



**Crown Castle**  
3530 Torington Way, Suite 300  
Charlotte, NC 28277

December 16, 2014

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

**RE: Sprint PCS-Exempt Modification - Crown Site BU: 876309**  
**Sprint PCS Site ID: CT03XC004**  
**Located at: 311 Old Gate Lane, Milford, CT 06460**

Dear Ms. Bachman:

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

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **311 Old Gate Lane, Milford, CT 06460**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint’s operations at the site (Exhibit-3).

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint’s additional antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

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4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.
5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

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

Sincerely,



Susan Vale  
Real Estate Specialist

Enclosures

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

Tab 2: Exhibit-2: Structural Modification Report

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

cc: Mayor Benjamin G. Blake  
City of Milford  
70 West River Street  
Milford, CT 06460

BVS Jai Alai LLC  
1720 Post Road  
Fairfield, CT 06824

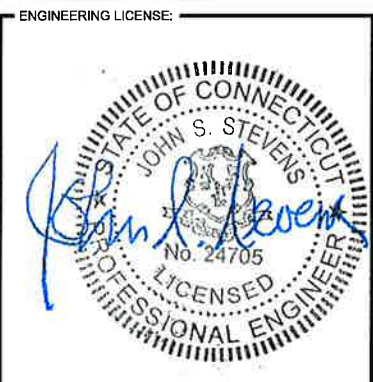


PROJECT: 2.5 EQUIPMENT DEPLOYMENT  
 SITE NAME: (R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI  
 SITE CASCADE: CT03XC004  
 SITE NUMBER: 876309  
 SITE ADDRESS: 311 OLD GATE LANE MILFORD, CT 06460  
 SITE TYPE: MONOPOLE TOWER  
 MARKET: SOUTHERN CONNECTICUT

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**



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REVISIONS:	DESCRIPTION	DATE	BY	REV

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

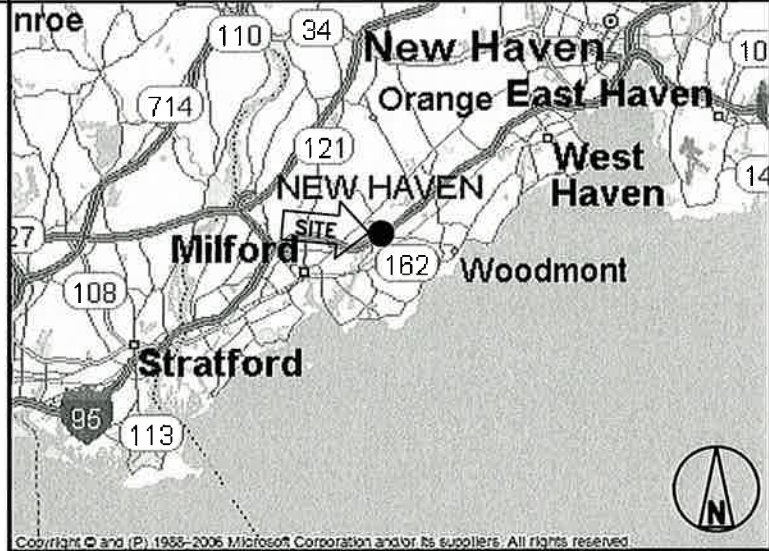
**POWER COMPANY:**  
 CONNECTICUT LIGHT & POWER  
 (860) 947-2000

**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.

- INTERNATIONAL BUILDING CODE (2012 IBC)
- TIA-EIA-222-G OR LATEST EDITION
- NFPA 780 - LIGHTNING PROTECTION CODE
- 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
- ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
- CT BUILDING CODE
- LOCAL BUILDING CODE
- CITY/COUNTY ORDINANCES

**DRAWING INDEX**

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





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:
- GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
  - GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
  - GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
  - NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
  - AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
  - INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
  - AMERICAN CONCRETE INSTITUTE (ACI)
  - AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
  - CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
  - AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
  - PORTLAND CEMENT ASSOCIATION (PCA)
  - NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
  - BRICK INDUSTRY ASSOCIATION (BIA)
  - AMERICAN WELDING SOCIETY (AWS)
  - NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
  - SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
  - DOOR AND HARDWARE INSTITUTE (DHI)
  - OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
  - APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.
- 1.5 DEFINITIONS:
- A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
- B. COMPANY: SPRINT CORPORATION
- C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
- D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
- E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
- F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
- G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

- 1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.
- 1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.
- 1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.
- 1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
- A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
- B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
- C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.
- 1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.
- 1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED.
- 1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.
- 1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.
- NOTE: IN SHORT-FORM SPECIFICATIONS ON THE DRAWINGS, A/E TO INSERT LIST OF APPLICABLE MOPS INCLUDING EN-2012-001, EN-2013-002, EL-0568, AND TS-0193
- 1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

**PART 2 – PRODUCTS (NOT USED)**  
**PART 3 – EXECUTION**

- 3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.
- 3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.
- 3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.
- 3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

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

**SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT**  
**PART 1 – GENERAL**

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

**PART 2 – PRODUCTS (NOT USED)**  
**PART 3 – EXECUTION**

- 3.1 RECEIPT OF MATERIAL AND EQUIPMENT:
- A. A COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.
- B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
  - VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
  - TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
  - RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
  - PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
  - 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:



6580 Sprint Parkway  
Overland Park, Kansas 66251


PLANS PREPARED BY:



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

JOB NUMBER 353-000

MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
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 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
  2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
  3. ALL AVAILABLE JURISDICTIONAL INFORMATION
  4. PDF SCAN OF REDLINES PRODUCED IN FIELD

5. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
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

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 RADI).
    - 23. TOWER GROUND-RING TRENCH WITH GROUND-WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADI).

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

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

PLANS PREPARED FOR:




6580 Sprint Parkway  
Overland Park, Kansas 66251

PLANS PREPARED BY:




1033 Watervliet Shaker Rd  
Albany, NY 12205  
Office # (518) 890-0790  
Fax # (518) 890-0793  
JOB NUMBER 333-000

MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
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**

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:




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 PERMIT: 12/10/14 J.M 0

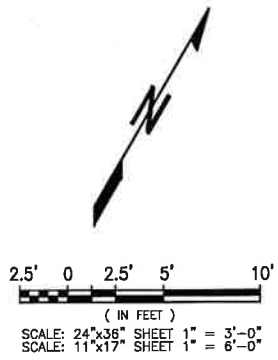
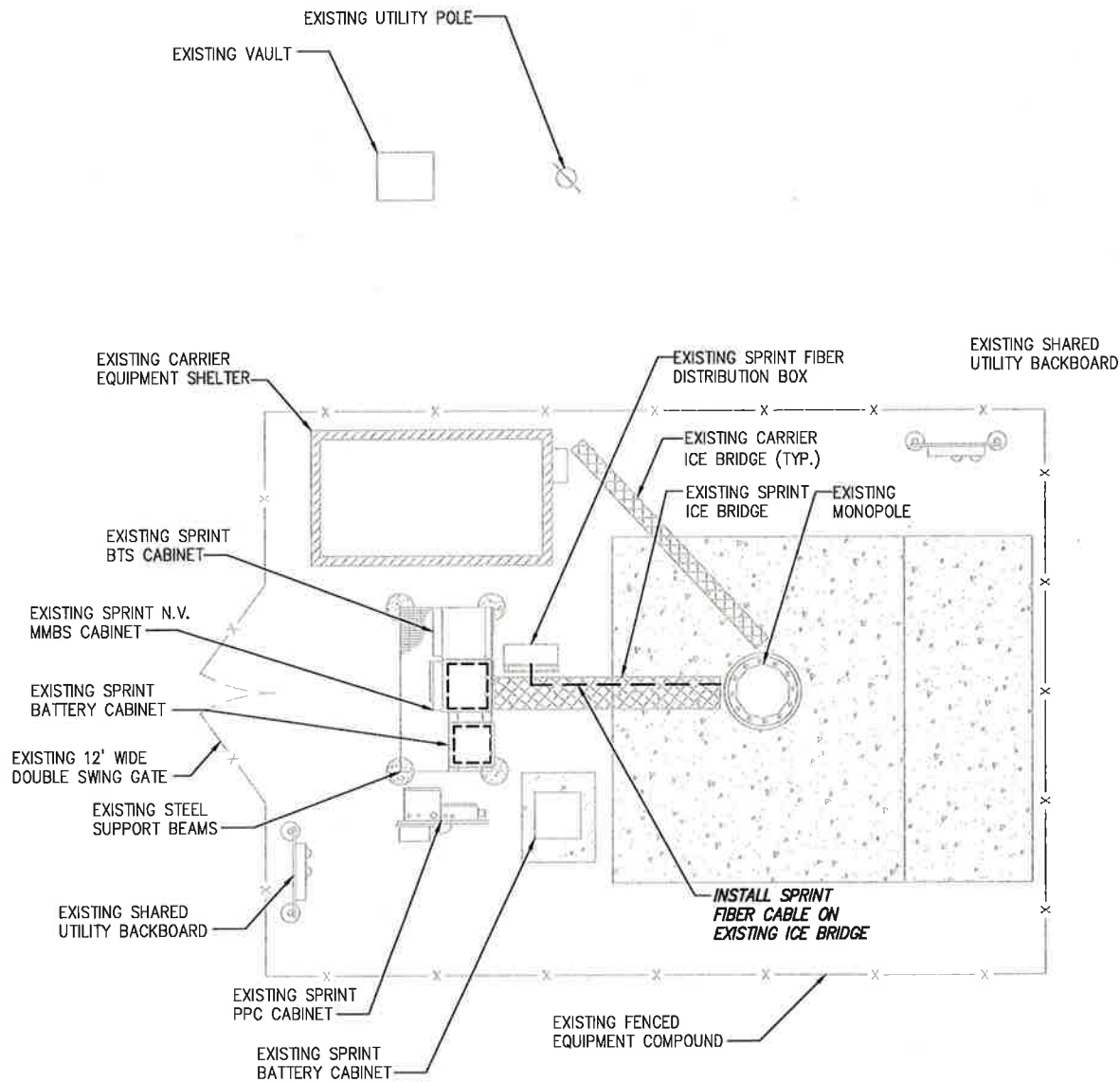
SITE NAME:  
**(R2E) CT2961 TO CT03XC004 MILFORD JAI-ALAI**

SITE CASCADE:  
**CT03XC004**

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

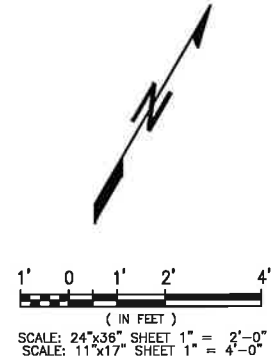
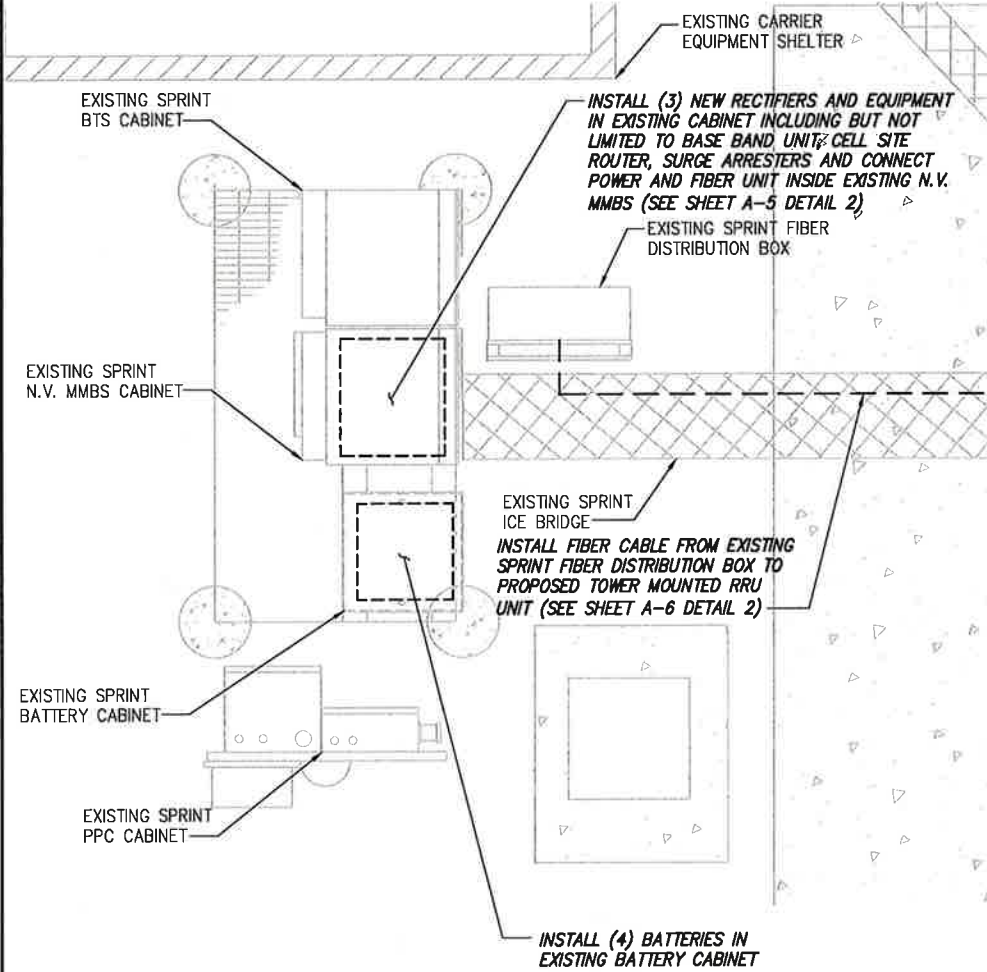
SHEET DESCRIPTION:  
**SITE PLAN**

SHEET NUMBER:  
**A-1**



**OVERALL SITE PLAN**

SCALE: AS NOTED 1



**SPRINT EQUIPMENT PLAN**

SCALE: AS NOTED 2

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

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

☉ OF EXISTING/TO BE INSTALLED SPRINT  
ANTENNAS ELEV. = 120'-0" A.G.L.

TOP OF EXISTING TOWER  
ELEV. = ±121'-0" A.G.L.

INSTALL (1) RRU-2.5 EACH SECTOR  
(SEE SHEET A-5 DETAILS 1)

INSTALL (1) SPRINT 2.5  
ANTENNA EACH SECTOR  
(SEE SHEET A-5 DETAIL 3)

EXISTING CARRIER  
PANEL ANTENNAS

**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 ANALYSIS REPORT, CARRIER SITE NUMBER: "CT03XC004", DATED: "DECEMBER 20, 2014", PAUL J. FORD AND COMPANY PROJECT NUMBER: "37513-2057 R2". 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.

EXISTING  
MONOPOLE TOWER

INSTALL FIBER CABLE FROM EXISTING  
SPRINT FIBER DISTRIBUTION BOX TO  
PROPOSED TOWER MOUNTED RRU  
UNIT (SEE SHEET A-6 DETAIL 2)

EXISTING SPRINT  
EQUIPMENT MOUNTED ON  
EQUIPMENT PLATFORM

GROUND LEVEL

DETAIL NOT USED

NO SCALE

2

TOWER ELEVATION

NO SCALE

1

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:



DRAWING NOTICE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR PERMIT	12/10/14	J.M.	0

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

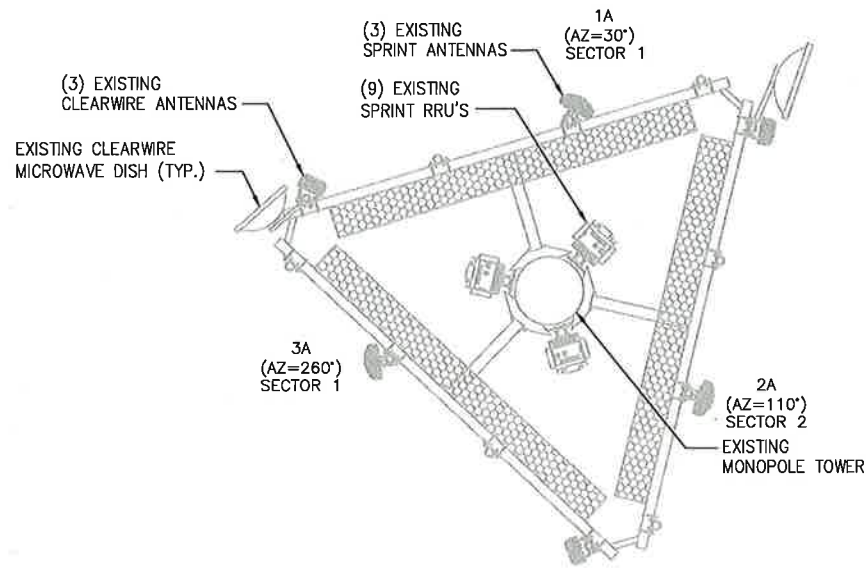
SITE CASCADE:  
CT03XC004

SITE ADDRESS:  
311 OLD GATE LANE  
MILFORD, CT 06460

SHEET DESCRIPTION:  
TOWER ELEVATION  
& CABLE PLAN

SHEET NUMBER:  
A-2

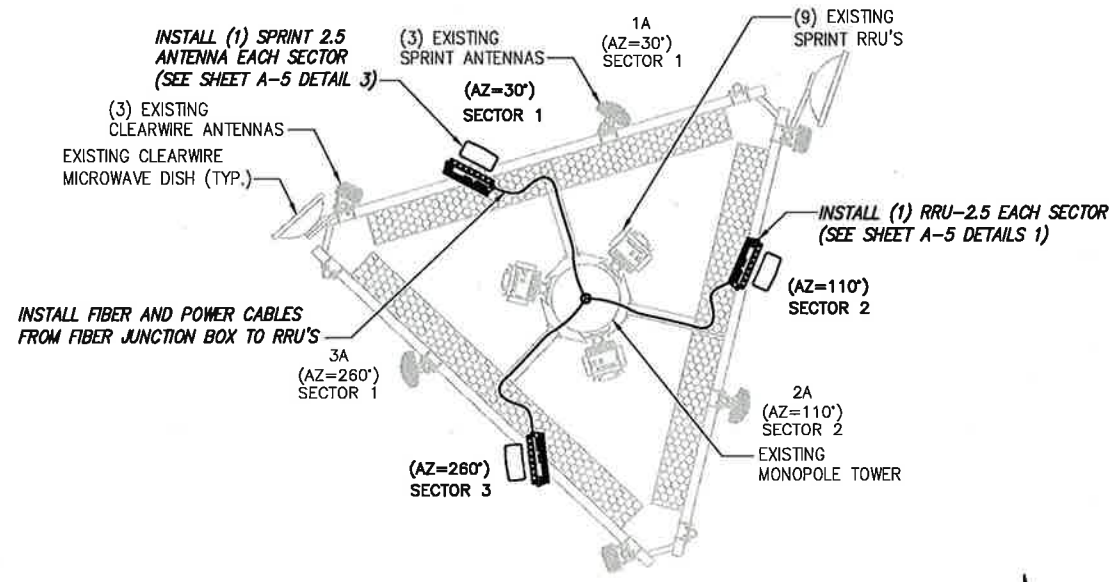




0' = TRUE NORTH

EXISTING ANTENNA & RRU LAYOUT

NO SCALE 1



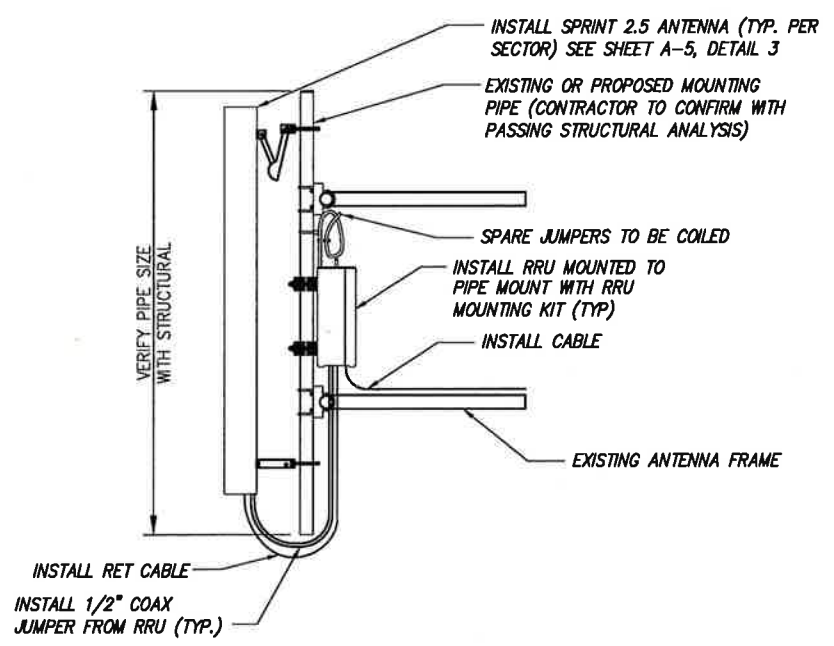
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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

0' = TRUE NORTH

FINAL ANTENNA LAYOUT

NO SCALE 2



- NOTES:
- CUT DC CONDUCTORS TO LENGTH.
  - COIL FIBER CABLE AND SECURE AT SIDE OF RRU.
  - 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.

TYPICAL ANTENNA & RRU MOUNTING DETAILS

NO SCALE 4

DETAIL NOT USED

NO SCALE 3

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 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**

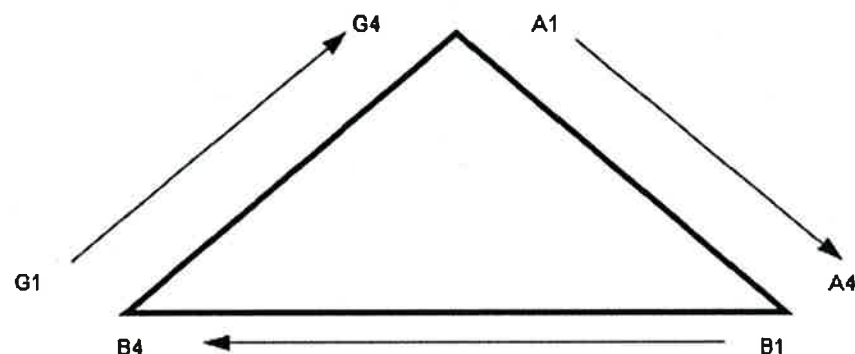
SHEET NUMBER:  
**A-3**

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



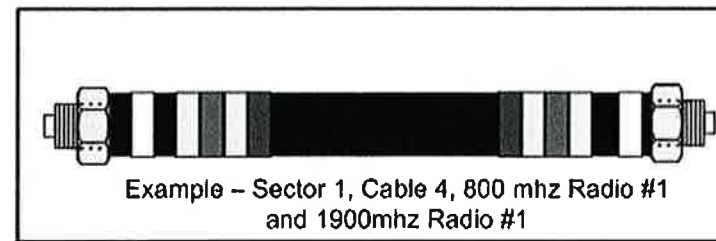
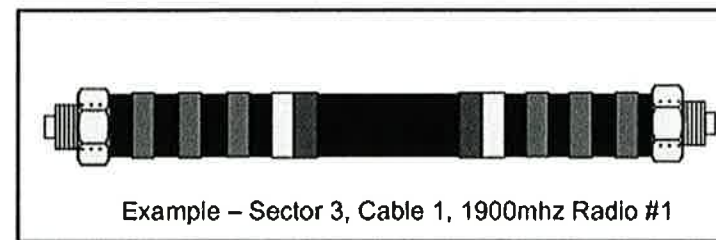
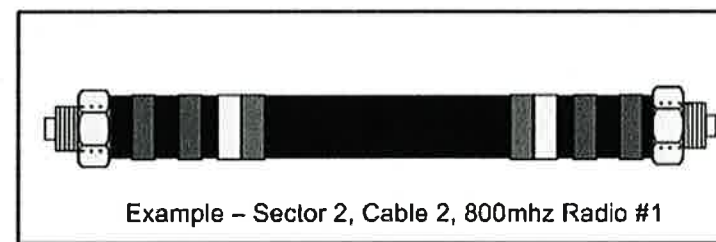
NOTES:

- 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	GRN
1900-1	YEL RED	RED
1900-2	YEL BRN	BRN
1900-3	YEL BLU	BLU
1900-4	YEL SLT	SLT
800-1	YEL ORG	ORG
RESERVED	YEL WHT	WHT
RESERVED	YEL PPL	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:

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PLANS PREPARED BY:

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Office # (518) 690-0790  
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MLA PARTNER:

ENGINEERING LICENSE:

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REVISIONS:

DESCRIPTION	DATE	BY	REV

ISSUED FOR PERMIT: 12/10/14 JLM 0

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

SITE CASCADE:  
CT03XC004

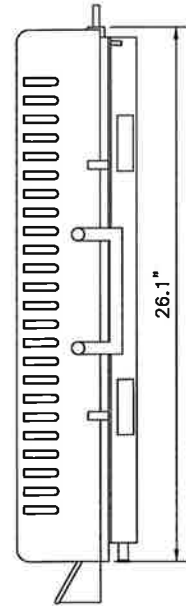
SITE ADDRESS:  
311 OLD GATE LANE  
MILFORD, CT 06460

SHEET DESCRIPTION:  
COLOR CODING  
AND NOTES

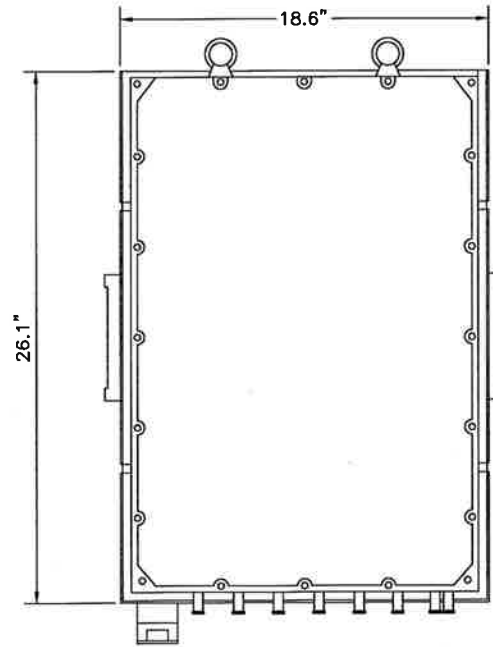
SHEET NUMBER:  
A-4



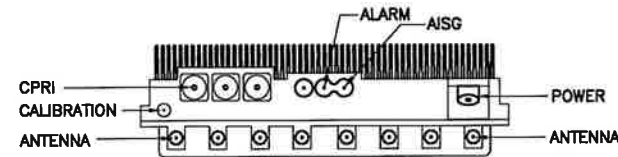
RRU: ALCATEL LUCENT TD-RRHBX20



SIDE VIEW



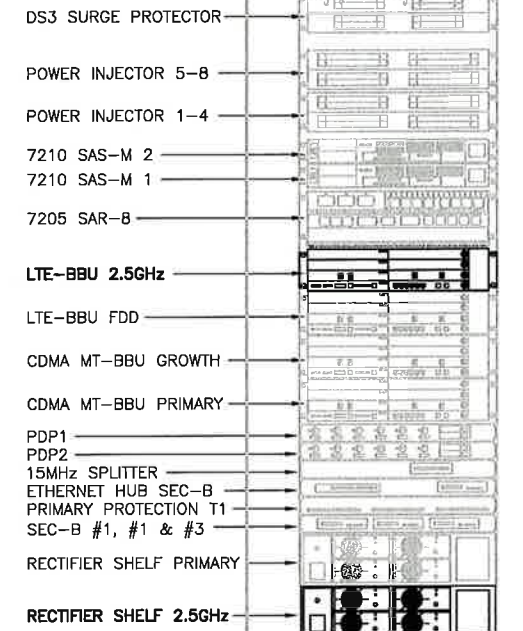
FRONT VIEW



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



FRONT VIEW

2.5 RRU'S

NO SCALE

1

NEW EQUIPMENT IN EXISTING CABINET

NO SCALE

2

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:

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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:

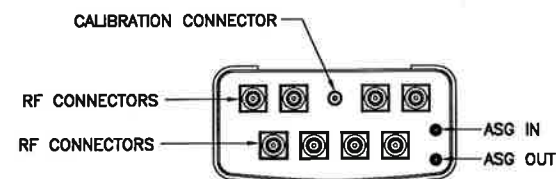
EQUIPMENT & MOUNTING DETAILS

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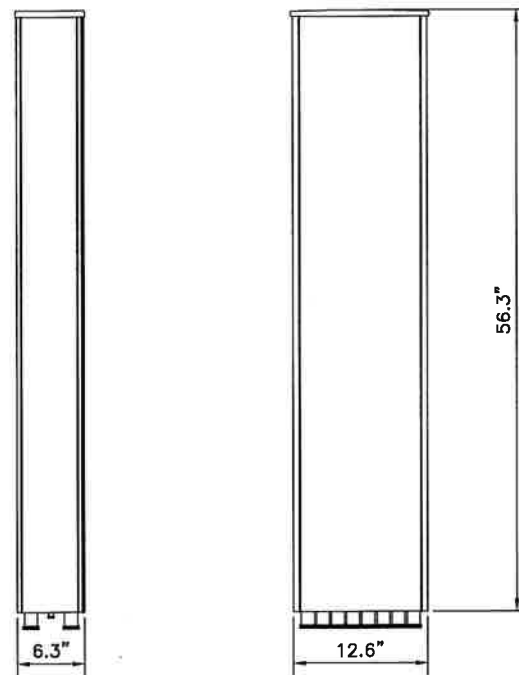
A-5

ANTENNA: RFS APXVTM14-C-I20

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



PLAN VIEW



2.5 ANTENNA

NO SCALE

3

DETAIL NOT USED

NO SCALE

4

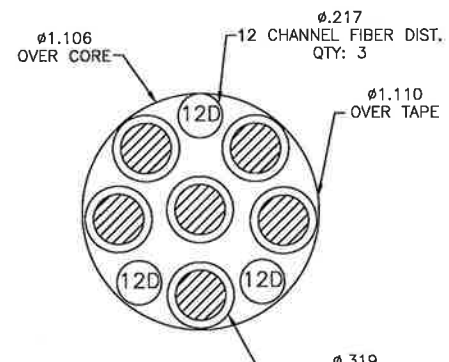
**RFS HYBRIFLEX RISER CABLE SCHEDULE**

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

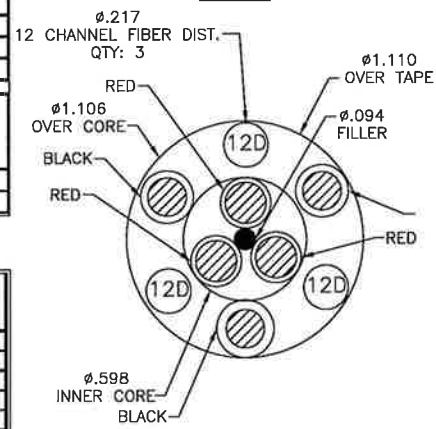
**RFS HYBRIFLEX JUMPER CABLE SCHEDULE**

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

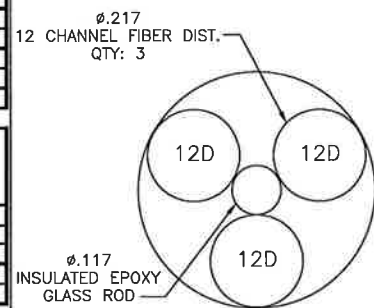
**NOTE:**  
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



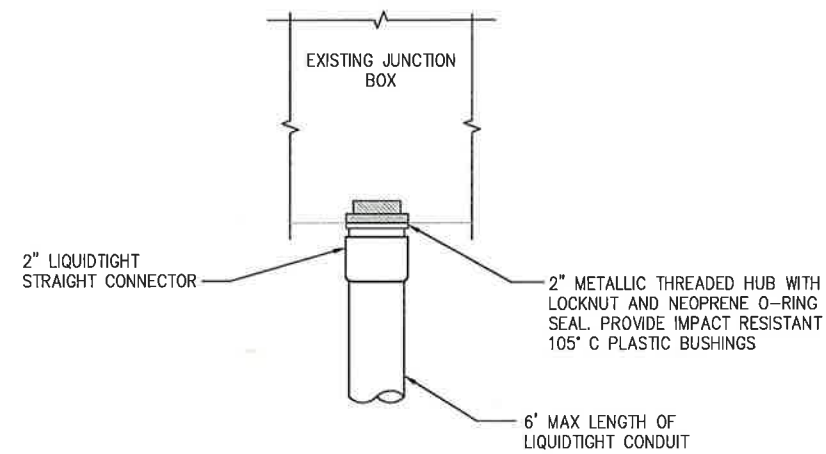
**4 AWG**



**B & 6 AWG**



**FIBER ONLY**



**FIBER JUNCTION BOX PENETRATION**

NO SCALE

2

**2.5 CABLE CROSS SECTION DATA**

NO SCALE

1

**DETAIL NOT USED**

NO SCALE

3

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:

DESCRIPTION	DATE	BY	REV
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**

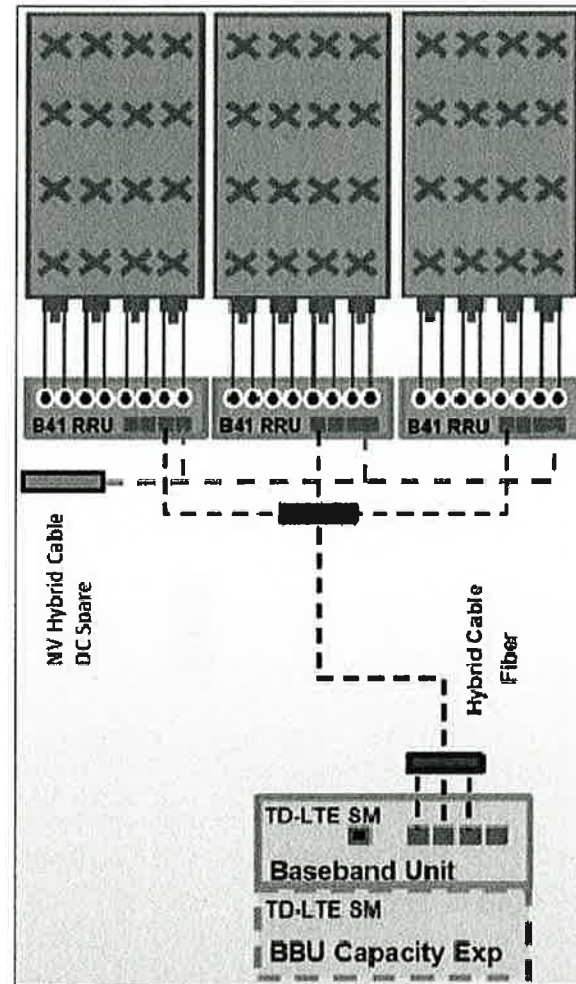
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**CIVIL DETAILS**

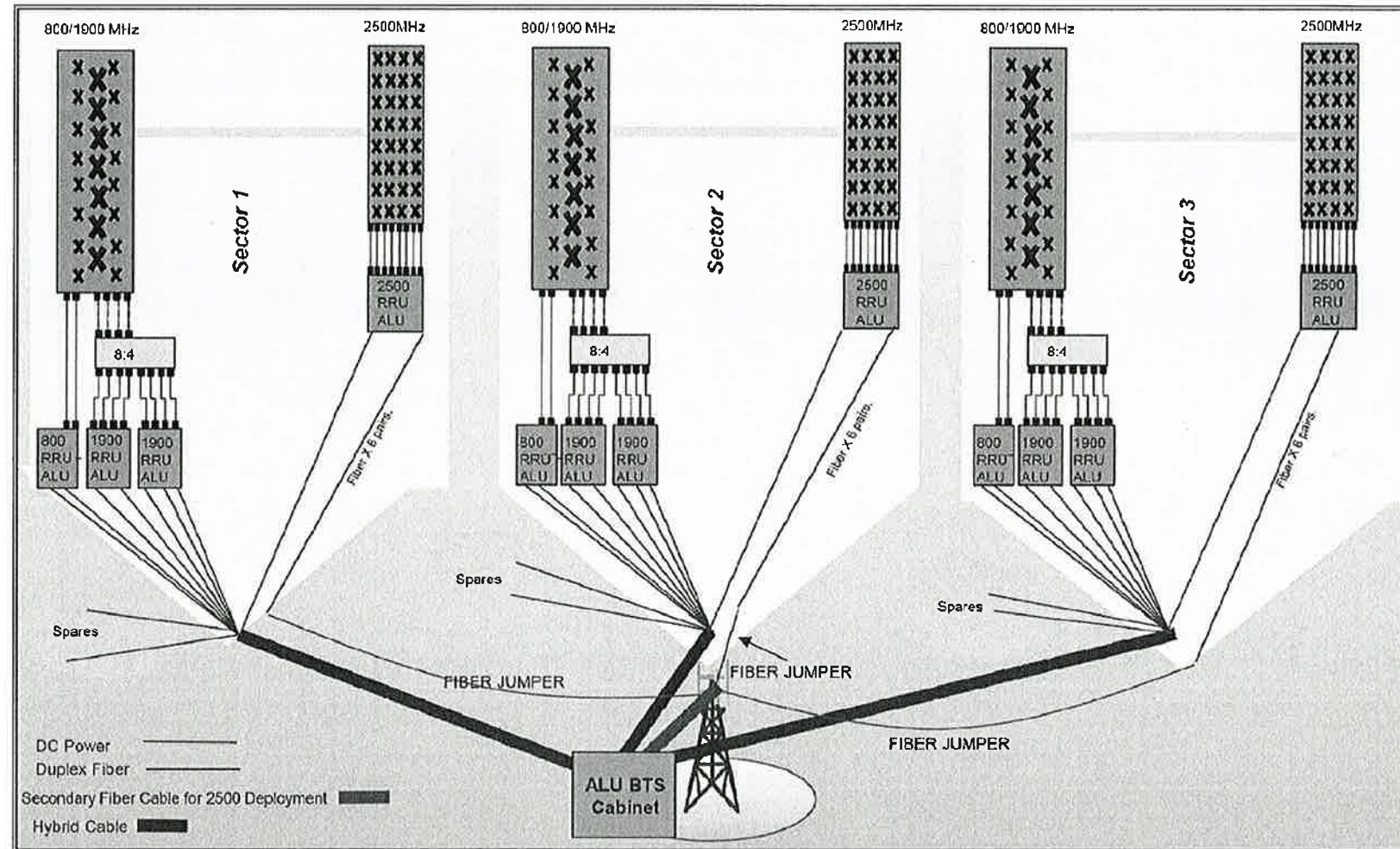
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**A-6**

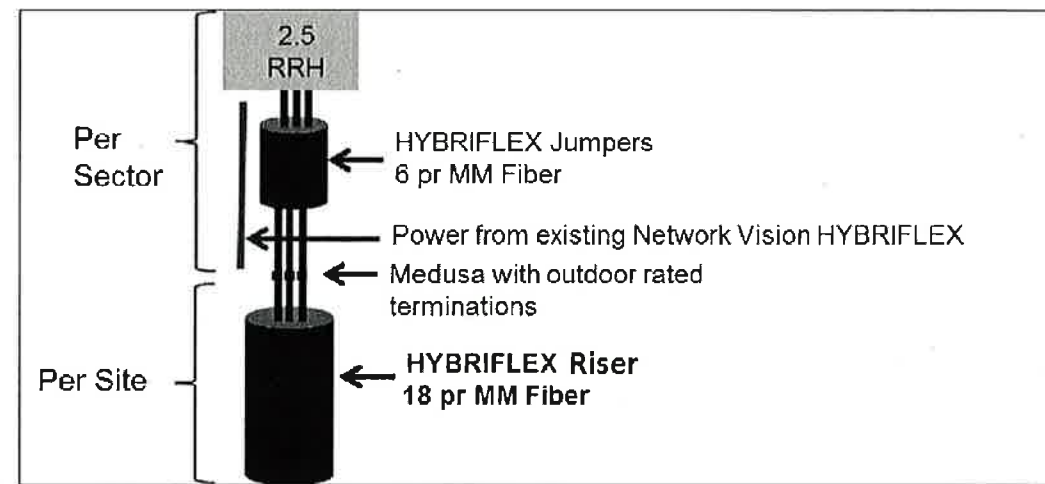




ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



RF 2.5 ALU SCENARIO 1

PLUMBING DIAGRAM

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



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REVISIONS:	DESCRIPTION	DATE	BY	REV
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:  
**CIVIL DETAILS**

SHEET NUMBER:  
**A-7**

PLANS PREPARED FOR:



PLANS PREPARED BY:



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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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

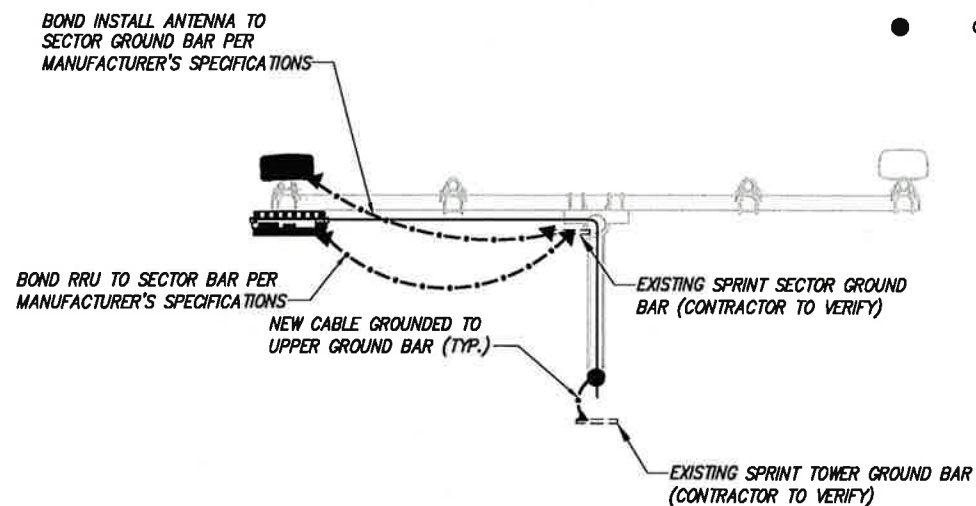
PLAN NOT USED

NO SCALE

1

**LEGEND:**

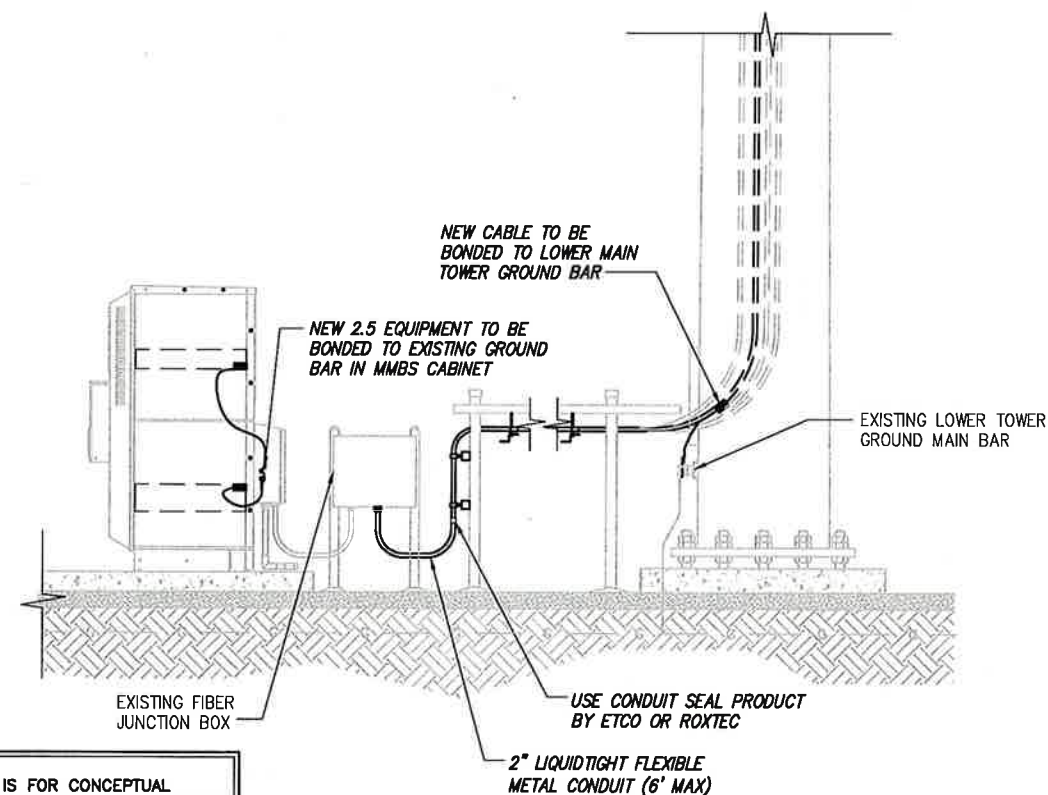
- G — EXISTING GROUND RING
- CADWELD CONNECTION (EXOTHERMIC WELD)
- ▲ MECHANICAL CONNECTION
- ⊗ GROUND ROD
- CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE

2



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

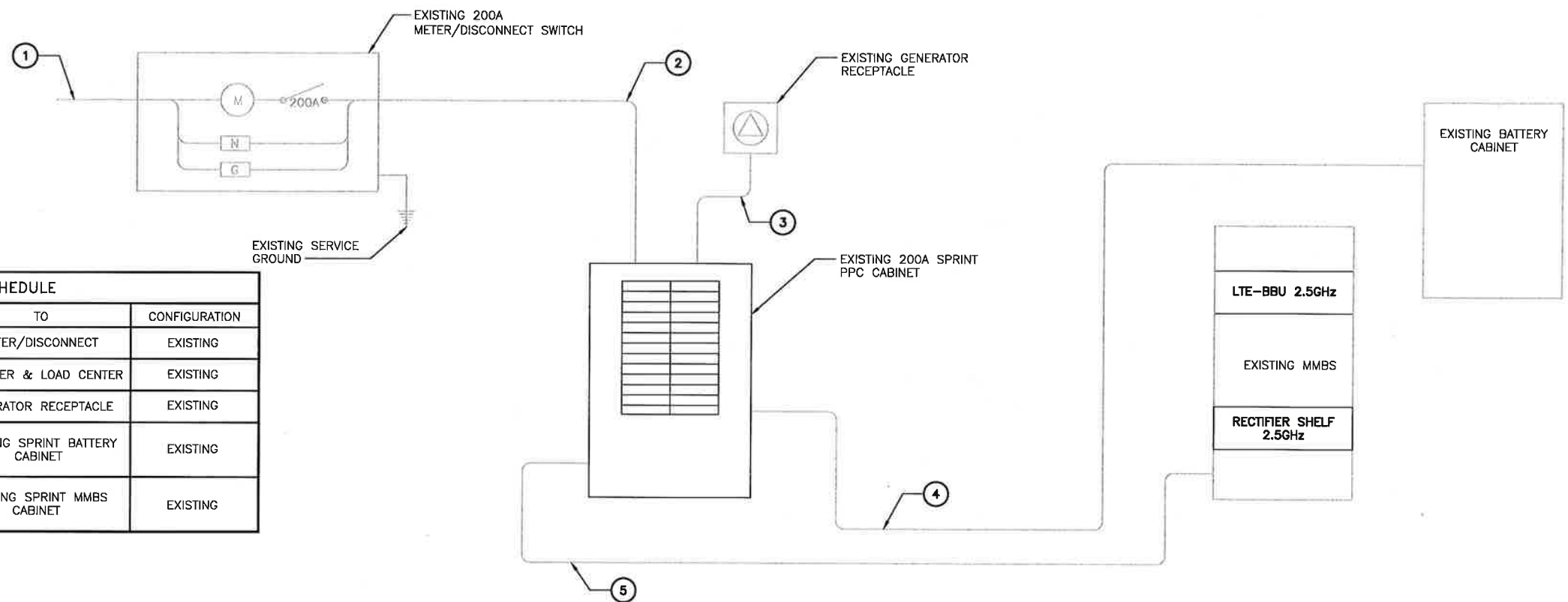
TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION)

NO SCALE

3



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

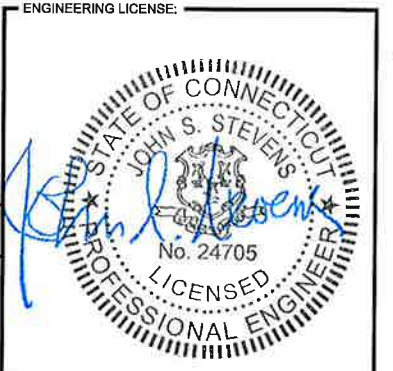


CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	EXISTING
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EXISTING SPRINT BATTERY CABINET	EXISTING
5	TRANSFER & LOAD CENTER	EXISTING SPRINT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

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:  
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REVISIONS:	DESCRIPTION	DATE	BY	REV
ISSUED FOR PERMIT		12/10/14	JM	0

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

SITE CASCADE:  
**CT03XC004**

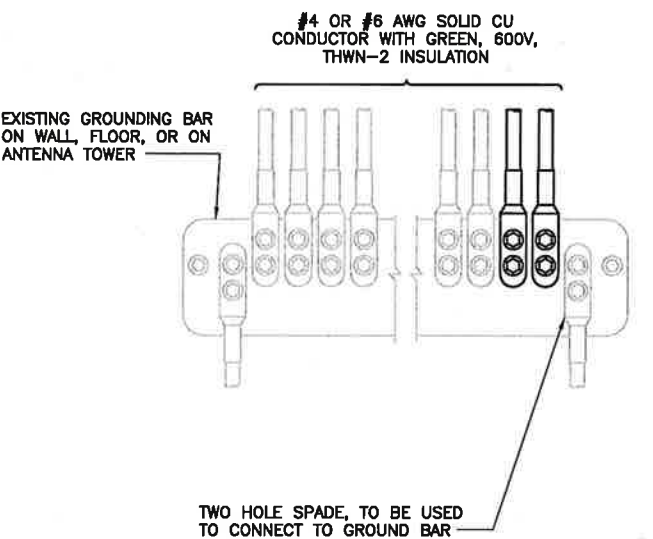
SITE ADDRESS:  
**311 OLD GATE LANE  
 MILFORD, CT 06460**

SHEET DESCRIPTION:  
**ELECTRICAL & GROUNDING DETAILS**

SHEET NUMBER:  
**E-2**

**ELECTRICAL ONE-LINE DIAGRAM**

NO SCALE 1

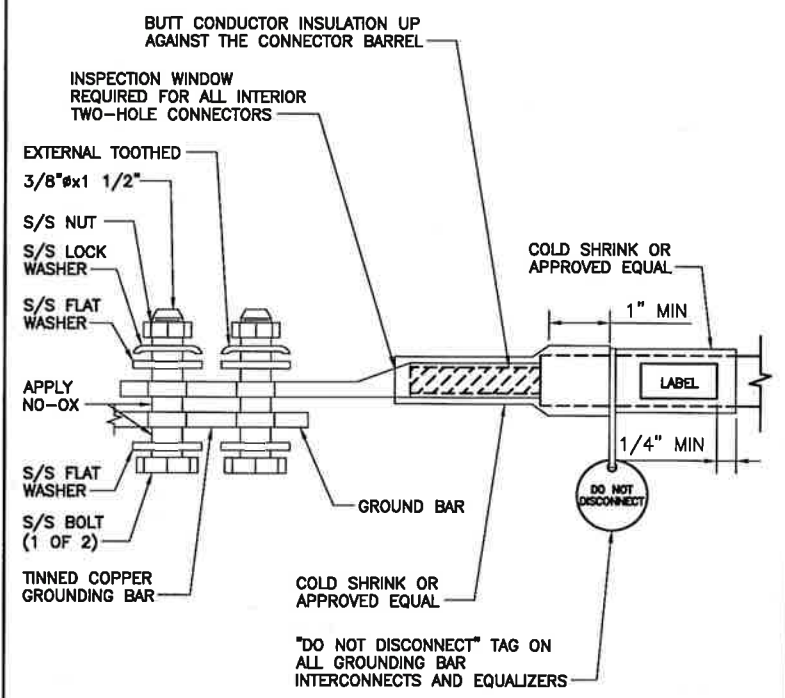


**NOTES**  
 1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.  
 2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

**INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR**

NO SCALE

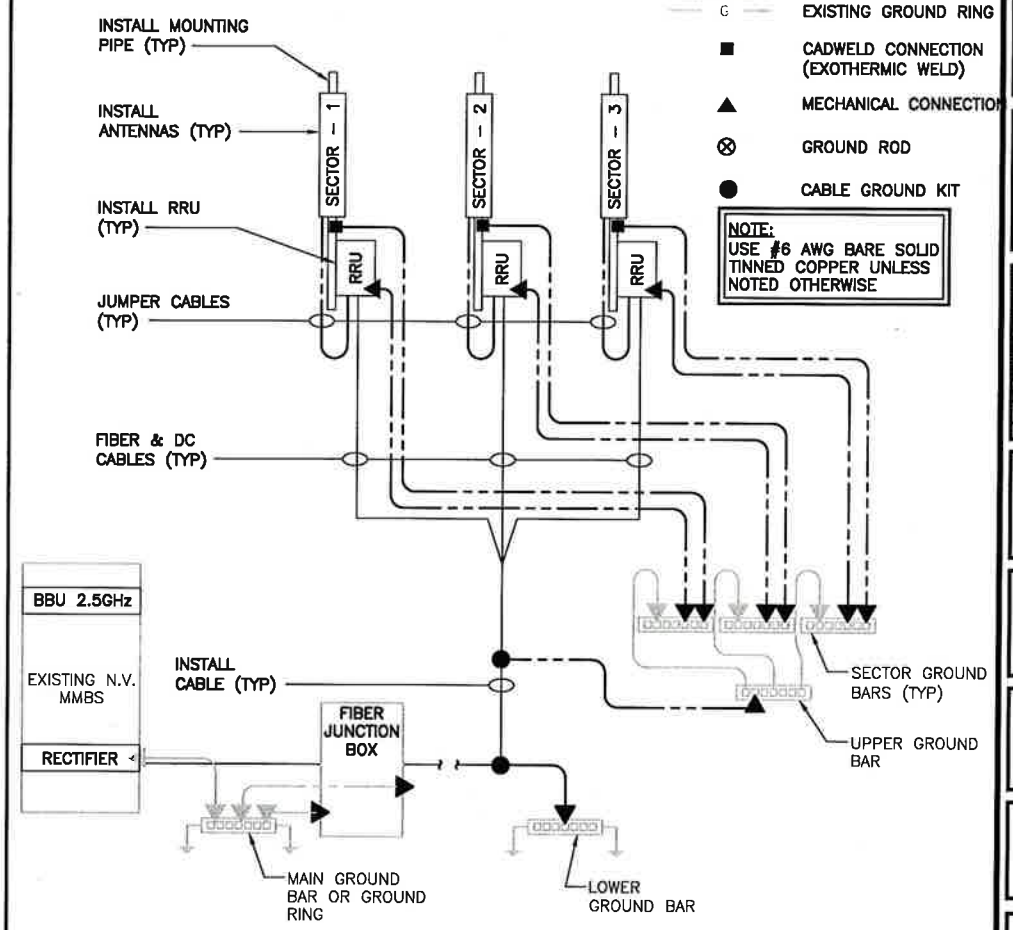
2



**TWO HOLE LUG**

NO SCALE

3



**GROUNDING RISER DIAGRAM**

NO SCALE

4



PAUL J. FORD AND COMPANY  
STRUCTURAL ENGINEERS  
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **September 15, 2014**

Steve Tuttle  
Crown Castle  
8 Parkmeadow Drive  
Pittsford, NY 14534

Paul J. Ford and Company  
250 E. Broad Street, Suite 600  
Columbus, OH 43215  
614.221.6679

**Subject: Structural Modification Report**

**Carrier Designation:** *Sprint PCS Co-Locate* Scenario 2.5B  
**Carrier Site Number:** CT03XC004  
**Carrier Site Name:** (R2E) CT2961 TO CT03XC004 MILF

**Crown Castle Designation:** **Crown Castle BU Number:** 876309  
**Crown Castle Site Name:** MILFORD JAI-ALAI  
**Crown Castle JDE Job Number:** 251812  
**Crown Castle Work Order Number:** 925172  
**Crown Castle Application Number:** 206055 Rev. 3

**Engineering Firm Designation:** **Paul J. Ford and Company Project Number:** 37513-2057.005.7700

**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 Steve Tuttle,

Paul J. Ford and Company is pleased to submit this "Structural Modification Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 702582, in accordance with application 206055, revision 3.

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

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

**Sufficient Capacity**

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

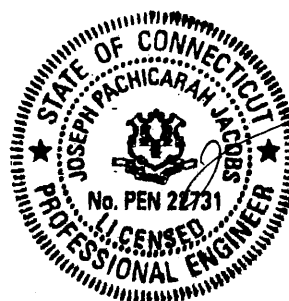
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Paul J. Ford and Company 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:

Joey Meinerding, E.I. *JM*  
Structural Designer

tnxTower Report - version 6.1.4.1



**SEP 18 2014**





PAUL J. FORD AND COMPANY  
STRUCTURAL ENGINEERS  
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **September 15, 2014**

Steve Tuttle  
Crown Castle  
8 Parkmeadow Drive  
Pittsford, NY 14534

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The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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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

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

**Table 1 - Proposed Antenna and Cable Information**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	120.0	6	alcatel lucent	1900MHz RRH (65MHz)	4	1-1/4	--
		3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ RRH			
		3	alcatel lucent	TD-RRH8x20-25			
		9	rfs celwave	ACU-A20-N			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		2	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			
		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	3 3 2	1/4 5/16 1/2	1	
		1	dragonwave	Horizon Compact				
	121.0	1	andrew	VHLP1-18				
		1	dragonwave	Horizon Compact				
	117.0	119.0	5	rfs celwave	APXV86-906515-C w/ Mount Pipe	1 6 9	1/2 1-1/4 1-5/8	3
		117.0	5	decibel	DB950F85E-M w/Mount Pipe	-- -- -- --	-- -- -- --	1
			3	samsung telecom	FDD_R6_RRH			
			3	argus technologies	LLPX310R W/ Mount Pipe			
1			tower mounts	Platform Mount [LP 502-1]				
100.0	100.0	3	antel	BXA-70063-6CF-2 w/ Mount Pipe	-- -- --	-- -- --	3	
		6	antel	LPA-80063/8CF w/ Mount Pipe				
		3	andrew	LNX-4514DS-A1M w/ Mount Pipe				
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	-- --	-- --	2	
		3	antel	BXA-70063-6BF-EDIN-0 w/ Mount Pipe				
		6	rfs celwave	FD9R6004/2C-3L	12	1-5/8	1	
		6	rfs celwave	FD9R6004/2C-3L				
		3	antel	BXA-171063-8BF-EDIN-2 w/ Mount Pipe				
		1	tower mounts	Platform Mount [LP 303-1]				

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



### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 08-02129G, 03/04/2008	2221322	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, 2010111.29, 05/23/2010	2638363	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn. 343738SA, 12/16/1996	2068407	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn. 343738SA, 12/16/1996	2068406	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Vertical Solutions, 07574.03, 11/12/2007	2217524	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37511-0052 BP, 12/28/2011	3088811	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37512-0676 BP, 03/19/2012	3139251	CCISITES
4-TOWER STRUCTURAL ANALYSIS REPORTS	PJF, 37513-2057 BP, 09/25/2013	4000292	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-2057.005.7700, 09/15/2014	--	PJF

#### 3.1) Analysis Method

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

#### 3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was reinforced in conformance with the referenced modification drawings. Please note that our calculations indicate that the existing bridge stiffeners designed by Vertical solutions are not adequate. Therefore, we did not consider them in this analysis.
- 5) The flange bolts at the 60' elevation were considered in this analysis per methodology used by Crown Castle during original design of existing welded bridge stiffeners. However, the flange bolts were not considered at the 30' elevation for the design of the new welded bridge stiffeners per new Crown Castle standards.
- 6) Monopole will be reinforced in conformance with the attached proposed modification drawings.

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

#### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 98.75	Pole	P24x0.25	1	-5.07	589.19	60.7	Pass
L2	98.75 - 90	Pole	RPS 24" x 0.38762"	2	-6.15	824.91	65.8	Pass
L3	90 - 79.25	Pole	P24x0.375	3	-7.51	934.94	87.6	Pass
L4	79.25 - 75.17	Pole	Pipe 24" x 0.51722" Reinf	4	-8.17	1232.93	76.0	Pass
L5	75.17 - 60	Pole	RPS 24" x 0.66391"	5	-11.18	1573.10	87.8	Pass
L6	60 - 49.25	Pole	RPS 30" x 0.52963"	6	-16.82	1488.73	91.1	Pass
L7	49.25 - 43	Pole	RPS 30" x 0.6427"	7	-18.29	1800.10	84.9	Pass
L8	43 - 30	Pole	RPS 30" x 0.80546"	8	-22.00	2081.56	91.2	Pass
L9	30 - 26	Pole	RPS 36" x 0.55016"	9	-27.52	1757.79	93.9	Pass
L10	26 - 20.75	Pole	RPS 36" x 0.64191"	10	-28.97	2045.62	87.4	Pass
L11	20.75 - 18	Pole	RPS 36" x 0.78214"	11	-29.87	2482.62	75.4	Pass
L12	18 - 13.5	Pole	RPS 36" x 0.68817"	12	-31.20	2190.17	90.2	Pass
L13	13.5 - 8	Pole	RPS 36" x 0.69662"	13	-32.84	2175.14	97.4	Pass
L14	8 - 6.25	Pole	RPS 36" x 0.86801"	14	-33.47	2746.17	79.5	Pass
L15	6.25 - 0	Pole	RPS 36" x 0.8575"	15	-35.71	2667.53	88.1	Pass
							Summary	
						Pole (L13)	97.4	Pass
						RATING =	97.4	Pass

**Table 5 - Tower Component Stresses vs. Capacity**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	0	85.3	Pass
1	Base Plate	0	56.8	Pass
1	Base Foundation Structural Steel	0	26.4	Pass
1	Base Foundation Soil Interaction	0	94.8	Pass
1,3	Flange Connection	30	47.0	Pass
1,3	Flange Connection	60	92.6	Pass
1	Flange Connection	90	57.6	Pass

<b>Structure Rating (max from all components) =</b>	<b>97.4%</b>
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Worst case scenario between existing and post installed anchors.
- 3) See assumption #5.

#### 4.1) Recommendations

Install the proposed modifications per the attached drawings.



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

## Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in New Haven County, Connecticut.
- 2) Basic wind speed of 90.00 mph.
- 3) Nominal ice thickness of 0.7500 in.
- 4) Ice density of 56.00 pcf.
- 5) A wind speed of 37.60 mph is used in combination with ice.
- 6) Temperature drop of 50.00 °F.
- 7) Deflections calculated using a wind speed of 50.00 mph.
- 8) A non-linear (P-delta) analysis was used.
- 9) Pressures are calculated at each section.
- 10) Stress ratio used in pole design is 1.333.
- 11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
--	--	--

## Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	120.0000-98.7500	21.2500	P24x0.25	A53-B-42 (42 ksi)	
L2	98.7500-90.0000	8.7500	RPS 24" x 0.38762"	Reinf 35.87 ksi (36 ksi)	
L3	90.0000-79.2500	10.7500	P24x0.375	A53-B-42 (42 ksi)	
L4	79.2500-75.1700	4.0800	Pipe 24" x 0.51722" Reinf	Reinf 40.40 ksi (40 ksi)	
L5	75.1700-60.0000	15.1700	RPS 24" x 0.66391"	Reinf 40.41 ksi (40 ksi)	
L6	60.0000-49.2500	10.7500	RPS 30" x 0.52963"	Reinf 37.96 ksi	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L7	49.2500-43.0000	6.2500	RPS 30" x 0.6427"	(38 ksi) Reinf 37.97 ksi	
L8	43.0000-30.0000	13.0000	RPS 30" x 0.80546"	(38 ksi) Reinf 35.23 ksi	
L9	30.0000-26.0000	4.0000	RPS 36" x 0.55016"	(35 ksi) Reinf 35.87 ksi	
L10	26.0000-20.7500	5.2500	RPS 36" x 0.64191"	(36 ksi) Reinf 35.87 ksi	
L11	20.7500-18.0000	2.7500	RPS 36" x 0.78214"	(36 ksi) Reinf 35.87 ksi	
L12	18.0000-13.5000	4.5000	RPS 36" x 0.68817"	(36 ksi) Reinf 35.87 ksi	
L13	13.5000-8.0000	5.5000	RPS 36" x 0.69662"	(36 ksi) Reinf 35.20 ksi	
L14	8.0000-6.2500	1.7500	RPS 36" x 0.86801"	(35 ksi) Reinf 35.84 ksi	
L15	6.2500-0.0000	6.2500	RPS 36" x 0.8575"	(36 ksi) Reinf 35.23 ksi (35 ksi)	

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 120.0000- 98.7500				1	1	1		
L2 98.7500- 90.0000				1	1	1		
L3 90.0000- 79.2500				1	1	1		
L4 79.2500- 75.1700				1	1	1		
L5 75.1700- 60.0000				1	1	1		
L6 60.0000- 49.2500				1	1	1		
L7 49.2500- 43.0000				1	1	1		
L8 43.0000- 30.0000				1	1	1		
L9 30.0000- 26.0000				1	1	1		
L10 26.0000- 20.7500				1	1	1		
L11 20.7500- 18.0000				1	1	1		
L12 18.0000- 13.5000				1	1	1		
L13 13.5000- 8.0000				1	1	1		
L14 8.0000- 6.2500				1	1	1		
L15 6.2500- 0.0000				1	1	1		



### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub>		Weight
						ft <sup>2</sup> /ft	plf	
7983A(1/2")	C	No	CaAa (Out Of Face)	117.0000 - 0.0000	2	No Ice	0.0000	0.08
						1/2" Ice	0.0000	0.74
						1" Ice	0.0000	2.01
9207(5/16")	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	0.06
						1/2" Ice	0.0000	0.06
						1" Ice	0.0000	0.06
9248( 1/4)	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	0.03
						1/2" Ice	0.0000	0.03
						1" Ice	0.0000	0.03
2" Conduit	C	No	CaAa (Out Of Face)	117.0000 - 0.0000	1	No Ice	0.0000	1.16
						1/2" Ice	0.0000	2.53
						1" Ice	0.0000	4.51
2" Conduit	C	No	CaAa (Out Of Face)	117.0000 - 0.0000	1	No Ice	0.1740	1.16
						1/2" Ice	0.2740	2.53
						1" Ice	0.3740	4.51
*								
HB114-1-0813U4-M5J( 1 1/4")	C	No	Inside Pole	117.0000 - 0.0000	3	No Ice	0.0000	1.20
						1/2" Ice	0.0000	1.20
						1" Ice	0.0000	1.20
HB114-13U3M12-XXXF(1-1/4")	C	No	Inside Pole	117.0000 - 0.0000	1	No Ice	0.0000	0.99
						1/2" Ice	0.0000	0.99
						1" Ice	0.0000	0.99
***								
561(1-5/8")	C	No	Inside Pole	100.0000 - 0.0000	12	No Ice	0.0000	1.35
						1/2" Ice	0.0000	1.35
						1" Ice	0.0000	1.35
***								
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	22.0000 - 0.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
1 1/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	44.0000 - 30.0000	1	No Ice	0.2083	0.00
						1/2" Ice	0.3194	0.00
						1" Ice	0.4306	0.00
***								
Aero MP3-05	C	No	CaAa (Out Of Face)	30.0000 - 0.0000	1	No Ice	0.3478	0.00
						1/2" Ice	0.4001	0.00
						1" Ice	0.6566	0.00
Aero MP3-04	C	No	CaAa (Out Of Face)	60.0000 - 30.0000	1	No Ice	0.2690	0.00
						1/2" Ice	0.3801	0.00
						1" Ice	0.4913	0.00
Aero MP3-03	C	No	CaAa (Out Of Face)	75.1700 - 60.0000	1	No Ice	0.2625	0.00
						1/2" Ice	0.3736	0.00
						1" Ice	0.4847	0.00
***								
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	100.2500 - 90.2500	1	No Ice	0.1250	0.00
						1/2" Ice	0.2361	0.00
						1" Ice	0.3472	0.00

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	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>	Weight K
L1	120.0000-98.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.363	0.15
L2	98.7500-90.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.585	0.21
L3	90.0000-79.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.871	0.25

Tower Section n	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	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>	Weight K
L4	79.2500-75.1700	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.710	0.10
L5	75.1700-60.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.621	0.36
L6	60.0000-49.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.763	0.25
L7	49.2500-43.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.977	0.15
L8	43.0000-30.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	8.468	0.31
L9	30.0000-26.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.087	0.09
L10	26.0000-20.7500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.000	0.12
L11	20.7500-18.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.008	0.06
L12	18.0000-13.5000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.286	0.11
L13	13.5000-8.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.016	0.13
L14	8.0000-6.2500	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.278	0.04
L15	6.2500-0.0000	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.563	0.15

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

Tower Section n	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>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>	Weight K
L1	120.0000- 98.7500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.350	0.29
L2	98.7500-90.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.314	0.27
L3	90.0000-79.2500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.483	0.33
L4	79.2500-75.1700	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.322	0.13
L5	75.1700-60.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.425	0.47
L6	60.0000-49.2500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.167	0.33
L7	49.2500-43.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.123	0.19
L8	43.0000-30.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.751	0.40

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A <sub>R</sub>	A <sub>F</sub>	C <sub>A</sub> A <sub>A</sub> In Face	C <sub>A</sub> A <sub>A</sub> Out Face	Weight
n	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L9	30.0000-26.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.409	0.12
L10	26.0000-20.7500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.943	0.16
L11	20.7500-18.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.375	0.08
L12	18.0000-13.5000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.523	0.14
L13	13.5000-8.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.750	0.17
L14	8.0000-6.2500	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.148	0.05
L15	6.2500-0.0000	A	0.750	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.671	0.19

### Feed Line Center of Pressure

Section	Elevation	CP <sub>x</sub>	CP <sub>z</sub>	CP <sub>x</sub> Ice	CP <sub>z</sub> Ice
	ft	in	in	in	in
L1	120.0000-98.7500	-0.1905	0.1100	-0.3203	0.1849
L2	98.7500-90.0000	-0.3344	0.1931	-0.5775	0.3334
L3	90.0000-79.2500	-0.2079	0.1201	-0.3437	0.1984
L4	79.2500-75.1700	-0.2079	0.1201	-0.3437	0.1984
L5	75.1700-60.0000	-0.4654	0.2687	-0.6798	0.3925
L6	60.0000-49.2500	-0.4889	0.2823	-0.7289	0.4208
L7	49.2500-43.0000	-0.5198	0.3001	-0.7728	0.4462
L8	43.0000-30.0000	-0.6713	0.3875	-0.9801	0.5659
L9	30.0000-26.0000	-0.5774	0.3334	-0.8351	0.4822
L10	26.0000-20.7500	-0.6235	0.3600	-0.9024	0.5210
L11	20.7500-18.0000	-0.7628	0.4404	-1.0990	0.6345
L12	18.0000-13.5000	-0.7628	0.4404	-1.0990	0.6345
L13	13.5000-8.0000	-0.7628	0.4404	-1.0990	0.6345
L14	8.0000-6.2500	-0.7628	0.4404	-1.0990	0.6345
L15	6.2500-0.0000	-0.7628	0.4404	-1.0990	0.6345

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustmen t	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight	
			ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
LLPX310R w/ Mount Pipe	A	From Leg	4.0000	0.0000	117.0000	No Ice	4.9623	2.8484	0.04
			0.00			1/2"	5.3512	3.3668	0.08
			0.00			Ice	5.7501	3.9019	0.12
(2) LLPX310R w/ Mount Pipe	B	From Leg	4.0000	0.0000	117.0000	No Ice	4.9623	2.8484	0.04
			0.00			1/2"	5.3512	3.3668	0.08
			0.00			Ice	5.7501	3.9019	0.12
FDD_R6_RRH	A	From Leg	4.0000	0.0000	117.0000	1" Ice			
						No Ice	1.7889	0.7778	0.03



Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
			0.00			1/2"	1.9715	0.9182	0.04	
			0.00			Ice	2.1627	1.0673	0.06	
(2) FDD_R6_RRH	B	From Leg	4.0000		0.0000	117.0000	1.7889	0.7778	0.03	
			0.00			No Ice	1.9715	0.9182	0.04	
			0.00			Ice	2.1627	1.0673	0.06	
HORIZON COMPACT	A	From Leg	4.0000		0.0000	117.0000	0.8409	0.4295	0.01	
			0.00			No Ice	0.9658	0.5249	0.02	
			4.00			Ice	1.0993	0.6289	0.03	
HORIZON COMPACT	B	From Leg	4.0000		0.0000	117.0000	0.8409	0.4295	0.01	
			0.00			No Ice	0.9658	0.5249	0.02	
			7.00			Ice	1.0993	0.6289	0.03	
						1" Ice				
*										
APXV9ERR18-C-A20 w/ Mount Pipe	A	From Leg	4.0000		0.0000	117.0000	No Ice	8.4975	7.4708	0.09
			0.00			1/2"	9.1490	8.6564	0.16	
			3.00			Ice	9.7672	9.5559	0.24	
						1" Ice				
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000		0.0000	117.0000	No Ice	8.4975	6.9458	0.08
			0.00			1/2"	9.1490	8.1266	0.15	
			3.00			Ice	9.7672	9.0212	0.23	
						1" Ice				
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000		0.0000	117.0000	No Ice	8.4975	6.9458	0.08
			0.00			1/2"	9.1490	8.1266	0.15	
			3.00			Ice	9.7672	9.0212	0.23	
						1" Ice				
800MHZ RRH	A	From Leg	4.0000		0.0000	117.0000	No Ice	2.4899	2.0685	0.05
			0.00			1/2"	2.7061	2.2705	0.07	
			3.00			Ice	2.9310	2.4812	0.10	
						1" Ice				
800MHZ RRH	B	From Leg	4.0000		0.0000	117.0000	No Ice	2.4899	2.0685	0.05
			0.00			1/2"	2.7061	2.2705	0.07	
			3.00			Ice	2.9310	2.4812	0.10	
						1" Ice				
800MHZ RRH	C	From Leg	4.0000		0.0000	117.0000	No Ice	2.4899	2.0685	0.05
			0.00			1/2"	2.7061	2.2705	0.07	
			3.00			Ice	2.9310	2.4812	0.10	
						1" Ice				
(2) 1900MHz RRH (65MHz)	A	From Leg	4.0000		0.0000	117.0000	No Ice	2.7087	2.6087	0.06
			0.00			1/2"	2.9477	2.8450	0.08	
			3.00			Ice	3.1953	3.0899	0.11	
						1" Ice				
(2) 1900MHz RRH (65MHz)	B	From Leg	4.0000		0.0000	117.0000	No Ice	2.7087	2.6087	0.06
			0.00			1/2"	2.9477	2.8450	0.08	
			3.00			Ice	3.1953	3.0899	0.11	
						1" Ice				
(2) 1900MHz RRH (65MHz)	C	From Leg	4.0000		0.0000	117.0000	No Ice	2.7087	2.6087	0.06
			0.00			1/2"	2.9477	2.8450	0.08	
			3.00			Ice	3.1953	3.0899	0.11	
						1" Ice				
(3) ACU-A20-N	A	From Leg	4.0000		0.0000	117.0000	No Ice	0.0778	0.1361	0.00
			0.00			1/2"	0.1210	0.1890	0.00	
			3.00			Ice	0.1728	0.2506	0.00	
						1" Ice				
(3) ACU-A20-N	B	From Leg	4.0000		0.0000	117.0000	No Ice	0.0778	0.1361	0.00
			0.00			1/2"	0.1210	0.1890	0.00	
			3.00			Ice	0.1728	0.2506	0.00	
						1" Ice				
(3) ACU-A20-N	C	From Leg	4.0000		0.0000	117.0000	No Ice	0.0778	0.1361	0.00
			0.00			1/2"	0.1210	0.1890	0.00	
			3.00			Ice	0.1728	0.2506	0.00	
						1" Ice				
800 EXTERNAL NOTCH	A	From Leg	4.0000		0.0000	117.0000	No Ice	0.7701	0.3747	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
FILTER			0.00 3.00			1/2" Ice 1.0181	0.8898 0.4647 0.5634	0.02 0.02	
800 EXTERNAL NOTCH FILTER	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 1.0181	0.7701 0.3747 0.8898 0.4647 0.5634	0.01 0.02 0.02	
800 EXTERNAL NOTCH FILTER	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 1.0181	0.7701 0.3747 0.8898 0.4647 0.5634	0.01 0.02 0.02	
IBC1900HB-2	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 1.6603	1.3125 0.7875 1.4821 0.9377 1.0965	0.04 0.05 0.06	
IBC1900HB-2	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 1.6603	1.3125 0.7875 1.4821 0.9377 1.0965	0.04 0.05 0.06	
IBC1900HB-2	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 1.6603	1.3125 0.7875 1.4821 0.9377 1.0965	0.04 0.05 0.06	
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 8.1830	7.1342 4.9591 7.6618 5.7544 6.4723	0.08 0.13 0.19	
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 8.1830	7.1342 4.9591 7.6618 5.7544 6.4723	0.08 0.13 0.19	
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 8.1830	7.1342 4.9591 7.6618 5.7544 6.4723	0.08 0.13 0.19	
TD-RRH8x20-25	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 5.3165	4.7198 1.7027 5.0138 1.9196 2.1453	0.07 0.10 0.13	
TD-RRH8x20-25	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 5.3165	4.7198 1.7027 5.0138 1.9196 2.1453	0.07 0.10 0.13	
TD-RRH8x20-25	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 5.3165	4.7198 1.7027 5.0138 1.9196 2.1453	0.07 0.10 0.13	
(2) 2.375" OD x 6' Mount Pipe	A	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 2.2939	1.4250 1.4250 1.9250 1.9250 2.2939	0.03 0.04 0.05	
(2) 2.375" OD x 6' Mount Pipe	B	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 2.2939	1.4250 1.4250 1.9250 1.9250 2.2939	0.03 0.04 0.05	
(2) 2.375" OD x 6' Mount Pipe	C	From Leg	4.0000 0.00 3.00	0.0000	117.0000	1" Ice No Ice 1/2" Ice 2.2939	1.4250 1.4250 1.9250 1.9250 2.2939	0.03 0.04 0.05	
Platform Mount [LP 502-1]	C	None		0.0000	117.0000	1" Ice No Ice 1/2" Ice 58.9882	32.3472 32.3472 45.6677 45.6677 58.9882	0.93 1.19 1.46	
***						1" Ice			
BXA-171063-8BF-EDIN-2	A	From Leg	4.0000	0.0000	100.0000	No Ice	3.1789	3.3530	0.03

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight K
			Horz ft	Lateral ft			ft <sup>2</sup>	ft <sup>2</sup>	
w/ Mount Pipe			0.00						
			0.00			1/2"	3.5550	3.9709	0.06
						Ice	3.9637	4.5951	0.10
						1" Ice			
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2"	3.5550	3.9709	0.06
			0.00			Ice	3.9637	4.5951	0.10
						1" Ice			
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2"	3.5550	3.9709	0.06
			0.00			Ice	3.9637	4.5951	0.10
						1" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.0000	100.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.01
			0.00			Ice	0.5433	0.1965	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.0000	0.0000	100.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.01
			0.00			Ice	0.5433	0.1965	0.01
						1" Ice			
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.0000	100.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.01
			0.00			Ice	0.5433	0.1965	0.01
						1" Ice			
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	7.5371	5.4600	0.04
			0.00			1/2"	8.0822	6.3840	0.10
			0.00			Ice	8.6298	7.1844	0.16
						1" Ice			
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	7.5371	5.4600	0.04
			0.00			1/2"	8.0822	6.3840	0.10
			0.00			Ice	8.6298	7.1844	0.16
						1" Ice			
BXA-70063-6BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	7.5371	5.4600	0.04
			0.00			1/2"	8.0822	6.3840	0.10
			0.00			Ice	8.6298	7.1844	0.16
						1" Ice			
LNx-4514DS-A1M w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	7.9031	4.5411	0.05
			0.00			1/2"	8.4084	5.2329	0.10
			0.00			Ice	8.9164	5.9168	0.17
						1" Ice			
LNx-4514DS-A1M w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	7.9031	4.5411	0.05
			0.00			1/2"	8.4084	5.2329	0.10
			0.00			Ice	8.9164	5.9168	0.17
						1" Ice			
LNx-4514DS-A1M w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	7.9031	4.5411	0.05
			0.00			1/2"	8.4084	5.2329	0.10
			0.00			Ice	8.9164	5.9168	0.17
						1" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.0000	0.0000	100.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2"	3.5550	3.9709	0.06
			0.00			Ice	3.9637	4.5951	0.10
						1" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.0000	0.0000	100.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2"	3.5550	3.9709	0.06
			0.00			Ice	3.9637	4.5951	0.10
						1" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.0000	0.0000	100.0000	No Ice	3.1789	3.3530	0.03
			0.00			1/2"	3.5550	3.9709	0.06
			0.00			Ice	3.9637	4.5951	0.10
						1" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.0000	0.0000	100.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.01
			0.00			Ice	0.5433	0.1965	0.01
						1" Ice			
(2) FD9R6004/2C-3L	B	From Leg	4.0000	0.0000	100.0000	No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.01



Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			0.00			Ice	0.5433	0.1965	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.0000	0.0000	100.0000	1" Ice			
			0.00			No Ice	0.3665	0.0846	0.00
			0.00			1/2"	0.4506	0.1362	0.01
						Ice	0.5433	0.1965	0.01
Platform Mount [LP 303-1]	C	None		0.0000	100.0000	1" Ice			
						No Ice	14.6600	14.6600	1.25
						1/2"	18.8700	18.8700	1.48
						Ice	23.0800	23.0800	1.71
						1" Ice			
***									
Bridge Stiffener (35" x 10.5" x 1.25")	A	None		0.0000	60.0000	No Ice	0.6076	3.5729	0.82
						1/2"	0.8483	3.8721	0.84
						Ice	1.0660	4.1800	0.86
						1" Ice			
Bridge Stiffener (35" x 10.5" x 1.25")	B	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.82
						1/2"	0.0000	0.0000	0.84
						Ice	0.0000	0.0000	0.86
						1" Ice			
Bridge Stiffener (35" x 10.5" x 1.25")	C	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.82
						1/2"	0.0000	0.0000	0.84
						Ice	0.0000	0.0000	0.86
						1" Ice			
Bridge Stiffener (35" x 10.5" x 1.25")	A	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.82
						1/2"	0.0000	0.0000	0.84
						Ice	0.0000	0.0000	0.86
						1" Ice			
Bridge Stiffener (35" x 10.5" x 1.25")	B	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.82
						1/2"	0.0000	0.0000	0.84
						Ice	0.0000	0.0000	0.86
						1" Ice			
Bridge Stiffener (35" x 10.5" x 1.25")	C	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.82
						1/2"	0.0000	0.0000	0.84
						Ice	0.0000	0.0000	0.86
						1" Ice			
***									
Bridge Stiffener (58" x 14" x 1.25")	A	None		0.0000	60.0000	No Ice	1.0069	7.8944	0.35
						1/2"	1.5617	8.3654	0.38
						Ice	2.0568	8.8451	0.42
						1" Ice			
Bridge Stiffener (58" x 14" x 1.25")	B	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.35
						1/2"	0.0000	0.0000	0.38
						Ice	0.0000	0.0000	0.42
						1" Ice			
Bridge Stiffener (58" x 14" x 1.25")	C	None		0.0000	60.0000	No Ice	0.0000	0.0000	0.35
						1/2"	0.0000	0.0000	0.38
						Ice	0.0000	0.0000	0.42
						1" Ice			
Bridge Stiffener (58" x 14" x 1.25")	A	None		0.0000	30.0000	No Ice	1.0069	7.8944	0.35
						1/2"	1.5617	8.3654	0.38
						Ice	2.0568	8.8451	0.42
						1" Ice			
Bridge Stiffener (58" x 14" x 1.25")	B	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2"	0.0000	0.0000	0.38
						Ice	0.0000	0.0000	0.42
						1" Ice			
Bridge Stiffener (58" x 14" x 1.25")	C	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2"	0.0000	0.0000	0.38
						Ice	0.0000	0.0000	0.42
						1" Ice			
***									
Bridge Stiffener (93" x 16" x 1.25")	A	None		0.0000	30.0000	No Ice	1.6146	14.4667	0.35
						1/2"	2.4934	15.1775	0.41
						Ice	3.3846	15.8969	0.47
						1" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	Ice	C <sub>AA</sub> <sub>Front</sub> ft <sup>2</sup>	C <sub>AA</sub> <sub>Side</sub> ft <sup>2</sup>	Weight K
Bridge Stiffener (93" x 16" x 1.25")	B	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.41
						1" Ice	0.0000	0.0000	0.47
Bridge Stiffener (93" x 16" x 1.25")	C	None		0.0000	30.0000	No Ice	0.0000	0.0000	0.35
						1/2" Ice	0.0000	0.0000	0.41
						1" Ice	0.0000	0.0000	0.47

### Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight K	
VHLP1-18	A	Paraboloid w/o Radome	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/o Radome	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

$G_H = 1.690$

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> <sub>In</sub> Face ft <sup>2</sup>	C <sub>AA</sub> <sub>Out</sub> Face ft <sup>2</sup>
L1 120.0000-98.7500	109.3750	1.408	29.20	42.500	A	0.000	42.500	42.500	100.00	0.000	0.000
					B	0.000	42.500	42.500	100.00	0.000	0.000
					C	0.000	42.500	42.500	100.00	0.000	3.363
L2 98.7500-90.0000	94.3750	1.35	28.00	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500	17.500	100.00	0.000	0.000
					C	0.000	17.500	17.500	100.00	0.000	2.585
L3 90.0000-79.2500	84.6250	1.309	27.14	21.500	A	0.000	21.500	21.500	100.00	0.000	0.000
					B	0.000	21.500	21.500	100.00	0.000	0.000
					C	0.000	21.500	21.500	100.00	0.000	1.871
L4 79.2500-75.1700	77.2100	1.275	26.44	8.160	A	0.000	8.160	8.160	100.00	0.000	0.000
					B	0.000	8.160	8.160	100.00	0.000	0.000
					C	0.000	8.160	8.160	100.00	0.000	0.710
L5 75.1700-60.0000	67.5850	1.227	25.45	30.340	A	0.000	30.340	30.340	100.00	0.000	0.000
					B	0.000	30.340	30.340	100.00	0.000	0.000
					C	0.000	30.340	30.340	100.00	0.000	6.621
L6 60.0000-49.2500	54.6250	1.155	23.95	26.875	A	0.000	26.875	26.875	100.00	0.000	0.000
					B	0.000	26.875	26.875	100.00	0.000	0.000
					C	0.000	26.875	26.875	100.00	0.000	4.763
L7 49.2500-43.0000	46.1250	1.1	22.82	15.625	A	0.000	15.625	15.625	100.00	0.000	0.000
					B	0.000	15.625	15.625	100.00	0.000	0.000
					C	0.000	15.625	15.625	100.00	0.000	2.977
L8 43.0000-30.0000	36.5000	1.029	21.34	32.500	A	0.000	32.500	32.500	100.00	0.000	0.000
					B	0.000	32.500	32.500	100.00	0.000	0.000
					C	0.000	32.500	32.500	100.00	0.000	8.468
L9 30.0000-	28.0000	1	20.74	12.000	A	0.000	12.000	12.000	100.00	0.000	0.000

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$A_G$ ft <sup>2</sup>	Face ft	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
26.0000					B	0.000	12.000		100.00	0.000	0.000
L10 26.0000-20.7500	23.3750	1	20.74	15.750	C	0.000	12.000		100.00	0.000	2.087
					A	0.000	15.750	15.750	100.00	0.000	0.000
					B	0.000	15.750		100.00	0.000	0.000
L11 20.7500-18.0000	19.3750	1	20.74	8.250	C	0.000	15.750		100.00	0.000	3.000
					A	0.000	8.250	8.250	100.00	0.000	0.000
					B	0.000	8.250		100.00	0.000	0.000
L12 18.0000-13.5000	15.7500	1	20.74	13.500	C	0.000	8.250		100.00	0.000	2.008
					A	0.000	13.500	13.500	100.00	0.000	0.000
					B	0.000	13.500		100.00	0.000	0.000
L13 13.5000-8.0000	10.7500	1	20.74	16.500	C	0.000	13.500		100.00	0.000	3.286
					A	0.000	16.500	16.500	100.00	0.000	0.000
					B	0.000	16.500		100.00	0.000	0.000
L14 8.0000-6.2500	7.1250	1	20.74	5.250	C	0.000	16.500		100.00	0.000	4.016
					A	0.000	5.250	5.250	100.00	0.000	0.000
					B	0.000	5.250		100.00	0.000	0.000
L15 6.2500-0.0000	3.1250	1	20.74	18.750	C	0.000	5.250		100.00	0.000	1.278
					A	0.000	18.750	18.750	100.00	0.000	0.000
					B	0.000	18.750		100.00	0.000	0.000
					C	0.000	18.750		100.00	0.000	4.563

### Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	$K_z$	$q_z$ psf	$t_z$ in	$A_G$ ft <sup>2</sup>	Face ft	$A_F$ ft <sup>2</sup>	$A_R$ ft <sup>2</sup>	$A_{leg}$ ft <sup>2</sup>	Leg %	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>
L1 120.0000-98.7500	109.3750	1.408	5.10	0.7500	45.156	A	0.000	45.156	45.156	100.00	0.000	0.000
						B	0.000	45.156		100.00	0.000	0.000
						C	0.000	45.156		100.00	0.000	6.350
L2 98.7500-90.0000	94.3750	1.35	4.89	0.7500	18.594	A	0.000	18.594	18.594	100.00	0.000	0.000
						B	0.000	18.594		100.00	0.000	0.000
						C	0.000	18.594		100.00	0.000	5.314
L3 90.0000-79.2500	84.6250	1.309	4.74	0.7500	22.844	A	0.000	22.844	22.844	100.00	0.000	0.000
						B	0.000	22.844		100.00	0.000	0.000
						C	0.000	22.844		100.00	0.000	3.483
L4 79.2500-75.1700	77.2100	1.275	4.61	0.7500	8.670	A	0.000	8.670	8.670	100.00	0.000	0.000
						B	0.000	8.670		100.00	0.000	0.000
						C	0.000	8.670		100.00	0.000	1.322
L5 75.1700-60.0000	67.5850	1.227	4.44	0.7500	32.236	A	0.000	32.236	32.236	100.00	0.000	0.000
						B	0.000	32.236		100.00	0.000	0.000
						C	0.000	32.236		100.00	0.000	11.425
L6 60.0000-49.2500	54.6250	1.155	4.18	0.7500	28.219	A	0.000	28.219	28.219	100.00	0.000	0.000
						B	0.000	28.219		100.00	0.000	0.000
						C	0.000	28.219		100.00	0.000	8.167
L7 49.2500-43.0000	46.1250	1.1	3.98	0.7500	16.406	A	0.000	16.406	16.406	100.00	0.000	0.000
						B	0.000	16.406		100.00	0.000	0.000
						C	0.000	16.406		100.00	0.000	5.123
L8 43.0000-30.0000	36.5000	1.029	3.72	0.7500	34.125	A	0.000	34.125	34.125	100.00	0.000	0.000
						B	0.000	34.125		100.00	0.000	0.000
						C	0.000	34.125		100.00	0.000	14.751
L9 30.0000-26.0000	28.0000	1	3.62	0.7500	12.500	A	0.000	12.500	12.500	100.00	0.000	0.000
						B	0.000	12.500		100.00	0.000	0.000
						C	0.000	12.500		100.00	0.000	3.409
L10 26.0000-20.7500	23.3750	1	3.62	0.7500	16.406	A	0.000	16.406	16.406	100.00	0.000	0.000
						B	0.000	16.406		100.00	0.000	0.000
						C	0.000	16.406		100.00	0.000	4.943
L11 20.7500-18.0000	19.3750	1	3.62	0.7500	8.594	A	0.000	8.594	8.594	100.00	0.000	0.000
						B	0.000	8.594		100.00	0.000	0.000
						C	0.000	8.594		100.00	0.000	3.375
L12 18.0000-13.5000	15.7500	1	3.62	0.7500	14.063	A	0.000	14.063	14.063	100.00	0.000	0.000
						B	0.000	14.063		100.00	0.000	0.000
						C	0.000	14.063		100.00	0.000	5.523



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>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>
L13 13.5000-8.0000	10.7500	1	3.62	0.7500	17.188	A	0.000	17.188	17.188	100.00	0.000	0.000
						B	0.000	17.188		100.00	0.000	0.000
						C	0.000	17.188		100.00	0.000	6.750
L14 8.0000-6.2500	7.1250	1	3.62	0.7500	5.469	A	0.000	5.469	5.469	100.00	0.000	0.000
						B	0.000	5.469		100.00	0.000	0.000
						C	0.000	5.469		100.00	0.000	2.148
L15 6.2500-0.0000	3.1250	1	3.62	0.7500	19.531	A	0.000	19.531	19.531	100.00	0.000	0.000
						B	0.000	19.531		100.00	0.000	0.000
						C	0.000	19.531		100.00	0.000	7.671

**Tower Pressure - Service**

$G_H = 1.690$

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>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>
L1 120.0000-98.7500	109.3750	1.408	9.01	42.500	A	0.000	42.500	42.500	100.00	0.000	0.000
					B	0.000	42.500		100.00	0.000	0.000
					C	0.000	42.500		100.00	0.000	3.363
L2 98.7500-90.0000	94.3750	1.35	8.64	17.500	A	0.000	17.500	17.500	100.00	0.000	0.000
					B	0.000	17.500		100.00	0.000	0.000
					C	0.000	17.500		100.00	0.000	2.585
L3 90.0000-79.2500	84.6250	1.309	8.38	21.500	A	0.000	21.500	21.500	100.00	0.000	0.000
					B	0.000	21.500		100.00	0.000	0.000
					C	0.000	21.500		100.00	0.000	1.871
L4 79.2500-75.1700	77.2100	1.275	8.16	8.160	A	0.000	8.160	8.160	100.00	0.000	0.000
					B	0.000	8.160		100.00	0.000	0.000
					C	0.000	8.160		100.00	0.000	0.710
L5 75.1700-60.0000	67.5850	1.227	7.85	30.340	A	0.000	30.340	30.340	100.00	0.000	0.000
					B	0.000	30.340		100.00	0.000	0.000
					C	0.000	30.340		100.00	0.000	6.621
L6 60.0000-49.2500	54.6250	1.155	7.39	26.875	A	0.000	26.875	26.875	100.00	0.000	0.000
					B	0.000	26.875		100.00	0.000	0.000
					C	0.000	26.875		100.00	0.000	4.763
L7 49.2500-43.0000	46.1250	1.1	7.04	15.625	A	0.000	15.625	15.625	100.00	0.000	0.000
					B	0.000	15.625		100.00	0.000	0.000
					C	0.000	15.625		100.00	0.000	2.977
L8 43.0000-30.0000	36.5000	1.029	6.59	32.500	A	0.000	32.500	32.500	100.00	0.000	0.000
					B	0.000	32.500		100.00	0.000	0.000
					C	0.000	32.500		100.00	0.000	8.468
L9 30.0000-26.0000	28.0000	1	6.40	12.000	A	0.000	12.000	12.000	100.00	0.000	0.000
					B	0.000	12.000		100.00	0.000	0.000
					C	0.000	12.000		100.00	0.000	2.087
L10 26.0000-20.7500	23.3750	1	6.40	15.750	A	0.000	15.750	15.750	100.00	0.000	0.000
					B	0.000	15.750		100.00	0.000	0.000
					C	0.000	15.750		100.00	0.000	3.000
L11 20.7500-18.0000	19.3750	1	6.40	8.250	A	0.000	8.250	8.250	100.00	0.000	0.000
					B	0.000	8.250		100.00	0.000	0.000
					C	0.000	8.250		100.00	0.000	2.008
L12 18.0000-13.5000	15.7500	1	6.40	13.500	A	0.000	13.500	13.500	100.00	0.000	0.000
					B	0.000	13.500		100.00	0.000	0.000
					C	0.000	13.500		100.00	0.000	3.286
L13 13.5000-8.0000	10.7500	1	6.40	16.500	A	0.000	16.500	16.500	100.00	0.000	0.000
					B	0.000	16.500		100.00	0.000	0.000
					C	0.000	16.500		100.00	0.000	4.016
L14 8.0000-6.2500	7.1250	1	6.40	5.250	A	0.000	5.250	5.250	100.00	0.000	0.000
					B	0.000	5.250		100.00	0.000	0.000
					C	0.000	5.250		100.00	0.000	1.278
L15 6.2500-0.0000	3.1250	1	6.40	18.750	A	0.000	18.750	18.750	100.00	0.000	0.000
					B	0.000	18.750		100.00	0.000	0.000
					C	0.000	18.750		100.00	0.000	4.563

## Load Combinations

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

## Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 98.75	Pole	Max Tension	5	0.00	0.00	0.00
			Max. Compression	14	-9.71	-1.39	0.07
			Max. Mx	5	-5.09	-167.48	-2.77
			Max. My	2	-5.09	4.39	167.86
			Max. Vy	11	-12.48	166.95	4.20
			Max. Vx	8	12.50	-3.62	-167.75
			Max. Torque	8			1.84
L2	98.75 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-11.03	-1.33	0.03
			Max. Mx	5	-6.17	-279.27	-4.11
			Max. My	2	-6.17	6.48	280.03
			Max. Vy	11	-13.14	279.04	6.00
			Max. Vx	8	13.15	-5.05	-279.99
			Max. Torque	8			1.82
L3	90 - 79.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-12.63	-1.23	-0.03
			Max. Mx	11	-7.52	423.95	8.20
			Max. My	8	-7.52	-6.79	-425.07

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	79.25 - 75.17	Pole	Max. Vy	11	-13.82	423.95	8.20
			Max. Vx	8	13.83	-6.79	-425.07
			Max. Torque	8			1.80
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-13.38	-1.20	-0.05
L5	75.17 - 60	Pole	Max. Mx	11	-8.19	480.83	9.04
			Max. My	8	-8.18	-7.44	-482.02
			Max. Vy	11	-14.07	480.83	9.04
			Max. Vx	8	14.09	-7.44	-482.02
			Max. Torque	8			1.79
L6	60 - 49.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.70	-1.06	-0.12
			Max. Mx	11	-11.20	702.41	12.15
			Max. My	8	-11.20	-9.89	-703.85
			Max. Vy	11	-15.13	702.41	12.15
L7	49.25 - 43	Pole	Max. Vx	8	15.14	-9.89	-703.85
			Max. Torque	8			1.78
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22.87	-0.95	-0.18
			Max. Mx	11	-16.83	875.85	14.36
L8	43 - 30	Pole	Max. My	8	-16.83	-11.62	-877.47
			Max. Vy	11	-16.53	875.85	14.36
			Max. Vx	8	16.54	-11.62	-877.47
			Max. Torque	8			1.74
			Max Tension	1	0.00	0.00	0.00
L9	30 - 26	Pole	Max. Compression	14	-24.50	-0.88	-0.22
			Max. Mx	11	-18.30	980.47	15.64
			Max. My	8	-18.30	-12.62	-982.19
			Max. Vy	11	-16.96	980.47	15.64
			Max. Vx	8	16.98	-12.62	-982.19
L10	26 - 20.75	Pole	Max. Torque	8			1.71
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.53	-0.73	-0.30
			Max. Mx	11	-22.01	1206.80	18.29
			Max. My	8	-22.01	-14.69	-1208.74
L11	20.75 - 18	Pole	Max. Vy	11	-17.86	1206.80	18.29
			Max. Vx	8	17.87	-14.69	-1208.74
			Max. Torque	8			1.69
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34.68	-0.68	-0.33
L12	18 - 13.5	Pole	Max. Mx	11	-27.52	1282.21	19.10
			Max. My	8	-27.52	-15.32	-1284.21
			Max. Vy	11	-18.99	1282.21	19.10
			Max. Vx	8	19.01	-15.32	-1284.21
			Max. Torque	8			1.63
L13	13.5 - 8	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.29	-0.61	-0.37
			Max. Mx	11	-28.97	1382.83	20.17
			Max. My	8	-28.97	-16.15	-1384.92
			Max. Vy	11	-19.35	1382.83	20.17
L12	18 - 13.5	Pole	Max. Vx	8	19.37	-16.15	-1384.92
			Max. Torque	8			1.61
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37.28	-0.58	-0.39
			Max. Mx	11	-29.87	1436.32	20.72
L11	20.75 - 18	Pole	Max. My	8	-29.87	-16.58	-1438.45
			Max. Vy	11	-19.56	1436.32	20.72
			Max. Vx	8	19.58	-16.58	-1438.45
			Max. Torque	8			1.59
			Max Tension	1	0.00	0.00	0.00
L12	18 - 13.5	Pole	Max. Compression	14	-38.74	-0.52	-0.42
			Max. Mx	11	-31.20	1525.05	21.63
			Max. My	8	-31.20	-17.29	-1527.25
			Max. Vy	11	-19.89	1525.05	21.63
			Max. Vx	8	19.90	-17.29	-1527.25
L13	13.5 - 8	Pole	Max. Torque	8			1.58
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40.54	-0.45	-0.46

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L14	8 - 6.25	Pole	Max. Mx	11	-32.84	1635.42	22.72
			Max. My	8	-32.84	-18.14	-1637.71
			Max. Vy	11	-20.26	1635.42	22.72
			Max. Vx	8	20.28	-18.14	-1637.71
			Max. Torque	8			1.55
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41.22	-0.42	-0.48
			Max. Mx	11	-33.47	1670.97	23.07
			Max. My	8	-33.47	-18.41	-1673.29
			Max. Vy	11	-20.39	1670.97	23.07
L15	6.25 - 0	Pole	Max. Vx	8	20.41	-18.41	-1673.29
			Max. Torque	8			1.52
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43.64	-0.34	-0.52
			Max. Mx	11	-35.71	1799.67	24.31
			Max. My	8	-35.71	-19.37	-1802.09
			Max. Vy	11	-20.81	1799.67	24.31
			Max. Vx	8	20.83	-19.37	-1802.09
			Max. Torque	8			1.51

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	43.64	0.00	0.00
	Max. H <sub>x</sub>	11	35.72	20.80	0.20
	Max. H <sub>z</sub>	2	35.72	0.23	20.81
	Max. M <sub>x</sub>	2	1801.35	0.23	20.81
	Max. M <sub>z</sub>	5	1796.61	-20.77	-0.15
	Max. Torsion	8	1.48	-0.16	-20.82
	Min. Vert	11	35.72	20.80	0.20
	Min. H <sub>x</sub>	5	35.72	-20.77	-0.15
	Min. H <sub>z</sub>	8	35.72	-0.16	-20.82
	Min. M <sub>x</sub>	8	-1802.09	-0.16	-20.82
	Min. M <sub>z</sub>	11	-1799.67	20.80	0.20
	Min. Torsion	2	-1.36	0.23	20.81

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	35.72	-0.00	0.00	0.07	-0.39	0.00
Dead+Wind 0 deg - No Ice	35.72	-0.23	-20.81	-1801.35	28.08	1.36
Dead+Wind 30 deg - No Ice	35.72	10.26	-17.90	-1545.13	-883.07	1.13
Dead+Wind 60 deg - No Ice	35.72	17.92	-10.25	-881.99	-1547.59	0.68
Dead+Wind 90 deg - No Ice	35.72	20.77	0.15	17.94	-1796.61	0.03
Dead+Wind 120 deg - No Ice	35.72	18.07	10.60	925.18	-1565.76	-0.71
Dead+Wind 150 deg - No Ice	35.72	10.50	18.13	1572.72	-912.47	-1.25
Dead+Wind 180 deg - No Ice	35.72	0.16	20.82	1802.09	-19.37	-1.48
Dead+Wind 210 deg - No Ice	35.72	-10.23	17.95	1551.69	878.66	-1.29
Dead+Wind 240 deg - No Ice	35.72	-17.96	10.28	885.24	1552.74	-0.65
Dead+Wind 270 deg - No Ice	35.72	-20.80	-0.20	-24.31	1799.67	0.13
Dead+Wind 300 deg - No Ice	35.72	-18.11	-10.54	-917.44	1570.27	0.80
Dead+Wind 330 deg - No Ice	35.72	-10.59	-18.08	-1566.45	922.49	1.23
Dead+Ice+Temp	43.64	-0.00	-0.00	0.52	-0.34	0.00
Dead+Wind 0 deg+Ice+Temp	43.64	-0.04	-4.49	-396.71	4.91	0.28
Dead+Wind 30 deg+Ice+Temp	43.64	2.22	-3.87	-340.67	-195.78	0.24



Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg+Ice+Temp	43.64	3.87	-2.22	-194.74	-341.97	0.16
Dead+Wind 90 deg+Ice+Temp	43.64	4.48	0.03	3.61	-396.48	0.03
Dead+Wind 120 deg+Ice+Temp	43.64	3.89	2.28	203.71	-345.12	-0.12
Dead+Wind 150 deg+Ice+Temp	43.64	2.26	3.91	346.86	-200.77	-0.24
Dead+Wind 180 deg+Ice+Temp	43.64	0.03	4.49	397.91	-3.72	-0.30
Dead+Wind 210 deg+Ice+Temp	43.64	-2.21	3.88	343.11	194.18	-0.27
Dead+Wind 240 deg+Ice+Temp	43.64	-3.88	2.22	196.48	342.41	-0.16
Dead+Wind 270 deg+Ice+Temp	43.64	-4.49	-0.04	-3.92	396.48	0.00
Dead+Wind 300 deg+Ice+Temp	43.64	-3.90	-2.27	-201.03	345.42	0.14
Dead+Wind 330 deg+Ice+Temp	43.64	-2.28	-3.90	-344.49	202.25	0.24
Dead+Wind 0 deg - Service	35.72	-0.07	-6.42	-556.27	8.38	0.43
Dead+Wind 30 deg - Service	35.72	3.17	-5.52	-477.17	-273.03	0.35
Dead+Wind 60 deg - Service	35.72	5.53	-3.16	-272.32	-478.21	0.21
Dead+Wind 90 deg - Service	35.72	6.41	0.05	5.59	-555.17	0.01
Dead+Wind 120 deg - Service	35.72	5.58	3.27	285.78	-483.85	-0.22
Dead+Wind 150 deg - Service	35.72	3.24	5.59	485.82	-282.13	-0.39
Dead+Wind 180 deg - Service	35.72	0.05	6.42	556.60	-6.27	-0.46
Dead+Wind 210 deg - Service	35.72	-3.16	5.54	479.25	271.06	-0.40
Dead+Wind 240 deg - Service	35.72	-5.54	3.17	273.43	479.23	-0.21
Dead+Wind 270 deg - Service	35.72	-6.42	-0.06	-7.46	555.54	0.04
Dead+Wind 300 deg - Service	35.72	-5.59	-3.25	-283.32	484.72	0.25
Dead+Wind 330 deg - Service	35.72	-3.27	-5.58	-483.72	284.61	0.39

## 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	-35.72	0.00	0.00	35.72	-0.00	0.000%
2	-0.23	-35.72	-20.81	0.23	35.72	20.81	0.002%
3	10.26	-35.72	-17.90	-10.26	35.72	17.90	0.000%
4	17.92	-35.72	-10.25	-17.92	35.72	10.25	0.000%
5	20.77	-35.72	0.15	-20.77	35.72	-0.15	0.004%
6	18.07	-35.72	10.60	-18.07	35.72	-10.60	0.000%
7	10.50	-35.72	18.13	-10.50	35.72	-18.13	0.000%
8	0.16	-35.72	20.82	-0.16	35.72	-20.82	0.002%
9	-10.23	-35.72	17.95	10.23	35.72	-17.95	0.000%
10	-17.96	-35.72	10.28	17.96	35.72	-10.28	0.000%
11	-20.80	-35.72	-0.20	20.80	35.72	0.20	0.004%
12	-18.11	-35.72	-10.54	18.11	35.72	10.54	0.000%
13	-10.59	-35.72	-18.08	10.59	35.72	18.08	0.000%
14	0.00	-43.64	0.00	0.00	43.64	0.00	0.001%
15	-0.04	-43.64	-4.49	0.04	43.64	4.49	0.000%
16	2.22	-43.64	-3.87	-2.22	43.64	3.87	0.000%
17	3.87	-43.64	-2.22	-3.87	43.64	2.22	0.000%
18	4.48	-43.64	0.03	-4.48	43.64	-0.03	0.000%
19	3.89	-43.64	2.28	-3.89	43.64	-2.28	0.000%
20	2.26	-43.64	3.91	-2.26	43.64	-3.91	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
21	0.03	-43.64	4.49	-0.03	43.64	-4.49	0.000%
22	-2.21	-43.64	3.88	2.21	43.64	-3.88	0.000%
23	-3.88	-43.64	2.22	3.88	43.64	-2.22	0.000%
24	-4.49	-43.64	-0.04	4.49	43.64	0.04	0.000%
25	-3.90	-43.64	-2.27	3.90	43.64	2.27	0.000%
26	-2.28	-43.64	-3.90	2.28	43.64	3.90	0.000%
27	-0.07	-35.72	-6.42	0.07	35.72	6.42	0.003%
28	3.17	-35.72	-5.53	-3.17	35.72	5.52	0.001%
29	5.53	-35.72	-3.16	-5.53	35.72	3.16	0.003%
30	6.41	-35.72	0.05	-6.41	35.72	-0.05	0.003%
31	5.58	-35.72	3.27	-5.58	35.72	-3.27	0.003%
32	3.24	-35.72	5.59	-3.24	35.72	-5.59	0.001%
33	0.05	-35.72	6.42	-0.05	35.72	-6.42	0.003%
34	-3.16	-35.72	5.54	3.16	35.72	-5.54	0.003%
35	-5.54	-35.72	3.17	5.54	35.72	-3.17	0.003%
36	-6.42	-35.72	-0.06	6.42	35.72	0.06	0.003%
37	-5.59	-35.72	-3.25	5.59	35.72	3.25	0.001%
38	-3.27	-35.72	-5.58	3.27	35.72	5.58	0.003%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	15	0.00000001	0.00007154
3	Yes	18	0.00000001	0.00006538
4	Yes	17	0.00000001	0.00014656
5	Yes	14	0.00004776	0.00006860
6	Yes	18	0.00000001	0.00006527
7	Yes	18	0.00000001	0.00007082
8	Yes	15	0.00000001	0.00013672
9	Yes	17	0.00000001	0.00014202
10	Yes	18	0.00000001	0.00006427
11	Yes	14	0.00004776	0.00012116
12	Yes	18	0.00000001	0.00006960
13	Yes	18	0.00000001	0.00006380
14	Yes	6	0.00000001	0.00001535
15	Yes	15	0.00000001	0.00009459
16	Yes	15	0.00000001	0.00010470
17	Yes	15	0.00000001	0.00010400
18	Yes	15	0.00000001	0.00009457
19	Yes	15	0.00000001	0.00010700
20	Yes	15	0.00000001	0.00010779
21	Yes	15	0.00000001	0.00009494
22	Yes	15	0.00000001	0.00010313
23	Yes	15	0.00000001	0.00010405
24	Yes	15	0.00000001	0.00009372
25	Yes	15	0.00000001	0.00010633
26	Yes	15	0.00000001	0.00010566
27	Yes	13	0.00011581	0.00007526
28	Yes	14	0.00000001	0.00007564
29	Yes	13	0.00000001	0.00011250
30	Yes	13	0.00011583	0.00005462
31	Yes	13	0.00011564	0.00012162
32	Yes	14	0.00000001	0.00008449
33	Yes	13	0.00011581	0.00008528
34	Yes	13	0.00000001	0.00010198
35	Yes	13	0.00000001	0.00013935
36	Yes	13	0.00011579	0.00005639
37	Yes	14	0.00000001	0.00007779
38	Yes	13	0.00011562	0.00011450

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 98.75	18.522	31	1.3856	0.0071
L2	98.75 - 90	12.509	31	1.2752	0.0044
L3	90 - 79.25	10.246	31	1.1874	0.0035
L4	79.25 - 75.17	7.756	31	1.0129	0.0024
L5	75.17 - 60	6.917	31	0.9501	0.0021
L6	60 - 49.25	4.258	31	0.7085	0.0013
L7	49.25 - 43	2.817	31	0.5664	0.0009
L8	43 - 30	2.128	31	0.4855	0.0007
L9	30 - 26	1.017	31	0.3248	0.0004
L10	26 - 20.75	0.764	31	0.2788	0.0003
L11	20.75 - 18	0.488	31	0.2229	0.0003
L12	18 - 13.5	0.367	31	0.1972	0.0002
L13	13.5 - 8	0.204	31	0.1474	0.0002
L14	8 - 6.25	0.071	31	0.0833	0.0001
L15	6.25 - 0	0.044	31	0.0659	0.0001

### 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	31	18.522	1.3856	0.0074	24818
121.0000	VHLP1-18	31	18.522	1.3856	0.0074	24818
117.0000	LLPX310R w/ Mount Pipe	31	17.652	1.3735	0.0070	24818
100.0000	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	31	12.846	1.2844	0.0047	6241
60.0000	Bridge Stiffener (35" x 10.5" x 1.25")	31	4.258	0.7085	0.0013	3678
30.0000	Bridge Stiffener (35" x 10.5" x 1.25")	31	1.017	0.3248	0.0004	4647

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 98.75	59.781	6	4.4700	0.0232
L2	98.75 - 90	40.403	6	4.1178	0.0143
L3	90 - 79.25	33.104	6	3.8356	0.0115
L4	79.25 - 75.17	25.068	6	3.2733	0.0079
L5	75.17 - 60	22.358	6	3.0705	0.0069
L6	60 - 49.25	13.769	6	2.2908	0.0041
L7	49.25 - 43	9.112	6	1.8318	0.0029
L8	43 - 30	6.882	6	1.5701	0.0023
L9	30 - 26	3.291	6	1.0507	0.0013
L10	26 - 20.75	2.472	6	0.9018	0.0011
L11	20.75 - 18	1.579	6	0.7212	0.0008
L12	18 - 13.5	1.187	6	0.6381	0.0007
L13	13.5 - 8	0.661	6	0.4771	0.0005
L14	8 - 6.25	0.230	6	0.2695	0.0003
L15	6.25 - 0	0.141	6	0.2132	0.0002

### 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	6	59.781	4.4700	0.0237	7856
121.0000	VHLP1-18	6	59.781	4.4700	0.0237	7856
117.0000	LLPX310R w/ Mount Pipe	6	56.977	4.4315	0.0222	7856
100.0000	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	6	41.490	4.1473	0.0149	1973
60.0000	Bridge Stiffener (35" x 10.5" x 1.25")	6	13.769	2.2908	0.0043	1143
30.0000	Bridge Stiffener (35" x 10.5" x 1.25")	6	3.291	1.0507	0.0014	1438

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P P <sub>a</sub>
L1	120 - 98.75 (1)	P24x0.25	21.2500	0.0000	0.0	23.696	18.6532	-5.07	442.00	0.011
L2	98.75 - 90 (2)	RPS 24" x 0.38762"	8.7500	0.0000	0.0	21.522	28.7538	-6.15	618.84	0.010
L3	90 - 79.25 (3)	P24x0.375	10.7500	0.0000	0.0	25.200	27.8325	-7.51	701.38	0.011
L4	79.25 - 75.17 (4)	Pipe 24" x 0.51722" Reinf	4.0800	0.0000	0.0	24.240	38.1570	-8.17	924.93	0.009
L5	75.17 - 60 (5)	RPS 24" x 0.66391"	15.1700	0.0000	0.0	24.246	48.6729	-11.18	1180.12	0.009
L6	60 - 49.25 (6)	RPS 30" x 0.52963"	10.7500	0.0000	0.0	22.776	49.0352	-16.82	1116.83	0.015
L7	49.25 - 43 (7)	RPS 30" x 0.6427"	6.2500	0.0000	0.0	22.782	59.2754	-18.29	1350.41	0.014
L8	43 - 30 (8)	RPS 30" x 0.80546"	13.0000	0.0000	0.0	21.138	73.8747	-22.00	1561.56	0.014
L9	30 - 26 (9)	RPS 36" x 0.55016"	4.0000	0.0000	0.0	21.522	61.2707	-27.52	1318.67	0.021
L10	26 - 20.75 (10)	RPS 36" x 0.64191"	5.2500	0.0000	0.0	21.522	71.3038	-28.97	1534.60	0.019
L11	20.75 - 18 (11)	RPS 36" x 0.78214"	2.7500	0.0000	0.0	21.522	86.5361	-29.87	1862.43	0.016
L12	18 - 13.5 (12)	RPS 36" x 0.68817"	4.5000	0.0000	0.0	21.522	76.3424	-31.20	1643.04	0.019
L13	13.5 - 8 (13)	RPS 36" x 0.69662"	5.5000	0.0000	0.0	21.120	77.2613	-32.84	1631.76	0.020
L14	8 - 6.25 (14)	RPS 36" x 0.86801"	1.7500	0.0000	0.0	21.504	95.8026	-33.47	2060.14	0.016
L15	6.25 - 0 (15)	RPS 36" x 0.8575"	6.2500	0.0000	0.0	21.138	94.6709	-35.71	2001.15	0.018

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> F <sub>by</sub>
L1	120 - 98.75 (1)	P24x0.25	171.01	18.722	23.696	0.790	0.00	0.000	23.696	0.000
L2	98.75 - 90 (2)	RPS 24" x 0.38762"	284.44	20.434	23.674	0.863	0.00	0.000	23.674	0.000
L3	90 - 79.25 (3)	P24x0.375	430.98	31.953	27.720	1.153	0.00	0.000	27.720	0.000
L4	79.25 - 75.17 (4)	Pipe 24" x 0.51722" Reinf	488.49	26.731	26.664	1.003	0.00	0.000	26.664	0.000
L5	75.17 - 60 (5)	RPS 24" x 0.66391"	712.38	30.936	26.671	1.160	0.00	0.000	26.671	0.000
L6	60 - 49.25 (6)	RPS 30" x 0.52963"	887.47	29.998	25.054	1.197	0.00	0.000	25.054	0.000
L7	49.25 - 43 (7)	RPS 30" x 0.6427"	993.04	27.978	25.060	1.116	0.00	0.000	25.060	0.000
L8	43 - 30 (8)	RPS 30" x 0.80546"	1221.3	27.911	23.252	1.200	0.00	0.000	23.252	0.000
L9	30 - 26 (9)	RPS 36" x 0.55016"	1297.3	29.108	23.674	1.230	0.00	0.000	23.674	0.000
L10	26 - 20.75 (10)	RPS 36" x 0.64191"	1398.7	27.105	23.674	1.145	0.00	0.000	23.674	0.000
L11	20.75 - 18 (11)	RPS 36" x 0.78214"	1452.6	23.376	23.674	0.987	0.00	0.000	23.674	0.000
L12	18 - 13.5 (12)	RPS 36" x 0.68817"	1542.0	27.982	23.674	1.182	0.00	0.000	23.674	0.000



Section No.	Elevation ft	Size	Actual $M_x$ kip-ft	Actual $f_{bx}$ ksi	Allow. $F_{bx}$ ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual $M_y$ kip-ft	Actual $f_{by}$ ksi	Allow. $F_{by}$ ksi	Ratio $\frac{f_{by}}{F_{by}}$
L13	13.5 - 8 (13)	RPS 36" x 0.69662"	1653.2 4	29.656	23.232	1.277	0.00	0.000	23.232	0.000
L14	8 - 6.25 (14)	RPS 36" x 0.86801"	1689.0 5	24.668	23.654	1.043	0.00	0.000	23.654	0.000
L15	6.25 - 0 (15)	RPS 36" x 0.8575"	1818.6 7	26.863	23.252	1.155	0.00	0.000	23.252	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V$ K	Actual $f_v$ ksi	Allow. $F_v$ ksi	Ratio $\frac{f_v}{F_v}$	Actual $T$ kip-ft	Actual $f_{vt}$ ksi	Allow. $F_{vt}$ ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	120 - 98.75 (1)	P24x0.25	12.64	1.355	16.800	0.081	1.05	0.057	11.901	0.005
L2	98.75 - 90 (2)	RPS 24" x 0.38762"	13.29	0.925	14.348	0.064	1.03	0.037	14.348	0.003
L3	90 - 79.25 (3)	P24x0.375	13.97	1.004	16.800	0.060	1.02	0.038	16.800	0.002
L4	79.25 - 75.17 (4)	Pipe 24" x 0.51722" Reinf	14.23	0.746	16.160	0.046	1.02	0.028	16.160	0.002
L5	75.17 - 60 (5)	RPS 24" x 0.66391"	15.28	0.628	16.164	0.039	0.97	0.021	16.164	0.001
L6	60 - 49.25 (6)	RPS 30" x 0.52963"	16.68	0.680	15.184	0.045	0.94	0.016	15.184	0.001
L7	49.25 - 43 (7)	RPS 30" x 0.6427"	17.11	0.577	15.188	0.038	0.92	0.013	15.188	0.001
L8	43 - 30 (8)	RPS 30" x 0.80546"	18.01	0.488	14.092	0.035	0.87	0.010	14.092	0.001
L9	30 - 26 (9)	RPS 36" x 0.55016"	19.15	0.625	14.348	0.044	0.85	0.010	14.348	0.001
L10	26 - 20.75 (10)	RPS 36" x 0.64191"	19.51	0.547	14.348	0.038	0.83	0.008	14.348	0.001
L11	20.75 - 18 (11)	RPS 36" x 0.78214"	19.72	0.456	14.348	0.032	0.82	0.007	14.348	0.000
L12	18 - 13.5 (12)	RPS 36" x 0.68817"	20.04	0.525	14.348	0.037	0.79	0.007	14.348	0.000
L13	13.5 - 8 (13)	RPS 36" x 0.69662"	20.42	0.528	14.080	0.038	0.76	0.007	14.080	0.000
L14	8 - 6.25 (14)	RPS 36" x 0.86801"	20.54	0.429	14.336	0.030	0.75	0.005	14.336	0.000
L15	6.25 - 0 (15)	RPS 36" x 0.8575"	20.96	0.443	14.092	0.031	0.71	0.005	14.092	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P$ $P_a$	Ratio $f_{bx}$ $F_{bx}$	Ratio $f_{by}$ $F_{by}$	Ratio $f_v$ $F_v$	Ratio $f_{vt}$ $F_{vt}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 98.75 (1)	0.011	0.790	0.000	0.081	0.005	0.809	1.333	H1-3+VT ✓
L2	98.75 - 90 (2)	0.010	0.863	0.000	0.064	0.003	0.878	1.333	H1-3+VT ✓
L3	90 - 79.25 (3)	0.011	1.153	0.000	0.060	0.002	1.167	1.333	H1-3+VT ✓
L4	79.25 - 75.17 (4)	0.009	1.003	0.000	0.046	0.002	1.014	1.333	H1-3+VT ✓
L5	75.17 - 60 (5)	0.009	1.160	0.000	0.039	0.001	1.171	1.333	H1-3+VT ✓
L6	60 - 49.25 (6)	0.015	1.197	0.000	0.045	0.001	1.215	1.333	H1-3+VT ✓
L7	49.25 - 43 (7)	0.014	1.116	0.000	0.038	0.001	1.131	1.333	H1-3+VT ✓
L8	43 - 30 (8)	0.014	1.200	0.000	0.035	0.001	1.216	1.333	H1-3+VT ✓
L9	30 - 26 (9)	0.021	1.230	0.000	0.044	0.001	1.252	1.333	H1-3+VT ✓
L10	26 - 20.75	0.019	1.145	0.000	0.038	0.001	1.165	1.333	H1-3+VT ✓

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	(10)						✓		
L11	20.75 - 18	0.016	0.987	0.000	0.032	0.000	1.004	1.333	H1-3+VT ✓
	(11)						✓		
L12	18 - 13.5 (12)	0.019	1.182	0.000	0.037	0.000	1.202	1.333	H1-3+VT ✓
L13	13.5 - 8 (13)	0.020	1.277	0.000	0.038	0.000	1.298	1.333	H1-3+VT ✓
L14	8 - 6.25 (14)	0.016	1.043	0.000	0.030	0.000	1.060	1.333	H1-3+VT ✓
L15	6.25 - 0 (15)	0.018	1.155	0.000	0.031	0.000	1.174	1.333	H1-3+VT ✓

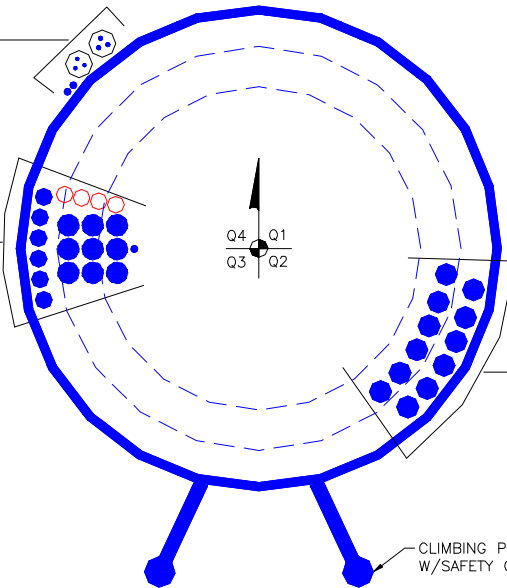
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* $P_{allow}$ K	% Capacity	Pass Fail	
L1	120 - 98.75	Pole	P24x0.25	1	-5.07	589.19	60.7	Pass	
L2	98.75 - 90	Pole	RPS 24" x 0.38762"	2	-6.15	824.91	65.8	Pass	
L3	90 - 79.25	Pole	P24x0.375	3	-7.51	934.94	87.6	Pass	
L4	79.25 - 75.17	Pole	Pipe 24" x 0.51722" Reinf	4	-8.17	1232.93	76.0	Pass	
L5	75.17 - 60	Pole	RPS 24" x 0.66391"	5	-11.18	1573.10	87.8	Pass	
L6	60 - 49.25	Pole	RPS 30" x 0.52963"	6	-16.82	1488.73	91.1	Pass	
L7	49.25 - 43	Pole	RPS 30" x 0.6427"	7	-18.29	1800.10	84.9	Pass	
L8	43 - 30	Pole	RPS 30" x 0.80546"	8	-22.00	2081.56	91.2	Pass	
L9	30 - 26	Pole	RPS 36" x 0.55016"	9	-27.52	1757.79	93.9	Pass	
L10	26 - 20.75	Pole	RPS 36" x 0.64191"	10	-28.97	2045.62	87.4	Pass	
L11	20.75 - 18	Pole	RPS 36" x 0.78214"	11	-29.87	2482.62	75.4	Pass	
L12	18 - 13.5	Pole	RPS 36" x 0.68817"	12	-31.20	2190.17	90.2	Pass	
L13	13.5 - 8	Pole	RPS 36" x 0.69662"	13	-32.84	2175.14	97.4	Pass	
L14	8 - 6.25	Pole	RPS 36" x 0.86801"	14	-33.47	2746.17	79.5	Pass	
L15	6.25 - 0	Pole	RPS 36" x 0.8575"	15	-35.71	2667.53	88.1	Pass	
							Summary		
							Pole (L13)	97.4	Pass
							<b>RATING =</b>	<b>97.4</b>	<b>Pass</b>

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

(INSTALLED—BUNDLED IN (2) 2" CONDUITS)  
(3) 1/4" TO 117 FT LEVEL  
(3) 5/16" TO 117 FT LEVEL  
(INSTALLED)  
(2) 1/2" TO 117 FT LEVEL

(PROPOSED)  
(4) 1-1/4" TO 117 FT LEVEL  
(INSTALLED TO BE REMOVED)  
(1) 1/2" TO 117 FT LEVEL  
(6) 1-1/4" TO 117 FT LEVEL  
(9) 1-5/8" TO 117 FT LEVEL



(INSTALLED)  
(12) 1-5/8" TO 100 FT LEVEL



## **APPENDIX C**

### **ADDITIONAL CALCULATIONS**

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Program Version 6.1.4.1 - 12/17/2013 File:T:/375\_Crown\_Castle/2013/37513-2057 BU 876309/WO 925172 BU 876309 - 005 SDD/37513-2057.005.7700.eri

**DESIGNED APPURTENANCE LOADING**

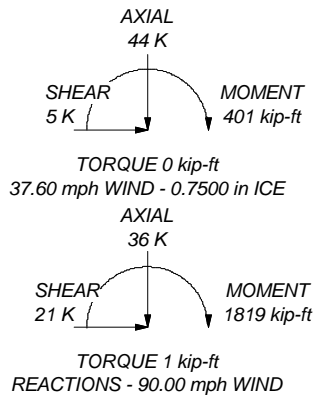
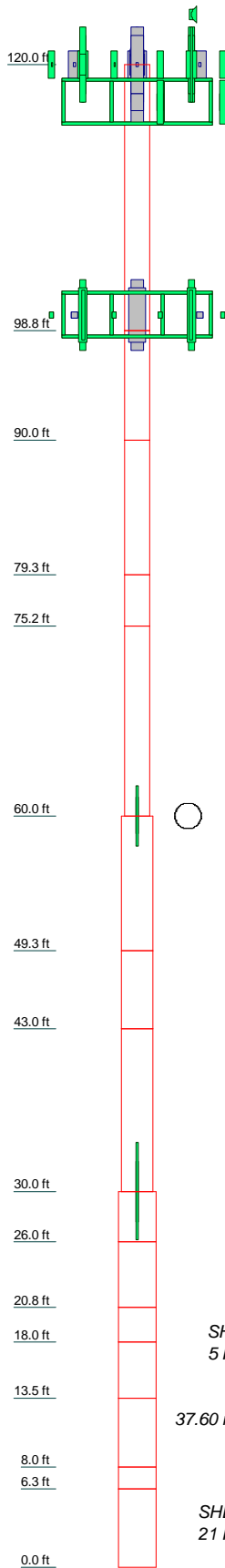
TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe	117	(2) FD9R6004/2C-3L	100
(2) LLPX310R w/ Mount Pipe	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
FDD_R6_RRH	117	(2) FD9R6004/2C-3L	100
(2) FDD_R6_RRH	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
HORIZON COMPACT	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
HORIZON COMPACT	117	BXA-70063-6BF-EDIN-0 w/ Mount Pipe	100
APXV9ERR18-C-A20 w/ Mount Pipe	117	LNx-4514DS-A1M w/ Mount Pipe	100
APXVSP18-C-A20 w/ Mount Pipe	117	LNx-4514DS-A1M w/ Mount Pipe	100
APXVSP18-C-A20 w/ Mount Pipe	117	LNx-4514DS-A1M w/ Mount Pipe	100
800MHZ RRH	117	LNx-4514DS-A1M w/ Mount Pipe	100
800MHZ RRH	117	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	100
800MHZ RRH	117	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	100
(2) 1900MHZ RRH (65MHz)	117	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	100
(2) 1900MHZ RRH (65MHz)	117	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	100
(2) 1900MHZ RRH (65MHz)	117	BXA-171063-8BF-EDIN-0 w/ Mount Pipe	100
(3) ACU-A20-N	117	(2) FD9R6004/2C-3L	100
(3) ACU-A20-N	117	(2) FD9R6004/2C-3L	100
(3) ACU-A20-N	117	(2) FD9R6004/2C-3L	100
800 EXTERNAL NOTCH FILTER	117	Platform Mount [LP 303-1]	100
800 EXTERNAL NOTCH FILTER	117	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	100
800 EXTERNAL NOTCH FILTER	117	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	100
IBC1900HB-2	117	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	100
IBC1900HB-2	117	BXA-171063-8BF-EDIN-2 w/ Mount Pipe	100
IBC1900HB-2	117	Bridge Stiffener (35" x 10.5" x 1.25")	60
APXVTM14-C-120 w/ Mount Pipe	117	Bridge Stiffener (58" x 14" x 1.25")	60
APXVTM14-C-120 w/ Mount Pipe	117	Bridge Stiffener (58" x 14" x 1.25")	60
APXVTM14-C-120 w/ Mount Pipe	117	Bridge Stiffener (58" x 14" x 1.25")	60
TD-RRH8x20-25	117	Bridge Stiffener (35" x 10.5" x 1.25")	60
TD-RRH8x20-25	117	Bridge Stiffener (35" x 10.5" x 1.25")	60
TD-RRH8x20-25	117	Bridge Stiffener (35" x 10.5" x 1.25")	30
(2) 2.375" OD x 6" Mount Pipe	117	Bridge Stiffener (58" x 14" x 1.25")	30
(2) 2.375" OD x 6" Mount Pipe	117	Bridge Stiffener (58" x 14" x 1.25")	30
(2) 2.375" OD x 6" Mount Pipe	117	Bridge Stiffener (58" x 14" x 1.25")	30
Platform Mount [LP 502-1]	117	Bridge Stiffener (93" x 16" x 1.25")	30
VHLP1-18	117	Bridge Stiffener (93" x 16" x 1.25")	30
VHLP1-18	117	Bridge Stiffener (93" x 16" x 1.25")	30
BXA-171063-8BF-EDIN-2 w/ Mount Pipe	100	Bridge Stiffener (35" x 10.5" x 1.25")	30
(2) FD9R6004/2C-3L	100	Bridge Stiffener (35" x 10.5" x 1.25")	30
(2) FD9R6004/2C-3L	100		


**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi	Reinf 37.97 ksi	38 ksi	48 ksi
Reinf 35.87 ksi	36 ksi	45 ksi	Reinf 35.23 ksi	35 ksi	45 ksi
Reinf 40.40 ksi	40 ksi	51 ksi	Reinf 35.20 ksi	35 ksi	44 ksi
Reinf 40.41 ksi	40 ksi	51 ksi	Reinf 35.84 ksi	36 ksi	45 ksi
Reinf 37.96 ksi	38 ksi	48 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90.00 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.60 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50.00 mph wind.
5. TOWER RATING: 97.4%





**Paul J. Ford and Company**  
 250 E. Broad Street, Suite 600  
 Columbus, OH 43215  
 Phone: 614.221.6679  
 FAX: 614.448.4105

**Job: 120 ft Monopole / Jai-Alai**

Project: **PJF 37513-2057 / BU 876309**

Client: CCI	Drawn by: Joey Meinerding	App'd:
Code: TIA/EIA-222-F	Date: 09/18/14	Scale: NTS
Path:		Dwg No. E-1

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**Asymmetric Bolt Analysis**

Moment = 284 k-ft  
 Axial = 6.2 kips  
 Shear = 13.3 kips  
 Anchor Qty = 23

TIA Ref. = F  
 ASIF = 1.3333  
 Max Ratio = 100.0%

Location = Flange Plate  
 η = N/A for BP, Rev. G Sect. 4.9.9  
 Threads = N/A for FP, Rev. G

**\*\* For Flange Plates: Prying action is not considered in the bolt loads. \*\***

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt Circle, in	Area Override, in <sup>2</sup>	Area, in <sup>2</sup>	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.000	A325	92	120	0.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
2	1.000	A325	92	120	18.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
3	1.000	A325	92	120	36.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
4	1.000	A325	92	120	54.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
5	1.000	A325	92	120	72.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
6	1.000	A325	92	120	90.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
7	1.000	A325	92	120	108.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
8	1.000	A325	92	120	126.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
9	1.000	A325	92	120	144.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
10	1.000	A325	92	120	162.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
11	1.000	A325	92	120	180.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
12	1.000	A325	92	120	198.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
13	1.000	A325	92	120	216.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
14	1.000	A325	92	120	234.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
15	1.000	A325	92	120	252.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
16	1.000	A325	92	120	270.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
17	1.000	A325	92	120	288.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
18	1.000	A325	92	120	306.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
19	1.000	A325	92	120	324.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
20	1.000	A325	92	120	342.0	29.00	0.00	0.79	13.80	13.40	13.40	0.00	46.08	29.1%
21	0.000	CCI 4 x 0.75 (65 ksi)	65	80	90.0	32.75	3.00	3.00	59.42	57.91	59.42	103.13	103.13	57.6%
22	0.000	CCI 4 x 0.75 (65 ksi)	65	80	210.0	32.75	3.00	3.00	59.42	57.91	59.42	103.13	103.13	57.6%
23	0.000	CCI 4 x 0.75 (65 ksi)	65	80	330.0	32.75	3.00	3.00	59.42	57.91	59.42	103.13	103.13	57.6%

24.71

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

### Site Data

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

### Reactions

Moment:	164.3	ft-kips
Axial:	3.9	kips
Shear:	8.5	kips
Elevation:	90	feet

Pole Manufacturer:	Other
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If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

### Flange Bolt Results

Bolt Tension Capacity, <b>B</b> :	46.08 kips
Max Bolt <u>directly</u> applied T:	13.40 Kips
Min. PL "tc" for <b>B</b> cap. <b>w/o</b> Pry:	2.018 in
Min PL "treq" for actual <b>T w/ Pry</b> :	0.830 in
Min PL "t1" for actual <b>T w/o Pry</b> :	1.089 in
T allowable with Prying:	35.76 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	13.40 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	29.1% <b>Pass</b>

<b>Rigid</b>
Service, ASD
Fty*ASIF

Bolt Data	
Qty:	20
Diameter (in.):	1
Bolt Material:	A325
N/A:	0 <-- Disregard
N/A:	0 <-- Disregard
Circle (in.):	29

Bolt Fu:	120
Bolt Fy:	92
Bolt Fty:	44.00

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

### Exterior Flange Plate Results

Compression Side Plate Stress:	14.1 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	39.1% <b>Pass</b>
<b>No Prying</b>	
Tension Side Stress Ratio, (treq/t)^2:	30.7% <b>Pass</b>

### Flexural Check

<b>Rigid</b>	
Service ASD	
0.75*Fy*ASIF	
Comp. Y.L. Length:	16.28

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

**n/a**

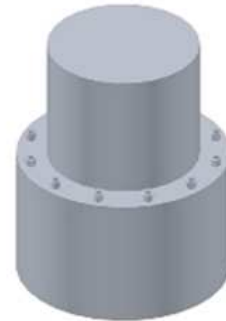
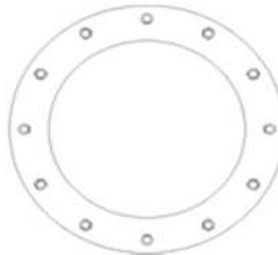
### Stiffener Results

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

### Pole Results

Pole Punching Shear Check:	n/a
----------------------------	-----

Pole Data	
Diam:	24 in
Thick:	0.25 in
Grade:	42 ksi
# of Sides:	0 "0" IF Round
Fu:	63 ksi
Reinf. Fillet Weld:	0 "0" if None



### Stress Increase Factor

ASIF:	1.3333333
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\* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

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



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

### Site Data

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

### Reactions

Moment:	164.3	ft-kips
Axial:	3.9	kips
Shear:	8.5	kips
Elevation:	90	feet

Pole Manufacturer:	Other
--------------------	-------

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

### Flange Bolt Results

Bolt Tension Capacity, <b>B</b> :	46.08 kips
Max Bolt <u>directly</u> applied T:	13.40 Kips
Min. PL "tc" for <b>B</b> cap. <b>w/o</b> Pry:	2.018 in
Min PL "treq" for actual <b>T w/ Pry</b> :	0.830 in
Min PL "t1" for actual <b>T w/o Pry</b> :	1.089 in
T allowable with Prying:	35.76 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	13.40 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	29.1% <b>Pass</b>

<b>Rigid</b>
Service, ASD
Fty*ASIF

Bolt Data	
Qty:	20
Diameter (in.):	1
Bolt Material:	A325
N/A:	0 <-- Disregard
N/A:	0 <-- Disregard
Circle (in.):	29

Bolt Fu:	120
Bolt Fy:	92
Bolt Fty:	44.00

0≤α'≤1 case

### Exterior Flange Plate Results

Compression Side Plate Stress:	14.1 ksi
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	39.1% <b>Pass</b>
<b>No Prying</b>	
Tension Side Stress Ratio, (treq/t)^2:	30.7% <b>Pass</b>

### Flexural Check

<b>Rigid</b>	
Service ASD	
0.75*Fy*ASIF	
Comp. Y.L. Length:	16.28

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

n/a

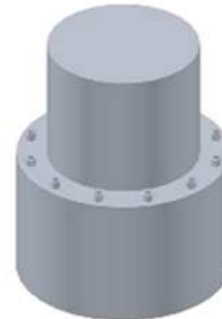
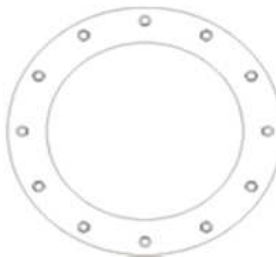
### Stiffener Results

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

### Pole Results

Pole Punching Shear Check:	n/a
----------------------------	-----

Pole Data	
Diam:	24 in
Thick:	0.375 in
Grade:	42 ksi
# of Sides:	0 "0" IF Round
Fu:	63 ksi
Reinf. Fillet Weld:	0 "0" if None



Stress Increase Factor	
ASIF:	1.3333333

\* 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



**PAUL J. FORD AND COMPANY**  
**STRUCTURAL ENGINEERS**  
 250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: 9/18/2014  
 Project No: 37513-2057.005.7700  
 Site Name: Milford Jai-Alai  
 Site Number/BUN: 876309  
 Description:  
 Owner:  
 Engineer:

v2.0, Effective Date: 1-12-12

**Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)**

**General Parameters and Loading:**

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	712.4	k-ft
Axial, Pf:	11.2	kips
Shear, Vf:	15.3	kips

**Pole Parameters:**

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	24.00	30.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	41.00	41.00	in

**Bridge Stiffener Parameters:**

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	3	
Upper Weld Length, L1:	25.00	47.25	in
Lower Weld Length, L2:	22.00	44.13	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E70	E80	
Effective Stiffener Width, Ws:	6.68	7.00	in
Stiffener Thickness, ts:	1.34	1.25	in
Notch, n:	1.00	0.50	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	11.75	4.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	75	degrees
Stiffener Circle:	49.68	49.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.84	12.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.84	9.50	in = (Df - Dp) / 2 + n + Ws / 2

**Flange Bolt Parameters:**

	(1) Bolt Circle		
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	35.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

**Weld Analysis per AISC Table XIX & pg. 4-72:**

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	6	Num. of Sixteenths in Weld
a:	0.5136	0.2646	= e1 / L1
k:	0	0	
C:	0.7715	1.2251	Tabulated Coefficient
C1:	1.0000	1.1400	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	119.6	115.3	kips
Allowable Axial, Pa:	154.3	527.9	kips = ASIF C C1 D L
Ratio:	77.5%	21.8%	
Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.4473	0.2153	= e2 / L2
k:	0	0	
C:	0.8671	1.3502	Tabulated Coefficient
C1:	1.0000	1.1400	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	119.6	115.3	kips
Allowable Axial, Pa:	152.6	543.4	kips = ASIF C C1 D L
Ratio:	78.3%	21.2%	

**Pole Analysis per AISC Sect. F4:**

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	119.6	115.3	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	2.4	1.2	kips/in = P / (2 L1)
Section Modulus, S:	208.3	744.2	in <sup>2</sup> = L1 <sup>2</sup> / 3
Bending Stress, fb:	7.4	1.9	kips/in = P e1 / S
Combined Stress, f:	7.7	2.3	kips/in = (fv <sup>2</sup> + fb <sup>2</sup> ) <sup>1/2</sup>
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	92.2%	27.3%	
Lower Pole			
Stiffener Axial, P:	119.6	115.3	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	2.7	1.3	ksi = P / (2 L2)
Section Modulus, S:	161.3	649.0	in <sup>2</sup> = L2 <sup>2</sup> / 3
Bending Stress, fb:	7.3	1.7	ksi = P e2 / S
Combined Stress, f:	7.8	2.1	kips/in = (fv <sup>2</sup> + fb <sup>2</sup> ) <sup>1/2</sup>
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	92.6%	25.4%	

**Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B**

	Stiffener Type 1	
Gross Area, Ag:	8.9512	in <sup>2</sup>
Net Area, An:	8.9512	in <sup>2</sup>
Stiffener Axial, P:	119.6	kips
Stiffener Stress, f:	13.4	ksi = P / Ag
b:	16.1800	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.0746	in
Q, Where Qa = 1.0:	0.9049	= Qa 1.340 - 0.00447 (b / ts) Fy <sup>1/2</sup>
r:	0.3868	in <sup>3</sup>
K L / r:	24.3004	
ASIF:	1.3333	
Allowable Axial, Fa:	43.28	ksi = ASIF Q [1 - (K L / r) / 2 Cc <sup>2</sup> ] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) <sup>3</sup> / 8 Cc <sup>3</sup> ]
ASIF:	1.3333	
Allowable Bending, Fb:	47.05	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	30.9%	

**Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B**

	Stiffener Type 2	
Gross Area, Ag:	8.7500	in <sup>2</sup>
Net Area, An:	8.7500	in <sup>2</sup>
Stiffener Axial, P:	115.3	kips
Stiffener Stress, f:	13.2	ksi = P / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8787	= Qa 1.340 - 0.00447 (b / ts) Fy <sup>1/2</sup>
r:	0.3608	in <sup>3</sup>
K L / r:	10.2537	
ASIF:	1.3333	
Allowable Axial, Fa:	44.43	ksi = ASIF Q [1 - (K L / r) / 2 Cc <sup>2</sup> ] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) <sup>3</sup> / 8 Cc <sup>3</sup> ]
ASIF:	1.3333	
Allowable Bending, Fb:	45.69	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	29.7%	

**Analysis Summary:**

**Bridge Stiffener Type 1**  
 Weld Analysis Ratio: 78.3% PASS  
 Pole Analysis Ratio: 92.6% PASS  
 Stiffener Analysis Ratio: 30.9% PASS

**Bridge Stiffener Type 2**  
 Weld Analysis Ratio: 21.8% PASS  
 Pole Analysis Ratio: 27.3% PASS  
 Stiffener Analysis Ratio: 29.7% PASS



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Date: 9/18/2014  
Project No: 37513-2057.005.7700  
Site Name: Milford Jai-Alai  
Site Number/BUN: 876309  
Description:  
Owner:  
Engineer:

v2.0, Effective Date: 1-12-12

### Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

#### General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	1221.3	k-ft
Axial, Pf:	22.0	kips
Shear, Vf:	18.0	kips

#### Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	30.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	63	63	ksi
Flange Diameter, Df:	47.00	47.00	in

#### Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	3	
Upper Weld Length, L1:	45.25	47.25	in
Lower Weld Length, L2:	42.25	44.13	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E70	E80	
Effective Stiffener Width, Ws:	7.00	7.00	in
Stiffener Thickness, ts:	1.25	1.25	in
Notch, n:	0.50	0.50	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	5.63	4.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	22.5	75	degrees
Stiffener Circle:	55.00	55.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.50	12.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.50	9.50	in = (Df - Dp) / 2 + n + Ws / 2

#### Flange Bolt Parameters:

	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	41.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

#### Weld Analysis per AISC Table XIX & pg. 4-72:

	Stiffener Type 1	Stiffener Type 2	
Upper Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.2762	0.2646	= e1 / L1
k:	0	0	
C:	1.1970	1.2251	Tabulated Coefficient
C1:	1.0000	1.1400	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	181.4	181.4	kips
Allowable Axial, Pa:	433.3	527.9	kips = ASIF C C1 D L
Ratio:	41.9%	34.4%	
Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.2249	0.2153	= e2 / L2
k:	0	0	
C:	1.3254	1.3502	Tabulated Coefficient
C1:	1.0000	1.1400	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	181.4	181.4	kips
Allowable Axial, Pa:	448.0	543.4	kips = ASIF C C1 D L
Ratio:	40.5%	33.4%	

#### Pole Analysis per AISC Sect. F4:

	Stiffener Type 1	Stiffener Type 2	
Upper Pole			
Stiffener Axial, P:	181.4	181.4	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	2.0	1.9	kips/in = P / (2 L1)
Section Modulus, S:	682.5	744.2	in <sup>2</sup> = L1 <sup>2</sup> / 3
Bending Stress, fb:	3.3	3.0	kips/in = P e1 / S
Combined Stress, f:	3.9	3.6	kips/in = (fv <sup>2</sup> + fb <sup>2</sup> ) <sup>1/2</sup>
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	46.2%	42.9%	
Lower Pole			
Stiffener Axial, P:	181.4	181.4	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	2.1	2.1	ksi = P / (2 L2)
Section Modulus, S:	595.0	649.0	in <sup>2</sup> = L2 <sup>2</sup> / 3
Bending Stress, fb:	2.9	2.7	ksi = P e2 / S
Combined Stress, f:	3.6	3.4	kips/in = (fv <sup>2</sup> + fb <sup>2</sup> ) <sup>1/2</sup>
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	42.9%	40.0%	

#### Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	8.7500	in <sup>2</sup>
Net Area, An:	8.7500	in <sup>2</sup>
Stiffener Axial, P:	181.4	kips
Stiffener Stress, f:	20.7	ksi = P / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8787	= Qa 1.340 - 0.00447 (b / ts) Fy <sup>1/2</sup>
r:	0.3608	in <sup>3</sup>
K L / r:	12.4708	
ASIF:	1.3333	
Allowable Axial, Fa:	44.11	ksi = ASIF Q [1 - (K L / r) / 2 Cc <sup>2</sup> ] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) <sup>3</sup> / 8 Cc <sup>3</sup> ]
ASIF:	1.3333	
Allowable Bending, Fb:	45.69	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	47.0%	

#### Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	8.7500	in <sup>2</sup>
Net Area, An:	8.7500	in <sup>2</sup>
Stiffener Axial, P:	181.4	kips
Stiffener Stress, f:	20.7	ksi = P / Ag
b:	16.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.8000	in
Q, Where Qa = 1.0:	0.8787	= Qa 1.340 - 0.00447 (b / ts) Fy <sup>1/2</sup>
r:	0.3608	in <sup>3</sup>
K L / r:	10.2537	
ASIF:	1.3333	
Allowable Axial, Fa:	44.43	ksi = ASIF Q [1 - (K L / r) / 2 Cc <sup>2</sup> ] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) <sup>3</sup> / 8 Cc <sup>3</sup> ]
ASIF:	1.3333	
Allowable Bending, Fb:	45.69	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	46.7%	

### Analysis Summary:

**Bridge Stiffener Type 1**  
Weld Analysis Ratio: 41.9% PASS  
Pole Analysis Ratio: 46.2% PASS  
Stiffener Analysis Ratio: 47.0% PASS

**Bridge Stiffener Type 2**  
Weld Analysis Ratio: 34.4% PASS  
Pole Analysis Ratio: 42.9% PASS  
Stiffener Analysis Ratio: 46.7% PASS



v4.4 - Effective 7-12-13

**Asymmetric Anchor Rod Analysis**

Moment = 1819 k-ft  
Axial = 36.0 kips  
Shear = 21.0 kips  
Anchor Qty = 23

TIA Ref. = F  
ASIF = 1.3333  
Max Ratio = 100.0%

Location = Base Plate  
η = N/A for BP, Rev. G Sect. 4.9.9  
Threads = N/A for FP, Rev. G

**\*\* For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. \*\***

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in <sup>2</sup>	Area, in <sup>2</sup>	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	41.00	0.00	1.77	59.30	56.69	56.69	0.00	97.19	58.3%
2	1.500	A354 Gr BC	109	125	22.5	41.00	0.00	1.77	59.41	56.80	56.80	0.00	97.19	58.4%
3	1.500	A354 Gr BC	109	125	45.0	41.00	0.00	1.77	60.16	57.55	57.55	0.00	97.19	59.2%
4	1.500	A354 Gr BC	109	125	67.5	41.00	0.00	1.77	61.55	58.95	58.95	0.00	97.19	60.6%
5	1.500	A354 Gr BC	109	125	90.0	41.00	0.00	1.77	63.14	60.53	60.53	0.00	97.19	62.3%
6	1.500	A354 Gr BC	109	125	112.5	41.00	0.00	1.77	64.26	61.65	61.65	0.00	97.19	63.4%
7	1.500	A354 Gr BC	109	125	135.0	41.00	0.00	1.77	64.37	61.77	61.77	0.00	97.19	63.5%
8	1.500	A354 Gr BC	109	125	157.5	41.00	0.00	1.77	63.33	60.72	60.72	0.00	97.19	62.5%
9	1.500	A354 Gr BC	109	125	180.0	41.00	0.00	1.77	61.45	58.84	58.84	0.00	97.19	60.5%
10	1.500	A354 Gr BC	109	125	202.5	41.00	0.00	1.77	59.40	56.79	56.79	0.00	97.19	58.4%
11	1.500	A354 Gr BC	109	125	225.0	41.00	0.00	1.77	57.94	55.33	55.33	0.00	97.19	56.9%
12	1.500	A354 Gr BC	109	125	247.5	41.00	0.00	1.77	57.49	54.88	54.88	0.00	97.19	56.5%
13	1.500	A354 Gr BC	109	125	270.0	41.00	0.00	1.77	57.93	55.32	55.32	0.00	97.19	56.9%
14	1.500	A354 Gr BC	109	125	292.5	41.00	0.00	1.77	58.71	56.10	56.10	0.00	97.19	57.7%
15	1.500	A354 Gr BC	109	125	315.0	41.00	0.00	1.77	59.28	56.67	56.67	0.00	97.19	58.3%
16	1.500	A354 Gr BC	109	125	337.5	41.00	0.00	1.77	59.41	56.80	56.80	0.00	97.19	58.4%
17	1.750	Dywidag (150 ksi)	127.7	150	101.3	47.00	0.00	2.71	111.33	107.33	107.33	0.00	178.99	60.0%
18	1.750	Dywidag (150 ksi)	127.7	150	221.3	47.00	0.00	2.71	102.14	98.13	98.13	0.00	178.99	54.8%
19	0.000	Dywidag (150 ksi)	0	0	341.3	47.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0%
20	2.000	A193 Gr B7	105	125	326.3	47.00	0.00	3.14	121.30	116.66	116.66	0.00	172.79	67.5%
21	2.250	A193 Gr B7	105	125	56.3	58.50	0.00	3.98	192.31	186.44	186.44	0.00	218.68	85.3%
22	2.250	A193 Gr B7	105	125	191.3	58.50	0.00	3.98	192.01	186.14	186.14	0.00	218.68	85.1%
23	2.250	A193 Gr B7	105	125	303.8	58.50	0.00	3.98	190.91	185.04	185.04	0.00	218.68	84.6%

48.77

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

## TIA Rev F

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

Reactions		
Moment:	862	ft-kips
Axial:	20.9	kips
Shear:	12.2	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data		
Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	41	in

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

Anchor Rod Results		Stiffened
Maximum Rod Tension:	61.8 Kips	Service, ASD
		Fty*ASIF

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

Base Plate Results		Flexural Check	Stiffened
Base Plate Stress:		20.4 ksi	Service, ASD
Allowable Plate Stress:		36.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:		56.8% <b>Pass</b>	Y.L. Length: N/A, Roark

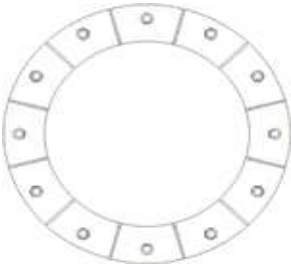
Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Groove	
Groove Depth:	0.4375	in **
Groove Angle:	45	degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:	0.25	in
Width:	5.5	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Stiffener Results		
Horizontal Weld :		55.5% <b>Pass</b>
Vertical Weld:		29.2% <b>Pass</b>
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:		4.2% <b>Pass</b>
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:		24.3% <b>Pass</b>
Plate Comp. (AISC Bracket):		24.5% <b>Pass</b>

Pole Results		
Pole Punching Shear Check:		7.7% <b>Pass</b>

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

Stress Increase Factor	
ASIF:	1.333



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

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



foundation loads

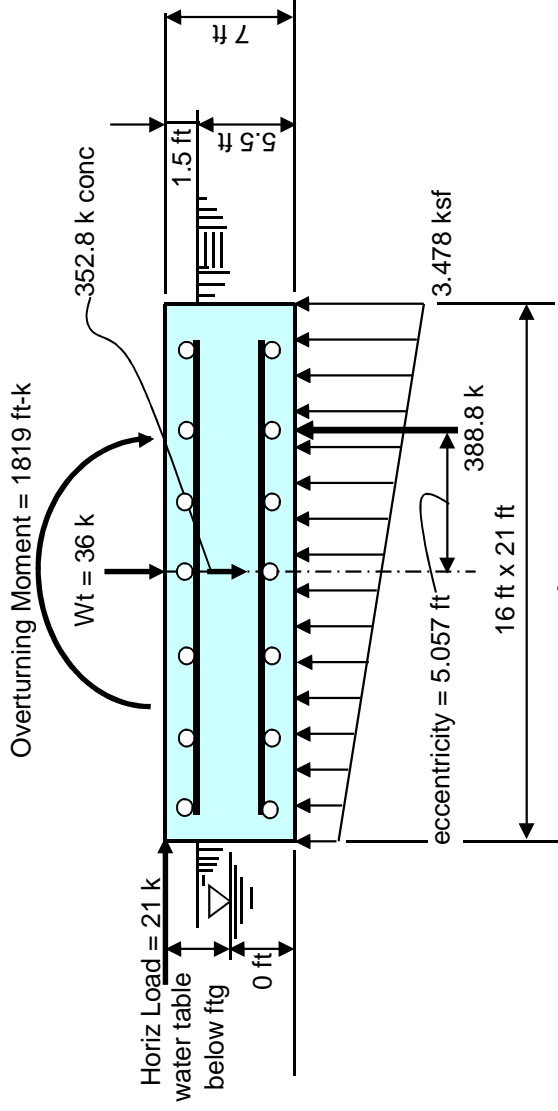
Tower or Pole Weight = **36** kips  
 Total Horizontal Force = **21** kips  
 Overturning Moment = **1819** ft-kips

soil properties

Safety factor against overturning = **1.5**  
 Soil density = **130** pcf  
 Allowable soil bearing = **10** ksf  
 Depth to water table = **6.7** ft

mat dimensions

depth to bottom of footing = **5.5** ft  
 Footing thickness = **7** ft  
 Footing Width = **16** ft  
 Footing Length = **21** ft  
 Tower/Pole Center Offset = **0** ft



Volume of concrete =  $87.111 \text{ yd}^3$  Concrete strength =  $f_c = \underline{3}$  (ksi)  
 Rebar = ( 34 ) #8 x 15.5 ft long plus ( 34 ) #8 x 20.5 ft long  
 reinforcing steel = ( 17 ) #8 by 15.5 long @ 15.38 in o.c. top and bot short bars  
 reinforcing steel = ( 17 ) #8 by 20.5 long @ 11.63 in o.c. top and bot long bars

Summary of analysis results

Overturning Moment: (Stress Ratio = 0.948 ) < **CONTROLLING CRITERIA**

Calculated Overturning Moment = 1966 ft-kips  
 Resisting Moment = 3110.4 ft-kips  
 Factor of Safety against overturning = 1.582 > **1.5 okay**

Rebar strength =  $F_y = \underline{60}$  (ksi)  
 minimum cover over rebar =  $\underline{3}$  inches

Soil Bearing

(Stress Ratio = 0.348 )  
 Net Soil Bearing Resistance = 10 ksf  
 Calculated Soil Bearing Pressure = 3.478 **ksf < 10 ksf okay**

Bending Moment

(Stress Ratio = 0.264 )  
 Ultimate Bending Moment Resistance = 4755 ft-kips  
 Calculated Ultimate Bending Moment = 1256 **ft-kips < 4755 ft-kips okay**

Bending Shear

(Stress Ratio = 0.151 )  
 Ultimate Bending Shear Resistance = 1254 kips  
 Calculated Ultimate Bending Shear = 189 **kips < 1254 kips okay**

# MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

**BU #876309; MILFORD JAI-ALAI**

APP: 206055 REV. 3; WO: 925172

SITE ADDRESS

**311 OLD GATE LANE**

**MILFORD, CONNECTICUT 06460**

**NEW HAVEN COUNTY**

## PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

(B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

(C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

## PROJECT CONTACTS:

### MONOPOLE OWNER:

CROWN CASTLE  
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534  
TSA CONTACT: STEVE TUTTLE AT STEVE.TUTTLE@CROWNCastle.COM  
PH: (585) 899-3445  
MOD PM: JERRY BRUNO AT JERRY.BRUNO@CROWNCastle.COM  
PH: (781) 970-0069

### STRUCTURAL ENGINEER OF RECORD (EOR):

PAUL J. FORD AND COMPANY  
250 EAST BROAD STREET, SUITE 600  
COLUMBUS, OHIO 43215-3708  
CONTACT: JOEY MEINERDING AT JMEINERDING@PJFWEB.COM  
PHONE: 614-221-6679

## DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE 2005 CONNECTICUT BUILDING CODE AND THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 90 MPH (FASTEST MILE) WITH NO ICE, 37.6 MPH WITH 3/4 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-2057.005.7700), DATED 9-15-2014.

## THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

WELDED FLANGE BRIDGE STIFFENERS  
BOLTED FLANGE BRIDGE STIFFENERS  
SHAFT REINFORCING  
FIELD WELDED ANCHOR BRACKETS  
POST INSTALLED ANCHOR RODS

## SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
S-5	SHAFT REINFORCING CHARTS
S-6	BASE PLATE DETAILS
S-7	MISC DETAILS
S-8	WELDED BRIDGE STIFFENER DETAILS
S-9	WELDED BRIDGE STIFFENER DETAILS
S-10	BOLTED BRIDGE STIFFENER DETAILS
S-11	MI CHECKLIST



PAUL J. FORD AND COMPANY  
STRUCTURAL ENGINEERS  
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**CROWN CASTLE**

8 PARKMEADOW DRIVE, PITTSFORD, NY 14534  
PH: (585) 899-3445

**BU #876309; MILFORD JAI-ALAI**  
**MILFORD, CONNECTICUT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.  
CHECKED BY:  
J.W.M.  
APPROVED BY:  
DATE:  
9-15-2014

TITLE SHEET

**T-1**

CROWN CASTLE PROJECT: BU #876309; MILFORD JAI-ALAI; MILFORD, CONNECTICUT  
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

**A. GENERAL NOTES**

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
- THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F-1996 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. **IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES:** THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT".
- THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
- ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

**B. (SECTION NOT USED)**

**C. SPECIAL INSPECTION AND TESTING**

- ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
  - ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
  - THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
  - GENERAL:**
    - PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
  - FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)**
  - CONCRETE TESTING PER ACI - (NOT REQUIRED)**
  - STRUCTURAL STEEL**
    - CHECK THE STEEL ON THE JOB WITH THE PLANS.
    - CHECK MILL CERTIFICATIONS.
    - CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
    - INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
    - CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
    - CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
    - CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
    - CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
  - WELDING:**
    - VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
    - INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
    - APPROVE FIELD WELDING SEQUENCE.
      - A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
    - INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
      - INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
      - VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
      - INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
      - VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
      - SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
      - INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
      - VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
      - REVIEW THE REPORTS BY TESTING LABS.
      - CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
      - INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
      - CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
  - REPORTS:**
    - COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
- THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
- AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
- RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.



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**BU #876309; MILFORD JAI-ALAI**  
**MILFORD, CONNECTICUT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:

DATE:  
9-15-2014

GENERAL NOTES

**S-1**

**D. STRUCTURAL STEEL**

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
- A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
- "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
  - "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
  - "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
- B. BY THE AMERICAN WELDING SOCIETY (AWS):
- "STRUCTURAL WELDING CODE - STEEL D1.1."
  - "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
- PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
  - ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
  - ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

**E. BASE PLATE GROUT - (NOT REQUIRED)****F. FOUNDATION WORK - (NOT REQUIRED)****G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)****H. EPOXY GROUTED REINFORCING ANCHOR RODS**

1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.
3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
4. ULTRABOND 1, HILTI HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

**I. TOUCH UP OF GALVANIZING**

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

**J. HOT DIP GALVANIZING**

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

**K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".



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MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:

DATE:  
9-15-2014

GENERAL NOTES

**S-2**

AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

- NOTES:**
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
  3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
  4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

**NOTES FOR AJAX M20 'ONE-SIDE BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):**

**DTI'S REQUIRED:** DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH RED DURABLE SQUIRT MEDIA EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY APPLIED BOLTING TECHNOLOGY PRODUCTS' INC.:

**PART NUMBER:** 2DTIM208MGAFSIF

**DESCRIPTION:** P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONESIDE BOLT. FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

**DISTRIBUTOR CONTACT DETAILS:**

ALLFASTENERS  
15401 COMMERCE PARK DR.  
BROOKPARK, OHIO 44142  
PHONE: 440-232-6060  
E-MAIL: SALES@ALLFASTENERS.COM

**DTI:** USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

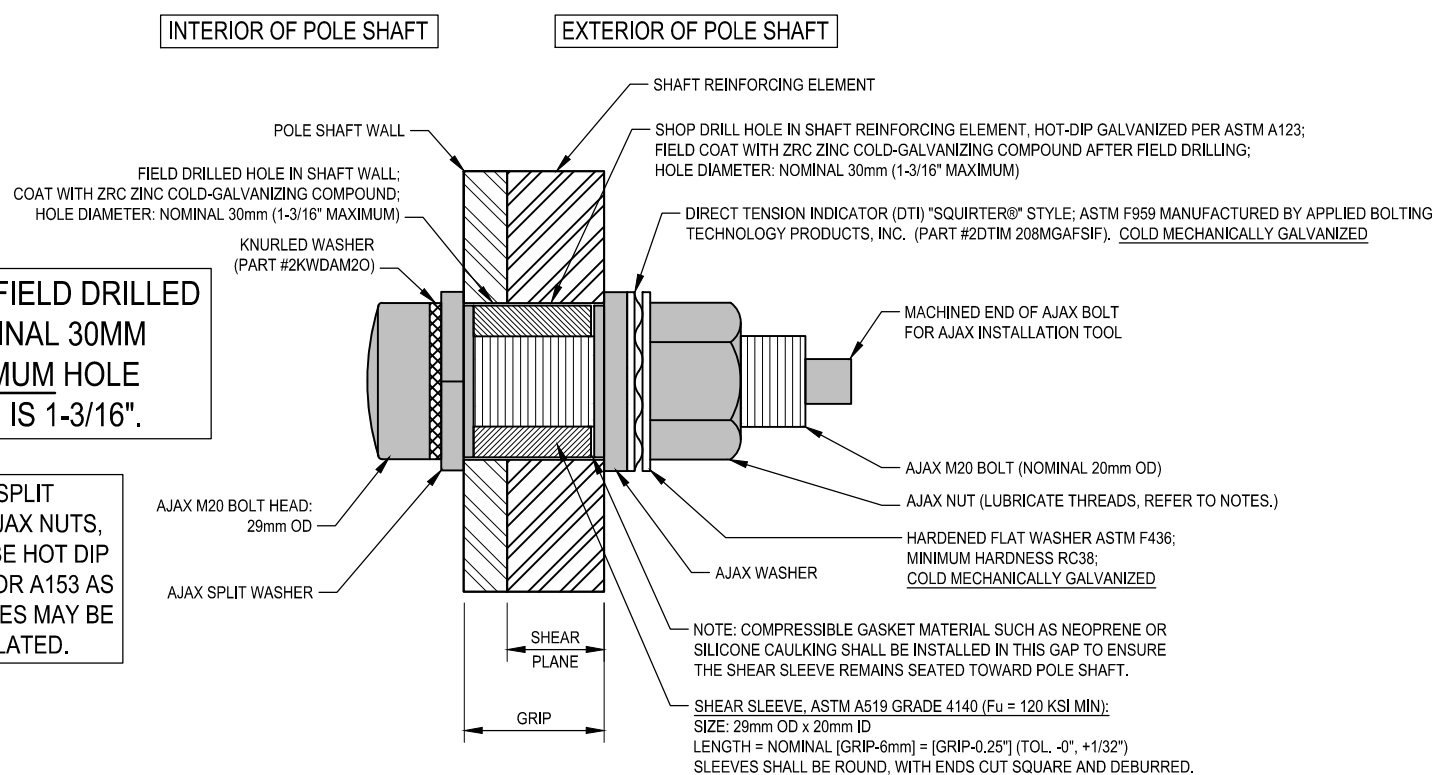
**HARDENED WASHERS REQUIRED:** USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

**NUT LUBRICATION REQUIRED:** PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

**NOTE:** COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

**INSPECTION REQUIRED:** ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



**NOTE:** ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

**NOTE:** ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.

TYPICAL AJAX BOLT DETAIL 1  
S-3

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8 PARKMEADOW DRIVE, PITTSFORD, NY 14534  
PH: (585) 899-3445

BU #876309; MILFORD JAI-ALAI  
MILFORD, CONNECTICUT  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.  
CHECKED BY:  
J.W.M.  
APPROVED BY:

AJAX BOLT DETAIL

DATE:  
9-15-2014

S-3



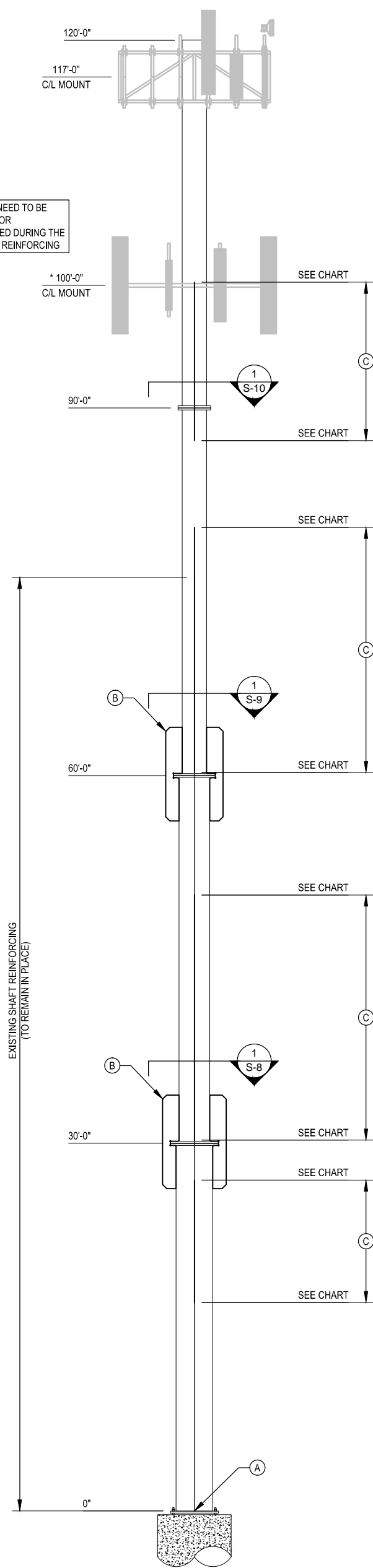
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	ASTM A53-B-42
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1 1/2"Ø A354 GR BC

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	30.00	0.2500		24.000	24.000
2	30.00	0.3750		24.000	24.000
3	30.00	0.3750		30.000	30.000
4	30.00	0.3750		36.000	36.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

- MODIFICATIONS:**
- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-6.
  - (B) INSTALL NEW WELDED FLANGE BRIDGE STIFFENERS AT EL. 30' AND 60'. SEE SHEETS S-8 & S-9.
  - (C) INSTALL NEW SHAFT REINFORCING AND BOLTED FLANGE BRIDGE STIFFENERS AT EL. 90'. SEE CHARTS ON SHEET S-5 AND DETAILS ON SHEET S-10.

\* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING



POLE ELEVATION 1  
S-4

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,849,659; 8,424,269 AND PATENT PENDING

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**MILFORD, CONNECTICUT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.  
CHECKED BY:  
J.W.M.  
APPROVED BY:

MONOPOLE PROFILE

DATE:  
9-15-2014

**S-4**

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NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
17'-0"	27'-0"	90, 210 & 330	CCI-SFP-04007510	10'-0"	3	13	39	4	4	16"	306 LBS.
30'-3"	50'-3"	90, 210 & 330	CCI-SFP-04007520	20'-0"	3	21	63	4	4	16"	612 LBS.
60'-3"	80'-3"	90, 210 & 330	CCI-SFP-04007520	20'-0"	3	21	63	4	4	16"	612 LBS.
90'-3"	100'-3"	90, 210 & 330	(CUSTOM) CCI-AFP-04007510	10'-0"	3	19	57	8	6	16"	306 LBS.
222											1836 LBS.

**NOTES:**

- 1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 3.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
- 4.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
- 5.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
- 6.) ALL SHIMS SHALL BE ASTM A-36.

Level	QNTY	Jump Plate Size		Unbraced Length		Jump Plate Length (in)	Jump Weight	Bottom Bolts	Top Bolts	Filler Plate Size			Filler Plate Length (in)	Filler Weight	Weld Length (in)
		Width (in)	Thk (in)	(Bolt Spacing at Flange) (in)	Width (in)					Thk (in)	Sft Plt Thk (in)				
90'	3	4	0.75	16	64	163	8	8	5	4.00		27	459	162	
									5	3.25	0.75	27	373	162	
												Total Jump Wt.	832 lbs		
												Total Steel Weight	995 lbs		
												Total Weld Length	324 in		
												Total AJAX bolts	48		
Distance from Pole to edge of Flange												4.0	in		

**NOTES:**

- 1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 3.) ALL FILLER BARS SHALL BE ASTM A572 GR. 36
- 3.) ALL JUMP BARS SHALL BE ASTM A572 GR. 65
- 4.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.

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**MILFORD, CONNECTICUT**  
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PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

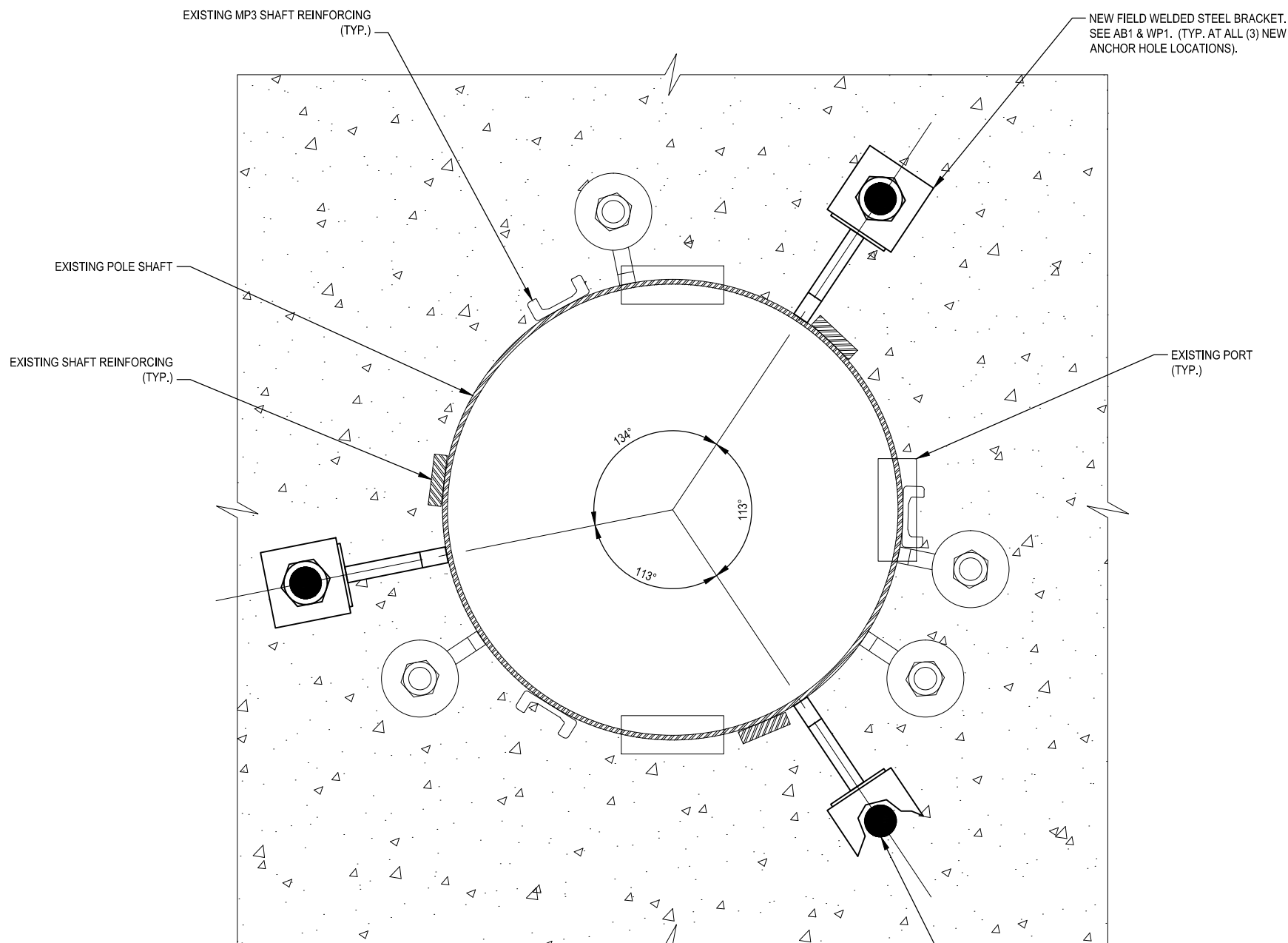
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SHAFT REINFORCING  
CHARTS

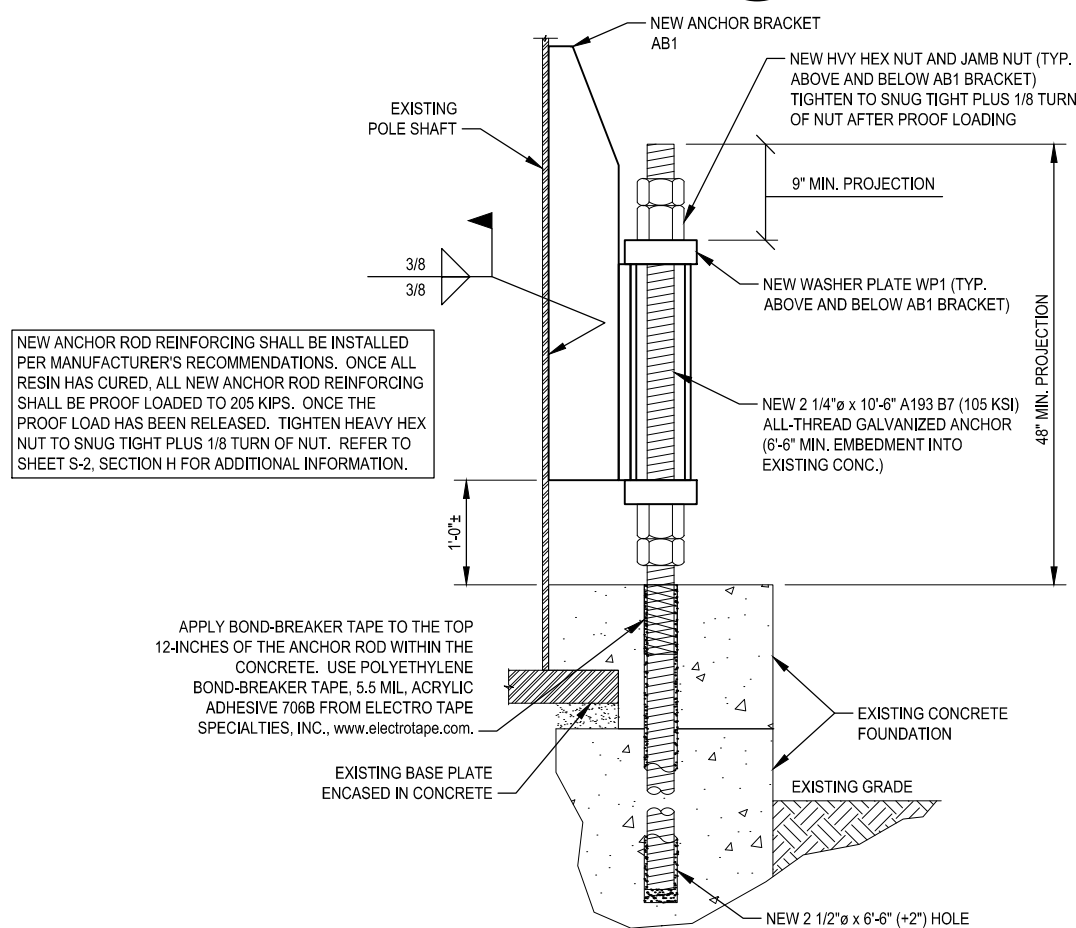
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**BASE PLATE 1**  
S-6

NEW HOLE IN EXISTING CONCRETE FOR NEW ANCHOR. NEW HOLE B.C.=58.5". HOLES IN CONCRETE & BRACKET MUST ALIGN. SEE DETAIL 2/S-6 (TYP.) (PARTIAL CUT-AWAY VIEW)



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 205 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

APPLY BOND-BREAKER TAPE TO THE TOP 12-INCHES OF THE ANCHOR ROD WITHIN THE CONCRETE. USE POLYETHYLENE BOND-BREAKER TAPE, 5.5 MIL, ACRYLIC ADHESIVE 706B FROM ELECTRO TAPE SPECIALTIES, INC., www.electrotape.com.

**NEW ANCHOR & BRACKET DETAIL 2**  
S-6

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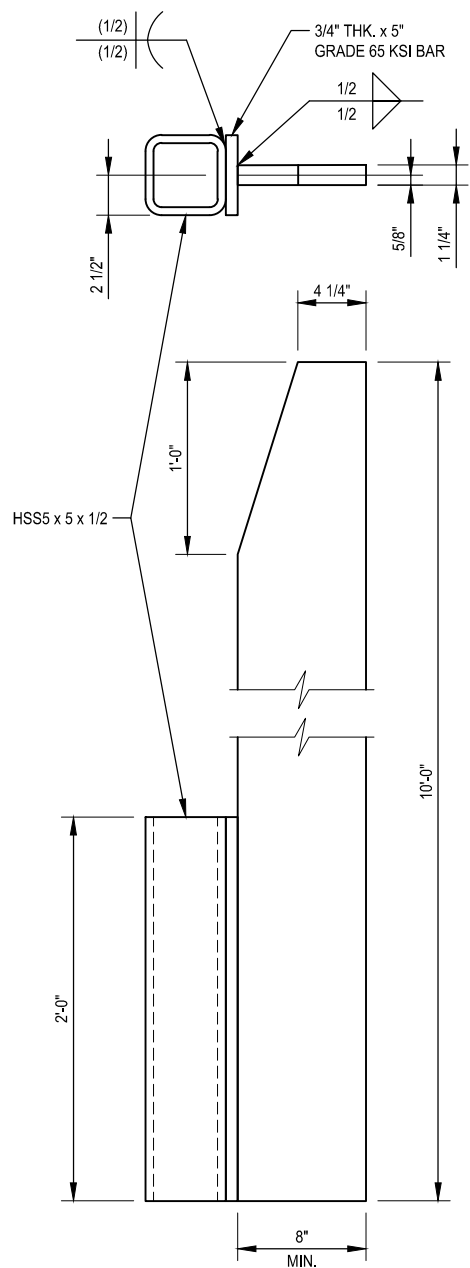
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J.W.M.  
APPROVED BY:

BASE PLATE DETAILS

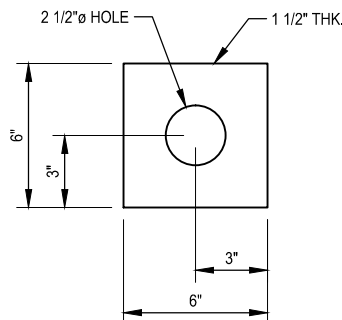
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**ANCHOR BRACKET MK~AB1**  
 (3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



**WASHER PLATE MK~WP1**  
 (6 REQUIRED) (Fy = 50 KSI)

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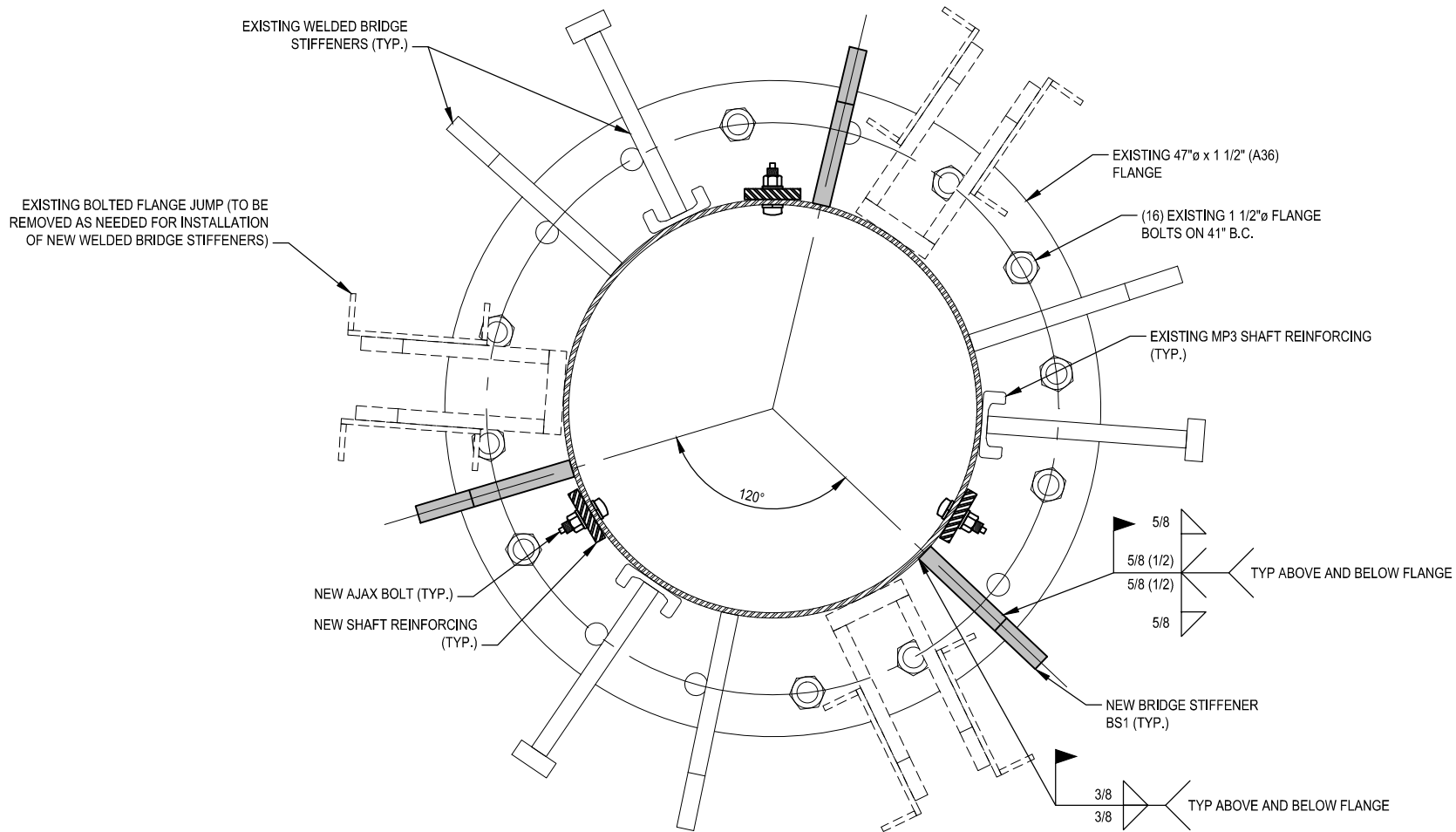
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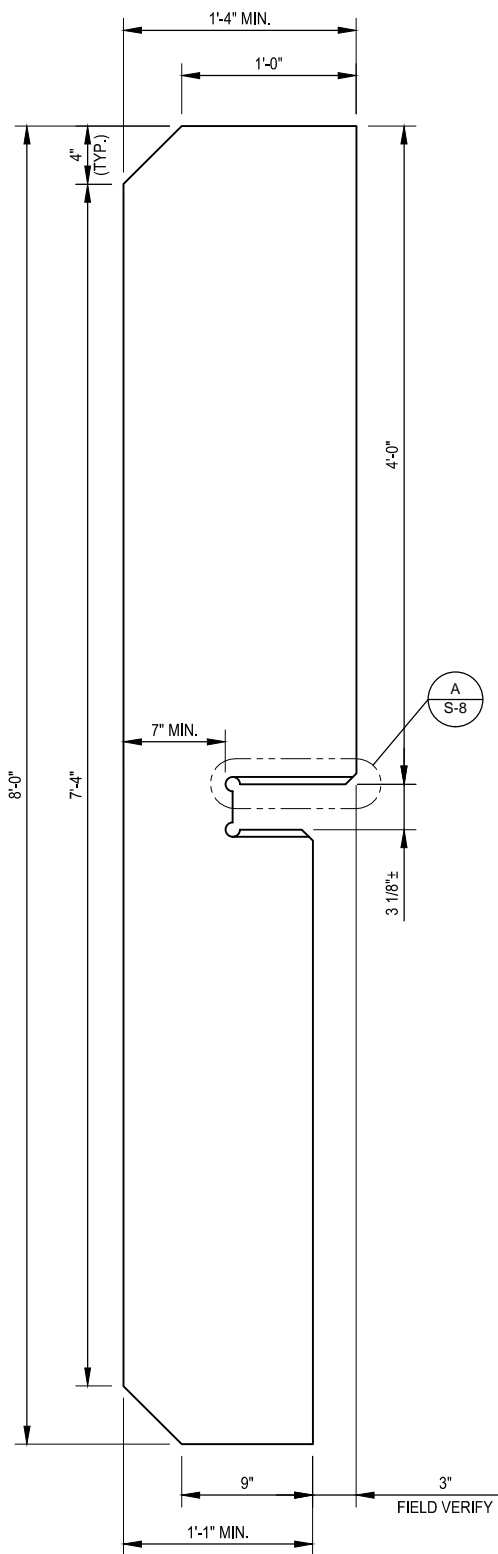
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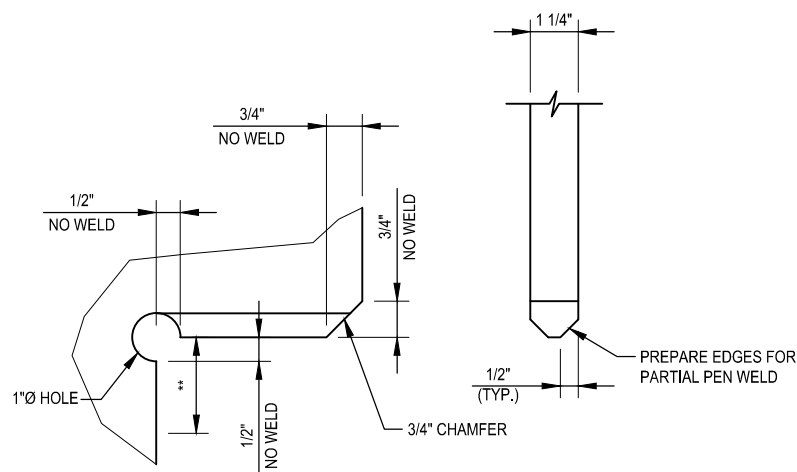
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APPROVED BY:	
DATE: 9-15-2014	<b>S-7</b>



**SHAFT PLAN 1**  
EL. 30'  
**S-8**



**BRIDGE STIFFENER MK~BS1**  
(3 REQUIRED) (Fy = 65 KSI)



\*\* NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

**DETAIL A**  
(TYPICAL)

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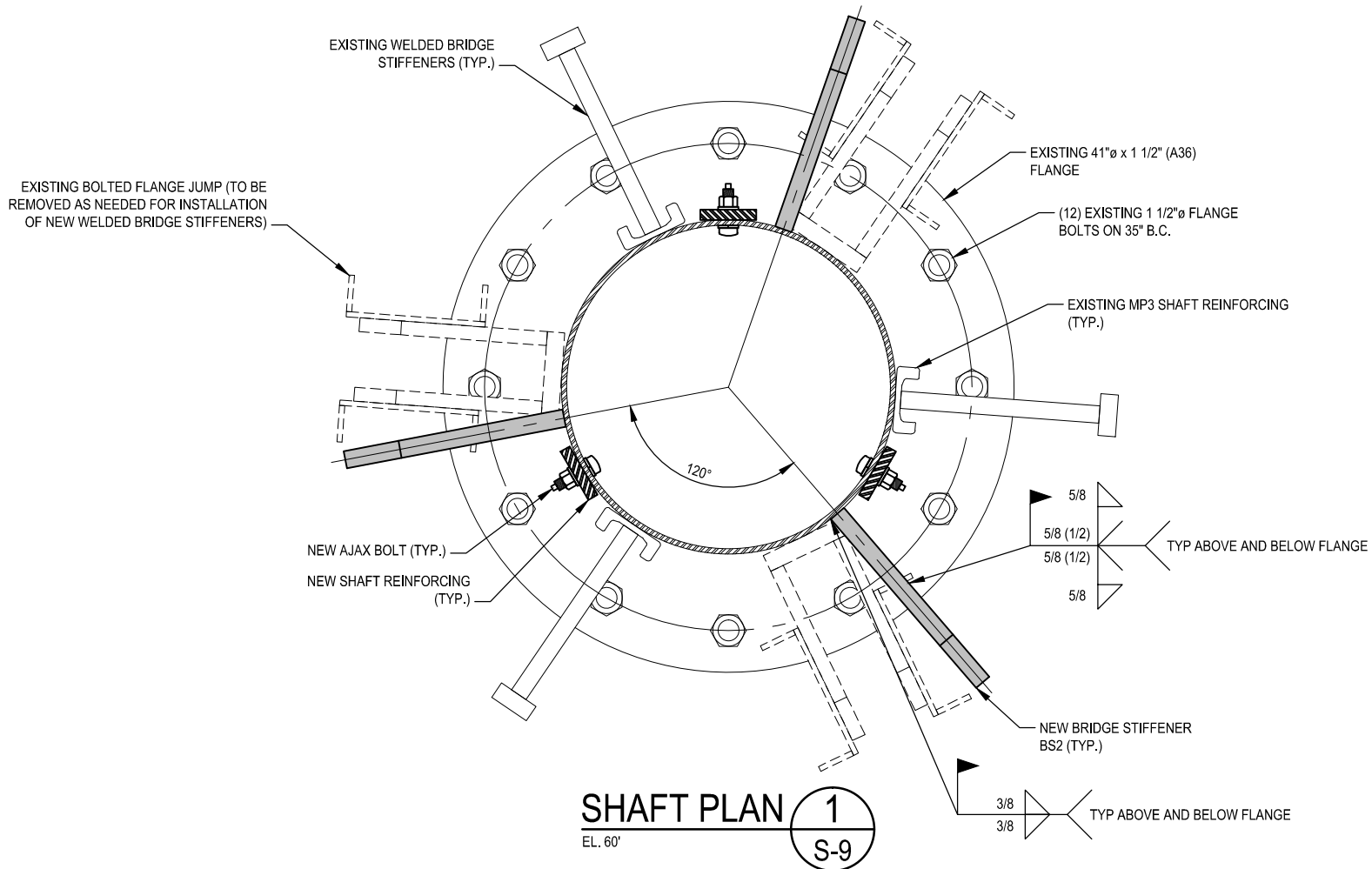
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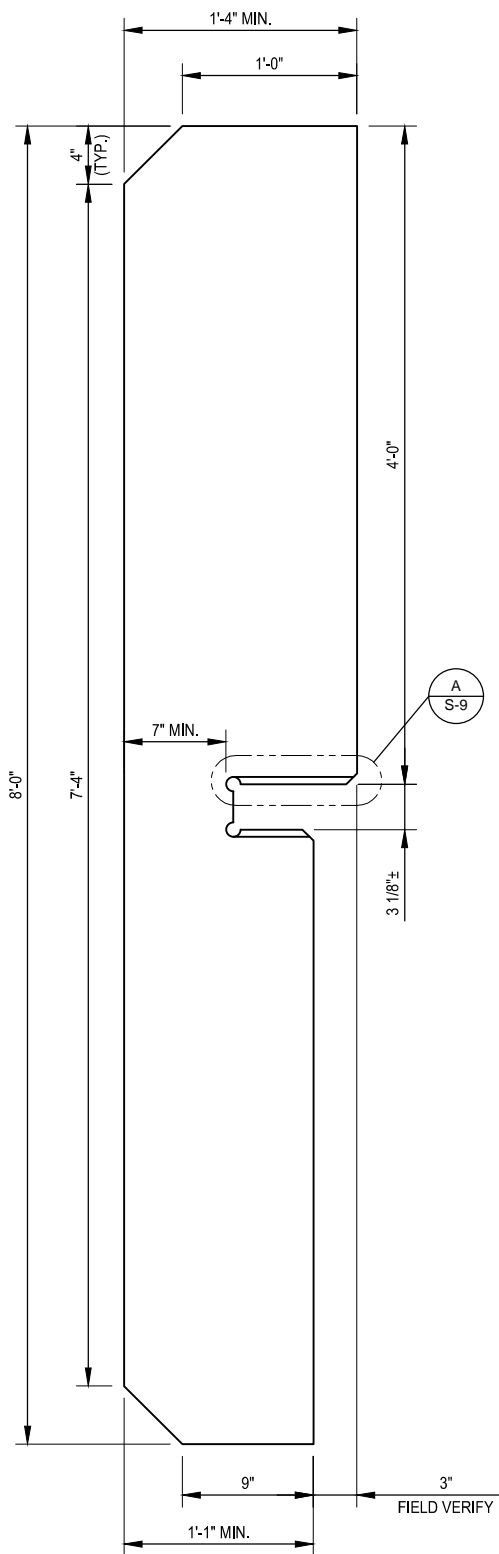
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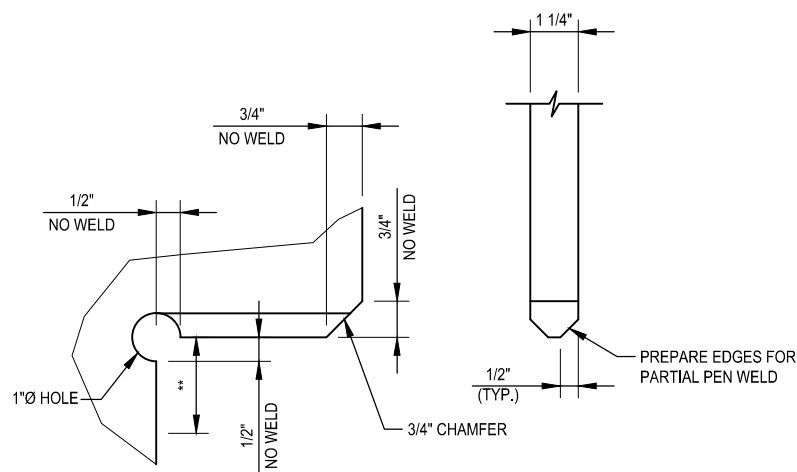
DRAWN BY: B.M.S.	WELDED BRIDGE STIFFENER DETAILS
CHECKED BY: J.W.M.	
APPROVED BY:	<b>S-8</b>
DATE: 9-15-2014	



**SHAFT PLAN 1**  
EL. 60'



**BRIDGE STIFFENER MK~BS2**  
(3 REQUIRED) (Fy = 65 KSI)



\*\* NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS

**DETAIL A**  
(TYPICAL)

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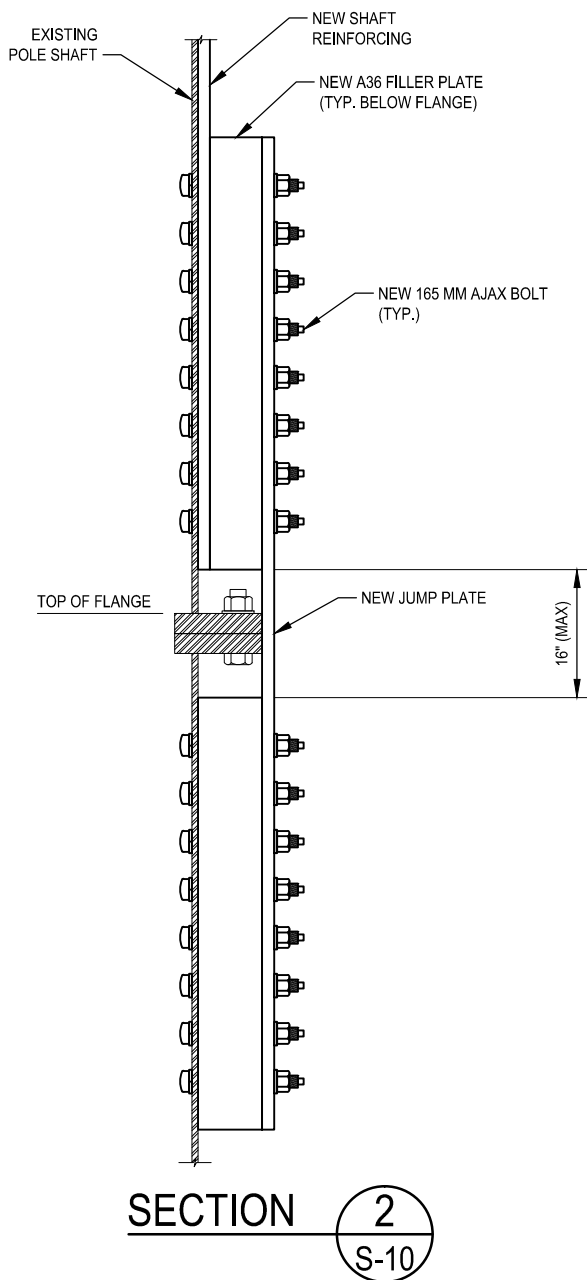
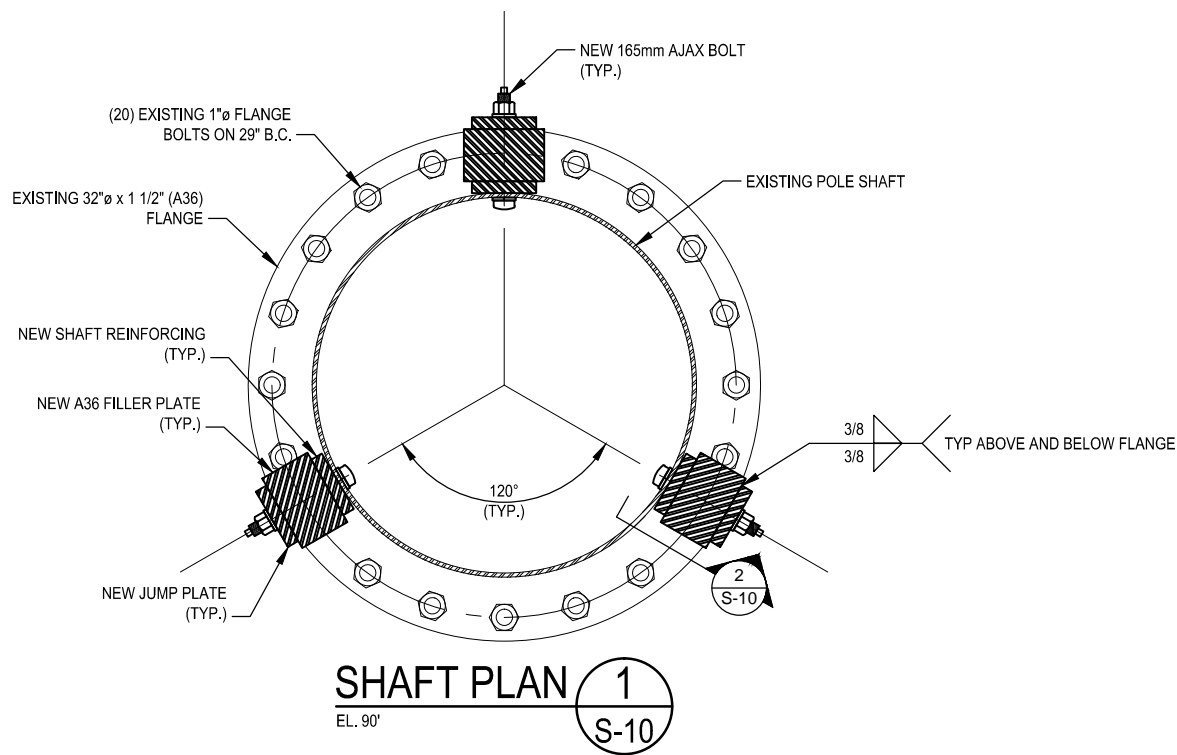
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DRAWN BY: B.M.S.	WELDED BRIDGE STIFFENER DETAILS
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APPROVED BY:	<b>S-9</b>
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PROJECT: 37513-2057.005.7700

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 B.M.S.  
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 J.W.M.  
 APPROVED BY:

BOLTED BRIDGE  
 STIFFENER DETAILS

DATE:  
 9-15-2014

**S-10**

**MODIFICATION INSPECTION NOTES:****GENERAL**

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

**MI INSPECTOR**

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

**GENERAL CONTRACTOR**

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN DENG-SOW-10007.

**RECOMMENDATIONS**

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

**CANCELLATION OR DELAYS IN SCHEDULED MI**

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

**CORRECTION OF FAILING MI'S**

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

**MI VERIFICATION INSPECTIONS**

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

**PHOTOGRAPHS**

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

**MI CHECKLIST**

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
<b>PRE-CONSTRUCTION</b>	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: -----	
<b>CONSTRUCTION</b>	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
ADDITIONAL TESTING AND INSPECTIONS: -----	
<b>POST-CONSTRUCTION</b>	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: -----	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT

NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

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**CROWN CASTLE**  
8 PARKMEADOW DRIVE, PITTSFORD, NY 14534  
PH: (585) 899-3445

**BU #876309; MILFORD JAI-ALAI**  
**MILFORD, CONNECTICUT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:

B.M.S.

CHECKED BY:

J.W.M.

APPROVED BY:

DATE:

9-15-2014

MI CHECKLIST

**S-11**

# MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME  
**BU #876309; MILFORD JAI-ALAI**  
 APP: 206055 REV. 3; WO: 925172

SITE ADDRESS  
**311 OLD GATE LANE**  
**MILFORD, CONNECTICUT 06460**  
**NEW HAVEN COUNTY**

## PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CSITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
4. (A.) DTIS REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTIS) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.  
 (B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.  
 (C.) REQUIREMENT EFFECTIVE 04/20/2013. PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

## PROJECT CONTACTS:

### MONOPOLE OWNER:

CROWN CASTLE  
 8 PARKMEADOW DRIVE, PITTSFORD, NY 14534  
 TSA CONTACT: STEVE TUTTLE AT STEVE.TUTTLE@CROWNCastle.COM  
 PH: (585) 899-3445  
 MOD PM: JERRY BRUNO AT JERRY.BRUNO@CROWNCastle.COM  
 PH: (781) 970-0069

### STRUCTURAL ENGINEER OF RECORD (EOR):

PAUL J. FORD AND COMPANY  
 250 EAST BROAD STREET, SUITE 600  
 COLUMBUS, OHIO 43215-3708  
 CONTACT: JOEY MEINERDING AT JMEINERDING@PJFWEB.COM  
 PHONE: 614-221-6679

## DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE 2005 CONNECTICUT BUILDING CODE AND THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 90 MPH (FASTEST MILE) WITH NO ICE, 37.6 MPH WITH 3/4 INCH ICE AND 50 MPH SERVICE LOADS.

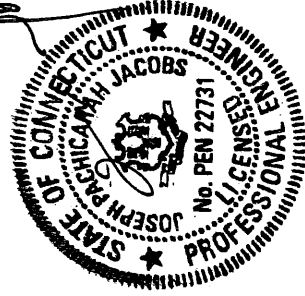
REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-2057.005.7700), DATED 9-15-2014.

## THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

WELDED FLANGE BRIDGE STIFFENERS  
 BOLTED FLANGE BRIDGE STIFFENERS  
 SHAFT REINFORCING  
 FIELD WELDED ANCHOR BRACKETS  
 POST INSTALLED ANCHOR RODS

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S-4	MONOPOLE PROFILE
S-5	SHAFT REINFORCING CHARTS
S-6	BASE PLATE DETAILS
S-7	MISC DETAILS
S-8	WELDED BRIDGE STIFFENER DETAILS
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SEP 18 2014

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PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:  
PJF

DATE:  
9-15-2014

TITLE SHEET

T-1

CROWN CASTLE PROJECT: BU #876309; MILFORD JAI-ALAI; MILFORD, CONNECTICUT  
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

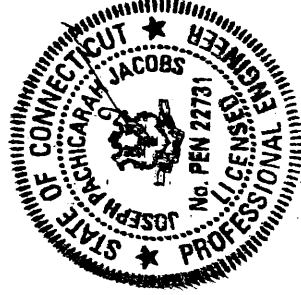
**A. GENERAL NOTES**

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
- THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F-1998 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING AND SAFETY GUIDELINES. THE GUIDELINES PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING PLAN" (DOC# ENG-PIN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.
- THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
- ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

**B. (SECTION NOT USED)**

- C. SPECIAL INSPECTION AND TESTING**  
ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.  
(A) ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.  
(B) THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.  
**A. GENERAL:**  
(1) PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.  
**B. FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)**  
**C. CONCRETE TESTING PER A.C.I. - (NOT REQUIRED)**  
**D. STRUCTURAL STEEL**  
(1) CHECK THE STEEL ON THE JOB WITH THE PLANS.  
(2) CHECK MILL CERTIFICATIONS.  
(3) CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.  
(4) INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.  
(5) CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.  
(6) CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.  
(7) CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.  
(8) CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.  
**E. WELDING:**  
(1) VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.  
(2) INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.  
(3) APPROVE FIELD WELDING SEQUENCE.  
(A) A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.  
(4) INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:  
(A) INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.  
(B) VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.  
(C) INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.  
(D) VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.  
(E) SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.  
(F) INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.  
(G) VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.  
(H) REVIEW THE REPORTS BY TESTING LABS.  
(I) CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.  
(J) INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.  
(K) CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.  
**F. REPORTS:**  
(1) COMPILER AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.  
6. THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.  
7. AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.  
8. RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.

SEP 18 2014



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**BU #876309; MILFORD JAI-ALAI**  
**MILFORD, CONNECTICUT**  
**MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

PROJECT: 37513-2057.005.7700

DRAWN BY:

B.M.S.

CHECKED BY:

J.W.M.

APPROVED BY:

JAF

DATE:

9-15-2014

GENERAL NOTES

S-1

- D. STRUCTURAL STEEL**
1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
  - A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
    - (A) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
    - (B) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
    - (C) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
  - B. BY THE AMERICAN WELDING SOCIETY (AWS):
    - (A) "STRUCTURAL WELDING CODE - STEEL D1.1."
    - (B) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
  2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
  3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
  4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
  5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
  6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
  7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
  8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
  9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
  10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
  11. FIELD CUTTING OF STEEL:
    - (A) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
    - (B) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
    - (C) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

**E. BASE PLATE GROUT - (NOT REQUIRED)**

**F. FOUNDATION WORK - (NOT REQUIRED)**

**G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

- H. EPOXY GROUTED REINFORCING ANCHOR RODS**
1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.
  2. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY.
  3. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
  4. ULTRABOND 1, HILTI HT-RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J. FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
  5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
  6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

**I. TOUCH UP OF GALVANIZING**

THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.

THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

**HOT DIP GALVANIZING**

HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.

PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.

DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.

ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

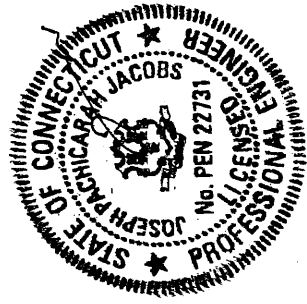
**PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER**

AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.

THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.

THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".

*for*



SEP 18 2014

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BU #876309; MILFORD JAI-ALAI  
MILFORD, CONNECTICUT  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:  
KNT

DATE:  
9-15-2014

GENERAL NOTES

S-2



AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

**NOTES:**

- ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
- ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

- ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
- ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

**NOTES FOR AJAX M20 'ONE-SIDE BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):**

**DTI'S REQUIRED:** DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH RED DURABLE SQUIRT MEDIA EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY APPLIED BOLTING TECHNOLOGY PRODUCTS' INC.:

**PART NUMBER:** 2DTIM208MGAFSIF

**DESCRIPTION:** P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONE-SIDE BOLT. FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

**DISTRIBUTOR CONTACT DETAILS:**

ALLFASTENERS  
15401 COMMERCE PARK DR.  
BROOKPARK, OHIO 44142  
PHONE: 440-232-6060  
E-MAIL: SALES@ALLFASTENERS.COM

**DTI:** USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

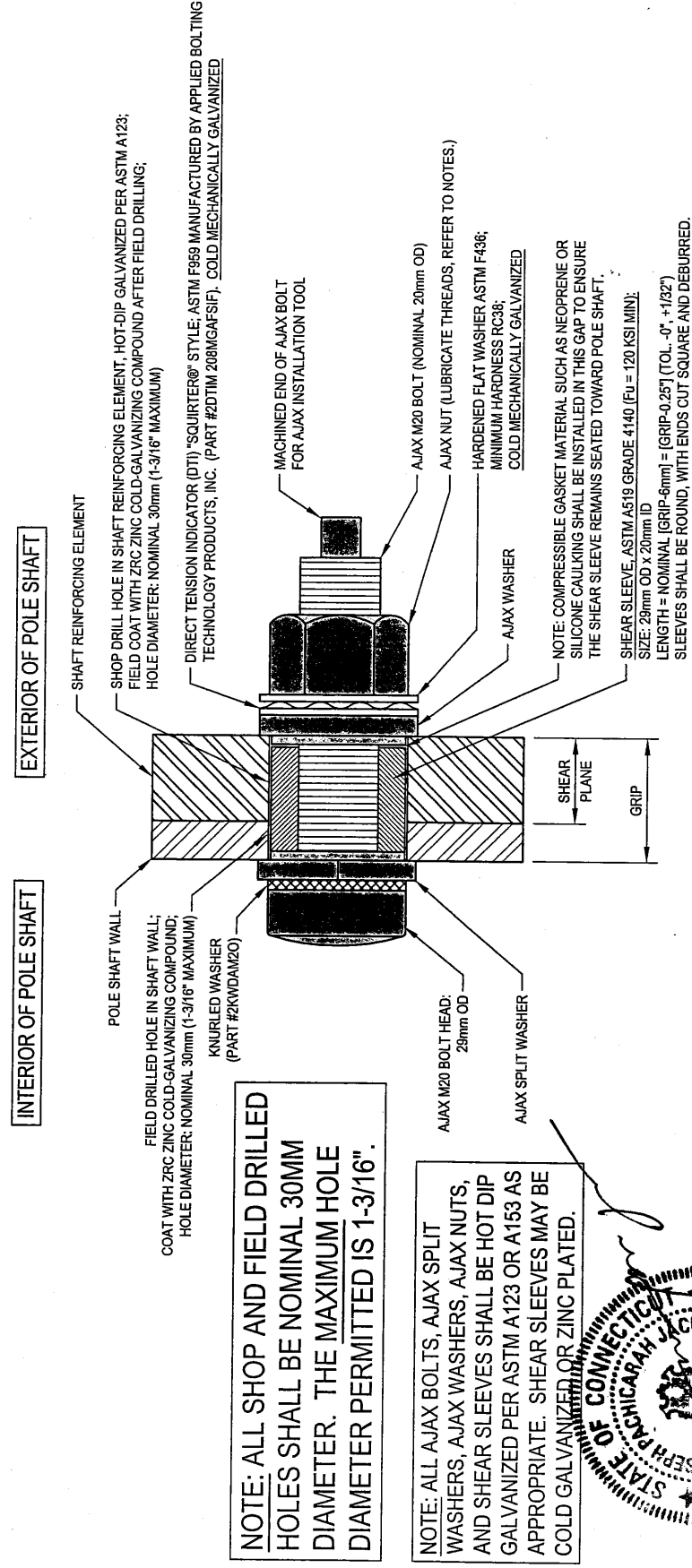
**HARDENED WASHERS REQUIRED:** USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

**NUT LUBRICATION REQUIRED:** PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

**NOTE:** COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

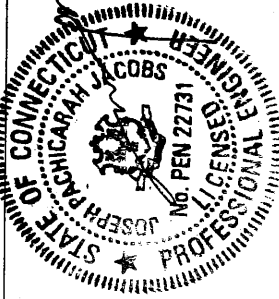
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

**INSPECTION REQUIRED:** ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



**NOTE:** ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16\".

**NOTE:** ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX NUTS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.



TYPICAL AJAX BOLT DETAIL 1  
S-3

SEP 18 2014



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BU #876309; MILFORD JAI-ALAI  
MILFORD, CONNECTICUT  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:  
KAT

DATE:  
9-15-2014

AJAX BOLT DETAIL

S-3



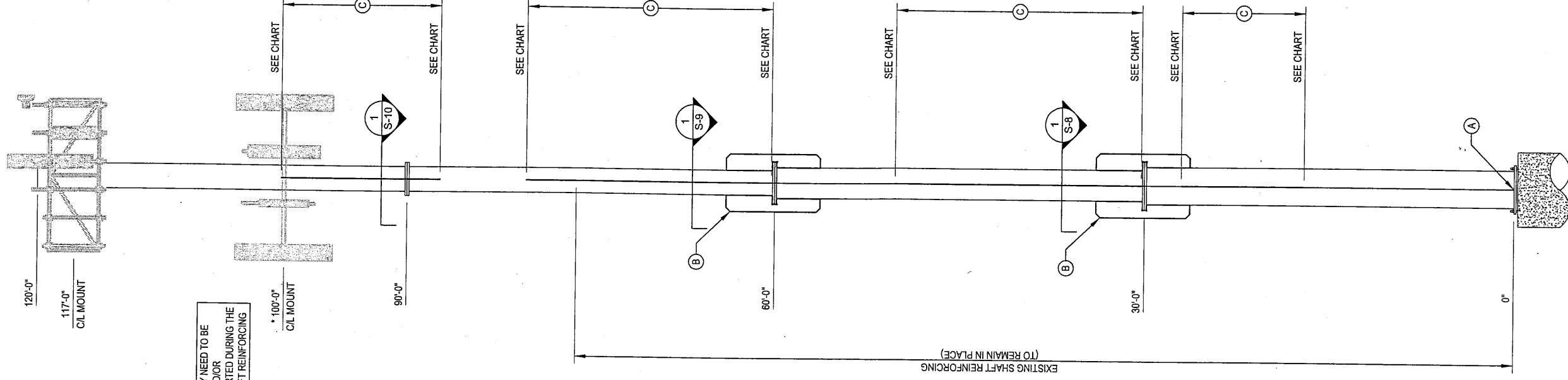
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	ASTM A53-B-42
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1 1/2" A354 GR BC

SHAFT SECTION	SHAFT SECTION DATA			DIAMETER ACROSS FLATS (IN)	
	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	@ TOP	@ BOTTOM
1	30.00	0.2500		24.000	24.000
2	30.00	0.3750		24.000	24.000
3	30.00	0.3750		30.000	30.000
4	30.00	0.3750		36.000	36.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

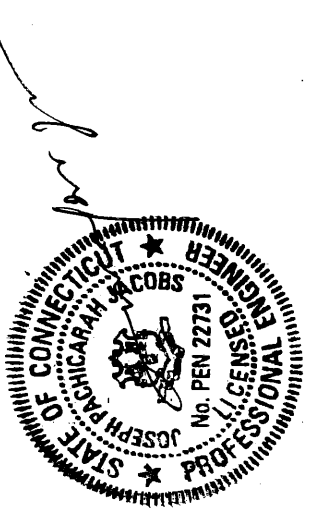
**MODIFICATIONS:**

- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-6.
- (B) INSTALL NEW WELDED FLANGE BRIDGE STIFFENERS AT EL. 30' AND 60'. SEE SHEETS S-8 & S-9.
- (C) INSTALL NEW SHAFT REINFORCING AND BOLTED FLANGE BRIDGE STIFFENERS AT EL. 90'. SEE CHARTS ON SHEET S-3 AND DETAILS ON SHEET S-10.



\* EXISTING MOUNTS MAY NEED TO BE ADJUSTED, MOVED AND/OR TEMPORARILY SUPPORTED DURING THE INSTALLATION OF SHAFT REINFORCING

**POLE ELEVATION 1**  
S-4



SEP 18 2014

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,849,659; 8,424,269 AND PATENT PENDING

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PROJECT: 37513-2057.005.7700

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CHECKED BY: J.W.M.  
APPROVED BY: *[Signature]*

DATE: 9-15-2014  
MONOPOLE PROFILE  
S-4

**BU #876309; MILFORD JAI-ALAI**  
**MILFORD, CONNECTICUT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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**NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE**

BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
17'-0"	27'-0"	90, 210 & 330	CCI-SFP-04007510	10'-0"	3	13	39	4	4	16"	306 LBS.
30'-3"	50'-3"	90, 210 & 330	CCI-SFP-04007520	20'-0"	3	21	63	4	4	16"	612 LBS.
60'-3"	80'-3"	90, 210 & 330	CCI-SFP-04007520 (CUST OM)	20'-0"	3	21	63	4	4	16"	612 LBS.
90'-3"	100'-3"	90, 210 & 330	CCHAFP-04007510	10'-0"	3	19	57	8	6	16"	306 LBS.

NOTES:

- 1) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 3) ALL REINFORCING SHALL BE ASTM A572 GR. 65
- 4) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
- 5) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
- 6) ALL SHIMS SHALL BE ASTM A-36.

222

1836 LBS.

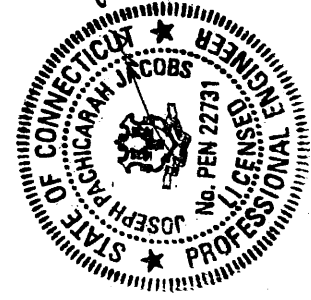
Level	QNTY	Jump Plate Size Width (in) Thk (in)	Unbraced Length (Bolt Spacing at Flange) (m)	Jump Plate Length (in)	Jump Weight	Bottom Bolts	Top Bolts	Filler Plate Size Width (in) Thk (in)	Slt Pl Thk (in)	Filler Plate Length (in)	Filler Weight	Weld Length (in)
90'	3	4	0.75	16	64	8	8	5	4.00	27	459	162
								5	3.25	27	373	162
				Total Jump Wt.							832 lbs	
											995 lbs	
											324 in	
											48	

Total Steel Weight  
995 lbs  
Total Weld Length  
324 in  
Total AJAX bolts  
48

Distance from Pole to edge of Flange  
4.0 in

**NOTES:**

- 1) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 3) ALL FILLER BARS SHALL BE ASTM A572 GR. 36
- 3) ALL JUMP BARS SHALL BE ASTM A572 GR. 65
- 4) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.



*Paul J. Ford*

**SEP 18 2014**

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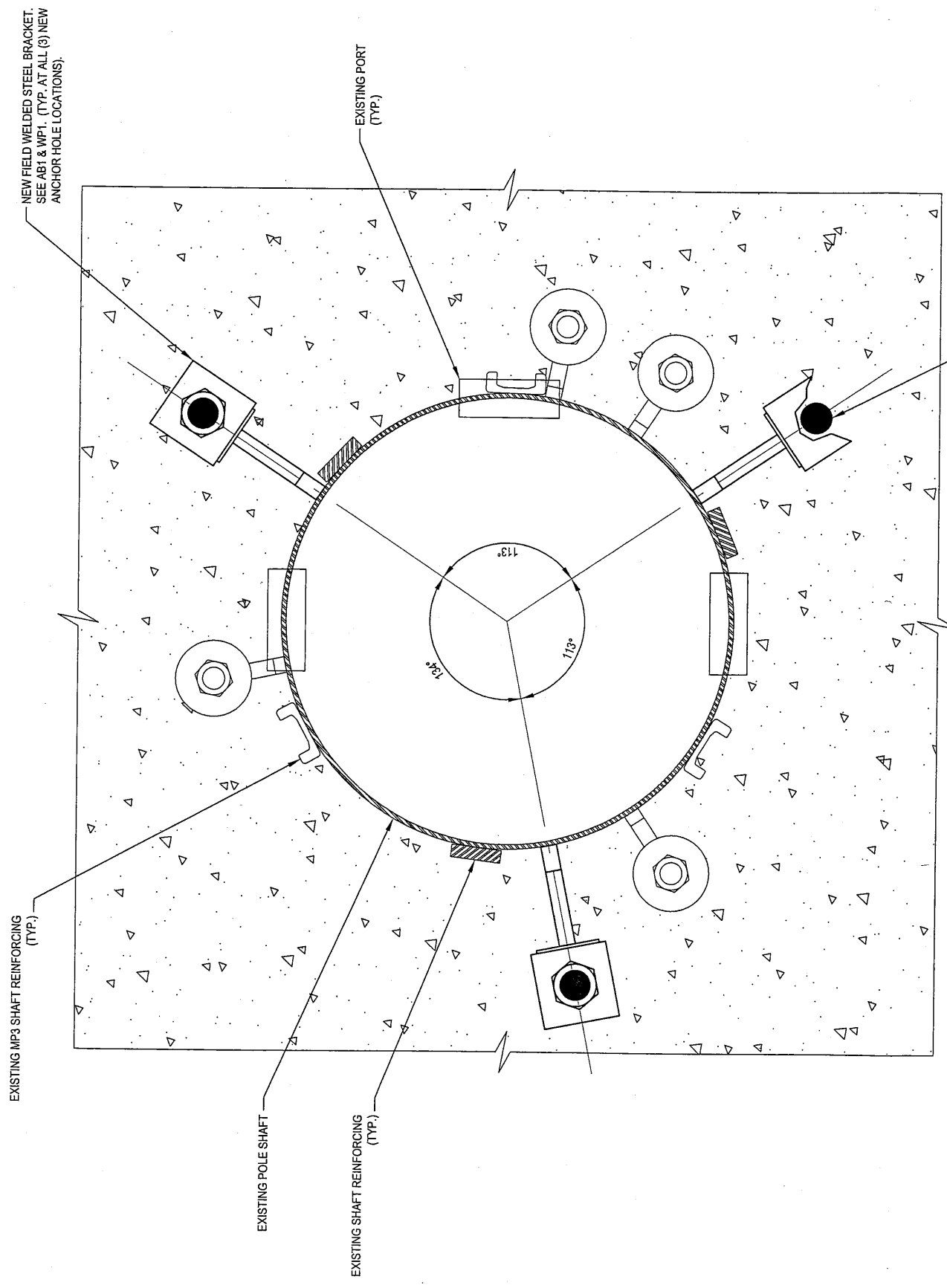
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CHECKED BY:  
J.W.M.  
APPROVED BY:  
*[Signature]*

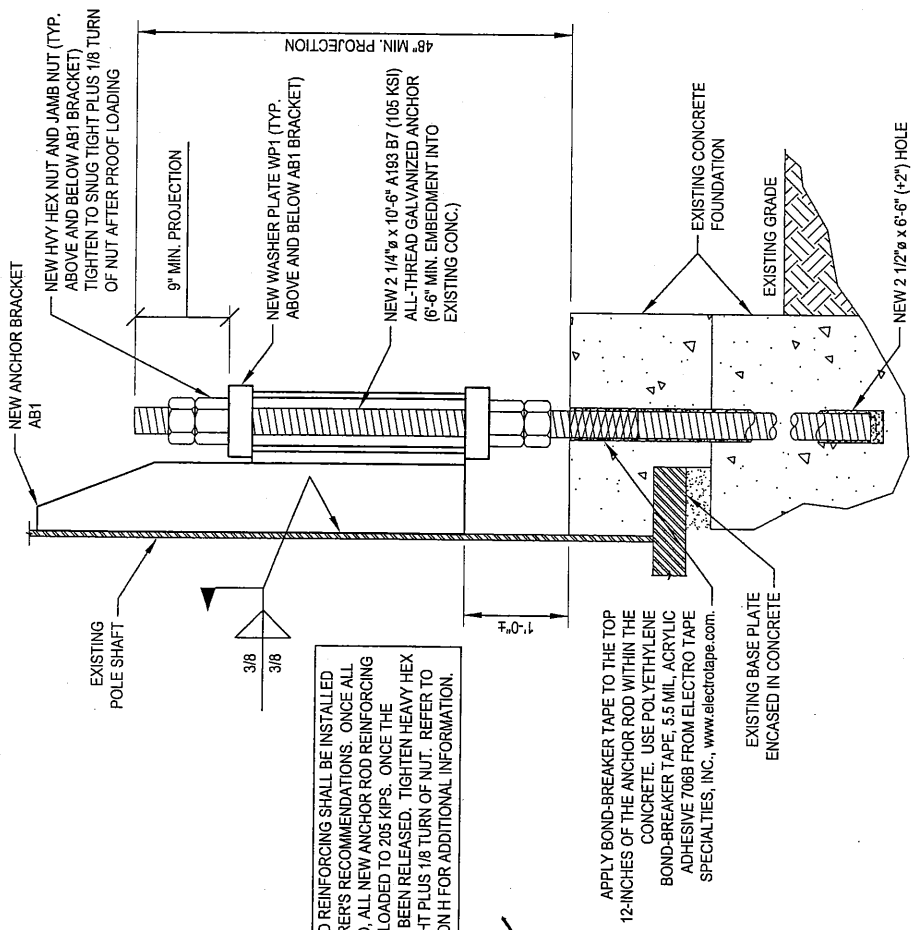
SHAFT REINFORCING  
CHARTS

DATE:  
9-15-2014

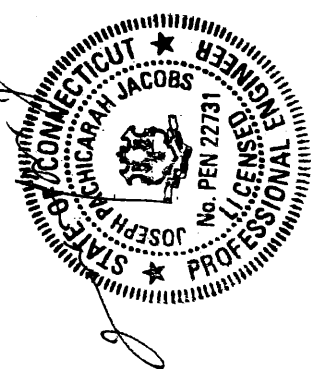
**S-5**



**BASE PLATE 1**  
S-6



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 205 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.



SEP 18 2014

**NEW ANCHOR & BRACKET DETAIL 2**  
S-6

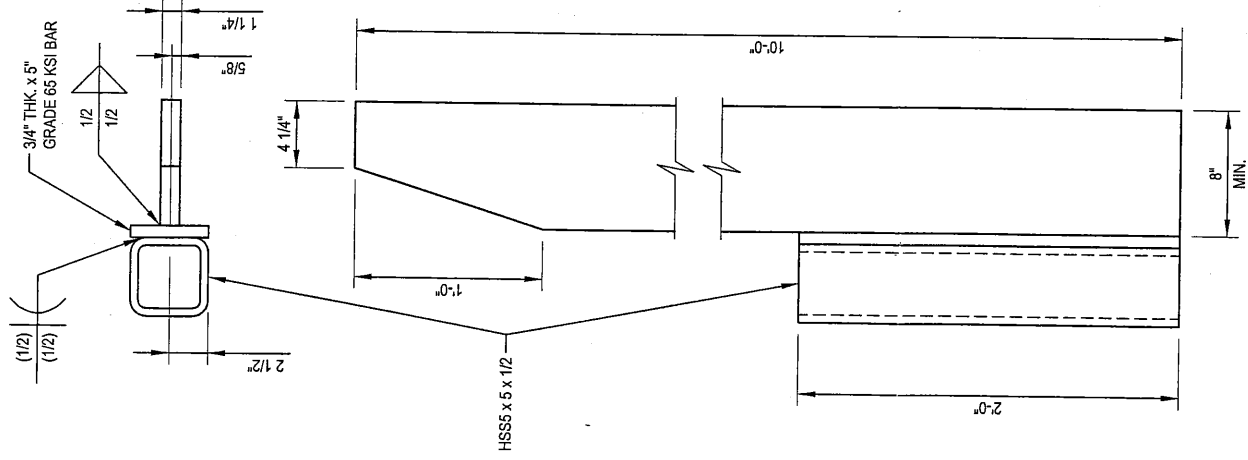
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8 PARKMEADOW DRIVE, PITTSFORD, NY 14534  
PH: (605) 899-3445

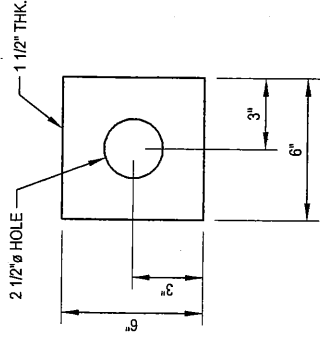
**BU #876309; MILFORD JAI-ALAI**  
**MILFORD, CONNECTICUT**  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700	
DRAWN BY: B.M.S.	BASE PLATE DETAILS
CHECKED BY: J.W.M.	
APPROVED BY: <i>[Signature]</i>	
DATE: 9-15-2014	<b>S-6</b>



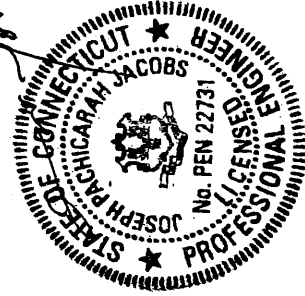
**ANCHOR BRACKET MK~AB1**

(3 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



**WASHER PLATE MK~WP1**

(6 REQUIRED) (Fy = 50 KSI)



SEP 18 2014

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**MILFORD, CONNECTICUT**  
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

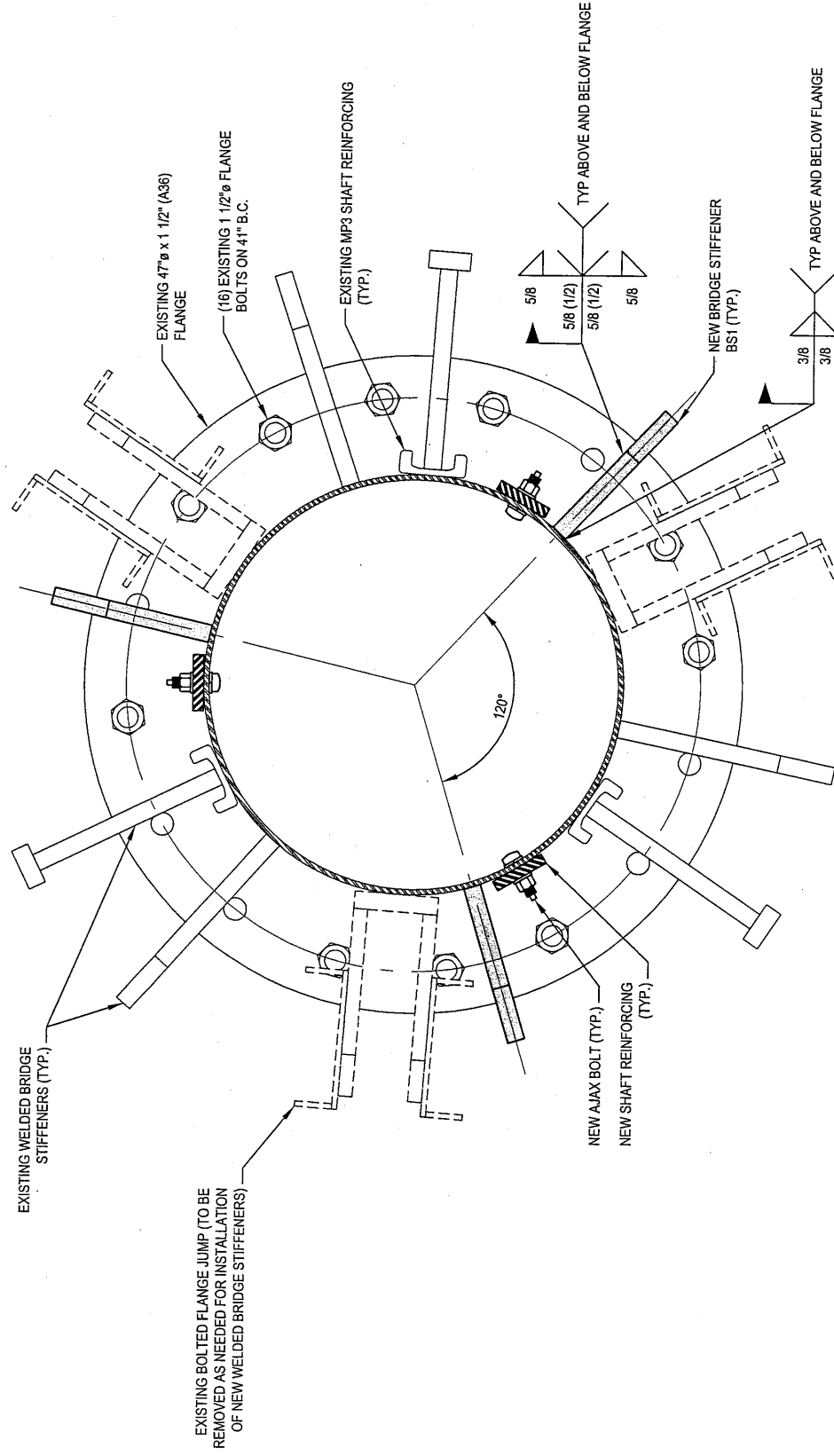
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J.W.M.

APPROVED BY:  
*[Signature]*

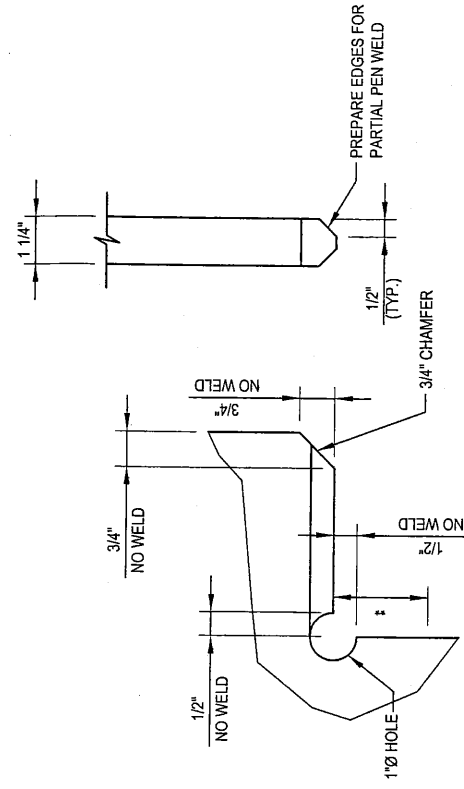
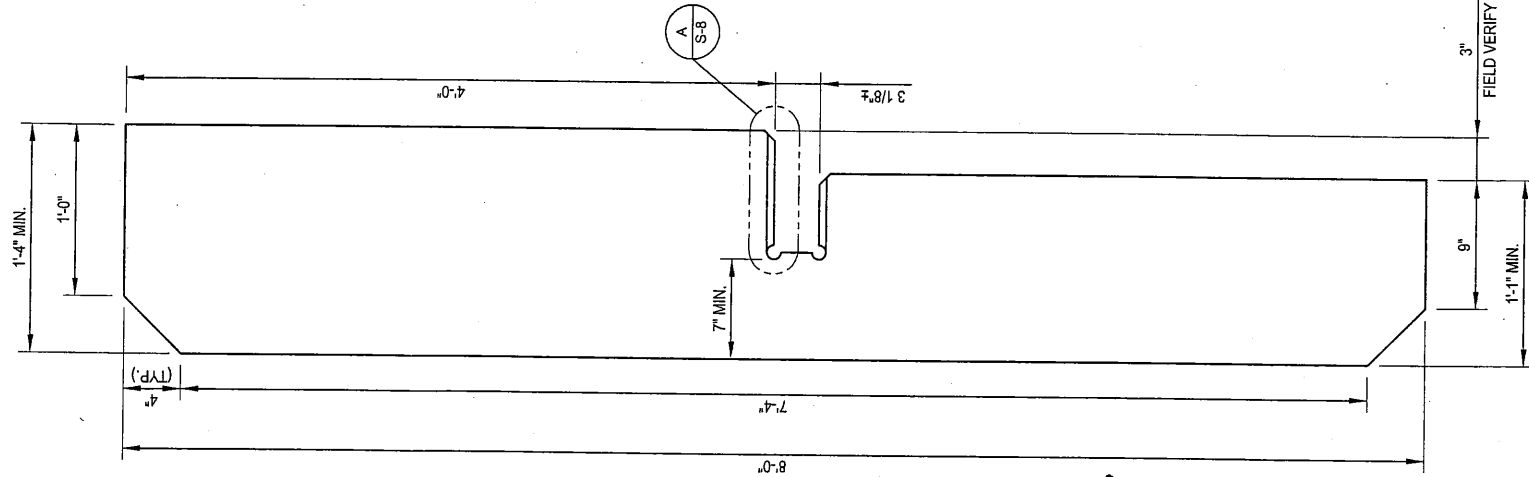
DATE:  
9-15-2014

MISC DETAILS

S-7

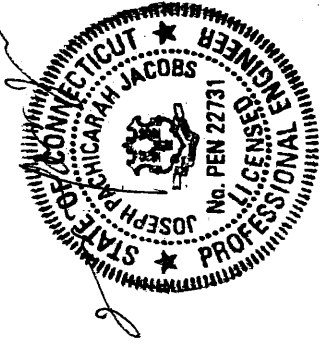


SHAFT PLAN 1  
EL. 30' S-8



NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS  
DETAIL A  
(TYPICAL)

SEP 18 2014  
BRIDGE STIFFENER MK~BS1  
(3 REQUIRED) (F<sub>y</sub> = 65 KSI)



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MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

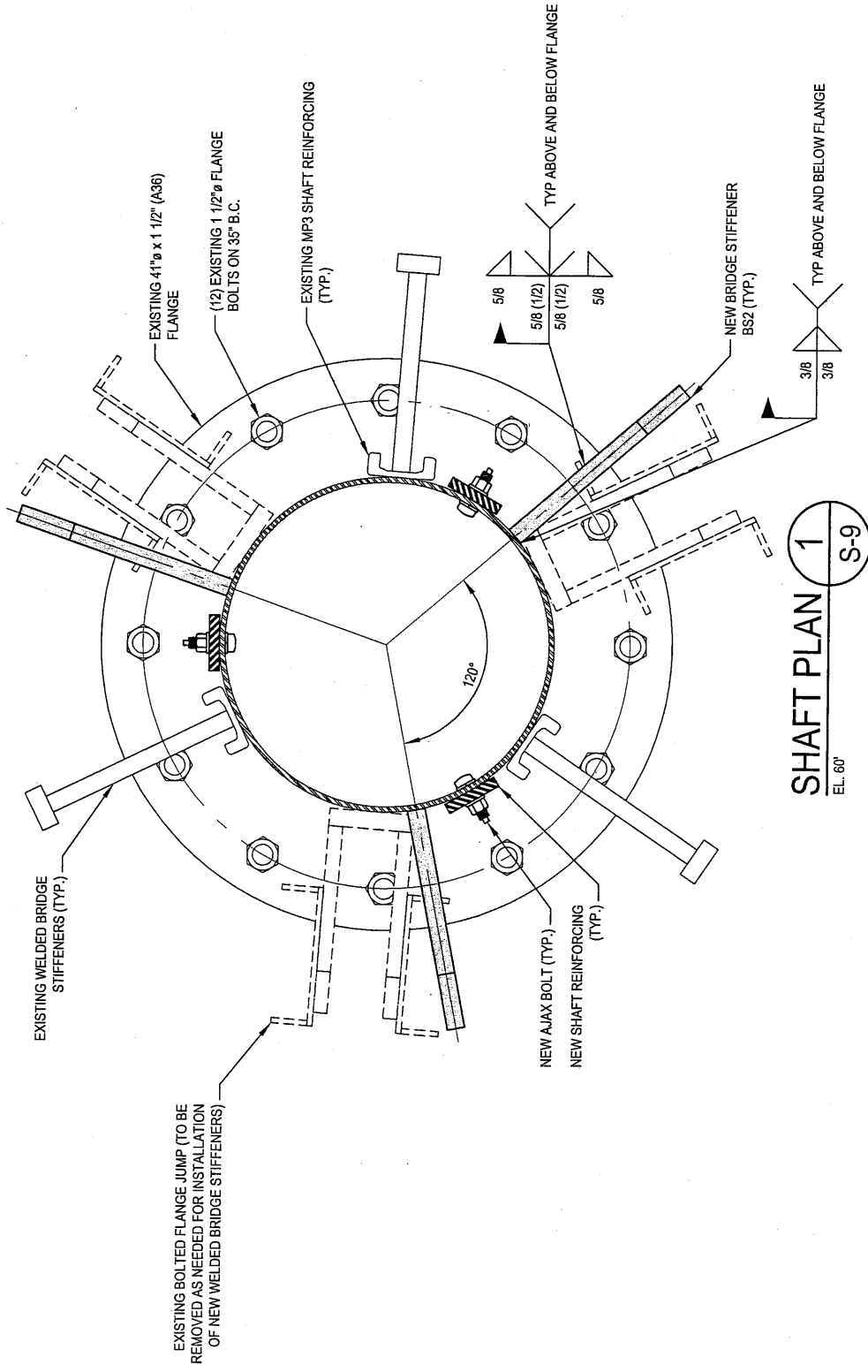
PROJECT: 37513-2057.005.7700

DRAWN BY: B.M.S.  
CHECKED BY: J.W.M.  
APPROVED BY: [Signature]

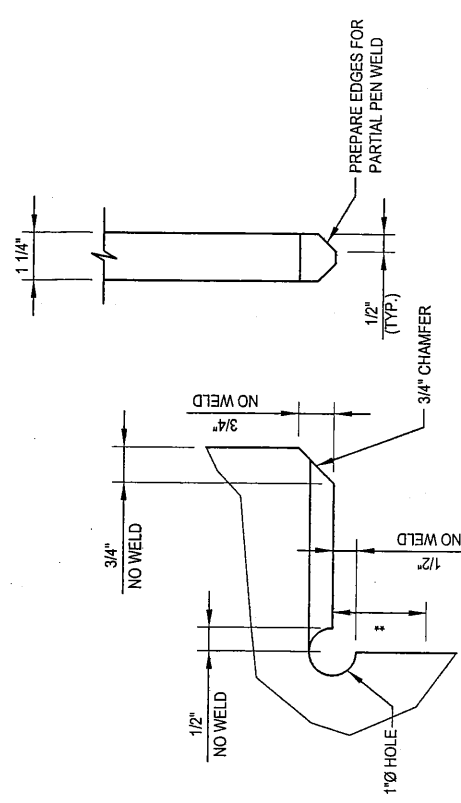
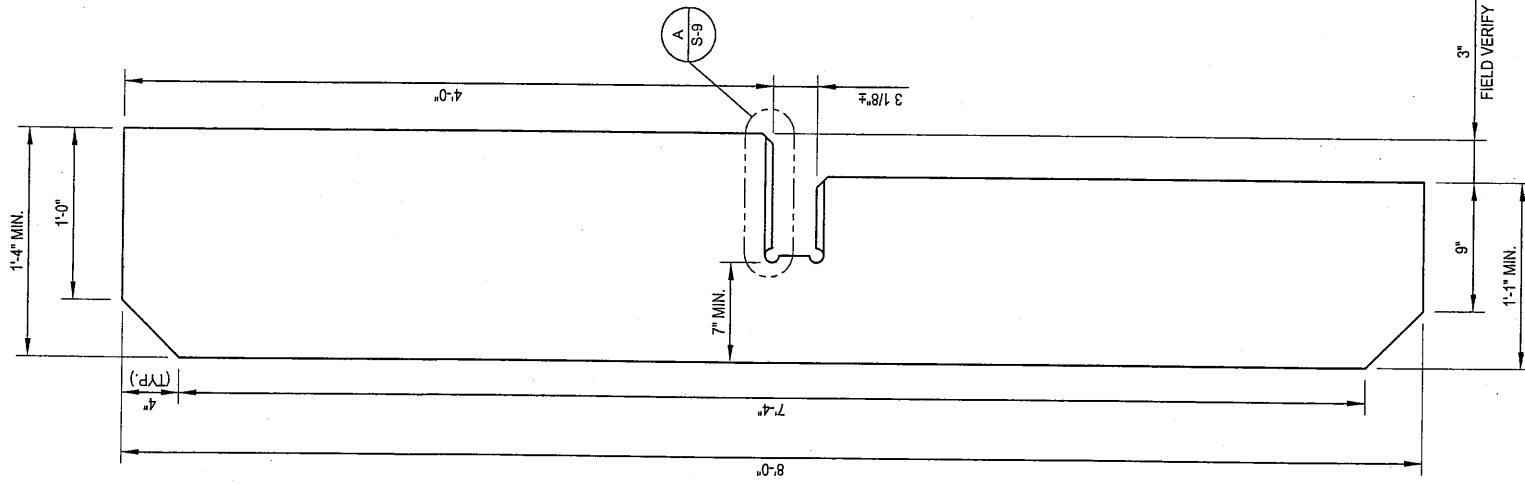
DATE: 9-15-2014

WELDED BRIDGE STIFFENER DETAILS

S-8

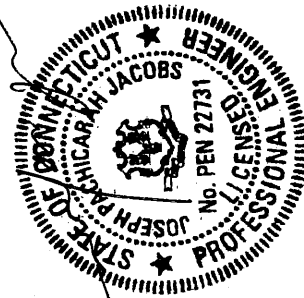


SHAFT PLAN 1 S-9  
EL. 60'



DETAIL A  
(TYPICAL)

\*\* NO WELD REGION SHOULD EXTEND BEYOND FLANGE LOCATIONS



SEP 18 2014

BRIDGE STIFFENER MK~BS2  
(3 REQUIRED) (Fy = 65 KSI)

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BU #876309; MILFORD JAI-ALAI  
MILFORD, CONNECTICUT  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

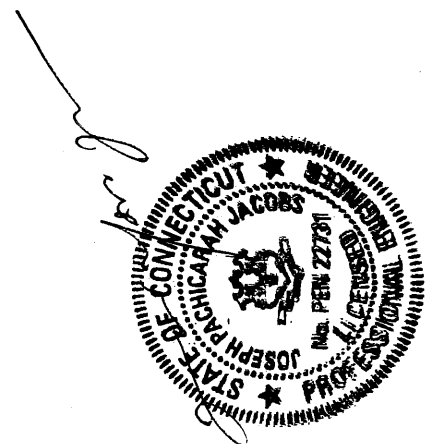
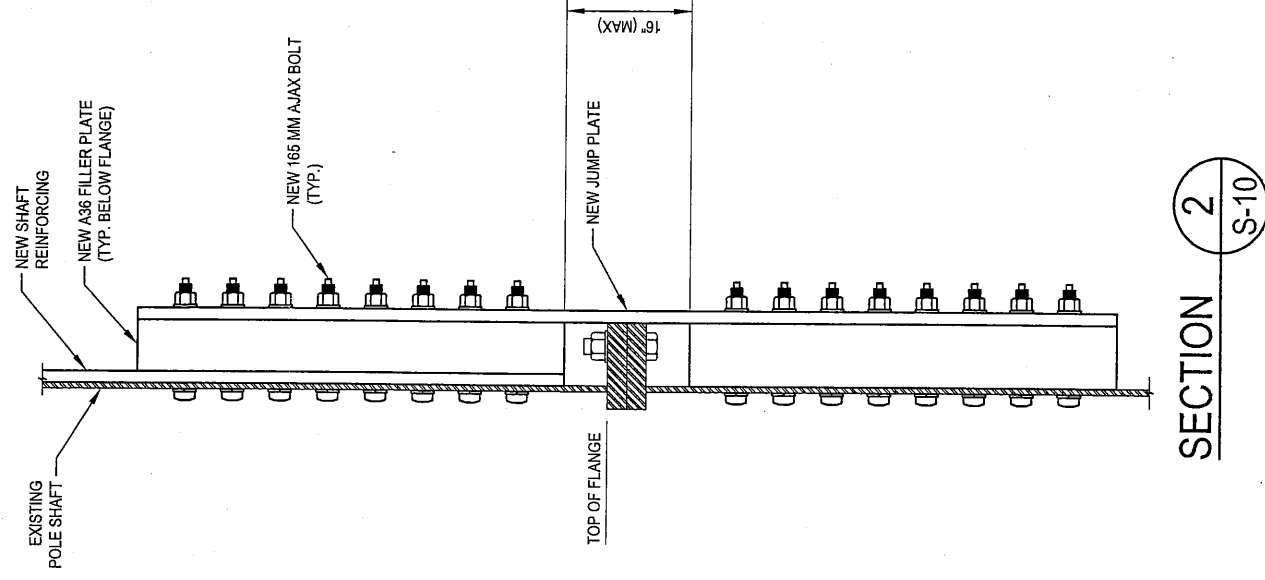
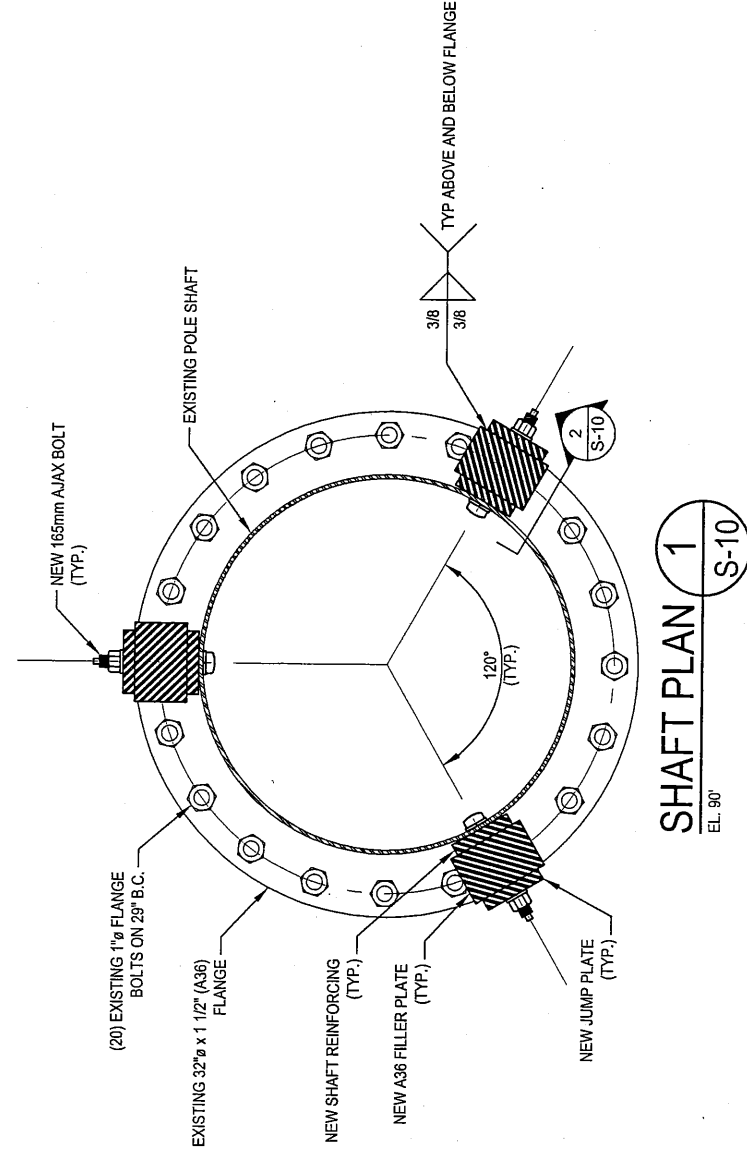
APPROVED BY:  
KAT

DATE:  
9-15-2014

WELDED BRIDGE  
STIFFENER DETAILS

S-9





SEP 18 2014

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 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:  
[Signature]

DATE:  
9-15-2014

BOLTED BRIDGE  
STIFFENER DETAILS

**S-10**

**MODIFICATION INSPECTION NOTES:**

**GENERAL**  
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF. NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL M/S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

**MI INSPECTOR**  
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

**GENERAL CONTRACTOR**  
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN ENG-SOW-10007.

**RECOMMENDATIONS**

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON-SITE.

**CANCELLATION OR DELAYS IN SCHEDULED MI**

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

**CORRECTION OF FAILING M/S**

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

**MI VERIFICATION INSPECTIONS**

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

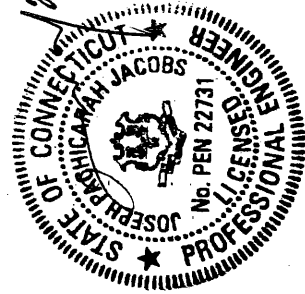
**PHOTOGRAPHS**

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/RESECTION AND INSPECTION
- RAW MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- FOUNDATION MODIFICATIONS
- WELD PREPARATION
- BOLT INSTALLATION AND TORQUE
- FINAL INSTALLED CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL INFELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.



SEP 18 2014

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CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)

MI CHECKLIST

REPORT ITEM

PRE-CONSTRUCTION

MI CHECKLIST DRAWINGS	X
EOR REVIEW	X
FABRICATION INSPECTION	X
FABRICATOR CERTIFIED WELD INSPECTION	X
MATERIAL TEST REPORT (MTR)	X
FABRICATOR NDE INSPECTION	NA
NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	NA
PACKING SLIPS	X

ADDITIONAL TESTING AND INSPECTIONS:

CONSTRUCTION

CONSTRUCTION INSPECTIONS	X
FOUNDATION INSPECTIONS	NA
CONCRETE COMP. STRENGTH AND SLUMP TESTS	NA
POST INSTALLED ANCHOR ROD VERIFICATION	X
BASE PLATE GROUT VERIFICATION	NA
CONTRACTOR'S CERTIFIED WELD INSPECTION	X
EARTHWORK: LIFT AND DENSITY	NA
ON SITE COLD GALVANIZING VERIFICATION	X
GUY WIRE TENSION REPORT	NA
GC AS-BUILT DOCUMENTS	X
INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-3	X
MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS	NA
REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.	NA

ADDITIONAL TESTING AND INSPECTIONS:

POST-CONSTRUCTION

MI INSPECTOR REDLINE OR RECORD DRAWING(S)	X
POST INSTALLED ANCHOR ROD PULL-OUT TESTING	X
PHOTOGRAPHS	X

ADDITIONAL TESTING AND INSPECTIONS:

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT

NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

PROJECT: 37513-2057.005.7700

DRAWN BY:  
B.M.S.

CHECKED BY:  
J.W.M.

APPROVED BY:  
KAT

DATE:  
9-15-2014

MI CHECKLIST

S-11

BU #876309; MILFORD JAI-ALAI  
MILFORD, CONNECTICUT  
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

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

Sprint Existing Facility

Site ID: CT03XC004

Milford Jai-Lai  
311 Old Gate Lane  
Milford, CT 06460

**August 13, 2012**

August 13, 2012

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

Re: Emissions Values for Site **CT03XC004 – Milford Jai-Lai**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 311 Old Gate Lane, Milford, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the cellular band is approximately  $567 \mu\text{W}/\text{cm}^2$ , and the general population exposure limit for the PCS band 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 upgrades to the existing 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. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

- 1) 6 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
- 2) 1 CDMA Carrier (850 MHz ) was considered for each sector of the proposed installation
- 3) 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.
- 4) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
- 5) The antenna used in this modeling is the RFS APXVSP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

- 6) The antenna mounting height centerline of the proposed antennas is **120.3 feet** above ground level (AGL)
- 7) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits



Site ID	CT03XC004 - Milford Jai-Lai
Site Address	311 Old Gate Lane, Milford, CT 06460
Site Type	Monopole

**Sector 1**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	15.9	120.3	114.3	1/2 "	0.5	0	4160.8422	114.4972	11.44972%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	120.3	114.3	1/2 "	0.5	0	389.96892	10.73108	1.89261%
Sector total Power Density Value:																13.342%	

**Sector 2**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	15.9	120.3	114.3	1/2 "	0.5	0	4160.8422	114.4972	11.44972%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	120.3	114.3	1/2 "	0.5	0	389.96892	10.73108	1.89261%
Sector total Power Density Value:																13.342%	

**Sector 3**

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	6	120	15.9	120.3	114.3	1/2 "	0.5	0	4160.8422	114.4972	11.44972%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	120.3	114.3	1/2 "	0.5	0	389.96892	10.73108	1.89261%
Sector total Power Density Value:																13.342%	

Site Composite MPE %	
Carrier	MPE %
Sprint	40.027%
Clearwire	1.310%
Verizon Wireless	26.270%
<b>Total Site MPE %</b>	<b>67.607%</b>

## Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **40.027% (13.342% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **67.607%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

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



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