



Crown Castle
3530 Torringdon Way, Suite 300
Charlotte, NC 28277

April 1, 2015

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

RE: Sprint PCS-Exempt Modification - Crown Site BU: 876320
Sprint PCS Site ID: CT03XC038
Located at: 528 Wheelers Farm Rd, 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 the City of Milford, and The Village Foundation Inc., Property Owner.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **528 Wheelers Farm Road, 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: Heather Helton.

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: The Honorable Benjamin G. Blake, Mayor
City of Milford
110 River St
Milford, CT 06460

The Village Foundation Inc.
528 Wheelers Farm Rd
Milford, CT 06460

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

- 1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.
- 1.2 RELATED DOCUMENTS:
 - A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
 - B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HERewith.
- 1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.
- 1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:
 - A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
 1. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
 5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
 3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
 4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
 5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
 6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
 7. AMERICAN CONCRETE INSTITUTE (ACI)
 8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
 9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
 10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
 11. PORTLAND CEMENT ASSOCIATION (PCA)
 12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
 13. BRICK INDUSTRY ASSOCIATION (BIA)
 14. AMERICAN WELDING SOCIETY (AWS)
 15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
 16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
 17. DOOR AND HARDWARE INSTITUTE (DHI)
 18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
 19. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

- A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
- B. COMPANY: SPRINT CORPORATION
- C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
- D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
- E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
- F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
- G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

- 1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.
- 1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.
- 1.8 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.
- 1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

- A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
- B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
- C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

- 1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.
- 1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED.
- 1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- 1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.
- 1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

3.2 DELIVERABLES:

- A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
- B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.
- C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

1.3 NOTICE TO PROCEED

- A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.
- B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

- 3.1 FUNCTIONAL REQUIREMENTS:
 - A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
 - B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
 - C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
 - D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE:



DRAWING NOTICE:

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

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	MJB	B
ISSUED FOR REVIEW	02/03/14	MJB	A

SITE NAME:

528 WHEELERS FARM ROAD

SITE CASCADE:

CT03XC038

SITE ADDRESS:

528 WHEELERS FARM ROAD
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 - ANTENNA ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:



6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:



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Albany, NY 12205
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JOB NUMBER 353-XXX

MLA PARTNER:



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REVISIONS:

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ISSUED FOR REVIEW	02/03/14	MJB	A

SITE NAME:

528 WHEELERS
FARM ROAD

SITE CASCADE:

CT03XC038

SITE ADDRESS:

528 WHEELERS FARM ROAD
MILFORD, CT 06460

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

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

SECTION 01 400 - SUBMITTALS & TESTS

PART 1 - GENERAL

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

1.2 RELATED DOCUMENTS:

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 WEEKLY REPORTS:

- A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.
- B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

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

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

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

PLANS PREPARED FOR:



PLANS PREPARED BY:



MLA PARTNER:



ENGINEERING LICENSE



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REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	MAP	B
ISSUED FOR REVIEW	02/03/14	MJB	A

SITE NAME:

528 WHEELERS FARM ROAD

SITE CASCADE:

CT03XC038

SITE ADDRESS:

**528 WHEELERS FARM ROAD
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.

PLANS PREPARED FOR:



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Overland Park, Kansas 66251

PLANS PREPARED BY:



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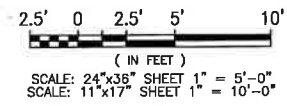
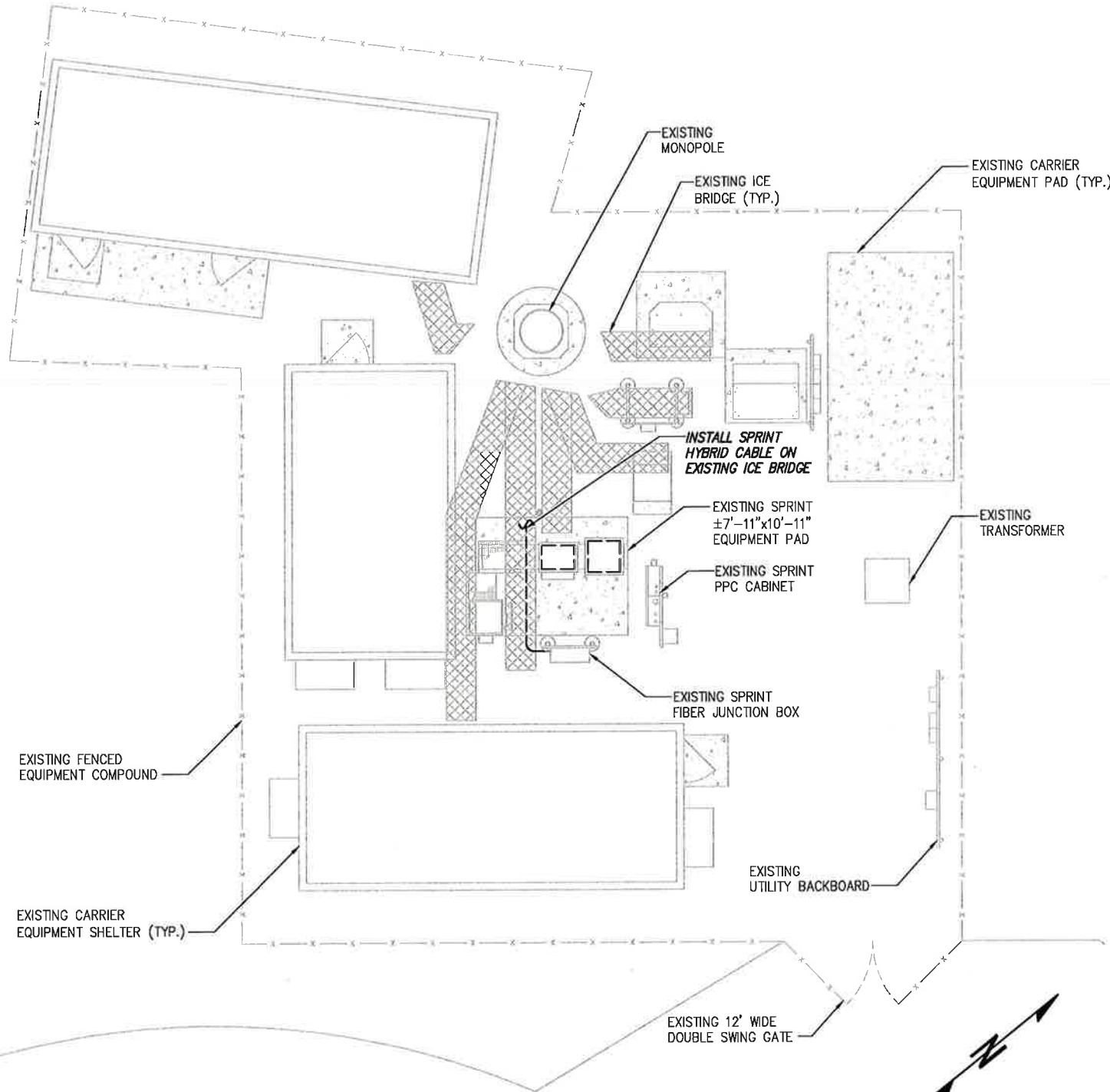
SITE NAME:
528 WHEELERS FARM ROAD

SITE CASCADE:
CT03XC038

SITE ADDRESS:
528 WHEELERS FARM ROAD
MILFORD, CT 06460

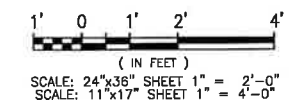
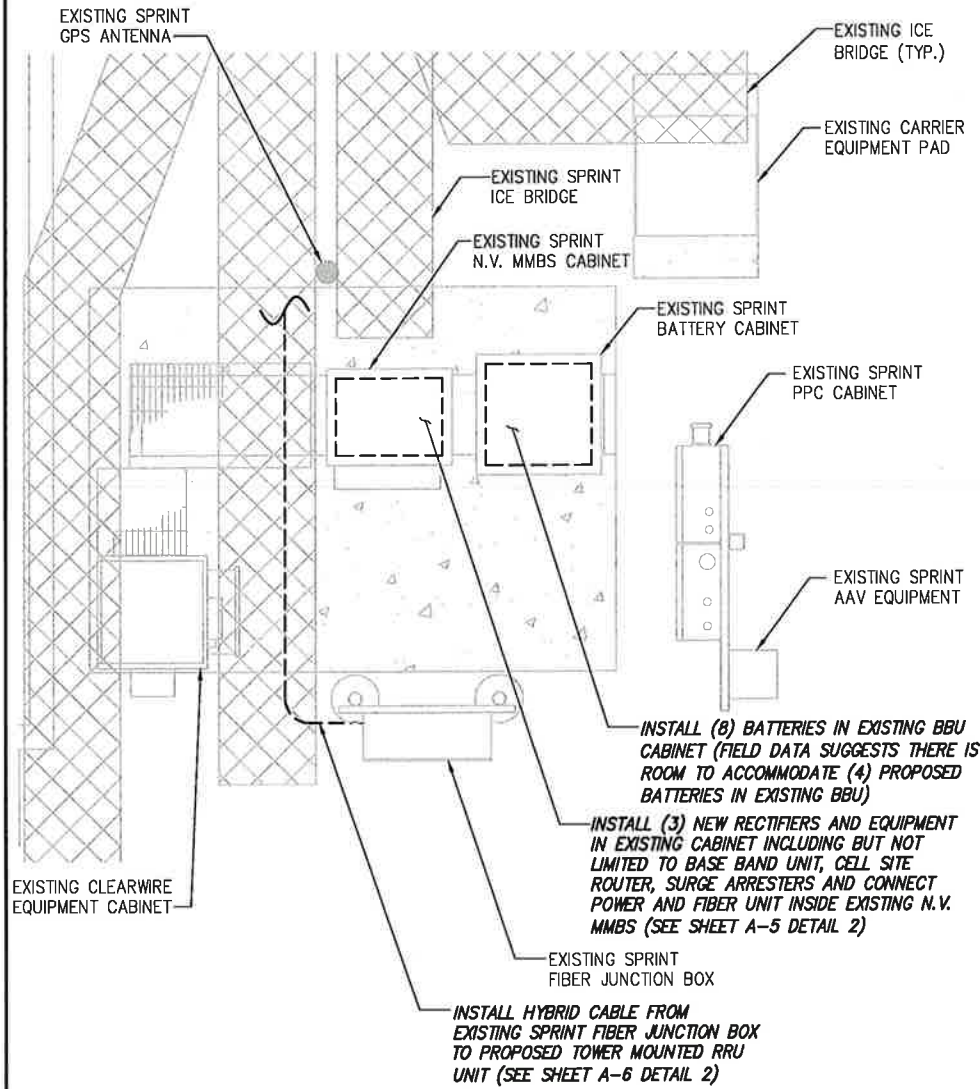
SHEET DESCRIPTION:
SITE PLAN

SHEET NUMBER:
A-1



OVERALL SITE PLAN

SCALE: AS NOTED 1



SPRINT EQUIPMENT PLAN

SCALE: AS NOTED 2

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	02/20/14	MJB	B
ISSUED FOR REVIEW	02/03/14	MJB	A

SITE NAME:
528 WHEELERS FARM ROAD

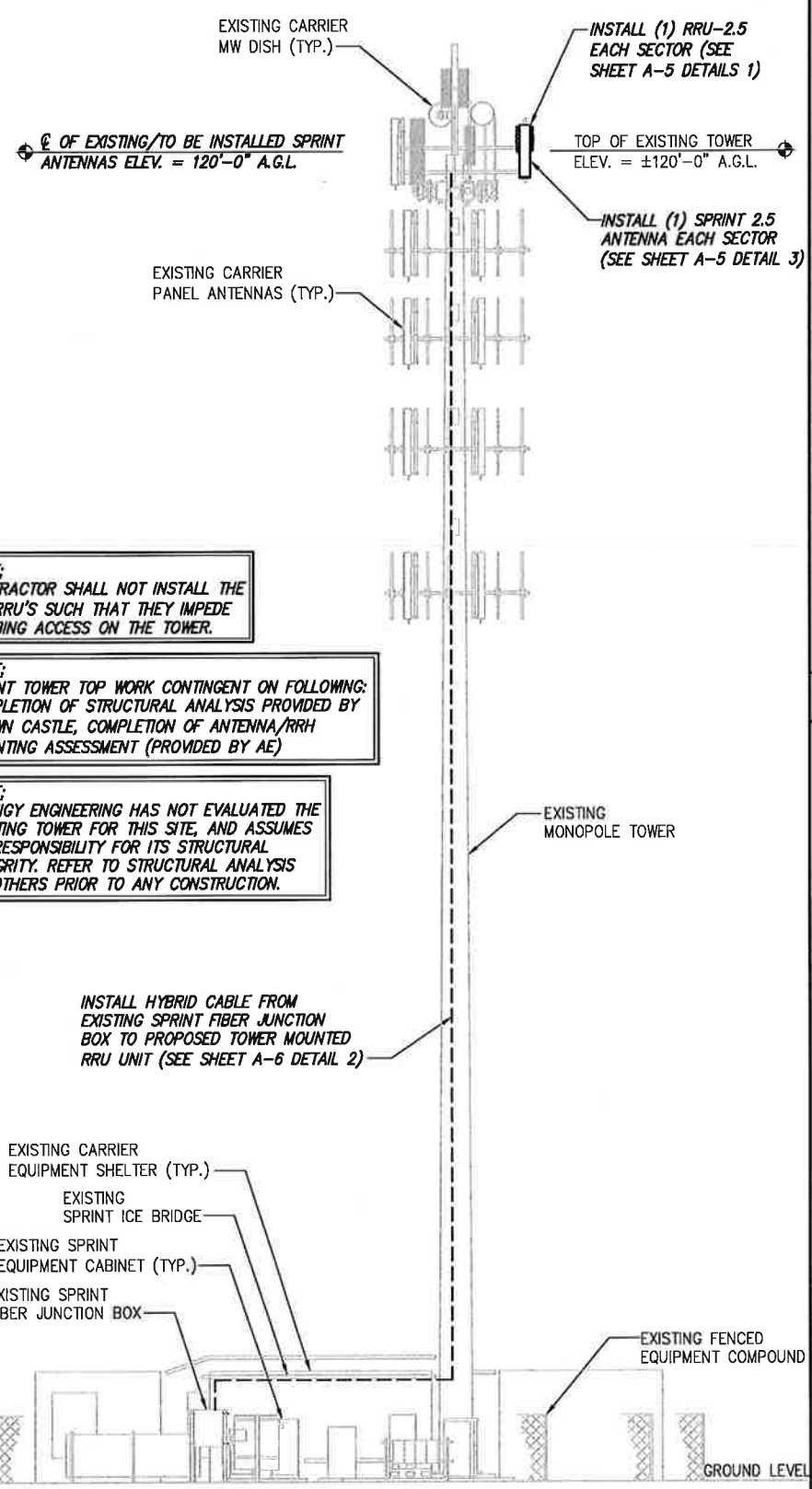
SITE CASCADE:
CT03XC038

SITE ADDRESS:
**528 WHEELERS FARM ROAD
MILFORD, CT 06460**

SHEET DESCRIPTION:
TOWER ELEVATION & CABLE PLAN

SHEET NUMBER:
A-2

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



NOTE:
CONTRACTOR SHALL NOT INSTALL THE 2.5 RRU'S SUCH THAT THEY IMPEDE CLIMBING ACCESS ON THE TOWER.

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 FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS BY OTHERS PRIOR TO ANY CONSTRUCTION.

DETAIL NOT USED	NO SCALE	2
-----------------	----------	---

DETAIL NOT USED	NO SCALE	3
DETAIL NOT USED	NO SCALE	4

TOWER ELEVATION	NO SCALE	1
-----------------	----------	---

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PLANS PREPARED BY:



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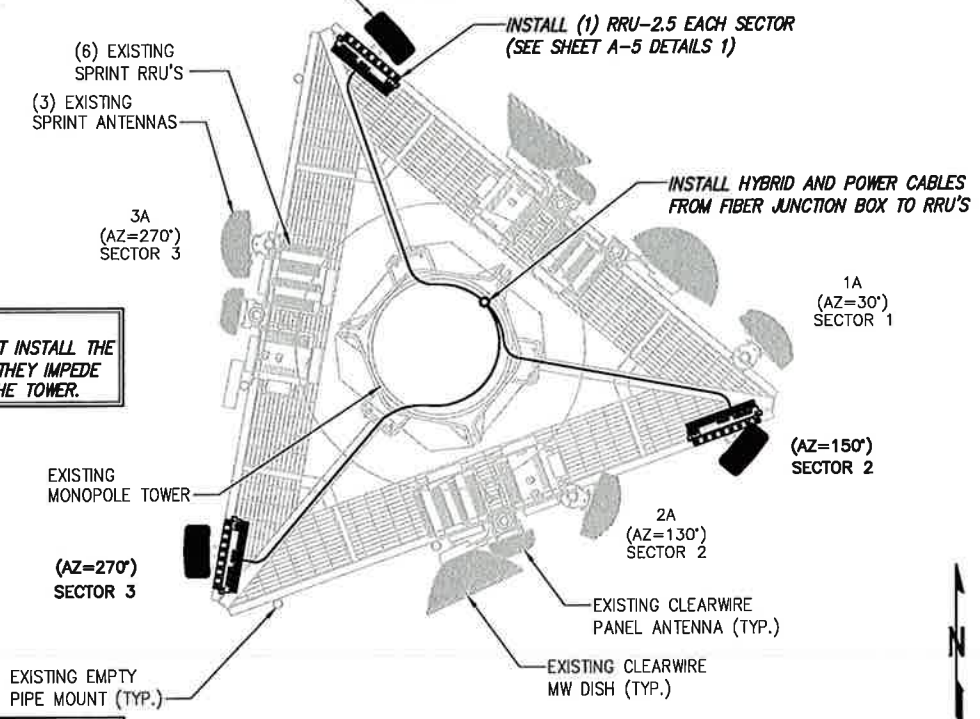
ANTENNA LAYOUT & MOUNTING DETAILS

SHEET NUMBER:

A-3

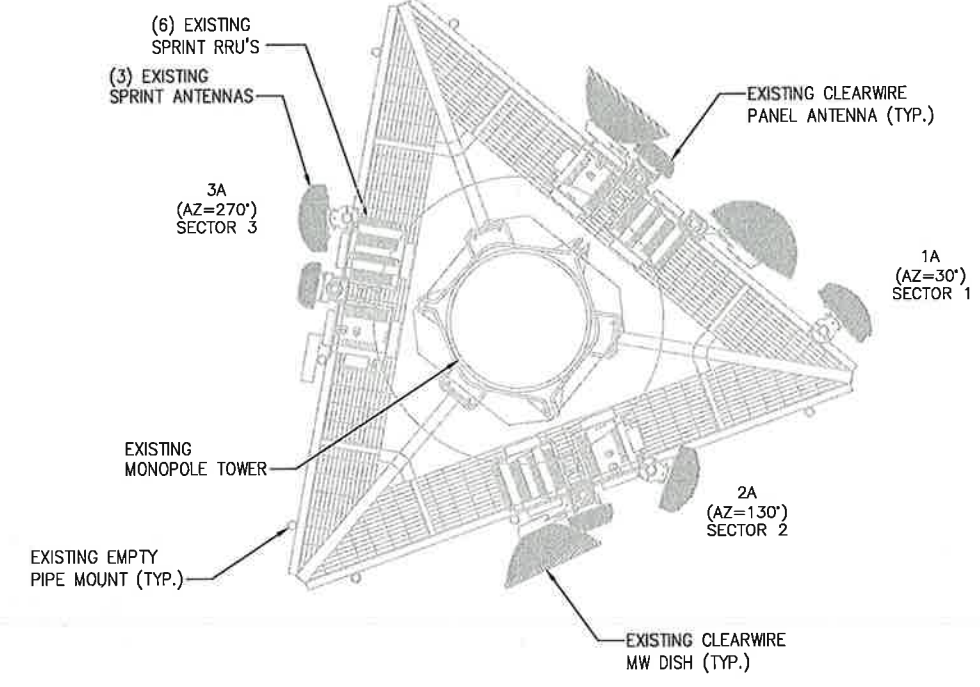
THE CONFIGURATION PLANS ARE BASED ON PROVIDED INFORMATION AND ARE FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR TO VERIFY FIELD CONDITIONS PRIOR TO CONSTRUCTION.

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



NOTE: CONTRACTOR SHALL NOT INSTALL THE 2.5 RRU'S SUCH THAT THEY IMPEDE CLIMBING ACCESS ON THE TOWER.

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



EXISTING ANTENNA & RRU LAYOUT

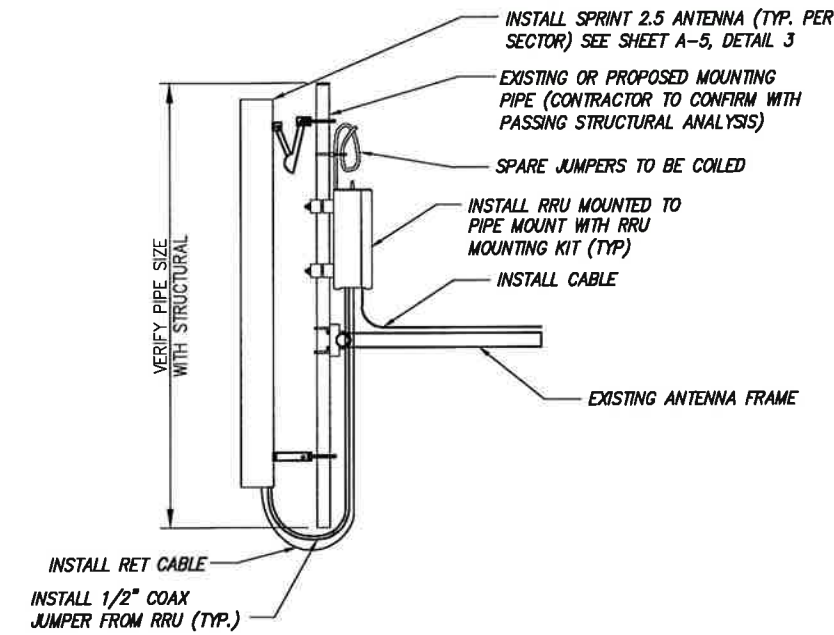
NO SCALE

1

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 NY RRHS AT SPRINT ARRAY. THESE ARE TO BE USED TO POWER UP THE 2.5 RRHS AND TIED INTO EXISTING DC BREAKERS INSIDE THE FIBER JUNCTION BOX LOCATED AT EQUIPMENT.

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

DETAIL NOT USED

NO SCALE

3

TYPICAL ANTENNA & RRU MOUNTING DETAILS

NO SCALE

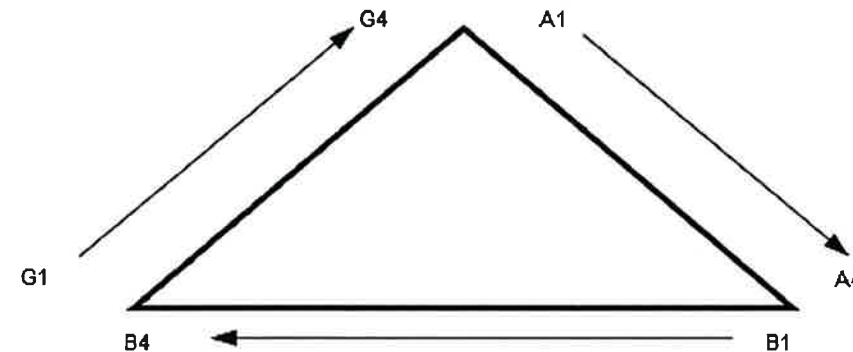
4

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



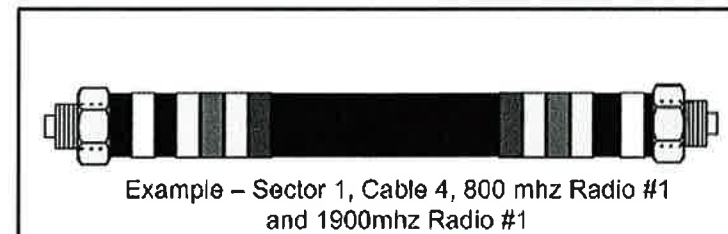
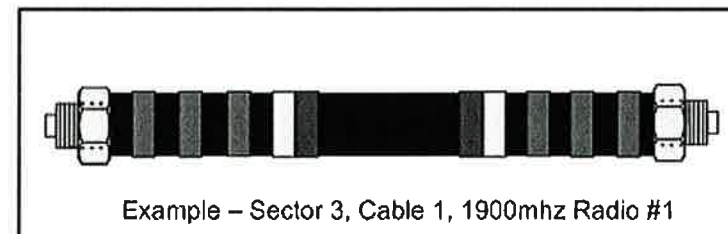
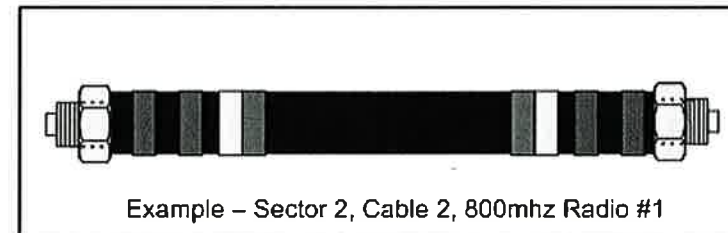
NOTES:

- 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	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	No Tape	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	No Tape	No Tape	No Tape
	3	Brown	Brown	Brown
	4	White	White	White
	5	Red	Red	Red
	6	Grey	Grey	Grey
	7	Purple	Purple	Purple
	8	Orange	Orange	Orange

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

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



PLANS PREPARED FOR:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793
JOB NUMBER 353-100X

MLA PARTNER:

ENGINEERING LICENSE:

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ISSUED FOR CONSTRUCTION		02/20/14	MAB	B
ISSUED FOR REVIEW		02/03/14	MAB	A

SITE NAME:
528 WHEELERS FARM ROAD

SITE CASCADE:
CT03XC038

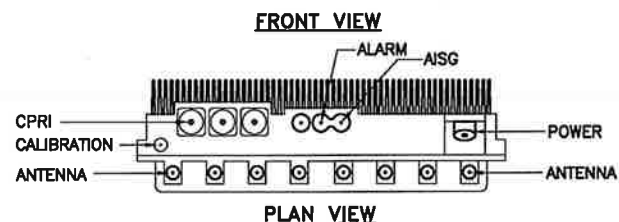
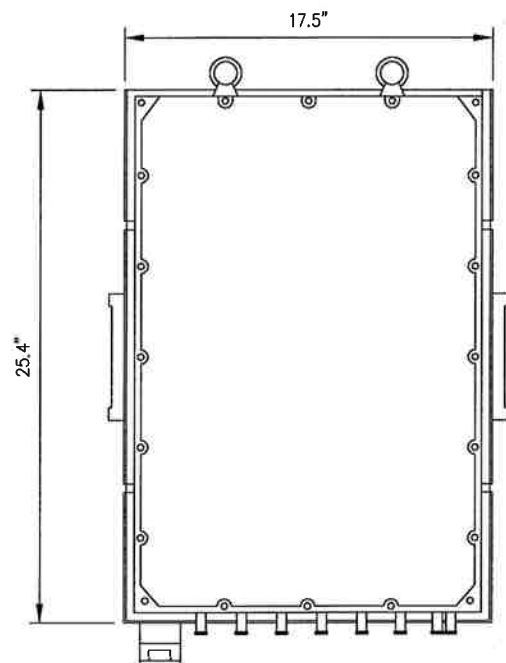
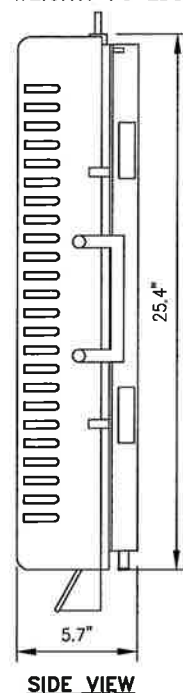
SITE ADDRESS:
528 WHEELERS FARM ROAD
MILFORD, CT 06460

SHEET DESCRIPTION:
COLOR CODING AND NOTES

SHEET NUMBER:
A-4

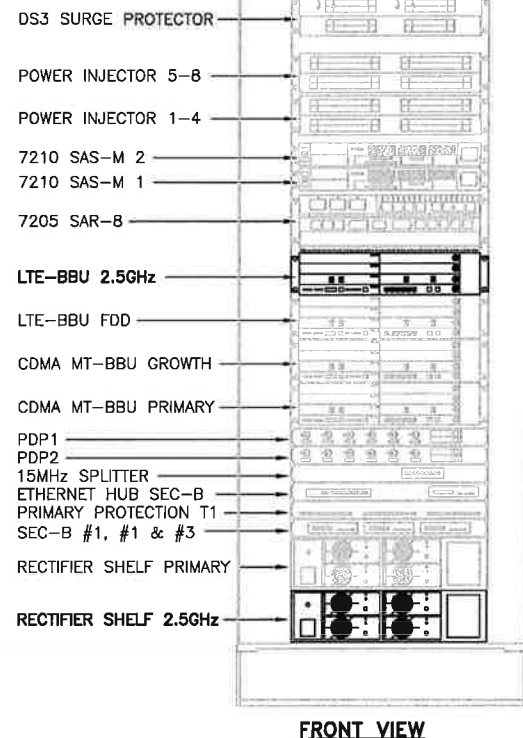
RRU: ALCATEL LUCENT TD-RRH8X20

COLOR: LIGHT GREY
WEIGHT: 70 LBS.



NOTES

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



2.5 RRU'S

NO SCALE

1

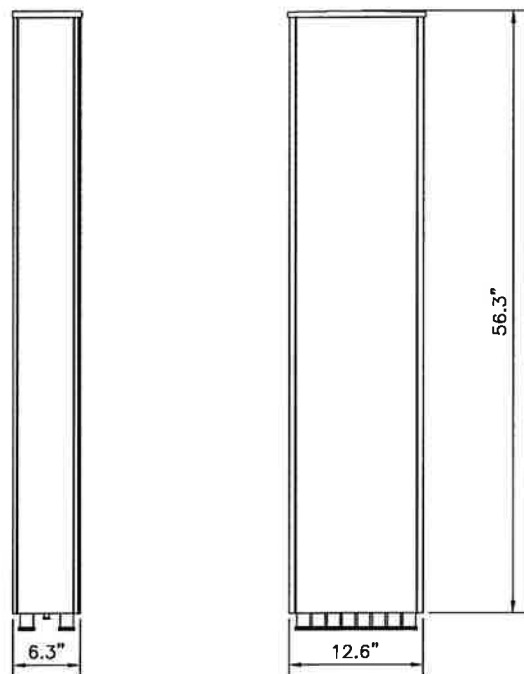
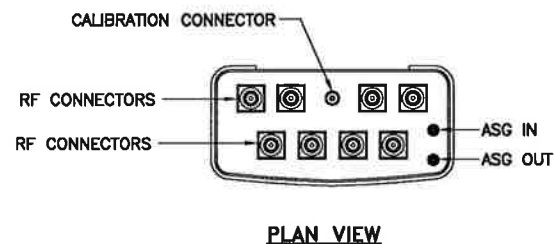
NEW EQUIPMENT IN EXISTING CABINET

NO SCALE

2

ANTENNA: RFS APXVTM14-C-120

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



2.5 ANTENNA

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-XXX

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528 WHEELERS FARM ROAD

SITE CASCADE:
CT03XC038

SITE ADDRESS:
528 WHEELERS FARM ROAD
MILFORD, CT 06460

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-5

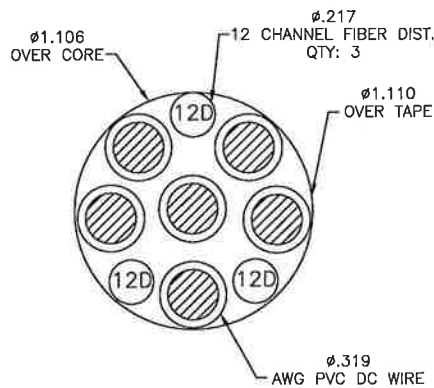
RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: 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
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
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: HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

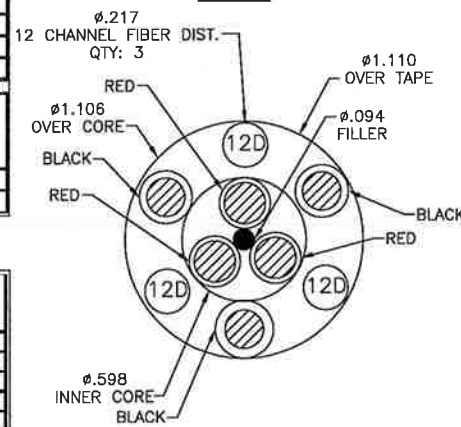
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

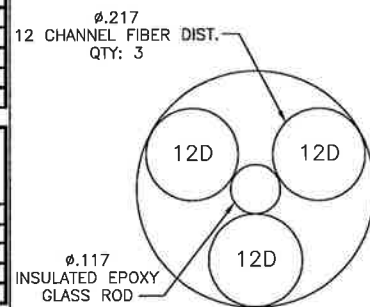
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE
AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF
HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



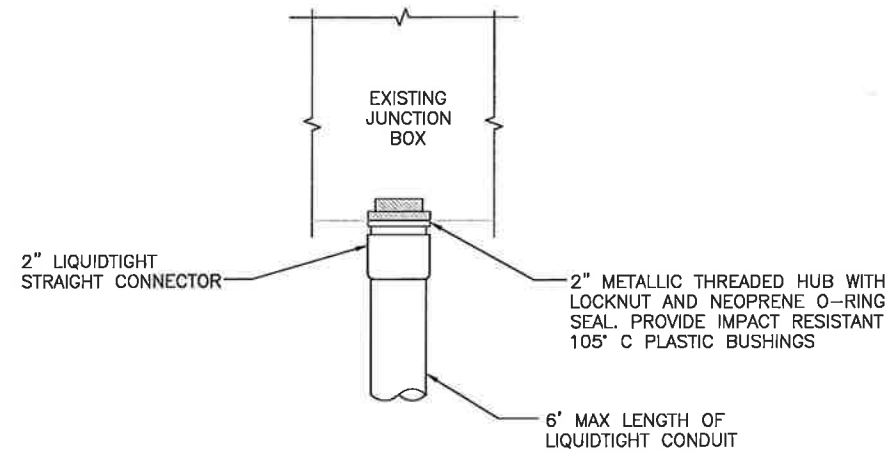
4 AWG



8 & 6 AWG



FIBER ONLY



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:

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

Design. Build. Deliver.

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SITE NAME:

528 WHEELERS FARM ROAD

SITE CASCADE:

CT03XC038

SITE ADDRESS:

528 WHEELERS FARM ROAD
MILFORD, CT 06460

SHEET DESCRIPTION:

CIVIL DETAILS

SHEET NUMBER:

A-6

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ISSUED FOR REVIEW	02/03/14	MJB	A

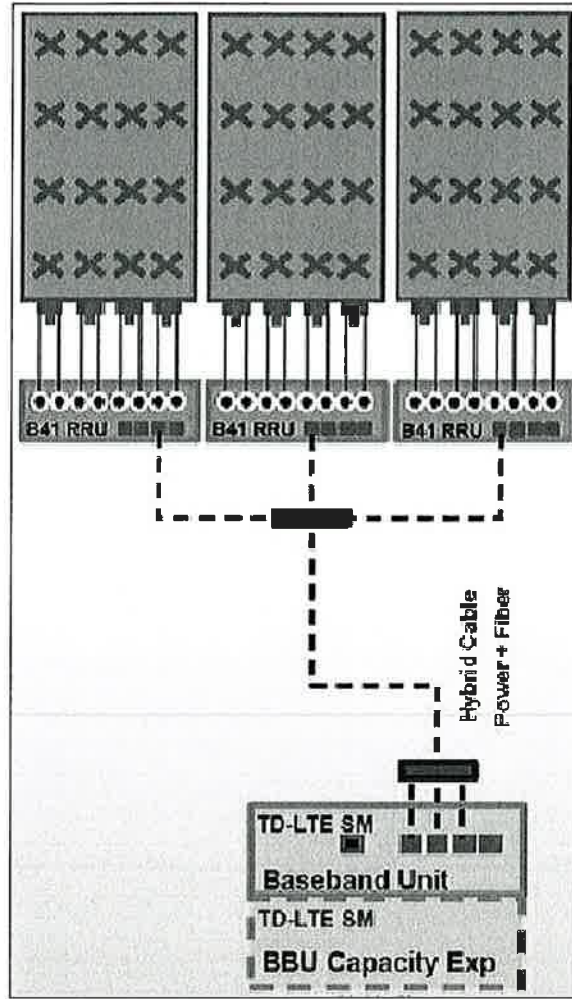
SITE NAME:
528 WHEELERS FARM ROAD

SITE CASCADE:
CT03XC038

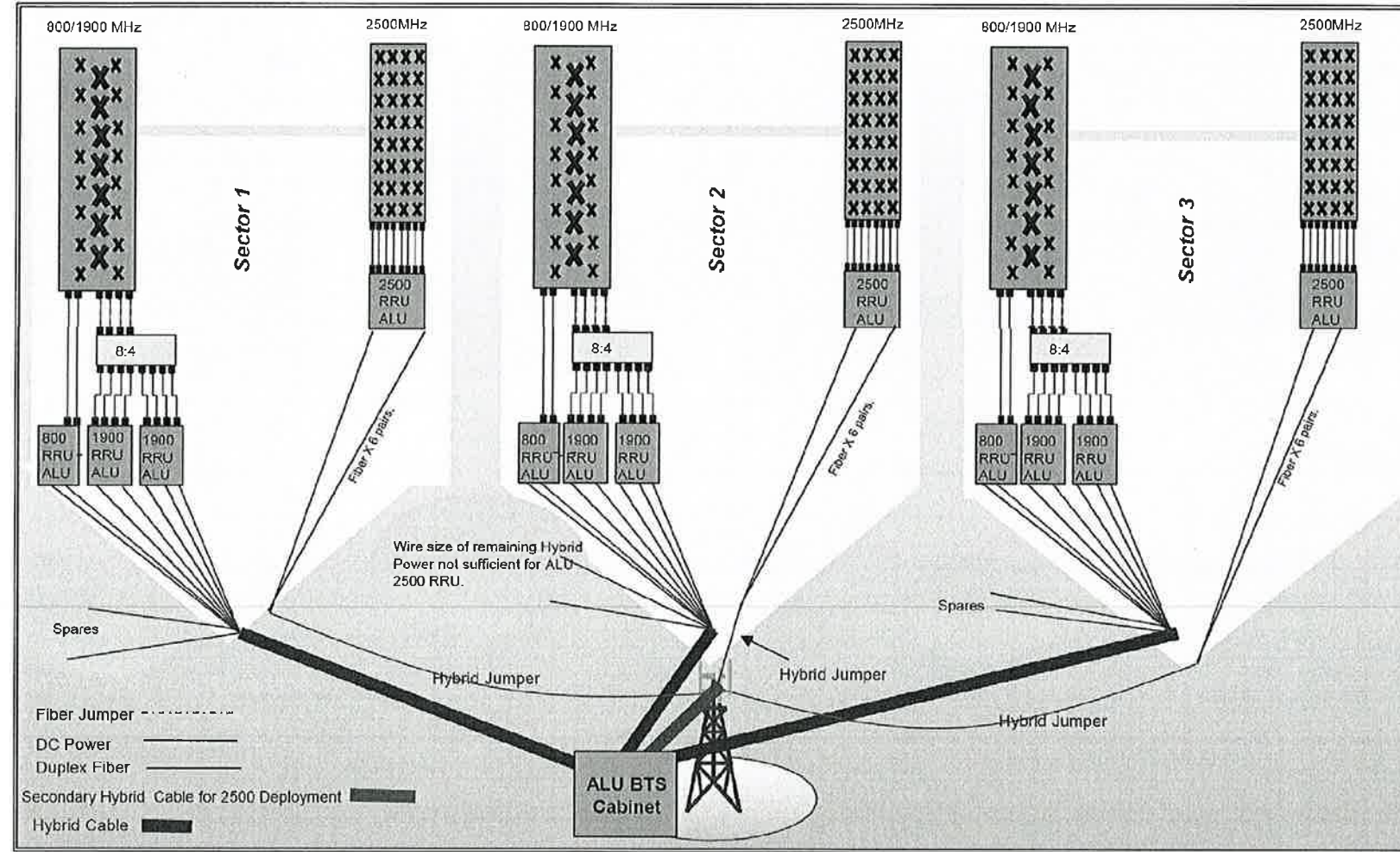
SITE ADDRESS:
**528 WHEELERS FARM ROAD
MILFORD, CT 06460**

SHEET DESCRIPTION:
PLUMBING DIAGRAM

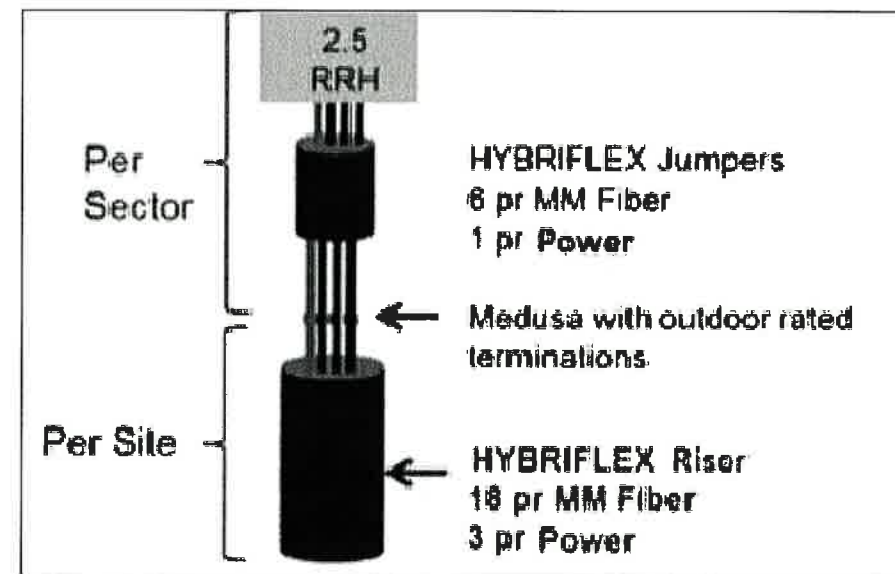
SHEET NUMBER:
A-7



ALU 2.5 ALU SCENARIO 1



RAN WIRING DIAGRAM



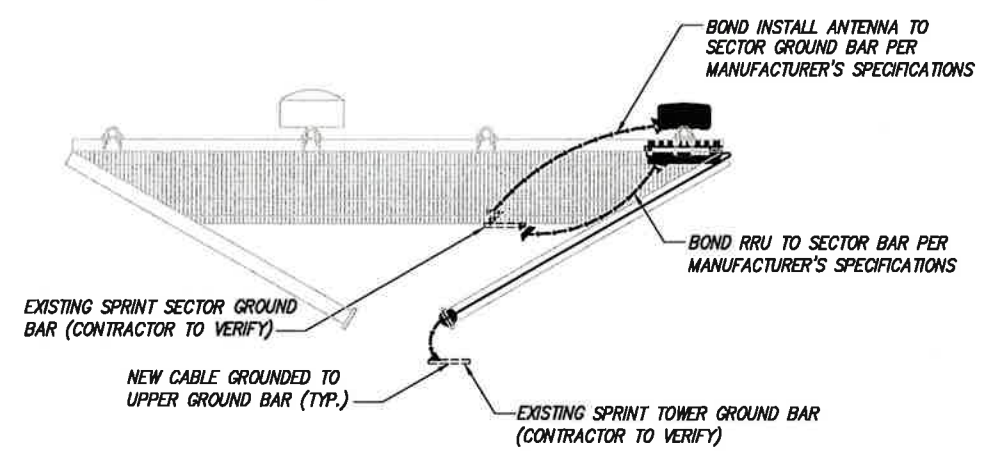
RF 2.5 ALU SCENARIO 1

PLAN NOT USED

NO SCALE

1

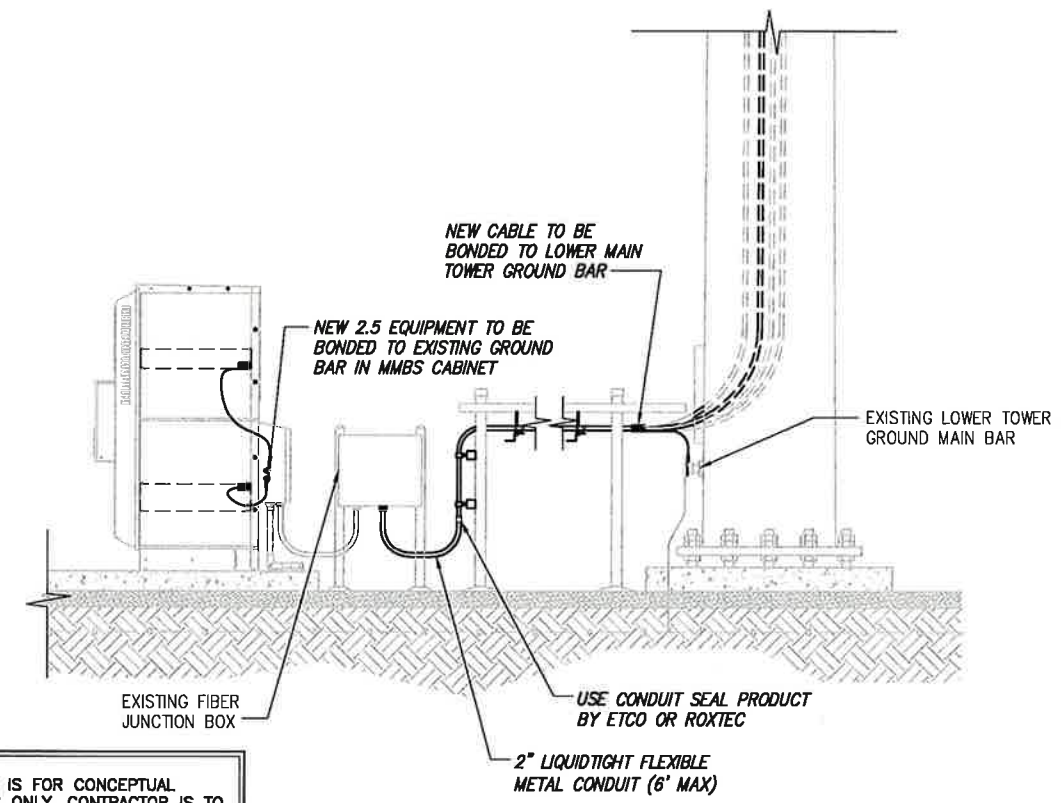
- LEGEND:**
- EXISTING GROUND RING
 - CADWELD CONNECTION (EXOTHERMIC WELD)
 - ▲ MECHANICAL CONNECTION
 - ⊗ GROUND ROD
 - CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE

2



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

TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION)

NO SCALE

3

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ISSUED FOR REVIEW	02/03/14	MJB	A

SITE NAME:
528 WHEELERS FARM ROAD

SITE CASCADE:
CT03XC038

SITE ADDRESS:
 528 WHEELERS FARM ROAD
 MILFORD, CT 06460

SHEET DESCRIPTION:
ELECTRICAL & GROUNDING PLAN

SHEET NUMBER:
E-1

REVISIONS:	DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION		02/20/14	MJP	B
ISSUED FOR REVIEW		02/03/14	MJB	A

SITE NAME:
528 WHEELERS FARM ROAD

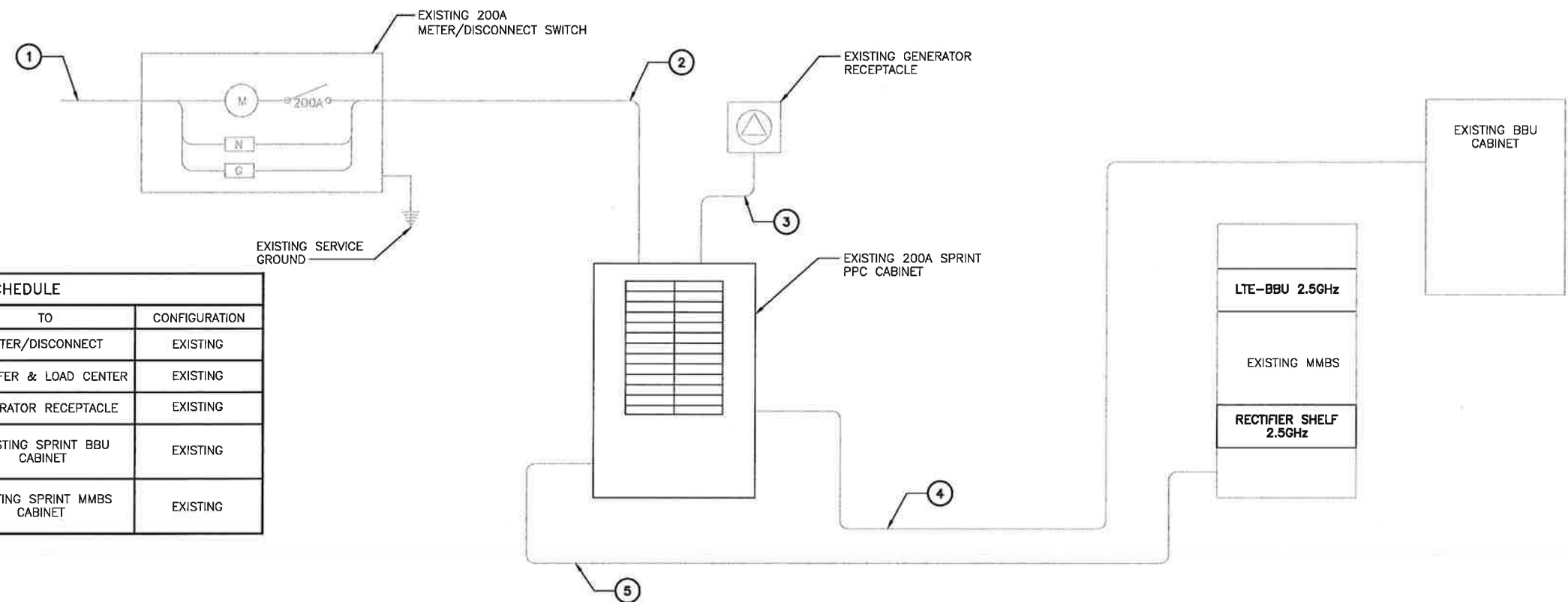
SITE CASCADE:
CT03XC038

SITE ADDRESS:
**528 WHEELERS FARM ROAD
 MILFORD, CT 06460**

SHEET DESCRIPTION:
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:
E-2

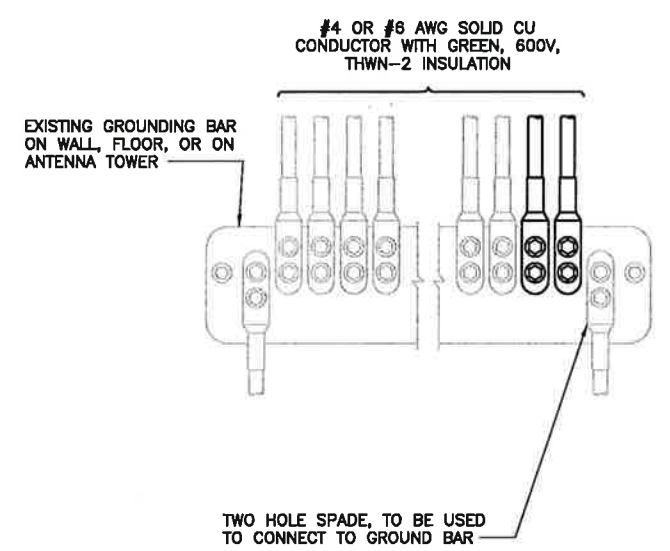
NOTES
 CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



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

ELECTRICAL ONE-LINE DIAGRAM

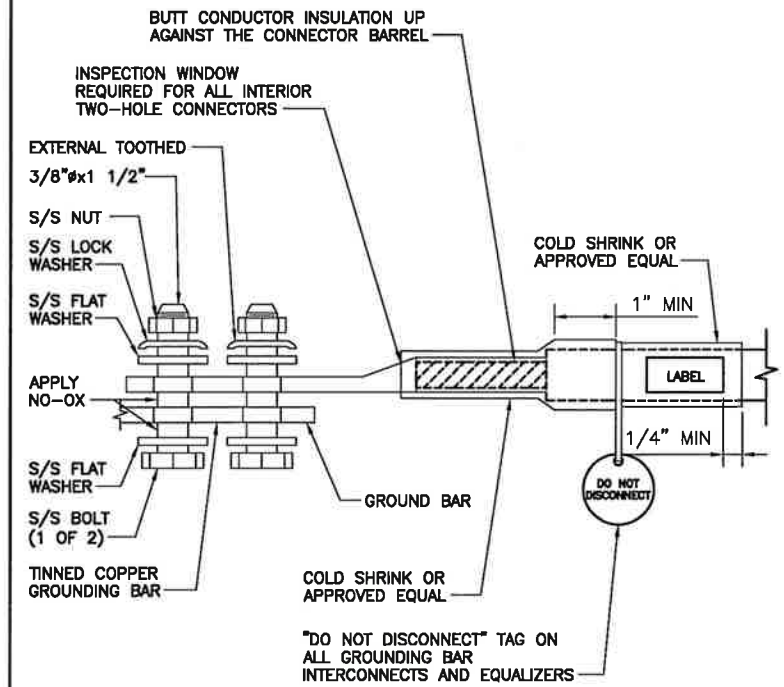
NO SCALE 1



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

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

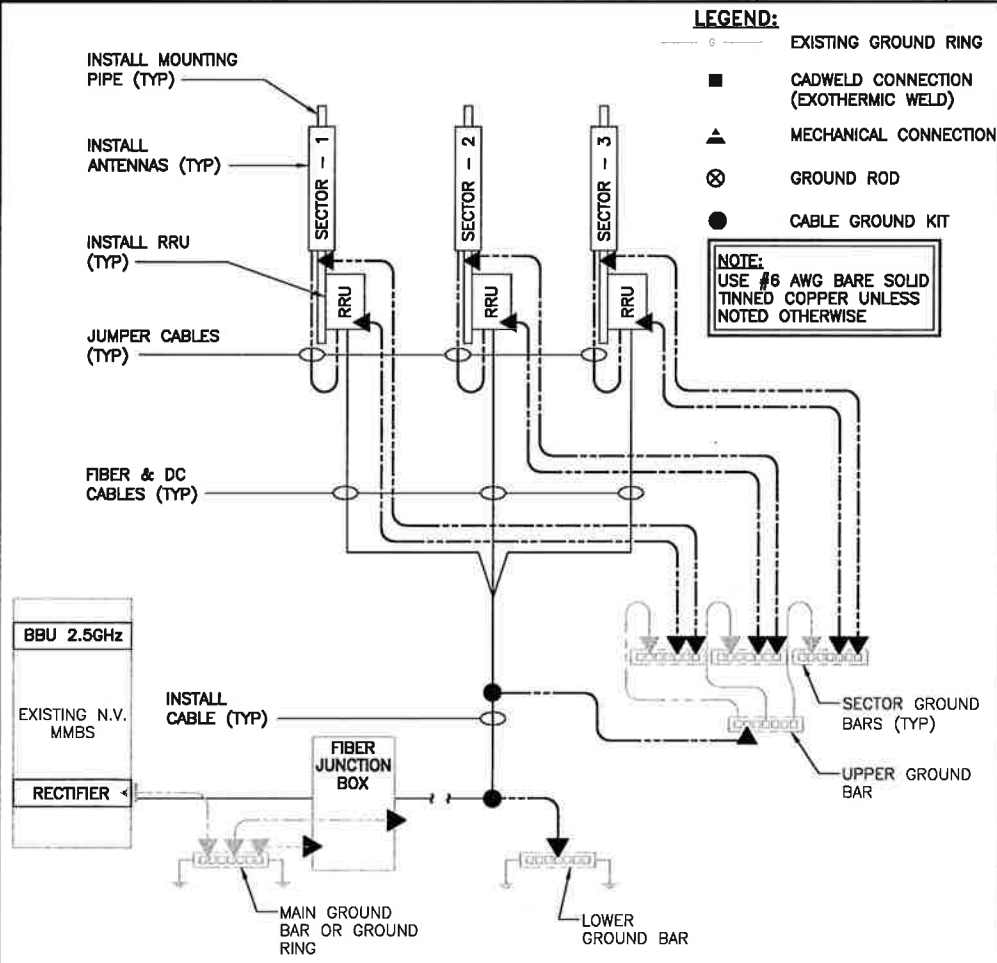
NO SCALE 2



"DO NOT DISCONNECT" TAG ON ALL GROUNDING BAR INTERCONNECTS AND EQUALIZERS

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: **May 14, 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 Co-Locate*
Carrier Site Number: CT03XC038
Carrier Site Name: 528 Wheelers Farm Rd

Crown Castle Designation:
Crown Castle BU Number: 876320
Crown Castle Site Name: 528 WHEELERS FARM RD
Crown Castle JDE Job Number: 251813
Crown Castle Work Order Number: 753170
Crown Castle Application Number: 206046 Rev. 1

Engineering Firm Designation: Paul J Ford and Company Project Number: 37513-2328 BP B

Site Data: 528 Wheelers Farm Road, MILFORD, New Haven County, CT
 Latitude 41° 14' 54.35", Longitude -73° 4' 44.67"
 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 643405, in accordance with application 206046, revision 1.

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

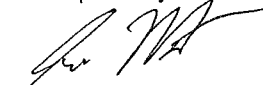
LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
 Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

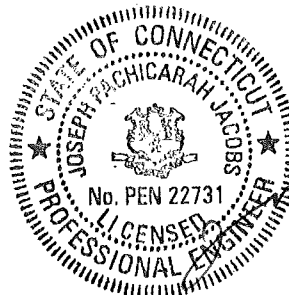
The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 90 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service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


 Jason C. Martin, E.I.
 Structural Designer *BKK*





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

Date: **May 14, 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 Co-Locate**
Carrier Site Number: CT03XC038
Carrier Site Name: 528 Wheelers Farm Rd

Crown Castle Designation: **Crown Castle BU Number:** 876320
Crown Castle Site Name: 528 WHEELERS
FARM RD
Crown Castle JDE Job Number: 251813
Crown Castle Work Order Number: 753170
Crown Castle Application Number: 206046 Rev. 1

Engineering Firm Designation: **Paul J Ford and Company Project Number:** 37513-2328 BP B

Site Data: **528 Wheelers Farm Road, MILFORD, New Haven County, CT**
Latitude 41° 14' 54.35", Longitude -73° 4' 44.67"
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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 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:

Jason C. Martin, E.I.
Structural Designer

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7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by SUMMIT in February of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of 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
120.0	120.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	--
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
126.0	126.0	3	rfs celwave	APXV18-206516S-C-A20 w/ Mount Pipe	6	1-5/8	1	
		1	tower mounts	Pipe Mount (PM 701-1)				
120.0	122.0	2	andrew	VHLP2-11	--	--	1	
		1	mti wireless edge	MT-485025				
	3	alcatel lucent	800 EXTERNAL NOTCH FILTER					
	120.0	120.0	3	alcatel lucent	800MHZ RRH	6 3 3	5/16 1/2 1-1/4	1
			3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
			9	rfs celwave	ACU-A20-N			
			3	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
			3	samsung	FDD_R6_RRH			
	1	tower mounts	Platform Mount [LP 713-1]					
119.0	3	argus	LLPX310R w/ Mount Pipe					

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
113.0	116.0	1	trimble	ACUTIME 2000	--	--	1
	114.0	1	andrew	LNX-6514DS-T4M w/ Mount Pipe	--	--	3
		1	antel	BXA-70063/6CF w/ Mount Pipe			
		1	powerwave	P65.16.XL.2 w/ Mount Pipe			
		3	alcatel lucent	RRH2x40-AWS	1	1-5/8	2
		3	antel	BXA-171063-8BF-EDIN-0 w/ Mount Pipe			
		1	antel	BXA-70040/6CFx2 w/ Mount Pipe			
		1	antel	BXA-70040/6CFx4 w/ Mount Pipe			
		1	antel	BXA-70063/6CF w/ Mount Pipe			
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
		4	antel	LPA-80063/4CF w/ Mount Pipe			
	2	decibel	DB846F65ZAXY w/ Mount Pipe	1 12	1/2 1-5/8	1	
	3	rymsa	MG D3-800Tx w/ Mount Pipe				
	6	rfs celwave	FD9R6004/2C-3L				
113.0		1	tower mounts	Platform Mount [LP 303-1]			
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	6 7	1-1/4 1-5/8	1
3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe					
3	ericsson	KRY 112 144/1					
105.0	108.0	1	tower mounts	Platform Mount [LP 712-1]			
97.0	97.0	3	ericsson	RRUS 11	--	--	3
		3	ericsson	RRUS 11	--	--	2
		3	ericsson	RRUS 11	--	--	1
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
96.0	97.0	6	powerwave	7770.00 w/ Mount Pipe	1 2 12	3/8 5/8 1-1/4	1
		12	powerwave	LGP2140X			
		3	powerwave	P65-16-XLH-RR w/ Mount Pipe			
	96.0	1	tower mounts	Platform Mount [LP 601-1]			
82.0	83.0	12	decibel	DB844H90-XY w/ Mount Pipe	12	7/8	3
	82.0	1	tower mounts	Platform Mount [LP 712-1]			
75.0	76.0	1	trimble	ACUTIME 2000	1	1/2	1
	75.0	1	tower mounts	Side Arm Mount [SO 701-1]			

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed - Not Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
--	--	--	--	--	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 08-10145E G1, 10/22/2008	1613534	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit, 2249, 02/27/1997	1614583	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 2249, 02/27/1997	1614557	CCISITES
4-POST-MODIFICATION INSPECTION	Semaan, CT03XC038, 05/17/2003	3350209	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214, 07/15/2009	2460628	CCISITES
4-POST-MODIFICATION INSPECTION	B&T, 80214.003, 04/04/2012	3349204	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 1210009, 04/01/2013	3753892	CCISITES

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.
- 5) Monopole will be reinforced in conformance with the attached 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 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 90.5	Pole	TP27.9604x22x0.25	1	-10.88	1070.46	91.2	Pass
L2	90.5 - 78	Pole	TP30.486x27.9604x0.3545	2	-12.42	1611.68	83.0	Pass
L3	78 - 72	Pole	TP31.1982x29.0193x0.4127	3	-14.83	1965.60	88.7	Pass
L4	72 - 69.75	Pole	TP31.6528x31.1982x0.411	4	-15.31	1987.09	92.0	Pass
L5	69.75 - 54	Pole	TP34.8349x31.6528x0.685	5	-20.14	2910.21	83.3	Pass
L6	54 - 53.5	Pole	TP34.9359x34.8349x0.8289	6	-20.34	3513.79	70.0	Pass
L7	53.5 - 39.75	Pole	TP37.714x34.9359x0.5346	7	-22.84	2759.23	98.5	Pass
L8	39.75 - 35	Pole	TP38.0487x35.6851x0.7536	8	-27.29	4011.97	77.5	Pass
L9	35 - 25	Pole	TP40.069x38.0487x0.7309	9	-31.07	4117.49	82.9	Pass
L10	25 - 14.5	Pole	TP42.1905x40.069x0.7714	10	-35.39	4590.76	81.4	Pass
L11	14.5 - 4.75	Pole	TP44.1603x42.1905x0.797	11	-39.70	4985.98	80.6	Pass
L12	4.75 - 0	Pole	TP45.12x44.1603x0.6706	12	-41.60	4303.94	96.0	Pass
							Summary	
						Pole (L7)	98.5	Pass
						RATING =	98.5	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	79.4	Pass
1	Base Plate	0	46.8	Pass
1	Base Foundation Structural Steel	0	66.6	Pass
1,2	Base Foundation Soil Interaction	0	88.5	Pass

Structure Rating (max from all components) =	98.5%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Foundation Analysis Notes: According to the procedures prescribed and agreed to by the Crown Castle Engineering Foundation Committee, held in January 2010, the existing caisson foundation was analyzed using the methodology in the software 'PLS-Caisson' (Version 8.10, or newer, by Power Line Systems, Inc.). Per the methods in PLS-Caisson, the soil reactions of cohesive soils are calculated using 8CD independent of the depth of the soil layer. The depth of soil to be ignored at the top of the caisson is the greater of the geotechnical report's recommendation, the frost depth of the site or half of the caisson diameter.

4.1) Recommendations

Install the modifications per the attached modification drawings by PJF dated 5/14/2014.

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 mph.
3. Nominal ice thickness of 0.7500 in.
4. Ice density of 56 pcf.
5. A wind speed of 38 mph is used in combination with ice.
6. Temperature drop of 50 °F.
7. Deflections calculated using a wind speed of 50 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
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Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.00-90.50	29.50	0.00	12	22.0000	27.9604	0.2500	1.0000	A607-60 (60 ksi)
L2	90.50-78.00	12.50	3.75	12	27.9604	30.4860	0.3545	1.4180	Reinf 60.10 ksi (60 ksi)
L3	78.00-72.00	9.75	0.00	12	29.0193	31.1982	0.4127	1.6506	Reinf 60.08 ksi (60 ksi)
L4	72.00-69.75	2.25	0.00	12	31.1982	31.6528	0.4110	1.6440	Reinf 60.09 ksi (60 ksi)
L5	69.75-54.00	15.75	0.00	12	31.6528	34.8349	0.6849	2.7398	Reinf 48.31 ksi (48 ksi)
L6	54.00-53.50	0.50	0.00	12	34.8349	34.9359	0.8289	3.3156	Reinf 48.26 ksi (48 ksi)
L7	53.50-39.75	13.75	4.75	12	34.9359	37.7140	0.5346	2.1385	Reinf 55.33 ksi (55 ksi)
L8	39.75-35.00	9.50	0.00	12	35.6851	38.0487	0.7536	3.0143	Reinf 55.43 ksi (55 ksi)
L9	35.00-25.00	10.00	0.00	12	38.0487	40.0690	0.7309	2.9234	Reinf 55.61 ksi (56 ksi)
L10	25.00-14.50	10.50	0.00	12	40.0690	42.1904	0.7714	3.0857	Reinf 55.79 ksi (56 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L11	14.50-4.75	9.75	0.00	12	42.1904	44.1603	0.7970	3.1879	Reinf 56.02 ksi (56 ksi)
L12	4.75-0.00	4.75		12	44.1603	45.1200	0.6705	2.6822	Reinf 56.07 ksi (56 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	28.9467	22.3069	2186.3023	9.9203	14.4835	150.9514	4430.0412	10.9788	6.8234	27.294
L2	28.9467	31.5110	3065.1520	9.8829	14.4835	211.6308	6210.8289	15.5087	6.5434	18.459
	31.5614	34.3938	3985.7357	10.7871	15.7917	252.3936	8076.1812	16.9276	7.2202	20.368
L3	30.9106	38.0107	3970.3290	10.2412	15.0320	264.1248	8044.9630	18.7077	6.6713	16.167
	32.2987	40.9058	4948.3909	11.0212	16.1607	306.1998	10026.781	20.1326	7.2552	17.582
L4	32.2987	40.7444	4929.3970	11.0218	16.1607	305.0244	9988.2948	20.0531	7.2596	17.663
	32.7694	41.3460	5150.9979	11.1846	16.3961	314.1591	10437.318	20.3492	7.3815	17.96
L5	32.7694	68.3008	8360.5228	11.0865	16.3961	509.9078	16940.685	33.6156	6.6473	9.705
	36.0638	75.3191	11211.705	12.2257	18.0445	621.3368	22717.954	37.0698	7.5001	10.95
L6	36.0638	90.7651	13397.267	12.1742	18.0445	742.4576	27146.496	44.6718	7.1143	8.583
	36.1683	91.0347	13517.018	12.2103	18.0968	746.9280	27389.144	44.8045	7.1414	8.615
L7	36.1683	59.2211	8945.6591	12.3157	18.0968	494.3222	18126.330	29.1468	7.9301	14.833
	39.0444	64.0034	11292.587	13.3102	19.5359	578.0443	22881.843	31.5005	8.6746	16.226
L8	38.1674	84.7611	13201.324	12.5055	18.4849	714.1691	26749.462	41.7169	7.5440	10.011
	39.3909	90.4964	16066.467	13.3516	19.7092	815.1758	32555.019	44.5396	8.1775	10.852
L9	39.3909	87.8214	15610.561	13.3598	19.7092	792.0442	31631.229	43.2230	8.2384	11.272
	41.4825	92.5760	18285.767	14.0831	20.7558	880.9971	37051.922	45.5631	8.7798	12.013
L10	41.4825	97.6142	19241.169	14.0685	20.7558	927.0278	38987.825	48.0427	8.6711	11.24
	43.6788	102.8837	22528.511	14.8280	21.8547	1030.8336	45648.871	50.6362	9.2396	11.977
L11	43.6788	106.2271	23231.901	14.8189	21.8547	1063.0185	47074.130	52.2817	9.1711	11.507
	45.7181	111.2823	26708.987	15.5241	22.8750	1167.6037	54119.649	54.7698	9.6991	12.17
L12	45.7181	93.9019	22669.102	15.5693	22.8750	990.9970	45933.747	46.2156	10.0379	14.97
	46.7117	95.9740	24203.165	15.9129	23.3722	1035.5553	49042.174	47.2355	10.2951	15.353

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 120.00-90.50				1	1	1		
L2 90.50-78.00				1	1	1		
L3 78.00-72.00				1	1	1		
L4 72.00-69.75				1	1	1		
L5 69.75-54.00				1	1	1		

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft ²	in					in	in
L6 54.00-53.50				1	1	1		
L7 53.50-39.75				1	1	1		
L8 39.75-35.00				1	1	1		
L9 35.00-25.00				1	1	1		
L10 25.00-14.50				1	1	1		
L11 14.50-4.75				1	1	1		
L12 4.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	Number Per Row	Clear Spacing	Width or Diameter	Perimeter	Weight
				ft			in	r	r	plf

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		$C_A A_A$	Weight		
				ft			ft ² /ft	plf		
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	120.00 - 113.00	1	No Ice	0.20	0.83		
						1/2" Ice	0.30	2.34		
						1" Ice	0.40	4.47		
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	120.00 - 113.00	5	No Ice	0.00	0.83		
						1/2" Ice	0.00	2.34		
						1" Ice	0.00	4.47		
CR 50 1873(1-5/8")	C	No	CaAa (Out Of Face)	113.00 - 0.00	6	No Ice	0.00	0.83		
						1/2" Ice	0.00	2.34		
						1" Ice	0.00	4.47		

9207(5/16")	C	No	CaAa (Out Of Face)	120.00 - 0.00	6	No Ice	0.00	0.60		
						1/2" Ice	0.00	1.11		
						1" Ice	0.00	2.22		
7983A(1/2")	C	No	CaAa (Out Of Face)	120.00 - 0.00	3	No Ice	0.00	0.08		
						1/2" Ice	0.00	0.74		
						1" Ice	0.00	2.01		
2" Conduit	C	No	CaAa (Out Of Face)	120.00 - 0.00	1	No Ice	0.00	1.16		
						1/2" Ice	0.00	2.53		
						1" Ice	0.00	4.51		
2" Conduit	C	No	CaAa (Out Of Face)	120.00 - 0.00	1	No Ice	0.17	1.16		
						1/2" Ice	0.27	2.53		
						1" Ice	0.37	4.51		
HB114-13U3M12-XXXF(1-1/4")	C	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	0.99		
						1/2" Ice	0.00	0.99		
						1" Ice	0.00	0.99		
HB114-1-0813U4-M5J(1 1/4")	C	No	Inside Pole	120.00 - 0.00	3	No Ice	0.00	1.20		
						1/2" Ice	0.00	1.20		
						1" Ice	0.00	1.20		

HB158-1-08U8-S8J18(1-5/8)	C	No	CaAa (Out Of Face)	113.00 - 0.00	1	No Ice	0.00	1.30		
						1/2" Ice	0.00	2.81		
						1" Ice	0.00	4.94		
LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	113.00 - 0.00	1	No Ice	0.00	0.15		
						1/2" Ice	0.00	0.84		
						1" Ice	0.00	2.14		
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.00 - 0.00	2	No Ice	0.20	0.82		
						1/2" Ice	0.30	2.33		

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _A A _A ft ² /ft	Weight plf
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	113.00 - 0.00	10	1" Ice	0.40	4.46
						No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46

MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	CaAa (Out Of Face)	105.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	2.37
						1" Ice	0.00	4.28
LDF6-50A(1-1/4")	C	No	Inside Pole	105.00 - 0.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	105.00 - 0.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46

FB-L98B-002-50000(3/8)	C	No	Inside Pole	96.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	96.00 - 0.00	2	No Ice	0.00	0.31
						1/2" Ice	0.00	0.31
						1" Ice	0.00	0.31
LDF6-50A(1-1/4")	C	No	Inside Pole	96.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
2" Conduit	C	No	Inside Pole	96.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16

LDF4-50A(1/2")	C	No	Inside Pole	75.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

C6 x 10.5	C	No	CaAa (Out Of Face)	56.00 - 0.00	2	No Ice	0.34	0.00
						1/2" Ice	0.42	0.00
						1" Ice	0.51	0.00
1" Flat Reinforcement	C	No	CaAa (Out Of Face)	92.00 - 56.00	2	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	120.00-90.50	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	15.929	0.92
L2	90.50-78.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.292	0.58
L3	78.00-72.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.420	0.28
L4	72.00-69.75	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	2.033	0.11
L5	69.75-54.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.917	0.74
L6	54.00-53.50	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	0.624	0.02
L7	53.50-39.75	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	17.160	0.64

Tower Section	Tower Elevation	Face	A _R	A _F	C _{AA} _A In Face	C _{AA} _A Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L8	39.75-35.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.928	0.22
L9	35.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.480	0.47
L10	25.00-14.50	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	13.104	0.49
L11	14.50-4.75	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	12.168	0.46
L12	4.75-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.928	0.22

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	A _R	A _F	C _{AA} _A In Face	C _{AA} _A Out Face	Weight
n	ft		in	ft ²	ft ²	ft ²	ft ²	K
L1	120.00-90.50	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	28.654	2.86
L2	90.50-78.00	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	21.083	1.62
L3	78.00-72.00	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	10.120	0.78
L4	72.00-69.75	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	3.795	0.29
L5	69.75-54.00	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	27.088	2.05
L6	54.00-53.50	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	0.974	0.06
L7	53.50-39.75	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	26.785	1.79
L8	39.75-35.00	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	9.253	0.62
L9	35.00-25.00	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	19.480	1.30
L10	25.00-14.50	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	20.454	1.36
L11	14.50-4.75	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	18.993	1.27
L12	4.75-0.00	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	9.253	0.62

Feed Line Center of Pressure

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L1	120.00-90.50	-0.5634	0.3253	-0.8362	0.4828
L2	90.50-78.00	-0.8560	0.4942	-1.2564	0.7254
L3	78.00-72.00	-0.8660	0.5000	-1.2797	0.7388

Section	Elevation	CP _x	CP _z	CP _x Ice	CP _z Ice
	ft	in	in	in	in
L4	72.00-69.75	-0.8725	0.5037	-1.2951	0.7477
L5	69.75-54.00	-0.9186	0.5304	-1.3422	0.7749
L6	54.00-53.50	-1.1343	0.6549	-1.4772	0.8528
L7	53.50-39.75	-1.1479	0.6628	-1.5019	0.8671
L8	39.75-35.00	-1.1582	0.6687	-1.5206	0.8779
L9	35.00-25.00	-1.1719	0.6766	-1.5459	0.8925
L10	25.00-14.50	-1.1885	0.6862	-1.5768	0.9104
L11	14.50-4.75	-1.2037	0.6949	-1.6055	0.9269
L12	4.75-0.00	-1.2139	0.7009	-1.6250	0.9382

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
APXV18-206516S-C-A20 w/ Mount Pipe	A	From Leg	1.00	0.0000	126.00	No Ice	3.86	3.30	0.04
			0.00			1/2"	4.27	4.00	0.07
			0.00			Ice	4.73	4.67	0.11
APXV18-206516S-C-A20 w/ Mount Pipe	B	From Leg	1.00	0.0000	126.00	No Ice	3.86	3.30	0.04
			0.00			1/2"	4.27	4.00	0.07
			0.00			Ice	4.73	4.67	0.11
APXV18-206516S-C-A20 w/ Mount Pipe	C	From Leg	1.00	0.0000	126.00	No Ice	3.86	3.30	0.04
			0.00			1/2"	4.27	4.00	0.07
			0.00			Ice	4.73	4.67	0.11
Pipe Mount (PM 701-1)	C	None		0.0000	126.00	No Ice	10.61	10.61	0.28
						1/2"	12.54	12.54	0.37
						Ice	14.47	14.47	0.46
12' x 8" Cylinder	C	None		0.0000	126.00	No Ice	8.36	8.36	0.20
						1/2"	9.08	9.08	0.26
						Ice	9.82	9.82	0.34

LLPX310R w/ Mount Pipe	A	From Leg	4.00	0.0000	120.00	No Ice	4.96	2.85	0.04
			0.00			1/2"	5.35	3.37	0.08
			-1.00			Ice	5.75	3.90	0.12
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	120.00	No Ice	4.96	2.85	0.04
			0.00			1/2"	5.35	3.37	0.08
			-1.00			Ice	5.75	3.90	0.12
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	120.00	No Ice	4.96	2.85	0.04
			0.00			1/2"	5.35	3.37	0.08
			-1.00			Ice	5.75	3.90	0.12
MT-485025	A	From Leg	4.00	0.0000	120.00	No Ice	2.08	0.24	0.01
			0.00			1/2"	2.27	0.33	0.01
			2.00			Ice	2.47	0.45	0.03
FDD_R6_RRH	A	From Leg	4.00	0.0000	120.00	No Ice	1.79	0.78	0.03
			0.00			1/2"	1.97	0.92	0.04
			0.00			Ice	2.16	1.07	0.06
FDD_R6_RRH	B	From Leg	4.00	0.0000	120.00	No Ice	1.79	0.78	0.03
			0.00			1/2"	1.97	0.92	0.04
			0.00			Ice	2.16	1.07	0.06
FDD_R6_RRH	C	From Leg	4.00	0.0000	120.00	No Ice	1.79	0.78	0.03
			0.00			1/2"	1.97	0.92	0.04
			0.00			Ice	2.16	1.07	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
800 EXTERNAL NOTCH FILTER	B	From Leg	4.00	0.0000	120.00	No Ice	0.77	0.37	0.01
			0.00			1/2"	0.89	0.46	0.02
			0.00			Ice	1.02	0.56	0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	4.00	0.0000	120.00	1" Ice			
			0.00			No Ice	0.77	0.37	0.01
			0.00			1/2"	0.89	0.46	0.02
800MHZ RRH	A	From Leg	4.00	0.0000	120.00	Ice	1.02	0.56	0.02
			0.00			1" Ice			
			0.00			No Ice	2.49	2.07	0.05
800MHZ RRH	B	From Leg	4.00	0.0000	120.00	1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
			0.00			1" Ice			
800MHZ RRH	B	From Leg	4.00	0.0000	120.00	No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
			0.00			Ice	2.93	2.48	0.10
800MHZ RRH	C	From Leg	4.00	0.0000	120.00	1" Ice			
			0.00			No Ice	2.49	2.07	0.05
			0.00			1/2"	2.71	2.27	0.07
Platform Mount [LP 713-1]	C	None		0.0000	120.00	Ice	2.93	2.48	0.10
						1" Ice			
						No Ice	31.27	31.27	1.51
*** (2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	1/2"	39.68	39.68	1.93
			0.00			Ice	48.09	48.09	2.35
			1.00			1" Ice			
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	No Ice	7.27	7.82	0.05
			0.00			1/2"	7.88	9.01	0.11
			1.00			Ice	8.48	9.91	0.19
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	1" Ice			
			0.00			No Ice	7.25	7.26	0.04
			1.00			1/2"	7.72	7.96	0.10
(2) LPA-80063/4CF w/ Mount Pipe	C	From Leg	4.00	0.0000	113.00	Ice	8.20	8.67	0.18
			0.00			1" Ice			
			1.00			No Ice	7.25	7.26	0.04
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	1/2"	7.72	7.96	0.10
			0.00			Ice	8.20	8.67	0.18
			1.00			1" Ice			
MG D3-800Tx w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	No Ice	3.57	3.42	0.03
			0.00			1/2"	3.98	4.12	0.07
			1.00			Ice	4.39	4.78	0.11
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	1" Ice			
			0.00			No Ice	3.57	3.42	0.03
			1.00			1/2"	3.98	4.12	0.07
MG D3-800Tx w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	Ice	4.39	4.78	0.11
			0.00			1" Ice			
			1.00			No Ice	3.57	3.42	0.03
MG D3-800Tx w/ Mount Pipe	C	From Leg	4.00	0.0000	113.00	1/2"	3.98	4.12	0.07
			0.00			Ice	4.39	4.78	0.11
			1.00			1" Ice			
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.0000	113.00	No Ice	0.37	0.08	0.00
			0.00			1/2"	0.45	0.14	0.01
			0.00			Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	113.00	1" Ice			
			0.00			No Ice	0.37	0.08	0.00
			0.00			1/2"	0.45	0.14	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	113.00	Ice	0.54	0.20	0.01
			0.00			1" Ice			
			0.00			No Ice	0.37	0.08	0.00
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	113.00	1/2"	0.45	0.14	0.01
			0.00			Ice	0.54	0.20	0.01
			0.00			1" Ice			
ACUTIME 2000	A	From Leg	4.00	0.0000	113.00	No Ice	0.30	0.30	0.00
			0.00			1/2"	0.37	0.37	0.00
			3.00			Ice	0.46	0.46	0.01
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz	Lateral			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			1.00			Ice	3.96	4.60	0.10
						1" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			1.00			Ice	3.96	4.60	0.10
						1" Ice			
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	C	From Leg	4.00	0.0000	113.00	No Ice	3.18	3.35	0.03
			0.00			1/2"	3.56	3.97	0.06
			1.00			Ice	3.96	4.60	0.10
						1" Ice			
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00	0.0000	113.00	No Ice	7.98	5.41	0.04
			0.00			1/2"	8.62	6.56	0.10
			1.00			Ice	9.23	7.42	0.17
						1" Ice			
BXA-70040/6CFx4 w/ Mount Pipe	B	From Leg	4.00	0.0000	113.00	No Ice	16.55	7.37	0.06
			0.00			1/2"	17.27	8.54	0.16
			1.00			Ice	17.96	9.42	0.27
						1" Ice			
BXA-70040/6CFx2 w/ Mount Pipe	C	From Leg	4.00	0.0000	113.00	No Ice	16.55	7.37	0.06
			0.00			1/2"	17.27	8.54	0.16
			1.00			Ice	17.96	9.42	0.27
						1" Ice			
RRH2x40-AWS	A	From Leg	4.00	0.0000	113.00	No Ice	2.98	1.60	0.04
			0.00			1/2"	3.24	1.82	0.06
			1.00			Ice	3.50	2.06	0.08
						1" Ice			
RRH2x40-AWS	B	From Leg	4.00	0.0000	113.00	No Ice	2.98	1.60	0.04
			0.00			1/2"	3.24	1.82	0.06
			1.00			Ice	3.50	2.06	0.08
						1" Ice			
RRH2x40-AWS	C	From Leg	4.00	0.0000	113.00	No Ice	2.98	1.60	0.04
			0.00			1/2"	3.24	1.82	0.06
			1.00			Ice	3.50	2.06	0.08
						1" Ice			
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	113.00	No Ice	5.60	2.33	0.04
			0.00			1/2"	5.92	2.56	0.08
			1.00			Ice	6.24	2.79	0.12
						1" Ice			
Platform Mount [LP 303-1]	C	None		0.0000	113.00	No Ice	14.66	14.66	1.25
						1/2"	18.87	18.87	1.48
						Ice	23.08	23.08	1.71
						1" Ice			

ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00	0.0000	105.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			3.00			Ice	7.86	7.26	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00	0.0000	105.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			3.00			Ice	7.86	7.26	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00	0.0000	105.00	No Ice	6.83	5.64	0.11
			0.00			1/2"	7.35	6.48	0.17
			3.00			Ice	7.86	7.26	0.23
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00	0.0000	105.00	No Ice	6.82	5.63	0.11
			0.00			1/2"	7.34	6.47	0.17
			3.00			Ice	7.85	7.25	0.23
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00	0.0000	105.00	No Ice	6.82	5.63	0.11
			0.00			1/2"	7.34	6.47	0.17
			3.00			Ice	7.85	7.25	0.23
						1" Ice			

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00	0.0000	105.00	No Ice	6.82	5.63	0.11
			0.00			1/2"	7.34	6.47	0.17
			3.00			Ice	7.85	7.25	0.23
KRY 112 144/1	A	From Leg	4.00	0.0000	105.00	No Ice	0.41	0.20	0.01
			0.00			1/2"	0.50	0.27	0.01
			3.00			Ice	0.59	0.35	0.02
KRY 112 144/1	B	From Leg	4.00	0.0000	105.00	No Ice	0.41	0.20	0.01
			0.00			1/2"	0.50	0.27	0.01
			3.00			Ice	0.59	0.35	0.02
KRY 112 144/1	C	From Leg	4.00	0.0000	105.00	No Ice	0.41	0.20	0.01
			0.00			1/2"	0.50	0.27	0.01
			3.00			Ice	0.59	0.35	0.02
Platform Mount [LP 712-1]	C	None		0.0000	105.00	No Ice	24.53	24.53	1.34
						1/2"	29.94	29.94	1.65
						Ice	35.35	35.35	1.96

RRUS 11	A	From Leg	2.00	0.0000	97.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
RRUS 11	B	From Leg	2.00	0.0000	97.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
RRUS 11	C	From Leg	2.00	0.0000	97.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
DC6-48-60-18-8F	A	From Leg	2.00	0.0000	97.00	No Ice	2.57	2.57	0.02
			0.00			1/2"	2.80	2.80	0.04
			0.00			Ice	3.04	3.04	0.07
RRUS 11	A	From Leg	2.00	0.0000	97.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
RRUS 11	B	From Leg	2.00	0.0000	97.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
RRUS 11	C	From Leg	2.00	0.0000	97.00	No Ice	3.25	1.37	0.05
			0.00			1/2"	3.49	1.55	0.07
			0.00			Ice	3.74	1.74	0.10
2.375" OD x 5' Mount Pipe	A	From Leg	2.00	0.0000	97.00	No Ice	1.19	1.19	0.02
			0.00			1/2"	1.50	1.50	0.03
			0.00			Ice	1.81	1.81	0.04
2.375" OD x 5' Mount Pipe	B	From Leg	2.00	0.0000	97.00	No Ice	1.19	1.19	0.02
			0.00			1/2"	1.50	1.50	0.03
			0.00			Ice	1.81	1.81	0.04
2.375" OD x 5' Mount Pipe	C	From Leg	2.00	0.0000	97.00	No Ice	1.19	1.19	0.02
			0.00			1/2"	1.50	1.50	0.03
			0.00			Ice	1.81	1.81	0.04
Side Arm Mount [SO 102-3]	C	None		0.0000	97.00	No Ice	3.00	3.00	0.08
						1/2"	3.48	3.48	0.11
						Ice	3.96	3.96	0.14
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft ²	ft ²	K

(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00	0.0000	96.00	No Ice	6.12	4.25	0.06	
			0.00				1/2"	6.63	5.01	0.10
			1.00				Ice	7.13	5.71	0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00	0.0000	96.00	No Ice	6.12	4.25	0.06	
			0.00				1/2"	6.63	5.01	0.10
			1.00				Ice	7.13	5.71	0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	96.00	No Ice	6.12	4.25	0.06	
			0.00				1/2"	6.63	5.01	0.10
			1.00				Ice	7.13	5.71	0.16
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.00	0.0000	96.00	No Ice	8.64	6.36	0.08	
			0.00				1/2"	9.29	7.54	0.14
			1.00				Ice	9.91	8.43	0.22
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.00	0.0000	96.00	No Ice	8.64	6.36	0.08	
			0.00				1/2"	9.29	7.54	0.14
			1.00				Ice	9.91	8.43	0.22
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.00	0.0000	96.00	No Ice	8.64	6.36	0.08	
			0.00				1/2"	9.29	7.54	0.14
			1.00				Ice	9.91	8.43	0.22
(4) LGP2140X	A	From Leg	4.00	0.0000	96.00	No Ice	1.26	0.38	0.01	
			0.00				1/2"	1.42	0.49	0.02
			1.00				Ice	1.58	0.62	0.03
(4) LGP2140X	B	From Leg	4.00	0.0000	96.00	No Ice	1.26	0.38	0.01	
			0.00				1/2"	1.42	0.49	0.02
			1.00				Ice	1.58	0.62	0.03
(4) LGP2140X	C	From Leg	4.00	0.0000	96.00	No Ice	1.26	0.38	0.01	
			0.00				1/2"	1.42	0.49	0.02
			1.00				Ice	1.58	0.62	0.03
2.375" OD x 5' Mount Pipe	A	From Leg	4.00	0.0000	96.00	No Ice	1.19	1.19	0.02	
			0.00				1/2"	1.50	1.50	0.03
			1.00				Ice	1.81	1.81	0.04
2.375" OD x 5' Mount Pipe	B	From Leg	4.00	0.0000	96.00	No Ice	1.19	1.19	0.02	
			0.00				1/2"	1.50	1.50	0.03
			1.00				Ice	1.81	1.81	0.04
2.375" OD x 5' Mount Pipe	C	From Leg	4.00	0.0000	96.00	No Ice	1.19	1.19	0.02	
			0.00				1/2"	1.50	1.50	0.03
			1.00				Ice	1.81	1.81	0.04
Platform Mount [LP 601-1]	C	None		0.0000	96.00	No Ice	28.47	28.47	1.12	
							1/2"	33.59	33.59	1.51
							Ice	38.71	38.71	1.91

ACUTIME 2000	A	From Leg	3.00	0.0000	75.00	No Ice	0.30	0.30	0.00	
			0.00				1/2"	0.37	0.37	0.00
			1.00				Ice	0.46	0.46	0.01
Side Arm Mount [SO 701-1]	A	None		0.0000	75.00	No Ice	0.85	1.67	0.07	
							1/2"	1.14	2.34	0.08
							Ice	1.43	3.01	0.09

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 ²	Weight K
VHLP2-11	A	Paraboloid w/o Radome	From Leg	4.00	37.0000		120.00	2.17	No Ice	0.03
				0.00					1/2" Ice	0.05
				2.00					1" Ice	0.07
VHLP2-11	B	Paraboloid w/o Radome	From Leg	4.00	10.0000		120.00	2.17	No Ice	0.03
				0.00					1/2" Ice	0.05
				2.00					1" Ice	0.07

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 120.00-90.50	104.66	1.391	28.84	61.410	A	0.000	61.410	61.410	100.00	0.000	0.000
					B	0.000	61.410	100.00	0.000	0.000	
					C	0.000	61.410	100.00	0.000	15.929	
L2 90.50-78.00	84.16	1.307	27.10	30.441	A	0.000	30.441	30.441	100.00	0.000	0.000
					B	0.000	30.441	100.00	0.000	0.000	
					C	0.000	30.441	100.00	0.000	11.292	
L3 78.00-72.00	74.98	1.264	26.22	15.264	A	0.000	15.264	15.264	100.00	0.000	0.000
					B	0.000	15.264	100.00	0.000	0.000	
					C	0.000	15.264	100.00	0.000	5.420	
L4 72.00-69.75	70.87	1.244	25.80	5.892	A	0.000	5.892	5.892	100.00	0.000	0.000
					B	0.000	5.892	100.00	0.000	0.000	
					C	0.000	5.892	100.00	0.000	2.033	
L5 69.75-54.00	61.75	1.196	24.80	43.633	A	0.000	43.633	43.633	100.00	0.000	0.000
					B	0.000	43.633	100.00	0.000	0.000	
					C	0.000	43.633	100.00	0.000	14.917	
L6 54.00-53.50	53.75	1.15	23.84	1.454	A	0.000	1.454	1.454	100.00	0.000	0.000
					B	0.000	1.454	100.00	0.000	0.000	
					C	0.000	1.454	100.00	0.000	0.624	
L7 53.50-39.75	46.54	1.103	22.88	41.622	A	0.000	41.622	41.622	100.00	0.000	0.000
					B	0.000	41.622	100.00	0.000	0.000	
					C	0.000	41.622	100.00	0.000	17.160	
L8 39.75-35.00	37.36	1.036	21.48	14.827	A	0.000	14.827	14.827	100.00	0.000	0.000
					B	0.000	14.827	100.00	0.000	0.000	
					C	0.000	14.827	100.00	0.000	5.928	
L9 35.00-25.00	29.96	1	20.74	32.549	A	0.000	32.549	32.549	100.00	0.000	0.000
					B	0.000	32.549	100.00	0.000	0.000	
					C	0.000	32.549	100.00	0.000	12.480	
L10 25.00-14.50	19.70	1	20.74	35.989	A	0.000	35.989	35.989	100.00	0.000	0.000
					B	0.000	35.989	100.00	0.000	0.000	
					C	0.000	35.989	100.00	0.000	13.104	
L11 14.50-4.75	9.59	1	20.74	35.080	A	0.000	35.080	35.080	100.00	0.000	0.000
					B	0.000	35.080	100.00	0.000	0.000	
					C	0.000	35.080	100.00	0.000	12.168	
L12 4.75-0.00	2.37	1	20.74	17.670	A	0.000	17.670	17.670	100.00	0.000	0.000
					B	0.000	17.670	100.00	0.000	0.000	
					C	0.000	17.670	100.00	0.000	5.928	

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z psf	t_z in	A_G ft ²	Face	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 120.00-90.50	104.66	1.391	5.03	0.7500	65.097	A	0.000	65.097	65.097	100.00	0.000	0.000
						B	0.000	65.097	65.097	100.00	0.000	0.000
						C	0.000	65.097	65.097	100.00	0.000	28.654
L2 90.50-78.00	84.16	1.307	4.73	0.7500	32.003	A	0.000	32.003	32.003	100.00	0.000	0.000
						B	0.000	32.003	32.003	100.00	0.000	0.000
						C	0.000	32.003	32.003	100.00	0.000	21.083
L3 78.00-72.00	74.98	1.264	4.58	0.7500	16.014	A	0.000	16.014	16.014	100.00	0.000	0.000
						B	0.000	16.014	16.014	100.00	0.000	0.000
						C	0.000	16.014	16.014	100.00	0.000	10.120
L4 72.00-69.75	70.87	1.244	4.50	0.7500	6.174	A	0.000	6.174	6.174	100.00	0.000	0.000
						B	0.000	6.174	6.174	100.00	0.000	0.000
						C	0.000	6.174	6.174	100.00	0.000	3.795
L5 69.75-54.00	61.75	1.196	4.33	0.7500	45.601	A	0.000	45.601	45.601	100.00	0.000	0.000
						B	0.000	45.601	45.601	100.00	0.000	0.000
						C	0.000	45.601	45.601	100.00	0.000	27.088
L6 54.00-53.50	53.75	1.15	4.16	0.7500	1.516	A	0.000	1.516	1.516	100.00	0.000	0.000
						B	0.000	1.516	1.516	100.00	0.000	0.000
						C	0.000	1.516	1.516	100.00	0.000	0.974
L7 53.50-39.75	46.54	1.103	3.99	0.7500	43.341	A	0.000	43.341	43.341	100.00	0.000	0.000
						B	0.000	43.341	43.341	100.00	0.000	0.000
						C	0.000	43.341	43.341	100.00	0.000	26.785
L8 39.75-35.00	37.36	1.036	3.75	0.7500	15.421	A	0.000	15.421	15.421	100.00	0.000	0.000
						B	0.000	15.421	15.421	100.00	0.000	0.000
						C	0.000	15.421	15.421	100.00	0.000	9.253
L9 35.00-25.00	29.96	1	3.62	0.7500	33.799	A	0.000	33.799	33.799	100.00	0.000	0.000
						B	0.000	33.799	33.799	100.00	0.000	0.000
						C	0.000	33.799	33.799	100.00	0.000	19.480
L10 25.00-14.50	19.70	1	3.62	0.7500	37.301	A	0.000	37.301	37.301	100.00	0.000	0.000
						B	0.000	37.301	37.301	100.00	0.000	0.000
						C	0.000	37.301	37.301	100.00	0.000	20.454
L11 14.50-4.75	9.59	1	3.62	0.7500	36.299	A	0.000	36.299	36.299	100.00	0.000	0.000
						B	0.000	36.299	36.299	100.00	0.000	0.000
						C	0.000	36.299	36.299	100.00	0.000	18.993
L12 4.75-0.00	2.37	1	3.62	0.7500	18.264	A	0.000	18.264	18.264	100.00	0.000	0.000
						B	0.000	18.264	18.264	100.00	0.000	0.000
						C	0.000	18.264	18.264	100.00	0.000	9.253

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft ²	Face	A_F ft ²	A_R ft ²	A_{leg} ft ²	Leg %	C_{AA} In Face ft ²	C_{AA} Out Face ft ²
L1 120.00-90.50	104.66	1.391	8.90	61.410	A	0.000	61.410	61.410	100.00	0.000	0.000
					B	0.000	61.410	61.410	100.00	0.000	0.000
					C	0.000	61.410	61.410	100.00	0.000	15.929
L2 90.50-78.00	84.16	1.307	8.36	30.441	A	0.000	30.441	30.441	100.00	0.000	0.000
					B	0.000	30.441	30.441	100.00	0.000	0.000
					C	0.000	30.441	30.441	100.00	0.000	11.292
L3 78.00-72.00	74.98	1.264	8.09	15.264	A	0.000	15.264	15.264	100.00	0.000	0.000
					B	0.000	15.264	15.264	100.00	0.000	0.000
					C	0.000	15.264	15.264	100.00	0.000	5.420
L4 72.00-69.75	70.87	1.244	7.96	5.892	A	0.000	5.892	5.892	100.00	0.000	0.000
					B	0.000	5.892	5.892	100.00	0.000	0.000
					C	0.000	5.892	5.892	100.00	0.000	2.033
L5 69.75-54.00	61.75	1.196	7.65	43.633	A	0.000	43.633	43.633	100.00	0.000	0.000
					B	0.000	43.633	43.633	100.00	0.000	0.000
					C	0.000	43.633	43.633	100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L6 54.00-53.50	53.75	1.15	7.36	1.454	C	0.000	43.633	1.454	100.00	0.000	14.917
					A	0.000	1.454		100.00	0.000	0.000
					B	0.000	1.454		100.00	0.000	0.000
L7 53.50-39.75	46.54	1.103	7.06	41.622	C	0.000	1.454	41.622	100.00	0.000	0.624
					A	0.000	41.622		100.00	0.000	0.000
					B	0.000	41.622		100.00	0.000	17.160
L8 39.75-35.00	37.36	1.036	6.63	14.827	A	0.000	14.827	14.827	100.00	0.000	0.000
					B	0.000	14.827		100.00	0.000	0.000
					C	0.000	14.827		100.00	0.000	5.928
L9 35.00-25.00	29.96	1	6.40	32.549	A	0.000	32.549	32.549	100.00	0.000	0.000
					B	0.000	32.549		100.00	0.000	0.000
					C	0.000	32.549		100.00	0.000	12.480
L10 25.00-14.50	19.70	1	6.40	35.989	A	0.000	35.989	35.989	100.00	0.000	0.000
					B	0.000	35.989		100.00	0.000	0.000
					C	0.000	35.989		100.00	0.000	13.104
L11 14.50-4.75	9.59	1	6.40	35.080	A	0.000	35.080	35.080	100.00	0.000	0.000
					B	0.000	35.080		100.00	0.000	0.000
					C	0.000	35.080		100.00	0.000	12.168
L12 4.75-0.00	2.37	1	6.40	17.670	A	0.000	17.670	17.670	100.00	0.000	0.000
					B	0.000	17.670		100.00	0.000	0.000
					C	0.000	17.670		100.00	0.000	5.928

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M _x kip-ft	Sum of Overturning Moments, M _z kip-ft	Sum of Torques kip-ft
Leg Weight	26.54					
Bracing Weight	0.00					
Total Member Self-Weight	26.54					
Total Weight	41.62			1.94	3.87	
Wind 0 deg - No Ice		-0.22	-41.33	-3571.94	31.09	-1.16
Wind 30 deg - No Ice		20.58	-35.78	-3092.53	-1771.84	-1.28
Wind 60 deg - No Ice		35.85	-20.58	-1774.50	-3096.96	-1.20
Wind 90 deg - No Ice		41.35	-0.01	0.47	-3571.63	-0.37
Wind 120 deg - No Ice		35.83	20.58	1778.27	-3094.72	0.19
Wind 150 deg - No Ice		20.53	35.89	3109.24	-1766.02	1.35
Wind 180 deg - No Ice		-0.17	41.33	3576.24	24.60	1.84
Wind 210 deg - No Ice		-20.72	35.81	3099.69	1796.32	1.76
Wind 240 deg - No Ice		-36.01	20.62	1783.89	3124.47	1.44
Wind 270 deg - No Ice		-41.54	0.04	7.14	3601.43	1.35
Wind 300 deg - No Ice		-35.92	-20.64	-1782.05	3113.48	0.24
Wind 330 deg - No Ice		-20.79	-35.78	-3091.55	1805.32	-0.95
Member Ice	3.87					
Total Weight Ice	62.06			8.35	15.39	
Wind 0 deg - Ice		-0.04	-8.74	-750.07	20.70	-0.37
Wind 30 deg - Ice		4.35	-7.56	-648.34	-361.78	-0.37
Wind 60 deg - Ice		7.58	-4.35	-368.82	-642.80	-0.30
Wind 90 deg - Ice		8.74	-0.00	8.06	-743.64	-0.06
Wind 120 deg - Ice		7.58	4.35	385.49	-642.36	0.12
Wind 150 deg - Ice		4.34	7.59	667.54	-360.64	0.39
Wind 180 deg - Ice		-0.03	8.74	766.85	19.43	0.50
Wind 210 deg - Ice		-4.38	7.57	665.68	395.82	0.46
Wind 240 deg - Ice		-7.61	4.36	386.58	677.43	0.34
Wind 270 deg - Ice		-8.78	0.01	9.36	778.72	0.25
Wind 300 deg - Ice		-7.59	-4.36	-370.29	675.29	-0.04
Wind 330 deg - Ice		-4.39	-7.56	-648.15	397.57	-0.32
Total Weight	41.62			1.94	3.87	
Wind 0 deg - Service		-0.07	-12.76	-1103.42	8.27	-0.36
Wind 30 deg - Service		6.35	-11.04	-955.45	-548.19	-0.40
Wind 60 deg - Service		11.06	-6.35	-548.65	-957.17	-0.37
Wind 90 deg - Service		12.76	-0.00	-0.82	-1103.67	-0.12
Wind 120 deg - Service		11.06	6.35	547.88	-956.48	0.06

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 150 deg - Service		6.34	11.08	958.67	-546.39	0.42
Wind 180 deg - Service		-0.05	12.76	1102.81	6.27	0.57
Wind 210 deg - Service		-6.39	11.05	955.73	553.10	0.54
Wind 240 deg - Service		-11.11	6.36	549.61	963.02	0.44
Wind 270 deg - Service		-12.82	0.01	1.24	1110.23	0.42
Wind 300 deg - Service		-11.09	-6.37	-550.98	959.63	0.07
Wind 330 deg - Service		-6.42	-11.04	-955.15	555.88	-0.29

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 - 90.5	Pole	Max Tension	14	0.00	-0.00	0.00
			Max. Compression	14	-22.51	2.26	-0.78
			Max. Mx	11	-10.88	542.80	-1.45
			Max. My	8	-10.91	5.98	-537.50
			Max. Vy	11	-27.44	542.80	-1.45
			Max. Vx	8	27.23	5.98	-537.50
			Max. Torque	11			-2.07
L2	90.5 - 78	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	78 - 72	Pole	Max. Compression	14	-24.86	3.33	-1.40
			Max. Mx	11	-12.42	788.89	-1.97
			Max. My	8	-12.44	7.79	-781.63
			Max. Vy	11	-28.77	788.89	-1.97
			Max. Vx	8	28.56	7.79	-781.63
			Max. Torque	11			-2.04
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.25	4.56	-2.07
			Max. Mx	11	-14.83	1077.71	-2.56
			Max. My	8	-14.86	9.82	-1068.27
			Max. Vy	11	-30.41	1077.71	-2.56
L4	72 - 69.75	Pole	Max. Vx	8	30.20	9.82	-1068.27
			Max. Torque	11			-1.99
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.92	4.85	-2.24
			Max. Mx	11	-15.31	1146.57	-2.70
			Max. My	8	-15.33	10.29	-1136.62
			Max. Vy	11	-30.75	1146.57	-2.70
			Max. Vx	8	30.54	10.29	-1136.62
			Max. Torque	11			-1.98
			Max Tension	1	0.00	0.00	0.00
			L5	69.75 - 54	Pole	Max. Compression	14
Max. Mx	11	-20.14				1650.89	-3.69
Max. My	8	-20.16				13.60	-1637.39
Max. Vy	11	-33.26				1650.89	-3.69
Max. Vx	8	33.05				13.60	-1637.39
Max. Torque	11						-1.96
Max Tension	1	0.00				0.00	0.00
Max. Compression	14	-35.56				7.10	-3.54
Max. Mx	11	-20.34				1667.56	-3.72
Max. My	8	-20.35				13.71	-1653.95
L6	54 - 53.5	Pole				Max. Vy	11
			Max. Vx	8	33.13	13.71	-1653.95
			Max. Torque	11			-1.85
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38.90	8.43	-4.31
			Max. Mx	11	-22.84	1974.19	-4.31
			Max. My	8	-22.86	15.62	-1958.54
			Max. Vy	11	-34.74	1974.19	-4.31
			Max. Vx	8	34.53	15.62	-1958.54
			Max. Torque	11			-1.84
			L7	53.5 - 39.75	Pole	Max Tension	1
Max. Compression	14	-44.32				9.87	-5.13
Max. Mx	11	-27.29				2312.29	-4.93
Max. My	8	-27.30				17.65	-2294.49
Max. Vy	11	-36.32				2312.29	-4.93
Max. Vx	8	36.11				17.65	-2294.49
Max. Torque	11						-1.72
Max Tension	1	0.00				0.00	0.00
Max. Compression	14	-49.07				11.43	-6.04
Max. Mx	11	-31.07				2683.08	-5.59
L8	39.75 - 35	Pole				Max. My	8
			Max. Vy	11	-37.79	2683.08	-5.59
			Max. Vx	8	37.58	19.79	-2663.02
			Max. Torque	11			-1.67
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-54.43	13.14	-7.03
			Max. Mx	11	-35.39	3088.42	-6.31
			Max. My	8	-35.40	22.05	-3065.99
			Max. Vy	11	-39.36	3088.42	-6.31
			Max. Vx	8	39.16	22.05	-3065.99
			L9	35 - 25	Pole	Max. Torque	8
Max Tension	1	0.00				0.00	0.00
Max. Compression	14	-59.70				14.81	-7.99
Max. Mx	11	-39.70				3479.73	-6.98
Max. My	8	-39.70				24.15	-3455.10
Max. Vy	11	-40.85				3479.73	-6.98
Max. Vx	8	40.64				24.15	-3455.10
Max. Torque	8						-1.76
Max Tension	1	0.00				0.00	0.00
Max. Compression	14	-59.70				14.81	-7.99
L10	25 - 14.5	Pole				Max. Mx	11
			Max. My	8	-39.70	24.15	-3455.10
			Max. Vy	11	-40.85	3479.73	-6.98
			Max. Vx	8	40.64	24.15	-3455.10
			Max. Torque	8			-1.59
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-59.70	14.81	-7.99
			Max. Mx	11	-39.70	3479.73	-6.98
			Max. My	8	-39.70	24.15	-3455.10
			Max. Vy	11	-40.85	3479.73	-6.98
			L11	14.5 - 4.75	Pole	Max. Vx	8
Max. Torque	8						-1.76

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L12	4.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-62.06	15.65	-8.48
			Max. M _x	11	-41.60	3675.57	-7.31
			Max. M _y	8	-41.60	25.18	-3649.87
			Max. V _y	11	-41.55	3675.57	-7.31
			Max. V _x	8	41.35	25.18	-3649.87
			Max. Torque	8			-1.84

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	62.06	-0.00	0.00
	Max. H _x	11	41.62	41.53	-0.04
	Max. H _z	2	41.62	0.22	41.33
	Max. M _x	2	3645.38	0.22	41.33
	Max. M _z	5	3645.03	-41.35	0.01
	Max. Torsion	3	1.29	-20.58	35.78
	Min. Vert	2	41.62	0.22	41.33
	Min. H _x	5	41.62	-41.35	0.01
	Min. H _z	8	41.62	0.17	-41.33
	Min. M _x	8	-3649.87	0.17	-41.33
	Min. M _z	11	-3675.57	41.53	-0.04
	Min. Torsion	8	-1.84	0.17	-41.33

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	41.62	-0.00	0.00	1.94	3.87	0.00
Dead+Wind 0 deg - No Ice	41.62	-0.22	-41.33	-3645.38	31.82	-1.18
Dead+Wind 30 deg - No Ice	41.62	20.58	-35.78	-3156.26	-1808.30	-1.29
Dead+Wind 60 deg - No Ice	41.62	35.85	-20.58	-1811.03	-3160.76	-1.19
Dead+Wind 90 deg - No Ice	41.62	41.35	-0.01	0.47	-3645.03	-0.37
Dead+Wind 120 deg - No Ice	41.62	35.83	20.58	1814.87	-3158.47	0.19
Dead+Wind 150 deg - No Ice	41.62	20.53	35.89	3173.32	-1802.32	1.37
Dead+Wind 180 deg - No Ice	41.62	-0.17	41.33	3649.87	25.18	1.84
Dead+Wind 210 deg - No Ice	41.62	-20.72	35.81	3163.53	1833.31	1.73
Dead+Wind 240 deg - No Ice	41.62	-36.01	20.62	1820.59	3188.84	1.43
Dead+Wind 270 deg - No Ice	41.62	-41.53	0.04	7.31	3675.57	1.33
Dead+Wind 300 deg - No Ice	41.62	-35.92	-20.64	-1818.74	3177.61	0.24
Dead+Wind 330 deg - No Ice	41.62	-20.79	-35.78	-3155.22	1842.53	-0.94
Dead+Ice+Temp	62.06	0.00	-0.00	8.48	15.65	0.00
Dead+Wind 0 deg+Ice+Temp	62.06	-0.04	-8.74	-777.78	21.49	-0.36
Dead+Wind 30 deg+Ice+Temp	62.06	4.35	-7.56	-672.30	-375.12	-0.37
Dead+Wind 60 deg+Ice+Temp	62.06	7.58	-4.35	-382.44	-666.53	-0.30
Dead+Wind 90 deg+Ice+Temp	62.06	8.74	-0.00	8.33	-771.08	-0.06
Dead+Wind 120 deg+Ice+Temp	62.06	7.58	4.35	399.68	-666.07	0.11
Dead+Wind 150 deg+Ice+Temp	62.06	4.34	7.59	692.17	-373.93	0.39
Dead+Wind 180 deg+Ice+Temp	62.06	-0.03	8.74	795.13	20.17	0.50
Dead+Wind 210 deg+Ice+Temp	62.06	-4.38	7.57	690.23	410.43	0.46
Dead+Wind 240 deg+Ice+Temp	62.06	-7.61	4.36	400.82	702.45	0.34
Dead+Wind 270 deg+Ice+Temp	62.06	-8.78	0.01	9.69	807.48	0.25

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
deg+Ice+Temp						
Dead+Wind 300	62.06	-7.59	-4.36	-383.97	700.22	-0.03
deg+Ice+Temp						
Dead+Wind 330	62.06	-4.39	-7.56	-672.10	412.26	-0.31
deg+Ice+Temp						
Dead+Wind 0 deg - Service	41.62	-0.07	-12.75	-1124.65	12.56	-0.36
Dead+Wind 30 deg - Service	41.62	6.35	-11.04	-973.64	-555.87	-0.40
Dead+Wind 60 deg - Service	41.62	11.06	-6.35	-558.10	-973.69	-0.37
Dead+Wind 90 deg - Service	41.62	12.76	-0.00	1.51	-1123.17	-0.12
Dead+Wind 120 deg - Service	41.62	11.06	6.35	562.01	-972.99	0.06
Dead+Wind 150 deg - Service	41.62	6.34	11.08	981.64	-554.03	0.42
Dead+Wind 180 deg - Service	41.62	-0.05	12.75	1128.72	10.51	0.57
Dead+Wind 210 deg - Service	41.62	-6.39	11.05	978.65	569.08	0.54
Dead+Wind 240 deg - Service	41.62	-11.11	6.36	563.77	987.81	0.44
Dead+Wind 270 deg - Service	41.62	-12.82	0.01	3.62	1138.05	0.42
Dead+Wind 300 deg - Service	41.62	-11.09	-6.37	-560.49	984.37	0.08
Dead+Wind 330 deg - Service	41.62	-6.42	-11.04	-973.36	571.93	-0.29

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	-41.62	0.00	0.00	41.62	-0.00	0.000%
2	-0.22	-41.62	-41.33	0.22	41.62	41.33	0.003%
3	20.58	-41.62	-35.78	-20.58	41.62	35.78	0.000%
4	35.85	-41.62	-20.58	-35.85	41.62	20.58	0.000%
5	41.35	-41.62	-0.01	-41.35	41.62	0.01	0.003%
6	35.83	-41.62	20.58	-35.83	41.62	-20.58	0.000%
7	20.53	-41.62	35.89	-20.53	41.62	-35.89	0.000%
8	-0.17	-41.62	41.33	0.17	41.62	-41.33	0.001%
9	-20.72	-41.62	35.81	20.72	41.62	-35.81	0.000%
10	-36.01	-41.62	20.62	36.01	41.62	-20.62	0.000%
11	-41.54	-41.62	0.04	41.53	41.62	-0.04	0.001%
12	-35.92	-41.62	-20.64	35.92	41.62	20.64	0.000%
13	-20.79	-41.62	-35.78	20.79	41.62	35.78	0.000%
14	0.00	-62.06	0.00	-0.00	62.06	0.00	0.004%
15	-0.04	-62.06	-8.74	0.04	62.06	8.74	0.000%
16	4.35	-62.06	-7.56	-4.35	62.06	7.56	0.000%
17	7.58	-62.06	-4.35	-7.58	62.06	4.35	0.000%
18	8.74	-62.06	-0.00	-8.74	62.06	0.00	0.000%
19	7.58	-62.06	4.35	-7.58	62.06	-4.35	0.000%
20	4.34	-62.06	7.59	-4.34	62.06	-7.59	0.000%
21	-0.03	-62.06	8.74	0.03	62.06	-8.74	0.000%
22	-4.38	-62.06	7.57	4.38	62.06	-7.57	0.000%
23	-7.61	-62.06	4.36	7.61	62.06	-4.36	0.000%
24	-8.78	-62.06	0.01	8.78	62.06	-0.01	0.000%
25	-7.59	-62.06	-4.36	7.59	62.06	4.36	0.000%
26	-4.39	-62.06	-7.56	4.39	62.06	7.56	0.000%
27	-0.07	-41.62	-12.76	0.07	41.62	12.75	0.004%
28	6.35	-41.62	-11.04	-6.35	41.62	11.04	0.001%
29	11.06	-41.62	-6.35	-11.06	41.62	6.35	0.000%
30	12.76	-41.62	-0.00	-12.76	41.62	0.00	0.004%
31	11.06	-41.62	6.35	-11.06	41.62	-6.35	0.000%
32	6.34	-41.62	11.08	-6.34	41.62	-11.08	0.001%
33	-0.05	-41.62	12.76	0.05	41.62	-12.75	0.004%
34	-6.39	-41.62	11.05	6.39	41.62	-11.05	0.000%
35	-11.11	-41.62	6.36	11.11	41.62	-6.36	0.001%
36	-12.82	-41.62	0.01	12.82	41.62	-0.01	0.004%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
37	-11.09	-41.62	-6.37	11.09	41.62	6.37	0.000%
38	-6.42	-41.62	-11.04	6.42	41.62	11.04	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	11	0.00000001	0.00014401
3	Yes	14	0.00000001	0.00008186
4	Yes	14	0.00000001	0.00008507
5	Yes	11	0.00000001	0.00010059
6	Yes	14	0.00000001	0.00008280
7	Yes	14	0.00000001	0.00008258
8	Yes	12	0.00000001	0.00006276
9	Yes	14	0.00000001	0.00008662
10	Yes	14	0.00000001	0.00008308
11	Yes	12	0.00000001	0.00005718
12	Yes	14	0.00000001	0.00008579
13	Yes	14	0.00000001	0.00008514
14	Yes	6	0.00000001	0.00006065
15	Yes	13	0.00000001	0.00006958
16	Yes	13	0.00000001	0.00007369
17	Yes	13	0.00000001	0.00007379
18	Yes	13	0.00000001	0.00006884
19	Yes	13	0.00000001	0.00007473
20	Yes	13	0.00000001	0.00007526
21	Yes	13	0.00000001	0.00007099
22	Yes	13	0.00000001	0.00007773
23	Yes	13	0.00000001	0.00007802
24	Yes	13	0.00000001	0.00007215
25	Yes	13	0.00000001	0.00007684
26	Yes	13	0.00000001	0.00007634
27	Yes	10	0.00000001	0.00010452
28	Yes	11	0.00000001	0.00014613
29	Yes	12	0.00000001	0.00005448
30	Yes	10	0.00000001	0.00010382
31	Yes	12	0.00000001	0.00005000
32	Yes	11	0.00000001	0.00014991
33	Yes	10	0.00000001	0.00011638
34	Yes	12	0.00000001	0.00005666
35	Yes	11	0.00000001	0.00014900
36	Yes	10	0.00000001	0.00012378
37	Yes	12	0.00000001	0.00005499
38	Yes	12	0.00000001	0.00005304

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90.5	19.907	36	1.5594	0.0057
L2	90.5 - 78	10.968	36	1.2270	0.0020
L3	81.75 - 72	8.854	36	1.0753	0.0014
L4	72 - 69.75	6.786	36	0.9276	0.0010
L5	69.75 - 54	6.360	36	0.8838	0.0009
L6	54 - 53.5	3.768	36	0.6852	0.0006
L7	53.5 - 39.75	3.696	36	0.6798	0.0006
L8	44.5 - 35	2.555	36	0.5306	0.0004
L9	35 - 25	1.582	36	0.4350	0.0003
L10	25 - 14.5	0.807	36	0.3050	0.0002
L11	14.5 - 4.75	0.277	36	0.1770	0.0001
L12	4.75 - 0	0.032	36	0.0639	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
126.00	APXV18-206516S-C-A20 w/ Mount Pipe	36	19.907	1.5594	0.0057	15668
122.00	VHLP2-11	36	19.907	1.5594	0.0057	15668
120.00	LLPX310R w/ Mount Pipe	36	19.907	1.5594	0.0057	15668
113.00	(2) DB846F65ZAXY w/ Mount Pipe	36	17.639	1.4994	0.0047	11191
105.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	36	15.115	1.4222	0.0036	5222
97.00	RRUS 11	36	12.737	1.3260	0.0027	3405
96.00	(2) 7770.00 w/ Mount Pipe	36	12.454	1.3122	0.0025	3263
75.00	ACUTIME 2000	36	7.387	0.9780	0.0012	3228

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 90.5	64.204	11	5.0315	0.0183
L2	90.5 - 78	35.393	11	3.9596	0.0065
L3	81.75 - 72	28.576	11	3.4702	0.0046
L4	72 - 69.75	21.904	11	2.9941	0.0033
L5	69.75 - 54	20.527	11	2.8528	0.0030
L6	54 - 53.5	12.164	11	2.2119	0.0019
L7	53.5 - 39.75	11.933	11	2.1944	0.0019
L8	44.5 - 35	8.250	11	1.7132	0.0012
L9	35 - 25	5.107	11	1.4044	0.0009
L10	25 - 14.5	2.605	11	0.9847	0.0006
L11	14.5 - 4.75	0.896	11	0.5715	0.0004
L12	4.75 - 0	0.103	11	0.2063	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
126.00	APXV18-206516S-C-A20 w/ Mount Pipe	11	64.204	5.0315	0.0183	4922
122.00	VHLP2-11	11	64.204	5.0315	0.0183	4922
120.00	LLPX310R w/ Mount Pipe	11	64.204	5.0315	0.0183	4922
113.00	(2) DB846F65ZAXY w/ Mount Pipe	11	56.895	4.8380	0.0151	3515
105.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11	48.759	4.5888	0.0116	1639
97.00	RRUS 11	11	41.096	4.2788	0.0086	1067
96.00	(2) 7770.00 w/ Mount Pipe	11	40.184	4.2341	0.0082	1023
75.00	ACUTIME 2000	11	23.841	3.1567	0.0037	1006

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	120 - 90.5 (1)	TP27.9604x22x0.25	29.50	0.00	0.0	36.000	22.3069	-10.88	803.05	0.014
L2	90.5 - 78 (2)	TP30.486x27.9604x0.3545	12.50	0.00	0.0	36.060	33.5290	-12.42	1209.06	0.010
L3	78 - 72 (3)	TP31.1982x29.0193x0.4127	9.75	0.00	0.0	36.048	40.9058	-14.83	1474.57	0.010
L4	72 - 69.75 (4)	TP31.6528x31.1982x0.411	2.25	0.00	0.0	36.054	41.3460	-15.31	1490.69	0.010
L5	69.75 - 54 (5)	TP34.8349x31.6528x0.685	15.75	0.00	0.0	28.986	75.3191	-20.14	2183.20	0.009
L6	54 - 53.5 (6)	TP34.9359x34.8349x0.8289	0.50	0.00	0.0	28.956	91.0347	-20.34	2636.00	0.008
L7	53.5 - 39.75 (7)	TP37.714x34.9359x0.5346	13.75	0.00	0.0	33.198	62.3513	-22.84	2069.94	0.011
L8	39.75 - 35 (8)	TP38.0487x35.6851x0.7536	9.50	0.00	0.0	33.258	90.4964	-27.29	3009.73	0.009
L9	35 - 25 (9)	TP40.069x38.0487x0.7309	10.00	0.00	0.0	33.366	92.5760	-31.07	3088.89	0.010
L10	25 - 14.5 (10)	TP42.1905x40.069x0.7714	10.50	0.00	0.0	33.474	102.8840	-35.39	3443.93	0.010
L11	14.5 - 4.75 (11)	TP44.1603x42.1905x0.797	9.75	0.00	0.0	33.612	111.2820	-39.70	3740.42	0.011
L12	4.75 - 0 (12)	TP45.12x44.1603x0.6706	4.75	0.00	0.0	33.642	95.9740	-41.60	3228.76	0.013

Pole Bending Design Data

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 $\frac{f_{by}}{F_{by}}$
L1	120 - 90.5 (1)	TP27.9604x22x0.25	542.80	43.151	36.000	1.199	0.00	0.000	36.000	0.000
L2	90.5 - 78 (2)	TP30.486x27.9604x0.3545	788.89	39.480	36.060	1.095	0.00	0.000	36.060	0.000
L3	78 - 72 (3)	TP31.1982x29.0193x0.4127	1077.7	42.236	36.048	1.172	0.00	0.000	36.048	0.000
L4	72 - 69.75 (4)	TP31.6528x31.1982x0.411	1146.5	43.796	36.054	1.215	0.00	0.000	36.054	0.000
L5	69.75 - 54 (5)	TP34.8349x31.6528x0.685	1650.8	31.884	28.986	1.100	0.00	0.000	28.986	0.000
L6	54 - 53.5 (6)	TP34.9359x34.8349x0.8289	1667.5	26.791	28.956	0.925	0.00	0.000	28.956	0.000
L7	53.5 - 39.75 (7)	TP37.714x34.9359x0.5346	1974.1	43.200	33.198	1.301	0.00	0.000	33.198	0.000
L8	39.75 - 35 (8)	TP38.0487x35.6851x0.7536	2312.2	34.039	33.258	1.023	0.00	0.000	33.258	0.000
L9	35 - 25 (9)	TP40.069x38.0487x0.7309	2683.0	36.546	33.366	1.095	0.00	0.000	33.366	0.000
L10	25 - 14.5 (10)	TP42.1905x40.069x0.7714	3088.4	35.953	33.474	1.074	0.00	0.000	33.474	0.000
L11	14.5 - 4.75 (11)	TP44.1603x42.1905x0.797	3479.7	35.763	33.612	1.064	0.00	0.000	33.612	0.000
L12	4.75 - 0 (12)	TP45.12x44.1603x0.6706	3675.5	42.593	33.642	1.266	0.00	0.000	33.642	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 - 90.5 (1)	TP27.9604x22x0.25	27.44	1.230	24.000	0.104	2.05	0.077	24.000	0.003
L2	90.5 - 78 (2)	TP30.486x27.9604x0.354 5	28.77	0.858	24.040	0.073	1.99	0.047	24.040	0.002
L3	78 - 72 (3)	TP31.1982x29.0193x0.41 27	30.41	0.744	24.032	0.063	1.98	0.037	24.032	0.002
L4	72 - 69.75 (4)	TP31.6528x31.1982x0.41 1	30.75	0.744	24.036	0.063	1.97	0.035	24.036	0.001
L5	69.75 - 54 (5)	TP34.8349x31.6528x0.68 5	33.26	0.442	19.324	0.046	1.86	0.017	19.324	0.001
L6	54 - 53.5 (6)	TP34.9359x34.8349x0.82 89	33.34	0.366	19.304	0.039	1.85	0.014	19.304	0.001
L7	53.5 - 39.75 (7)	TP37.714x34.9359x0.534 6	34.74	0.557	22.132	0.051	1.77	0.018	22.132	0.001
L8	39.75 - 35 (8)	TP38.0487x35.6851x0.75 36	36.32	0.401	22.172	0.037	1.68	0.012	22.172	0.001
L9	35 - 25 (9)	TP40.069x38.0487x0.730 9	37.79	0.408	22.244	0.037	1.59	0.010	22.244	0.000
L10	25 - 14.5 (10)	TP42.1905x40.069x0.771 4	39.36	0.383	22.316	0.035	1.49	0.008	22.316	0.000
L11	14.5 - 4.75 (11)	TP44.1603x42.1905x0.79 7	40.85	0.367	22.408	0.033	1.39	0.007	22.408	0.000
L12	4.75 - 0 (12)	TP45.12x44.1603x0.6706	41.55	0.433	22.428	0.039	1.34	0.007	22.428	0.000

Pole Interaction Design Data

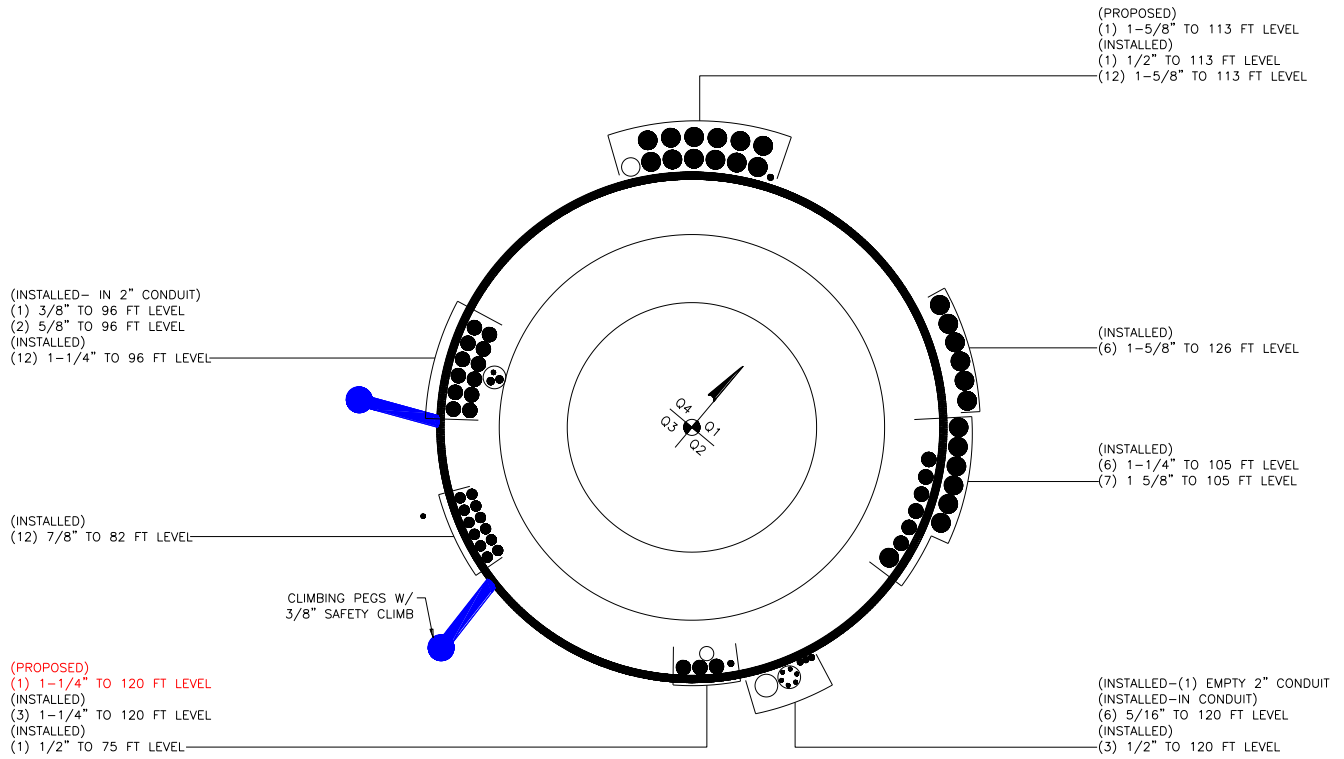
Section No.	Elevation ft	Ratio P P_a	Ratio f_{bx} F_{bx}	Ratio f_{by} F_{by}	Ratio f_v F_v	Ratio f_{vt} F_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 90.5 (1)	0.014	1.199	0.000	0.104	0.003	1.215	1.333	H1-3+VT ✓
L2	90.5 - 78 (2)	0.010	1.095	0.000	0.073	0.002	1.107	1.333	H1-3+VT ✓
L3	78 - 72 (3)	0.010	1.172	0.000	0.063	0.002	1.183	1.333	H1-3+VT ✓
L4	72 - 69.75 (4)	0.010	1.215	0.000	0.063	0.001	1.226	1.333	H1-3+VT ✓
L5	69.75 - 54 (5)	0.009	1.100	0.000	0.046	0.001	1.110	1.333	H1-3+VT ✓
L6	54 - 53.5 (6)	0.008	0.925	0.000	0.039	0.001	0.933	1.333	H1-3+VT ✓
L7	53.5 - 39.75 (7)	0.011	1.301	0.000	0.051	0.001	1.313	1.333	H1-3+VT ✓
L8	39.75 - 35 (8)	0.009	1.023	0.000	0.037	0.001	1.033	1.333	H1-3+VT ✓
L9	35 - 25 (9)	0.010	1.095	0.000	0.037	0.000	1.106	1.333	H1-3+VT ✓
L10	25 - 14.5 (10)	0.010	1.074	0.000	0.035	0.000	1.085	1.333	H1-3+VT ✓
L11	14.5 - 4.75 (11)	0.011	1.064	0.000	0.033	0.000	1.075	1.333	H1-3+VT ✓
L12	4.75 - 0 (12)	0.013	1.266	0.000	0.039	0.000	1.279	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 - 90.5	Pole	TP27.9604x22x0.25	1	-10.88	1070.46	91.2	Pass	
L2	90.5 - 78	Pole	TP30.486x27.9604x0.3545	2	-12.42	1611.68	83.0	Pass	
L3	78 - 72	Pole	TP31.1982x29.0193x0.4127	3	-14.83	1965.60	88.7	Pass	
L4	72 - 69.75	Pole	TP31.6528x31.1982x0.411	4	-15.31	1987.09	92.0	Pass	
L5	69.75 - 54	Pole	TP34.8349x31.6528x0.685	5	-20.14	2910.21	83.3	Pass	
L6	54 - 53.5	Pole	TP34.9359x34.8349x0.8289	6	-20.34	3513.79	70.0	Pass	
L7	53.5 - 39.75	Pole	TP37.714x34.9359x0.5346	7	-22.84	2759.23	98.5	Pass	
L8	39.75 - 35	Pole	TP38.0487x35.6851x0.7536	8	-27.29	4011.97	77.5	Pass	
L9	35 - 25	Pole	TP40.069x38.0487x0.7309	9	-31.07	4117.49	82.9	Pass	
L10	25 - 14.5	Pole	TP42.1905x40.069x0.7714	10	-35.39	4590.76	81.4	Pass	
L11	14.5 - 4.75	Pole	TP44.1603x42.1905x0.797	11	-39.70	4985.98	80.6	Pass	
L12	4.75 - 0	Pole	TP45.12x44.1603x0.6706	12	-41.60	4303.94	96.0	Pass	
							Summary		
							Pole (L7)	98.5	Pass
							RATING =	98.5	Pass

APPENDIX B

BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

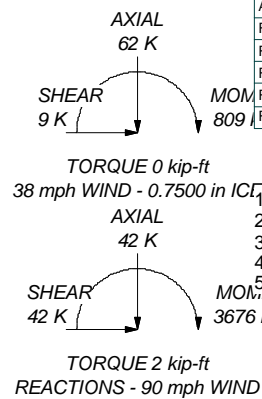
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXV18-206516S-C-A20 w/ Mount Pipe	126	BXA-70063/6CF w/ Mount Pipe	113
APXV18-206516S-C-A20 w/ Mount Pipe	126	BXA-70040/6CFx4 w/ Mount Pipe	113
APXV18-206516S-C-A20 w/ Mount Pipe	126	BXA-70040/6CFx2 w/ Mount Pipe	113
Pipe Mount (PM 701-1)	126	RRH2x40-AWS	113
12' x 8" Cylinder	126	RRH2x40-AWS	113
LLPX310R w/ Mount Pipe	120	RRH2x40-AWS	113
LLPX310R w/ Mount Pipe	120	DB-T1-6Z-8AB-0Z	113
LLPX310R w/ Mount Pipe	120	Platform Mount [LP 303-1]	113
MT-485025	120	(2) DB846F65ZAXY w/ Mount Pipe	113
FDD_R6_RRH	120	(2) LPA-80063/4CF w/ Mount Pipe	113
FDD_R6_RRH	120	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
FDD_R6_RRH	120	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	120	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	120	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
APXVTM14-C-120 w/ Mount Pipe	120	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	105
TD-RRH8x20-25	120	KRY 112 144/1	105
TD-RRH8x20-25	120	KRY 112 144/1	105
TD-RRH8x20-25	120	KRY 112 144/1	105
APXVSP18-C-A20 w/ Mount Pipe	120	Platform Mount [LP 712-1]	105
APXVSP18-C-A20 w/ Mount Pipe	120	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
APXVSP18-C-A20 w/ Mount Pipe	120	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
PCS 1900MHz 4x45W-65MHz	120	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	105
PCS 1900MHz 4x45W-65MHz	120	RRUS 11	97
(3) ACU-A20-N	120	DC6-48-60-18-8F	97
(3) ACU-A20-N	120	RRUS 11	97
(3) ACU-A20-N	120	RRUS 11	97
800 EXTERNAL NOTCH FILTER	120	RRUS 11	97
800 EXTERNAL NOTCH FILTER	120	2.375" OD x 5' Mount Pipe	97
800 EXTERNAL NOTCH FILTER	120	2.375" OD x 5' Mount Pipe	97
800MHZ RRH	120	2.375" OD x 5' Mount Pipe	97
800MHZ RRH	120	Side Arm Mount [SO 102-3]	97
800MHZ RRH	120	RRUS 11	97
Platform Mount [LP 713-1]	120	RRUS 11	97
VHLP2-11	120	(2) 7770.00 w/ Mount Pipe	96
VHLP2-11	120	P65-16-XLH-RR w/ Mount Pipe	96
(2) LPA-80063/4CF w/ Mount Pipe	113	P65-16-XLH-RR w/ Mount Pipe	96
MG D3-800Tx w/ Mount Pipe	113	(4) LGP2140X	96
MG D3-800Tx w/ Mount Pipe	113	(4) LGP2140X	96
MG D3-800Tx w/ Mount Pipe	113	(4) LGP2140X	96
(2) FD9R6004/2C-3L	113	2.375" OD x 5' Mount Pipe	96
(2) FD9R6004/2C-3L	113	2.375" OD x 5' Mount Pipe	96
(2) FD9R6004/2C-3L	113	2.375" OD x 5' Mount Pipe	96
ACUTIME 2000	113	Platform Mount [LP 601-1]	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	(2) 7770.00 w/ Mount Pipe	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	(2) 7770.00 w/ Mount Pipe	96
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	ACUTIME 2000	75
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	113	Side Arm Mount [SO 701-1]	75

MATERIAL STRENGTH

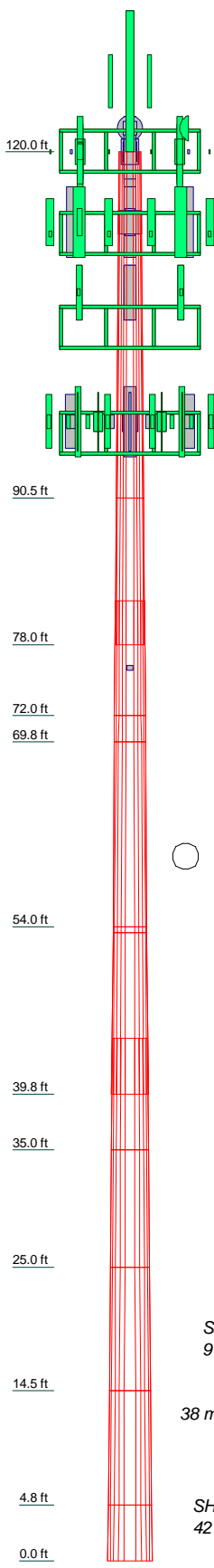
GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	Reinf 55.33 ksi	55 ksi	70 ksi
Reinf 60.10 ksi	60 ksi	76 ksi	Reinf 55.43 ksi	55 ksi	70 ksi
Reinf 60.08 ksi	60 ksi	76 ksi	Reinf 55.61 ksi	56 ksi	70 ksi
Reinf 60.09 ksi	60 ksi	76 ksi	Reinf 55.79 ksi	56 ksi	70 ksi
Reinf 48.31 ksi	48 ksi	61 ksi	Reinf 56.02 ksi	56 ksi	71 ksi
Reinf 48.26 ksi	48 ksi	61 ksi	Reinf 56.07 ksi	56 ksi	71 ksi


TOWER DESIGN NOTES



1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.5%

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	29.50	12	0.2500		22.0000	27.9604	A607-60	2.0
2	12.50	12	0.3545	3.75	27.9604	30.4860		1.4
3	9.75	12	0.4127		31.1982	31.1982		1.3
4	2.25	12	0.4110		31.6528	31.6528		0.3
5	15.75	12	0.6849	4.75	31.6528	34.8349		3.8
6	0.60	12	0.6289		34.8349	34.8349		0.2
7	13.75	12	0.5346	4.75	34.9359	37.7140		2.9
8	9.50	12	0.7536		35.6651	38.0487		2.8
9	10.00	12	0.7309		38.0487	40.0690		3.1
10	10.50	12	0.7714		40.0690	42.1904		3.6
11	9.75	12	0.7970		42.1904	44.1603		3.6
12	4.75	12	0.6705		44.1603	45.1200		1.5
								26.5





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

Job: **Ex 120 ft Monopole / 528 Wheelers Farm Rd**

Project: **PJF 37513-2328 BP / BU 876320**

Client: CCI	Drawn by: Jason Martin, E.I.	App'd:
Code: TIA/EIA-222-F	Date: 05/14/14	Scale: NTS
Path:		Dwg No. E-1



v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment = 3676 k-ft
Axial = 42.0 kips
Shear = 42.0 kips
Anchor Qty = 24

TIA Ref. = F
ASIF = 1.3333
Max Ratio = 105.0%

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 ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	2.250	#18J A615 Gr 75	75	100	27.3	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
2	2.250	#18J A615 Gr 75	75	100	39.1	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
3	2.250	#18J A615 Gr 75	75	100	50.9	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
4	2.250	#18J A615 Gr 75	75	100	62.7	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
5	2.250	#18J A615 Gr 75	75	100	117.3	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
6	2.250	#18J A615 Gr 75	75	100	129.1	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
7	2.250	#18J A615 Gr 75	75	100	140.9	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
8	2.250	#18J A615 Gr 75	75	100	152.7	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
9	2.250	#18J A615 Gr 75	75	100	207.3	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
10	2.250	#18J A615 Gr 75	75	100	219.1	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
11	2.250	#18J A615 Gr 75	75	100	230.9	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
12	2.250	#18J A615 Gr 75	75	100	242.7	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
13	2.250	#18J A615 Gr 75	75	100	297.3	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
14	2.250	#18J A615 Gr 75	75	100	309.1	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
15	2.250	#18J A615 Gr 75	75	100	320.9	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
16	2.250	#18J A615 Gr 75	75	100	332.7	58.00	0.00	3.98	159.20	154.87	154.87	0.00	195.00	79.4%
17	1.375	Williams R71	127.7	150	352.1	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
18	1.375	Williams R71	127.7	150	7.9	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
19	1.375	Williams R71	127.7	150	82.1	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
20	1.375	Williams R71	127.7	150	97.9	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
21	1.375	Williams R71	127.7	150	172.1	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
22	1.375	Williams R71	127.7	150	187.9	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
23	1.375	Williams R71	127.7	150	262.1	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%
24	1.375	Williams R71	127.7	150	277.9	58.00	0.00	1.68	67.12	65.29	65.29	0.00	110.75	59.0%

77.10

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F / G

- Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
 2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
 3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: 876320

Site Name: 528 Wheelers Farm Rd

App #:

Anchor Rod Data

Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	58	in
Anchor Spacing:	6	in

Plate Data

W=Side:	57	in
Thick:	3.25	in
Grade:	50	ksi
Clip Distance:	16	in

Stiffener Data (Welding at both sides)

Configuration:	Stiffened	
Weld Type:	Both	**
Groove Depth:	0.5	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.5	in
Fillet V. Weld:	0.375	in
Width:	9	in
Height:	18	in
Thick:	1	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	80	ksi

Pole Data

Diam:	45.12	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor

ASD ASIF:	1.333	
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** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Base Reactions

TIA Revision:	F	
Unfactored Moment, M:	3044.90333	ft-kips
Unfactored Axial, P:	42	kips
Unfactored Shear, V:	42	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Results

TIA F --> Maximum Rod Tension	154.9 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	79.4% Pass

Base Plate Results

Base Plate Stress:	3.8 ksi	Shear Check Only
Allowable PL Bending Stress:	26.7 ksi	
Base Plate Stress Ratio:	14.4% Pass	

PL Ref. Data

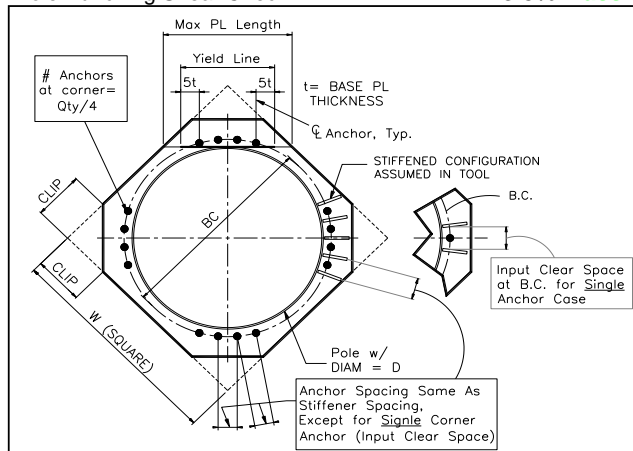
Yield Line (in):	N/A, Roark
Max PL Length:	35.49

Stiffener Results

Horizontal Weld :	45.3% Pass
Vertical Weld:	38.2% Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	12.5% Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	46.4% Pass
Plate Comp. (AISC Bracket):	46.8% Pass

Pole Results

Pole Punching Shear Check:	13.5% Pass
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DRILLED PIER SOIL AND STEEL ANALYSIS - TIA/EIA-222-F

Unfactored Base Reactions from RISA

	Comp. (+)	Tension (-)	
Moment, M =	3676.0		k-ft
Shear, V =	42.0		kips
Axial Load, P =	42.0		kips
OTM =	3697.0	0.0	k-ft @ Ground

Safety Factors / Load Factors / Φ Factors

Tower Type =	Monopole DP
ACI Code =	ACI 318-02
Seismic Design Category =	D
Reference Standard =	TIA/EIA-222-F
Use 1.3 Load Factor?	Yes
Load Factor =	1.30

Drilled Pier Parameters

Diameter =	7	ft
Height Above Grade =	0.5	ft
Depth Below Grade =	19	ft
fc' =	3	ksi
ec =	0.003	in/in
Mat Ftdn. Cap Width =		ft
Mat Ftdn. Cap Length =		ft
Depth Below Grade =		ft

	Safety Factor	Φ Factor
Soil Lateral Resistance =	2.00	0.75
Skin Friction =	2.00	0.75
End Bearing =	2.00	0.75
Concrete Wt. Resist Uplift =	1.25	

Load Combinations Checked per TIA/EIA-222-F

- Ult. Skin Friction/2.00 + Ult. End Bearing/2.00 + Effective Soil Wt. - Buoyant Conc. Wt. \geq Comp.
- Ult. Skin Friction/2.00 + Buoyant Conc. Wt./1.25 \geq Uplift
- Ult. Skin Friction/1.50 + Buoyant Conc. Wt./1.50 \geq Uplift

Steel Parameters

Number of Bars =	32
Rebar Size =	#11
Rebar Fy =	60
Rebar MOE =	29000
Tie Size =	#5
Side Clear Cover to Ties =	4

Soil Parameters

Water Table Depth =	7.00	ft
Depth to Ignore Soil =	3.50	ft
Depth to Full Cohesion =	0	ft
Full Cohesion Starts at?	Ground	

Above Full Cohesion Lateral Resistance = 4(Cohesion)(Dia)(H)
Below Full Cohesion Lateral Resistance = 8(Cohesion)(Dia)(H)

Direct Embed Pole Shaft Parameters

Dia @ Grade =		in
Dia @ Depth Below Grade =		in
Number of Sides =		
Thickness =		in
Fy =		ksi
Backfill Condition =		

Maximum Capacity Ratios

Maximum Soil Ratio =	110.0%
Maximum Steel Ratio =	105.0%

Define Soil Layers

Note: Cohesion = Undrained Shear Strength = Unconfined Compressive Strength / 2

Layer	Thickness ft	Unit Weight pcf	Cohesion psf	Friction Angle degrees	Soil Type	Ultimate End Bearing psf	Comp. Ult. Skin Friction psf	Tension Ult. Skin Friction psf	Depth ft
1	2	100	0	28	Sand				2
2	5	135	0	42	Sand				7
3	6.5	135	0	42	Sand	20000			13.5
4	8.5	140	8000	0	Clay	20000			22
5									
6									
7									
8									
9									
10									
11									
12									

Soil Results: Overturning

Depth to COR =	15.24	ft, from Grade
Bending Moment, M =	4336.99	k-ft, from COR
Resisting Moment, Ma =	4900.52	k-ft, from COR

MOMENT RATIO = 88.5% OK

Shear, V =	42.00	kips
Resisting Shear, Va =	47.46	kips

Shear RATIO = 88.5% OK

Soil Results: Uplift

Uplift, T =	0.00	kips
Allowable Uplift Cap., Ta =	67.00	kips

UPLIFT RATIO = 0.0% OK

Soil Results: Compression

Compression, C =	42.00	kips
Allowable Comp. Cap., Ca =	369.36	kips

COMPRESSION RATIO = 11.4% OK

Steel Results (ACI 318-02):

Minimum Steel Area =	18.47	sq in
Actual Steel Area =	49.92	sq in

Allowable Min Axial, Pa =	-2073.60	kips, Where Ma = 0 k-ft
Allowable Max Axial, Pa =	6799.77	kips, Where Ma = 0 k-ft

Axial Load, P =	73.75	kips @ 5.00 ft Below Grade
Moment, M =	3882.21	k-ft @ 5.00 ft Below Grade
Allowable Moment, Ma =	5828.48	k-ft

MOMENT RATIO = 66.6% OK

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: 876320
 Site Name: 528 Wheelers Farm Rd
 App #:

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties	
Concrete:	
Pier Diameter =	7.0 ft
Concrete Area =	5541.8 in ²
Reinforcement:	
Clear Cover to Tie=	4.00 in
Horiz. Tie Bar Size=	5
Vert. Cage Diameter =	6.11 ft
Vert. Cage Diameter =	73.34 in
Vertical Bar Size =	11
Bar Diameter =	1.41 in
Bar Area =	1.56 in ²
Number of Bars =	32
As Total=	49.92 in ²
A s/ Aconc, Rho:	0.0090 0.90%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
 Min As for Flexural, Tension Controlled, Shafts:

$$(3) * (\text{sqrt}(f'c) / F_y) = 0.0027$$

$$200 / F_y = 0.0033$$

Minimum Rho Check:

Actual Req'd Min. Rho: 0.33% Flexural
 Provided Rho: 0.90% **OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = ($\phi=0.65$) Pn		
Pn per ACI 318 (10-2)	8839.70	kips
at Mu=($\phi=0.65$)Mn=	5309.39	ft-kips
Max Tu, ($\phi=0.9$) Tn =	2695.68	kips
at Mu= $\phi=(0.90)$ Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	3882.21	ft-kips (* Note)
Max. Service Shaft P:	73.75	kips
Max Axial Force Type:	Comp.	

(* Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

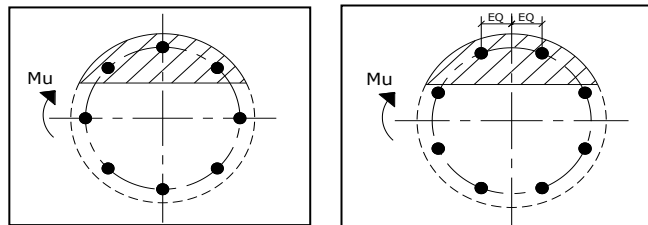
Load Factor	Shaft Factored Loads	
1.30	Mu:	5046.873 ft-kips
1.30	Pu:	95.875 kips

Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2002	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	High	

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: 2



Case 1

Case 2

Dist. From Edge to Neutral Axis: 17.12 in

Extreme Steel Strain, et: 0.0108

et > 0.0050, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ Pn = Pu: 95.88 kips
 Drilled Shaft Moment Capacity, ϕ Mn: 7577.02 ft-kips
 Drilled Shaft Superimposed Mu: 5046.87 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 66.6%

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876320; 528 WHEELERS FARM RD

APP: 206046 REV. 1; WO: 753170

SITE ADDRESS

**528 WHEELERS FARM ROAD
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
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

MOD PM: ROY PYPTIUK AT ROY.PYPTIUK@CROWNCastle.COM
PH: (518) 433-6245

STRUCTURAL ENGINEER OF RECORD (EOR):

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

DESIGN STANDARD

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 ANTENNAS TOWERS AND ANTENNA SUPPORTING STRUCTURES USING A FASTEST MILE WIND SPEED OF 90 MPH WITH NO ICE, 37.6 MPH WITH 3/4 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-2328B), DATED 5-14-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
REMOVE EXISTING MOUNT

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 CHART
S-6	MI CHECKLIST



PAUL J. FORD AND COMPANY
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CROWN CASTLE

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PH: (585) 899-3445 FAX: (585) 899-3448

**BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT**
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-2328B

DRAWN BY:
B.M.S.

CHECKED BY:
J.C.M.

APPROVED BY:

DATE:
5-14-2014

ISSUE DATE OF
PERMIT B: 5-14-2014

T-1

CROWN CASTLE PROJECT: BU #876320; 528 WHEELERS FARM RD; 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 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.
 - SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS - (NOT REQUIRED)**
 - 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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CROWN CASTLE

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BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-2328B

DRAWN BY:
B.M.S.

CHECKED BY:
J.C.M.

APPROVED BY:

DATE:
5-14-2014

ISSUE DATE OF
PERMIT B: 5-14-2014

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 - (NOT REQUIRED)****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.

J. 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.

K. 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".



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BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-2328B

DRAWN BY:
B.M.S.

CHECKED BY:
J.C.M.

APPROVED BY:

DATE:
5-14-2014

ISSUE DATE OF
PERMIT B: 5-14-2014

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AJAX BOLT NOTE SHEET: REV. 1.4, 5-20-2013

- 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 SILICONE 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.
1413 ROCKINGHAM ROAD BELLOWS FALLS, VERMONT, USA 05101
PHONE 1-800-552-1999
WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
[HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML](http://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML)

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.

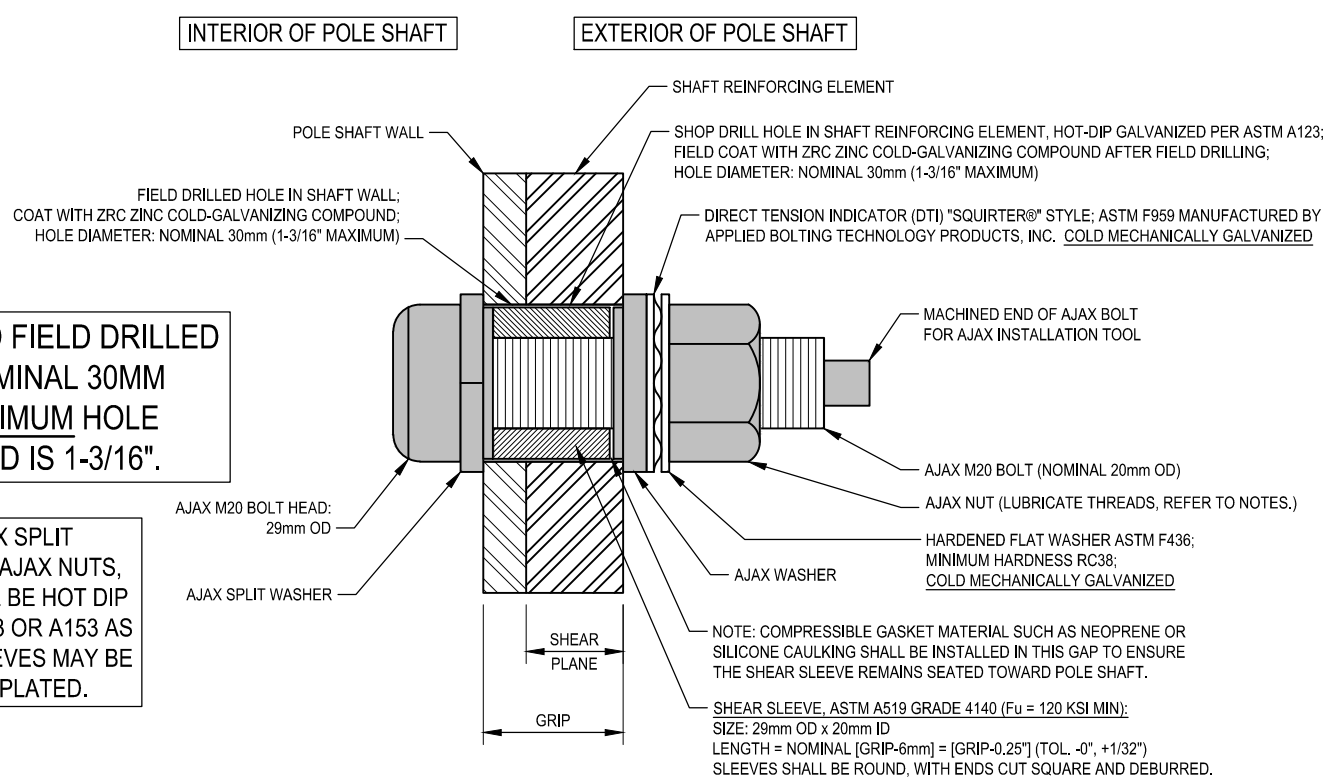
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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
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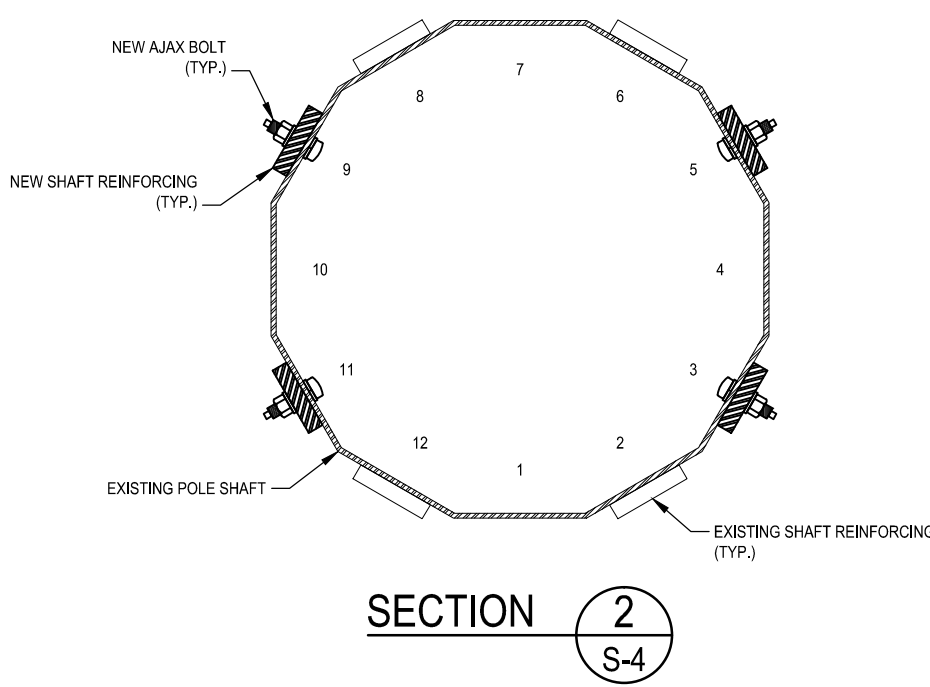
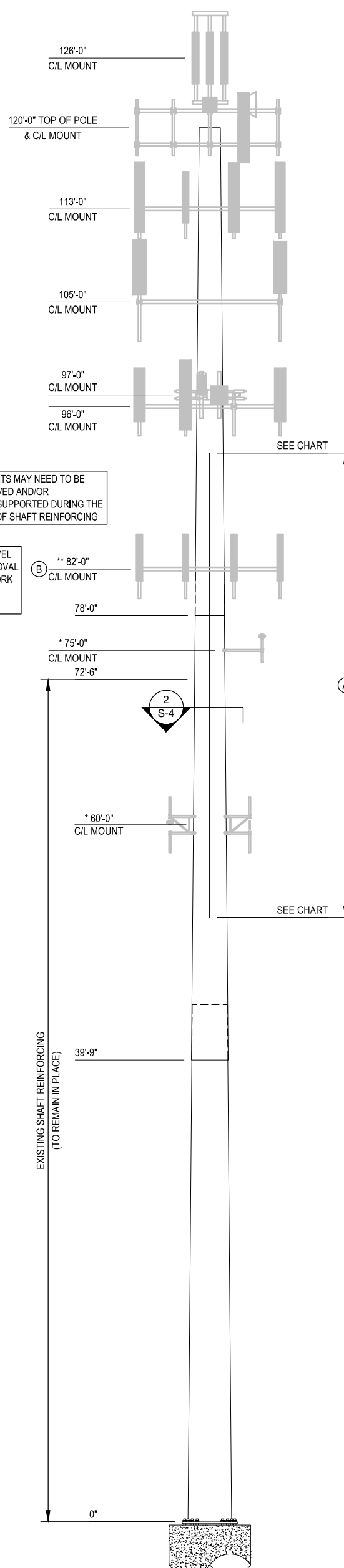
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	12-SIDED POLYGON
TAPER:	0.202038 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 60
BASE PL STEEL:	ASTM A572 GR. 50 (50 KSI)
ANCHOR RODS:	2 1/4"Ø #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	42.00	0.2500	45.00	22.000	30.486
2	42.00	0.3125	57.00	29.228	37.714
3	44.50	0.3750		36.129	45.120

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND AN EXTRA LONG "SPLICE SHIM" SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND ALL TERMINATION POINTS, AS REQUIRED.

- MODIFICATIONS:
- (A) INSTALL NEW SHAFT REINFORCING. SEE CHART ON SHEET S-5.
 - (B) REMOVE EXISTING MOUNT - COORDINATE WITH CROWN CASTLE.



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

** EQUIPMENT AND MOUNT AT 82'-0" LEVEL TO BE REMOVED. COORDINATE REMOVAL WITH CROWN CASTLE. SCOPE OF WORK TO BE VERIFIED DURING BIDDING PROCESS.

POLE ELEVATION 1 S-4

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NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE												
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	CMRP 65 KSI CATAGLOG PART	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
52'-0"	72'-0"	3, 5, 9 & 11	1" x 4-1/2"	20'-0"	CCI-SFP-04510020	4	22	88	6	6	20"	1225 LBS.
72'-0"	92'-0"	3, 5, 9 & 11	1" x 4-1/2"	20'-0"	CCI-SFP-04510020	4	22	88	6	6	20"	1225 LBS.
								176				2450 LBS.

NOTES:

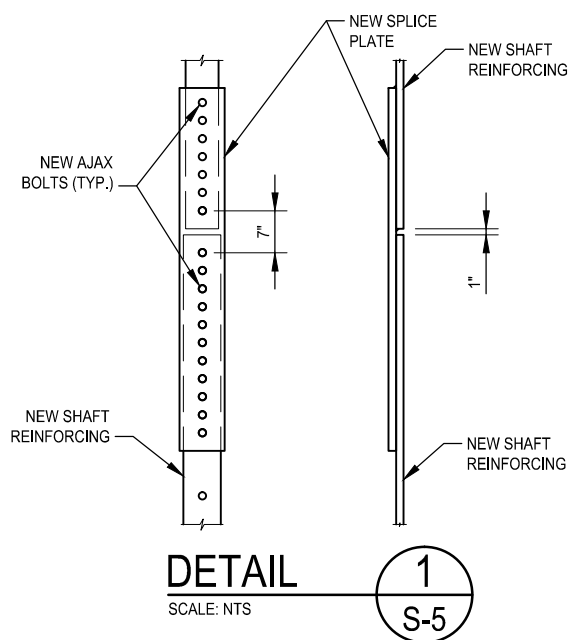
- 1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM 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.

SPLICE PLATE INSTALLATION CHART									
ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPLICE*	TOTAL STEEL WEIGHT	
72'-0"	1"	4 1/2"	3'-7"	4	--	0'	12	220 LBS.	

* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

NEW SHIM CHART				
SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	SHIM THICKNESS	HOLE DIAMETER
16	4"	4"	1/16"	1-1/4"

*NOTE: SHIMS ARE FOR BIDDING PURPOSES ONLY. CONTRACTOR TO VERIFY REQUIRED SHIM SIZES AND QUANTITIES.



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

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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 MIs

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
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	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: -----	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	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
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS: -----	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	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

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BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No:
37513-2328B

DRAWN BY:
B.M.S.

CHECKED BY:
J.C.M.

APPROVED BY:

DATE:
5-14-2014

ISSUE DATE OF
PERMIT B: 5-14-2014

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MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876320; 528 WHEELERS FARM RD

APP: 206046 REV. 1; WO: 753170

SITE ADDRESS

**528 WHEELERS FARM ROAD
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
CONTACT: STEVE TUTTLE
PH: (585) 899-3445

MOD PM: ROY PYPTIUK AT ROY.PYPTIUK@CROWNCastle.COM
PH: (518) 433-6245

STRUCTURAL ENGINEER OF RECORD (EOR):

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

DESIGN STANDARD

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 ANTENNAS TOWERS AND ANTENNA SUPPORTING STRUCTURES USING A FASTEST MILE WIND SPEED OF 90 MPH WITH NO ICE, 37.6 MPH WITH 3/4 INCH ICE THICKNESS AND 50 MPH UNDER SERVICE LOADS.

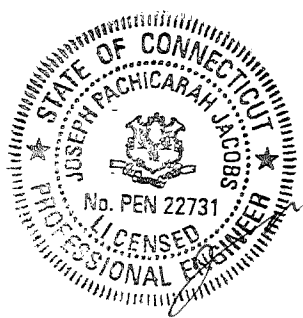
REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-2328B), DATED 5-14-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
REMOVE EXISTING MOUNT

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 CHART
S-6	MI CHECKLIST



MAY 14 2014



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**BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

PROJECT No:
37513-2328B
DRAWN BY:
B.M.S.
CHECKED BY:
J.C.M.
APPROVED BY:
BKK
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T-1

CROWN CASTLE PROJECT: BU #876320; 528 WHEELERS FARM RD; MILFORD, CONNECTICUT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

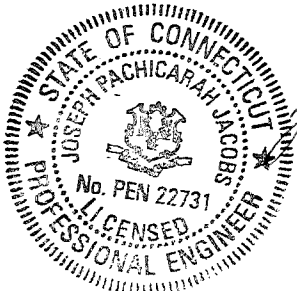
A. GENERAL NOTES

1. 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.
2. 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 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
3. 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.
4. 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".
5. 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.
6. 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.
7. 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.
8. 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.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
10. 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.
11. 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

1. 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.
2. 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.
3. OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
4. 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.
5. 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 ACI - (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. SPECIAL INSPECTION OF EXISTING SHAFT-TO-FLANGE WELD CONNECTIONS - (NOT REQUIRED)
 - G. 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.



MAY 3 4 2014



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BU #876320; 528 WHEELERS FARM RD
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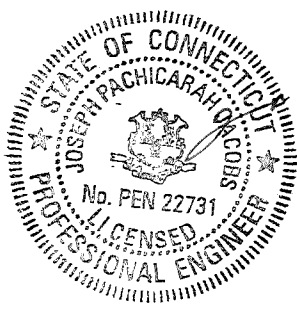
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- D. STRUCTURAL STEEL**
1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
 (A.) "SPECIFICATION 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.

- G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**
- H. EPOXY GROUTED REINFORCING ANCHOR RODS - (NOT REQUIRED)**
- 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".

- E. BASE PLATE GROUT - (NOT REQUIRED)**
- F. FOUNDATION WORK - (NOT REQUIRED)**



J. Ford

MAY 14 2014

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**BU #876320; 528 WHEELERS FARM RD
 MILFORD, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

PROJECT No: 37513-2328B	ISSUE DATE OF PERMIT B: 5-14-2014
DRAWN BY: B.M.S.	S-2
CHECKED BY: J.C.M.	
APPROVED BY: <i>BKK</i>	DATE: 5-14-2014

AJAX BOLT NOTE SHEET: REV. 1.4, 5-20-2013

- 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 SILICONE 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.
 1413 ROCKINGHAM ROAD BELLOWS FALLS, VERMONT, USA 05101
 PHONE 1-800-552-1999
 WEBSITE: WWW.APPLIEDBOLTING.COM

DISTRIBUTORS OF SQUIRTER® DTI'S:
[HTTP://WWW.APPLIEDBOLTING.COM/APPLIED-BOLTING-DISTRIBUTORS.HTML](http://www.appliedbolting.com/applied-bolting-distributors.html)

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.

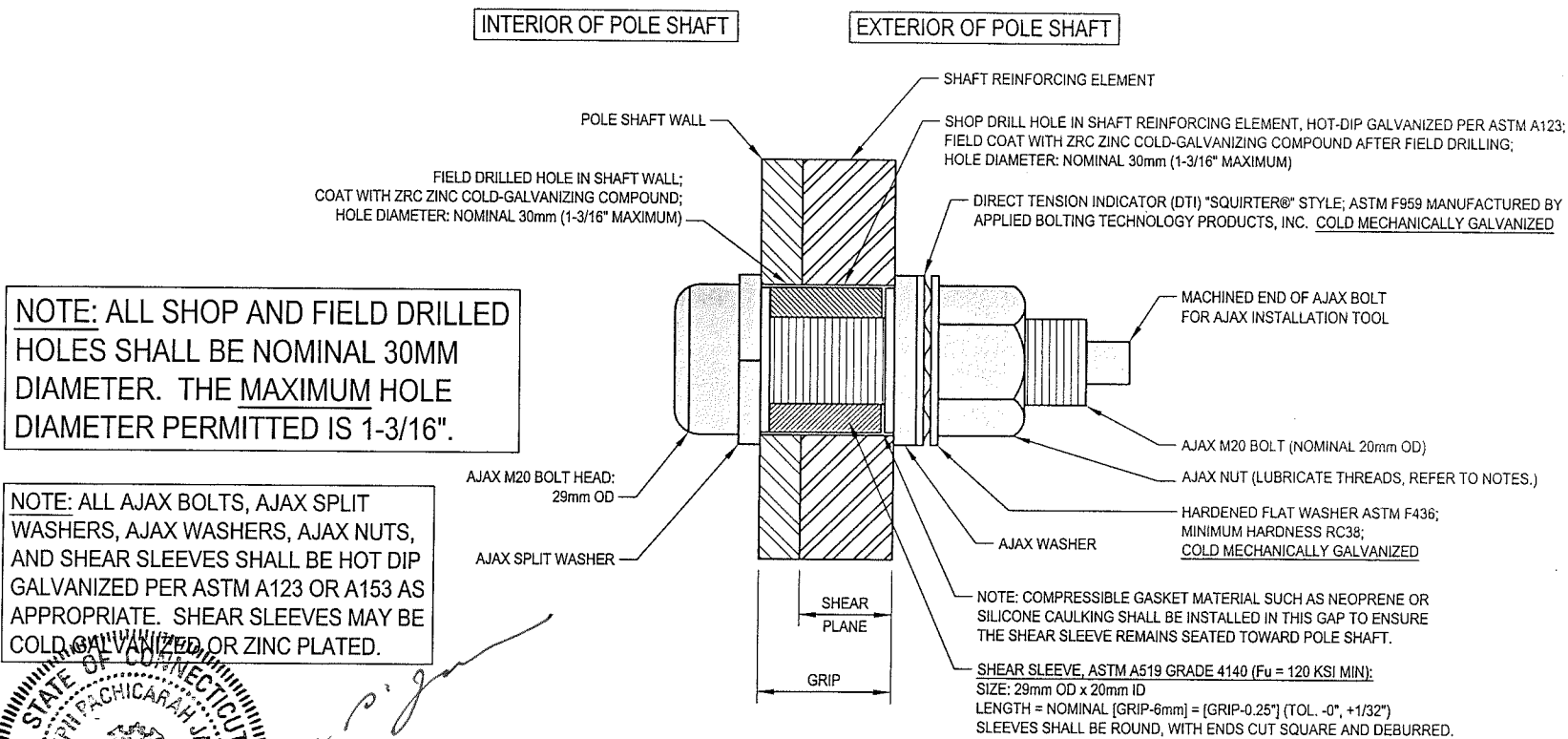
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY 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.

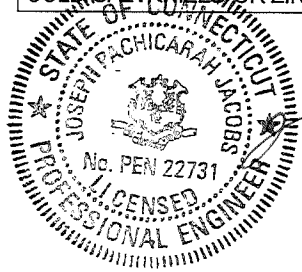
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

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

MAY 14 2014

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BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT No: 37513-2328B	ISSUE DATE OF PERMIT B: 5-14-2014
DRAWN BY: B.M.S.	S-3
CHECKED BY: J.C.M.	
APPROVED BY: B.K.K.	
DATE: 5-14-2014	

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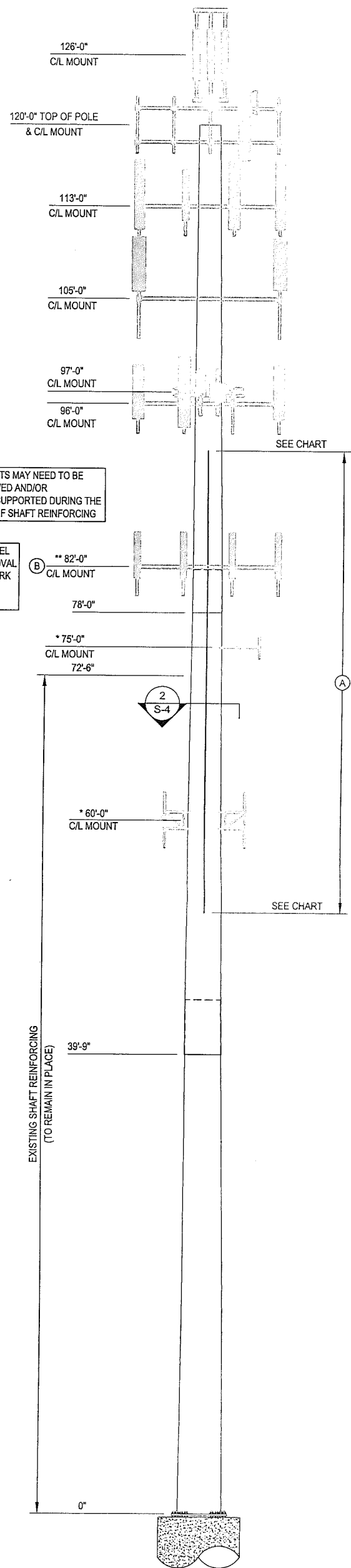
POLE SPECIFICATIONS	
POLE SHAPE TYPE:	12-SIDED POLYGON
TAPER:	0.202038 IN/FT
SHAFT STEEL:	ASTM A607 GRADE 60
BASE PL STEEL:	ASTM A572 GR. 50 (50 KSI)
ANCHOR RODS:	2 1/4"Ø #18J ASTM A615 GRADE 75

SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	42.00	0.2500		22.000	30.486
2	42.00	0.3125	45.00	29.228	37.714
3	44.50	0.3750	57.00	36.129	45.120

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

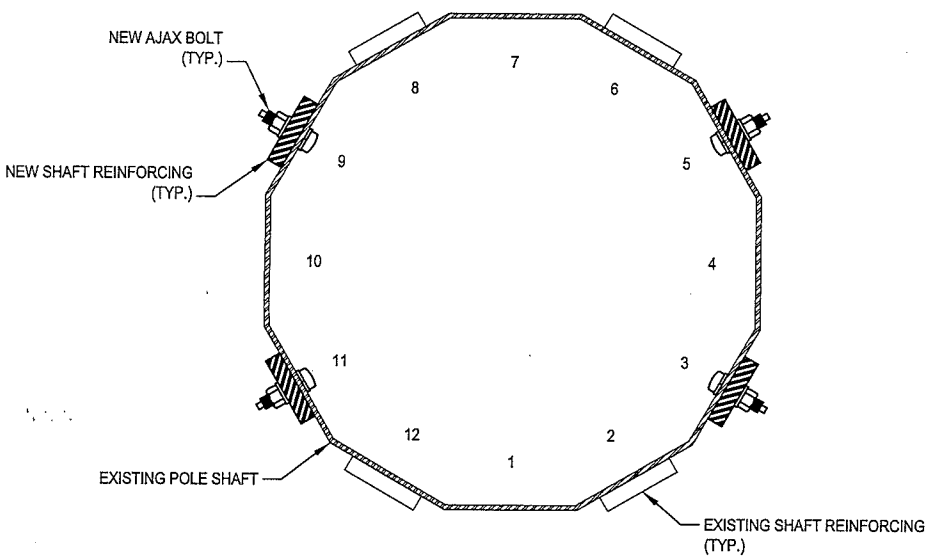
CONTRACTOR SHALL PROVIDE ASTM A36 SHIM PLATES BELOW SLIP JOINTS. THE SHIM PLATES SHALL BE PLACED BETWEEN THE NEW SHAFT REINFORCEMENT AND THE EXISTING POLE SHAFT FROM THE SLIP JOINT TO THE NEW SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND AN EXTRA LONG "SPLICE SHIM" SHALL BE PLACED BETWEEN THE NEW UPPER AND LOWER SHAFT REINFORCEMENT PLATES AT THE SHAFT REINFORCEMENT SPLICE PLATE LOCATION AND ALL TERMINATION POINTS, AS REQUIRED.

- MODIFICATIONS:
- (A) INSTALL NEW SHAFT REINFORCING. SEE CHART ON SHEET S-5.
 - (B) REMOVE EXISTING MOUNT - COORDINATE WITH CROWN CASTLE.



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

** EQUIPMENT AND MOUNT AT 82'-0" LEVEL TO BE REMOVED. COORDINATE REMOVAL WITH CROWN CASTLE. SCOPE OF WORK TO BE VERIFIED DURING BIDDING PROCESS.



SECTION 2
S-4

POLE ELEVATION 1
S-4

Paul J. Ford

STATE OF CONNECTICUT
 JOSEPH PACHICARAH JACOBS
 No. PEN 22731
 LICENSED PROFESSIONAL ENGINEER

MAY 14 2014

PAUL J. FORD AND COMPANY STRUCTURAL ENGINEERS 250 East Broad Street · Suite 600 · Columbus, Ohio 43215 (614) 221-6679 www.pjfweb.com	BU #876320; 528 WHEELERS FARM RD MILFORD, CONNECTICUT MONOPOLE REINFORCEMENT AND RETROFIT PROJECT	PROJECT No: 37513-2328B DRAWN BY: B.M.S. CHECKED BY: J.C.M. APPROVED BY: <i>B.K.K.</i> DATE: 5-14-2014	ISSUE DATE OF PERMIT B: 5-14-2014 S-4
CROWN CASTLE 8 PARKMEADOW DRIVE, PITTSFORD, NY 14534 PH: (585) 899-3445 FAX: (585) 899-3448			

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NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE												
BOTTOM ELEVATION	TOP ELEVATION	FLAT #/ DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	CMRP 65 KSI CATAGLOG PART	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
52'-0"	72'-0"	3, 5, 9 & 11	1" x 4-1/2"	20'-0"	CCI-SFP-04510020	4	22	88	6	6	20"	1225 LBS.
72'-0"	92'-0"	3, 5, 9 & 11	1" x 4-1/2"	20'-0"	CCI-SFP-04510020	4	22	88	6	6	20"	1225 LBS.
								176				2450 LBS.

NOTES:

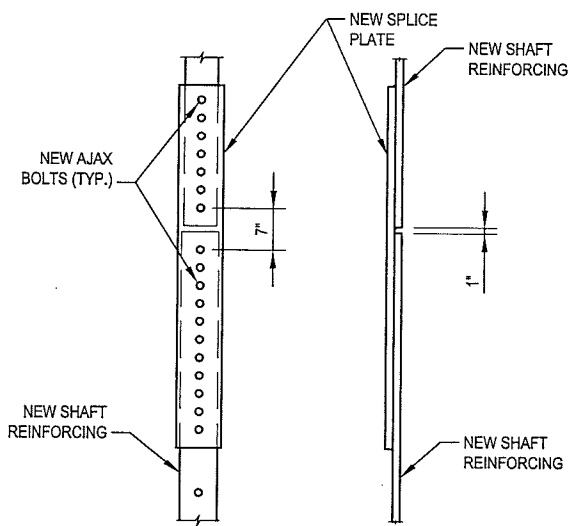
- 1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM 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 A672 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.

SPLICE PLATE INSTALLATION CHART								
ELEVATION	FLAT PLATE THICKNESS	FLAT PLATE WIDTH	FLAT PLATE LENGTH	FLAT PLATE QUANTITY	WELD LENGTH PER SIDE	TOTAL WELD LENGTH	AJAX BOLTS PER SPLICE*	TOTAL STEEL WEIGHT
72'-0"	1"	4 1/2"	3'-7"	4	-	-	12	220 LBS.
						0"		

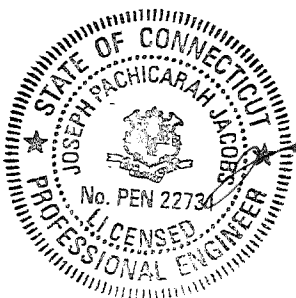
* BOLTS INCLUDED IN THE TOTAL QUANTITY LISTED IN THE FLAT PLATE INSTALLATION CHART.

NEW SHIM CHART				
SHIM QUANTITY	SHIM WIDTH	SHIM LENGTH	SHIM THICKNESS	HOLE DIAMETER
16	4"	4"	1/16"	1-1/4"

*NOTE: SHIMS ARE FOR BIDDING PURPOSES ONLY. CONTRACTOR TO VERIFY REQUIRED SHIM SIZES AND QUANTITIES.



DETAIL 1
SCALE: NTS
S-5



MAY 14 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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S-5

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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 MIs 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 MIs

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.

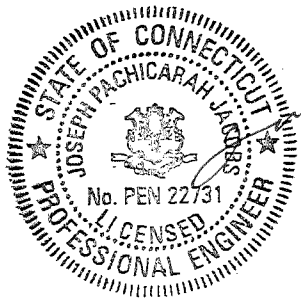
PHOTOGRAPHS

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.



MAY 14 2014

MI CHECKLIST	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR APPROVED SHOP DRAWINGS
X	FABRICATION INSPECTION
NA	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:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
NA	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
NA	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
NA	THIRD PARTY ONSITE INSPECTION OF BOLT PRETENSION PER CROWN REQUIREMENTS
X	INSPECTION OF AJAX BOLTS AND DTIS PER REQUIREMENTS ON SHEET S-3
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	THIRD PARTY ONSITE BOLT INSPECTION REPORT
NA	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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**BU #876320; 528 WHEELERS FARM RD
MILFORD, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

PROJECT No:
37513-2328B
DRAWN BY:
B.M.S.
CHECKED BY:
J.C.M.
APPROVED BY:
Bkk
DATE:
5-14-2014

ISSUE DATE OF
PERMIT B: 5-14-2014

S-6

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RADIO FREQUENCY FCC REGULATORY COMPLIANCE
MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT03XC038

528 Wheelers Farm Road

528 Wheelers Farm Road
Milford, CT 06460

March 7, 2014

EBI Project Number: 62140947

March 7, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC038 - 528 Wheelers Farm Road

Site Total: 96.319% - MPE % in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 528 Wheelers Farm Road, Milford, CT, for the purpose of determining whether the radio frequency (RF) exposure levels 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 (850 MHz Band) is approximately $567 \mu\text{W}/\text{cm}^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 528 Wheelers Farm Road, 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) 4 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
- 2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
- 3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
- 4) 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.
- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications was used in this direction.

- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTMM-C-120. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 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. The RFS APXVTMM-C-120 has a 15.9 dBd gain value at its main lobe at 2500 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.
- 7) The antenna mounting height centerline for the proposed antennas is **120 feet** above ground level (AGL).
- 8) 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	CT03XC038 - 528 Wheelers Farm Road
Site Address	528 Wheelers Farm Road, 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	Antenna Height Meters	Cable Size	Cable Loss (dB)	Additional Loss (dB)	Gain Factor	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	15.9	120	114	34.74762	1/2 "	0.5	3	17.378008	1390.2407	38.45796	3.84580%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	120	114	34.74762	1/2 "	0.5	3	9.7723722	195.44744	5.406625	0.95355%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	120	114	34.74762	1/2 "	0.5	3	9.7723722	390.89489	10.81325	1.90710%
Sector total Power Density Value:																		6.706%	

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	Antenna Height Meters	Cable Size	Cable Loss (dB)	Additional Loss (dB)	Gain Factor	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	15.9	120	114	34.74762	1/2 "	0.5	3	17.378008	1390.2407	38.45796	3.84580%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	120	114	34.74762	1/2 "	0.5	3	9.7723722	195.44744	5.406625	0.95355%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	120	114	34.74762	1/2 "	0.5	3	9.7723722	390.89489	10.81325	1.90710%
Sector total Power Density Value:																		6.706%	

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	Antenna Height Meters	Cable Size	Cable Loss (dB)	Additional Loss (dB)	Gain Factor	ERP	Power Density Value	Power Density Percentage
3a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	15.9	120	114	34.74762	1/2 "	0.5	3	17.378008	1390.2407	38.45796	3.84580%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	13.4	120	114	34.74762	1/2 "	0.5	3	9.7723722	195.44744	5.406625	0.95355%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	13.4	120	114	34.74762	1/2 "	0.5	3	9.7723722	390.89489	10.81325	1.90710%
Sector total Power Density Value:																		6.706%	

Site Composite MPE %	
Carrier	MPE %
Sprint	20.119%
AT&T	20.020%
XM Radio	1.790%
MetroPCS	4.150%
Clearwire	1.320%
T-Mobile	0.300%
Nextel	8.280%
Metricom	5.610%
Verizon Wireless	34.730%
Total Site MPE %	96.319%

Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **20.119% (6.706% 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 **96.319%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE 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.



Scott Heffernan
RF Engineering Director

EBI Consulting

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