	Aero MP303	69.79 - 74.79	1.0000	1.0000
L16	52	4" x 0.75" Flat Plate (G)	69.79 - 74.79	1.0000	1.0000
L16	53	4" x 0.75" Flat Plate (G)	69.79 - 74.79	1.0000	1.0000
L16	54	4" x 0.75" Flat Plate (G)	69.79 - 74.79	1.0000	1.0000
L17	1	7983A(1/2")	64.79 - 69.79	1.0000	1.0000
L17	4	2" (Nominal) Conduit	64.79 - 69.79	1.0000	1.0000
L17	12	HB158-1-08U8-S8J18(1-5/8)	64.79 - 69.79	1.0000	1.0000
L17	14	Safety Line 3/8	64.79 - 69.79	1.0000	1.0000
L17	40	Aero MP303	64.79 - 69.79	1.0000	1.0000
L17	41	Aero MP303	64.79 - 69.79	1.0000	1.0000
L17	42	Aero MP303	64.79 - 69.79	1.0000	1.0000
L17	52	4" x 0.75" Flat Plate (G)	64.79 - 69.79	1.0000	1.0000
L17	53	4" x 0.75" Flat Plate (G)	64.79 - 69.79	1.0000	1.0000
L17	54	4" x 0.75" Flat Plate (G)	64.79 - 69.79	1.0000	1.0000
L18	1	7983A(1/2")	60.00 - 64.79	1.0000	1.0000
L18	4	2" (Nominal) Conduit	60.00 - 64.79	1.0000	1.0000
L18	12	HB158-1-08U8-S8J18(1-5/8)	60.00 - 64.79	1.0000	1.0000
L18	14	Safety Line 3/8	60.00 - 64.79	1.0000	1.0000
L18	40	Aero MP303	60.21 - 64.79	1.0000	1.0000
L18	41	Aero MP303	60.21 - 64.79	1.0000	1.0000
L18	42	Aero MP303	60.21 - 64.79	1.0000	1.0000
L18	52	4" x 0.75" Flat Plate (G)	60.00 - 64.79	1.0000	1.0000
L18	53	4" x 0.75" Flat Plate (G)	60.00 - 64.79	1.0000	1.0000
L18	54	4" x 0.75" Flat Plate (G)	60.00 - 64.79	1.0000	1.0000
L19	1	7983A(1/2")	59.75 - 60.00	1.0000	1.0000
L19	4	2" (Nominal) Conduit	59.75 - 60.00	1.0000	1.0000
L19	12	HB158-1-08U8-S8J18(1-5/8)	59.75 - 60.00	1.0000	1.0000
L19	14	Safety Line 3/8	59.75 - 60.00	1.0000	1.0000
L20	1	7983A(1/2")	54.75 - 59.75	1.0000	1.0000
L20	4	2" (Nominal) Conduit	54.75 - 59.75	1.0000	1.0000
L20	12	HB158-1-08U8-S8J18(1-5/8)	54.75 - 59.75	1.0000	1.0000
L20	14	Safety Line 3/8	54.75 - 59.75	1.0000	1.0000
L20	36	Aero MP304	54.75 - 59.23	1.0000	1.0000
L20	37	Aero MP304	54.75 - 59.23	1.0000	1.0000
L20	38	Aero MP304	54.75 - 59.23	1.0000	1.0000
L21	1	7983A(1/2")	49.75 - 54.75	1.0000	1.0000
L21	4	2" (Nominal) Conduit	49.75 - 54.75	1.0000	1.0000
L21	12	HB158-1-08U8-S8J18(1-5/8)	49.75 - 54.75	1.0000	1.0000
L21	14	Safety Line 3/8	49.75 - 54.75	1.0000	1.0000
L21	36	Aero MP304	49.75 - 54.75	1.0000	1.0000

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<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L21	37	Aero MP304	49.75 - 54.75	1.0000	1.0000
L21	38	Aero MP304	49.75 - 54.75	1.0000	1.0000
L22	1	7983A(1/2")	49.25 - 49.75	1.0000	1.0000
L22	4	2" (Nominal) Conduit	49.25 - 49.75	1.0000	1.0000
L22	12	HB158-1-08U8-S8J18(1-5/8)	49.25 - 49.75	1.0000	1.0000
L22	14	Safety Line 3/8	49.25 - 49.75	1.0000	1.0000
L22	36	Aero MP304	49.25 - 49.75	1.0000	1.0000
L22	37	Aero MP304	49.25 - 49.75	1.0000	1.0000
L22	38	Aero MP304	49.25 - 49.75	1.0000	1.0000
L23	1	7983A(1/2")	49.00 - 49.25	1.0000	1.0000
L23	4	2" (Nominal) Conduit	49.00 - 49.25	1.0000	1.0000
L23	12	HB158-1-08U8-S8J18(1-5/8)	49.00 - 49.25	1.0000	1.0000
L23	14	Safety Line 3/8	49.00 - 49.25	1.0000	1.0000
L23	36	Aero MP304	49.00 - 49.25	1.0000	1.0000
L23	37	Aero MP304	49.00 - 49.25	1.0000	1.0000
L23	38	Aero MP304	49.00 - 49.25	1.0000	1.0000
L24	1	7983A(1/2")	44.00 - 49.00	1.0000	1.0000
L24	4	2" (Nominal) Conduit	44.00 - 49.00	1.0000	1.0000
L24	12	HB158-1-08U8-S8J18(1-5/8)	44.00 - 49.00	1.0000	1.0000
L24	14	Safety Line 3/8	44.00 - 49.00	1.0000	1.0000
L24	36	Aero MP304	44.00 - 49.00	1.0000	1.0000
L24	37	Aero MP304	44.00 - 49.00	1.0000	1.0000
L24	38	Aero MP304	44.00 - 49.00	1.0000	1.0000
L24	48	4" x 0.75" Flat Plate (G)	44.00 - 48.88	1.0000	1.0000
L24	49	4" x 0.75" Flat Plate (G)	44.00 - 48.88	1.0000	1.0000
L24	50	4" x 0.75" Flat Plate (G)	44.00 - 48.88	1.0000	1.0000
L25	1	7983A(1/2")	43.00 - 44.00	1.0000	1.0000
L25	4	2" (Nominal) Conduit	43.00 - 44.00	1.0000	1.0000
L25	12	HB158-1-08U8-S8J18(1-5/8)	43.00 - 44.00	1.0000	1.0000
L25	14	Safety Line 3/8	43.00 - 44.00	1.0000	1.0000
L25	22	3.25" x 1.25" Flat Plate (G)	43.00 - 44.00	1.0000	1.0000
L25	23	3.25" x 1.25" Flat Plate (G)	43.00 - 44.00	1.0000	1.0000
L25	24	3.25" x 1.25" Flat Plate (G)	43.00 - 44.00	1.0000	1.0000
L25	36	Aero MP304	43.00 - 44.00	1.0000	1.0000
L25	37	Aero MP304	43.00 - 44.00	1.0000	1.0000
L25	38	Aero MP304	43.00 - 44.00	1.0000	1.0000
L25	48	4" x 0.75" Flat Plate (G)	43.00 - 44.00	1.0000	1.0000
L25	49	4" x 0.75" Flat Plate (G)	43.00 - 44.00	1.0000	1.0000
L25	50	4" x 0.75" Flat Plate (G)	43.00 - 44.00	1.0000	1.0000
L26	1	7983A(1/2")	42.75 - 43.00	1.0000	1.0000
L26	4	2" (Nominal) Conduit	42.75 - 43.00	1.0000	1.0000
L26	12	HB158-1-08U8-S8J18(1-5/8)	42.75 - 43.00	1.0000	1.0000
L26	14	Safety Line 3/8	42.75 - 43.00	1.0000	1.0000
L26	22	3.25" x 1.25" Flat Plate (G)	42.75 - 43.00	1.0000	1.0000
L26	23	3.25" x 1.25" Flat Plate (G)	42.75 - 43.00	1.0000	1.0000
L26	24	3.25" x 1.25" Flat Plate (G)	42.75 - 43.00	1.0000	1.0000
L26	36	Aero MP304	42.75 - 43.00	1.0000	1.0000
L26	37	Aero MP304	42.75 - 43.00	1.0000	1.0000
L26	38	Aero MP304	42.75 - 43.00	1.0000	1.0000
L26	48	4" x 0.75" Flat Plate (G)	42.75 - 43.00	1.0000	1.0000
L26	49	4" x 0.75" Flat Plate (G)	42.75 - 43.00	1.0000	1.0000
L26	50	4" x 0.75" Flat Plate (G)	42.75 - 43.00	1.0000	1.0000
L27	1	7983A(1/2")	39.00 - 42.75	1.0000	1.0000
L27	4	2" (Nominal) Conduit	39.00 - 42.75	1.0000	1.0000
L27	12	HB158-1-08U8-S8J18(1-5/8)	39.00 - 42.75	1.0000	1.0000
L27	14	Safety Line 3/8	39.00 - 42.75	1.0000	1.0000
L27	22	3.25" x 1.25" Flat Plate (G)	39.00 - 42.75	1.0000	1.0000
L27	23	3.25" x 1.25" Flat Plate (G)	39.00 - 42.75	1.0000	1.0000
L27	24	3.25" x 1.25" Flat Plate (G)	39.00 - 42.75	1.0000	1.0000
L27	36	Aero MP304	39.00 - 42.75	1.0000	1.0000
L27	37	Aero MP304	39.00 - 42.75	1.0000	1.0000
L27	38	Aero MP304	39.00 - 42.75	1.0000	1.0000

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<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L27	48	4" x 0.75" Flat Plate (G)	39.00 - 42.75	1.0000	1.0000
L27	49	4" x 0.75" Flat Plate (G)	39.00 - 42.75	1.0000	1.0000
L27	50	4" x 0.75" Flat Plate (G)	39.00 - 42.75	1.0000	1.0000
L28	1	7983A(1/2")	38.75 - 39.00	1.0000	1.0000
L28	4	2" (Nominal) Conduit	38.75 - 39.00	1.0000	1.0000
L28	12	HB158-1-08U8-S8J18(1-5/8)	38.75 - 39.00	1.0000	1.0000
L28	14	Safety Line 3/8	38.75 - 39.00	1.0000	1.0000
L28	22	3.25" x 1.25" Flat Plate (G)	38.75 - 39.00	1.0000	1.0000
L28	23	3.25" x 1.25" Flat Plate (G)	38.75 - 39.00	1.0000	1.0000
L28	24	3.25" x 1.25" Flat Plate (G)	38.75 - 39.00	1.0000	1.0000
L28	36	Aero MP304	38.75 - 39.00	1.0000	1.0000
L28	37	Aero MP304	38.75 - 39.00	1.0000	1.0000
L28	38	Aero MP304	38.75 - 39.00	1.0000	1.0000
L28	48	4" x 0.75" Flat Plate (G)	38.75 - 39.00	1.0000	1.0000
L28	49	4" x 0.75" Flat Plate (G)	38.75 - 39.00	1.0000	1.0000
L28	50	4" x 0.75" Flat Plate (G)	38.75 - 39.00	1.0000	1.0000
L29	1	7983A(1/2")	33.75 - 38.75	1.0000	1.0000
L29	4	2" (Nominal) Conduit	33.75 - 38.75	1.0000	1.0000
L29	12	HB158-1-08U8-S8J18(1-5/8)	33.75 - 38.75	1.0000	1.0000
L29	14	Safety Line 3/8	33.75 - 38.75	1.0000	1.0000
L29	22	3.25" x 1.25" Flat Plate (G)	33.75 - 38.75	1.0000	1.0000
L29	23	3.25" x 1.25" Flat Plate (G)	33.75 - 38.75	1.0000	1.0000
L29	24	3.25" x 1.25" Flat Plate (G)	33.75 - 38.75	1.0000	1.0000
L29	36	Aero MP304	33.75 - 38.75	1.0000	1.0000
L29	37	Aero MP304	33.75 - 38.75	1.0000	1.0000
L29	38	Aero MP304	33.75 - 38.75	1.0000	1.0000
L29	48	4" x 0.75" Flat Plate (G)	33.75 - 38.75	1.0000	1.0000
L29	49	4" x 0.75" Flat Plate (G)	33.75 - 38.75	1.0000	1.0000
L29	50	4" x 0.75" Flat Plate (G)	33.75 - 38.75	1.0000	1.0000
L30	1	7983A(1/2")	30.00 - 33.75	1.0000	1.0000
L30	4	2" (Nominal) Conduit	30.00 - 33.75	1.0000	1.0000
L30	12	HB158-1-08U8-S8J18(1-5/8)	30.00 - 33.75	1.0000	1.0000
L30	14	Safety Line 3/8	30.00 - 33.75	1.0000	1.0000
L30	22	3.25" x 1.25" Flat Plate (G)	32.00 - 33.75	1.0000	1.0000
L30	23	3.25" x 1.25" Flat Plate (G)	32.00 - 33.75	1.0000	1.0000
L30	24	3.25" x 1.25" Flat Plate (G)	32.00 - 33.75	1.0000	1.0000
L30	36	Aero MP304	30.23 - 33.75	1.0000	1.0000
L30	37	Aero MP304	30.23 - 33.75	1.0000	1.0000
L30	38	Aero MP304	30.23 - 33.75	1.0000	1.0000
L30	48	4" x 0.75" Flat Plate (G)	30.00 - 33.75	1.0000	1.0000
L30	49	4" x 0.75" Flat Plate (G)	30.00 - 33.75	1.0000	1.0000
L30	50	4" x 0.75" Flat Plate (G)	30.00 - 33.75	1.0000	1.0000
L31	1	7983A(1/2")	29.75 - 30.00	1.0000	1.0000
L31	4	2" (Nominal) Conduit	29.75 - 30.00	1.0000	1.0000
L31	12	HB158-1-08U8-S8J18(1-5/8)	29.75 - 30.00	1.0000	1.0000
L31	14	Safety Line 3/8	29.75 - 30.00	1.0000	1.0000
L31	48	4" x 0.75" Flat Plate (G)	29.80 - 30.00	1.0000	1.0000
L31	49	4" x 0.75" Flat Plate (G)	29.80 - 30.00	1.0000	1.0000
L31	50	4" x 0.75" Flat Plate (G)	29.80 - 30.00	1.0000	1.0000
L32	1	7983A(1/2")	26.00 - 29.75	1.0000	1.0000
L32	4	2" (Nominal) Conduit	26.00 - 29.75	1.0000	1.0000
L32	12	HB158-1-08U8-S8J18(1-5/8)	26.00 - 29.75	1.0000	1.0000
L32	14	Safety Line 3/8	26.00 - 29.75	1.0000	1.0000
L32	31	Aero MP305	26.00 - 29.25	1.0000	1.0000
L32	33	Aero MP305	26.00 - 29.25	1.0000	1.0000
L32	34	Aero MP305	26.00 - 29.25	1.0000	1.0000
L32	44	4" x 0.75" Flat Plate (G)	26.00 - 26.58	1.0000	1.0000
L32	45	4" x 0.75" Flat Plate (G)	26.00 - 26.58	1.0000	1.0000
L32	46	4" x 0.75" Flat Plate (G)	26.00 - 26.58	1.0000	1.0000
L33	1	7983A(1/2")	25.75 - 26.00	1.0000	1.0000
L33	4	2" (Nominal) Conduit	25.75 - 26.00	1.0000	1.0000
L33	12	HB158-1-08U8-S8J18(1-5/8)	25.75 - 26.00	1.0000	1.0000

# tnxTower

**FDH Velocitel**  
6521 Meridien Drive, Suite 107  
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<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	18 of 50
<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L33	14	Safety Line 3/8	25.75 - 26.00	1.0000	1.0000
L33	31	Aero MP305	25.75 - 26.00	1.0000	1.0000
L33	33	Aero MP305	25.75 - 26.00	1.0000	1.0000
L33	34	Aero MP305	25.75 - 26.00	1.0000	1.0000
L33	44	4" x 0.75" Flat Plate (G)	25.75 - 26.00	1.0000	1.0000
L33	45	4" x 0.75" Flat Plate (G)	25.75 - 26.00	1.0000	1.0000
L33	46	4" x 0.75" Flat Plate (G)	25.75 - 26.00	1.0000	1.0000
L34	1	7983A(1/2")	20.75 - 25.75	1.0000	1.0000
L34	4	2" (Nominal) Conduit	20.75 - 25.75	1.0000	1.0000
L34	12	HB158-1-08U8-S8J18(1-5/8)	20.75 - 25.75	1.0000	1.0000
L34	14	Safety Line 3/8	20.75 - 25.75	1.0000	1.0000
L34	18	3.5" x 1.25" Flat Plate (G)	20.75 - 22.00	1.0000	1.0000
L34	19	3.5" x 1.25" Flat Plate (G)	20.75 - 22.00	1.0000	1.0000
L34	20	3.5" x 1.25" Flat Plate (G)	20.75 - 22.00	1.0000	1.0000
L34	31	Aero MP305	20.75 - 25.75	1.0000	1.0000
L34	33	Aero MP305	20.75 - 25.75	1.0000	1.0000
L34	34	Aero MP305	20.75 - 25.75	1.0000	1.0000
L34	44	4" x 0.75" Flat Plate (G)	20.75 - 25.75	1.0000	1.0000
L34	45	4" x 0.75" Flat Plate (G)	20.75 - 25.75	1.0000	1.0000
L34	46	4" x 0.75" Flat Plate (G)	20.75 - 25.75	1.0000	1.0000
L35	1	7983A(1/2")	20.50 - 20.75	1.0000	1.0000
L35	4	2" (Nominal) Conduit	20.50 - 20.75	1.0000	1.0000
L35	12	HB158-1-08U8-S8J18(1-5/8)	20.50 - 20.75	1.0000	1.0000
L35	14	Safety Line 3/8	20.50 - 20.75	1.0000	1.0000
L35	18	3.5" x 1.25" Flat Plate (G)	20.50 - 20.75	1.0000	1.0000
L35	19	3.5" x 1.25" Flat Plate (G)	20.50 - 20.75	1.0000	1.0000
L35	20	3.5" x 1.25" Flat Plate (G)	20.50 - 20.75	1.0000	1.0000
L35	31	Aero MP305	20.50 - 20.75	1.0000	1.0000
L35	33	Aero MP305	20.50 - 20.75	1.0000	1.0000
L35	34	Aero MP305	20.50 - 20.75	1.0000	1.0000
L35	44	4" x 0.75" Flat Plate (G)	20.50 - 20.75	1.0000	1.0000
L35	45	4" x 0.75" Flat Plate (G)	20.50 - 20.75	1.0000	1.0000
L35	46	4" x 0.75" Flat Plate (G)	20.50 - 20.75	1.0000	1.0000
L36	1	7983A(1/2")	18.00 - 20.50	1.0000	1.0000
L36	4	2" (Nominal) Conduit	18.00 - 20.50	1.0000	1.0000
L36	12	HB158-1-08U8-S8J18(1-5/8)	18.00 - 20.50	1.0000	1.0000
L36	14	Safety Line 3/8	18.00 - 20.50	1.0000	1.0000
L36	18	3.5" x 1.25" Flat Plate (G)	18.00 - 20.50	1.0000	1.0000
L36	19	3.5" x 1.25" Flat Plate (G)	18.00 - 20.50	1.0000	1.0000
L36	20	3.5" x 1.25" Flat Plate (G)	18.00 - 20.50	1.0000	1.0000
L36	31	Aero MP305	18.00 - 20.50	1.0000	1.0000
L36	33	Aero MP305	18.00 - 20.50	1.0000	1.0000
L36	34	Aero MP305	18.00 - 20.50	1.0000	1.0000
L36	44	4" x 0.75" Flat Plate (G)	18.00 - 20.50	1.0000	1.0000
L36	45	4" x 0.75" Flat Plate (G)	18.00 - 20.50	1.0000	1.0000
L36	46	4" x 0.75" Flat Plate (G)	18.00 - 20.50	1.0000	1.0000
L37	1	7983A(1/2")	17.75 - 18.00	1.0000	1.0000
L37	4	2" (Nominal) Conduit	17.75 - 18.00	1.0000	1.0000
L37	12	HB158-1-08U8-S8J18(1-5/8)	17.75 - 18.00	1.0000	1.0000
L37	14	Safety Line 3/8	17.75 - 18.00	1.0000	1.0000
L37	18	3.5" x 1.25" Flat Plate (G)	17.75 - 18.00	1.0000	1.0000
L37	19	3.5" x 1.25" Flat Plate (G)	17.75 - 18.00	1.0000	1.0000
L37	20	3.5" x 1.25" Flat Plate (G)	17.75 - 18.00	1.0000	1.0000
L37	31	Aero MP305	17.75 - 18.00	1.0000	1.0000
L37	33	Aero MP305	17.75 - 18.00	1.0000	1.0000
L37	34	Aero MP305	17.75 - 18.00	1.0000	1.0000
L37	44	4" x 0.75" Flat Plate (G)	17.75 - 18.00	1.0000	1.0000
L37	45	4" x 0.75" Flat Plate (G)	17.75 - 18.00	1.0000	1.0000
L37	46	4" x 0.75" Flat Plate (G)	17.75 - 18.00	1.0000	1.0000
L38	1	7983A(1/2")	13.46 - 17.75	1.0000	1.0000
L38	4	2" (Nominal) Conduit	13.46 - 17.75	1.0000	1.0000
L38	12	HB158-1-08U8-S8J18(1-5/8)	13.46 - 17.75	1.0000	1.0000

# tnxTower

**FDH Velocitel**  
6521 Meridien Drive, Suite 107  
Raleigh, North Carolina 27616  
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<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	19 of 50
<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L38	14	Safety Line 3/8	13.46 - 17.75	1.0000	1.0000
L38	18	3.5" x 1.25" Flat Plate (G)	13.46 - 17.75	1.0000	1.0000
L38	19	3.5" x 1.25" Flat Plate (G)	13.46 - 17.75	1.0000	1.0000
L38	20	3.5" x 1.25" Flat Plate (G)	13.46 - 17.75	1.0000	1.0000
L38	28	Aero MP304	13.46 - 14.88	1.0000	1.0000
L38	29	Aero MP304	13.46 - 14.88	1.0000	1.0000
L38	31	Aero MP305	13.46 - 17.75	1.0000	1.0000
L38	33	Aero MP305	13.46 - 17.75	1.0000	1.0000
L38	34	Aero MP305	13.46 - 17.75	1.0000	1.0000
L38	44	4" x 0.75" Flat Plate (G)	16.58 - 17.75	1.0000	1.0000
L38	45	4" x 0.75" Flat Plate (G)	16.58 - 17.75	1.0000	1.0000
L38	46	4" x 0.75" Flat Plate (G)	16.58 - 17.75	1.0000	1.0000
L39	1	7983A(1/2")	13.21 - 13.46	1.0000	1.0000
L39	4	2" (Nominal) Conduit	13.21 - 13.46	1.0000	1.0000
L39	12	HB158-1-08U8-S8J18(1-5/8)	13.21 - 13.46	1.0000	1.0000
L39	14	Safety Line 3/8	13.21 - 13.46	1.0000	1.0000
L39	18	3.5" x 1.25" Flat Plate (G)	13.21 - 13.46	1.0000	1.0000
L39	19	3.5" x 1.25" Flat Plate (G)	13.21 - 13.46	1.0000	1.0000
L39	20	3.5" x 1.25" Flat Plate (G)	13.21 - 13.46	1.0000	1.0000
L39	28	Aero MP304	13.21 - 13.46	1.0000	1.0000
L39	29	Aero MP304	13.21 - 13.46	1.0000	1.0000
L39	31	Aero MP305	13.21 - 13.46	1.0000	1.0000
L39	33	Aero MP305	13.21 - 13.46	1.0000	1.0000
L39	34	Aero MP305	13.21 - 13.46	1.0000	1.0000
L40	1	7983A(1/2")	8.21 - 13.21	1.0000	1.0000
L40	4	2" (Nominal) Conduit	8.21 - 13.21	1.0000	1.0000
L40	12	HB158-1-08U8-S8J18(1-5/8)	8.21 - 13.21	1.0000	1.0000
L40	14	Safety Line 3/8	8.21 - 13.21	1.0000	1.0000
L40	18	3.5" x 1.25" Flat Plate (G)	8.21 - 13.21	1.0000	1.0000
L40	19	3.5" x 1.25" Flat Plate (G)	8.21 - 13.21	1.0000	1.0000
L40	20	3.5" x 1.25" Flat Plate (G)	8.21 - 13.21	1.0000	1.0000
L40	26	Aero MP305	8.21 - 8.50	1.0000	1.0000
L40	28	Aero MP304	8.21 - 13.21	1.0000	1.0000
L40	29	Aero MP304	8.21 - 13.21	1.0000	1.0000
L40	31	Aero MP305	11.25 - 13.21	1.0000	1.0000
L40	33	Aero MP305	8.21 - 13.21	1.0000	1.0000
L40	34	Aero MP305	8.21 - 13.21	1.0000	1.0000
L41	1	7983A(1/2")	6.08 - 8.21	1.0000	1.0000
L41	4	2" (Nominal) Conduit	6.08 - 8.21	1.0000	1.0000
L41	12	HB158-1-08U8-S8J18(1-5/8)	6.08 - 8.21	1.0000	1.0000
L41	14	Safety Line 3/8	6.08 - 8.21	1.0000	1.0000
L41	18	3.5" x 1.25" Flat Plate (G)	6.08 - 8.21	1.0000	1.0000
L41	19	3.5" x 1.25" Flat Plate (G)	6.08 - 8.21	1.0000	1.0000
L41	20	3.5" x 1.25" Flat Plate (G)	6.08 - 8.21	1.0000	1.0000
L41	26	Aero MP305	6.08 - 8.21	1.0000	1.0000
L41	28	Aero MP304	6.08 - 8.21	1.0000	1.0000
L41	29	Aero MP304	6.08 - 8.21	1.0000	1.0000
L41	33	Aero MP305	6.08 - 8.21	1.0000	1.0000
L41	34	Aero MP305	6.08 - 8.21	1.0000	1.0000
L42	1	7983A(1/2")	5.83 - 6.08	1.0000	1.0000
L42	4	2" (Nominal) Conduit	5.83 - 6.08	1.0000	1.0000
L42	12	HB158-1-08U8-S8J18(1-5/8)	5.83 - 6.08	1.0000	1.0000
L42	14	Safety Line 3/8	5.83 - 6.08	1.0000	1.0000
L42	18	3.5" x 1.25" Flat Plate (G)	5.83 - 6.08	1.0000	1.0000
L42	19	3.5" x 1.25" Flat Plate (G)	5.83 - 6.08	1.0000	1.0000
L42	20	3.5" x 1.25" Flat Plate (G)	5.83 - 6.08	1.0000	1.0000
L42	26	Aero MP305	5.83 - 6.08	1.0000	1.0000
L42	28	Aero MP304	5.83 - 6.08	1.0000	1.0000
L42	29	Aero MP304	5.83 - 6.08	1.0000	1.0000
L42	33	Aero MP305	5.83 - 6.08	1.0000	1.0000
L42	34	Aero MP305	5.83 - 6.08	1.0000	1.0000
L43	1	7983A(1/2")	0.83 - 5.83	1.0000	1.0000

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 20 of 50
	<b>Project</b> 17QGOI1400	<b>Date</b> 17:29:33 06/21/17
	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L43	4	2" (Nominal) Conduit	0.83 - 5.83	1.0000	1.0000
L43	12	HB158-1-08U8-S8J18(1-5/8)	0.83 - 5.83	1.0000	1.0000
L43	14	Safety Line 3/8	0.83 - 5.83	1.0000	1.0000
L43	18	3.5" x 1.25" Flat Plate (G)	0.83 - 5.83	1.0000	1.0000
L43	19	3.5" x 1.25" Flat Plate (G)	0.83 - 5.83	1.0000	1.0000
L43	20	3.5" x 1.25" Flat Plate (G)	0.83 - 5.83	1.0000	1.0000
L43	26	Aero MP305	0.83 - 5.83	1.0000	1.0000
L43	28	Aero MP304	4.88 - 5.83	1.0000	1.0000
L43	29	Aero MP304	4.88 - 5.83	1.0000	1.0000
L43	33	Aero MP305	0.83 - 5.83	1.0000	1.0000
L43	34	Aero MP305	0.83 - 5.83	1.0000	1.0000
L44	1	7983A(1/2")	0.00 - 0.83	1.0000	1.0000
L44	4	2" (Nominal) Conduit	0.00 - 0.83	1.0000	1.0000
L44	12	HB158-1-08U8-S8J18(1-5/8)	0.00 - 0.83	1.0000	1.0000
L44	14	Safety Line 3/8	0.00 - 0.83	1.0000	1.0000
L44	18	3.5" x 1.25" Flat Plate (G)	0.00 - 0.83	1.0000	1.0000
L44	19	3.5" x 1.25" Flat Plate (G)	0.00 - 0.83	1.0000	1.0000
L44	20	3.5" x 1.25" Flat Plate (G)	0.00 - 0.83	1.0000	1.0000
L44	26	Aero MP305	0.50 - 0.83	1.0000	1.0000
L44	33	Aero MP305	0.50 - 0.83	1.0000	1.0000
L44	34	Aero MP305	0.50 - 0.83	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
LLPX310R w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 4.5380 1/2" Ice 4.8915 1" Ice 5.2541	2.9846 3.5275 4.0872	0.05 0.08 0.13
(2) LLPX310R w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 4.5380 1/2" Ice 4.8915 1" Ice 5.2541	2.9846 3.5275 4.0872	0.05 0.08 0.13
(2) FDD_R6_RRH	B	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1.5333 1/2" Ice 1.6898 1" Ice 1.8537	0.6840 0.7999 0.9228	0.03 0.04 0.06
FDD_R6_RRH	C	From Leg	4.0000 0.00 0.00	0.0000	117.0000	No Ice 1.5333 1/2" Ice 1.6898 1" Ice 1.8537	0.6840 0.7999 0.9228	0.03 0.04 0.06
HORIZON COMPACT	A	From Leg	4.0000 0.00 4.00	0.0000	117.0000	No Ice 0.0000 1/2" Ice 0.0000 1" Ice 0.0000	0.3681 0.4499 0.5391	0.01 0.02 0.03
HORIZON COMPACT	B	From Leg	4.0000 0.00 7.00	0.0000	117.0000	No Ice 0.0000 1/2" Ice 0.0000 1" Ice 0.0000	0.3681 0.4499 0.5391	0.01 0.02 0.03
***								
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	No Ice 8.2619 1/2" Ice 8.8215 1" Ice 9.3462	7.4708 8.6564 9.5559	0.09 0.16 0.24
KS24019-L112A	A	From Leg	4.0000 0.00	0.0000	117.0000	No Ice 0.1407 1/2" Ice 0.1979	0.1407 0.1979	0.01 0.01

<p><b>tnxTower</b></p> <p><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	21 of 50
	<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight					
			Horz	Lateral						°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	6.00		0.0000	117.0000	1" Ice	0.2621	0.2621	0.01				
			4.0000								No Ice	8.2619	7.4708	0.09
			0.00								1/2" Ice	8.8215	8.6564	0.16
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	3.00		0.0000	117.0000	1" Ice	9.3462	9.5559	0.24				
			4.0000								No Ice	8.2619	7.4708	0.09
			0.00								1/2" Ice	8.8215	8.6564	0.16
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	3.00		0.0000	117.0000	1" Ice	9.3462	9.5559	0.24				
			4.0000								No Ice	6.5799	4.9591	0.08
			0.00								1/2" Ice	7.0306	5.7544	0.13
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	3.00		0.0000	117.0000	1" Ice	7.4733	6.4723	0.19				
			4.0000								No Ice	6.5799	4.9591	0.08
			0.00								1/2" Ice	7.0306	5.7544	0.13
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	3.00		0.0000	117.0000	1" Ice	7.4733	6.4723	0.19				
			4.0000								No Ice	6.5799	4.9591	0.08
			0.00								1/2" Ice	7.0306	5.7544	0.13
TD-RRH8x20-25	A	From Leg	3.00		0.0000	117.0000	1" Ice	7.4733	6.4723	0.19				
			4.0000								No Ice	3.7042	1.2939	0.07
			0.00								1/2" Ice	3.9462	1.4646	0.09
TD-RRH8x20-25	B	From Leg	3.00		0.0000	117.0000	1" Ice	4.1956	1.6424	0.12				
			4.0000								No Ice	3.7042	1.2939	0.07
			0.00								1/2" Ice	3.9462	1.4646	0.09
TD-RRH8x20-25	C	From Leg	3.00		0.0000	117.0000	1" Ice	4.1956	1.6424	0.12				
			4.0000								No Ice	3.7042	1.2939	0.07
			0.00								1/2" Ice	3.9462	1.4646	0.09
800MHZ RRH	A	From Leg	3.00		0.0000	117.0000	1" Ice	4.1956	1.6424	0.12				
			4.0000								No Ice	2.1342	1.7730	0.05
			0.00								1/2" Ice	2.3195	1.9461	0.07
800MHZ RRH	B	From Leg	3.00		0.0000	117.0000	1" Ice	2.5123	2.1267	0.10				
			4.0000								No Ice	2.1342	1.7730	0.05
			0.00								1/2" Ice	2.3195	1.9461	0.07
800MHZ RRH	C	From Leg	3.00		0.0000	117.0000	1" Ice	2.5123	2.1267	0.10				
			4.0000								No Ice	2.1342	1.7730	0.05
			0.00								1/2" Ice	2.3195	1.9461	0.07
(2) 1900MHz RRH (65MHz)	A	From Leg	3.00		0.0000	117.0000	1" Ice	2.5123	2.1267	0.10				
			4.0000								No Ice	2.3125	2.3750	0.06
			0.00								1/2" Ice	2.5168	2.5809	0.08
(2) 1900MHz RRH (65MHz)	B	From Leg	3.00		0.0000	117.0000	1" Ice	2.7284	2.7943	0.11				
			4.0000								No Ice	2.3125	2.3750	0.06
			0.00								1/2" Ice	2.5168	2.5809	0.08
(2) 1900MHz RRH (65MHz)	C	From Leg	3.00		0.0000	117.0000	1" Ice	2.7284	2.7943	0.11				
			4.0000								No Ice	2.3125	2.3750	0.06
			0.00								1/2" Ice	2.5168	2.5809	0.08
(3) ACU-A20-N	A	From Leg	3.00		0.0000	117.0000	1" Ice	2.7284	2.7943	0.11				
			4.0000								No Ice	0.0000	0.1167	0.00
			0.00								1/2" Ice	0.0000	0.1620	0.00
(3) ACU-A20-N	B	From Leg	3.00		0.0000	117.0000	1" Ice	0.0000	0.2148	0.00				
			4.0000								No Ice	0.0000	0.1167	0.00
			0.00								1/2" Ice	0.0000	0.1620	0.00
(3) ACU-A20-N	B	From Leg	3.00		0.0000	117.0000	1" Ice	0.0000	0.2148	0.00				
			4.0000								No Ice	0.0000	0.1167	0.00
			0.00								1/2" Ice	0.0000	0.1620	0.00
800 EXTERNAL NOTCH FILTER	A	From Leg	3.00		0.0000	117.0000	1" Ice	0.0000	0.2148	0.00				
			4.0000								No Ice	0.0000	0.3211	0.01
			0.00								1/2" Ice	0.0000	0.3983	0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	3.00		0.0000	117.0000	1" Ice	0.0000	0.4830	0.02				
			4.0000								No Ice	0.0000	0.3211	0.01
			0.00								1/2" Ice	0.0000	0.3983	0.02



<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	22 of 50
	<b>Project</b>	17QGOI1400	<b>Date</b>	17:29:33 06/21/17
	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						Vert
			ft	ft						
800 EXTERNAL NOTCH FILTER	C	From Leg	3.00				1" Ice	0.0000	0.4830	0.02
			4.0000	0.0000	117.0000	No Ice	0.0000	0.3211	0.01	
			0.00			1/2" Ice	0.0000	0.3983	0.02	
IBC1900HB-2	A	From Leg	3.00				1" Ice	0.0000	0.4830	0.02
			4.0000	0.0000	117.0000	No Ice	1.1250	0.7125	0.04	
			0.00			1/2" Ice	1.2704	0.8368	0.05	
IBC1900HB-2	B	From Leg	3.00				1" Ice	1.4231	0.9682	0.06
			4.0000	0.0000	117.0000	No Ice	1.1250	0.7125	0.04	
			0.00			1/2" Ice	1.2704	0.8368	0.05	
IBC1900HB-2	C	From Leg	3.00				1" Ice	1.4231	0.9682	0.06
			4.0000	0.0000	117.0000	No Ice	1.1250	0.7125	0.04	
			0.00			1/2" Ice	1.2704	0.8368	0.05	
(2) Pipe Mount	A	From Leg	3.00				1" Ice	1.4231	0.9682	0.06
			4.0000	0.0000	117.0000	No Ice	1.2000	1.2000	0.02	
			0.00			1/2" Ice	1.5024	1.5024	0.03	
(2) Pipe Mount	B	From Leg	3.00				1" Ice	1.8141	1.8141	0.04
			4.0000	0.0000	117.0000	No Ice	1.2000	1.2000	0.02	
			0.00			1/2" Ice	1.5024	1.5024	0.03	
(2) Pipe Mount	C	From Leg	3.00				1" Ice	1.8141	1.8141	0.04
			4.0000	0.0000	117.0000	No Ice	1.2000	1.2000	0.02	
			0.00			1/2" Ice	1.5024	1.5024	0.03	
Platform Mount [LP 502-1]	C	None	3.00				1" Ice	1.8141	1.8141	0.04
			0.00	0.0000	117.0000	No Ice	32.3472	32.3472	0.93	
			3.00			1/2" Ice	45.6677	45.6677	1.19	
***						1" Ice	58.9882	58.9882	1.46	
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	7.3296	5.4600	0.04	
			0.00			1/2" Ice	7.7872	6.3840	0.10	
			2.00			1" Ice	8.2456	7.1844	0.16	
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	7.3296	5.4600	0.04	
			0.00			1/2" Ice	7.7872	6.3840	0.10	
			2.00			1" Ice	8.2456	7.1844	0.16	
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	7.3296	5.4600	0.04	
			0.00			1/2" Ice	7.7872	6.3840	0.10	
			2.00			1" Ice	8.2456	7.1844	0.16	
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.0000	100.0000	No Ice	0.0000	0.0762	0.00	
			0.00			1/2" Ice	0.0000	0.1189	0.01	
			0.00			1" Ice	0.0000	0.1685	0.01	
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.0000	100.0000	No Ice	0.0000	0.0762	0.00	
			0.00			1/2" Ice	0.0000	0.1189	0.01	
			2.00			1" Ice	0.0000	0.1685	0.01	
(4) FD9R6004/2C-3L	B	From Leg	4.0000	0.0000	100.0000	No Ice	0.0000	0.0762	0.00	
			0.00			1/2" Ice	0.0000	0.1189	0.01	
			2.00			1" Ice	0.0000	0.1685	0.01	
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.0000	100.0000	No Ice	0.0000	0.0762	0.00	
			0.00			1/2" Ice	0.0000	0.1189	0.01	
			0.00			1" Ice	0.0000	0.1685	0.01	
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.0000	100.0000	No Ice	0.0000	0.0762	0.00	
			0.00			1/2" Ice	0.0000	0.1189	0.01	
			2.00			1" Ice	0.0000	0.1685	0.01	
(3) SBNHH-1D45A w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	7.7194	4.6769	0.07	
			0.00			1/2" Ice	8.2421	5.4773	0.13	
			2.00			1" Ice	8.7280	6.1538	0.20	
(3) SBNHH-1D45A w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	7.7194	4.6769	0.07	
			0.00			1/2" Ice	8.2421	5.4773	0.13	
			2.00			1" Ice	8.7280	6.1538	0.20	
(3) SBNHH-1D45A w/	C	From Leg	4.0000	0.0000	100.0000	No Ice	7.7194	4.6769	0.07	



<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 24 of 50
	<b>Project</b> 17QGOI1400	<b>Date</b> 17:29:33 06/21/17
	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

## Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz Lateral	Vert						
				ft	°	°	ft	ft	ft <sup>2</sup>	K	
VHLP1-18	A	Paraboloid w/Shroud (HP)	From Leg	4.0000	0.0000		117.0000	1.2750	No Ice	1.2800	0.01
				0.00					1/2" Ice	1.4500	0.02
				4.00					1" Ice	1.6200	0.03
VHLP1-18	B	Paraboloid w/Shroud (HP)	From Leg	4.0000	0.0000		117.0000	1.2750	No Ice	1.2800	0.01
				0.00					1/2" Ice	1.4500	0.02
				7.00					1" Ice	1.6200	0.03

## Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face
ft	ft		psf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 120.0000-115.0000	117.5000	1.309	29.96	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000	10.000	100.00	0.000	0.000
					C	0.000	10.000	10.000	100.00	1.182	0.000
L2 115.0000-110.0000	112.5000	1.297	29.69	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000	10.000	100.00	0.000	0.000
					C	0.000	10.000	10.000	100.00	2.955	0.000
L3 110.0000-105.0000	107.5000	1.285	29.41	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000	10.000	100.00	0.000	0.000
					C	0.000	10.000	10.000	100.00	2.955	0.000
L4 105.0000-100.0000	102.5000	1.272	29.11	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000	10.000	100.00	0.000	0.000
					C	0.000	10.000	10.000	100.00	2.955	0.000
L5 100.0000-98.5000	99.2500	1.264	28.91	3.000	A	0.000	3.000	3.000	100.00	1.056	0.000
					B	0.000	3.000	3.000	100.00	1.000	0.000
					C	0.000	3.000	3.000	100.00	2.184	0.000
L6 98.5000-98.2500	98.3750	1.261	28.86	0.500	A	0.000	0.500	0.500	100.00	0.176	0.000
					B	0.000	0.500	0.500	100.00	0.167	0.000
					C	0.000	0.500	0.500	100.00	0.364	0.000
L7 98.2500-93.2500	95.7500	1.254	28.70	10.000	A	0.000	10.000	10.000	100.00	3.521	0.000
					B	0.000	10.000	10.000	100.00	3.333	0.000
					C	0.000	10.000	10.000	100.00	7.278	0.000
L8 93.2500-90.0000	91.6250	1.243	28.43	6.500	A	0.000	6.500	6.500	100.00	2.289	0.000
					B	0.000	6.500	6.500	100.00	2.167	0.000
					C	0.000	6.500	6.500	100.00	4.731	0.000
L9 90.0000-89.7500	89.8750	1.237	28.32	0.500	A	0.000	0.500	0.500	100.00	0.009	0.000
					B	0.000	0.500	0.500	100.00	0.000	0.000
					C	0.000	0.500	0.500	100.00	0.197	0.000
L10 89.7500-84.7500	87.2500	1.23	28.14	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000	10.000	100.00	0.000	0.000
					C	0.000	10.000	10.000	100.00	3.945	0.000
L11 84.7500-79.7500	82.2500	1.215	27.79	10.000	A	0.000	10.000	10.000	100.00	0.354	0.000
					B	0.000	10.000	10.000	100.00	0.167	0.000

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 25 of 50
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	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
00					C	0.000	10.000		100.00	4.112	0.000
L12	79.0000	1.204	27.56	3.000	A	0.000	3.000	3.000	100.00	1.056	0.000
79.7500-78.2500					B	0.000	3.000		100.00	1.000	0.000
00					C	0.000	3.000		100.00	2.184	0.000
L13	78.1250	1.202	27.49	0.500	A	0.000	0.500	0.500	100.00	0.176	0.000
78.2500-78.0000					B	0.000	0.500		100.00	0.167	0.000
00					C	0.000	0.500		100.00	0.364	0.000
L14	76.5200	1.196	27.37	5.920	A	0.000	5.920	5.920	100.00	2.199	0.000
78.0000-75.0400					B	0.000	5.920		100.00	2.088	0.000
00					C	0.000	5.920		100.00	4.424	0.000
L15	74.9150	1.191	27.25	0.500	A	0.000	0.500	0.500	100.00	0.345	0.000
75.0400-74.7900					B	0.000	0.500		100.00	0.336	0.000
00					C	0.000	0.500		100.00	0.533	0.000
L16	72.2900	1.182	27.05	10.000	A	0.000	10.000	10.000	100.00	6.904	0.000
74.7900-69.7900					B	0.000	10.000		100.00	6.717	0.000
00					C	0.000	10.000		100.00	10.662	0.000
L17	67.2900	1.164	26.64	10.000	A	0.000	10.000	10.000	100.00	6.904	0.000
69.7900-64.7900					B	0.000	10.000		100.00	6.717	0.000
00					C	0.000	10.000		100.00	10.662	0.000
L18	62.3950	1.146	26.22	9.580	A	0.000	9.580	9.580	100.00	6.472	0.000
64.7900-60.0000					B	0.000	9.580		100.00	6.292	0.000
00					C	0.000	9.580		100.00	10.072	0.000
L19	59.8750	1.136	26.00	0.625	A	0.000	0.625	0.625	100.00	0.009	0.000
60.0000-59.7500					B	0.000	0.625		100.00	0.000	0.000
00					C	0.000	0.625		100.00	0.197	0.000
L20	57.2500	1.125	25.75	12.500	A	0.000	12.500	12.500	100.00	3.757	0.000
59.7500-54.7500					B	0.000	12.500		100.00	3.569	0.000
00					C	0.000	12.500		100.00	7.514	0.000
L21	52.2500	1.104	25.26	12.500	A	0.000	12.500	12.500	100.00	4.171	0.000
54.7500-49.7500					B	0.000	12.500		100.00	3.983	0.000
00					C	0.000	12.500		100.00	7.928	0.000
L22	49.5000	1.091	24.98	1.250	A	0.000	1.250	1.250	100.00	0.417	0.000
49.7500-49.2500					B	0.000	1.250		100.00	0.398	0.000
00					C	0.000	1.250		100.00	0.793	0.000
L23	49.1250	1.09	24.94	0.625	A	0.000	0.625	0.625	100.00	0.209	0.000
49.2500-49.0000					B	0.000	0.625		100.00	0.199	0.000
00					C	0.000	0.625		100.00	0.396	0.000
L24	46.5000	1.077	24.65	12.500	A	0.000	12.500	12.500	100.00	7.424	0.000
49.0000-44.0000					B	0.000	12.500		100.00	7.237	0.000
00					C	0.000	12.500		100.00	11.182	0.000
L25	43.5000	1.062	24.31	2.500	A	0.000	2.500	2.500	100.00	2.043	0.000
44.0000-43.0000					B	0.000	2.500		100.00	2.005	0.000
00					C	0.000	2.500		100.00	2.794	0.000
L26	42.8750	1.059	24.23	0.625	A	0.000	0.625	0.625	100.00	0.511	0.000
43.0000-42.7500					B	0.000	0.625		100.00	0.501	0.000
00					C	0.000	0.625		100.00	0.699	0.000
L27	40.8750	1.048	23.99	9.375	A	0.000	9.375	9.375	100.00	7.659	0.000
42.7500-39.0000					B	0.000	9.375		100.00	7.519	0.000
00					C	0.000	9.375		100.00	10.477	0.000
L28	38.8750	1.037	23.74	0.625	A	0.000	0.625	0.625	100.00	0.511	0.000
39.0000-38.7500					B	0.000	0.625		100.00	0.501	0.000
00					C	0.000	0.625		100.00	0.699	0.000
L29	36.2500	1.022	23.39	12.500	A	0.000	12.500	12.500	100.00	10.213	0.000
38.7500-33.7500					B	0.000	12.500		100.00	10.025	0.000
00					C	0.000	12.500		100.00	13.970	0.000
L30	31.8750	0.995	22.77	9.375	A	0.000	9.375	9.375	100.00	6.393	0.000
33.7500-30.0000					B	0.000	9.375		100.00	6.252	0.000
00					C	0.000	9.375		100.00	9.211	0.000
L31	29.8750	0.981	22.46	0.750	A	0.000	0.750	0.750	100.00	0.143	0.000
30.0000-29.7500					B	0.000	0.750		100.00	0.133	0.000

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 26 of 50
	<b>Project</b> 17QGOI1400	<b>Date</b> 17:29:33 06/21/17
	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
00					C	0.000	0.750		100.00	0.331	0.000
L32	27.8750	0.967	22.13	11.250	A	0.000	11.250	11.250	100.00	3.414	0.000
29.7500-26.00					B	0.000	11.250		100.00	3.274	0.000
00					C	0.000	11.250		100.00	6.232	0.000
L33	25.8750	0.952	21.79	0.750	A	0.000	0.750	0.750	100.00	0.398	0.000
26.0000-25.75					B	0.000	0.750		100.00	0.389	0.000
00					C	0.000	0.750		100.00	0.586	0.000
L34	23.2500	0.931	21.30	15.000	A	0.000	15.000	15.000	100.00	8.692	0.000
25.7500-20.75					B	0.000	15.000		100.00	8.504	0.000
00					C	0.000	15.000		100.00	12.449	0.000
L35	20.6250	0.908	20.77	0.750	A	0.000	0.750	0.750	100.00	0.544	0.000
20.7500-20.50					B	0.000	0.750		100.00	0.535	0.000
00					C	0.000	0.750		100.00	0.732	0.000
L36	19.2500	0.895	20.47	7.500	A	0.000	7.500	7.500	100.00	5.440	0.000
20.5000-18.00					B	0.000	7.500		100.00	5.346	0.000
00					C	0.000	7.500		100.00	7.318	0.000
L37	17.8750	0.881	20.16	0.750	A	0.000	0.750	0.750	100.00	0.544	0.000
18.0000-17.75					B	0.000	0.750		100.00	0.535	0.000
00					C	0.000	0.750		100.00	0.732	0.000
L38	15.6050	0.856	19.59	12.870	A	0.000	12.870	12.870	100.00	8.386	0.000
17.7500-13.46					B	0.000	12.870		100.00	7.093	0.000
00					C	0.000	12.870		100.00	11.610	0.000
L39	13.3350	0.85	19.45	0.750	A	0.000	0.750	0.750	100.00	0.576	0.000
13.4600-13.21					B	0.000	0.750		100.00	0.368	0.000
00					C	0.000	0.750		100.00	0.764	0.000
L40	10.7100	0.85	19.45	15.000	A	0.000	15.000	15.000	100.00	9.086	0.000
13.2100-8.210					B	0.000	15.000		100.00	7.358	0.000
0					C	0.000	15.000		100.00	15.287	0.000
L41	7.1450	0.85	19.45	6.390	A	0.000	6.390	6.390	100.00	4.911	0.000
8.2100-6.0800					B	0.000	6.390		100.00	3.135	0.000
00					C	0.000	6.390		100.00	6.512	0.000
L42	5.9550	0.85	19.45	0.750	A	0.000	0.750	0.750	100.00	0.576	0.000
6.0800-5.8300					B	0.000	0.750		100.00	0.368	0.000
00					C	0.000	0.750		100.00	0.764	0.000
L43	3.3300	0.85	19.45	15.000	A	0.000	15.000	15.000	100.00	8.303	0.000
5.8300-0.8300					B	0.000	15.000		100.00	7.358	0.000
00					C	0.000	15.000		100.00	12.060	0.000
L44	0.4150	0.85	19.45	2.490	A	0.000	2.490	2.490	100.00	0.808	0.000
0.8300-0.0000					B	0.000	2.490		100.00	0.777	0.000
00					C	0.000	2.490		100.00	1.432	0.000

### Tower Pressure - With Ice

$$G_H = 1.100$$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L1	117.5000	1.309	7.96	1.7031	11.419	A	0.000	11.419	11.419	100.00	1.891	0.000
120.0000-115.00						B	0.000	11.419		100.00	0.000	0.000
00						C	0.000	11.419		100.00	3.181	0.000
L2	112.5000	1.297	7.89	1.6957	11.413	A	0.000	11.413	11.413	100.00	1.883	0.000
115.0000-110.00						B	0.000	11.413		100.00	0.000	0.000
00						C	0.000	11.413		100.00	7.933	0.000
L3	107.5000	1.285	7.81	1.6880	11.407	A	0.000	11.407	11.407	100.00	1.876	0.000

<p align="center"><b>tnxTower</b></p> <p align="center"><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	27 of 50
	<b>Project</b>	17QGO1400	<b>Date</b>	17:29:33 06/21/17
	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Section Elevation ft	z ft	Kz	qz psf	tz in	AG ft <sup>2</sup>	F a c e	AF ft <sup>2</sup>	AR ft <sup>2</sup>	Aleg ft <sup>2</sup>	Leg %	CAAA In Face ft <sup>2</sup>	CAAA Out Face ft <sup>2</sup>
110.0000-105.0000						B	0.000	11.407		100.00	0.000	0.000
00						C	0.000	11.407		100.00	7.914	0.000
L4	102.5000	1.272	7.74	1.6800	11.400	A	0.000	11.400	11.400	100.00	1.868	0.000
105.0000-100.0000						B	0.000	11.400		100.00	0.000	0.000
00						C	0.000	11.400		100.00	7.894	0.000
L5	99.2500	1.264	7.68	1.6746	3.419	A	0.000	3.419	3.419	100.00	1.895	0.000
100.0000-98.5000						B	0.000	3.419		100.00	1.336	0.000
0						C	0.000	3.419		100.00	4.500	0.000
L6	98.3750	1.261	7.67	1.6731	0.570	A	0.000	0.570	0.570	100.00	0.316	0.000
98.5000-98.2500						B	0.000	0.570		100.00	0.223	0.000
						C	0.000	0.570		100.00	0.750	0.000
L7	95.7500	1.254	7.62	1.6686	11.391	A	0.000	11.391	11.391	100.00	6.307	0.000
98.2500-93.2500						B	0.000	11.391		100.00	4.451	0.000
						C	0.000	11.391		100.00	14.975	0.000
L8	91.6250	1.243	7.55	1.6613	7.400	A	0.000	7.400	7.400	100.00	4.092	0.000
93.2500-90.0000						B	0.000	7.400		100.00	2.891	0.000
						C	0.000	7.400		100.00	9.715	0.000
L9	89.8750	1.237	7.52	1.6581	0.569	A	0.000	0.569	0.569	100.00	0.092	0.000
90.0000-89.7500						B	0.000	0.569		100.00	0.000	0.000
						C	0.000	0.569		100.00	0.524	0.000
L10	87.2500	1.23	7.48	1.6532	11.378	A	0.000	11.378	11.378	100.00	1.841	0.000
89.7500-84.7500						B	0.000	11.378		100.00	0.000	0.000
						C	0.000	11.378		100.00	10.470	0.000
L11	82.2500	1.215	7.38	1.6434	11.370	A	0.000	11.370	11.370	100.00	2.080	0.000
84.7500-79.7500						B	0.000	11.370		100.00	0.249	0.000
						C	0.000	11.370		100.00	10.685	0.000
L12	79.0000	1.204	7.32	1.6368	3.409	A	0.000	3.409	3.409	100.00	2.038	0.000
79.7500-78.2500						B	0.000	3.409		100.00	1.491	0.000
						C	0.000	3.409		100.00	4.615	0.000
L13	78.1250	1.202	7.31	1.6350	0.568	A	0.000	0.568	0.568	100.00	0.340	0.000
78.2500-78.0000						B	0.000	0.568		100.00	0.248	0.000
						C	0.000	0.568		100.00	0.769	0.000
L14	76.5200	1.196	7.27	1.6316	6.725	A	0.000	6.725	6.725	100.00	4.187	0.000
78.0000-75.0400						B	0.000	6.725		100.00	3.110	0.000
						C	0.000	6.725		100.00	9.263	0.000
L15	74.9150	1.191	7.24	1.6282	0.568	A	0.000	0.568	0.568	100.00	0.589	0.000
75.0400-74.7900						B	0.000	0.568		100.00	0.499	0.000
						C	0.000	0.568		100.00	1.018	0.000
L16	72.2900	1.182	7.19	1.6224	11.352	A	0.000	11.352	11.352	100.00	11.771	0.000
74.7900-69.7900						B	0.000	11.352		100.00	9.961	0.000
						C	0.000	11.352		100.00	20.323	0.000
L17	67.2900	1.164	7.08	1.6108	11.342	A	0.000	11.342	11.342	100.00	11.736	0.000
69.7900-64.7900						B	0.000	11.342		100.00	9.938	0.000
						C	0.000	11.342		100.00	20.260	0.000
L18	62.3950	1.146	6.97	1.5987	10.856	A	0.000	10.856	10.856	100.00	10.999	0.000
64.7900-60.0000						B	0.000	10.856		100.00	9.288	0.000
						C	0.000	10.856		100.00	19.136	0.000
L19	59.8750	1.136	6.91	1.5921	0.691	A	0.000	0.691	0.691	100.00	0.089	0.000
60.0000-59.7500						B	0.000	0.691		100.00	0.000	0.000
						C	0.000	0.691		100.00	0.513	0.000
L20	57.2500	1.125	6.84	1.5850	13.821	A	0.000	13.821	13.821	100.00	6.762	0.000
59.7500-54.7500						B	0.000	13.821		100.00	4.989	0.000
						C	0.000	13.821		100.00	15.220	0.000
L21	52.2500	1.104	6.71	1.5705	13.809	A	0.000	13.809	13.809	100.00	7.312	0.000
54.7500-49.7500						B	0.000	13.809		100.00	5.554	0.000
						C	0.000	13.809		100.00	15.735	0.000
L22	49.5000	1.091	6.64	1.5621	1.380	A	0.000	1.380	1.380	100.00	0.729	0.000
49.7500-49.2500						B	0.000	1.380		100.00	0.555	0.000
						C	0.000	1.380		100.00	1.570	0.000
L23	49.1250	1.09	6.63	1.5609	0.690	A	0.000	0.690	0.690	100.00	0.365	0.000

<p align="center"><b>tnxTower</b></p> <p align="center"><b>FDH Velocitel</b>          6521 Meridien Drive, Suite 107          Raleigh, North Carolina 27616          Phone: 9197551012          FAX: 9197551031</p>	<p align="center"><b>Job</b></p> <p align="center">120 ft Monopole / Jai-Alai</p>	<p align="center"><b>Page</b></p> <p align="center">28 of 50</p>
	<p align="center"><b>Project</b></p> <p align="center">17QGOI1400</p>	<p align="center"><b>Date</b></p> <p align="center">17:29:33 06/21/17</p>
	<p align="center"><b>Client</b></p> <p align="center">Crown Castle</p>	<p align="center"><b>Designed by</b></p> <p align="center">CShetti</p>

Section Elevation ft	z ft	Kz	qz psf	tz in	AG ft²	F a c e	AF ft²	AR ft²	Aleg ft²	Leg %	CAAA In Face ft²	CAAA Out Face ft²
49.2500-49.0000						B	0.000	0.690		100.00	0.277	0.000
						C	0.000	0.690		100.00	0.785	0.000
L24	46.5000	1.077	6.55	1.5523	13.794	A	0.000	13.794	13.794	100.00	12.044	0.000
49.0000-44.0000						B	0.000	13.794		100.00	10.304	0.000
						C	0.000	13.794		100.00	20.421	0.000
L25	43.5000	1.062	6.46	1.5420	2.757	A	0.000	2.757	2.757	100.00	3.266	0.000
44.0000-43.0000						B	0.000	2.757		100.00	2.920	0.000
						C	0.000	2.757		100.00	4.936	0.000
L26	42.8750	1.059	6.44	1.5398	0.689	A	0.000	0.689	0.689	100.00	0.816	0.000
43.0000-42.7500						B	0.000	0.689		100.00	0.730	0.000
						C	0.000	0.689		100.00	1.233	0.000
L27	40.8750	1.048	6.37	1.5324	10.333	A	0.000	10.333	10.333	100.00	12.220	0.000
42.7500-39.0000						B	0.000	10.333		100.00	10.930	0.000
						C	0.000	10.333		100.00	18.466	0.000
L28	38.8750	1.037	6.31	1.5248	0.689	A	0.000	0.689	0.689	100.00	0.813	0.000
39.0000-38.7500						B	0.000	0.689		100.00	0.728	0.000
						C	0.000	0.689		100.00	1.229	0.000
L29	36.2500	1.022	6.21	1.5142	13.762	A	0.000	13.762	13.762	100.00	16.225	0.000
38.7500-33.7500						B	0.000	13.762		100.00	14.523	0.000
						C	0.000	13.762		100.00	24.506	0.000
L30	31.8750	0.995	6.05	1.4948	10.309	A	0.000	10.309	10.309	100.00	10.197	0.000
33.7500-30.0000						B	0.000	10.309		100.00	8.935	0.000
						C	0.000	10.309		100.00	16.372	0.000
L31	29.8750	0.981	5.97	1.4852	0.812	A	0.000	0.812	0.812	100.00	0.276	0.000
30.0000-29.7500						B	0.000	0.812		100.00	0.193	0.000
						C	0.000	0.812		100.00	0.687	0.000
L32	27.8750	0.967	5.88	1.4749	12.172	A	0.000	12.172	12.172	100.00	5.598	0.000
29.7500-26.0000						B	0.000	12.172		100.00	4.351	0.000
						C	0.000	12.172		100.00	11.735	0.000
L33	25.8750	0.952	5.79	1.4640	0.811	A	0.000	0.811	0.811	100.00	0.595	0.000
26.0000-25.7500						B	0.000	0.811		100.00	0.513	0.000
						C	0.000	0.811		100.00	1.003	0.000
L34	23.2500	0.931	5.66	1.4484	16.207	A	0.000	16.207	16.207	100.00	12.960	0.000
25.7500-20.7500						B	0.000	16.207		100.00	11.324	0.000
						C	0.000	16.207		100.00	21.077	0.000
L35	20.6250	0.908	5.52	1.4311	0.810	A	0.000	0.810	0.810	100.00	0.809	0.000
20.7500-20.5000						B	0.000	0.810		100.00	0.728	0.000
						C	0.000	0.810		100.00	1.212	0.000
L36	19.2500	0.895	5.44	1.4213	8.092	A	0.000	8.092	8.092	100.00	8.069	0.000
20.5000-18.0000						B	0.000	8.092		100.00	7.265	0.000
						C	0.000	8.092		100.00	12.094	0.000
L37	17.8750	0.881	5.36	1.4108	0.809	A	0.000	0.809	0.809	100.00	0.805	0.000
18.0000-17.7500						B	0.000	0.809		100.00	0.725	0.000
						C	0.000	0.809		100.00	1.206	0.000
L38	15.6050	0.856	5.20	1.3918	13.865	A	0.000	13.865	13.865	100.00	12.404	0.000
17.7500-13.4600						B	0.000	13.865		100.00	9.711	0.000
						C	0.000	13.865		100.00	19.247	0.000
L39	13.3350	0.85	5.17	1.3701	0.807	A	0.000	0.807	0.807	100.00	0.818	0.000
13.4600-13.2100						B	0.000	0.807		100.00	0.505	0.000
						C	0.000	0.807		100.00	1.214	0.000
L40	10.7100	0.85	5.17	1.3404	16.117	A	0.000	16.117	16.117	100.00	13.003	0.000
13.2100-8.2100						B	0.000	16.117		100.00	10.039	0.000
						C	0.000	16.117		100.00	24.097	0.000
L41	7.1450	0.85	5.17	1.2872	6.847	A	0.000	6.847	6.847	100.00	6.365	0.000
8.2100-6.0800						B	0.000	6.847		100.00	4.231	0.000
						C	0.000	6.847		100.00	10.129	0.000
L42	5.9550	0.85	5.17	1.2639	0.803	A	0.000	0.803	0.803	100.00	0.744	0.000
6.0800-5.8300						B	0.000	0.803		100.00	0.494	0.000
						C	0.000	0.803		100.00	1.182	0.000
L43	3.3300	0.85	5.17	1.1926	15.994	A	0.000	15.994	15.994	100.00	10.922	0.000

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 29 of 50
	<b>Project</b> 17QGOI1400	<b>Date</b> 17:29:33 06/21/17
	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	t <sub>z</sub> in	A <sub>G</sub> ft <sup>2</sup>	F a c e ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
5.8300-0.8300						B	0.000	15.994		100.00	9.743	0.000
						C	0.000	15.994		100.00	19.477	0.000
L44 0.8300-0.0000	0.4150	0.85	5.17	0.9684	2.624	A	0.000	2.624	2.624	100.00	1.130	0.000
						B	0.000	2.624		100.00	1.002	0.000
						C	0.000	2.624		100.00	2.342	0.000

### Tower Pressure - Service

$$G_H = 1.100$$

Section Elevation ft	z ft	K <sub>Z</sub>	q <sub>z</sub> psf	A <sub>G</sub> ft <sup>2</sup>	F a c e ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	A <sub>R</sub> ft <sup>2</sup>	A <sub>leg</sub> ft <sup>2</sup>	Leg %	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>
L1 120.0000-115.0000	117.5000	1.309	10.26	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	1.182	0.000
L2 115.0000-110.0000	112.5000	1.297	10.16	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	2.955	0.000
L3 110.0000-105.0000	107.5000	1.285	10.07	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	2.955	0.000
L4 105.0000-100.0000	102.5000	1.272	9.97	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	2.955	0.000
L5 100.0000-98.5000	99.2500	1.264	9.90	3.000	A	0.000	3.000	3.000	100.00	1.056	0.000
					B	0.000	3.000		100.00	1.000	0.000
					C	0.000	3.000		100.00	2.184	0.000
L6 98.5000-98.2500	98.3750	1.261	9.88	0.500	A	0.000	0.500	0.500	100.00	0.176	0.000
					B	0.000	0.500		100.00	0.167	0.000
					C	0.000	0.500		100.00	0.364	0.000
L7 98.2500-93.2500	95.7500	1.254	9.82	10.000	A	0.000	10.000	10.000	100.00	3.521	0.000
					B	0.000	10.000		100.00	3.333	0.000
					C	0.000	10.000		100.00	7.278	0.000
L8 93.2500-90.0000	91.6250	1.243	9.73	6.500	A	0.000	6.500	6.500	100.00	2.289	0.000
					B	0.000	6.500		100.00	2.167	0.000
					C	0.000	6.500		100.00	4.731	0.000
L9 90.0000-89.7500	89.8750	1.237	9.69	0.500	A	0.000	0.500	0.500	100.00	0.009	0.000
					B	0.000	0.500		100.00	0.000	0.000
					C	0.000	0.500		100.00	0.197	0.000
L10 89.7500-84.7500	87.2500	1.23	9.63	10.000	A	0.000	10.000	10.000	100.00	0.188	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	3.945	0.000
L11 84.7500-79.7500	82.2500	1.215	9.51	10.000	A	0.000	10.000	10.000	100.00	0.354	0.000
					B	0.000	10.000		100.00	0.167	0.000
					C	0.000	10.000		100.00	4.112	0.000
L12 79.7500-78.2500	79.0000	1.204	9.43	3.000	A	0.000	3.000	3.000	100.00	1.056	0.000
					B	0.000	3.000		100.00	1.000	0.000
					C	0.000	3.000		100.00	2.184	0.000
L13 78.2500-78.0000	78.1250	1.202	9.41	0.500	A	0.000	0.500	0.500	100.00	0.176	0.000
					B	0.000	0.500		100.00	0.167	0.000
					C	0.000	0.500		100.00	0.364	0.000
L14 78.0000-75.0400	76.5200	1.196	9.37	5.920	A	0.000	5.920	5.920	100.00	2.199	0.000
					B	0.000	5.920		100.00	2.088	0.000



<p><b>tnxTower</b></p> <p><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	30 of 50
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>			
00					C	0.000	5.920		100.00	4.424	0.000
L15	74.9150	1.191	9.33	0.500	A	0.000	0.500	0.500	100.00	0.345	0.000
75.0400-74.79					B	0.000	0.500		100.00	0.336	0.000
00					C	0.000	0.500		100.00	0.533	0.000
L16	72.2900	1.182	9.26	10.000	A	0.000	10.000	10.000	100.00	6.904	0.000
74.7900-69.79					B	0.000	10.000		100.00	6.717	0.000
00					C	0.000	10.000		100.00	10.662	0.000
L17	67.2900	1.164	9.12	10.000	A	0.000	10.000	10.000	100.00	6.904	0.000
69.7900-64.79					B	0.000	10.000		100.00	6.717	0.000
00					C	0.000	10.000		100.00	10.662	0.000
L18	62.3950	1.146	8.98	9.580	A	0.000	9.580	9.580	100.00	6.472	0.000
64.7900-60.00					B	0.000	9.580		100.00	6.292	0.000
00					C	0.000	9.580		100.00	10.072	0.000
L19	59.8750	1.136	8.90	0.625	A	0.000	0.625	0.625	100.00	0.009	0.000
60.0000-59.75					B	0.000	0.625		100.00	0.000	0.000
00					C	0.000	0.625		100.00	0.197	0.000
L20	57.2500	1.125	8.82	12.500	A	0.000	12.500	12.500	100.00	3.757	0.000
59.7500-54.75					B	0.000	12.500		100.00	3.569	0.000
00					C	0.000	12.500		100.00	7.514	0.000
L21	52.2500	1.104	8.65	12.500	A	0.000	12.500	12.500	100.00	4.171	0.000
54.7500-49.75					B	0.000	12.500		100.00	3.983	0.000
00					C	0.000	12.500		100.00	7.928	0.000
L22	49.5000	1.091	8.55	1.250	A	0.000	1.250	1.250	100.00	0.417	0.000
49.7500-49.25					B	0.000	1.250		100.00	0.398	0.000
00					C	0.000	1.250		100.00	0.793	0.000
L23	49.1250	1.09	8.54	0.625	A	0.000	0.625	0.625	100.00	0.209	0.000
49.2500-49.00					B	0.000	0.625		100.00	0.199	0.000
00					C	0.000	0.625		100.00	0.396	0.000
L24	46.5000	1.077	8.44	12.500	A	0.000	12.500	12.500	100.00	7.424	0.000
49.0000-44.00					B	0.000	12.500		100.00	7.237	0.000
00					C	0.000	12.500		100.00	11.182	0.000
L25	43.5000	1.062	8.32	2.500	A	0.000	2.500	2.500	100.00	2.043	0.000
44.0000-43.00					B	0.000	2.500		100.00	2.005	0.000
00					C	0.000	2.500		100.00	2.794	0.000
L26	42.8750	1.059	8.30	0.625	A	0.000	0.625	0.625	100.00	0.511	0.000
43.0000-42.75					B	0.000	0.625		100.00	0.501	0.000
00					C	0.000	0.625		100.00	0.699	0.000
L27	40.8750	1.048	8.21	9.375	A	0.000	9.375	9.375	100.00	7.659	0.000
42.7500-39.00					B	0.000	9.375		100.00	7.519	0.000
00					C	0.000	9.375		100.00	10.477	0.000
L28	38.8750	1.037	8.13	0.625	A	0.000	0.625	0.625	100.00	0.511	0.000
39.0000-38.75					B	0.000	0.625		100.00	0.501	0.000
00					C	0.000	0.625		100.00	0.699	0.000
L29	36.2500	1.022	8.01	12.500	A	0.000	12.500	12.500	100.00	10.213	0.000
38.7500-33.75					B	0.000	12.500		100.00	10.025	0.000
00					C	0.000	12.500		100.00	13.970	0.000
L30	31.8750	0.995	7.79	9.375	A	0.000	9.375	9.375	100.00	6.393	0.000
33.7500-30.00					B	0.000	9.375		100.00	6.252	0.000
00					C	0.000	9.375		100.00	9.211	0.000
L31	29.8750	0.981	7.69	0.750	A	0.000	0.750	0.750	100.00	0.143	0.000
30.0000-29.75					B	0.000	0.750		100.00	0.133	0.000
00					C	0.000	0.750		100.00	0.331	0.000
L32	27.8750	0.967	7.58	11.250	A	0.000	11.250	11.250	100.00	3.414	0.000
29.7500-26.00					B	0.000	11.250		100.00	3.274	0.000
00					C	0.000	11.250		100.00	6.232	0.000
L33	25.8750	0.952	7.46	0.750	A	0.000	0.750	0.750	100.00	0.398	0.000
26.0000-25.75					B	0.000	0.750		100.00	0.389	0.000
00					C	0.000	0.750		100.00	0.586	0.000
L34	23.2500	0.931	7.29	15.000	A	0.000	15.000	15.000	100.00	8.692	0.000
25.7500-20.75					B	0.000	15.000		100.00	8.504	0.000

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Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	F a c e	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>
00					C	0.000	15.000		100.00	12.449	0.000
L35	20.6250	0.908	7.11	0.750	A	0.000	0.750	0.750	100.00	0.544	0.000
20.7500-20.5000					B	0.000	0.750		100.00	0.535	0.000
					C	0.000	0.750		100.00	0.732	0.000
L36	19.2500	0.895	7.01	7.500	A	0.000	7.500	7.500	100.00	5.440	0.000
20.5000-18.0000					B	0.000	7.500		100.00	5.346	0.000
					C	0.000	7.500		100.00	7.318	0.000
L37	17.8750	0.881	6.90	0.750	A	0.000	0.750	0.750	100.00	0.544	0.000
18.0000-17.7500					B	0.000	0.750		100.00	0.535	0.000
					C	0.000	0.750		100.00	0.732	0.000
L38	15.6050	0.856	6.71	12.870	A	0.000	12.870	12.870	100.00	8.386	0.000
17.7500-13.4600					B	0.000	12.870		100.00	7.093	0.000
					C	0.000	12.870		100.00	11.610	0.000
L39	13.3350	0.85	6.66	0.750	A	0.000	0.750	0.750	100.00	0.576	0.000
13.4600-13.2100					B	0.000	0.750		100.00	0.368	0.000
					C	0.000	0.750		100.00	0.764	0.000
L40	10.7100	0.85	6.66	15.000	A	0.000	15.000	15.000	100.00	9.086	0.000
13.2100-8.2100					B	0.000	15.000		100.00	7.358	0.000
					C	0.000	15.000		100.00	15.287	0.000
L41	7.1450	0.85	6.66	6.390	A	0.000	6.390	6.390	100.00	4.911	0.000
8.2100-6.0800					B	0.000	6.390		100.00	3.135	0.000
					C	0.000	6.390		100.00	6.512	0.000
L42	5.9550	0.85	6.66	0.750	A	0.000	0.750	0.750	100.00	0.576	0.000
6.0800-5.8300					B	0.000	0.750		100.00	0.368	0.000
					C	0.000	0.750		100.00	0.764	0.000
L43	3.3300	0.85	6.66	15.000	A	0.000	15.000	15.000	100.00	8.303	0.000
5.8300-0.8300					B	0.000	15.000		100.00	7.358	0.000
					C	0.000	15.000		100.00	12.060	0.000
L44	0.4150	0.85	6.66	2.490	A	0.000	2.490	2.490	100.00	0.808	0.000
0.8300-0.0000					B	0.000	2.490		100.00	0.777	0.000
					C	0.000	2.490		100.00	1.432	0.000

### 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

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<i>Comb. No.</i>	<i>Description</i>
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
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
L1	120 - 115	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-8.81	-2.80	-0.41
			Max. Mx	8	-3.20	-24.62	-0.36
			Max. My	14	-3.20	-0.97	-24.01
			Max. Vy	20	-6.42	23.15	0.13
			Max. Vx	14	6.38	-0.97	-24.01
			Max. Torque	14			1.62
L2	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.62	-2.77	-0.51
			Max. Mx	8	-3.61	-57.51	-0.71
			Max. My	14	-3.61	-1.39	-56.75
			Max. Vy	20	-6.77	56.13	0.57
			Max. Vx	14	6.72	-1.39	-56.75
			Max. Torque	14			1.62
L3	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.42	-2.74	-0.60
			Max. Mx	8	-4.03	-92.10	-1.07
			Max. My	14	-4.03	-1.80	-91.20
			Max. Vy	20	-7.10	90.81	1.02
			Max. Vx	14	7.05	-1.80	-91.20
			Max. Torque	14			1.62
L4	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-11.23	-2.70	-0.69
			Max. Mx	8	-4.45	-128.35	-1.42

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	100 - 98.5	Pole	Max. My	14	-4.46	-2.22	-127.30
			Max. Vy	20	-7.43	127.16	1.46
			Max. Vx	14	7.38	-2.22	-127.30
			Max. Torque	14			1.62
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.82	-2.69	0.01
			Max. Mx	8	-7.21	-153.82	-1.38
			Max. My	14	-7.21	-2.34	-152.71
L6	98.5 - 98.25	Pole	Max. Vy	20	-12.15	152.65	1.74
			Max. Vx	14	12.15	-2.34	-152.71
			Max. Torque	14			1.62
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-18.88	-2.69	0.00
			Max. Mx	8	-7.25	-156.85	-1.39
			Max. My	14	-7.25	-2.36	-155.75
			Max. Vy	20	-12.17	155.69	1.76
L7	98.25 - 93.25	Pole	Max. Vx	14	12.16	-2.36	-155.75
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.16	-2.64	-0.13
			Max. Mx	8	-7.97	-218.48	-1.76
			Max. My	14	-7.97	-2.79	-217.41
			Max. Vy	20	-12.52	217.42	2.20
			Max. Vx	14	12.50	-2.79	-217.41
L8	93.25 - 90	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.99	-2.61	-0.22
			Max. Mx	8	-8.45	-259.45	-2.00
			Max. My	14	-8.45	-3.06	-258.38
			Max. Vy	20	-12.74	258.46	2.49
			Max. Vx	14	12.71	-3.06	-258.38
			Max. Torque	14			1.61
L9	90 - 89.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.05	-2.61	-0.23
			Max. Mx	8	-8.49	-262.64	-2.02
			Max. My	14	-8.49	-3.09	-261.56
			Max. Vy	20	-12.75	261.65	2.51
			Max. Vx	14	12.72	-3.09	-261.56
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
L10	89.75 - 84.75	Pole	Max. Compression	26	-22.17	-2.56	-0.37
			Max. Mx	8	-9.24	-327.11	-2.39
			Max. My	14	-9.24	-3.51	-325.95
			Max. Vy	20	-13.08	326.23	2.96
			Max. Vx	14	13.03	-3.51	-325.95
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.30	-2.50	-0.51
L11	84.75 - 79.75	Pole	Max. Mx	8	-10.00	-393.16	-2.76
			Max. My	14	-10.01	-3.93	-391.85
			Max. Vy	20	-13.38	392.38	3.40
			Max. Vx	14	13.33	-3.93	-391.85
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.68	-2.49	-0.55
			Max. Mx	8	-10.23	-413.27	-2.87
L12	79.75 - 78.25	Pole	Max. My	14	-10.23	-4.05	-411.90
			Max. Vy	20	-13.47	412.51	3.53
			Max. Vx	14	13.41	-4.05	-411.90
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.68	-2.49	-0.55
			Max. Mx	8	-10.23	-413.27	-2.87
			Max. My	14	-10.23	-4.05	-411.90
L13	78.25 - 78	Pole	Max. Vy	20	-13.47	412.51	3.53
			Max. Vx	14	13.41	-4.05	-411.90

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L14	78 - 75.04	Pole	Max. Compression	26	-23.75	-2.49	-0.56
			Max. Mx	8	-10.29	-416.63	-2.89
			Max. My	14	-10.29	-4.08	-415.25
			Max. Vy	20	-13.48	415.88	3.56
			Max. Vx	14	13.42	-4.08	-415.25
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.62	-2.45	-0.64
			Max. Mx	8	-10.84	-456.76	-3.11
			Max. My	14	-10.84	-4.32	-455.24
L15	75.04 - 74.79	Pole	Max. Vy	20	-13.67	456.07	3.82
			Max. Vx	14	13.60	-4.32	-455.24
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-24.71	-2.46	-0.65
			Max. Mx	8	-10.90	-460.17	-3.12
			Max. My	14	-10.91	-4.35	-458.64
			Max. Vy	20	-13.68	459.49	3.84
			Max. Vx	14	13.61	-4.35	-458.64
			Max. Torque	14			1.61
L16	74.79 - 69.79	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-26.50	-2.40	-0.78
			Max. Mx	8	-12.02	-529.26	-3.49
			Max. My	14	-12.02	-4.76	-527.45
			Max. Vy	20	-14.00	528.68	4.28
			Max. Vx	14	13.91	-4.76	-527.45
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.29	-2.34	-0.91
			Max. Mx	8	-13.15	-599.86	-3.86
L17	69.79 - 64.79	Pole	Max. My	14	-13.15	-5.18	-597.70
			Max. Vy	20	-14.29	599.38	4.72
			Max. Vx	14	14.19	-5.18	-597.70
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-29.98	-2.28	-1.04
			Max. Mx	8	-14.24	-668.82	-4.22
			Max. My	14	-14.24	-5.58	-666.26
			Max. Vy	20	-14.55	668.43	5.15
			Max. Vx	14	14.44	-5.58	-666.26
L18	64.79 - 60	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-31.68	-2.28	-1.05
			Max. Mx	8	-15.55	-672.54	-4.24
			Max. My	14	-15.56	-5.60	-669.96
			Max. Vy	20	-14.94	672.17	5.17
			Max. Vx	14	14.83	-5.60	-669.96
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-33.40	-2.19	-1.19
L19	60 - 59.75	Pole	Max. Mx	8	-16.70	-747.97	-4.61
			Max. My	14	-16.71	-6.01	-744.95
			Max. Vy	20	-15.27	747.70	5.61
			Max. Vx	14	15.16	-6.01	-744.95
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.13	-2.11	-1.34
			Max. Mx	8	-17.87	-824.98	-4.98
			Max. My	14	-17.87	-6.42	-821.52
			Max. Vy	20	-15.58	824.82	6.04
L20	59.75 - 54.75	Pole	Max. Vx	14	15.47	-6.42	-821.52
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.13	-2.11	-1.34
			Max. Mx	8	-17.87	-824.98	-4.98
L21	54.75 - 49.75	Pole	Max. My	14	-17.87	-6.42	-821.52
			Max. Vy	20	-15.58	824.82	6.04
			Max. Vx	14	15.47	-6.42	-821.52
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L22	49.75 - 49.25	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.30	-2.10	-1.36
			Max. Mx	8	-17.99	-832.77	-5.02
			Max. My	14	-17.99	-6.46	-829.26
			Max. Vy	20	-15.61	832.62	6.09
			Max. Vx	14	15.50	-6.46	-829.26
L23	49.25 - 49	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.39	-2.10	-1.37
			Max. Mx	8	-18.06	-836.67	-5.04
			Max. My	14	-18.06	-6.49	-833.14
			Max. Vy	20	-15.62	836.52	6.11
			Max. Vx	14	15.51	-6.49	-833.14
L24	49 - 44	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.43	-2.01	-1.51
			Max. Mx	8	-19.40	-915.43	-5.41
			Max. My	14	-19.40	-6.90	-911.47
			Max. Vy	22	-16.12	845.91	492.42
			Max. Vx	14	15.82	-6.90	-911.47
L25	44 - 43	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.87	-2.00	-1.54
			Max. Mx	8	-19.67	-931.37	-5.49
			Max. My	14	-19.67	-6.98	-927.31
			Max. Vy	22	-16.26	862.09	501.81
			Max. Vx	14	15.88	-6.98	-927.31
L26	43 - 42.75	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-37.99	-2.00	-1.55
			Max. Mx	8	-19.75	-935.36	-5.51
			Max. My	14	-19.76	-7.00	-931.28
			Max. Vy	22	-16.29	866.16	504.17
			Max. Vx	14	15.89	-7.00	-931.28
L27	42.75 - 39	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.80	-1.93	-1.65
			Max. Mx	20	-20.94	995.76	6.98
			Max. My	14	-20.95	-7.30	-991.30
			Max. Vy	22	-16.82	928.23	540.21
			Max. Vx	14	16.12	-7.30	-991.30
L28	39 - 38.75	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-39.90	-1.93	-1.67
			Max. Mx	20	-21.02	999.82	7.00
			Max. My	14	-21.02	-7.33	-995.33
			Max. Vy	22	-16.85	932.44	542.65
			Max. Vx	14	16.13	-7.33	-995.33
L29	38.75 - 33.75	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.05	-1.85	-1.80
			Max. Mx	20	-22.37	1081.63	7.44
			Max. My	14	-22.38	-7.73	-1076.62
			Max. Vy	22	-17.50	1018.30	592.48
			Max. Vx	14	16.39	-7.73	-1076.62
L30	33.75 - 30	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-43.60	-1.79	-1.91
			Max. Mx	20	-23.40	1143.78	7.76
			Max. My	14	-23.40	-8.03	-1138.39

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L31	30 - 29.75	Pole	Max. Vy	22	-17.95	1084.75	631.04
			Max. Vx	14	16.57	-8.03	-1138.39
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-47.13	-1.79	-1.92
			Max. Mx	20	-25.98	1148.17	7.78
			Max. My	14	-25.98	-8.05	-1142.75
			Max. Vy	22	-18.73	1089.43	633.75
			Max. Vx	14	17.45	-8.05	-1142.75
L32	29.75 - 26	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-48.62	-1.72	-2.04
			Max. Mx	20	-27.03	1214.41	8.10
			Max. My	14	-27.03	-8.36	-1208.61
			Max. Vy	22	-18.97	1160.09	674.74
			Max. Vx	14	17.68	-8.36	-1208.61
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
L33	26 - 25.75	Pole	Max. Compression	26	-48.73	-1.72	-2.05
			Max. Mx	20	-27.12	1218.86	8.12
			Max. My	14	-27.12	-8.38	-1213.03
			Max. Vy	22	-18.98	1164.84	677.49
			Max. Vx	14	17.69	-8.38	-1213.03
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.05	-1.62	-2.21
			Max. Mx	20	-28.70	1308.51	8.55
L34	25.75 - 20.75	Pole	Max. My	14	-28.70	-8.78	-1302.18
			Max. Vy	22	-19.30	1260.53	732.99
			Max. Vx	14	17.97	-8.78	-1302.18
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.19	-1.63	-2.22
			Max. Mx	20	-28.80	1313.03	8.57
			Max. My	14	-28.80	-8.80	-1306.68
			Max. Vy	22	-19.33	1265.36	735.79
L35	20.75 - 20.5	Pole	Max. Vx	14	17.98	-8.80	-1306.68
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.52	-1.57	-2.30
			Max. Mx	20	-29.72	1358.41	8.78
			Max. My	14	-29.72	-8.99	-1351.81
			Max. Vy	22	-19.67	1314.10	764.06
			Max. Vx	14	18.12	-8.99	-1351.81
			Max. Torque	14			1.61
L36	20.5 - 18	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.64	-1.58	-2.31
			Max. Mx	20	-29.80	1362.97	8.80
			Max. My	14	-29.81	-9.01	-1356.34
			Max. Vy	22	-19.70	1319.02	766.91
			Max. Vx	14	18.13	-9.01	-1356.34
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.71	-1.45	-2.42
L37	18 - 17.75	Pole	Max. Mx	20	-31.24	1441.64	9.16
			Max. My	14	-31.24	-9.35	-1434.57
			Max. Vy	22	-20.22	1404.64	816.55
			Max. Vx	14	18.34	-9.35	-1434.57
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.83	-1.44	-2.42
			Max. Mx	20	-31.24	1441.64	9.16
			Max. My	14	-31.24	-9.35	-1434.57
L38	17.75 - 13.46	Pole	Max. Vy	22	-20.22	1404.64	816.55
			Max. Vx	14	18.34	-9.35	-1434.57
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.83	-1.44	-2.42
			Max. Mx	20	-31.24	1441.64	9.16
			Max. My	14	-31.24	-9.35	-1434.57
			Max. Vy	22	-20.22	1404.64	816.55
			Max. Vx	14	18.34	-9.35	-1434.57
L39	13.46 - 13.21	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.83	-1.44	-2.42

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L40	13.21 - 8.21	Pole	Max. Mx	20	-31.33	1446.25	9.18
			Max. My	14	-31.33	-9.37	-1439.16
			Max. Vy	22	-20.24	1409.70	819.48
			Max. Vx	14	18.35	-9.37	-1439.16
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.25	-1.24	-2.49
			Max. Mx	20	-33.06	1539.05	9.60
			Max. My	14	-33.06	-9.77	-1531.46
			Max. Vy	22	-20.84	1512.39	879.02
L41	8.21 - 6.08	Pole	Max. Vx	14	18.58	-9.77	-1531.46
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.28	-1.14	-2.52
			Max. Mx	20	-33.80	1578.92	9.78
			Max. My	14	-33.80	-9.93	-1571.11
			Max. Vy	22	-21.08	1557.01	904.89
			Max. Vx	14	18.67	-9.93	-1571.11
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
L42	6.08 - 5.83	Pole	Max. Compression	26	-58.40	-1.13	-2.53
			Max. Mx	20	-33.89	1583.61	9.80
			Max. My	14	-33.89	-9.95	-1575.78
			Max. Vy	22	-21.10	1562.28	907.94
			Max. Vx	14	18.67	-9.95	-1575.78
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.64	-1.03	-2.65
			Max. Mx	20	-35.57	1677.95	10.22
			Max. My	14	-35.57	-10.34	-1669.62
L43	5.83 - 0.83	Pole	Max. Vy	22	-21.66	1669.18	969.90
			Max. Vx	14	18.87	-10.34	-1669.62
			Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.97	-1.02	-2.66
			Max. Mx	20	-35.86	1693.70	10.28
			Max. My	14	-35.86	-10.41	-1685.29
			Max. Vy	22	-21.69	1687.16	980.33
			Max. Vx	14	18.90	-10.41	-1685.29
			Max. Torque	14			1.61
L44	0.83 - 0	Pole	Max. Torque	14			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.97	-1.02	-2.66
			Max. Mx	20	-35.86	1693.70	10.28
			Max. My	14	-35.86	-10.41	-1685.29
			Max. Vy	22	-21.69	1687.16	980.33
			Max. Vx	14	18.90	-10.41	-1685.29
			Max. Torque	14			1.61

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	60.97	0.00	0.00
	Max. H <sub>x</sub>	22	35.86	21.68	12.57
	Max. H <sub>z</sub>	2	35.86	0.10	18.88
	Max. M <sub>x</sub>	2	1682.78	0.10	18.88
	Max. M <sub>z</sub>	8	1692.78	-18.97	-0.07
	Max. Torsion	14	1.61	-0.08	-18.89
	Min. Vert	9	26.90	-18.97	-0.07
	Min. H <sub>x</sub>	10	35.86	-21.67	-12.58
	Min. H <sub>z</sub>	15	26.90	-0.08	-18.89
	Min. M <sub>x</sub>	14	-1685.29	-0.08	-18.89
	Min. M <sub>z</sub>	20	-1693.70	18.99	0.09



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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Torsion	2	-1.59	0.10	18.88

## Tower Mast Reaction Summary

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overtuning Moment, M <sub>x</sub>	Overtuning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	29.89	-0.00	-0.00	0.37	-0.50	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	35.86	-0.10	-18.88	-1682.78	11.21	1.59
0.9 Dead+1.6 Wind 0 deg - No Ice	26.90	-0.10	-18.88	-1668.99	11.27	1.57
1.2 Dead+1.6 Wind 30 deg - No Ice	35.86	9.37	-16.30	-1452.75	-835.13	1.27
0.9 Dead+1.6 Wind 30 deg - No Ice	26.90	9.37	-16.30	-1440.88	-828.08	1.26
1.2 Dead+1.6 Wind 60 deg - No Ice	35.86	16.31	-9.38	-834.20	-1454.88	0.47
0.9 Dead+1.6 Wind 60 deg - No Ice	26.90	16.31	-9.38	-827.44	-1442.70	0.46
1.2 Dead+1.6 Wind 90 deg - No Ice	35.86	18.97	0.07	8.67	-1692.78	-0.46
0.9 Dead+1.6 Wind 90 deg - No Ice	26.90	18.97	0.07	8.47	-1678.67	-0.46
1.2 Dead+1.6 Wind 120 deg - No Ice	35.86	21.67	12.58	982.16	-1685.98	-0.75
0.9 Dead+1.6 Wind 120 deg - No Ice	26.90	21.66	12.58	974.36	-1672.63	-0.74
1.2 Dead+1.6 Wind 150 deg - No Ice	35.86	9.49	16.38	1463.35	-849.41	-1.55
0.9 Dead+1.6 Wind 150 deg - No Ice	26.90	9.49	16.38	1451.15	-842.23	-1.53
1.2 Dead+1.6 Wind 180 deg - No Ice	35.86	0.08	18.89	1685.29	-10.41	-1.61
0.9 Dead+1.6 Wind 180 deg - No Ice	26.90	0.08	18.89	1671.27	-10.14	-1.59
1.2 Dead+1.6 Wind 210 deg - No Ice	35.86	-9.36	16.33	1456.78	832.67	-1.26
0.9 Dead+1.6 Wind 210 deg - No Ice	26.90	-9.36	16.33	1444.65	825.97	-1.24
1.2 Dead+1.6 Wind 240 deg - No Ice	35.86	-16.32	9.38	835.54	1454.45	-0.47
0.9 Dead+1.6 Wind 240 deg - No Ice	26.90	-16.32	9.38	828.54	1442.61	-0.46
1.2 Dead+1.6 Wind 270 deg - No Ice	35.86	-18.99	-0.09	-10.28	1693.70	0.44
0.9 Dead+1.6 Wind 270 deg - No Ice	26.90	-18.99	-0.09	-10.30	1679.90	0.44
1.2 Dead+1.6 Wind 300 deg - No Ice	35.86	-21.68	-12.57	-980.33	1687.16	0.78
0.9 Dead+1.6 Wind 300 deg - No Ice	26.90	-21.68	-12.57	-972.76	1674.13	0.77
1.2 Dead+1.6 Wind 330 deg - No Ice	35.86	-9.50	-16.38	-1461.82	849.30	1.56
0.9 Dead+1.6 Wind 330 deg - No Ice	26.90	-9.50	-16.38	-1449.87	842.44	1.54
1.2 Dead+1.0 Ice+1.0 Temp	60.97	-0.00	-0.00	2.66	-1.02	-0.00

<p style="text-align: center;"><b><i>tnxTower</i></b></p> <p style="text-align: center;"><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	39 of 50	
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Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overtuning Moment, M <sub>x</sub>	Overtuning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	60.97	-0.01	-5.85	-516.74	0.27	0.50
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	60.97	2.84	-4.92	-439.08	-256.09	0.41
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	60.97	5.07	-2.92	-256.53	-451.06	0.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	60.97	6.62	0.00	3.34	-569.83	-0.11
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	60.97	5.91	3.42	289.74	-495.97	-0.16
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	60.97	2.84	4.93	445.61	-257.04	-0.48
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	60.97	0.01	5.85	522.74	-2.13	-0.51
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	60.97	-2.83	4.92	445.48	253.40	-0.40
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	60.97	-5.07	2.92	262.24	448.89	-0.17
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	60.97	-6.62	-0.01	1.62	568.00	0.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	60.97	-5.91	-3.42	-283.90	494.20	0.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	60.97	-2.85	-4.92	-439.85	254.95	0.48
Dead+Wind 0 deg - Service	29.89	-0.02	-4.04	-358.00	1.99	0.34
Dead+Wind 30 deg - Service	29.89	2.01	-3.49	-309.05	-178.22	0.27
Dead+Wind 60 deg - Service	29.89	3.49	-2.01	-177.34	-310.18	0.10
Dead+Wind 90 deg - Service	29.89	4.06	0.01	2.13	-360.83	-0.10
Dead+Wind 120 deg - Service	29.89	4.64	2.69	209.49	-359.52	-0.24
Dead+Wind 150 deg - Service	29.89	2.03	3.51	311.87	-181.27	-0.33
Dead+Wind 180 deg - Service	29.89	0.02	4.04	359.10	-2.61	-0.35
Dead+Wind 210 deg - Service	29.89	-2.00	3.49	310.47	176.90	-0.27
Dead+Wind 240 deg - Service	29.89	-3.49	2.01	178.19	309.30	-0.10
Dead+Wind 270 deg - Service	29.89	-4.06	-0.02	-1.91	360.22	0.10
Dead+Wind 300 deg - Service	29.89	-4.64	-2.69	-208.54	358.99	0.25
Dead+Wind 330 deg - Service	29.89	-2.03	-3.50	-310.99	180.44	0.33

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-29.89	0.00	0.00	29.89	0.00	0.000%
2	-0.10	-35.86	-18.88	0.10	35.86	18.88	0.000%
3	-0.10	-26.90	-18.88	0.10	26.90	18.88	0.001%
4	9.37	-35.86	-16.30	-9.37	35.86	16.30	0.000%
5	9.37	-26.90	-16.30	-9.37	26.90	16.30	0.000%
6	16.31	-35.86	-9.38	-16.31	35.86	9.38	0.000%
7	16.31	-26.90	-9.38	-16.31	26.90	9.38	0.000%
8	18.97	-35.86	0.07	-18.97	35.86	-0.07	0.002%
9	18.97	-26.90	0.07	-18.97	26.90	-0.07	0.001%
10	21.67	-35.86	12.58	-21.67	35.86	-12.58	0.000%
11	21.67	-26.90	12.58	-21.66	26.90	-12.58	0.000%
12	9.49	-35.86	16.38	-9.49	35.86	-16.38	0.000%
13	9.49	-26.90	16.38	-9.49	26.90	-16.38	0.000%
14	0.08	-35.86	18.89	-0.08	35.86	-18.89	0.000%
15	0.08	-26.90	18.89	-0.08	26.90	-18.89	0.000%
16	-9.36	-35.86	16.33	9.36	35.86	-16.33	0.000%

<p><b>tnxTower</b></p> <p><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<p><b>Job</b></p> <p>120 ft Monopole / Jai-Alai</p>	<p><b>Page</b></p> <p>40 of 50</p>
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	<p><b>Client</b></p> <p>Crown Castle</p>	<p><b>Designed by</b></p> <p>CShetti</p>

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
17	-9.36	-26.90	16.33	9.36	26.90	-16.33	0.000%
18	-16.32	-35.86	9.38	16.32	35.86	-9.38	0.000%
19	-16.32	-26.90	9.38	16.32	26.90	-9.38	0.000%
20	-18.99	-35.86	-0.09	18.99	35.86	0.09	0.001%
21	-18.99	-26.90	-0.09	18.99	26.90	0.09	0.001%
22	-21.68	-35.86	-12.57	21.68	35.86	12.57	0.000%
23	-21.68	-26.90	-12.57	21.68	26.90	12.57	0.000%
24	-9.50	-35.86	-16.38	9.50	35.86	16.38	0.000%
25	-9.50	-26.90	-16.38	9.50	26.90	16.38	0.000%
26	0.00	-60.97	0.00	0.00	60.97	0.00	0.002%
27	-0.01	-60.97	-5.85	0.01	60.97	5.85	0.000%
28	2.84	-60.97	-4.92	-2.84	60.97	4.92	0.000%
29	5.07	-60.97	-2.92	-5.07	60.97	2.92	0.000%
30	6.62	-60.97	0.00	-6.62	60.97	-0.00	0.000%
31	5.91	-60.97	3.42	-5.91	60.97	-3.42	0.000%
32	2.84	-60.97	4.93	-2.84	60.97	-4.93	0.000%
33	0.01	-60.97	5.85	-0.01	60.97	-5.85	0.000%
34	-2.83	-60.97	4.92	2.83	60.97	-4.92	0.000%
35	-5.07	-60.97	2.92	5.07	60.97	-2.92	0.000%
36	-6.62	-60.97	-0.01	6.62	60.97	0.01	0.000%
37	-5.91	-60.97	-3.42	5.91	60.97	3.42	0.000%
38	-2.85	-60.97	-4.92	2.85	60.97	4.92	0.000%
39	-0.02	-29.89	-4.04	0.02	29.89	4.04	0.002%
40	2.01	-29.89	-3.49	-2.01	29.89	3.49	0.001%
41	3.49	-29.89	-2.01	-3.49	29.89	2.01	0.001%
42	4.06	-29.89	0.01	-4.06	29.89	-0.01	0.002%
43	4.64	-29.89	2.69	-4.64	29.89	-2.69	0.001%
44	2.03	-29.89	3.51	-2.03	29.89	-3.51	0.001%
45	0.02	-29.89	4.04	-0.02	29.89	-4.04	0.002%
46	-2.00	-29.89	3.49	2.00	29.89	-3.49	0.001%
47	-3.49	-29.89	2.01	3.49	29.89	-2.01	0.001%
48	-4.06	-29.89	-0.02	4.06	29.89	0.02	0.002%
49	-4.64	-29.89	-2.69	4.64	29.89	2.69	0.000%
50	-2.03	-29.89	-3.50	2.03	29.89	3.50	0.001%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	18	0.00000001	0.00007928
3	Yes	17	0.00000001	0.00014246
4	Yes	21	0.00000001	0.00006745
5	Yes	20	0.00000001	0.00012110
6	Yes	20	0.00000001	0.00014778
7	Yes	20	0.00000001	0.00011326
8	Yes	16	0.00000001	0.00009266
9	Yes	16	0.00000001	0.00007326
10	Yes	21	0.00000001	0.00007505
11	Yes	20	0.00000001	0.00013121
12	Yes	21	0.00000001	0.00007040
13	Yes	20	0.00000001	0.00012624
14	Yes	18	0.00000001	0.00010704
15	Yes	18	0.00000001	0.00008512
16	Yes	20	0.00000001	0.00014340
17	Yes	20	0.00000001	0.00010993

<p style="text-align: center;"><b>tnxTower</b></p> <p style="text-align: center;"><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	41 of 50
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18	Yes	21	0.00000001	0.00006536
19	Yes	20	0.00000001	0.00011731
20	Yes	17	0.00000001	0.00008774
21	Yes	17	0.00000001	0.00007049
22	Yes	21	0.00000001	0.00007957
23	Yes	20	0.00000001	0.00013944
24	Yes	20	0.00000001	0.00014702
25	Yes	20	0.00000001	0.00011258
26	Yes	8	0.00000001	0.00009200
27	Yes	19	0.00000001	0.00010492
28	Yes	19	0.00000001	0.00011984
29	Yes	19	0.00000001	0.00012040
30	Yes	19	0.00000001	0.00011362
31	Yes	19	0.00000001	0.00013185
32	Yes	19	0.00000001	0.00012176
33	Yes	19	0.00000001	0.00010621
34	Yes	19	0.00000001	0.00011807
35	Yes	19	0.00000001	0.00011997
36	Yes	19	0.00000001	0.00011174
37	Yes	19	0.00000001	0.00012949
38	Yes	19	0.00000001	0.00011716
39	Yes	14	0.00000001	0.00011162
40	Yes	15	0.00000001	0.00012930
41	Yes	15	0.00000001	0.00010004
42	Yes	14	0.00000001	0.00005504
43	Yes	15	0.00000001	0.00012248
44	Yes	15	0.00000001	0.00013978
45	Yes	14	0.00000001	0.00011966
46	Yes	15	0.00000001	0.00009362
47	Yes	15	0.00000001	0.00011263
48	Yes	14	0.00000001	0.00005717
49	Yes	16	0.00000001	0.00007326
50	Yes	15	0.00000001	0.00009695

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 115	13.462	43	0.9653	0.0047
L2	115 - 110	12.452	43	0.9633	0.0045
L3	110 - 105	11.447	43	0.9533	0.0040
L4	105 - 100	10.458	43	0.9354	0.0035
L5	100 - 98.5	9.491	43	0.9093	0.0031
L6	98.5 - 98.25	9.207	43	0.8991	0.0029
L7	98.25 - 93.25	9.160	43	0.8979	0.0029
L8	93.25 - 90	8.234	43	0.8690	0.0026
L9	90 - 89.75	7.651	43	0.8451	0.0024
L10	89.75 - 84.75	7.606	43	0.8430	0.0024
L11	84.75 - 79.75	6.747	43	0.7962	0.0021
L12	79.75 - 78.25	5.943	43	0.7390	0.0017
L13	78.25 - 78	5.713	43	0.7198	0.0016
L14	78 - 75.04	5.676	43	0.7174	0.0016
L15	75.04 - 74.79	5.240	43	0.6871	0.0015
L16	74.79 - 69.79	5.204	43	0.6850	0.0015
L17	69.79 - 64.79	4.510	43	0.6394	0.0013
L18	64.79 - 60	3.868	43	0.5870	0.0011
L19	60 - 59.75	3.307	43	0.5302	0.0009
L20	59.75 - 54.75	3.279	43	0.5282	0.0009
L21	54.75 - 49.75	2.748	43	0.4860	0.0008

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L22	49.75 - 49.25	2.263	43	0.4388	0.0007
L23	49.25 - 49	2.217	43	0.4338	0.0007
L24	49 - 44	2.195	43	0.4317	0.0007
L25	44 - 43	1.765	43	0.3879	0.0006
L26	43 - 42.75	1.685	43	0.3786	0.0006
L27	42.75 - 39	1.665	43	0.3767	0.0006
L28	39 - 38.75	1.381	43	0.3469	0.0005
L29	38.75 - 33.75	1.363	43	0.3444	0.0005
L30	33.75 - 30	1.029	43	0.2914	0.0004
L31	30 - 29.75	0.817	43	0.2486	0.0003
L32	29.75 - 26	0.804	43	0.2466	0.0003
L33	26 - 25.75	0.622	43	0.2158	0.0003
L34	25.75 - 20.75	0.611	43	0.2140	0.0003
L35	20.75 - 20.5	0.407	43	0.1763	0.0002
L36	20.5 - 18	0.397	43	0.1747	0.0002
L37	18 - 17.75	0.310	43	0.1579	0.0002
L38	17.75 - 13.46	0.302	43	0.1560	0.0002
L39	13.46 - 13.21	0.177	43	0.1215	0.0001
L40	13.21 - 8.21	0.171	43	0.1195	0.0001
L41	8.21 - 6.08	0.068	43	0.0771	0.0001
L42	6.08 - 5.83	0.038	43	0.0582	0.0001
L43	5.83 - 0.83	0.035	43	0.0559	0.0001
L44	0.83 - 0	0.001	43	0.0082	0.0000

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.0000	VHLP1-18	43	13.462	0.9653	0.0047	47931
121.0000	VHLP1-18	43	13.462	0.9653	0.0047	47931
117.0000	LLPX310R w/ Mount Pipe	43	12.855	0.9648	0.0046	47931
100.0000	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	43	9.491	0.9093	0.0031	9963
60.0000	Bridge Stiffener (58" x 14" x 1.25")	43	3.307	0.5302	0.0009	5641
30.0000	Bridge Stiffener (58" x 14" x 1.25")	43	0.817	0.2486	0.0003	5862

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 115	63.011	10	4.5130	0.0221
L2	115 - 110	58.295	10	4.5047	0.0211
L3	110 - 105	53.607	10	4.4601	0.0189
L4	105 - 100	48.984	10	4.3787	0.0167
L5	100 - 98.5	44.465	10	4.2586	0.0145
L6	98.5 - 98.25	43.137	10	4.2113	0.0138
L7	98.25 - 93.25	42.917	10	4.2057	0.0137
L8	93.25 - 90	38.586	10	4.0715	0.0123
L9	90 - 89.75	35.855	10	3.9602	0.0113
L10	89.75 - 84.75	35.648	10	3.9505	0.0112

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L11	84.75 - 79.75	31.627	10	3.7321	0.0097
L12	79.75 - 78.25	27.859	10	3.4647	0.0082
L13	78.25 - 78	26.785	10	3.3748	0.0077
L14	78 - 75.04	26.609	10	3.3634	0.0077
L15	75.04 - 74.79	24.569	10	3.2218	0.0070
L16	74.79 - 69.79	24.401	10	3.2119	0.0070
L17	69.79 - 64.79	21.149	10	2.9986	0.0061
L18	64.79 - 60	18.137	10	2.7534	0.0052
L19	60 - 59.75	15.507	10	2.4871	0.0044
L20	59.75 - 54.75	15.377	10	2.4777	0.0044
L21	54.75 - 49.75	12.886	10	2.2796	0.0038
L22	49.75 - 49.25	10.613	10	2.0583	0.0033
L23	49.25 - 49	10.399	10	2.0349	0.0032
L24	49 - 44	10.293	10	2.0252	0.0032
L25	44 - 43	8.279	10	1.8195	0.0027
L26	43 - 42.75	7.902	10	1.7760	0.0026
L27	42.75 - 39	7.809	10	1.7670	0.0026
L28	39 - 38.75	6.476	10	1.6275	0.0023
L29	38.75 - 33.75	6.391	10	1.6156	0.0023
L30	33.75 - 30	4.828	10	1.3670	0.0019
L31	30 - 29.75	3.833	10	1.1660	0.0015
L32	29.75 - 26	3.772	10	1.1567	0.0015
L33	26 - 25.75	2.920	10	1.0124	0.0013
L34	25.75 - 20.75	2.867	10	1.0039	0.0013
L35	20.75 - 20.5	1.907	22	0.8270	0.0010
L36	20.5 - 18	1.864	22	0.8193	0.0010
L37	18 - 17.75	1.455	22	0.7408	0.0009
L38	17.75 - 13.46	1.417	22	0.7317	0.0009
L39	13.46 - 13.21	0.831	22	0.5700	0.0007
L40	13.21 - 8.21	0.802	22	0.5604	0.0006
L41	8.21 - 6.08	0.318	22	0.3617	0.0004
L42	6.08 - 5.83	0.176	22	0.2728	0.0003
L43	5.83 - 0.83	0.162	22	0.2620	0.0003
L44	0.83 - 0	0.003	22	0.0385	0.0000

### Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.0000	VHLP1-18	10	63.011	4.5130	0.0221	11190
121.0000	VHLP1-18	10	63.011	4.5130	0.0221	11190
117.0000	LLPX310R w/ Mount Pipe	10	60.180	4.5108	0.0216	11190
100.0000	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	10	44.465	4.2586	0.0145	2184
60.0000	Bridge Stiffener (58" x 14" x 1.25")	10	15.507	2.4871	0.0044	1209
30.0000	Bridge Stiffener (58" x 14" x 1.25")	10	3.833	1.1660	0.0015	1251

### Compression Checks

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<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

**Pole Design Data**

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	120 - 115 (1)	P24x0.25	5.0000	0.0000	0.0	18.6532	-3.17	662.26	0.005
L2	115 - 110 (2)	P24x0.25	5.0000	0.0000	0.0	18.6532	-3.58	662.26	0.005
L3	110 - 105 (3)	P24x0.25	5.0000	0.0000	0.0	18.6532	-3.99	662.26	0.006
L4	105 - 100 (4)	P24x0.25	5.0000	0.0000	0.0	18.6532	-4.41	662.26	0.007
L5	100 - 98.5 (5)	P24x0.25	1.5000	0.0000	0.0	18.6532	-7.15	662.26	0.011
L6	98.5 - 98.25 (6)	P24x0.3875	0.2500	0.0000	0.0	28.7451	-7.19	1086.56	0.007
L7	98.25 - 93.25 (7)	P24x0.3875	5.0000	0.0000	0.0	28.7451	-7.91	1086.56	0.007
L8	93.25 - 90 (8)	P24x0.3875	3.2500	0.0000	0.0	28.7451	-8.38	1086.56	0.008
L9	90 - 89.75 (9)	P24x0.375	0.2500	0.0000	0.0	27.8325	-8.42	1052.07	0.008
L10	89.75 - 84.75 (10)	P24x0.375	5.0000	0.0000	0.0	27.8325	-9.16	1052.07	0.009
L11	84.75 - 79.75 (11)	P24x0.375	5.0000	0.0000	0.0	27.8325	-9.92	1052.07	0.009
L12	79.75 - 78.25 (12)	P24x0.375	1.5000	0.0000	0.0	27.8325	-10.15	1052.07	0.010
L13	78.25 - 78 (13)	P24x0.51875	0.2500	0.0000	0.0	38.2674	-10.21	1446.51	0.007
L14	78 - 75.04 (14)	P24x0.51875	2.9600	0.0000	0.0	38.2674	-10.75	1446.51	0.007
L15	75.04 - 74.79 (15)	P24x0.675	0.2500	0.0000	0.0	49.4624	-10.81	1869.68	0.006
L16	74.79 - 69.79 (16)	P24x0.675	5.0000	0.0000	0.0	49.4624	-11.90	1869.68	0.006
L17	69.79 - 64.79 (17)	P24x0.675	5.0000	0.0000	0.0	49.4624	-13.02	1869.68	0.007
L18	64.79 - 60 (18)	P24x0.675	4.7900	0.0000	0.0	49.4624	-14.10	1869.68	0.008
L19	60 - 59.75 (19)	P30x0.53125	0.2500	0.0000	0.0	49.1825	-15.41	1859.10	0.008
L20	59.75 - 54.75 (20)	P30x0.53125	5.0000	0.0000	0.0	49.1825	-16.56	1859.10	0.009
L21	54.75 - 49.75 (21)	P30x0.53125	5.0000	0.0000	0.0	49.1825	-17.74	1859.10	0.010
L22	49.75 - 49.25 (22)	P30x0.53125	0.5000	0.0000	0.0	49.1825	-17.86	1859.10	0.010
L23	49.25 - 49 (23)	P30x0.65	0.2500	0.0000	0.0	59.9337	-17.93	2265.50	0.008
L24	49 - 44 (24)	P30x0.65	5.0000	0.0000	0.0	59.9337	-19.26	2265.50	0.009
L25	44 - 43 (25)	P30x0.65	1.0000	0.0000	0.0	59.9337	-19.53	2265.50	0.009
L26	43 - 42.75 (26)	P30x0.8125	0.2500	0.0000	0.0	74.5024	-19.62	2816.19	0.007
L27	42.75 - 39 (27)	P30x0.8125	3.7500	0.0000	0.0	74.5024	-20.80	2816.19	0.007
L28	39 - 38.75 (28)	P30x0.65	0.2500	0.0000	0.0	59.9337	-20.88	2265.50	0.009
L29	38.75 - 33.75 (29)	P30x0.65	5.0000	0.0000	0.0	59.9337	-22.24	2265.50	0.010
L30	33.75 - 30 (30)	P30x0.65	3.7500	0.0000	0.0	59.9337	-23.28	2265.50	0.010
L31	30 - 29.75 (31)	P36x0.55	0.2500	0.0000	0.0	61.2532	-25.86	2315.37	0.011
L32	29.75 - 26 (32)	P36x0.55	3.7500	0.0000	0.0	61.2532	-26.92	2315.37	0.012
L33	26 - 25.75 (33)	P36x0.65	0.2500	0.0000	0.0	72.1859	-27.01	2728.63	0.010
L34	25.75 - 20.75 (34)	P36x0.65	5.0000	0.0000	0.0	72.1859	-28.61	2728.63	0.010
L35	20.75 - 20.5 (35)	P36x0.7875	0.2500	0.0000	0.0	87.1159	-28.70	3292.98	0.009
L36	20.5 - 18 (36)	P36x0.7875	2.5000	0.0000	0.0	87.1159	-29.63	3292.98	0.009
L37	18 - 17.75 (37)	P36x0.6875	0.2500	0.0000	0.0	76.2695	-29.72	2882.99	0.010
L38	17.75 - 13.46 (38)	P36x0.6875	4.2900	0.0000	0.0	76.2695	-31.17	2882.99	0.011
L39	13.46 - 13.21 (39)	P36x0.7	0.2500	0.0000	0.0	77.6288	-31.26	2934.37	0.011
L40	13.21 - 8.21 (40)	P36x0.7	5.0000	0.0000	0.0	77.6288	-33.01	2934.37	0.011
L41	8.21 - 6.08 (41)	P36x0.7	2.1300	0.0000	0.0	77.6288	-33.76	2934.37	0.012

<p><b>tnxTower</b></p> <p><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	45 of 50
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
L42	6.08 - 5.83 (42)	P36x0.6875	0.2500	0.0000	0.0	76.2695	-33.85	2882.99	0.012
L43	5.83 - 0.83 (43)	P36x0.6875	5.0000	0.0000	0.0	76.2695	-35.57	2882.99	0.012
L44	0.83 - 0 (44)	P36x0.6875	0.8300	0.0000	0.0	76.2695	-35.85	2882.99	0.012

### Pole Bending Design Data

Section No.	Elevation ft	Size	M <sub>ux</sub> kip-ft	φM <sub>ux</sub> kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M <sub>uy</sub> kip-ft	φM <sub>uy</sub> kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	120 - 115 (1)	P24x0.25	24.74	396.68	0.062	0.00	396.68	0.000
L2	115 - 110 (2)	P24x0.25	57.95	396.68	0.146	0.00	396.68	0.000
L3	110 - 105 (3)	P24x0.25	92.87	396.68	0.234	0.00	396.68	0.000
L4	105 - 100 (4)	P24x0.25	129.46	396.68	0.326	0.00	396.68	0.000
L5	100 - 98.5 (5)	P24x0.25	155.01	396.68	0.391	0.00	396.68	0.000
L6	98.5 - 98.25 (6)	P24x0.3875	158.08	647.41	0.244	0.00	647.41	0.000
L7	98.25 - 93.25 (7)	P24x0.3875	220.50	647.41	0.341	0.00	647.41	0.000
L8	93.25 - 90 (8)	P24x0.3875	262.20	647.41	0.405	0.00	647.41	0.000
L9	90 - 89.75 (9)	P24x0.375	265.44	623.72	0.426	0.00	623.72	0.000
L10	89.75 - 84.75 (10)	P24x0.375	331.32	623.72	0.531	0.00	623.72	0.000
L11	84.75 - 79.75 (11)	P24x0.375	399.05	623.72	0.640	0.00	623.72	0.000
L12	79.75 - 78.25 (12)	P24x0.375	419.71	623.72	0.673	0.00	623.72	0.000
L13	78.25 - 78 (13)	P24x0.51875	423.18	901.12	0.470	0.00	901.12	0.000
L14	78 - 75.04 (14)	P24x0.51875	464.83	901.12	0.516	0.00	901.12	0.000
L15	75.04 - 74.79 (15)	P24x0.675	468.40	1157.13	0.405	0.00	1157.13	0.000
L16	74.79 - 69.79 (16)	P24x0.675	541.98	1157.13	0.468	0.00	1157.13	0.000
L17	69.79 - 64.79 (17)	P24x0.675	619.37	1157.13	0.535	0.00	1157.13	0.000
L18	64.79 - 60 (18)	P24x0.675	696.95	1157.13	0.602	0.00	1157.13	0.000
L19	60 - 59.75 (19)	P30x0.53125	701.18	1405.38	0.499	0.00	1405.38	0.000
L20	59.75 - 54.75 (20)	P30x0.53125	786.94	1405.38	0.560	0.00	1405.38	0.000
L21	54.75 - 49.75 (21)	P30x0.53125	874.76	1405.38	0.622	0.00	1405.38	0.000
L22	49.75 - 49.25 (22)	P30x0.53125	883.65	1405.38	0.629	0.00	1405.38	0.000
L23	49.25 - 49 (23)	P30x0.65	888.10	1764.05	0.503	0.00	1764.05	0.000
L24	49 - 44 (24)	P30x0.65	979.23	1764.05	0.555	0.00	1764.05	0.000
L25	44 - 43 (25)	P30x0.65	997.92	1764.05	0.566	0.00	1764.05	0.000
L26	43 - 42.75 (26)	P30x0.8125	1002.63	2180.93	0.460	0.00	2180.93	0.000
L27	42.75 - 39 (27)	P30x0.8125	1074.36	2180.93	0.493	0.00	2180.93	0.000
L28	39 - 38.75 (28)	P30x0.65	1079.22	1764.05	0.612	0.00	1764.05	0.000
L29	38.75 - 33.75 (29)	P30x0.65	1178.43	1764.05	0.668	0.00	1764.05	0.000
L30	33.75 - 30 (30)	P30x0.65	1255.22	1764.05	0.712	0.00	1764.05	0.000
L31	30 - 29.75 (31)	P36x0.55	1260.63	2052.07	0.614	0.00	2052.07	0.000
L32	29.75 - 26 (32)	P36x0.55	1342.27	2052.07	0.654	0.00	2052.07	0.000
L33	26 - 25.75 (33)	P36x0.65	1347.74	2483.30	0.543	0.00	2483.30	0.000
L34	25.75 - 20.75 (34)	P36x0.65	1458.31	2483.30	0.587	0.00	2483.30	0.000
L35	20.75 - 20.5	P36x0.7875	1463.88	3076.29	0.476	0.00	3076.29	0.000



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	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{rx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{rx}}$	$M_{uy}$ kip-ft	$\phi M_{ry}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ry}}$
	(35)							
L36	20.5 - 18 (36)	P36x0.7875	1520.21	3076.29	0.494	0.00	3076.29	0.000
L37	18 - 17.75 (37)	P36x0.6875	1525.89	2649.32	0.576	0.00	2649.32	0.000
L38	17.75 - 13.46 (38)	P36x0.6875	1624.81	2649.32	0.613	0.00	2649.32	0.000
L39	13.46 - 13.21 (39)	P36x0.7	1630.65	2705.17	0.603	0.00	2705.17	0.000
L40	13.21 - 8.21 (40)	P36x0.7	1749.29	2705.17	0.647	0.00	2705.17	0.000
L41	8.21 - 6.08 (41)	P36x0.7	1800.86	2705.17	0.666	0.00	2705.17	0.000
L42	6.08 - 5.83 (42)	P36x0.6875	1806.96	2649.32	0.682	0.00	2649.32	0.000
L43	5.83 - 0.83 (43)	P36x0.6875	1930.51	2649.32	0.729	0.00	2649.32	0.000
L44	0.83 - 0 (44)	P36x0.6875	1951.29	2649.32	0.737	0.00	2649.32	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 115 (1)	P24x0.25	6.47	331.13	0.020	0.72	648.61	0.001
L2	115 - 110 (2)	P24x0.25	6.81	331.13	0.021	0.72	648.61	0.001
L3	110 - 105 (3)	P24x0.25	7.15	331.13	0.022	0.72	648.61	0.001
L4	105 - 100 (4)	P24x0.25	7.48	331.13	0.023	0.72	648.61	0.001
L5	100 - 98.5 (5)	P24x0.25	12.25	331.13	0.037	1.12	648.61	0.002
L6	98.5 - 98.25 (6)	P24x0.3875	12.28	543.28	0.023	1.12	1052.04	0.001
L7	98.25 - 93.25 (7)	P24x0.3875	12.70	543.28	0.023	1.12	1052.04	0.001
L8	93.25 - 90 (8)	P24x0.3875	12.97	543.28	0.024	1.12	1052.04	0.001
L9	90 - 89.75 (9)	P24x0.375	12.99	526.03	0.025	1.12	1019.71	0.001
L10	89.75 - 84.75 (10)	P24x0.375	13.37	526.03	0.025	1.12	1019.71	0.001
L11	84.75 - 79.75 (11)	P24x0.375	13.73	526.03	0.026	1.12	1019.71	0.001
L12	79.75 - 78.25 (12)	P24x0.375	13.84	526.03	0.026	1.12	1019.71	0.001
L13	78.25 - 78 (13)	P24x0.51875	13.86	723.25	0.019	1.12	1385.33	0.001
L14	78 - 75.04 (14)	P24x0.51875	14.29	723.25	0.020	1.11	1385.33	0.001
L15	75.04 - 74.79 (15)	P24x0.675	14.33	934.84	0.015	1.10	1767.47	0.001
L16	74.79 - 69.79 (16)	P24x0.675	15.11	934.84	0.016	1.07	1767.47	0.001
L17	69.79 - 64.79 (17)	P24x0.675	15.86	934.84	0.017	1.04	1767.47	0.001
L18	64.79 - 60 (18)	P24x0.675	16.55	934.84	0.018	1.01	1767.47	0.001
L19	60 - 59.75 (19)	P30x0.53125	16.95	929.55	0.018	1.00	2243.03	0.000
L20	59.75 - 54.75 (20)	P30x0.53125	17.37	929.55	0.019	1.00	2243.03	0.000
L21	54.75 - 49.75 (21)	P30x0.53125	17.77	929.55	0.019	1.00	2243.03	0.000
L22	49.75 - 49.25 (22)	P30x0.53125	17.81	929.55	0.019	1.00	2243.03	0.000
L23	49.25 - 49 (23)	P30x0.65	17.83	1132.75	0.016	1.00	2711.82	0.000
L24	49 - 44 (24)	P30x0.65	18.63	1132.75	0.016	0.97	2711.82	0.000
L25	44 - 43 (25)	P30x0.65	18.79	1132.75	0.017	0.96	2711.82	0.000
L26	43 - 42.75 (26)	P30x0.8125	18.83	1408.10	0.013	0.96	3334.72	0.000
L27	42.75 - 39 (27)	P30x0.8125	19.44	1408.10	0.014	0.94	3334.72	0.000

<b>tnxTower</b>  <b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031	<b>Job</b> 120 ft Monopole / Jai-Alai	<b>Page</b> 47 of 50
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	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $V_u$ $\phi V_n$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $T_u$ $\phi T_n$
L28	39 - 38.75 (28)	P30x0.65	19.47	1132.75	0.017	0.93	2711.82	0.000
L29	38.75 - 33.75 (29)	P30x0.65	20.22	1132.75	0.018	0.91	2711.82	0.000
L30	33.75 - 30 (30)	P30x0.65	20.75	1132.75	0.018	0.89	2711.82	0.000
L31	30 - 29.75 (31)	P36x0.55	21.64	1157.69	0.019	0.88	3368.56	0.000
L32	29.75 - 26 (32)	P36x0.55	21.92	1157.69	0.019	0.88	3368.56	0.000
L33	26 - 25.75 (33)	P36x0.65	21.93	1364.31	0.016	0.88	3947.81	0.000
L34	25.75 - 20.75 (34)	P36x0.65	22.31	1364.31	0.016	0.88	3947.81	0.000
L35	20.75 - 20.5 (35)	P36x0.7875	22.34	1646.49	0.014	0.88	4728.09	0.000
L36	20.5 - 18 (36)	P36x0.7875	22.73	1646.49	0.014	0.87	4728.09	0.000
L37	18 - 17.75 (37)	P36x0.6875	22.76	1441.49	0.016	0.87	4162.47	0.000
L38	17.75 - 13.46 (38)	P36x0.6875	23.37	1441.49	0.016	0.84	4162.47	0.000
L39	13.46 - 13.21 (39)	P36x0.7	23.39	1467.18	0.016	0.83	4233.71	0.000
L40	13.21 - 8.21 (40)	P36x0.7	24.07	1467.18	0.016	0.81	4233.71	0.000
L41	8.21 - 6.08 (41)	P36x0.7	24.37	1467.18	0.017	0.83	4233.71	0.000
L42	6.08 - 5.83 (42)	P36x0.6875	24.39	1441.49	0.017	0.82	4162.47	0.000
L43	5.83 - 0.83 (43)	P36x0.6875	25.04	1441.49	0.017	0.79	4162.47	0.000
L44	0.83 - 0 (44)	P36x0.6875	25.08	1441.49	0.017	0.78	4162.47	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 115 (1)	0.005	0.062	0.000	0.020	0.001	0.068	1.000	4.8.2 ✓
L2	115 - 110 (2)	0.005	0.146	0.000	0.021	0.001	0.152	1.000	4.8.2 ✓
L3	110 - 105 (3)	0.006	0.234	0.000	0.022	0.001	0.241	1.000	4.8.2 ✓
L4	105 - 100 (4)	0.007	0.326	0.000	0.023	0.001	0.334	1.000	4.8.2 ✓
L5	100 - 98.5 (5)	0.011	0.391	0.000	0.037	0.002	0.403	1.000	4.8.2 ✓
L6	98.5 - 98.25 (6)	0.007	0.244	0.000	0.023	0.001	0.251	1.000	4.8.2 ✓
L7	98.25 - 93.25 (7)	0.007	0.341	0.000	0.023	0.001	0.348	1.000	4.8.2 ✓
L8	93.25 - 90 (8)	0.008	0.405	0.000	0.024	0.001	0.413	1.000	4.8.2 ✓
L9	90 - 89.75 (9)	0.008	0.426	0.000	0.025	0.001	0.434	1.000	4.8.2 ✓
L10	89.75 - 84.75 (10)	0.009	0.531	0.000	0.025	0.001	0.541	1.000	4.8.2 ✓
L11	84.75 - 79.75 (11)	0.009	0.640	0.000	0.026	0.001	0.650	1.000	4.8.2 ✓

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	<b>Client</b> Crown Castle	<b>Designed by</b> CShetti

Section No.	Elevation ft	Ratio $P_u$	Ratio $M_{ux}$	Ratio $M_{uy}$	Ratio $V_u$	Ratio $T_u$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\phi P_n$	$\phi M_{nx}$	$\phi M_{ny}$	$\phi V_n$	$\phi T_n$			
L12	79.75 - 78.25 (12)	0.010	0.673	0.000	0.026	0.001	0.683	1.000	4.8.2 ✓
L13	78.25 - 78 (13)	0.007	0.470	0.000	0.019	0.001	0.477	1.000	4.8.2 ✓
L14	78 - 75.04 (14)	0.007	0.516	0.000	0.020	0.001	0.524	1.000	4.8.2 ✓
L15	75.04 - 74.79 (15)	0.006	0.405	0.000	0.015	0.001	0.411	1.000	4.8.2 ✓
L16	74.79 - 69.79 (16)	0.006	0.468	0.000	0.016	0.001	0.475	1.000	4.8.2 ✓
L17	69.79 - 64.79 (17)	0.007	0.535	0.000	0.017	0.001	0.543	1.000	4.8.2 ✓
L18	64.79 - 60 (18)	0.008	0.602	0.000	0.018	0.001	0.610	1.000	4.8.2 ✓
L19	60 - 59.75 (19)	0.008	0.499	0.000	0.018	0.000	0.508	1.000	4.8.2 ✓
L20	59.75 - 54.75 (20)	0.009	0.560	0.000	0.019	0.000	0.569	1.000	4.8.2 ✓
L21	54.75 - 49.75 (21)	0.010	0.622	0.000	0.019	0.000	0.632	1.000	4.8.2 ✓
L22	49.75 - 49.25 (22)	0.010	0.629	0.000	0.019	0.000	0.639	1.000	4.8.2 ✓
L23	49.25 - 49 (23)	0.008	0.503	0.000	0.016	0.000	0.512	1.000	4.8.2 ✓
L24	49 - 44 (24)	0.009	0.555	0.000	0.016	0.000	0.564	1.000	4.8.2 ✓
L25	44 - 43 (25)	0.009	0.566	0.000	0.017	0.000	0.575	1.000	4.8.2 ✓
L26	43 - 42.75 (26)	0.007	0.460	0.000	0.013	0.000	0.467	1.000	4.8.2 ✓
L27	42.75 - 39 (27)	0.007	0.493	0.000	0.014	0.000	0.500	1.000	4.8.2 ✓
L28	39 - 38.75 (28)	0.009	0.612	0.000	0.017	0.000	0.621	1.000	4.8.2 ✓
L29	38.75 - 33.75 (29)	0.010	0.668	0.000	0.018	0.000	0.678	1.000	4.8.2 ✓
L30	33.75 - 30 (30)	0.010	0.712	0.000	0.018	0.000	0.722	1.000	4.8.2 ✓
L31	30 - 29.75 (31)	0.011	0.614	0.000	0.019	0.000	0.626	1.000	4.8.2 ✓
L32	29.75 - 26 (32)	0.012	0.654	0.000	0.019	0.000	0.666	1.000	4.8.2 ✓
L33	26 - 25.75 (33)	0.010	0.543	0.000	0.016	0.000	0.553	1.000	4.8.2 ✓
L34	25.75 - 20.75 (34)	0.010	0.587	0.000	0.016	0.000	0.598	1.000	4.8.2 ✓
L35	20.75 - 20.5 (35)	0.009	0.476	0.000	0.014	0.000	0.485	1.000	4.8.2 ✓
L36	20.5 - 18 (36)	0.009	0.494	0.000	0.014	0.000	0.503	1.000	4.8.2 ✓
L37	18 - 17.75 (37)	0.010	0.576	0.000	0.016	0.000	0.587	1.000	4.8.2 ✓

<p><b>tnxTower</b></p> <p><b>FDH Velocitel</b> 6521 Meridien Drive, Suite 107 Raleigh, North Carolina 27616 Phone: 9197551012 FAX: 9197551031</p>	<b>Job</b>	120 ft Monopole / Jai-Alai	<b>Page</b>	49 of 50
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	<b>Client</b>	Crown Castle	<b>Designed by</b>	CShetti

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L38	17.75 - 13.46 (38)	0.011	0.613	0.000	0.016	0.000	0.624 ✓	1.000	4.8.2 ✓
L39	13.46 - 13.21 (39)	0.011	0.603	0.000	0.016	0.000	0.614 ✓	1.000	4.8.2 ✓
L40	13.21 - 8.21 (40)	0.011	0.647	0.000	0.016	0.000	0.658 ✓	1.000	4.8.2 ✓
L41	8.21 - 6.08 (41)	0.012	0.666	0.000	0.017	0.000	0.678 ✓	1.000	4.8.2 ✓
L42	6.08 - 5.83 (42)	0.012	0.682	0.000	0.017	0.000	0.694 ✓	1.000	4.8.2 ✓
L43	5.83 - 0.83 (43)	0.012	0.729	0.000	0.017	0.000	0.741 ✓	1.000	4.8.2 ✓
L44	0.83 - 0 (44)	0.012	0.737	0.000	0.017	0.000	0.749 ✓	1.000	4.8.2 ✓

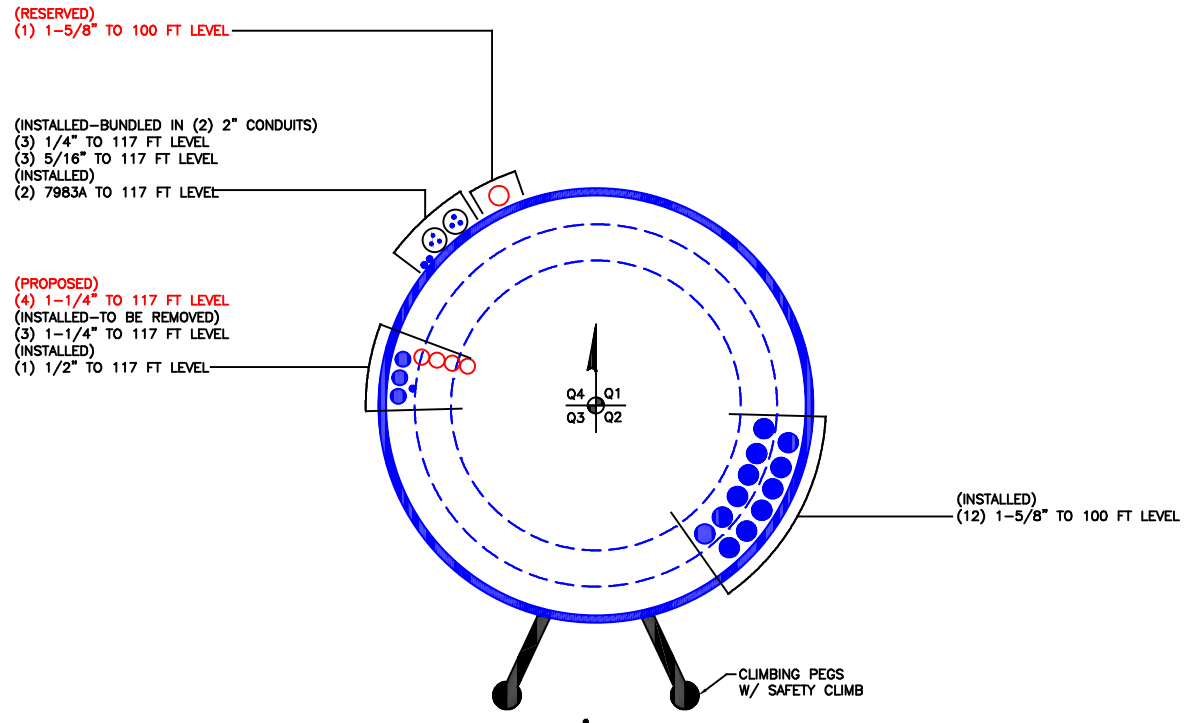
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	120 - 115	Pole	P24x0.25	1	-3.17	662.26	6.8	Pass
L2	115 - 110	Pole	P24x0.25	2	-3.58	662.26	15.2	Pass
L3	110 - 105	Pole	P24x0.25	3	-3.99	662.26	24.1	Pass
L4	105 - 100	Pole	P24x0.25	4	-4.41	662.26	33.4	Pass
L5	100 - 98.5	Pole	P24x0.25	5	-7.15	662.26	40.3	Pass
L6	98.5 - 98.25	Pole	P24x0.3875	6	-7.19	1086.56	25.1	Pass
L7	98.25 - 93.25	Pole	P24x0.3875	7	-7.91	1086.56	34.8	Pass
L8	93.25 - 90	Pole	P24x0.3875	8	-8.38	1086.56	41.3	Pass
L9	90 - 89.75	Pole	P24x0.375	9	-8.42	1052.07	43.4	Pass
L10	89.75 - 84.75	Pole	P24x0.375	10	-9.16	1052.07	54.1	Pass
L11	84.75 - 79.75	Pole	P24x0.375	11	-9.92	1052.07	65.0	Pass
L12	79.75 - 78.25	Pole	P24x0.375	12	-10.15	1052.07	68.3	Pass
L13	78.25 - 78	Pole	P24x0.51875	13	-10.21	1446.51	47.7	Pass
L14	78 - 75.04	Pole	P24x0.51875	14	-10.75	1446.51	52.4	Pass
L15	75.04 - 74.79	Pole	P24x0.675	15	-10.81	1869.68	41.1	Pass
L16	74.79 - 69.79	Pole	P24x0.675	16	-11.90	1869.68	47.5	Pass
L17	69.79 - 64.79	Pole	P24x0.675	17	-13.02	1869.68	54.3	Pass
L18	64.79 - 60	Pole	P24x0.675	18	-14.10	1869.68	61.0	Pass
L19	60 - 59.75	Pole	P30x0.53125	19	-15.41	1859.10	50.8	Pass
L20	59.75 - 54.75	Pole	P30x0.53125	20	-16.56	1859.10	56.9	Pass
L21	54.75 - 49.75	Pole	P30x0.53125	21	-17.74	1859.10	63.2	Pass
L22	49.75 - 49.25	Pole	P30x0.53125	22	-17.86	1859.10	63.9	Pass
L23	49.25 - 49	Pole	P30x0.65	23	-17.93	2265.50	51.2	Pass
L24	49 - 44	Pole	P30x0.65	24	-19.26	2265.50	56.4	Pass
L25	44 - 43	Pole	P30x0.65	25	-19.53	2265.50	57.5	Pass
L26	43 - 42.75	Pole	P30x0.8125	26	-19.62	2816.19	46.7	Pass
L27	42.75 - 39	Pole	P30x0.8125	27	-20.80	2816.19	50.0	Pass
L28	39 - 38.75	Pole	P30x0.65	28	-20.88	2265.50	62.1	Pass
L29	38.75 - 33.75	Pole	P30x0.65	29	-22.24	2265.50	67.8	Pass
L30	33.75 - 30	Pole	P30x0.65	30	-23.28	2265.50	72.2	Pass
L31	30 - 29.75	Pole	P36x0.55	31	-25.86	2315.37	62.6	Pass
L32	29.75 - 26	Pole	P36x0.55	32	-26.92	2315.37	66.6	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L33	26 - 25.75	Pole	P36x0.65	33	-27.01	2728.63	55.3	Pass	
L34	25.75 - 20.75	Pole	P36x0.65	34	-28.61	2728.63	59.8	Pass	
L35	20.75 - 20.5	Pole	P36x0.7875	35	-28.70	3292.98	48.5	Pass	
L36	20.5 - 18	Pole	P36x0.7875	36	-29.63	3292.98	50.3	Pass	
L37	18 - 17.75	Pole	P36x0.6875	37	-29.72	2882.99	58.7	Pass	
L38	17.75 - 13.46	Pole	P36x0.6875	38	-31.17	2882.99	62.4	Pass	
L39	13.46 - 13.21	Pole	P36x0.7	39	-31.26	2934.37	61.4	Pass	
L40	13.21 - 8.21	Pole	P36x0.7	40	-33.01	2934.37	65.8	Pass	
L41	8.21 - 6.08	Pole	P36x0.7	41	-33.76	2934.37	67.8	Pass	
L42	6.08 - 5.83	Pole	P36x0.6875	42	-33.85	2882.99	69.4	Pass	
L43	5.83 - 0.83	Pole	P36x0.6875	43	-35.57	2882.99	74.1	Pass	
L44	0.83 - 0	Pole	P36x0.6875	44	-35.85	2882.99	74.9	Pass	
							Summary		
							Pole (L44)	74.9	Pass
							<b>RATING =</b>	<b>74.9</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



**APPENDIX C**  
**ADDITIONAL CALCULATIONS**





# TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	120 - 115	5		0	24.000	24.000	0.25	A53-B-42	1.000
2	115 - 110	5		0	24.000	24.000	0.25	A53-B-42	1.000
3	110 - 105	5		0	24.000	24.000	0.25	A53-B-42	1.000
4	105 - 100	5		0	24.000	24.000	0.25	A53-B-42	1.000
5	100 - 98.5	1.5		0	24.000	24.000	0.25	A53-B-42	1.000
6	98.5 - 98.25	0.25		0	24.000	24.000	0.3875	A53-B-42	0.962
7	98.25 - 93.25	5		0	24.000	24.000	0.3875	A53-B-42	0.962
8	93.25 - 90	3.25	0	0	24.000	24.000	0.3875	A53-B-42	0.962
9	90 - 89.75	0.25		0	24.000	24.000	0.375	A53-B-42	1.000
10	89.75 - 84.75	5		0	24.000	24.000	0.375	A53-B-42	1.000
11	84.75 - 79.75	5		0	24.000	24.000	0.375	A53-B-42	1.000
12	79.75 - 78.25	1.5		0	24.000	24.000	0.375	A53-B-42	1.000
13	78.25 - 78	0.25		0	24.000	24.000	0.51875	A53-B-42	0.963
14	78 - 75.04	2.96		0	24.000	24.000	0.51875	A53-B-42	0.963
15	75.04 - 74.79	0.25		0	24.000	24.000	0.675	A53-B-42	0.922
16	74.79 - 69.79	5		0	24.000	24.000	0.675	A53-B-42	0.922
17	69.79 - 64.79	5		0	24.000	24.000	0.675	A53-B-42	0.922
18	64.79 - 60	4.79	0	0	24.000	24.000	0.675	A53-B-42	0.922
19	60 - 59.75	0.25		0	30.000	30.000	0.53125	A53-B-42	0.962
20	59.75 - 54.75	5		0	30.000	30.000	0.53125	A53-B-42	0.962
21	54.75 - 49.75	5		0	30.000	30.000	0.53125	A53-B-42	0.962
22	49.75 - 49.25	0.5		0	30.000	30.000	0.53125	A53-B-42	0.962
23	49.25 - 49	0.25		0	30.000	30.000	0.65	A53-B-42	0.939
24	49 - 44	5		0	30.000	30.000	0.65	A53-B-42	0.939
25	44 - 43	1		0	30.000	30.000	0.65	A53-B-42	0.939
26	43 - 42.75	0.25		0	30.000	30.000	0.8125	A53-B-42	0.919
27	42.75 - 39	3.75		0	30.000	30.000	0.8125	A53-B-42	0.919
28	39 - 38.75	0.25		0	30.000	30.000	0.65	A53-B-42	0.939
29	38.75 - 33.75	5		0	30.000	30.000	0.65	A53-B-42	0.939
30	33.75 - 30	3.75	0	0	30.000	30.000	0.65	A53-B-42	0.939
31	30 - 29.75	0.25		0	36.000	36.000	0.55	A53-B-42	0.962
32	29.75 - 26	3.75		0	36.000	36.000	0.55	A53-B-42	0.962
33	26 - 25.75	0.25		0	36.000	36.000	0.65	A53-B-42	0.941
34	25.75 - 20.75	5		0	36.000	36.000	0.65	A53-B-42	0.941
35	20.75 - 20.5	0.25		0	36.000	36.000	0.7875	A53-B-42	0.930
36	20.5 - 18	2.5		0	36.000	36.000	0.7875	A53-B-42	0.930
37	18 - 17.75	0.25		0	36.000	36.000	0.6875	A53-B-42	0.945
38	17.75 - 13.46	4.29		0	36.000	36.000	0.6875	A53-B-42	0.945
39	13.46 - 13.21	0.25		0	36.000	36.000	0.7	A53-B-42	0.962
40	13.21 - 8.21	5		0	36.000	36.000	0.7	A53-B-42	0.962
41	8.21 - 6.08	2.13		0	36.000	36.000	0.7	A53-B-42	0.962
42	6.08 - 5.83	0.25		0	36.000	36.000	0.6875	A53-B-42	0.945
43	5.83 - 0.83	5		0	36.000	36.000	0.6875	A53-B-42	0.945
44	0.83 - 0	0.83		0	36.000	36.000	0.6875	A53-B-42	0.945

## TNX Section Forces

Increment (ft):		5	TNX Output		
	Section Height (ft)	P <sub>u</sub> (K)	M <sub>ux</sub> (kip-ft)	V <sub>u</sub> (K)	
1	120 - 115	3.1665	24.741	6.471	
2	115 - 110	3.577	57.954	6.8149	
3	110 - 105	3.9928	92.871	7.1526	
4	105 - 100	7.3322	136.73	11.918	
5	100 - 98.5	7.1483	155.01	12.252	
6	98.5 - 98.25	7.1885	158.08	12.278	
7	98.25 - 93.25	7.9051	220.5	12.699	
8	93.25 - 90	8.3783	262.2	12.969	
9	90 - 89.75	8.4187	265.44	12.992	
10	89.75 - 84.75	9.1624	331.32	13.367	
11	84.75 - 79.75	9.9242	399.05	13.729	
12	79.75 - 78.25	10.152	419.72	13.842	
13	78.25 - 78	10.208	423.18	13.86	
14	78 - 75.04	10.747	464.83	14.294	
15	75.04 - 74.79	10.81	468.4	14.333	
16	74.79 - 69.79	11.904	541.98	15.106	
17	69.79 - 64.79	13.016	619.37	15.856	
18	64.79 - 60	14.096	696.95	16.547	
19	60 - 59.75	15.408	701.18	16.946	
20	59.75 - 54.75	16.565	786.94	17.367	
21	54.75 - 49.75	17.736	874.76	17.771	
22	49.75 - 49.25	17.857	883.65	17.807	
23	49.25 - 49	17.927	888.1	17.827	
24	49 - 44	19.263	979.22	18.629	
25	44 - 43	19.533	997.93	18.79	
26	43 - 42.75	19.618	1002.6	18.828	
27	42.75 - 39	20.805	1074.4	19.438	
28	39 - 38.75	20.879	1079.2	19.471	
29	38.75 - 33.75	22.241	1178.4	20.224	
30	33.75 - 30	23.276	1255.2	20.747	
31	30 - 29.75	25.86	1260.6	21.638	
32	29.75 - 26	26.92	1342.3	21.917	
33	26 - 25.75	27.008	1347.7	21.927	
34	25.75 - 20.75	28.606	1458.3	22.306	
35	20.75 - 20.5	28.704	1463.9	22.338	
36	20.5 - 18	29.628	1520.2	22.73	
37	18 - 17.75	29.719	1525.9	22.759	
38	17.75 - 13.46	31.165	1624.8	23.366	
39	13.46 - 13.21	31.3	1630.6	23.4	
40	13.21 - 8.21	33.0	1749.3	24.1	
41	8.21 - 6.08	33.8	1800.9	24.4	
42	6.08 - 5.83	33.9	1807.0	24.4	
43	5.83 - 0.83	35.6	1930.5	25.0	
44	0.83 - 0	35.9	1951.3	25.1	

# Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
120 - 115	Pole	TP24x24x0.25	Pole	6.8%	Pass
115 - 110	Pole	TP24x24x0.25	Pole	15.2%	Pass
110 - 105	Pole	TP24x24x0.25	Pole	24.1%	Pass
105 - 100	Pole	TP24x24x0.25	Pole	35.7%	Pass
100 - 98.5	Pole	TP24x24x0.25	Pole	40.3%	Pass
98.5 - 98.25	Pole + Reinf.	TP24x24x0.3875	Reinf. 12 Tension Rupture	29.0%	Pass
98.25 - 93.25	Pole + Reinf.	TP24x24x0.3875	Reinf. 12 Tension Rupture	40.3%	Pass
93.25 - 90	Pole + Reinf.	TP24x24x0.3875	Reinf. 12 Tension Rupture	47.8%	Pass
90 - 89.75	Pole	TP24x24x0.375	Pole	43.4%	Pass
89.75 - 84.75	Pole	TP24x24x0.375	Pole	54.1%	Pass
84.75 - 79.75	Pole	TP24x24x0.375	Pole	65.0%	Pass
79.75 - 78.25	Pole	TP24x24x0.375	Pole	68.3%	Pass
78.25 - 78	Pole + Reinf.	TP24x24x0.5188	Reinf. 11 Tension Rupture	58.5%	Pass
78 - 75.04	Pole + Reinf.	TP24x24x0.5188	Reinf. 11 Tension Rupture	64.2%	Pass
75.04 - 74.79	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	51.2%	Pass
74.79 - 69.79	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	59.2%	Pass
69.79 - 64.79	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	67.6%	Pass
64.79 - 60	Pole + Reinf.	TP24x24x0.675	Reinf. 11 Tension Rupture	76.0%	Pass
60 - 59.75	Pole + Reinf.	TP30x30x0.5313	Pole	53.8%	Pass
59.75 - 54.75	Pole + Reinf.	TP30x30x0.5313	Pole	60.3%	Pass
54.75 - 49.75	Pole + Reinf.	TP30x30x0.5313	Pole	67.0%	Pass
49.75 - 49.25	Pole + Reinf.	TP30x30x0.5313	Pole	67.7%	Pass
49.25 - 49	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	62.7%	Pass
49 - 44	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	69.1%	Pass
44 - 43	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	70.4%	Pass
43 - 42.75	Pole + Reinf.	TP30x30x0.8125	Reinf. 2 Tension Rupture	67.1%	Pass
42.75 - 39	Pole + Reinf.	TP30x30x0.8125	Reinf. 2 Tension Rupture	71.9%	Pass
39 - 38.75	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	76.1%	Pass
38.75 - 33.75	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	83.1%	Pass
33.75 - 30	Pole + Reinf.	TP30x30x0.65	Reinf. 10 Tension Rupture	88.5%	Pass
30 - 29.75	Pole + Reinf.	TP36x36x0.55	Pole	66.0%	Pass
29.75 - 26	Pole + Reinf.	TP36x36x0.55	Pole	70.2%	Pass
26 - 25.75	Pole + Reinf.	TP36x36x0.65	Reinf. 9 Tension Rupture	65.4%	Pass
25.75 - 20.75	Pole + Reinf.	TP36x36x0.65	Reinf. 9 Tension Rupture	70.7%	Pass
20.75 - 20.5	Pole + Reinf.	TP36x36x0.7875	Reinf. 1 Tension Rupture	65.6%	Pass
20.5 - 18	Pole + Reinf.	TP36x36x0.7875	Reinf. 1 Tension Rupture	68.1%	Pass
18 - 17.75	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	77.1%	Pass
17.75 - 13.46	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	82.0%	Pass
13.46 - 13.21	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	82.9%	Pass
13.21 - 8.21	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	88.9%	Pass
8.21 - 6.08	Pole + Reinf.	TP36x36x0.7	Reinf. 1 Tension Rupture	91.5%	Pass
6.08 - 5.83	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	91.2%	Pass
5.83 - 0.83	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	97.4%	Pass
0.83 - 0	Pole + Reinf.	TP36x36x0.6875	Reinf. 1 Tension Rupture	98.5%	Pass
				Summary	
			Pole	82.5%	Pass
			Reinforcement	98.5%	Pass
			Overall	98.5%	Pass

# Additional Calculations

Section Elevation (ft)	Moment of Inertia (in <sup>4</sup> )			Area (in <sup>2</sup> )			% Capacity												
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
120 - 115	1315	n/a	1315	18.65	n/a	18.65	6.8%												
115 - 110	1315	n/a	1315	18.65	n/a	18.65	15.2%												
110 - 105	1315	n/a	1315	18.65	n/a	18.65	24.1%												
105 - 100	1315	n/a	1315	18.65	n/a	18.65	35.7%												
100 - 98.5	1315	n/a	1315	18.65	n/a	18.65	40.3%												
98.5 - 98.25	1315	695	2011	18.65	9.00	27.65	26.8%												29.0%
98.25 - 93.25	1315	695	2011	18.65	9.00	27.65	37.2%												40.3%
93.25 - 90	1315	695	2011	18.65	9.00	27.65	44.1%												47.8%
90 - 89.75	1942	n/a	1942	27.83	n/a	27.83	43.4%												
89.75 - 84.75	1942	n/a	1942	27.83	n/a	27.83	54.1%												
84.75 - 79.75	1942	n/a	1942	27.83	n/a	27.83	65.0%												
79.75 - 78.25	1942	n/a	1942	27.83	n/a	27.83	68.3%												
78.25 - 78	1942	695	2638	27.83	9.00	36.83	50.7%												58.5%
78 - 75.04	1942	695	2638	27.83	9.00	36.83	55.7%												64.2%
75.04 - 74.79	1942	1392	3335	27.83	17.76	45.59	44.3%					43.6%							51.2%
74.79 - 69.79	1942	1392	3335	27.83	17.76	45.59	51.3%					50.4%							59.2%
69.79 - 64.79	1942	1392	3335	27.83	17.76	45.59	58.5%					57.6%							67.6%
64.79 - 60	1942	1392	3335	27.83	17.76	45.59	65.9%					64.7%							76.0%
60 - 59.75	3829	1516	5346	34.90	12.39	47.29	53.8%				50.3%								
59.75 - 54.75	3829	1516	5346	34.90	12.39	47.29	60.3%				56.4%								
54.75 - 49.75	3829	1516	5346	34.90	12.39	47.29	67.0%				62.6%								
49.75 - 49.25	3829	1516	5346	34.90	12.39	47.29	67.7%				63.2%								
49.25 - 49	3829	2586	6416	34.90	21.39	56.29	56.7%				53.0%							62.7%	
49 - 44	3829	2586	6416	34.90	21.39	56.29	62.5%				58.4%							69.1%	
44 - 43	3829	2586	6416	34.90	21.39	56.29	63.7%				59.5%							70.4%	
43 - 42.75	3829	4080	7910	34.90	33.58	68.48	51.9%	67.1%		48.5%								57.4%	
42.75 - 39	3829	4080	7910	34.90	33.58	68.48	55.6%	71.9%		51.9%								61.5%	
39 - 38.75	3829	2586	6416	34.90	21.39	56.29	68.9%			64.3%								76.1%	
38.75 - 33.75	3829	2586	6416	34.90	21.39	56.29	75.2%			70.2%								83.1%	
33.75 - 30	3829	2586	6416	34.90	21.39	56.29	80.1%			74.8%								88.5%	
30 - 29.75	6659	3003	9662	41.97	16.95	58.92	66.0%			58.2%				58.2%					
29.75 - 26	6659	3003	9662	41.97	16.95	58.92	70.2%			62.0%				62.0%					
26 - 25.75	6659	4529	11188	41.97	25.95	67.92	60.9%			53.7%				53.7%		65.4%			
25.75 - 20.75	6659	4529	11188	41.97	25.95	67.92	65.9%			58.1%				58.1%		70.7%			
20.75 - 20.5	6659	6813	13472	41.97	39.08	81.04	54.9%	65.6%		48.5%				48.5%		58.9%			
20.5 - 18	6659	6813	13472	41.97	39.08	81.04	57.0%	68.1%		50.3%				50.3%		61.2%			
18 - 17.75	6659	5287	11946	41.97	30.08	72.04	64.5%	77.1%		57.0%				57.0%					
17.75 - 13.46	6659	5287	11946	41.97	30.08	72.04	68.7%	82.0%		60.6%				60.6%					
13.46 - 13.21	6664	5428	12093	41.97	32.69	74.65	69.4%	82.9%		58.7%					59.9%				
13.21 - 8.21	6664	5428	12093	41.97	32.69	74.65	74.5%	88.9%		62.9%					64.3%				
8.21 - 6.08	6664	5428	12093	41.97	32.69	74.65	76.6%	91.5%		64.8%					66.1%				
6.08 - 5.83	6659	5287	11946	41.97	30.08	72.04	76.4%	91.2%		67.4%				67.4%					
5.83 - 0.83	6659	5287	11946	41.97	30.08	72.04	81.6%	97.4%		72.0%				72.0%					
0.83 - 0	6659	5287	11946	41.97	30.08	72.04	82.5%	98.5%		72.8%				72.8%					

Note: Section capacity checked in 5 degree increments.

## Bolted Bridge Stiffener Analysis

### Project & Site Details

Project No.	17QGO1400
Project Name	Milford Jai-Alai
Site ID	876309
Date	June 21, 2017
Code	ANSI/TIA-222-G
Maximum Stress Ratio	100%

### Tower Data

Pole Properties									Flange Properties						
Section	Bottom Elevation (ft)	Top Elevation (ft)	Section Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Pole Material	Flange Diameter (in)	Upper Thickness (in)	Lower Thickness (in)	Bolt Quantity	Bolt Diameter (in)	Bolt Circle Diameter (in)	Angle to First Bolt (°)
1	90	120	30	Round	24	24	0.25	A53-B-42	32	1.5	1.5	20	1	29	0
2															
3															
4															

### Reactions

Reactions from TNX				Adjusted Moment	
Elevation	Moment (k-ft)	Axial (kips)	Shear (kips)	Max. Flange Bolt Tension (kips)	Adjusted Moment (k-ft)
90	262.2	8.4	13.0	12.09	151.1
0				N/A	N/A
0				N/A	N/A
0				N/A	N/A

### Bridge Stiffener Orientation Input

Group Number	Elevation	Assembly Name	Quantity	Individual Bridge Stiffener Azimuth (°)								Axis Angle of Max (°)	Max. Axial Force (kips)	Controlling	Maximum Stress Ratio	Pass/Fail	
1	90	BS-1	3	40	160	280							70	53.9	Tension Rupture	43.6%	Pass
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

**Overall**    **43.6%**    **Pass**

### Bridge Stiffener Assembly Input

Assembly Name	Bridge Stiffener			Upper Members			Lower Members			
				Shaft Reinforcement	Filler Plate		Same as Upper Members?	Shaft Reinforcement	Filler Plate	
	Member	K Factor	Lu (in)	Member	Member	Gap (in)		Member	Member	Gap (in)
BS-1	BS 4x0.75	0.8	12	RF 4x0.75	FP 5x3.25	0	No	None	FP 5x3.25	0



## Summary of ANSI/TIA-222-G Bridge Stiffener Analysis

### Assembly Information

Group	1
Elevation	90
Assembly No.	BS-1

### Maximum Forces and Stresses

Maximum Axial Force (kip)	53.9
Maximum Shear per Bolt (Upper Connection) (kips)	6.7
Maximum Tension per Bolt (Upper Connection) (kips)	5.0
Maximum Bearing Stress (Upper Connection) (ksi)	3.2
Maximum Shear per Bolt (Lower Connection) (kips)	6.7
Maximum Tension per Bolt (Lower Connection) (kips)	4.1
Maximum Bearing Stress (Lower Connection) (kips)	2.6

### Maximum Stress Ratios

Compression	37.1%
Tension Yielding	30.7%
Tension Rupture	43.6%
Upper Plate Bearing	8.4%
Upper Bolt Shear	18.2%
Upper Bolt Shear and Tension	5.6%
Upper Bolt Bearing	21.3%
Lower Plate Bearing	Not Checked
Lower Bolt Shear	18.2%
Lower Bolt Shear and Tension	4.9%
Lower Bolt Bearing	Not Checked

<b>Controlling</b>	<b>43.6%</b>
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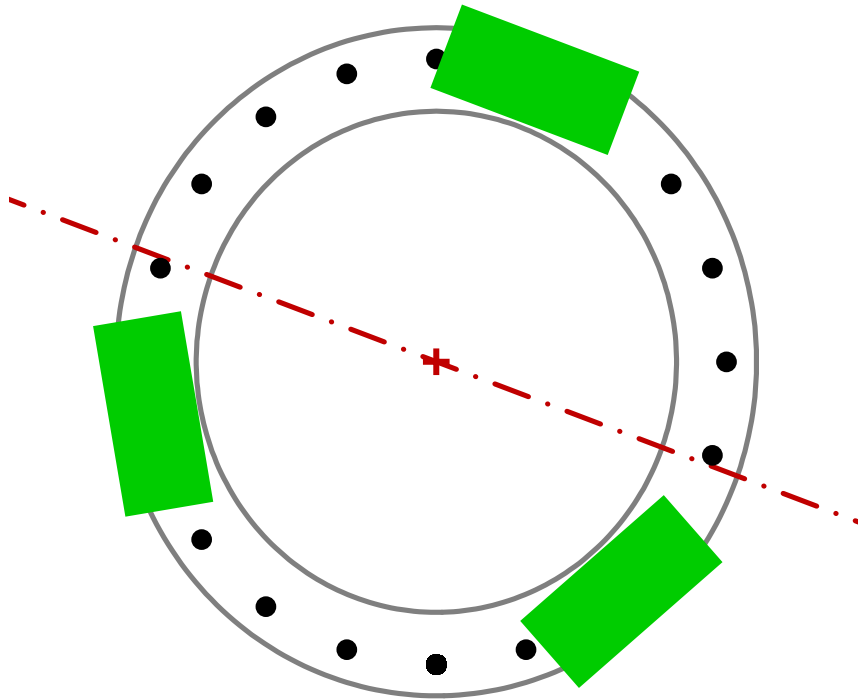
### Output Legend

Not Checked	Check requires additional user input
Not Needed	Check is not required
Passing	Check passes
Failing	Check fails

### Moments of Inertia

Elevation	Moment of Inertia (in <sup>4</sup> )		Axis Angle (°)	
	Max.	Min.	Max.	Min.
90	2865.1	2865.1	131	61





Assemblies:

- BS-1

Elevation: 90 ft

# Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

### Site Data

BU#: 876309  
 Site Name: Milford Jai-Alai  
 App #: 393387

Pole Manufacturer: **Rohn**

### Bolt Data

Qty:	20		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	29		

### Plate Data

Diam:	32	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

### Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

### Pole Data

Diam:	24	in
Thick:	0.3875	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None

### Reactions

Mu	151.10	ft-kips
Axial, Pu:	8.38	kips
Shear, Vu:	12.97	kips
Elevation:	90	feet

### Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
38.88

If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

### Flange Bolt Results

Bolt Tension Capacity, $\phi \cdot T_n, B1$ :	54.54 kips
Adjusted $\phi \cdot T_n$ (due to $V_u = V_u / Q_t$ ), <b>B</b> :	54.53 kips
Max Bolt <u>directly</u> applied $T_u$ :	12.09 Kips
Min. PL "tc" for <b>B</b> cap. <b>w/o Pry</b> :	1.488 in
Min PL "treq" for actual <b>T w/ Pry</b> :	0.534 in
Min PL "t1" for actual <b>T w/o Pry</b> :	0.701 in
T allowable w/o Prying:	54.54 kips
Prying Force, q:	0.00 kips
Total Bolt Tension= $T_u + q$ :	12.09 kips
Non-Prying Bolt Stress Ratio, $T_u / B$ :	22.2% <b>Pass</b>

Rigid
$\phi \cdot T_n$
$\phi T_n [1 - (V_u / \phi V_n)^2]^{0.5}$

$\alpha' < 0$  case

### Exterior Flange Plate Results

Flexural Check	Rohn/Piroc OK
Compression Side Plate Stress:	Rohn/Piroc OK
Allowable Plate Stress:	32.4 ksi
Compression Plate Stress Ratio:	Rohn/Piroc OK
<b>No Prying</b>	
Tension Side Stress Ratio, $(t_{req}/t)^2$ :	Rohn/Pirod OK

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length:
16.28

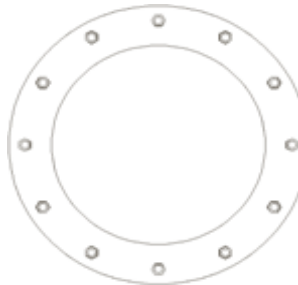
**n/a**

### Stiffener Results

N/A for Rohn / Pirod	
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$ :	N/A
Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$ :	N/A
Plate Comp. (AISC Bracket):	N/A

### Pole Results

Pole Punching Shear Check: N/A



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

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

## Flange Bypass for Step Monopole with Internal Flange Plates

### Code Specifications:

Code (F or G)	G
$\Phi$ or $\Omega$	0.9
Maximum Stress Ratio	1.05

### Project Details:

Site Name:	Milford Jai-Alai
Job No. :	17QGOI1400
Elevation:	60

### Bypass Plate Info.

Qty. Bypass Plates	3
$\phi$ Upper Pole (in)	24
$\phi$ Lower Pole (in)	30
Height - Total (in)	96
Bypass Plate Thk. (in)	1.25
Width - Min. (in)	7
$\phi$ Flange Plates (in)	41
Upper Flange Plate Thk. (in)	2
Lower Flange Plate Thk. (in)	2
Stiffener Height (in)	0
Unbraced Length (in)	8
Vertical Clearance (in)	0
Horizontal Clearance (in)	0.5
Upper Notch (in)	9
Lower Notch (in)	6
Upper Plate Width (in)	16
Lower Plate Width (in)	13
$F_y$ - Bypass Plates (ksi)	65
$F_u$ - Bypass Plates (ksi)	80
$A_g$ (in <sup>2</sup> )	8.75
$\phi$ of stiffeners (in)	49
$\bar{y}$ (in)	24.5
$I_{stiffeners}$ (in <sup>4</sup> )	7878.28125

### Reactions From tnx:

Moment (k-ft)	696.95
Axial (k)	14.096
Shear (k)	16.547

### Upper Eccentric Weld

Weld Thk.	6
Upper $L_{weld}$ (in)	44
$e_x$ (in)	12.50
a	0.28
C	3.16
Electrode	80
Electrode Strength, C1	1.03

### Lower Eccentric Weld

Weld Thk.	6
Lower $L_{weld}$ (in)	44
$e_x$ (in)	9.50
a	0.22
C	3.45
Electrode	80
Electrode Strength, C1	1.03

### Check Tension

$T_u$ (k)	222.88
$\phi T_n$ (k)	511.88
%capacity	43.54%

### Check Stress

$s_u$ (ksi)	29.19
$\phi s_n$ (ksi)	58.50
%capacity	49.89%

### Check Compression - Buckling

K	0.8
$I_{min}$ (in <sup>4</sup> )	1.139
r (in)	0.361
KL/r	17.74
$F_e$ (ksi)	909.86
$F_{cr}$ (ksi)	63.09
$P_u$ (k)	232.27
$\phi P_n$ (k)	496.80
%capacity	46.75%

### Check Compression - Lower Portion

$P_u$ (k)	232.27
$\phi P_n$ (k)	432.23
%capacity	53.74%

### Check Upper Eccentric Weld

$P_u$ (k)	232.27
$\phi R_n$ (k)	644.45
%capacity	36.04%

### Check Compression - Upper Portion

$P_u$ (k)	232.27
$\phi P_n$ (k)	545.45
%capacity	42.58%

### Check Lower Eccentric Weld

$P_u$ (k)	232.27
$\phi R_n$ (k)	702.8514
% capacity	33.05%

### Flange Bypass for Step Monopole with Internal Flange Plates

#### Code Specifications:

Code (F or G)	G
$\Phi$ or $\Omega$	0.9
Maximum Stress Ratio	1.05

#### Project Details:

Site Name:	Milford Jai-Alai
Job No. :	17QGOI1400
Elevation:	30

#### Bypass Plate Info.

Qty. Bypass Plates	3
$\phi$ Upper Pole (in)	30
$\phi$ Lower Pole (in)	36
Height - Total (in)	96
Bypass Plate Thk. (in)	1.25
Width - Min. (in)	7
$\phi$ Flange Plates (in)	47
Upper Flange Plate Thk. (in)	2
Lower Flange Plate Thk. (in)	2
Stiffener Height (in)	0
Unbraced Length (in)	8
Vertical Clearance (in)	0
Horizontal Clearance (in)	0.5
Upper Notch (in)	9
Lower Notch (in)	6
Upper Plate Width (in)	16
Lower Plate Width (in)	13
$F_y$ - Bypass Plates (ksi)	65
$F_u$ - Bypass Plates (ksi)	80
$A_g$ (in <sup>2</sup> )	8.75
$\phi$ of stiffeners (in)	55
$\bar{y}$ (in)	27.5
$I_{stiffeners}$ (in <sup>4</sup> )	9925.78125

#### Reactions From tnx:

Moment (k-ft)	1255.2
Axial (k)	23.276
Shear (k)	20.747

#### Upper Eccentric Weld

Weld Thk.	6
Upper $L_{weld}$ (in)	44
$e_x$ (in)	12.50
a	0.28
C	3.16
Electrode	80
Electrode Strength, C1	1.03

#### Lower Eccentric Weld

Weld Thk.	6
Lower $L_{weld}$ (in)	44
$e_x$ (in)	9.50
a	0.22
C	3.45
Electrode	80
Electrode Strength, C1	1.03

#### Check Tension

$T_u$ (k)	357.39
$\phi T_n$ (k)	511.88
%capacity	69.82%

#### Check Stress

$s_u$ (ksi)	46.16
$\phi s_n$ (ksi)	58.50
%capacity	78.90%

#### Check Compression - Buckling

K	0.8
$I_{min}$ (in <sup>4</sup> )	1.139
r (in)	0.361
KL/r	17.74
$F_e$ (ksi)	909.86
$F_{cr}$ (ksi)	63.09
$P_u$ (k)	372.91
$\phi P_n$ (k)	496.80
%capacity	75.06%

#### Check Compression - Lower Portion

$P_u$ (k)	372.91
$\phi P_n$ (k)	432.23
%capacity	86.27%

#### Check Upper Eccentric Weld

$P_u$ (k)	372.91
$\phi R_n$ (k)	644.45
%capacity	57.86%

#### Check Compression - Upper Portion

$P_u$ (k)	372.91
$\phi P_n$ (k)	545.45
%capacity	68.37%

#### Check Lower Eccentric Weld

$P_u$ (k)	372.91
$\phi R_n$ (k)	702.8514
% capacity	53.06%

## Monopole Anchor Rod Modifications

Project & Site Details	
Project No.	17QGOI1400
Project Name	Milford Jai-Alai
Site ID	876309
Date	June 21, 2017
Code	ANSI/TIA-222-G
Maximum Stress Ratio	100%

Tower Reactions		
Moment	1951.3	k-ft
Axial	35.9	k
Shear	25.1	k

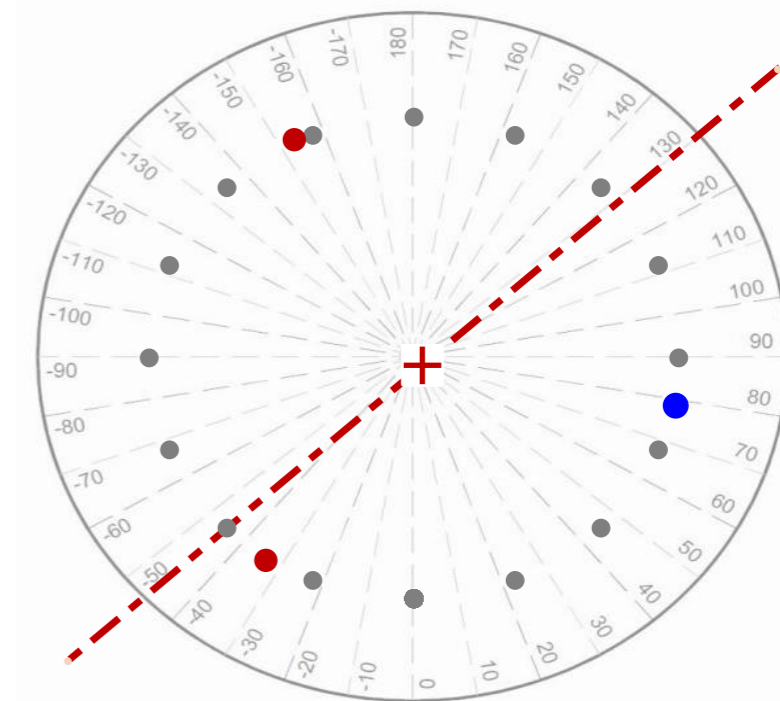
Optional Inputs	
Axis Angle to 0° (°)	132.5
Additional Inertia (in <sup>4</sup> )	0

Centroid		
x	0.9250	in
y	-0.8699	in

Existing Anchor Rod Input		
Anchor Rods	Y	(Y/N)
Base Plate Type	Round	
Quantity	16	Rods
Grade	A354 Gr. BC	
Thread Form	Non-Upset	
Diameter	1.5	in
Bolt Circle	47	in
Angle to 0° of First Rod	0	degrees
Spacing		
Detail Type	d	
I <sub>ar</sub>	5.5	in
η	0.5	

Moment of Inertia		
	I (in <sup>4</sup> )	Angle (°)
Min.	22185.6	130
Max.	25338.4	40
Current	<b>22190.7</b>	<b>132.5</b>

Post-Installed Anchor Rods		
Quantity	6	Rods
Any Symmetric Rods?	y	(Y/N)



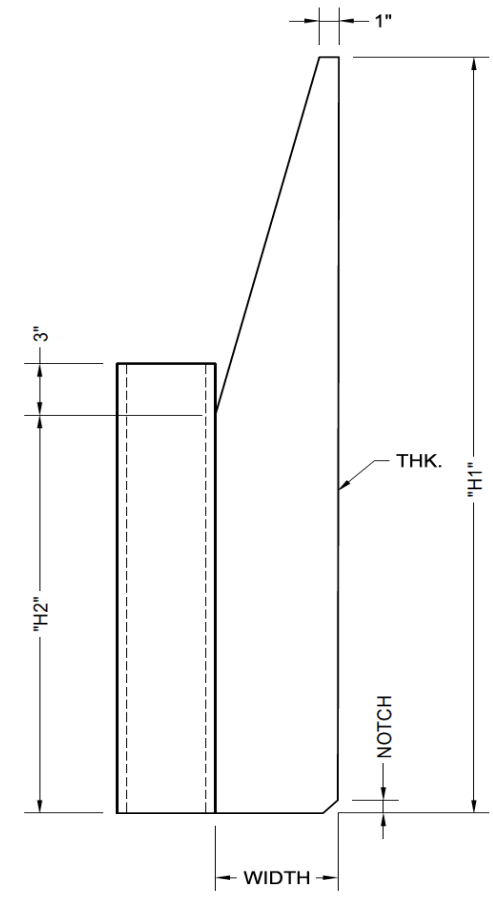
Individual Post-Installed Anchor Rod Input							
Name	Angle	Axis Angle of Max (°)	Axial Force (kips)	Allow. Axial (kips)	Controlling	Percentage	Pass/Fail
AR1	-153.5	120.5	63.0	228.0	Anchor Rod Tension	27.6%	Pass
AR1	-33.5	57.5	52.8	228.0	Anchor Rod Tension	23.2%	Pass
AR2	78.5	163.0	71.6	250.0	Anchor Rod Tension	28.6%	Pass
AR3	43	132.5	196.1	390.0	Anchor Rod Tension	50.3%	Pass
AR3	156	74.5	183.9	390.0	Anchor Rod Tension	47.1%	Pass
AR3	-70	12.5	182.4	390.0	Anchor Rod Tension	46.8%	Pass
Existing Rods		134.0	51.5	141.0	Shear-Tension Interaction	36.6%	Pass

**Overall** 50.3% Pass

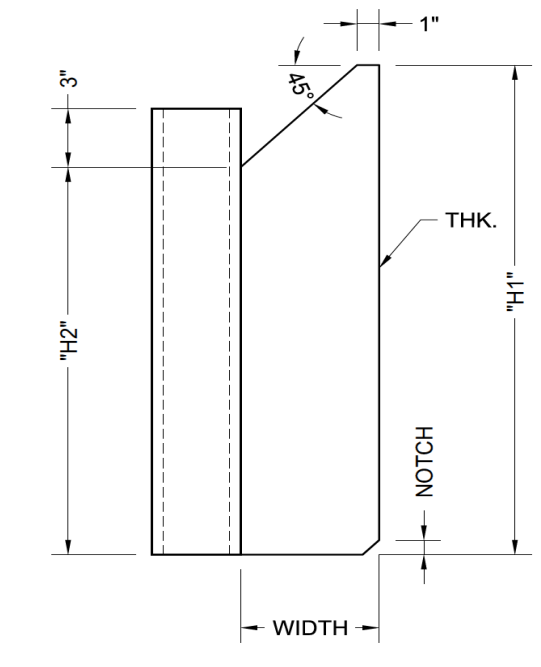
Post-Installed Anchor Rod Summary									
Post-Installed Anchor Rods					Anchor Rod Sleeve		Transfer Plate		
Assembly Name	Diameter (in)	Grade	Bolt Circle (in)	Target Tension (kips)	Required Embedment (ft)	Member	Grade	Dimensions (H" x W" x T")	Grade
AR1	1.75	Dywidag	47.5			P4x.674 (4.5 OD)	A53-B-35	42 x 3 1/2 x 1 1/4	A572-65
AR2	2	A193 B7	47.5			P4x.674 (4.5 OD)	A500-46	42 x 3 1/2 x 1 1/4	A572-65
AR3	2.25	Williams R71	96			P8x.875 (8.625 OD)	A53-B-42	96 x 24 3/4 x 1 1/4	A572-65

Anchor Rod Colors	
Apply New Rod Colors	
AR1	
AR2	
AR3	

Anchor Rod Assembly Database																							
Anchor Rod								Anchor Rod Sleeve					Transfer Plate										
Assembly Name	Grade	Thread Form	Diameter (in)	Bolt Circle (in)	Unbraced Length (in)	Installed Through Base Plate? (Y/N)	Breaker Bond Tape Length (in)	Sleeve Member Type	Sleeve Member	Sleeve Grade	Analysis/Design	AISC Sleeve Comp. Equation (13th Ed.)	Detail	Width (in)	Thickness (in)	Overall Height "H1" (in)	Term Height "H2" (in)	Notch (in)	Plate Grade	Weld Electrode (ksi)	Vert. Weld to Pole Size (in)	Vert. Weld to Sleeve Size (in)	
AR1	Dywidag	Non-Upset	1.75	47.5	0	N	0	Pipe	P4x.674 (4.5 OD)	A53-B-35	Analysis	J4-6	1	3.5	1.25	42	10.5	0.75	A572-65	80	5/8	5/8	
AR2	A193 B7	Non-Upset	2	47.5	0	N	0	Pipe	P4x.674 (4.5 OD)	A500-46	Analysis	J4-6	1	3.5	1.25	42	10.5	0.75	A572-65	80	5/8	5/8	
AR3	Williams R71	Non-Upset	2.25	96	0	N	0	Pipe	P8x.875 (8.625 OD)	A53-B-42	Analysis	J4-6	1	24.75	1.25	96	34.75	1	A572-65	80	3/8	5/8	



**Detail 1**



**Detail 2**

### Base Transfer Stiffener

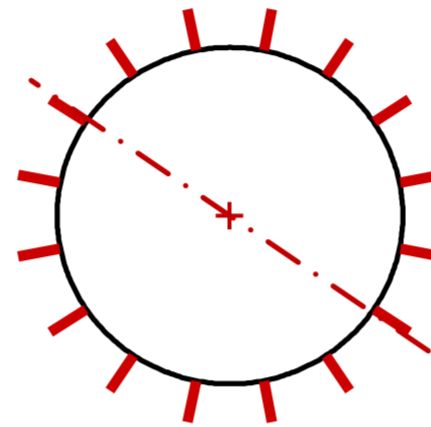
Project & Site Details	
Project No.	17QGOI1400
Project Name	Milford Jai-Alai
Site ID	876309
Date	June 21, 2017
Code	ANSI/TIA-222-G
Maximum Stress Ratio	100%

Tower Reactions		
Moment	1951.3	k-ft
Axial	35.9	kips
Shear	25.1	kips

Optional Inputs	
Axis Angle to 0° (°)	55
Additional Inertia (in <sup>4</sup> )	

Centroid		
x	0.0000	in
y	0.0000	in

Pole Properties		
Pole Diameter	36	in
Pole Thickness	0.375	in
Pole Grade	A53-B-42	
Number of Sides	Round	Sided



Moment of Inertia		
	I (in <sup>4</sup> )	Angle (°)
Min.	23691.6	2
Max.	23691.6	138
Current	23691.6	55

Stiffener Properties		
Stiffener Quantity	16	Stiffeners
Any Symmetric Plates?	N	(Y/N)

Individual Stiffener Input					
Stiffener Name	Angle to 0° (°)	Axis Angle of Max (°)	Controlling Case	Percentage	Pass/Fail
1. PL 5.5x1	11.25	100	Stress	52.3%	Pass
1. PL 5.5x1	33.75	125	Stress	52.3%	Pass
1. PL 5.5x1	56.25	145	Stress	52.3%	Pass
1. PL 5.5x1	78.75	170	Stress	52.3%	Pass
1. PL 5.5x1	101.25	10	Stress	52.3%	Pass
1. PL 5.5x1	123.75	35	Stress	52.3%	Pass
1. PL 5.5x1	146.25	55	Stress	52.3%	Pass
1. PL 5.5x1	168.75	80	Stress	52.3%	Pass
1. PL 5.5x1	191.25	100	Stress	52.3%	Pass
1. PL 5.5x1	213.75	125	Stress	52.3%	Pass
1. PL 5.5x1	236.25	145	Stress	52.3%	Pass
1. PL 5.5x1	258.75	170	Stress	52.3%	Pass
1. PL 5.5x1	281.25	10	Stress	52.3%	Pass
1. PL 5.5x1	303.75	35	Stress	52.3%	Pass
1. PL 5.5x1	326.25	55	Stress	52.3%	Pass
1. PL 5.5x1	348.75	80	Stress	52.3%	Pass
Pole		2	Stress	41.9%	Pass

<b>Overall</b>	<b>52.3%</b>	<b>Pass</b>
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Stiffener Input													
Stiffener Name	Width (in)	Thickness (in)	Considering Plate Capacity (Y/N)	Height (in)	Notch (in)	Offset from Pole (in)	Grade	Weld Electrode (ksi)	Vertical Weld Size (in)	Horizontal Weld Type	Groove Angle (°)	Horizontal Groove Size (in)	Horizontal Fillet Size (in)
1. PL 5.5x1	5.5	1	Y	18	0.75	0	A572-50	80	1/2	CJP			

# Stiffened or Unstiffened, UngROUTED, Circular Base Plate - Any Rod Material

**TIA Rev G**

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

Site Data	
BU#:	876309
Site Name:	Milford Jai-Alai
App #:	393387
Pole Manufacturer:	Rohn

Reactions		
Mu:	727.12917	ft-kips
Axial, Pu:	35.9	kips
Shear, Vu:	25.1	kips
Eta Factor,	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	47	in

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

**Anchor Rod Results**  
 Max Rod (Cu+ Vu/ ): 51.8 Kips  
 Allowable Axial, \*Fu\*Anet: 141.0 Kips  
 Anchor Rod Stress Ratio: 36.7% **Pass**

Stiffened
AISC LRFD
*Tn

Plate Data		
Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	in

**Base Plate Results**  
 Base Plate Stress: Rohn/Pirod, OK  
 Allowable Plate Stress: 32.4 ksi  
 Base Plate Stress Ratio: Rohn/Pirod, OK

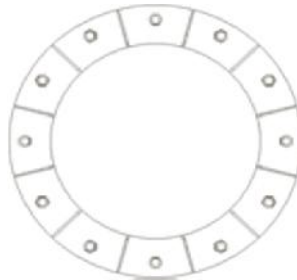
Stiffened
AISC LRFD
*Fy
Y.L. Length: N/A, Roark

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Groove	
Groove Depth:	0.4375	in **
Groove Angle:	45	degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:	0.25	in
Width:	5.5	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

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

**Pole Results**  
 Pole Punching Shear Check: N/A

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None



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

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



## Monopole Mat Foundation

Project Data		
Project Number:	<i>Project</i>	17QGOI1400
Site Name:	<i>SiteName</i>	Milford Jai-Alai
Site Number:	<i>SiteNumber</i>	876309

Legend	
Label/Units	Calc'd
Empty Input	Pass
Filled Input	Fail

Tower Reactions			
Moment:	<i>TwrM</i>	1951.3	ft-kip
Shear:	<i>TwrV</i>	25.1	kip
Axial:	<i>TwrP</i>	35.9	kip

Material Specifications			
Concrete Strength:	<i>fc</i>	3000	psi
Concrete Weight:	<i>ConcUnitWt</i>	150	pcf
Reinf. Yield Strength:	<i>Fy</i>	60	ksi

Soil & Steel Checks		
Lateral:	<i>LatRatio</i>	18.2%
Overturning:	<i>OTRatio</i>	67.0%
Bearing:	<i>Qratio</i>	18.8%
One-Way Shear:	<i>V1Ratio</i>	5.6%
Two-Way Shear:	<i>V2Ratio</i>	0.7%
Flexure:	<i>FlexRatio</i>	21.5%
Min. Reinforcement:	<i>MinPadCheck</i>	NO GOOD
Reinf. Development:	<i>DevPadCheck</i>	OK

Code & Design Parameters			
Standard:	<i>Standard</i>	TIA-222-G	-
Maximum Soil Stress Ratio:	<i>MaxSoilRatio</i>	100.00%	-
Maximum Steel Stress Ratio:	<i>MaxSteelRatio</i>	100.00%	-

Design Dimensions			
Anchor Rod Bolt Circle:	<i>ARBoltCircle</i>	47	in
Eccentric Loading:	<i>EccLoading</i>	FALSE	-
Bearing Depth:	<i>D</i>	5.5	ft
Mat Width:	<i>W</i>	16	ft
Mat Length:	<i>L</i>	21	ft
Mat Thickness:	<i>T</i>	7	ft

Controlling Percentages	
Controlling Soil - Overturning:	67.0%
Controlling Steel - Flexure:	21.5%

Site Details			
Frost Depth:	<i>Frost</i>	3.33	ft
Water Depth:	<i>Water</i>	100	ft
Seismic Design Category:	<i>SDC</i>	B	-

Soil Parameters			
Bearing Pressure Capacity:	<i>Bc</i>	30000	psf
Ultimate or Allowable:	<i>BcUltAll</i>	Ultimate	-
Bearing Pressure Type:	<i>BcType</i>	Net	-
Unit Weight:	<i>gamma</i>	140	pcf
Angle of Internal Friction:	<i>phi</i>	40	deg
Cohesion:	<i>cohesion</i>	0	psf
Sliding Friction Coefficient:	<i>mu</i>	0.4	-
Passive Pressure Coefficient:	<i>K_p</i>	0.00	-
Passive Pressure Coeff. Override	<i>KpOver</i>	0	-

Reinforcement			
Utilize Minimum Steel?:	<i>MinSteelCheck</i>	No	-
Clear Cover:	<i>cc</i>	3	in
Reinforcement Size:	<i>PadSize</i>	8	-
Reinforcement Qty (Along L):	<i>PadQtyL</i>	21	-
Reinforcement Qty (Along W):	<i>PadQtyW</i>	17	-

**Analysis Notes:**

1. Buoyant unit weights must be entered directly in the "ConcUnitWt" and "gamma" cells.
2. Checks both mat directions for worst case steel and soil capacities.
3. Utilizes elastic analysis methods with either trapezoidal or triangular distribution, a Kern limit of L/6, and a stability limit of L/2.
4. The assumed minimum steel used is based off the parameters from temperature & shrinkage (0.0018).



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

SPRINT Existing Facility

Site ID: CT03XC004

(R2E) CT2961 to CT03XC004

Milford Jai-Alai

311 Old Gate Lane

Milford, CT 06460

**July 29, 2017**

**EBC Project Number: 6217003228**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>8.73 %</b>



July 29, 2017

SPRINT

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

Emissions Analysis for Site: **CT03XC004 – (R2E) CT2961 to CT03XC004 Milford Jai-Alai**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **311 Old Gate Lane, Milford, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

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



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

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **311 Old Gate Lane, Milford, 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 APXVSP18-C-A20** and **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 **121 feet** above ground level (AGL) for **Sector A**, **121 feet** above ground level (AGL) for **Sector B** and **121 feet** above ground level (AGL) for Sector C.
- 10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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



## SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	<b>1</b>	Antenna #:	<b>1</b>	Antenna #:	<b>1</b>
Make / Model:	RFS APXVSPPI8-C-A20	Make / Model:	RFS APXVSPPI8-C-A20	Make / Model:	RFS APXVSPPI8-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	<b>121 feet</b>	Height (AGL):	<b>121 feet</b>	Height (AGL):	<b>121 feet</b>
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	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%	<b>2.32 %</b>	Antenna B1 MPE%	<b>2.32 %</b>	Antenna C1 MPE%	<b>2.32 %</b>
Antenna #:	<b>2</b>	Antenna #:	<b>2</b>	Antenna #:	<b>2</b>
Make / Model:	RFS APXVVM14-C-I20	Make / Model:	RFS APXVVM14-C-I20	Make / Model:	RFS APXVVM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	<b>121 feet</b>	Height (AGL):	<b>121 feet</b>	Height (AGL):	<b>121 feet</b>
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	<b>1.69 %</b>	Antenna B2 MPE%	<b>1.69 %</b>	Antenna C2 MPE%	<b>1.69 %</b>

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	<b>4.01 %</b>
Clearwire	0.14 %
Verizon Wireless	4.58 %
<b>Site Total MPE %:</b>	<b>8.73 %</b>

SPRINT Sector A Total:	4.01 %
SPRINT Sector B Total:	4.01 %
SPRINT Sector C Total:	4.01 %
<b>Site Total:</b>	<b>8.73 %</b>

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	121	1.19	850 MHz	567	0.21%
Sprint 850 MHz LTE	2	437.55	121	2.38	850 MHz	567	0.42%
Sprint 1900 MHz (PCS) CDMA	5	622.47	121	8.46	1900 MHz (PCS)	1000	0.85%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	121	8.46	1900 MHz (PCS)	1000	0.85%
Sprint 2500 MHz (BRS) LTE	8	778.09	121	16.92	2500 MHz (BRS)	1000	1.69%
						<b>Total:*</b>	<b>4.01%</b>

\*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:	4.01 %
Sector B:	4.01 %
Sector C:	4.01 %
SPRINT Maximum Total (per sector):	4.01 %
Site Total:	8.73 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **8.73 %** 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.