

January 7, 2015

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

RE: Sprint PCS-Exempt Modification – Crown Site BU: 841293
Sprint PCS Site ID: CT33XC101
Located at: 136 Bulls Bridge Road, Kent, CT 06785 (aka 136 Bulls Bridge Road, South Kent)

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 Mr. Bruce K. Adams, First Selectman for the Town of Kent, and South Kent School, the Property Owner.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **136 Bulls Bridge Road, Kent, CT 06785**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint’s operations at the site (Exhibit-3).

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

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

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

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

Sincerely,



Susan Vale
Real Estate Specialist

Enclosures

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

Tab 2: Exhibit-2: Structural Modification Report

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

cc: Mr. Bruce K. Adams, First Selectman
Town of Kent
P.O. Box 678
Kent, CT 06757

South Kent School
40 Bulls Bridge Road
Kent, CT 06785

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:
CT33XC101

SITE NAME:

FOREST CITY 2/SNET @ KENT SCHOOL

SITE ADDRESS:

136 BULLS BRIDGE ROAD
KENT, CT 06785

CROWN ID#: 841293

CROWN SITE NAME: KENT-BULLS BRIDGE ROAD

Sprint
2.5 EQUIPMENT DEPLOYMENT
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
OFFICE: (201) 684-4000
FAX: (201) 648-4223

CROWN CASTLE

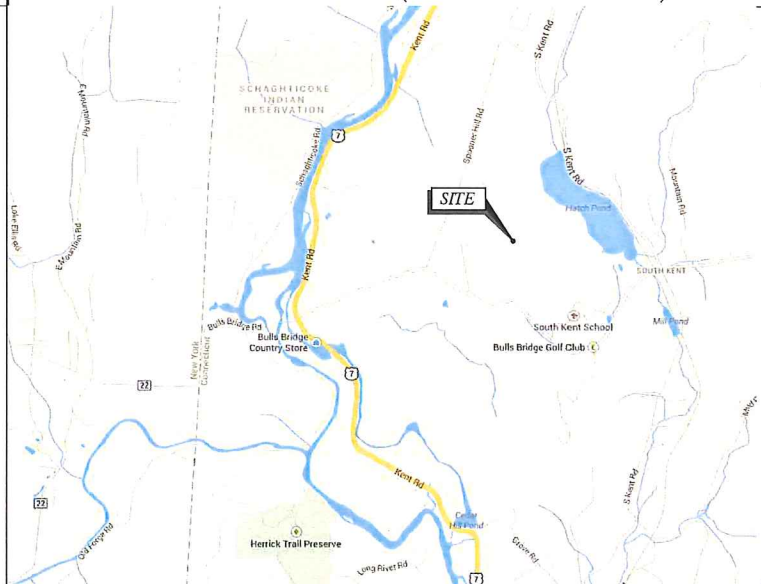
TECTONIC
PLANNING
ENGINEERING
SURVEYING
CONSTRUCTION
MANAGEMENT

TECTONIC Engineering & Surveying
Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703
www.tectonicengineering.com

SHEET INFORMATION

SITE NUMBER:	CT33XC101	LANDLORD:	CROWN CASTLE USA 2000 CORPORATE DRIVE CANONSBURG, PA
SITE NAME:	FOREST CITY 2/SNET @ KENT SCHOOL	LOCAL POWER COMPANY:	CONNECTICUT LIGHT AND POWER CONTACT CUSTOMER SERVICE (800) 286-2000
SITE ADDRESS:	136 BULLS BRIDGE ROAD KENT, CT 06785	APPLICANT:	SPRINT 1 INTERNATIONAL BLVD. SUITE 800 MAHWAH, NJ 07495 P: (201) 664-4000
COUNTY:	LITCHFIELD	ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 JQuicksell@tectonicengineering.com
COORDINATES: (NAD 83)	41° 40' 53.65" N 73° 29' 11.8" W	SPRINT CM:	PETER CULBERT (603) 203-6446 Peter.Culbert@sprint.com
GROUND ELEV:	781'± AMSL	CROWN CM:	JASON D'AMICO (860) 209-0104 jason.d'amico@crowncastle.com
STRUCTURE TYPE:	MONOPOLE		
STRUCTURE HEIGHT:	179'-8"± AGL		
STRUCTURE RAD CENTER:	124'-0"± AGL		
ZONING CLASSIFICATION:	VAC		
MAP-BLOCK-LOT:	6/39//9		

VICINITY MAP (NOT TO SCALE)



SHEET INDEX

SHT. NO.	SHEET DESCRIPTION
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A-3	ENLARGED EQUIPMENT LAYOUT PLANS
A-4	ANTENNA LAYOUT PLANS
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SUBMITTALS

PROJECT NO: 7225.CT33XC101

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	JT
1	01/06/15	FOR CONSTRUCTION	MP

DATE: 1/6/15
REVIEWED BY: JMQ

GENERAL NOTES

- THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED. FACILITY HAS NO PLUMBING OR REFRIGERANTS. THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATOR REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
- DEVELOPMENT AND USE OF THIS SITE WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
 - 2005 STATE OF CONNECTICUT BUILDING CODE.
 - ANSI/TIA/EIA-222-F-1996.
 - NATIONAL ELECTRICAL CODE, LATEST EDITION.

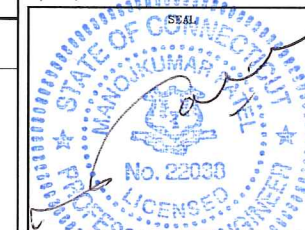
AERIAL VIEW (NOT TO SCALE)



APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

CONSTRUCTION: _____ DATE: _____
 LEASING/SITE ACQUISITION: _____ DATE: _____
 LANDLORD/PROPERTY OWNER: _____ DATE: _____
 R.F. ENGINEER: _____ DATE: _____



PROJECT DESCRIPTION

- (1) NEW 2.5 EQUIPMENT RACK INSIDE EXIST MMBTS CABINET.
- (2) NEW RFS APXVTM14-C-120 ANTENNAS AND (1) NEW RFS APXV9TM14-ALU-120 ANTENNA.
- (3) NEW TD-RRH8x20-25 RRH.
- (1) NEW 1-1/4" HYBRID CABLE.

SITE NUMBER:
CT33XC101
SITE NAME:
FOREST CITY 2/SNET
@ KENT SCHOOL
SITE ADDRESS:
136 BULLS BRIDGE ROAD
KENT, CT 06785

SHEET TITLE:
TITLE SHEET

SHEET NO:
T-1



DIVISION 01000--GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE PROJECT OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. 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.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK SHALL BE RELOCATED AS DIRECTED BY THE ARCHITECT/ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. THE CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, D) TRENCHING AND EXCAVATION OF ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHICH INTERFERE WITH THE EXECUTION OF THE WORK SHALL BE REMOVED AND OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK SUBJECT TO THE APPROVAL OF THE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
16. THE CONTRACTOR SHALL NOTIFY THE THE RF ENGINEER FOR ANTENNA AZIMUTH VERIFICATION (DURING ANTENNA INSTALLATION) PRIOR TO CONDUCTING SWEEP TESTS.
17. THE CONTRACTOR SHALL SUBMIT AT THE END OF THE PROJECT A COMPLETE SET OF AS-BUILT DRAWINGS TO THE CLIENT REPRESENTATIVE.

18. REFER TO: CONSTRUCTION STANDARDS--SPRINT DOCUMENT EXHIBIT A--STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV. 4.0-- 02.15.2011.DOCM.
19. REFER TO: WEATHER PROOFING SPECS: EXCERPT EXH A--WIHRPRF--STD CONSTR SPECS._157201110421855492.DOCM.
20. REFER TO: COLOR CODING--SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09-08-11.PDF
21. REFER TO LATEST DOCUMENTATION REVISION.

DIVISION 03000--CONCRETE

- 1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)
- A. ACI-301 -- SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
 - B. ACI-347 GUIDE TO FORM WORK FOR CONCRETE.
 - C. ASTM C33-- CONCRETE AGGREGATE
 - D. ASTM C94 -- READY MIXED CONCRETE e. ASTM C150 -- PORTLAND CEMENT.
 - E. ASTM C260 -- AIR--ENTRAINING ADMIXTURES FOR CONCRETE
 - F. ASTM C309-- LIQUID MEMBRANE FORMING COMPOUNDS FOR CURING CONCRETE.
 - H. ASTM C494 -- CHEMICAL ADMIXTURES FOR CONCRETE
 - I. ASTM A615-- DEFORMED AND PLAIN BILLET--STEEL BARS FOR CONCRETE REINFORCEMENT
 - J. ASTM A185-- STEEL WELDED WIRE FABRIC (PLAIN) FOR CONCRETE REINFORCEMENT

1.04 QUALITY ASSURANCE
CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ARCHITECT/ENGINEER AS DIRECTED BY THE CLIENT'S REPRESENTATIVE.

- 3.04 SURFACE FINISHES
- A. SURFACES AGAINST WHICH BACKFILL OR CONCRETE SHALL BE PLACED REQUIRE NO TREATMENT EXCEPT REPAIR OF DEFECTIVE AREAS.
 - B. SURFACES THAT WILL BE PERMANENTLY EXPOSED SHALL PRESENT A UNIFORM FINISH PROVIDED BY THE REMOVAL OF FINIS AND THE FILLING HOLES AND OTHER IRREGULARITIES WITH DRY PACK GROUT, OR BY SACKING WITH UTILITY OR ORDINARY GROUT.
 - C. SURFACES THAT WOULD NORMALLY BE LEVEL AND WHICH WILL BE PERMANENTLY EXPOSED TO THE WEATHER SHALL BE SLOPED FOR DRAINAGE. UNLESS ENGINEER'S DESIGN DRAWING SPECIFIES A HORIZONTAL SURFACE OR SURFACES SUCH AS STAIR TREADS, WALLS, CURBS, AND PARAPETS SHALL BE SLOPED APPROXIMATELY 1/4" PER FOOT.
 - D. SURFACES THAT WILL BE COVERED BY BACKFILL OR CONCRETE SHALL BE SMOOTH SCREENED.
 - E. EXPOSED SLAB SURFACES SHALL BE CONSOLIDATED, SCREENED, FLOATED, AND STEEL TROWELED. HAND OR POWER--DRIVEN EQUIPMENT MAY BE USED FOR FLOATING. FLOATING SHALL BE STARTED AS SOON AS THE SCREENED SURFACE HAS ATTAINED A STIFFNESS TO PERMIT FINISHING OPERATIONS. OPERATIONS. ALL EDGES MUST HAVE A 3/4" CHAMFER.

- 1.04 QUALITY ASSURANCE CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER.
- 3.05 PATCHING
THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON REMOVAL OF THE FORMS TO OBSERVE CONCRETE SURFACE CONDITIONS. IMPERFECTIONS SHALL BE PATCHED ACCORDING TO THE ENGINEER'S DIRECTION.
- 3.06 DEFECTIVE CONCRETE
THE CONTRACTOR SHALL NOTIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LEVELS AND LINES, DETAILS, AND ELEVATIONS AS SPECIFIED IN ACI 301.

- 3.07 PROTECTION
- A. IMMEDIATELY AFTER PLACEMENT, THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.
 - B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.
 - C. ALL CONCRETE SHALL BE WATER CURED PER ACCEPTABLE PRACTICES SPECIFIED BY ACI CODE (LATEST EDITION)

DIVISION 05000 -- METALS

- PART 1 -- GENERAL
- 1.01 WORK INCLUDED
- A. THE WORK CONSISTS OF THE FABRICATION AND INSTALLATION OF ALL MATERIALS TO BE FURNISHED. AND WITHOUT LIMITING THE GENERALITY THEREOF, INCLUDING ALL EQUIPMENT, LABOR AND SERVICES REQUIRED FOR ALL STRUCTURAL STEEL WORK AND ALL ITEMS INCIDENTAL AS SPECIFIED AND AS SHOWN ON THE DRAWINGS:

1. STEEL FRAMING INCLUDING BEAMS, ANGLES, CHANNELS AND PLATES.
2. WELDING AND BOLTING OF ATTACHMENTS.

- 1.02 REFERENCE STANDARDS
- A. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:
 1. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS IN BUILDING CODES" OR "LATEST EDITION."
 2. AWS: AMERICAN WELDING SOCIETY CODE OR LATEST EDITION.
 3. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

- PART 2 -- PRODUCTS
- 2.01 MATERIALS
- A. STRUCTURAL STEEL: SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A36 AND A992 FOR STRUCTURAL STEEL.

ALL PROPOSED STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISC CODE AND ASTM SPECIFICATIONS (LATEST EDITION) ALL NEW STEEL SHALL CONFORM TO THE FOLLOWING.

1. STRUCTURAL WIDE FLANGE: ASTM A992 Fy=50KSI.
2. MISCELLANEOUS STEEL (PLATES), CHANNELS, ANGLES, ETC): ASTM A36 (Fy=36KSI).
3. STRUCTURAL TUBING: ASTM A500 Gr. B (Fy=46KSI).
4. STEEL PIPE: ASTM A53 Gr B (Fy=35KSI).

- 2.02 WELDING
- A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.
 - B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM 1-233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN THE SUBMERGED ARC PROCESS SHALL CONFORM TO AISC SPECIFICATIONS.
 - C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE.
 - D. STUD WELDING SHALL BE ACCOMPLISHED BY CAPACITOR DISCHARGE (CD) WELDING TECHNIQUE USING CAPACITOR DISCHARGE STUD WELDER.
 - E. PROVIDE STUD FASTENERS OF MATERIALS AND SIZES SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE MANUFACTURER FOR STRUCTURAL LOADINGS REQUIRED.
 - F. FOLLOW MANUFACTURERS SPECIFICATIONS AND INSTRUCTIONS TO PROPERLY SELECT AND INSTALL STUD WELDS.

- 2.03 BOLTING
- A. BOLTS SHALL BE CONFORMING TO ASTM A35 HIGH STRENGTH HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.
 - B. BOLTS SHALL BE 3/4" (MINIMUM) CONFORMING TO ASTM A325, HOT DIP GALVANIZED, ASTM A153 NUTS SHALL BE HEAVY HEX TYPE.
 - C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.
 - D. EXCEPT WHERE SHOWN, ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS TO BE DOUBLE ANGLED CONNECTIONS WITH HIGH STRENGTH BOLTS (THREADS EXCLUDED FROM SHEAR PLANE) AND HARDENED WASHERS.
 - E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.
 - F. SNUG--TIGHT STRENGTH BEARING BOLTS MAY BE USED IN STANDARD HOLES CONFORMING TO ACIS, USING THE TURN OF THE NUT METHOD.
 - H. FULLY--TENSIONED HIGH STRENGTH (SLIP CRITICAL) SHALL BE USED IN OVERSIZED SLOT HOLES (RESPECTIVE OF SLOT ORIENTATION).
 - I. ALL BRACED CONNECTION, MOMENT CONNECTION AND CONNECTIONS NOTED AS "SLIP CRITICAL" SHALL BE BE SLIP CRITICAL JOINTS WITH CLASS A SURFACE CONDITIONS, UNLESS OTHERWISE NOTED.
 - J. EPOXY ANCHOR ASSEMBLIES SHALL BE AS MANUFACTURED BY HILTI OR ENGINEER APPROVED EQUAL, AS FOLLOWS:

BASE MATERIAL	ANCHOR SYSTEM
CONCRETE	HILTI HIT--HY 200
HOLLOW & GROUTED CMU OR BRICK	HILTI HIT--HY 70

- 2.04 FABRICATION
- A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS

- 2.05 FINISH
- A. STRUCTURAL STEEL EXPOSED TO WEATHER SHALL BE HOT--DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. (LATEST EDITION) UNLESS OTHERWISE NOTED.

- 2.06 PROTECTION
- A. UPON COMPLETION OF ERECTION, INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS OR GALVANIZED BREAKS WITH (2) COATS OF ZINC--RICH COLD GALVANIZING PAINT.

- PART 3 -- ERECTION
- A. PROVIDE ALL ERECTION, EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION, BUT ARE NECESSARY FOR ITS PROPER ERECTION.
 - B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING
 - C. TEMPORARY BRACING, GUYING, AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SET AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

Sprint

2.5 EQUIPMENT DEPLOYMENT
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
OFFICE: (201) 684-4000
FAX: (201) 648-4223

CROWN CASTLE

TECTONIC

PLANNING
ENGINEERING
SURVEYING
CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying
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1279 Route 300
Newburgh, NY 12550
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SUBMITTALS

PROJECT NO: 7225.CT33XC101

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	JT
1	01/06/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/6/15	JMQ

SEAL

STATE OF CONNECTICUT
MANUALLY SIGNATURED
No. 22038
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC101

SITE NAME:
FOREST CITY 2/SNET
@ KENT SCHOOL

SITE ADDRESS:
136 BULLS BRIDGE ROAD
KENT, CT 06785

SHEET TITLE:
GENERAL NOTES

SHEET NO:
SP-1

DIVISION 13000—SPECIAL CONSTRUCTION ANTENNA INSTALLATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. ANTENNAS AND HYBRIFLEX CABLES ARE FURNISHED BY CLIENT'S REPRESENTATIVE UNDER SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPERTY.

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT RESULT

F. INSTALL HYBRIFLEX CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

G. ANTENNA AND HYBRIFLEX CABLE GROUNDING:

1. ALL EXTERIOR #6 GREEN GROUND WIRE DAISY CHAIN CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE 3221213 OR EQUIVALENT.

2. ALL HYBRIFLEX CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF HYBRIFLEX CABLE (NOT WITHIN BENDS). 1.02 RELATED WORK FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

1. FLASHING OF OPENING INTO OUTSIDE WALLS.
2. SEALING AND CAULKING ALL OPENINGS.
3. PAINTING.
4. CUTTING AND PATCHING.

1.03 REQUIREMENTS OF REGULATOR AGENCIES

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. EIA - ELECTRONIC INDUSTRIES ASSOCIATION RS-22. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7480-IH, CONSTRUCTION MARKING AND LIGHTING.
3. FCC - FEDERAL COMMUNICATION COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES
4. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION FOR STRUCTURAL JOINTS USING ASTM 1325 OR A490 BOLTS.
5. NEC - NATIONAL ELECTRIC CODE - ON TOWER LIGHTING KITS.
6. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.
7. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

B. LIFE SAFETY CODE NFPA, LATEST EDITION.

DIVISION 13000—EARTHWORK

PART 1 GENERAL

1.01 WORK INCLUDED: REFER TO SURVEY AND SITE PLAN FOR WORK INCLUDED.

1.02 RELATED WORK

A. CONSTRUCTION OF EQUIPMENT FOUNDATIONS
B. INSTALLATION OF ANTENNA SYSTEM

PART 2 PRODUCTS

2.01 MATERIALS

A. ROAD AND SITE MATERIALS; FILL MATERIAL SHALL BE ACCEPTABLE, SELECT FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF HIGHWAY AND PUBLIC TRANSPORTATION STANDARD SPECIFICATIONS.

B. SOIL STERILIZER SHALL BE EPA REGISTERED OF LIQUID COMPOSITION AND OF PRE-EMERGENCE DESIGN.

C. SOIL STABILIZER FABRIC SHALL BE MIRAFI OR EQUAL - 600X AT ACCESS ROAD AND COMPOUND.

D. GRAVEL FILL; WELL GRADED, HARD, DURABLE, NATURAL SAND AND GRAVEL, FREE FROM ICE AND SNOW, ROOTS, SOD RUBBISH, AND OTHER DELETERIOUS OR ORGANIC MATTER.

MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS.

GRAVEL FILL TO BE PLACED IN LIFTS OF 9" MAXIMUM THICKNESS AND 90 % DENSITY. COMPACTED TO 95

E. NO FILL OR EMBANKMENT MATERIALS SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OF EMBANKMENT

2.02 EQUIPMENT

A. COMPACTION SHALL BE ACCOMPLISHED BY MECHANICAL MEANS. LARGER AREAS SHALL BE COMPACTED BY SHEEPS FOOT, VIBRATORY OR RUBBER TIED ROLLERS WEIGHING AT LEAST FIVE TONS. SMALLER AREAS SHALL BE COMPACTED BY POWER-DRIVER, HAND HELD TAMPERS.

B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS GRUB ORGANIC MATERIAL TO A MINIMUM OF 6" BELOW ORIGINAL GROUND LEVEL.

C. UNLESS OTHERWISE INSTRUCTED BY CLIENT'S REPRESENTATIVE, REMOVE TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED DISPOSAL LOCATION.

D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, ROLL THE SOIL.

E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE GRUBBED AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

3.03 INSTALLATION

A. THE SITE AND TURNAROUND AREAS SHALL BE AT THE SUB-BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE OR FILL THE SITE AND ACCESS ROAD AS REQUIRED TO PRODUCE EVEN DISTRIBUTION OF SPOILS RESULTING FROM FOUNDATION EXCAVATIONS. THE RESULTING GRADE SHALL CORRESPOND WITH SAID SUB-BASE COURSE, ELEVATIONS ARE TO BE CALCULATED FORM FINISHED GRADES OR SLOPES INDICATED.

B. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION.

C. DO NOT CREATE DEPRESSIONS WHERE WATER MAY POND.

D. THE CONTRACT INCLUDES ALL NECESSARY GRADING, BANKING, DITCHING AND COMPLETE SURFACE COURSE FOR ACCESS ROAD. ALL ROADS OR ROUTES UTILIZED FOR ACCESS TO PUBLIC THOROUGHFARE IS INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE INDICATED.

E. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATTER AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.

F. PLACE FILL OR STONE IN 3" MAXIMUM LIFTS AND COMPACT BEFORE PLACING NEXT LIFT.

G. THE FINISH GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF 12" BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.

H. RIPRAP SHALL BE APPLIED TO THE SIDE SLOPES OF ALL FENCED AREAS, PARKING AREAS AND TO ALL OTHER SLOPES GREATER THAN

2.1. RIPRAP SHALL BE APPLIED TO THE SIDES OF DITCHES OR DRAINAGE SWALES AS INDICATED ON PLANS.

J. RIPRAP ENTIRE DITCH FOR 6'-0" IN ALL DIRECTIONS AT CULVERT OPENINGS.

K. SEED, FERTILIZER AND STRAW COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES, NOT OTHERWISE RIP-RAPPED.

L. UNDER NO CIRCUMSTANCES SHALL DITCHES, SWALES OR CULVERTS BE PLACED SO THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SITE. IF OWNER DESIGNS OR IF DESIGN ELEVATIONS CONFLICT WITH THIS GUIDANCE ADVISE THE OWNER IMMEDIATELY.

M. IF A DITCH LIES WITH SLOPE GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALL IN THE DITCH AT CULVERT ENTRANCES. RIP-RAP THE UPSTREAM SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR 6'-0" ABOVE THE CULVERT.

N. IF A DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH FOR 6'-0" ABOVE THE CULVERT ENTRANCE.

O. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND TO LOOSEN THE SOIL.

P. SOW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMENDED BY THE SEED PRODUCER.

Q. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

3.04 FIELD QUALITY CONTROL

A. COMPACTION SHALL BE D-1557 FOR SITE WORK AND 95 % MAXIMUM DENSITY UNDER SLAB AREAS. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTOR'S EXPENSE. REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. THE COMPACTION TEST RESULTS SHALL BE AVAILABLE PRIOR TO THE CONCRETE POUR.

3.05 PROTECTION

A. PROTECT SEEDED AREAS FORM EROSION BY SPREADING STRAW TO A UNIFORM LOOSE DEPTH OF 1"-2". STAKE AND TIE DOWN AS REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT SHALL BE WRAPPED, TIED WITH HOSE PROTECTED WIRE AND SECURED TO STAKES EXTENDING 2'-0" INTO THE GROUND ON FOUR SIDES OF THE TREE.

C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION. STRAW BALES SHALL BE PLACED AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS. REFER TO DETAILS ON DRAWINGS

SYMBOLS	ABBREVIATIONS
— — — — G — — — — G —	GROUND WIRE
— — — — E — — — — E —	ELECTRIC
— — — — T — — — — T —	TELEPHONE
— — — — O — — — — O —	OVERHEAD WIRE
— — — — — — — — — —	PROPERTY LINE
— X — — — X — — — X — — —	CHAIN LINK FENCE
A-1	ANTENNA MARK
(E)	EXISTING
(P)	PROPOSED DETAIL
	REFERENCE
	SURFACE ELEVATION

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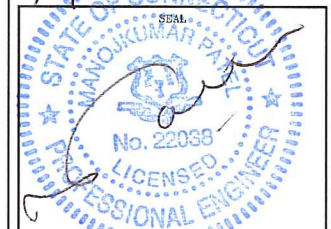
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SUBMITTALS

PROJECT NO: 7225.CT33XC101

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	JT
1	01/06/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/6/15	JMQ



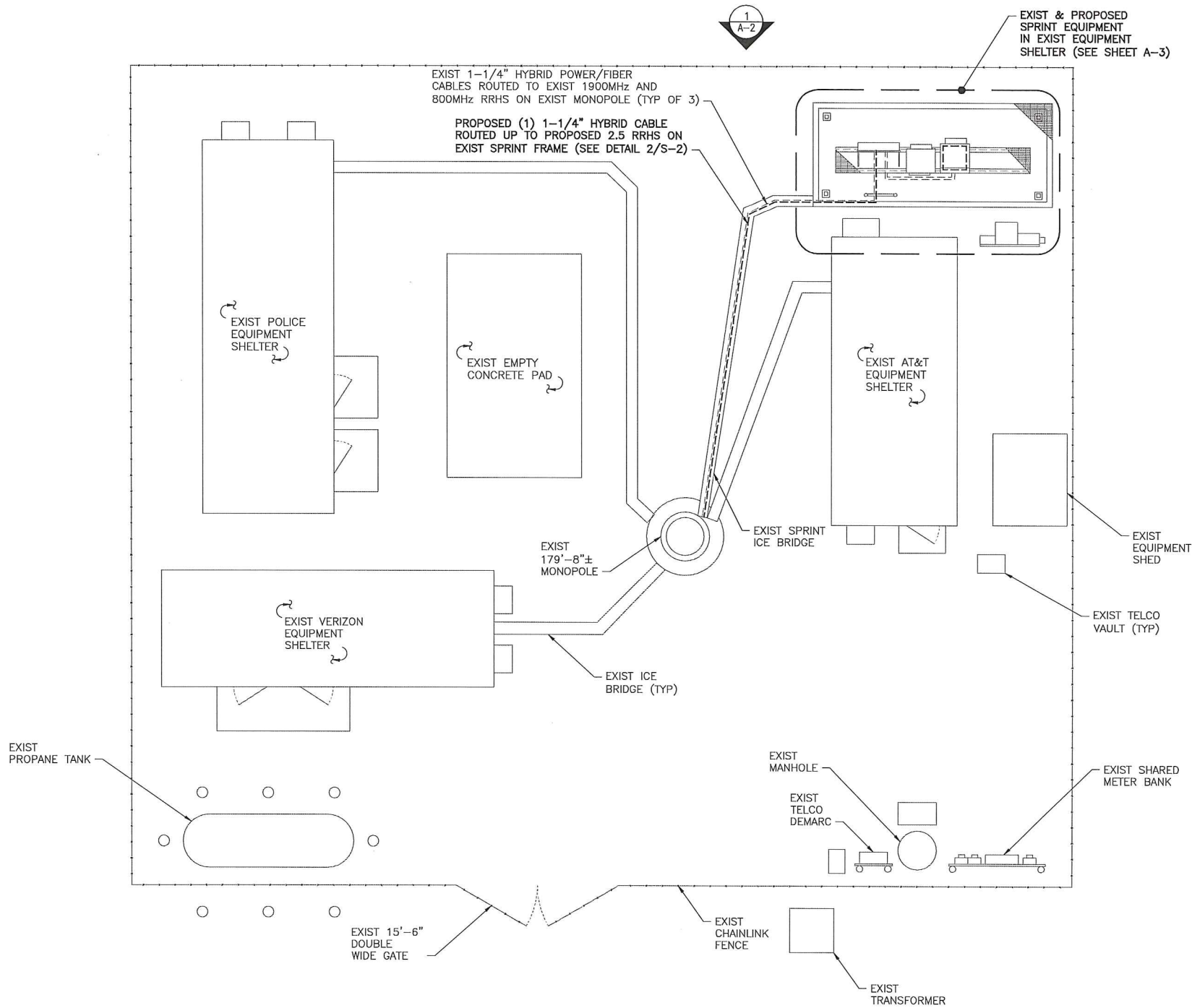
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 CT33XC101
 SITE NAME:
 FOREST CITY 2/SNET
 @ KENT SCHOOL
 SITE ADDRESS:
 136 BULLS BRIDGE ROAD
 KENT, CT 06785

SHEET TITLE:
 GENERAL NOTES

SHEET NO:
 SP-2



NORTH NOTE:
 NORTH SHOWN HAS BEEN ESTABLISHED USING
 THE USGS QUADRANGLE 7.5 MINUTE MAPS AND
 IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO
 INSTALLATION OF ANTENNAS.



1 SITE PLAN
 A-1 SCALE: 3/16" = 1'-0"

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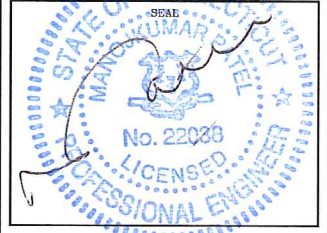
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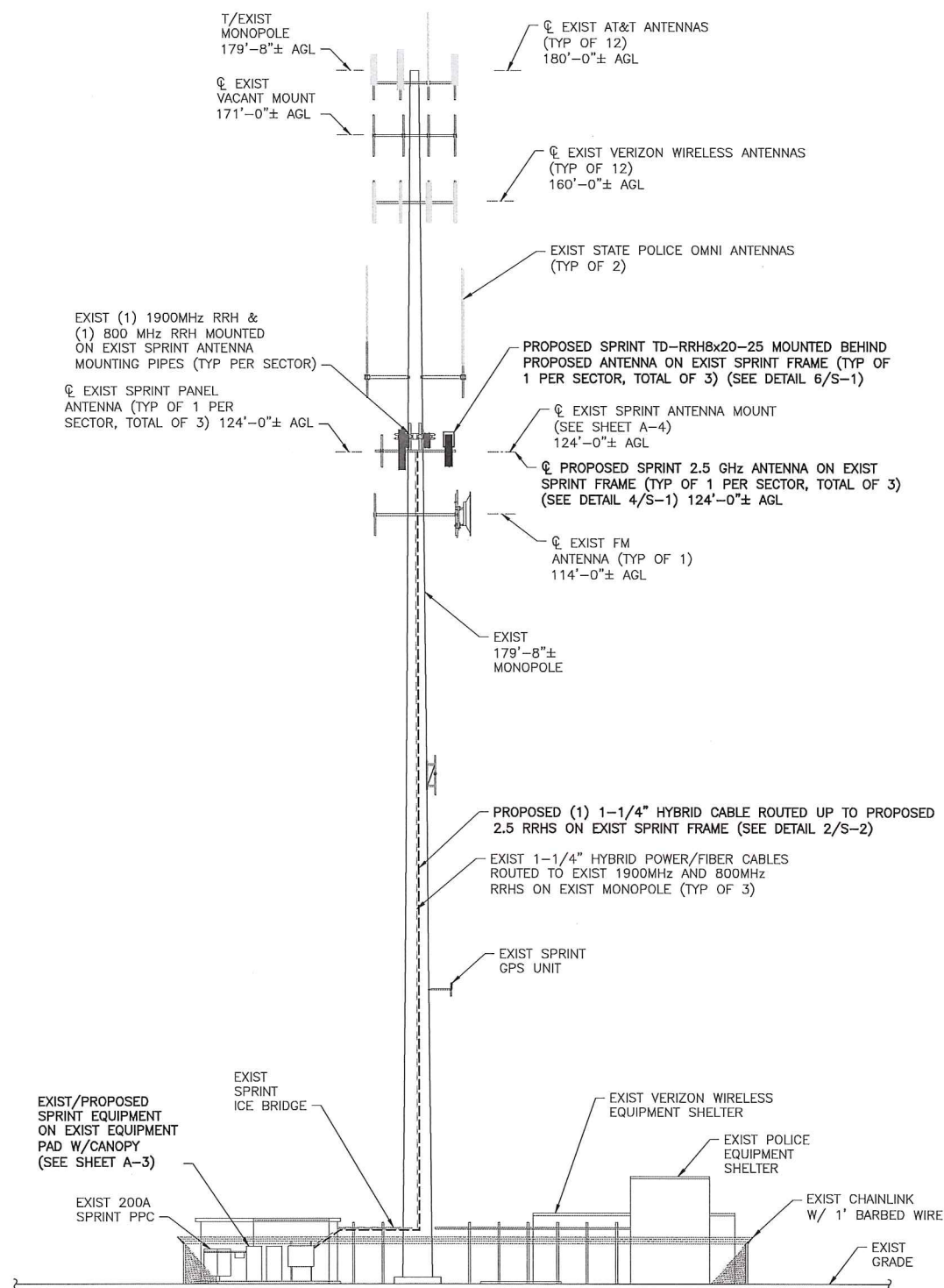
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 SITE NAME:
 FOREST CITY 2/SNET
 @ KENT SCHOOL
 SITE ADDRESS:
 136 BULLS BRIDGE ROAD
 KENT, CT 06785

SHEET TITLE:
 SITE PLAN

SHEET NO:
 A-1



1 ELEVATION
A-2 SCALE: 3/32" = 1'-0"

THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

THE EXISTING MOUNT HAS BEEN ANALYZED BY TECTONIC ENGINEERING AND FOUND TO BE ADEQUATE TO SUPPORT THE PROPOSED SPRINT UPGRADE AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 01/06/15.



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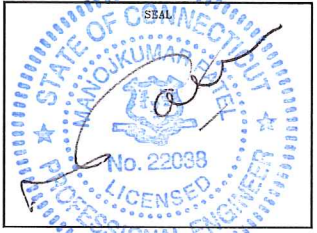
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SHEET TITLE: ELEVATION

SHEET NO: A-2

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1/6/15	JMA

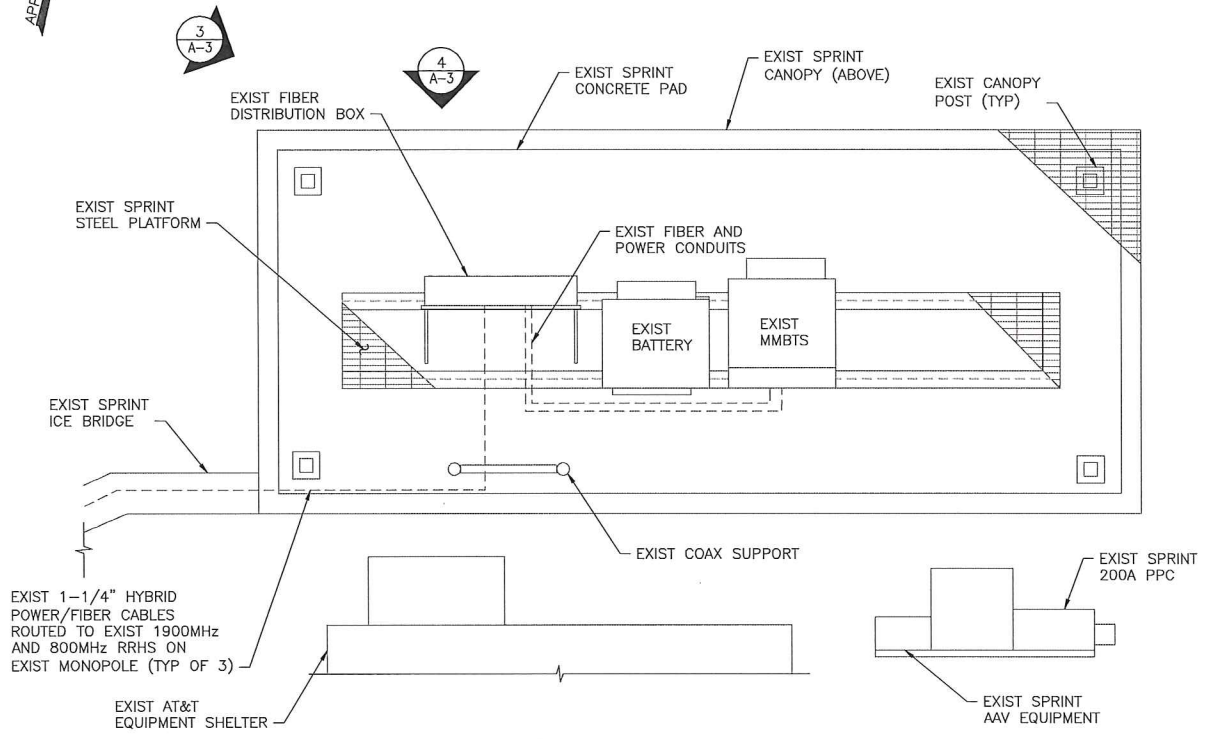


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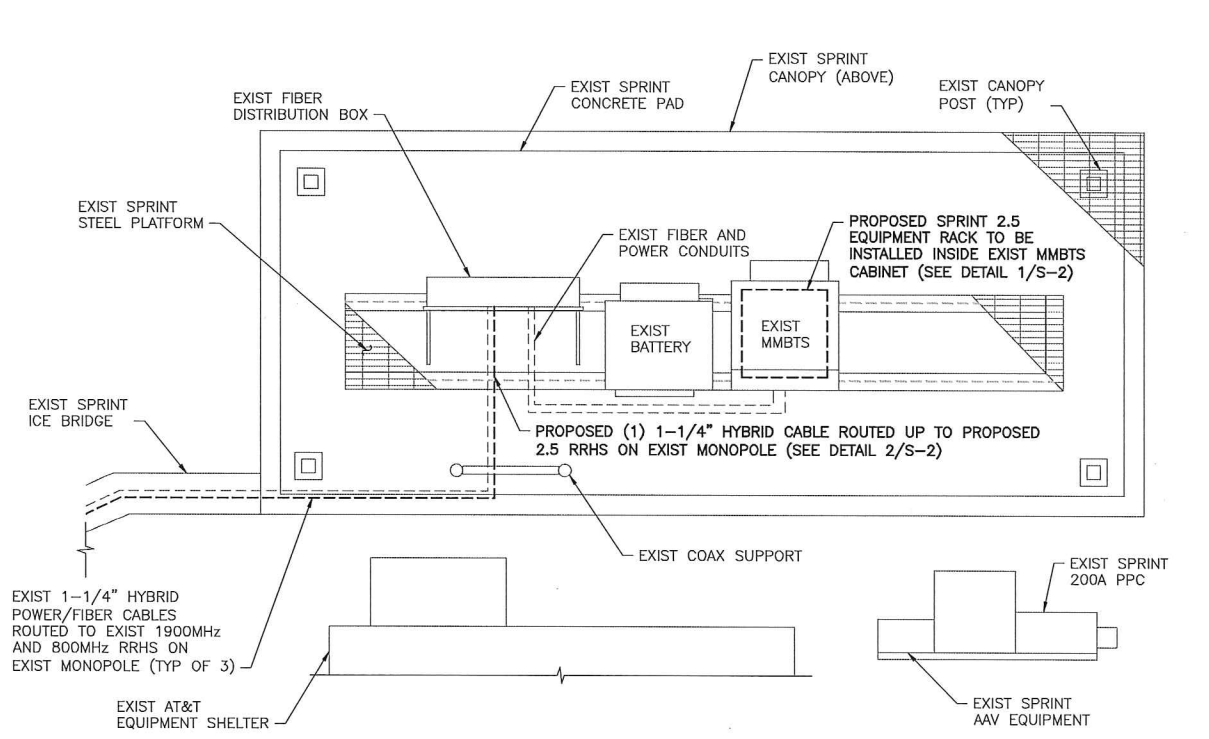
SHEET TITLE:
 ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
 A-3

NORTH NOTE:
 NORTH SHOWN HAS BEEN ESTABLISHED USING THE USGS QUADRANGLE 7.5 MINUTE MAPS AND IS APPROXIMATE. VERIFY TRUE NORTH PRIOR TO INSTALLATION OF ANTENNAS.



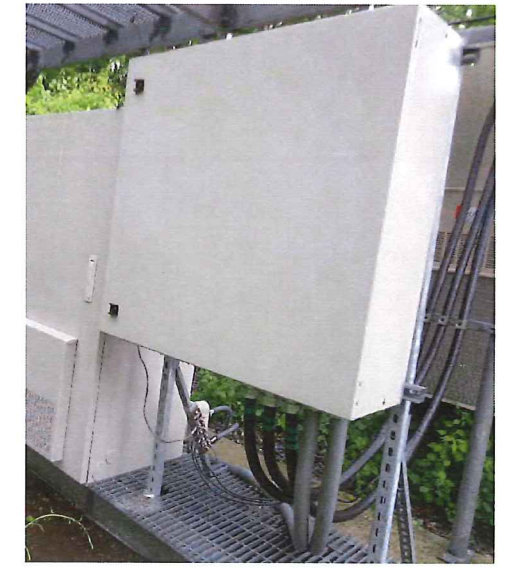
1 ENLARGED EQUIPMENT LAYOUT PLAN (EXIST)
 SCALE: 1/2" = 1'-0"



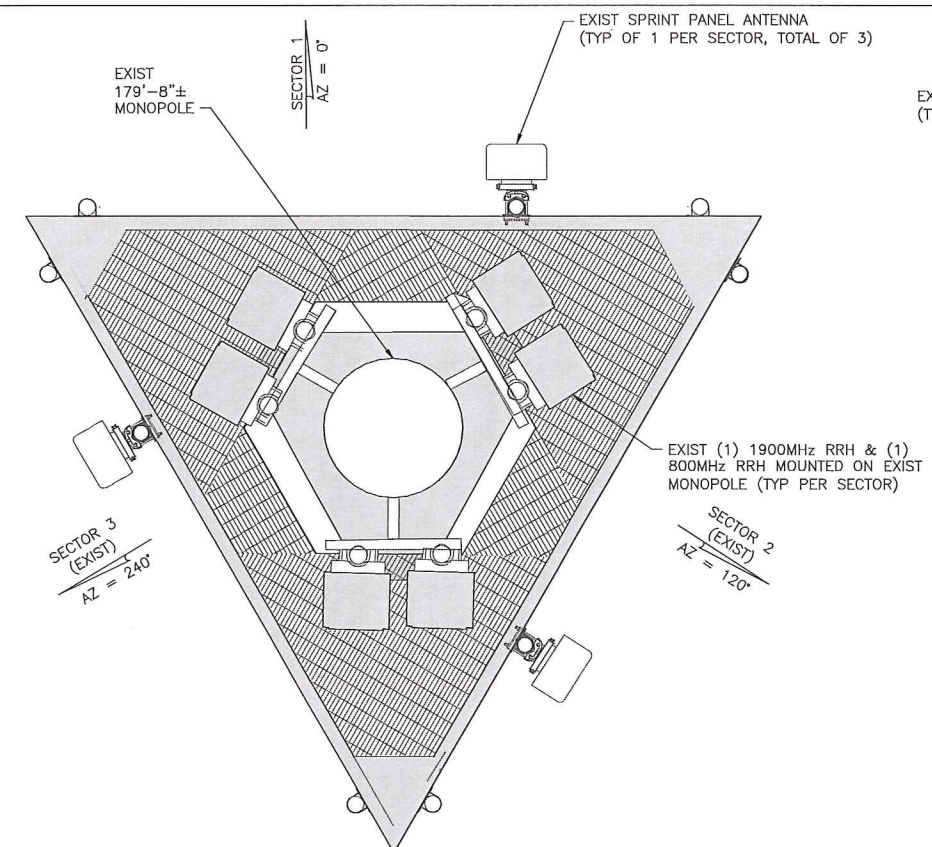
2 ENLARGED EQUIPMENT LAYOUT PLAN (FINAL)
 SCALE: 1/2" = 1'-0"



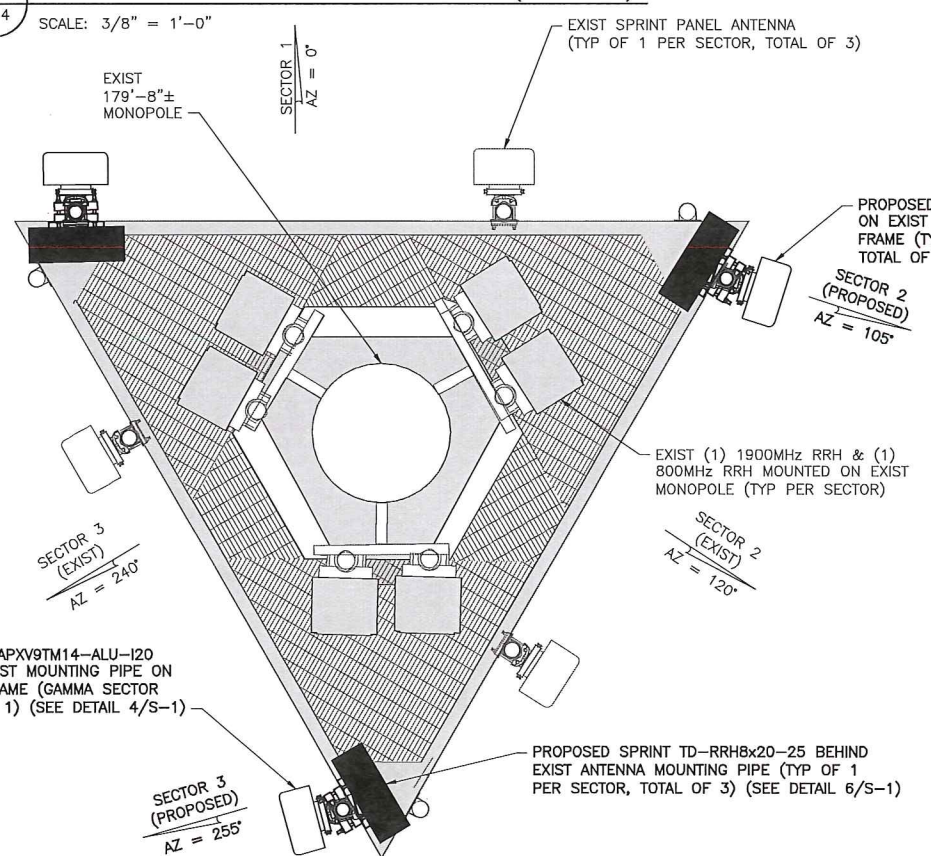
3 EXIST EQUIPMENT PAD
 SCALE: NTS



4 EXIST FIBER DISTRIBUTION BOX
 SCALE: NTS

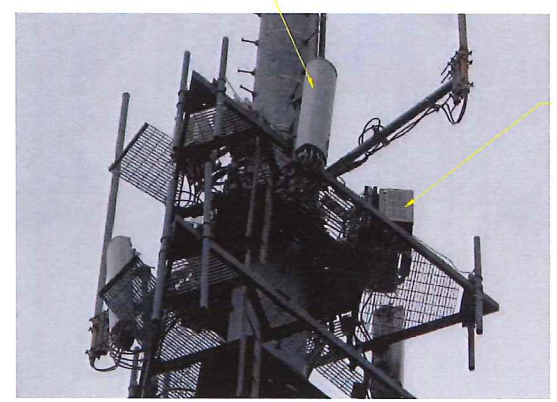


1 ANTENNA LAYOUT PLAN (EXIST)
A-4 SCALE: 3/8" = 1'-0"



2 ANTENNA LAYOUT PLAN (FINAL)
A-4 SCALE: 3/8" = 1'-0"

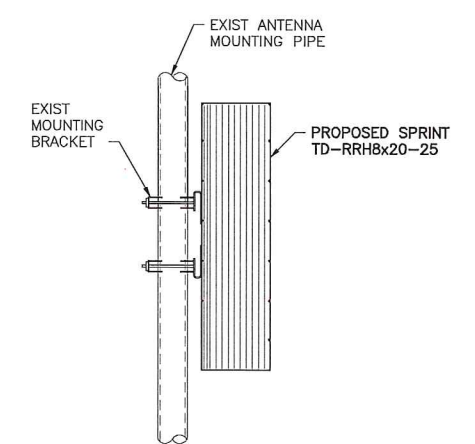
EXIST SPRINT PANEL ANTENNA
(TYP OF 1 PER SECTOR, TOTAL OF 3)



EXIST (1) 1900MHz RRH & (1) 800 MHz RRH MOUNTED ON EXIST MONOPOLE (TYP PER SECTOR)

THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

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3 RRH MOUNTING DETAIL
A-4 SCALE: 1 1/2" = 1'-0"

ANTENNA DATA

Status	Exist	Proposed
Antenna Manufacturer	RFS-CEL WAVE	RFS-CEL WAVE
Antenna Model Number	APXVSP18C-A20	APXVTM14-C-120/APXV9TM14-ALU-I20
Number of Antennas	3	2/1
Antenna RAD Center	124'	124'
Antenna Azimuth	0/120/240	0/105/255
Antenna RRH Model Number	1900MHz/800MHz RRHS	TD-RRH8x20-25
Number of RRH	6	3

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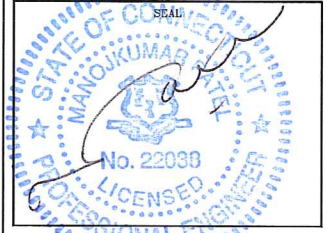
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SUBMITTALS

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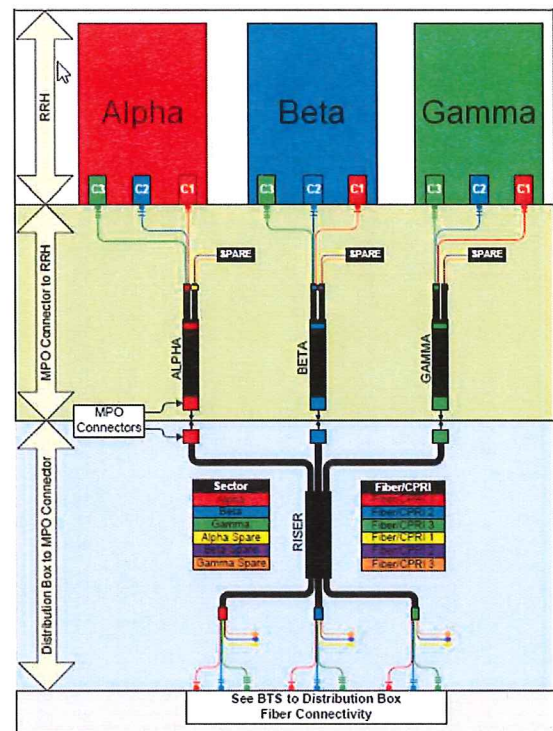
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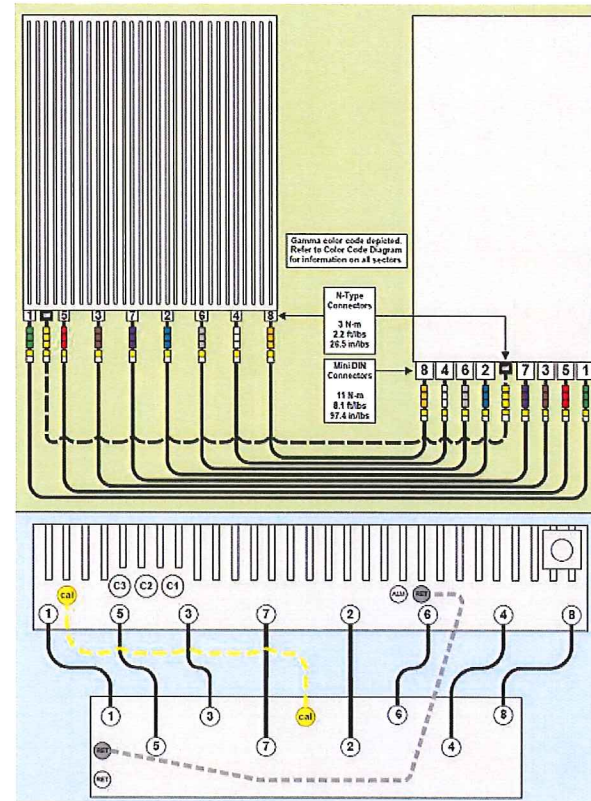
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SITE ADDRESS: 136 BULLS BRIDGE ROAD KENT, CT 06785

SHEET TITLE: ANTENNA LAYOUT PLANS

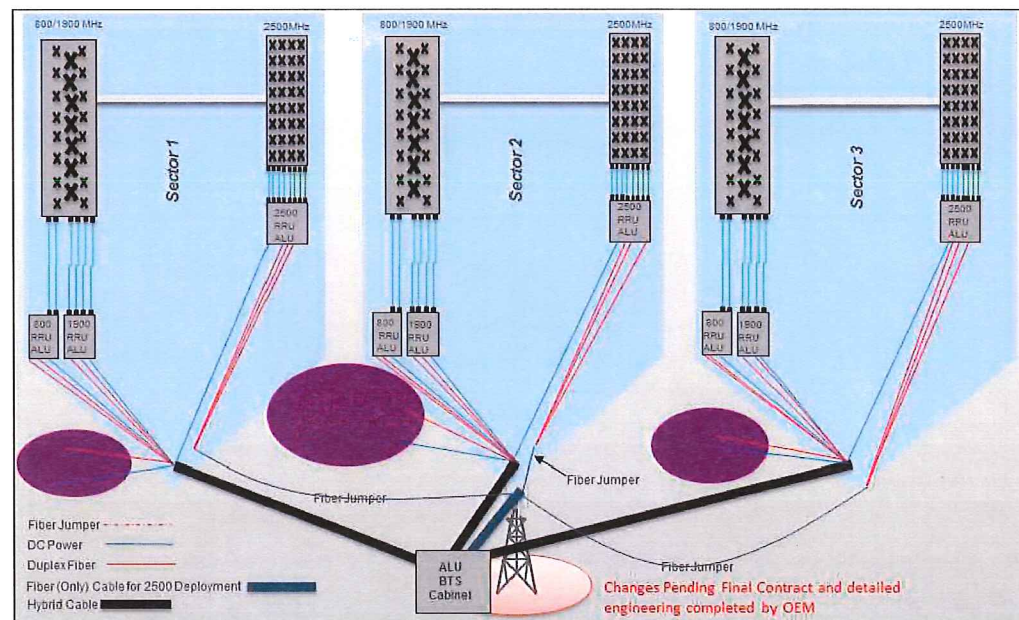
SHEET NO: A-4



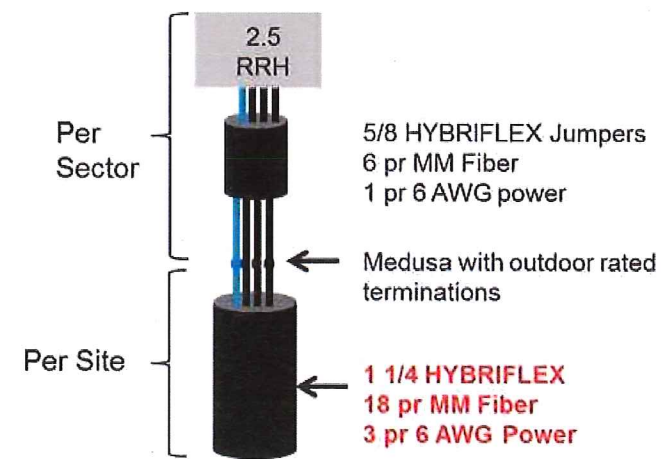
1 2.5 CABLE COLOR CODING
A-5 SCALE: N.T.S.



2 RRH CONNECTIVITY
A-5 SCALE: N.T.S.



3 RAN WIRING
A-5 SCALE: N.T.S.



4 CABLE SCENARIO
A-5 SCALE: N.T.S.

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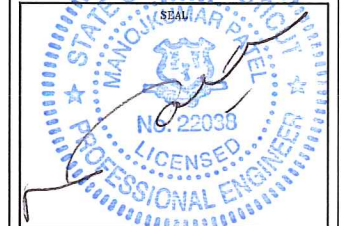
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SUBMITTALS

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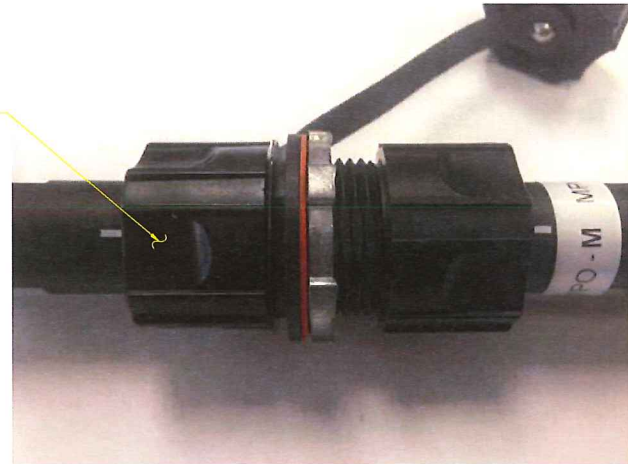
SHEET TITLE: RAN WIRING DIAGRAM

SHEET NO: A-5

IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION

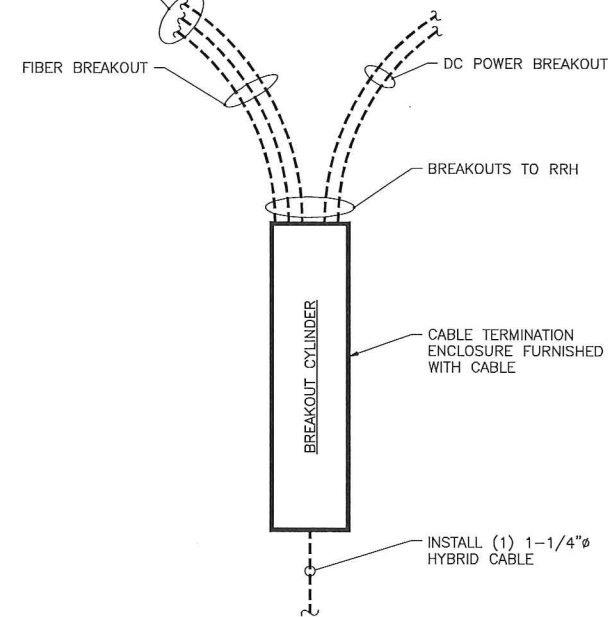


IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

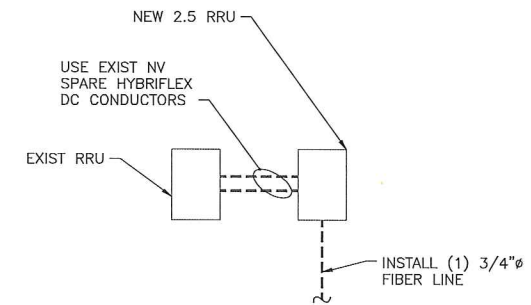


1 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS
A-6 SCALE: N.T.S.

TRUNK-LINE TO JUMPER CONNECTION (MPO) TO BE INSTALLED PER MANUFACTURER REQUIREMENTS. SEE DETAIL.



2.5 HYBRID CABLE W/FIBER & DC FEEDERS



FIBER ONLY TRUNK LINES

2 TRUNK LINE DETAILS (TYPICAL)
A-6 SCALE: N.T.S.

SPECIAL NOTES: CABLE MARKINGS AT RAD CENTER AND ALL WALL/BLDG. PENETRATIONS

- ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) WRAPS OF TAPE.
- ALL COLOR BANDS INSTALLED AT THE TOWER TOP SHALL BE A MINIMUM OF 3" WIDE AND SHALL HAVE A MINIMUM OF 3/4" OF SPACING BETWEEN EACH COLOR.
- ALL COLOR BANDS INSTALLED AT OR NEAR THE GROUND MAY BE ONLY 3/4" WIDE. EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
- EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH 3/4" COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
- ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" BANDS ON EACH END OF THE BOTTOM JUMPER.
- ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
- EACH COLOR BAND SHALL HAVE A MINIMUM OF (3) WRAPS AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT AS TO AVOID UNRAVELING.
- X-POLE ANTENNAS SHOULD USE "XX-1" FOR THE "+45" PORT, "XX-2" FOR THE "-45" PORT.
- COLOR BAND #4 REFERS TO THE FREQUENCY BAND: ORANGE=850, VIOLET=1900. USED ON JUMPERS ONLY.
- RF FEEDLINE SHALL BE IDENTIFIED WITH A METAL TAG (STAINLESS OR BRASS) AND STAMPED WITH THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER.
- ANTENNAS MUST BE IDENTIFIED, USING THE SECTOR LETTER AND ANTENNA NUMBER, WITH A BLACK MARKER PRIOR TO INSTALLATION.

Sprint
2.5 EQUIPMENT DEPLOYMENT
1 INTERNATIONAL BLVD., SUITE 800
MAHWAH, NJ 07495
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FAX: (201) 648-4223

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SUBMITTALS

PROJECT NO: 7225.CT33XC101

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	JT
1	01/06/15	FOR CONSTRUCTION	MP

DATE: 7/6/15 REVIEWED BY: JMQ



SITE NUMBER: CT33XC101
SITE NAME: FOREST CITY 2/SNET @ KENT SCHOOL
SITE ADDRESS: 136 BULLS BRIDGE ROAD KENT, CT 06785

SHEET TITLE: CABLE DETAILS

SHEET NO: A-6

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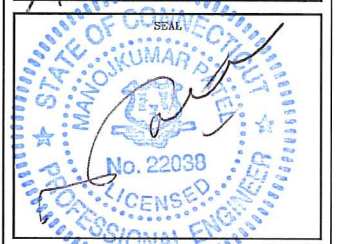
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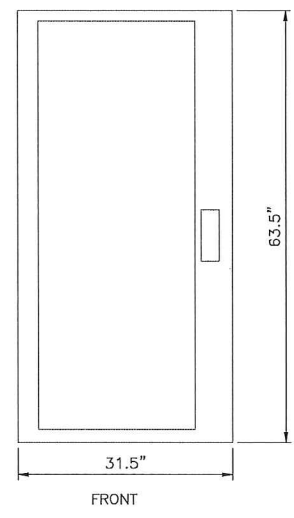
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 CT33XC101

SITE NAME:
 FOREST CITY 2/SNET
 @ KENT SCHOOL

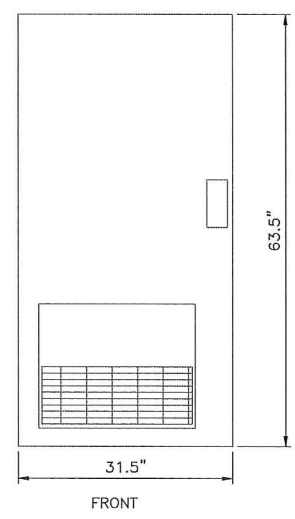
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 136 BULLS BRIDGE ROAD
 KENT, CT 06785

SHEET TITLE:
 EQUIPMENT DETAILS

SHEET NO:
 S-1



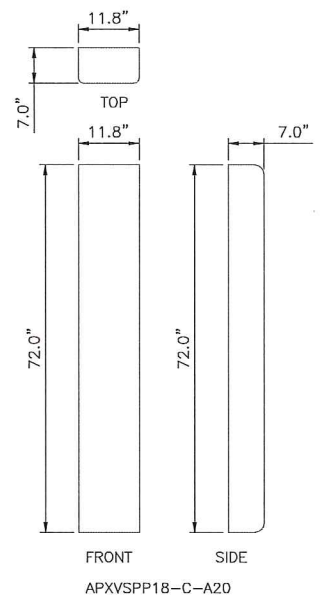
9927 MMBTS MODULAR CELL
 SPECIFICATIONS:
 HEIGHT: 63.5"
 WIDTH: 31.5"
 DEPTH: 38.0"



BATTERY
 SPECIFICATIONS:
 HEIGHT: 63.5"
 WIDTH: 31.5"
 DEPTH: 28.0"

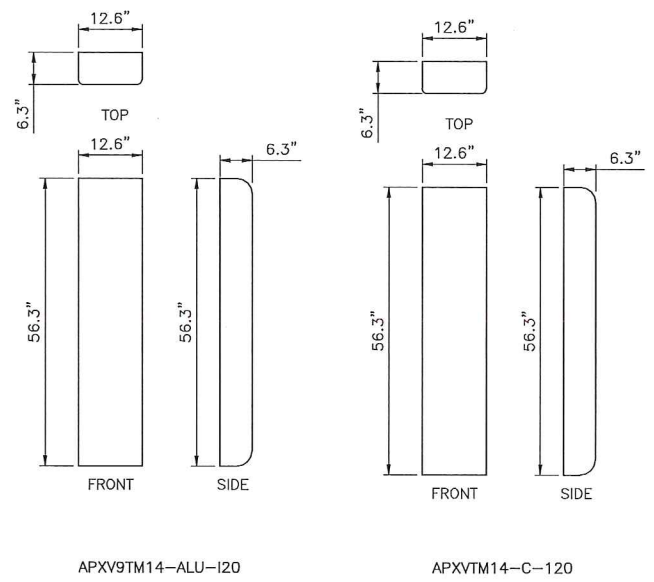
1 (EXIST) MMBTS CABINET
 S-1 SCALE: 1" = 1'-0"

2 (EXIST) BATTERY CABINET
 S-1 SCALE: 1" = 1'-0"



APXVSP18-C-A20

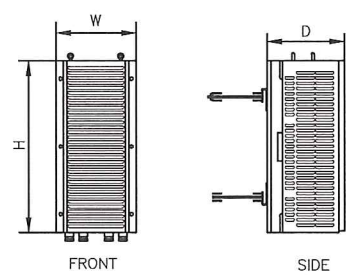
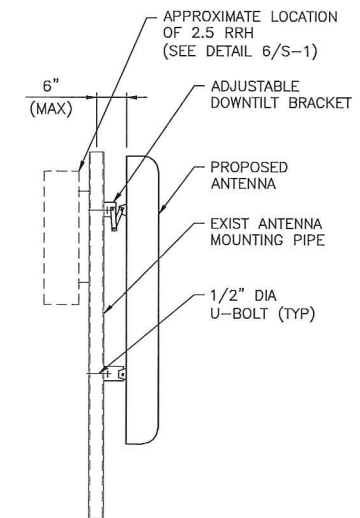
3 (EXIST) ANTENNA DETAIL
 S-1 SCALE: 3/4" = 1'-0"



APXV9TM14-ALU-I20

APXVTM14-C-120

4 (PROPOSED) ANTENNA DETAILS
 S-1 SCALE: 3/4" = 1'-0"

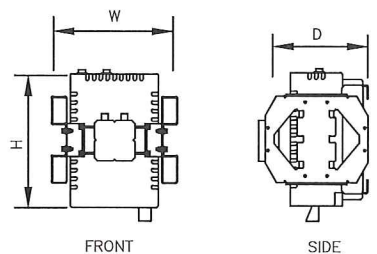


TYPE: 1900 MHz 4x45W
 MODEL #: RRH 1900 4X45 65MHz
 HEIGHT: 25.0"
 WIDTH: 11.1"
 DEPTH: 11.4"
 WEIGHT: ±60 LBS.

FRONT

SIDE

5 (EXIST) RRH DETAILS
 S-1 SCALE: 1 1/2" = 1'-0"

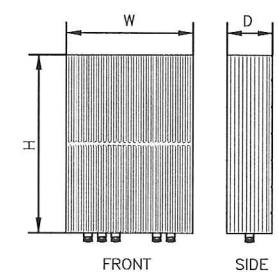


TYPE: 800 MHz 2x50W
 MODEL #: FD-RRH-2x50-800
 HEIGHT: 19.7"
 WIDTH: 13"
 DEPTH: 10.8"
 WEIGHT: ±53 LBS

FRONT

SIDE

6 (PROPOSED) RRH DETAIL
 S-1 SCALE: 1" = 1'-0"

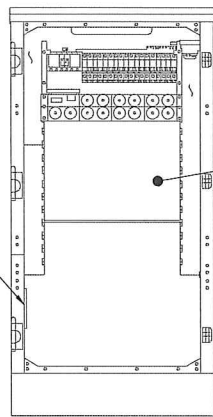


TYPE: 2.5 RRH
 MODEL #: TD-RRH8x20-25
 HEIGHT: 26.1"
 WIDTH: 18.6"
 DEPTH: 6.7"
 WEIGHT: ±70 LBS

FRONT

SIDE

NOTE:
LOCATIONS SHOWN FOR
INSTALLATION OF NEW
EQUIPMENT IN EXISTING
CABINET ARE APPROXIMATE.
ACTUAL SPACE AVAILABLE
TO BE VERIFIED IN FIELD
ON A SITE BY SITE BASIS.



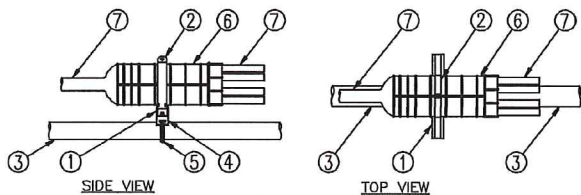
EXIST GROUND
BAR TO BE UTILIZED

INSTALL NEW 2.5
EQUIPMENT IN EXIST MMBTS
CABINET INCLUDING BUT
NOT LIMITED TO BASE BAND
UNIT, CELL SITE ROUTER
AND SURGE ARRESTORS.
GROUND EQUIPMENT TO
EXIST INTERIOR CABINET
GROUND BAR

FRONT ELEVATION
(CABINET INTERIOR)

1 MMBTS INTERIOR DETAIL
SCALE: N.T.S.

- LEGEND:
1. P1000T-HG UNISTRUT, 12" LONG.
 2. 6" PIPE HANGER.
 3. EXISTING SUPPORT PIPE.
 4. NEW STANDOFF BRACKET, ANDREW PART# 30848-4.
 5. NEW ROUND MEMBER ADAPTER SIZED FOR EXISTING PIPE SUPPORT.
 6. BREAKOUT UNIT.
 7. CABLE.



3 MEDUSA HEAD DETAIL
SCALE: NTS

RFS HYBRIFLEX RISER CABLES 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, 50ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft

8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft

6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft

4 AWG Power	Hybrid cable MN: HB114-21U3M12-225F 3x 4 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225ft	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

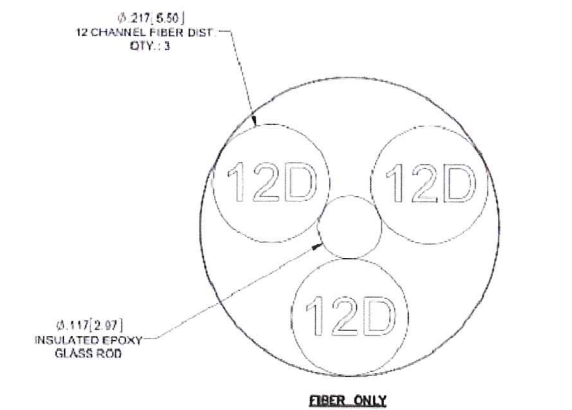
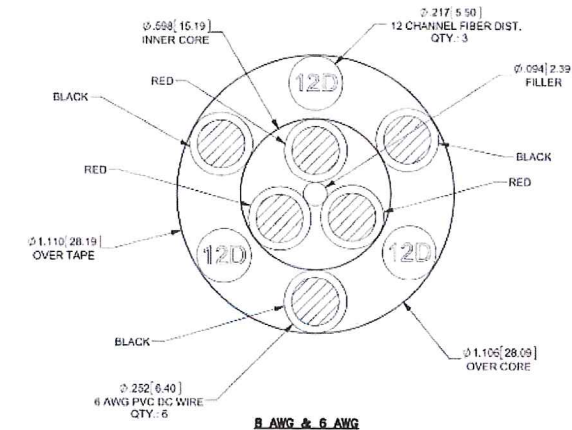
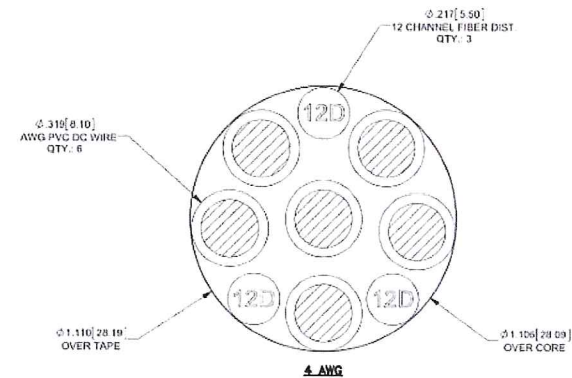
8 AWG Power	Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft

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

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE

MANUF:	RFS	DC CONDUCTOR	CABLE DIAMETER
CABLE	LENGTH	USE NV HYBRIFLEX	7/8"
FIBER ONLY	VARIES		
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



2 2.5 HYBRID CABLE X-SECTION AND DATA
SCALE: NTS

Sprint

2.5 EQUIPMENT DEPLOYMENT
1 INTERNATIONAL BLVD., SUITE 800
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OFFICE: (201) 684-4000
FAX: (201) 648-4223

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NO	DATE	DESCRIPTION	BY
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DATE REVIEWED BY
1/6/15 JMA



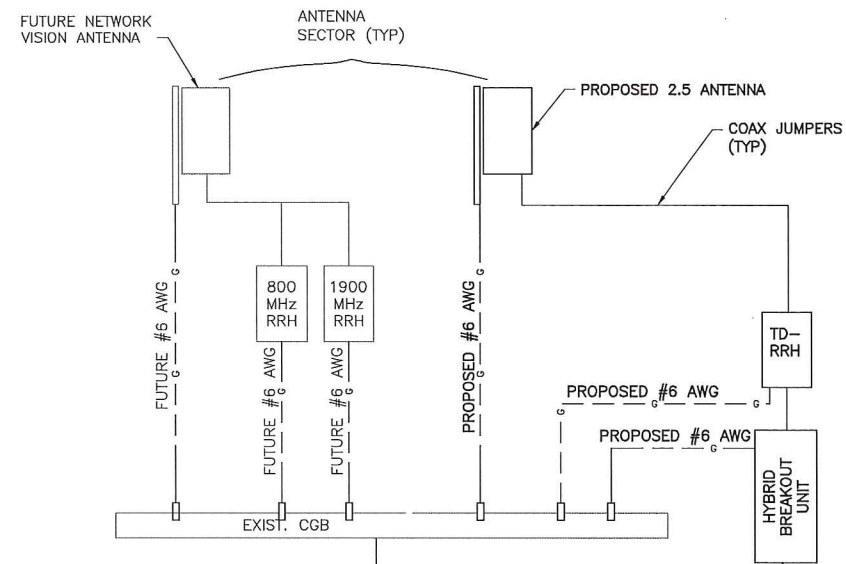
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CT35XC101

SITE NAME:
FOREST CITY 2/SNET
@ KENT SCHOOL

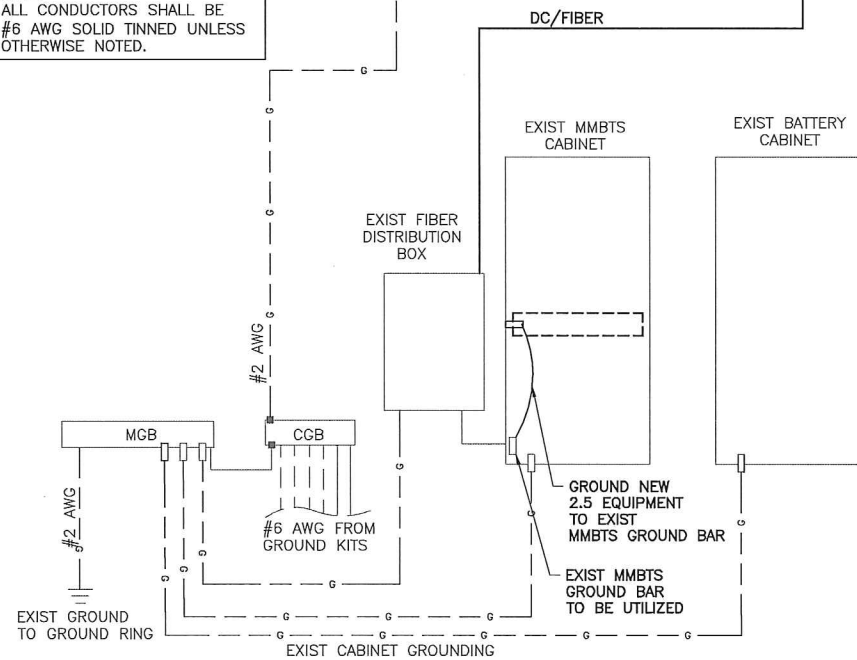
SITE ADDRESS:
136 BULLS BRIDGE ROAD
KENT, CT 08785

SHEET TITLE:
EQUIPMENT
SCHEMATIC DETAILS

SHEET NO:
S-2

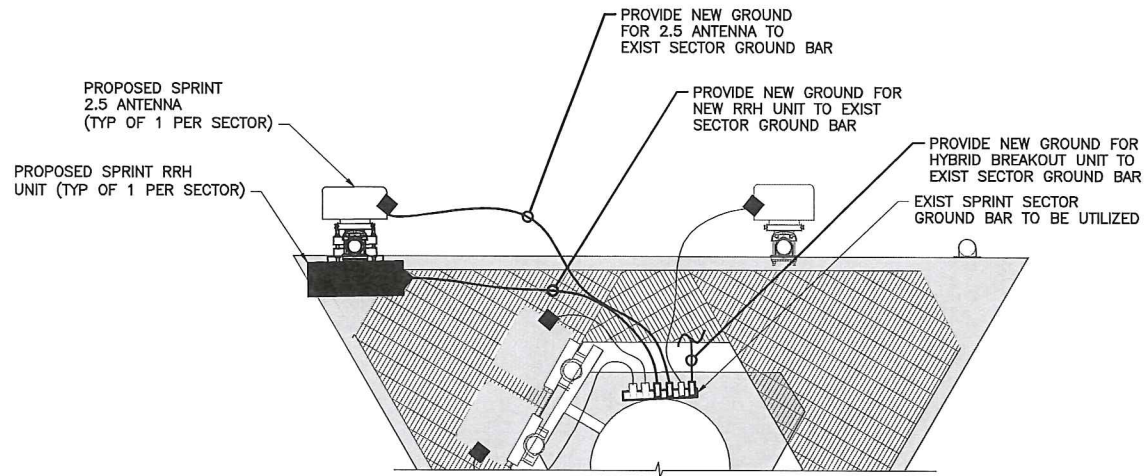


NOTE:
ALL CONDUCTORS SHALL BE #6 AWG SOLID TINNED UNLESS OTHERWISE NOTED.

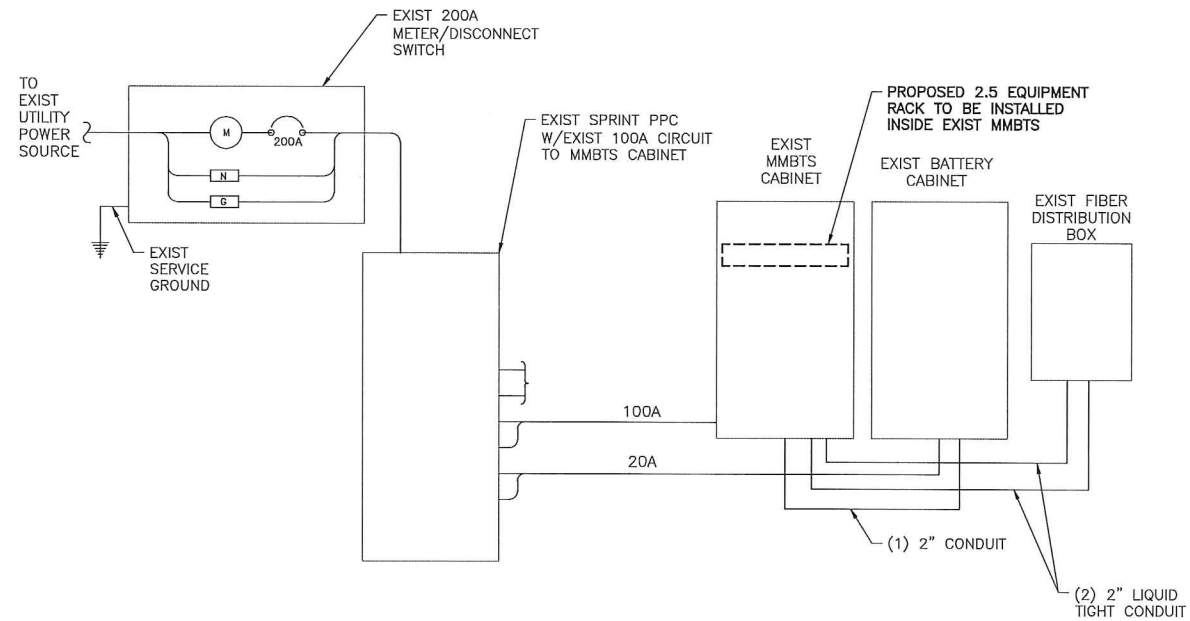


- LEGEND**
- CADWELD CONNECTION
 - MECHANICAL CONNECTION
 - COMPRESSION CONNECTION

1 TYPICAL GROUNDING ONE LINE DIAGRAM
E-1 SCALE: NTS



2 TYPICAL ANTENNA GROUNDING PLAN
E-1 SCALE: NTS



3 TYPICAL ELECTRICAL & TELCO PLAN
E-1 SCALE: NTS

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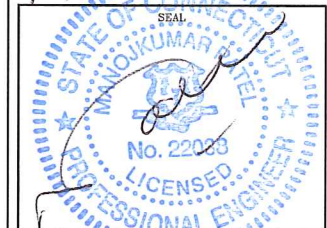
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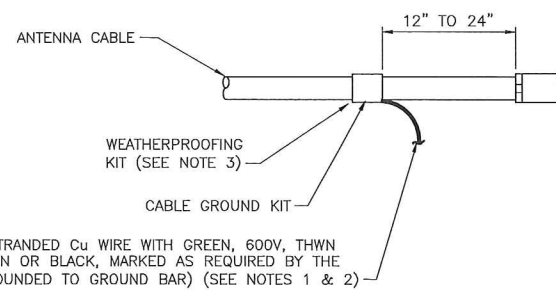
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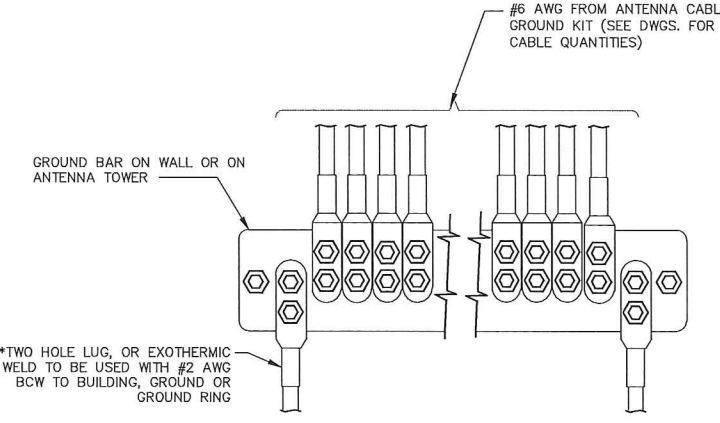
SHEET TITLE: ELECTRICAL & GROUNDING PLANS

SHEET NO: E-1



6 AWG STRANDED Cu WIRE WITH GREEN, 600V, THWN INSULATION OR BLACK, MARKED AS REQUIRED BY THE NEC (GROUNDED TO GROUND BAR) (SEE NOTES 1 & 2)

CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE



* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.
 - ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRID GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.
 - CONNECT SEQUENCE- BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

4 ANTENNA GROUND BAR DETAIL
 E-2 SCALE: NTS

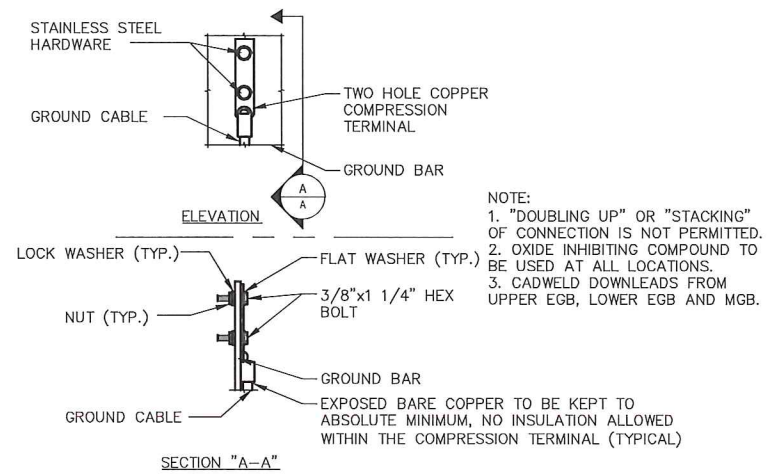
ELECTRICAL AND GROUNDING NOTES

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THNN INSULATION.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- WHERE CONDUIT BETWEEN BTS AND PROJECT OWNER CELL SITE PPC AND BETWEEN BTS AND PROJECT OWNER CELL SITE TELCO SERVICE CABINET ARE UNDERGROUND USE PVC, SCHEDULE 40 CONDUIT, ABOVE THE GROUND PORTION OF THESE CONDUITS SHALL BE PVC CONDUIT.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250.
- GROUND HYBRID CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRID CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- USE #2 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #2 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- BOND ANTENNA MOUNTING BRACKETS, HYBRID CABLE GROUND KITS, AND RRHs TO EGB PLACED NEAR THE ANTENNA LOCATION.
- BOND ANTENNA EGB'S AND MGB TO GROUND RING.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, HYBRID CABLES, GPS COAX AND RRH RETURN-LOSS AND DISTANCE- TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
- CONTRACTOR SHALL CHECK CAPACITY OF EXISTING SERVICE & PANEL ON SITE TO DETERMINE IF CAPACITY EXISTS TO ACCOMMODATE THE ADDED LOAD OF THIS PROJECT. ADVISE ENGINEER OF ANY DISCREPANCY.
- LOCATION OF ALL OUTLET, BOXES, ETC. AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.
- ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNERS REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT.

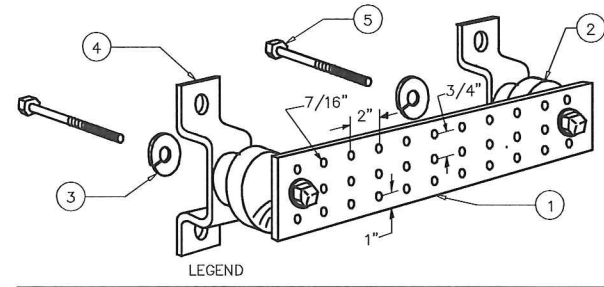
NOTES:

DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
 GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
 WEATHER PROOFING SHALL BE (TYPE AND PART NUMBER) AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER AND APPROVED BY CONTRACTOR.

1 CABLE GROUNDING KIT DETAIL
 E-2 SCALE: N.T.S.



2 GROUNDING BAR CONN. DETAIL
 E-2 SCALE: NTS



- LEGEND
- COPPER TINNED GROUND BAR, 1/4"X 4"X 20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
 - INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
 - 5/8" LOCKWASHERS OR EQUAL
 - WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
 - 5/8-11 X 1" H.H.C.S.BOLTS

NOTE:
 ALL BOLTS, NUTS, WASHERS AND LOCK WASHERS SHALL BE 18-8 STAINLESS STEEL.

3 GROUNDING BAR DETAIL
 E-2 SCALE: NTS

GROUNDING NOTES:

- GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.
- ALL GROUND WIRES SHALL BE #2 AWG UNLESS NOTED OTHERWISE.
- ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
- EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS WILL HAVE (2) CONNECTIONS.
- PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
- THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
- ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
- PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
- WHEN CABLE LENGTH IS OVER 20' THE MANUFACTURERS GROUND KIT MUST BE INSTALLED PER THE MANUFACTURERS SPECIFICATIONS.
- REFER TO "ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUNDING.
- HOME RUN GROUNDS ARE NOT APPROVED BY CROWN CASTLE CONSTRUCTION STANDARDS AND THAT ANTENNA BUSS BARS SHOULD BE INSTALLED DIRECTLY TO TOWER STEEL WITHOUT INSULATORS OR DOWN CONDUCTORS.

PROTECTIVE GROUNDING SYSTEM GENERAL NOTES:

- AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING, CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
- ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
- ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH PROJECT MANAGER.
- ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
- INSTALL GROUND BUSHING ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.
- GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
- GROUND HYBRID CABLE SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

Sprint

2.5 EQUIPMENT DEPLOYMENT
1 INTERNATIONAL BLVD., SUITE 800
 MAHWAH, NJ 07495
 OFFICE: (201) 684-4000
 FAX: (201) 648-4223

CROWN CASTLE

TECTONIC

TECTONIC Engineering & Surveying
 Consultants P.C.

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 Newburgh, NY 12550
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 Fax: (845) 567-8703
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SUBMITTALS

PROJECT NO: 7225.CT33XC101

NO	DATE	DESCRIPTION	BY
0	07/15/14	FOR COMMENT	JT
1	01/06/15	FOR CONSTRUCTION	MP

DATE: 1/6/15 REVIEWED BY: JMO

STATE OF CONNECTICUT
 MANOJKUMAR TELUKUTTI
 No. 22038
 LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC101

SITE NAME:
FOREST CITY 2/SNET @ KENT SCHOOL

SITE ADDRESS:
**136 BULLS BRIDGE ROAD
 KENT, CT 08785**

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E-2



Pier Structural Engineering Corp.
 55 Northfield Drive E, Suite 198
 Waterloo, ON N2K 3T6
 Tel: 519-885-3806
 Fax: 519-886-0076
 www.p-sec.ca

July 2, 2014

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

Subject: Structural Analysis Report

Carrier Designation: Carrier Co-Locate: **Sprint PCS – Scenario 2.5 B**
 Carrier Site Number: **CT33XC101**
 Carrier Site Name: **N/A**

Crown Castle Designation: Crown Castle BU Number: **841293**
 Crown Castle Site Name: **KENT-BULLS BRIDGE ROAD**
 Crown Castle JDE Job Number: **292807**
 Crown Castle WO Number: **780556**

Engineering Firm Designation: P-SEC Project Number: **11653**

Site Data: **136 BULLS BRIDGE ROAD, SOUTH KENT, Litchfield County, CT**
Latitude 41° 40' 53.65", Longitude -73° 29' 11.8"
180-ft Monopole Tower

Dear Darcy Tarr,

Pier Structural Engineering Corp. (P-SEC) is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural ‘Statement of Work’ and the terms of Crown Castle Purchase Order Number 661608, in accordance with application 248832, 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:

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

The analysis has been performed in accordance with the TIA/EIA-222-F Standard and 2005 CT State Building Code based upon a wind speed of 80 mph fastest mile.

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

Structural analysis prepared by: Nicolai Smitiuch, E.I.T.

Respectfully submitted by:

Martin Piercey, P.E., P.Eng.
 CT PE# 25582





Pier Structural Engineering Corp.
 55 Northfield Drive E, Suite 198
 Waterloo, ON N2K 3T6
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 Fax: 519-886-0076
 www.p-sec.ca

July 2, 2014

Darcy Tarr, Tower Structural Analyst
 Crown Castle USA Inc.
 3530 Torington Way Suite 300
 Charlotte, NC 28277

Subject: Structural Analysis Report

Carrier Designation: Carrier Co-Locate: **Sprint PCS – Scenario 2.5 B**
 Carrier Site Number: **CT33XC101**
 Carrier Site Name: **N/A**

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 CT PE# 25582

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1) INTRODUCTION

This tower is a 180-ft Monopole tower originally designed by Engineered Endeavors Inc. in December of 2000 for a wind speed of 80 mph per TIA/EIA-222-F. The tower was reinforced per GPD modification drawings of 2012.

2) ANALYSIS CRITERIA

The following design parameters have been used in our analysis:

Design Standard:		TIA/EIA-222-F Standard and the 2005 CT State Building Code
County/State:		Litchfield County, CT
Wind Speeds:	CASE 1	80 mph (fastest mile)
	CASE 2	28.1 mph (fastest mile) with 3/4" radial solid ice (per ASCE7 ice map)
	CASE 3	50 mph (fastest mile) for Serviceability
Allowable Stress:		Increased 1/3rd

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
124	124	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	1
		3	rfs celwave	APXVTM14-C-120			

Notes:

- Proposed Equipment

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180	190	1	telewave	ANT450F10	1	7/8	2
	185	3	decibel	ASP-952	15	1-5/8	1
	182	2	kmw	AM-X-CD-16-65-00T-RET			
		1	kmx	AM-X-CD-14-65-00T-RET			
		6	powerwave	7770.00			
		6	powerwave	LGP13519			
		6	powerwave	LGP21401			
		6	ericsson	RRUS 11			
		1	raycap	DC6-48-60-18-8F			
	180	1	--	Platform Mount [LP 601-1]			
170	174	1	telewave	ANT150D3			
	170	1	--	Platform Mount [LP 601-1]	--	--	1
160	160	3	antel	BXA-171085-12BF	--	--	2
		3	antel	BXA-70063-6CF-EDIN-0			
		6	rfs celwave	FD9R6004/2C-3L			
		6	antel	LPA-185080/12CFx2	12	1-5/8	3
		6	antel	LPA-80080-6CF-EDIN			
		1	--	Platform Mount [LP 601-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
134	143	1	sinclair	SC432D-HF6LDF(140-G06)	2	1-5/8	3
	134	1	decibel	DB809K-Y	2	1-5/8	2
		1	tx rx systems	431-86A-01-T			
		2	decibel	DB809DK-Y	4	1-5/8	1
		2	tx rx systems	422-86A-99575-18BW			
1	--	Side Arm Mount [SO 702-3]					
124	124	3	alcatel lucent	1900MHz RRH	--	--	4
		3	rfs celwave	APXVSPP18-C-A20	3	1-1/4	1
		3	alcatel lucent	800MHZ RRH			
		1	--	Platform Mount [LP 601-1]			
120	120	1	shively labs	6813	1	7/8	1
		1	--	Platform Mount [LP 601-1]			
100	100	1	weather bug	ANEMOMETER	1	1/2	1
		1	--	Pipe Mount [PM 601-1]			
80	80	1	--	Side Arm Mount [SO 702-1]	1	EW63	1
	75	1	amphenol	BCD-80609-EDIN-3-INVERT			
63	63	1	gps	GPS_A	1	1/2	1
		1	--	Side Arm Mount [SO 309-1]			

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Replaced by Reserved
- 4) Equipment To Be Replaced by Proposed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elev. (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Unknown						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	GPD, Proj. No. 2012801.85 dated 11/13/2012	4456627	CCISITES
4-POST-MODIFICATION INSPECTION	GPD, Proj. No. 2013707.52 dated 8/28/2013	4456621	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	FDH, Proj. No. 1403061500 dated 4/1/2014	4797649	CCISITES
4-TOWER MANUFACTURER DRAWINGS	SpectraSite, Proj. No. CT-0014 dated 6/25/2002	4456613	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD, Proj. No. 2012882.39 dated 12/13/2012	4456597	CCISITES
APPLICATION	Sprint PCS, Revision # 1 dated 5/19/2014	248832	CCISITES

3.1) Analysis Method

tnxTower (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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
- 5) P-SEC did not analyze antenna supporting mounts as part of this analysis report and assumed they are structurally sufficient. It is the carrier's responsibility to ensure structural compliance of their existing and/or proposed antenna supporting mounts.
- 6) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package dated 6/10/2014.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	180 - 133.24	Pole	TP25.5375x15x0.25	1	-6.22	1008.82	94.4	Pass
L2	133.24 - 87.6432	Pole	TP35.1887x24.2053x0.375	2	-16.57	2086.64	99.4	Pass
L3	87.6432 - 43.0729	Pole	TP44.3577x33.3472x0.4375	3	-27.55	3073.50	97.3	Pass
L4	43.0729 - 0	Pole	TP53x42.1374x0.5	4	-31.80	3628.24	89.3	Pass
							Summary	
						Pole (L2)	99.4	Pass
						RATING =	99.4	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
2	Anchor Rods	--	71.8	Pass
2	Base Plate	--	73.1	Pass
2	Base Foundation - Soil	--	95.2	Pass
2	Base Foundation - Rebar	--	58.1	Pass
Structure Rating (max from all components) =				99.4%

Notes: 1) See full member breakdown and section capacities in Appendix A.
 2) See additional documentation in Appendix C for supporting calculations.

4.1) Recommendations

The existing 180-ft self-support tower located in Litchfield County (KENT-BULLS BRIDGE ROAD), CT is structurally acceptable based on the TIA/EIA-222-F Standard and 2005 CT State Building Code requirements based upon a wind speed of 80 mph fastest mile.

No modifications are required for the proposed loading.

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

encl.
841293_248832 SA Report_20140702.doc

APPENDIX A
TNXTOWER OUTPUT

DESIGNED APPURTENANCE LOADING

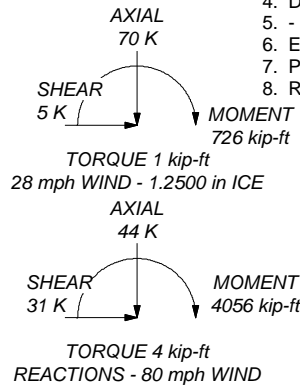
TYPE	ELEVATION	TYPE	ELEVATION
ANT450F10 (Carrier 180' R)	180	(2) LPA-80080-6CF-EDIN w/ Mount Pipe (Carrier 160' E)	160
AM-X-CD-16-65-00T-RET w/ Mount Pipe (Carrier 180' E)	180	(2) LPA-80080-6CF-EDIN w/ Mount Pipe (Carrier 160' E)	160
AM-X-CD-16-65-00T-RET w/ Mount Pipe (Carrier 180' E)	180	Platform Mount [LP 601-1] (Carrier 160' E)	160
AM-X-CD-14-65-00T-RET w/ Mount Pipe (Carrier 180' E)	180	431-86A-01-T (Carrier 134' P)	134
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	180	DB809K-Y (Carrier 134' P)	134
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	180	(2) 422-86A-99575-18BW (Carrier 134' E)	134
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	180	DB809DK-Y (Carrier 134' E)	134
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	180	DB809DK-Y (Carrier 134' E)	134
ASP-952 (Carrier 180' E)	180	Side Arm Mount [SO 702-3] (Carrier 134' E)	134
ASP-952 (Carrier 180' E)	180	APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	124
ASP-952 (Carrier 180' E)	180	APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	124
(2) RRUS 11 (Carrier 180' E)	180	APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	124
(2) RRUS 11 (Carrier 180' E)	180	APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	124
(2) RRUS 11 (Carrier 180' E)	180	APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	124
(2) LGP13519 (Carrier 180' E)	180	TD-RRH8x20-25 (Carrier 124' P)	124
(2) LGP13519 (Carrier 180' E)	180	TD-RRH8x20-25 (Carrier 124' P)	124
(2) LGP13519 (Carrier 180' E)	180	TD-RRH8x20-25 (Carrier 124' P)	124
(2) LGP21401 (Carrier 180' E)	180	APXVSP18-C-A20 w/ Mount Pipe (Carrier 124' E)	124
(2) LGP21401 (Carrier 180' E)	180	APXVSP18-C-A20 w/ Mount Pipe (Carrier 124' E)	124
(2) LGP21401 (Carrier 180' E)	180	APXVSP18-C-A20 w/ Mount Pipe (Carrier 124' E)	124
DC6-48-60-18-8F (Carrier 180' E)	180	APXVSP18-C-A20 w/ Mount Pipe (Carrier 124' E)	124
Platform Mount [LP 601-1] (Carrier 180' E)	180	800MHZ RRH (Carrier 124' E)	124
ANT150D3 (Carrier 170' R)	170	800MHZ RRH (Carrier 124' E)	124
Platform Mount [LP 601-1] (Carrier 170' E)	170	800MHZ RRH (Carrier 124' E)	124
BXA-171085-12BF w/ Mount Pipe (Carrier 160' R)	160	Platform Mount [LP 601-1] (Carrier 124' E)	124
BXA-171085-12BF w/ Mount Pipe (Carrier 160' R)	160	6813 (Carrier 120' E)	120
BXA-171085-12BF w/ Mount Pipe (Carrier 160' R)	160	Platform Mount [LP 601-1] (Carrier 120' E)	120
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (Carrier 160' R)	160	ANEMOMETER (Carrier 100' E)	100
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (Carrier 160' R)	160	Pipe Mount [PM 601-1] (Carrier 100' E)	100
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (Carrier 160' R)	160	BCD-80609-EDIN-3-INVERT (Carrier 80' E)	80
(2) FD9R6004/2C-3L (Carrier 160' R)	160	Side Arm Mount [SO 702-1] (Carrier 80' E)	80
(2) FD9R6004/2C-3L (Carrier 160' R)	160	GPS_A (Carrier 63' E)	63
(2) FD9R6004/2C-3L (Carrier 160' R)	160	Side Arm Mount [SO 309-1] (Carrier 63' E)	63
(2) LPA-80080-6CF-EDIN w/ Mount Pipe (Carrier 160' E)	160		

MATERIAL STRENGTH

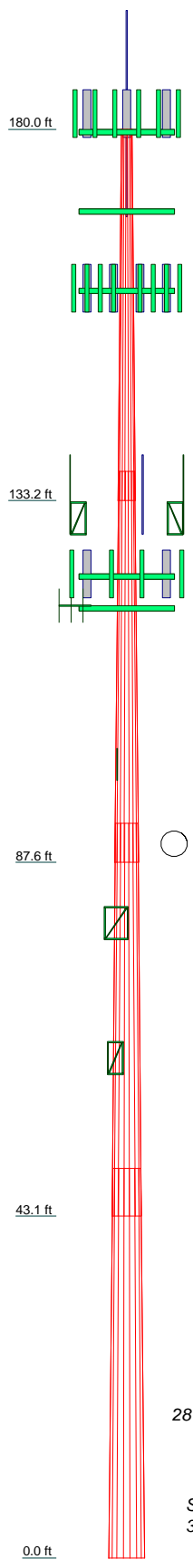
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.25 in ice.
4. Deflections are based upon a 50 mph wind.
5. -----
6. E - Existing, R/MLA - Reserved, P - Proposed
7. Proposed loading at 124ft elevation
8. Reserved loading at 134ft, 160ft, 170ft and 180ft



Section	1	2	3	4	A572-65	29.8
Length (ft)	46'9-1/8"	49'3-15/32"	49'5-5/8"	49'1-7/16"		
Number of Sides	18	18	18	18		
Thickness (in)	0.2500	0.3750	0.4375	0.5000		
Socket Length (ft)	3'8-9/32"	4'10-13/16"	6'15/32"	42.1374		
Top Dia (in)	15.0000	24.2053	33.3472	53.0000		
Bot Dia (in)	25.5375	35.1887	44.3577			
Grade						
Weight (K)	2.5	5.9	9.0	12.5		



<p>Pier Structural Engineering Corp. 198-55 Northfield Drive East Waterloo, Ontario Phone: 519 885 3806 FAX: 519 884 3806</p>	Job: PSEC 11653 (for SPRINT PCS)		
	Project: 841293 - KENT-BULLS BRIDGE ROAD		
	Client: CROWN CASTLE	Drawn by: nsmiulich	App'd:
	Code: TIA/EIA-222-F	Date: 07/02/14	Scale: NTS
	Path:		Dwg No. E-1

tnxTower Pier Structural Engineering Corp. 198-55 Northfield Drive East Waterloo, Ontario Phone: 519 885 3806 FAX: 519 884 3806	Job PSEC 11653 (for SPRINT PCS)	Page 1 of 13
	Project 841293 - KENT-BULLS BRIDGE ROAD	Date 14:57:03 07/02/14
	Client CROWN CASTLE	Designed by nsmitiuch

Tower Input Data

There is a pole section.

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

The following design criteria apply:

- Tower is located in Litchfield County, Connecticut.
- Basic wind speed of 80 mph.
- Nominal ice thickness of 1.2500 in.
- Ice density of 56 pcf.
- A wind speed of 28 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 50 mph.

E - Existing, R/MLA - Reserved, P - Proposed.

Proposed loading at 124ft elevation.

Reserved loading at 134ft, 160ft, 170ft and 180ft.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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> <ul style="list-style-type: none"> √ 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	180'-133'2"-7/8"	46'9-1/8"	3'8-9/32"	18	15.0000	25.5375	0.2500	1.0000	A572-65 (65 ksi)
L2	133'2-7/8"-87'7-11/16"	49'3-15/32"	4'10-13/16"	18	24.2053	35.1887	0.3750	1.5000	A572-65 (65 ksi)
L3	87'7-11/16"-43'27/32"	49'5-5/8"	6'15/32"	18	33.3472	44.3577	0.4375	1.7500	A572-65 (65 ksi)
L4	43'27/32"-0'	49'1-7/16"		18	42.1374	53.0000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I ² /Q in ²	w in	w/t
L1	15.2314	11.7041	321.7069	5.2363	7.6200	42.2188	643.8372	5.8532	2.2000	8.8
	25.9315	20.0656	1621.0711	8.9771	12.9731	124.9568	3244.2753	10.0347	4.0546	16.218
L2	25.4143	28.3641	2035.0104	8.4598	12.2963	165.4976	4072.6985	14.1847	3.6001	9.6
	35.7315	41.4370	6344.9205	12.3589	17.8759	354.9435	12698.1899	20.7224	5.5332	14.755
L3	34.9687	45.6992	6253.0569	11.6829	16.9404	369.1220	12514.3417	22.8539	5.0991	11.655
	45.0420	60.9887	14863.3039	15.5917	22.5337	659.6030	29746.1653	30.5001	7.0370	16.084
L4	44.1448	66.0785	14473.2120	14.7813	21.4058	676.1352	28965.4683	33.0455	6.5362	13.072
	53.8176	83.3175	29012.9766	18.6375	26.9240	1077.5879	58064.1291	41.6667	8.4480	16.896

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Spacing Diagonals in	Double Angle Spacing Bolt Horizontals in
L1 180'-133'2"-7/8"				1	1	1		
L2 133'2-7/8"-87'7-11/16"				1	1	1		
L3 87'7-11/16"-43'27/32"				1	1	1		
L4 43'27/32"-0'				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf
LDF4-50A(1/2") (Carrier 180° E)	A	No	Inside Pole	180' - 8'	1	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00
LDF5-50A(7/8") (Carrier 180° E)	A	No	Inside Pole	180' - 8'	2	No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00
						2" Ice	0.00

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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
LDF7-50A(1-5/8") (Carrier 180' E)	A	No	CaAa (Out Of Face)	180' - 8'	5	No Ice	0.05	0.82
						1/2" Ice	0.06	2.33
						1" Ice	0.07	4.46
						2" Ice	0.09	10.54
LDF7-50A(1-5/8") (Carrier 180' E)	A	No	Inside Pole	180' - 8'	10	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
LDF5-50A(7/8") (Carrier 180' R)	A	No	Inside Pole	180' - 8'	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33

LDF5-50A(7/8") (Carrier 170' R)	C	No	Inside Pole	170' - 8'	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33

LDF7-50A(1-5/8") (Carrier 160' E)	C	No	Inside Pole	160' - 8'	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82

LDF7-50A(1-5/8") (Carrier 134' E)	A	No	Inside Pole	134' - 8'	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
LDF7-50A(1-5/8") (Carrier 134' R)	A	No	Inside Pole	134' - 8'	2	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82

HB114-1-08U4-M5J(1 1/4") (Carrier 124' E)	C	No	Inside Pole	124' - 8'	3	No Ice	0.00	1.08
						1/2" Ice	0.00	1.08
						1" Ice	0.00	1.08
						2" Ice	0.00	1.08
HB114-21U3M12-XXX F(1-1/4") (Carrier 124' P)	C	No	Inside Pole	124' - 8'	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
						2" Ice	0.00	1.22

LDF5-50A(7/8") (Carrier 120' E)	A	No	Inside Pole	120' - 8'	1	No Ice	0.00	0.33
						1/2" Ice	0.00	0.33
						1" Ice	0.00	0.33
						2" Ice	0.00	0.33

LDF4-50A(1/2") (Carrier 100' E)	A	No	Inside Pole	100' - 8'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15

EW63(ELLIPTICAL) (Carrier 80' E)	C	No	Inside Pole	80' - 8'	1	No Ice	0.00	0.51
						1/2" Ice	0.00	0.51
						1" Ice	0.00	0.51
						2" Ice	0.00	0.51

LDF4-50A(1/2") (Carrier 63' E)	B	No	CaAa (Out Of Face)	63' - 8'	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
						2" Ice	0.00	6.58

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R	A_F	C_{AA} In Face	C_{AA} Out Face	Weight K
			ft^2	ft^2	ft^2	ft^2	
L1	180'-133'2-7/8"	A	0.000	0.000	0.000	11.690	0.63
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.28
L2	133'2-7/8"-87'7-11/16"	A	0.000	0.000	0.000	11.399	0.92
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.63
L3	87'7-11/16"-43'27/32"	A	0.000	0.000	0.000	11.143	0.91
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.67
L4	43'27/32"-0'	A	0.000	0.000	0.000	8.768	0.72
		B	0.000	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.53

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R	A_F	C_{AA} In Face	C_{AA} Out Face	Weight K
				ft^2	ft^2	ft^2	ft^2	
L1	180'-133'2-7/8"	A	1.250	0.000	0.000	0.000	17.535	1.84
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.28
L2	133'2-7/8"-87'7-11/16"	A	1.250	0.000	0.000	0.000	17.099	2.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.63
L3	87'7-11/16"-43'27/32"	A	1.250	0.000	0.000	0.000	16.714	2.06
		B		0.000	0.000	0.000	0.000	0.06
		C		0.000	0.000	0.000	0.000	0.67
L4	43'27/32"-0'	A	1.250	0.000	0.000	0.000	13.152	1.62
		B		0.000	0.000	0.000	0.000	0.11
		C		0.000	0.000	0.000	0.000	0.53

Feed Line Center of Pressure

Section	Elevation ft	CP_x	CP_z	CP_x Ice	CP_z Ice
		in	in	in	in
L1	180'-133'2-7/8"	0.0000	-0.3267	0.0000	-0.4181
L2	133'2-7/8"-87'7-11/16"	0.0000	-0.3410	0.0000	-0.4564
L3	87'7-11/16"-43'27/32"	0.0000	-0.3485	0.0000	-0.4776
L4	43'27/32"-0'	0.0000	-0.2853	0.0000	-0.3987

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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
ANT450F10 (Carrier 180' R)	A	From Leg	4.00	0.0000	180'	No Ice	5.59	5.59	0.04
			0'			1/2" Ice	7.66	7.66	0.08
			10'			1" Ice	9.74	9.74	0.14
						2" Ice	13.95	13.95	0.28

AM-X-CD-16-65-00T-RET w/ Mount Pipe (Carrier 180' E)	A	From Leg	4.00	0.0000	180'	No Ice	8.50	6.30	0.07
			0'			1/2" Ice	9.15	7.48	0.14
			2'			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
AM-X-CD-16-65-00T-RET w/ Mount Pipe (Carrier 180' E)	B	From Leg	4.00	0.0000	180'	No Ice	8.50	6.30	0.07
			0'			1/2" Ice	9.15	7.48	0.14
			2'			1" Ice	9.77	8.37	0.21
						2" Ice	11.03	10.18	0.38
AM-X-CD-14-65-00T-RET w/ Mount Pipe (Carrier 180' E)	C	From Leg	4.00	0.0000	180'	No Ice	5.74	4.02	0.05
			0'			1/2" Ice	6.20	4.63	0.10
			2'			1" Ice	6.66	5.28	0.15
						2" Ice	7.62	6.68	0.27
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	A	From Leg	4.00	0.0000	180'	No Ice	6.12	4.25	0.06
			0'			1/2" Ice	6.63	5.01	0.10
			2'			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	B	From Leg	4.00	0.0000	180'	No Ice	6.12	4.25	0.06
			0'			1/2" Ice	6.63	5.01	0.10
			2'			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
(2) 7770.00 w/ Mount Pipe (Carrier 180' E)	C	From Leg	4.00	0.0000	180'	No Ice	6.12	4.25	0.06
			0'			1/2" Ice	6.63	5.01	0.10
			2'			1" Ice	7.13	5.71	0.16
						2" Ice	8.16	7.16	0.29
ASP-952 (Carrier 180' E)	A	From Leg	4.00	0.0000	180'	No Ice	3.02	3.02	0.02
			0'			1/2" Ice	4.16	4.16	0.04
			5'			1" Ice	5.30	5.30	0.07
						2" Ice	6.96	6.96	0.15
ASP-952 (Carrier 180' E)	B	From Leg	4.00	0.0000	180'	No Ice	3.02	3.02	0.02
			0'			1/2" Ice	4.16	4.16	0.04
			5'			1" Ice	5.30	5.30	0.07
						2" Ice	6.96	6.96	0.15
ASP-952 (Carrier 180' E)	C	From Leg	4.00	0.0000	180'	No Ice	3.02	3.02	0.02
			0'			1/2" Ice	4.16	4.16	0.04
			5'			1" Ice	5.30	5.30	0.07
						2" Ice	6.96	6.96	0.15
(2) RRUS 11 (Carrier 180' E)	A	From Leg	4.00	0.0000	180'	No Ice	3.25	1.37	0.05
			0'			1/2" Ice	3.49	1.55	0.07
			2'			1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15
(2) RRUS 11 (Carrier 180' E)	B	From Leg	4.00	0.0000	180'	No Ice	3.25	1.37	0.05
			0'			1/2" Ice	3.49	1.55	0.07
			2'			1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15
(2) RRUS 11 (Carrier 180' E)	C	From Leg	4.00	0.0000	180'	No Ice	3.25	1.37	0.05
			0'			1/2" Ice	3.49	1.55	0.07
			2'			1" Ice	3.74	1.74	0.10
						2" Ice	4.27	2.14	0.15
(2) LGP13519	A	From Leg	4.00	0.0000	180'	No Ice	0.34	0.21	0.01

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Lateral						Vert
(Carrier 180' E)				0'					0.01	
				2'		1/2" Ice	0.42	0.28	0.01	
						1" Ice	0.51	0.36	0.01	
						2" Ice	0.73	0.55	0.02	
(2) LGP13519 (Carrier 180' E)	B	From Leg	4.00	0'	0.0000	180'	No Ice	0.34	0.21	0.01
				0'			1/2" Ice	0.42	0.28	0.01
				2'			1" Ice	0.51	0.36	0.01
							2" Ice	0.73	0.55	0.02
(2) LGP13519 (Carrier 180' E)	C	From Leg	4.00	0'	0.0000	180'	No Ice	0.34	0.21	0.01
				0'			1/2" Ice	0.42	0.28	0.01
				2'			1" Ice	0.51	0.36	0.01
							2" Ice	0.73	0.55	0.02
(2) LGP21401 (Carrier 180' E)	A	From Leg	4.00	0'	0.0000	180'	No Ice	1.29	0.23	0.01
				0'			1/2" Ice	1.45	0.31	0.02
				2'			1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
(2) LGP21401 (Carrier 180' E)	B	From Leg	4.00	0'	0.0000	180'	No Ice	1.29	0.23	0.01
				0'			1/2" Ice	1.45	0.31	0.02
				2'			1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
(2) LGP21401 (Carrier 180' E)	C	From Leg	4.00	0'	0.0000	180'	No Ice	1.29	0.23	0.01
				0'			1/2" Ice	1.45	0.31	0.02
				2'			1" Ice	1.61	0.40	0.03
							2" Ice	1.97	0.61	0.05
DC6-48-60-18-8F (Carrier 180' E)	A	From Leg	4.00	0'	0.0000	180'	No Ice	2.57	2.57	0.02
				0'			1/2" Ice	2.80	2.80	0.04
				2'			1" Ice	3.04	3.04	0.07
							2" Ice	3.54	3.54	0.13
Platform Mount [LP 601-1] (Carrier 180' E)	C	None			0.0000	180'	No Ice	28.47	28.47	1.12
							1/2" Ice	33.59	33.59	1.51
							1" Ice	38.71	38.71	1.91
							2" Ice	48.95	48.95	2.69

ANT150D3 (Carrier 170' R)	A	From Leg	4.00	0'	0.0000	170'	No Ice	1.60	1.60	0.02
				0'			1/2" Ice	2.88	2.88	0.02
				4'			1" Ice	4.16	4.16	0.03
							2" Ice	6.72	6.72	0.04
Platform Mount [LP 601-1] (Carrier 170' E)	C	None			0.0000	170'	No Ice	28.47	28.47	1.12
							1/2" Ice	33.59	33.59	1.51
							1" Ice	38.71	38.71	1.91
							2" Ice	48.95	48.95	2.69

BXA-171085-12BF w/ Mount Pipe (Carrier 160' R)	A	From Leg	4.00	0'	0.0000	160'	No Ice	4.97	5.23	0.04
				0'			1/2" Ice	5.52	6.39	0.09
				0'			1" Ice	6.04	7.26	0.14
							2" Ice	7.09	9.05	0.27
BXA-171085-12BF w/ Mount Pipe (Carrier 160' R)	B	From Leg	4.00	0'	0.0000	160'	No Ice	4.97	5.23	0.04
				0'			1/2" Ice	5.52	6.39	0.09
				0'			1" Ice	6.04	7.26	0.14
							2" Ice	7.09	9.05	0.27
BXA-171085-12BF w/ Mount Pipe (Carrier 160' R)	C	From Leg	4.00	0'	0.0000	160'	No Ice	4.97	5.23	0.04
				0'			1/2" Ice	5.52	6.39	0.09
				0'			1" Ice	6.04	7.26	0.14
							2" Ice	7.09	9.05	0.27
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (Carrier 160' R)	A	From Leg	4.00	0'	0.0000	160'	No Ice	7.97	5.80	0.04
				0'			1/2" Ice	8.61	6.95	0.10
				0'			1" Ice	9.22	7.82	0.17
							2" Ice	10.46	9.60	0.34

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	K
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (Carrier 160' R)	B	From Leg	4.00	0.0000	160'	No Ice	7.97	5.80	0.04
			0'	0'		1/2" Ice	8.61	6.95	0.10
			0'	0'		1" Ice	9.22	7.82	0.17
			0'	0'		2" Ice	10.46	9.60	0.34
BXA-70063-6CF-EDIN-0 w/ Mount Pipe (Carrier 160' R)	C	From Leg	4.00	0.0000	160'	No Ice	7.97	5.80	0.04
			0'	0'		1/2" Ice	8.61	6.95	0.10
			0'	0'		1" Ice	9.22	7.82	0.17
			0'	0'		2" Ice	10.46	9.60	0.34
(2) FD9R6004/2C-3L (Carrier 160' R)	A	From Leg	4.00	0.0000	160'	No Ice	0.37	0.08	0.00
			0'	0'		1/2" Ice	0.45	0.14	0.01
			0'	0'		1" Ice	0.54	0.20	0.01
			0'	0'		2" Ice	0.75	0.34	0.02
(2) FD9R6004/2C-3L (Carrier 160' R)	B	From Leg	4.00	0.0000	160'	No Ice	0.37	0.08	0.00
			0'	0'		1/2" Ice	0.45	0.14	0.01
			0'	0'		1" Ice	0.54	0.20	0.01
			0'	0'		2" Ice	0.75	0.34	0.02
(2) FD9R6004/2C-3L (Carrier 160' R)	C	From Leg	4.00	0.0000	160'	No Ice	0.37	0.08	0.00
			0'	0'		1/2" Ice	0.45	0.14	0.01
			0'	0'		1" Ice	0.54	0.20	0.01
			0'	0'		2" Ice	0.75	0.34	0.02
(2) LPA-80080-6CF-EDIN w/ Mount Pipe (Carrier 160' E)	A	From Leg	4.00	0.0000	160'	No Ice	4.56	10.74	0.05
			0'	0'		1/2" Ice	5.10	12.00	0.11
			0'	0'		1" Ice	5.61	12.98	0.19
			0'	0'		2" Ice	6.65	14.99	0.36
(2) LPA-80080-6CF-EDIN w/ Mount Pipe (Carrier 160' E)	B	From Leg	4.00	0.0000	160'	No Ice	4.56	10.74	0.05
			0'	0'		1/2" Ice	5.10	12.00	0.11
			0'	0'		1" Ice	5.61	12.98	0.19
			0'	0'		2" Ice	6.65	14.99	0.36
(2) LPA-80080-6CF-EDIN w/ Mount Pipe (Carrier 160' E)	C	From Leg	4.00	0.0000	160'	No Ice	4.56	10.74	0.05
			0'	0'		1/2" Ice	5.10	12.00	0.11
			0'	0'		1" Ice	5.61	12.98	0.19
			0'	0'		2" Ice	6.65	14.99	0.36
Platform Mount [LP 601-1] (Carrier 160' E)	C	None		0.0000	160'	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69

431-86A-01-T (Carrier 134' P)	A	From Leg	4.00	0.0000	134'	No Ice	1.87	1.40	0.05
			0'	0'		1/2" Ice	2.05	1.57	0.06
			0'	0'		1" Ice	2.25	1.74	0.08
			0'	0'		2" Ice	2.66	2.12	0.12
DB809K-Y (Carrier 134' P)	A	From Leg	6.00	0.0000	134'	No Ice	2.85	2.85	0.03
			0'	0'		1/2" Ice	4.03	4.03	0.05
			0'	0'		1" Ice	5.21	5.21	0.08
			0'	0'		2" Ice	7.17	7.17	0.16
(2) 422-86A-99575-18BW (Carrier 134' E)	B	From Leg	4.00	0.0000	134'	No Ice	3.45	1.36	0.05
			0'	0'		1/2" Ice	3.70	1.54	0.07
			0'	0'		1" Ice	3.96	1.74	0.09
			0'	0'		2" Ice	4.50	2.15	0.15
DB809DK-Y (Carrier 134' E)	B	From Leg	6.00	0.0000	134'	No Ice	3.39	3.39	0.03
			0'	0'		1/2" Ice	4.55	4.55	0.06
			0'	0'		1" Ice	5.73	5.73	0.09
			0'	0'		2" Ice	7.38	7.38	0.18
DB809DK-Y (Carrier 134' E)	C	From Leg	6.00	0.0000	134'	No Ice	3.39	3.39	0.03
			0'	0'		1/2" Ice	4.55	4.55	0.06
			0'	0'		1" Ice	5.73	5.73	0.09
			0'	0'		2" Ice	7.38	7.38	0.18

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Lateral					
Side Arm Mount [SO 702-3] (Carrier 134' E)	C	None			0.0000	134'	No Ice 3.22 1/2" Ice 4.15 1" Ice 5.08 2" Ice 6.94	3.22 4.15 5.08 6.94	0.08 0.11 0.15 0.21

APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	A	From Leg	4.00 0' 0'		0.0000	124'	No Ice 7.13 1/2" Ice 7.66 1" Ice 8.18 2" Ice 9.26	4.96 5.75 6.47 8.01	0.08 0.13 0.19 0.34
APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	B	From Leg	4.00 0' 0'		0.0000	124'	No Ice 7.13 1/2" Ice 7.66 1" Ice 8.18 2" Ice 9.26	4.96 5.75 6.47 8.01	0.08 0.13 0.19 0.34
APXVTM14-C-120 w/ Mount Pipe (Carrier 124' P)	C	From Leg	4.00 0' 0'		0.0000	124'	No Ice 7.13 1/2" Ice 7.66 1" Ice 8.18 2" Ice 9.26	4.96 5.75 6.47 8.01	0.08 0.13 0.19 0.34
TD-RRH8x20-25 (Carrier 124' P)	A	From Leg	4.00 0' 0'		0.0000	124'	No Ice 4.72 1/2" Ice 5.01 1" Ice 5.32 2" Ice 5.95	1.70 1.92 2.15 2.62	0.07 0.10 0.13 0.20
TD-RRH8x20-25 (Carrier 124' P)	B	From Leg	4.00 0' 0'		0.0000	124'	No Ice 4.72 1/2" Ice 5.01 1" Ice 5.32 2" Ice 5.95	1.70 1.92 2.15 2.62	0.07 0.10 0.13 0.20
TD-RRH8x20-25 (Carrier 124' P)	C	From Leg	4.00 0' 0'		0.0000	124'	No Ice 4.72 1/2" Ice 5.01 1" Ice 5.32 2" Ice 5.95	1.70 1.92 2.15 2.62	0.07 0.10 0.13 0.20
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 124' E)	A	From Leg	4.00 0' 0'		0.0000	124'	No Ice 8.50 1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03	6.95 8.13 9.02 10.84	0.08 0.15 0.23 0.41
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 124' E)	B	From Leg	4.00 0' 0'		0.0000	124'	No Ice 8.50 1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03	6.95 8.13 9.02 10.84	0.08 0.15 0.23 0.41
APXVSPP18-C-A20 w/ Mount Pipe (Carrier 124' E)	C	From Leg	4.00 0' 0'		0.0000	124'	No Ice 8.50 1/2" Ice 9.15 1" Ice 9.77 2" Ice 11.03	6.95 8.13 9.02 10.84	0.08 0.15 0.23 0.41
800MHZ RRH (Carrier 124' E)	A	From Leg	4.00 0' 0'		0.0000	124'	No Ice 2.49 1/2" Ice 2.71 1" Ice 2.93 2" Ice 3.41	2.07 2.27 2.48 2.93	0.05 0.07 0.10 0.16
800MHZ RRH (Carrier 124' E)	B	From Leg	4.00 0' 0'		0.0000	124'	No Ice 2.49 1/2" Ice 2.71 1" Ice 2.93 2" Ice 3.41	2.07 2.27 2.48 2.93	0.05 0.07 0.10 0.16
800MHZ RRH (Carrier 124' E)	C	From Leg	4.00 0' 0'		0.0000	124'	No Ice 2.49 1/2" Ice 2.71 1" Ice 2.93 2" Ice 3.41	2.07 2.27 2.48 2.93	0.05 0.07 0.10 0.16
Platform Mount [LP 601-1] (Carrier 124' E)	C	None			0.0000	124'	No Ice 28.47 1/2" Ice 33.59 1" Ice 38.71 2" Ice 48.95	28.47 33.59 38.71 48.95	1.12 1.51 1.91 2.69

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

6813 (Carrier 120' E)	C	From Leg	4.00	0.0000	120'	No Ice	27.82	20.48	0.06
			0'			1/2" Ice	28.70	21.31	0.24
			0'			1" Ice	29.59	22.15	0.44
						2" Ice	31.38	23.85	0.85
Platform Mount [LP 601-1] (Carrier 120' E)	C	None		0.0000	120'	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
						2" Ice	48.95	48.95	2.69

ANEMOMETER (Carrier 100' E)	C	From Leg	4.00	0.0000	100'	No Ice	0.66	1.58	0.00
			0'			1/2" Ice	0.78	1.74	0.01
			0'			1" Ice	0.91	1.92	0.02
						2" Ice	1.21	2.31	0.06
Pipe Mount [PM 601-1] (Carrier 100' E)	C	From Leg	0.00	0.0000	100'	No Ice	3.00	0.90	0.07
			0'			1/2" Ice	3.74	1.12	0.08
			0'			1" Ice	4.48	1.34	0.09
						2" Ice	5.96	1.78	0.12

BCD-80609-EDIN-3-INVERT (Carrier 80' E)	C	From Leg	6.00	0.0000	80'	No Ice	2.95	2.95	0.03
			0'			1/2" Ice	4.11	4.11	0.05
			-5'			1" Ice	5.29	5.29	0.08
						2" Ice	7.16	7.16	0.16
Side Arm Mount [SO 702-1] (Carrier 80' E)	C	From Leg	0.00	0.0000	80'	No Ice	1.00	1.43	0.03
			0'			1/2" Ice	1.00	2.05	0.04
			0'			1" Ice	1.00	2.67	0.05
						2" Ice	1.00	3.91	0.07

GPS_A (Carrier 63' E)	C	From Leg	4.00	0.0000	63'	No Ice	0.30	0.30	0.00
			0'			1/2" Ice	0.37	0.37	0.00
			0'			1" Ice	0.46	0.46	0.01
						2" Ice	0.65	0.65	0.02
Side Arm Mount [SO 309-1] (Carrier 63' E)	C	From Leg	0.00	0.0000	63'	No Ice	2.82	2.20	0.04
			0'			1/2" Ice	4.07	3.16	0.06
			0'			1" Ice	5.32	4.12	0.08
						2" Ice	7.82	6.04	0.13

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

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Comb. No.	Description
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	70.06	-0.00	-0.00
	Max. H _x	11	43.78	31.26	-0.07
	Max. H _z	2	43.78	-0.07	31.03
	Max. M _x	2	4029.59	-0.07	31.03
	Max. M _z	5	4055.98	-31.26	0.07
	Max. Torsion	2	3.90	-0.07	31.03
	Min. Vert	5	43.78	-31.26	0.07
	Min. H _x	5	43.78	-31.26	0.07
	Min. H _z	8	43.78	0.07	-31.03
	Min. M _x	8	-4027.46	0.07	-31.03
	Min. M _z	11	-4056.20	31.26	-0.07
	Min. Torsion	8	-3.89	0.07	-31.03

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	43.78	-0.00	0.00	-1.00	0.11	0.00
Dead+Wind 0 deg - No Ice	43.78	0.07	-31.03	-4029.59	-5.66	-3.90
Dead+Wind 30 deg - No Ice	43.78	15.69	-26.91	-3492.95	-2033.30	-3.22
Dead+Wind 60 deg - No Ice	43.78	27.11	-15.57	-2020.37	-3516.04	-1.68
Dead+Wind 90 deg - No Ice	43.78	31.26	-0.07	-6.78	-4055.98	0.31
Dead+Wind 120 deg - No Ice	43.78	27.04	15.46	2008.34	-3510.33	2.21
Dead+Wind 150 deg - No Ice	43.78	15.58	26.84	3485.11	-2023.40	3.52

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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+Wind 180 deg - No Ice	43.78	-0.07	31.03	4027.46	5.78	3.89
Dead+Wind 210 deg - No Ice	43.78	-15.69	26.91	3490.86	2033.45	3.21
Dead+Wind 240 deg - No Ice	43.78	-27.11	15.57	2018.28	3516.23	1.68
Dead+Wind 270 deg - No Ice	43.78	-31.26	0.07	4.65	4056.20	-0.30
Dead+Wind 300 deg - No Ice	43.78	-27.04	-15.46	-2010.51	3510.52	-2.20
Dead+Wind 330 deg - No Ice	43.78	-15.58	-26.84	-3487.28	2023.55	-3.52
Dead+Ice+Temp	70.06	0.00	0.00	-6.81	2.29	0.00
Dead+Wind 0 deg+Ice+Temp	70.06	0.01	-5.04	-725.66	1.41	-0.61
Dead+Wind 30 deg+Ice+Temp	70.06	2.54	-4.37	-629.87	-359.80	-0.62
Dead+Wind 60 deg+Ice+Temp	70.06	4.40	-2.53	-367.21	-623.97	-0.46
Dead+Wind 90 deg+Ice+Temp	70.06	5.07	-0.01	-8.04	-720.30	-0.18
Dead+Wind 120 deg+Ice+Temp	70.06	4.39	2.51	351.38	-623.00	0.15
Dead+Wind 150 deg+Ice+Temp	70.06	2.53	4.36	614.76	-358.12	0.44
Dead+Wind 180 deg+Ice+Temp	70.06	-0.01	5.04	711.52	3.36	0.61
Dead+Wind 210 deg+Ice+Temp	70.06	-2.54	4.37	615.73	364.57	0.62
Dead+Wind 240 deg+Ice+Temp	70.06	-4.40	2.53	353.07	628.74	0.46
Dead+Wind 270 deg+Ice+Temp	70.06	-5.07	0.01	-6.10	725.08	0.18
Dead+Wind 300 deg+Ice+Temp	70.06	-4.39	-2.51	-365.52	627.77	-0.15
Dead+Wind 330 deg+Ice+Temp	70.06	-2.53	-4.36	-628.90	362.89	-0.44
Dead+Wind 0 deg - Service	43.78	0.03	-12.12	-1579.00	-2.14	-1.54
Dead+Wind 30 deg - Service	43.78	6.13	-10.51	-1368.84	-796.36	-1.28
Dead+Wind 60 deg - Service	43.78	10.59	-6.08	-792.05	-1377.16	-0.68
Dead+Wind 90 deg - Service	43.78	12.21	-0.03	-3.31	-1588.78	0.11
Dead+Wind 120 deg - Service	43.78	10.56	6.04	786.02	-1374.93	0.86
Dead+Wind 150 deg - Service	43.78	6.08	10.49	1364.45	-792.49	1.39
Dead+Wind 180 deg - Service	43.78	-0.03	12.12	1576.84	2.33	1.54
Dead+Wind 210 deg - Service	43.78	-6.13	10.51	1366.69	796.55	1.28
Dead+Wind 240 deg - Service	43.78	-10.59	6.08	789.89	1377.36	0.68
Dead+Wind 270 deg - Service	43.78	-12.21	0.03	1.15	1588.98	-0.11
Dead+Wind 300 deg - Service	43.78	-10.56	-6.04	-788.18	1375.13	-0.86
Dead+Wind 330 deg - Service	43.78	-6.08	-10.49	-1366.62	792.69	-1.39

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	180 - 133.24	70.540	30	3.9929	0.0220
L2	136.932 - 87.6432	38.240	30	2.9441	0.0058
L3	92.5417 - 43.0729	16.089	36	1.7710	0.0035
L4	49.1172 - 0	4.246	36	0.8107	0.0013

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180'	ANT450F10	30	70.540	3.9929	0.0223	13943
170'	ANT150D3	30	62.535	3.7561	0.0165	6971
160'	BXA-171085-12BF w/ Mount Pipe	30	54.703	3.5171	0.0116	3484
134'	431-86A-01-T	30	36.385	2.8679	0.0056	1660
124'	APXVTM14-C-120 w/ Mount Pipe	30	30.519	2.6027	0.0055	1816
120'	6813	36	28.362	2.4953	0.0053	1888
100'	ANEMOMETER	36	19.023	1.9622	0.0041	2356
80'	BCD-80609-EDIN-3-INVERT	36	11.745	1.4662	0.0028	2543

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
63'	GPS A	36	7.046	1.0883	0.0019	2476

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 P/P _a
L1	180 - 133.24 (1)	TP25.5375x15x0.25	46'9-1/8"	0'	0.0	39.000	19.4053	-6.22	756.81	0.008
L2	133.24 - 87.6432 (2)	TP35.1887x24.2053x0.375	49'3-15/32"	0'	0.0	39.000	40.1378	-16.57	1565.37	0.011
L3	87.6432 - 43.0729 (3)	TP44.3577x33.3472x0.4375	49'5-5/8"	0'	0.0	39.000	59.1206	-27.55	2305.70	0.012
L4	43.0729 - 0 (4)	TP53x42.1374x0.5	49'1-7/16"	0'	0.0	39.000	69.7913	-31.80	2721.86	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} /F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} /F _{by}
L1	180 - 133.24 (1)	TP25.5375x15x0.25	474.51	48.739	39.000	1.250	0.00	0.000	39.000	0.000
L2	133.24 - 87.6432 (2)	TP35.1887x24.2053x0.375	1421.86	51.250	39.000	1.314	0.00	0.000	39.000	0.000
L3	87.6432 - 43.0729 (3)	TP44.3577x33.3472x0.4375	2586.93	50.100	39.000	1.285	0.00	0.000	39.000	0.000
L4	43.0729 - 0 (4)	TP53x42.1374x0.5	2891.97	45.982	39.000	1.179	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f _v ksi	Allow. F _v ksi	Ratio f _v /F _v	Actual T kip-ft	Actual f _{vt} ksi	Allow. F _{vt} ksi	Ratio f _{vt} /F _{vt}
L1	180 - 133.24 (1)	TP25.5375x15x0.25	14.86	0.766	26.000	0.059	1.55	0.077	26.000	0.003
L2	133.24 - 87.6432 (2)	TP35.1887x24.2053x0.375	25.12	0.626	26.000	0.048	0.00	0.000	26.000	0.000
L3	87.6432 - 43.0729 (3)	TP44.3577x33.3472x0.4375	28.44	0.481	26.000	0.037	0.40	0.004	26.000	0.000
L4	43.0729 - 0 (4)	TP53x42.1374x0.5	29.32	0.420	26.000	0.032	0.37	0.003	26.000	0.000

tnxTower Pier Structural Engineering Corp. 198-55 Northfield Drive East Waterloo, Ontario Phone: 519 885 3806 FAX: 519 884 3806	Job PSEC 11653 (for SPRINT PCS)	Page 13 of 13
	Project 841293 - KENT-BULLS BRIDGE ROAD	Date 14:57:03 07/02/14
	Client CROWN CASTLE	Designed by nsmitiuch

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P	Ratio f_{bx}	Ratio f_{by}	Ratio f_v	Ratio f_{vt}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_a	F_{bx}	F_{by}	F_v	F_{vt}			
L1	180 - 133.24 (1)	0.008	1.250	0.000	0.059	0.003	1.259 ✓	1.333	H1-3+VT ✓
L2	133.24 - 87.6432 (2)	0.011	1.314	0.000	0.048	0.000	1.325 ✓	1.333	H1-3+VT ✓
L3	87.6432 - 43.0729 (3)	0.012	1.285	0.000	0.037	0.000	1.297 ✓	1.333	H1-3+VT ✓
L4	43.0729 - 0 (4)	0.012	1.179	0.000	0.032	0.000	1.191 ✓	1.333	H1-3+VT ✓

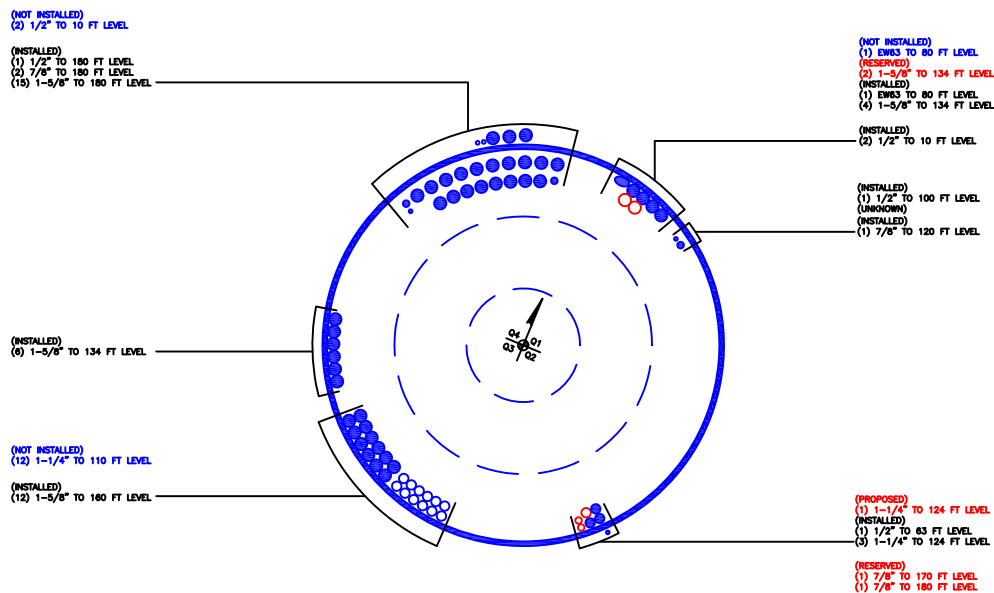
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF* P_{allow} K	% Capacity	Pass Fail
L1	180 - 133.24	Pole	TP25.5375x15x0.25	1	-6.22	1008.82	94.4	Pass
L2	133.24 - 87.6432	Pole	TP35.1887x24.2053x0.375	2	-16.57	2086.64	99.4	Pass
L3	87.6432 - 43.0729	Pole	TP44.3577x33.3472x0.4375	3	-27.55	3073.50	97.3	Pass
L4	43.0729 - 0	Pole	TP53x42.1374x0.5	4	-31.80	3628.24	89.3	Pass
Summary								
Pole (L2)							99.4	Pass
RATING =							99.4	Pass

APPENDIX B
BASE LEVEL DRAWING



TX LINE LAYOUT



Clients



Professional Stamp

Revisions

No.	Description	Date
A	ISSUED FOR REVIEW	7.2.14

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO THE CLIENT NAMED IS STRICTLY PROHIBITED

Engineering Firm
P-SEC
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 WATERLOO, ON N2K 3T6
 ph: 519-885-3806
 fx: 519-886-0076
 www.p-sec.ca

PSEC Job No. 11653

Site Name 841293 KENT-BULLS BRIDGE ROAD

Site Design

Sheet Title TX LINES

Drawn by NWS	Sheet A-1
Checked by	
Approved By	

APPENDIX C
ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#:	841293
Site Name:	KENT-BULLS BRIDGE RO
App #:	248832 Rev.1
Pole Manufacturer:	Other

Reactions		
Moment:	3485.2	ft-kips
Axial:	37.81	kips
Shear:	26.64	kips

Anchor Rod Data

Qty:	20	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	60	in

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

Anchor Rod Results

Maximum Rod Tension: 137.5 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 70.5% **Pass**

Rigid
Service ASD
Fty*ASIF

Plate Data

Diam:	68	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.41	in

Base Plate Results

Base Plate Stress: 43.9 ksi
 Allowable Plate Stress: 60.0 ksi
 Base Plate Stress Ratio: 73.1% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length:
28.12

Stiffener Data (Welding at both sides)

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

n/a

Stiffener Results

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

Pole Results

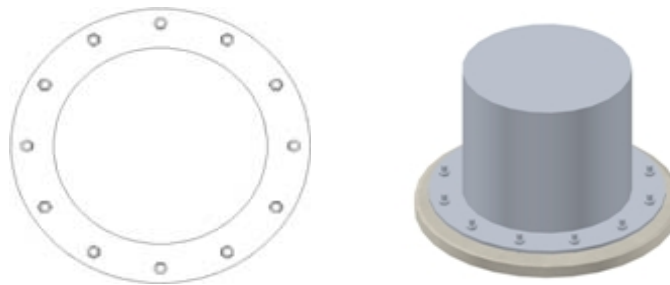
Pole Punching Shear Check: n/a

Pole Data

Diam:	53	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None


Stress Increase Factor

ASIF:	1.333
-------	-------



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

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

	55 Northfield Drive E Waterloo, ON N2K 3T6 Ph: 519-496-3806 Fx: 519-886-0076	Job 11653	Page 1 of 1
		Project 841293 - KENT-BULLS BRIDGE ROAD	Date 02/07/2014 15:52
		Client CROWN CASTLE	Design MLP

MONOPOLE MOMENT DISTRIBUTION & ROD CAPACITY

Design / Analysis in Accordance to TIA-222-F

ALLOWABLE BASE LOADS

Bottom Width:	53.000 in
Moment:	4056.00 k-ft
Axial:	44.00 kips
Shear:	31.00 kips

EXISTING ANCHOR BOLT PROPERTIES

Bolt Type	#18J ASTM A615		
	Fy	75.0	ksi
	Fu	100.0	ksi
Bolt Diameter	2.250 in		
# of Bolts	20	AG=	3.976
Bolt Circle	60.000 in	AE=	3.248

PROPOSED ANCHOR BOLT PROPERTIES

Bolt Type	F1554		
	Fy	105.0	ksi
	Fu	125.0	ksi
Bolt Diameter	1.750 in		
# of Bolts	4	AG=	2.405
Bolt Circle	71.000 in	AE=	1.899

RESULTS

EXISTING ANCHOR BOLTS

Anchor Bolt Force (C)	141.3	kips
Anchor Bolt Force (T)	137.5	kips
Anchor Bolt Capacity (Fy)	194.9	kips
Stress Ratio	70.6%	

Passes

PROPOSED ANCHOR BOLTS

Anchor Bolt Force (C)	98.0	kips
Anchor Bolt Force (T)	94.9	kips
Anchor Bolt Capacity (Fy)	132.3	kips
Stress Ratio	71.8%	

Passes

CALCULATIONS:

lb (existing) = **9000.0** in²
 AG (existing) = **3.976** in² - Gross Area
 AE (existing) = **3.248** in² - Net Area

lb (proposed) = **2520.5** in²
 AG (proposed) = **2.405** in²
 AE (proposed) = **1.899** in²

I (existing) = **35784.7** in⁴ - Gross Area
 I (existing) = **29229.2** in⁴ - Net Area

I (proposed) = **6062.5** in⁴ - Gross Area
 I (proposed) = **4787.6** in⁴ - Net Area

[GROSS] **85.5%** I (total) = **41847.2** in⁴ - Gross Area
 [NET] **85.9%** I (total) = **34016.8** in⁴ - Net Area

14.5%
14.1%

USED (AS REPRESENTS ACTUAL)

M (existing) = **3485.2** k-ft [MOMENT]
 A (existing) = **37.81** kips [AXIAL]
 S (existing) = **26.64** kips [SHEAR]

M (existing) = **570.8** k-ft
 A (existing) = **6.19** kips
 S (existing) = **4.36** kips

M = **41822** k-in
 y = **30** in
 lb = **9000** in⁴
 P = **37.81** kips
 n = **20**

M = **6850** k-in
 y = **35.5** in
 lb = **2521** in⁴
 P = **6.19** kips
 n = **4**

0.43 Fu - 1.8 fv ≤ 0.33 Fu [COMBINED FORMULA]
 fv = **0.33** ksi
 Ft = **33.00** ksi
 All T = **131.21** kips
 Max T = **174.95** kips

0.43 Fu - 1.8 fv ≤ 0.33 Fu
 fv = **0.45** ksi
 Ft = **41.25** ksi
 All T = **99.22** kips
 Max T = **132.29** kips

*****USED AS CAPACITY*****

ABFT = **137.52** kips [My/lb - P/n]
 ABFc = **141.30** kips [My/lb + P/n]

ABFT = **94.93** kips ALLOWABLE TENSION FORCE
 ABFc = **98.03** kips ALLOWABLE COMPRESSION FORCE

Ta = **194.86** kips [0.60AEFy(4/3)]
 Ta = **174.95** kips [0.33AGFu(4/3)]
 Ta = **194.86** kips [0.45AEFu(4/3)]

Ta = **159.55** kips OTHER FORMULAS
 Ta = **132.29** kips
 Ta = **142.46** kips [#18J ASTM A615 SPECIAL CASE]

P-SEC

 * CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc. 1993-2011 *

Project Title: 84in Caisson (7'-0")
 Project Notes: 841293 - KENT-BULLS BRIDGE ROAD

Calculation Method: Full 8CD

***** I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	1.00	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.00	0.00	130.0			
2	Sand	11.00	3.00	135.0	4.599	40.00	
3	Sand	4.00	14.00	145.0	5.045	42.00	
4	Sand	5.00	18.00	160.0	5.550	44.00	

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
4056.0	44.0	31.00	2.00

***** R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
20.500	118.340	1143.3	3075.0	4218.3

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	1.00	3.00	130.0			0.00	2.50
Sand	4.00	11.00	135.0	4.599	1203.13	10.70	
Sand	15.00	0.56	145.0	5.045	113.48	15.28	
Sand	15.56	3.44	145.0	5.045	-804.00	17.34	
Sand	19.00	1.50	160.0	5.550	-450.17	19.76	

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	62.4	8231.1	31.2	4115.5
2.05	62.4	8359.1	31.2	4179.5
4.10	58.6	8486.9	29.3	4243.4
6.15	-48.7	8506.4	-24.3	4253.2
8.20	-210.8	8249.9	-105.4	4124.9
10.25	-427.6	7604.9	-213.8	3802.4
12.30	-699.3	6459.2	-349.6	3229.6
14.35	-1025.7	4700.4	-512.9	2350.2
16.40	-1074.5	2347.4	-537.2	1173.7
18.45	-590.9	629.4	-295.5	314.7
20.50	0.0	0.0	0.0	0.0

P-SEC

 * CAISSON - Pier Foundations Analysis and Design - Copyright Power Line Systems, Inc. 1993-2011 *

Project Title: 84in Caisson (7'-0")
 Project Notes: 841293 - KENT-BULLS BRIDGE ROAD
 Calculation Method: Full 8CD
 ***** I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	1.00	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	3.00	0.00	130.0			
2	Sand	11.00	3.00	135.0	4.599	5.045	40.00
3	Sand	4.00	14.00	145.0	5.045	5.550	42.00
4	Sand	5.00	18.00	160.0	5.550		44.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
4056.0	44.0	31.00	2.10

***** R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	Pressure Due To Axial Load (psf)	Pressure Due To Weight (psf)	Total End-Bearing Pressure (psf)
21.000	121.226	1143.3	3150.0	4293.3

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	1.00	3.00	130.0			0.00	2.50
Sand	4.00	11.00	135.0	4.599	5.045	1203.13	10.70
Sand	15.00	0.95	145.0	5.045	5.045	194.98	15.48
Sand	15.95	3.05	145.0	5.045	5.045	-722.50	17.52
Sand	19.00	2.00	160.0	5.550	5.550	-609.56	20.02

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	66.1	8970.6	31.5	4271.7
2.10	66.1	9109.3	31.5	4337.8
4.20	58.3	9247.3	27.7	4403.5
6.30	-55.1	9260.7	-26.2	4409.8
8.40	-225.9	8975.7	-107.6	4274.2
10.50	-454.2	8271.7	-216.3	3938.9
12.60	-740.0	7027.8	-352.4	3346.6
14.70	-1083.3	5123.4	-515.9	2439.7
16.80	-1144.6	2565.2	-545.0	1221.5
18.90	-635.5	684.2	-302.6	325.8
21.00	0.0	-0.0	0.0	-0.0

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#: 841293
 Site Name: KENT-BULL BRIDGE ROAD
 App #: 248832 Rev.1

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=	4
Vert. Cage Diameter =	6.13 ft
Vert. Cage Diameter =	73.59 in
Vertical Bar Size =	11
Bar Diameter =	1.41 in
Bar Area =	1.56 in ²
Number of Bars =	42
As Total=	65.52 in ²
A s/ Aconc, Rho:	0.0118 1.18%

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

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

$$200 / Fy = 0.0033$$

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	1.18%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = ($\phi=0.65$) Pn.		
Pn per ACI 318 (10-2)	9305.73	kips
at Mu=($\phi=0.65$)Mn=	5557.54	ft-kips
Max Tu, ($\phi=0.9$) Tn =	3538.08	kips
at Mu= $\phi=(0.90)$ Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	4253.2	ft-kips (* Note)
Max. Service Shaft P:	44	kips
Max Axial Force Type:	Comp.	

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

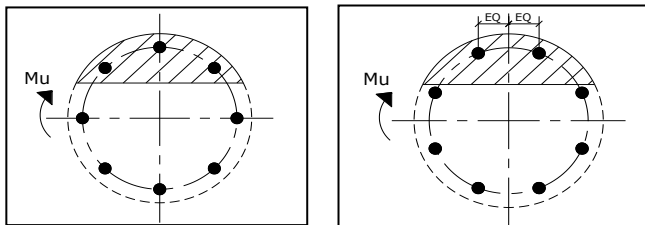
Load Factor	Shaft Factored Loads	
1.30	Mu:	5529.16 ft-kips
1.30	Pu:	57.2 kips

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=	2005	
Seismic Properties		
Seismic Design Category =	D	
Seismic Risk =	High	

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

Results:

Governing Orientation Case: 1



Case 1

Case 2

Dist. From Edge to Neutral Axis: 18.94 in

Extreme Steel Strain, ϵ_t : 0.0095

$\epsilon_t > 0.0050$, Tension Controlled

Reduction Factor, ϕ : 0.900

Output Note: Negative Pu=Tension
 For Axial Compression, ϕ Pn = Pu: 57.20 kips
 Drilled Shaft Moment Capacity, ϕ Mn: 9509.84 ft-kips
 Drilled Shaft Superimposed Mu: 5529.16 ft-kips

(Mu/ ϕ Mn, Drilled Shaft Flexure CSR: 58.1%

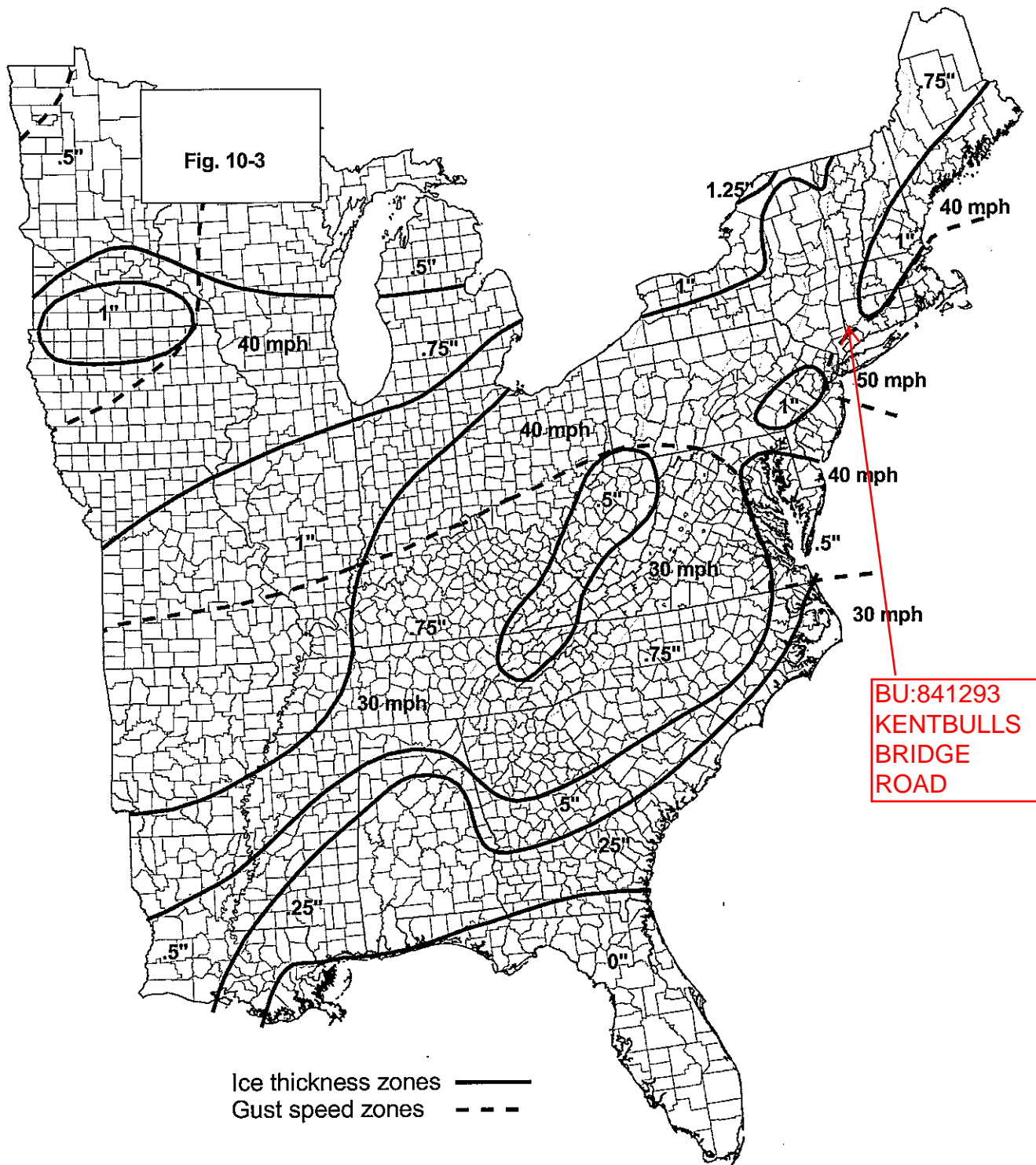


FIGURE 10-2 (continued) 50-YEAR MEAN RECURRENCE INTERVAL UNIFORM ICE THICKNESSES DUE TO FREEZING RAIN WITH CONCURRENT 3-SECOND GUST SPEEDS: CONTIGUOUS 48 STATES.

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

Sprint Existing Facility

Site ID: CT33XC101

Forest City / SNET @ Kent School

136 Bulls Ridge Road
Kent, CT 06785

September 19, 2014

EBI Project Number: 62144690

September 19, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT33XC101 - Forest City / SNET @ Kent School

Site Total: 79.92% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at **136 Bulls Ridge Road, Kent, 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 **136 Bulls Ridge Road, Kent, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

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

- 1) 2 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 minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

- 6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. 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 APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerline for the proposed antennas is **124 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	CT33XC101 - Forest City / SNET @ Kent School
Site Address	136 Bulls Ridge Road, Kent, CT, 06785
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 (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	124	118	1/2 "	0.5	0	138.69	0.36%
1a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	124	118	1/2 "	0.5	0	39.00	0.18%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	124	118	1/2 "	0.5	0	138.69	0.63%
Sector total Power Density Value:																1.17%

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 (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	124	118	1/2 "	0.5	0	138.69	0.36%
2a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	124	118	1/2 "	0.5	0	39.00	0.18%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	124	118	1/2 "	0.5	0	138.69	0.63%
Sector total Power Density Value:																1.17%

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 (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	124	118	1/2 "	0.5	0	138.69	0.36%
3a	RFS	APXVSP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	124	118	1/2 "	0.5	0	39.00	0.18%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	124	118	1/2 "	0.5	0	138.69	0.63%
Sector total Power Density Value:																1.17%

Site Composite MPE %	
Carrier	MPE %
Sprint	3.50%
AT&T	9.92%
Nextel	12.57%
CT State Police	40.29%
WMNR	2.59%
Verizon Wireless	11.05%
Total Site MPE %	79.92%

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 **3.50% (1.17% from sector 1, 1.17% from sector 2 and 1.17% from sector 3)** 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 **79.92%** 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.



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