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

September 11, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 841290**
Sprint PCS Site ID: CT03XC342
Located at: 363 Riversville Road, Greenwich, CT 06831

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. Peter Tesei, First Selectman for Town of Greenwich, and Greenwich Council Boy Scouts of America, Property Owner.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **363 Riversville Road, Greenwich, CT 06831**. 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.

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,

Raymond Perry
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. Peter Tesei, First Selectman
Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

Greenwich Council Boy Scouts of America
63 Mason Street
Greenwich, CT 06830

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:

CT03XC342

SITE NAME:

BOY SCOUTS/SNET

SITE ADDRESS:

363 RIVERSVILLE ROAD
GREENWICH, CT 06831

CROWN ID#: 841290

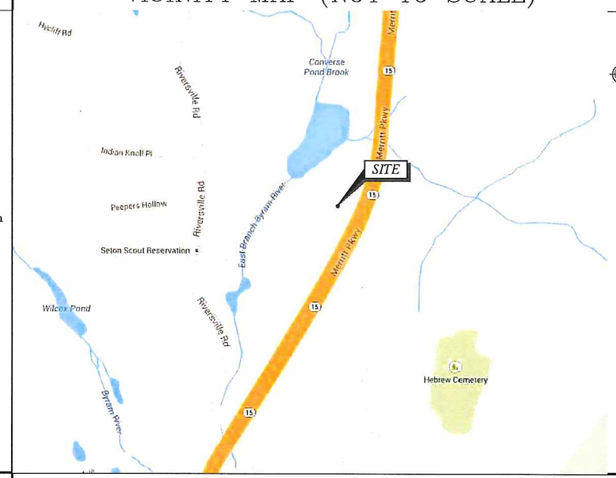
CROWN SITE NAME: GREENWICH NORTH

SHEET INFORMATION

SITE NUMBER:	CT03XC342
SITE NAME:	BOY SCOUTS/SNET
SITE ADDRESS:	363 RIVERSVILLE ROAD GREENWICH, CT 06831
COUNTY:	FAIRFIELD
COORDINATES: (NAD 83)	41° 3' 58.6" N 73° 40' 17.4" W
GROUND ELEV:	220'± AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	160'-0"± AGL
STRUCTURE RAD CENTER:	122'-0"± AGL
ZONING CLASSIFICATION:	PA-490
MAP-BLOCK-LOT:	10-4035

LANDLORD:	CROWN CASTLE USA 2000 CORPORATE DRIVE CANONSBURG, PA
LOCAL POWER COMPANY:	CONNECTICUT LIGHT AND POWER CONTACT CUSTOMER SERVICE (800) 286-2000
APPLICANT:	SPRINT 6580 SPRINT PARKWAY OVERLAND PARK, kANSAS 66251
ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 JQuicksell@tectonicengineering.com
SPRINT CM:	GARY WOOD (860) 940-9168 gary.wood@sprint.com
CROWN CM:	JASON D'AMICO (860) 209-0104 jason.d'amico@crowncastle.com
AAV:	FIBERTECH

VICINITY MAP (NOT TO SCALE)



SHEET INDEX

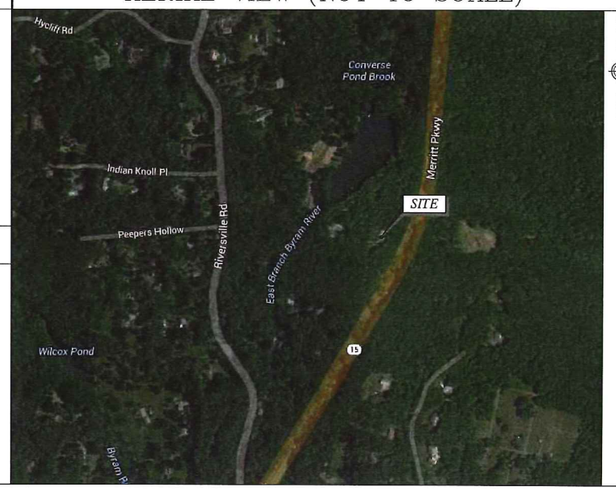
GENERAL NOTES

1. 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.
2. 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.
3. 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.

PROJECT DESCRIPTION

1. (1) NEW 2.5 EQUIPMENT RACK INSIDE EXIST MMBTS CABINET.
2. (3) NEW RFS APXVTM14-C-120 ANTENNAS.
3. (3) NEW TD-RRH8x20-25 RRH.
4. (1) NEW 5/8" FIBER CABLE.

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: _____

Sprint
2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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

SUBMITTALS

PROJECT NO: 7225.CT03XC342

NO	DATE	DESCRIPTION	BY
0	07/02/14	FOR COMMENT	MP
1	07/28/14	FOR CONSTRUCTION	MP
2	08/01/14	PER COMMENTS	MP

DATE	REVIEWED BY
8/1/14	JMQ

SEAL

STATE OF CONNECTICUT
ANJUKUMAR PATEL
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

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. AC1–301 – 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 FINS 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

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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

SUBMITTALS

PROJECT NO: 7225.CT03XC342

NO	DATE	DESCRIPTION	BY
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DATE	REVIEWED BY
8/1/14	JMG

SEAL

STATE OF CONNECTICUT
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
383 RIVERSVILLE ROAD
GREENWICH, CT 06831

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 QOTHER 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.

8. 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.

I. 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
—OHT—OHT—OHT—OHT—OHT—	OVERHEAD WIRE
——— — — ———	PROPERTY LINE
—X———X———X———	CHAIN LINK FENCE
A–1	ANTENNA MARK
(E)	EXISTING
(P)	PROPOSED DETAIL
DET # / SHT #	REFERENCE
	SURFACE ELEVATION

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

PROJECT NO: 7225.CT03XC342

NO	DATE	DESCRIPTION	BY
0	07/02/14	FOR COMMENT	MP
1	07/28/14	FOR CONSTRUCTION	MP
2	08/01/14	PER COMMENTS	MP

DATE	REVIEWED BY
8/11/14	JMG

STATE OF CONNECTICUT MANOUKIAN BRIAN J. No. 22008 LICENSED PROFESSIONAL ENGINEER
SEAL

SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

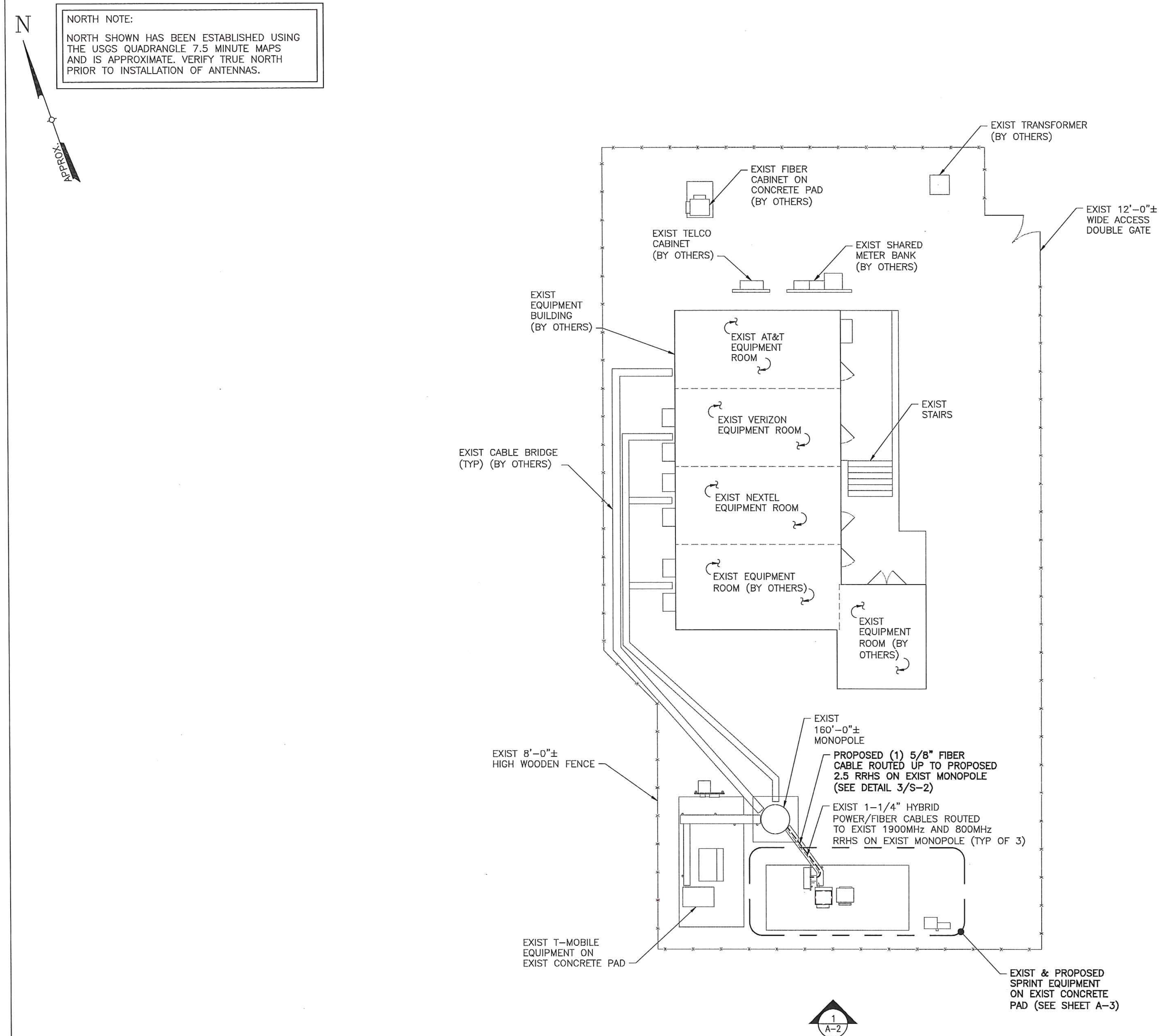
SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

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/A-1 SITE PLAN

SCALE: 1/8" = 1'-0"

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PROJECT NO: 7225.CT03XC342

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1	07/28/14	FOR CONSTRUCTION	MP
2	08/01/14	PER COMMENTS	MP

DATE	REVIEWED BY
8/1/14	JMG

STATE OF CONNECTICUT
No. 22038
LICENSED
PROFESSIONAL ENGINEER

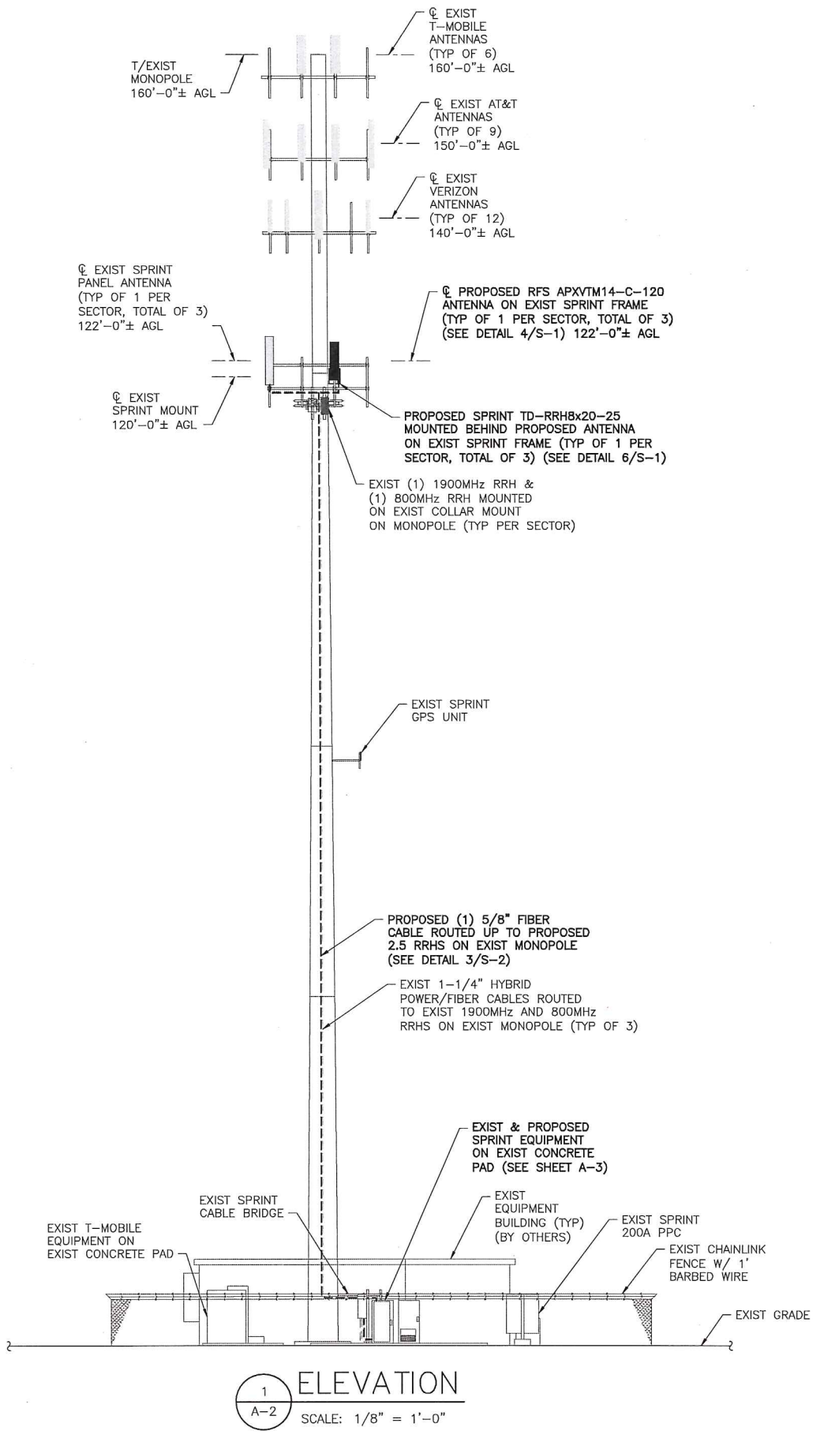
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
SITE PLAN

SHEET NO:
A-1

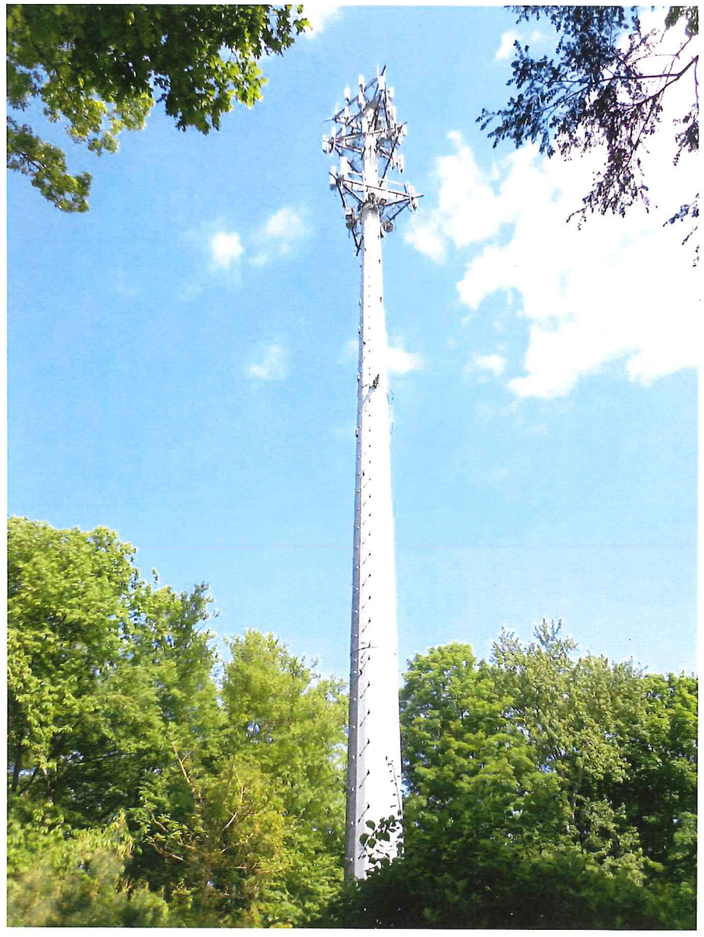


1/A–2 ELEVATION

SCALE: 1/8" = 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 07/28/14.



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8/7/14	JMQ

SEAL

STATE OF CONNECTICUT
SHOUKUMAR SINHA
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

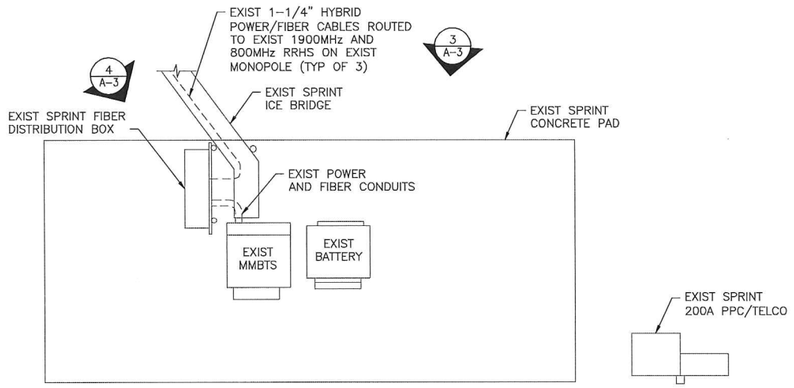
SHEET TITLE:
ELEVATION

SHEET NO:
A–2

N

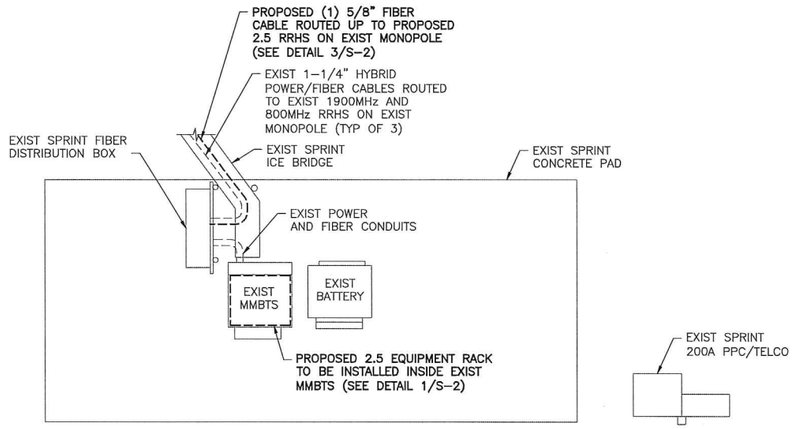
NORTH NOTE:

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 A-3 ENLARGED EQUIPMENT LAYOUT PLAN (EXIST)

SCALE: 3/8" = 1'-0"



2 A-3 ENLARGED EQUIPMENT LAYOUT PLAN (FINAL)

SCALE: 3/8" = 1'-0"

3 A-3 EXIST EQUIPMENT PAD

SCALE: NTS

4 A-3 EXIST FIBER DISTRIBUTION BOX

SCALE: NTS

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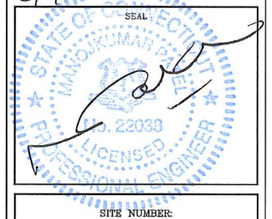
SEAL



SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

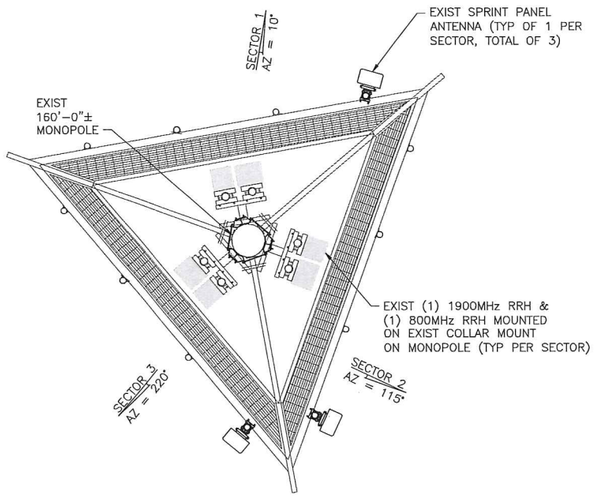
SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
A-3

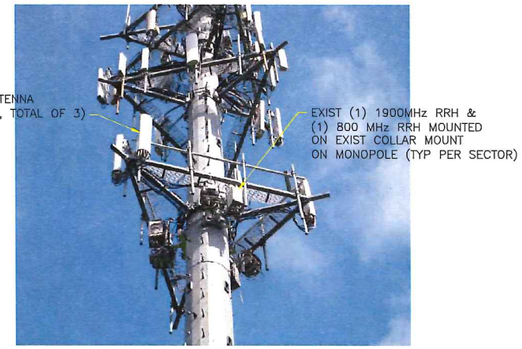
N

APPROX.



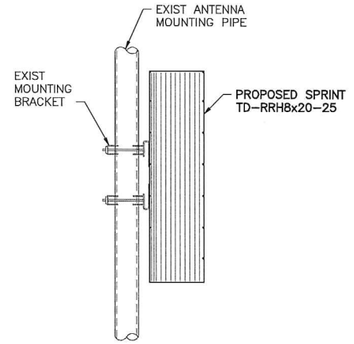
1 / A-4 ANTENNA LAYOUT PLAN (EXIST)

SCALE: 3/8" = 1'-0"



2 / A-4 ANTENNA LAYOUT PLAN (FINAL)

SCALE: 3/8" = 1'-0"



3 / A-4 RRH MOUNTING DETAIL

SCALE: 1 1/2" = 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 07/28/14.

ANTENNA DATA

Status	Exist	Proposed
Antenna Manufacturer	RFS-CEL WAVE	**RFS-CEL WAVE**
Antenna Model Number	APXVSPP18C-A20	**APXVTM14-C-120**
Number of Antennas	3	**3**
Antenna RAD Center	122'	**122'**
Antenna Azimuth	10/115/220	**10/115/220**
Antenna RRH Model Number	1900MHz/800MHz RRHS	**2.5GHz RRH-V3**
Number of RRH	6	**3**

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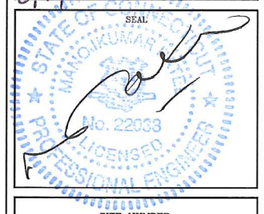
DATE	REVIEWED BY
8/1/14	JMG



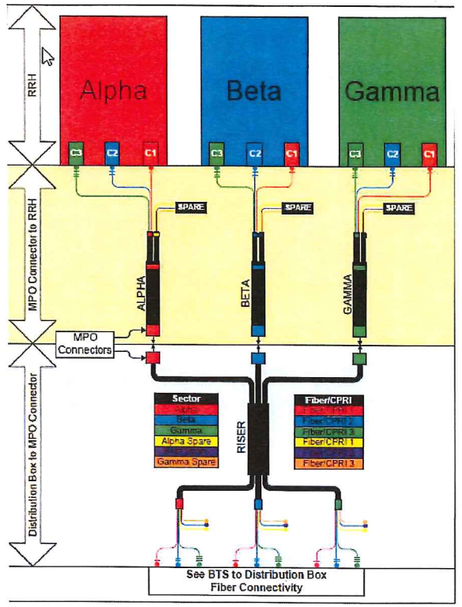
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

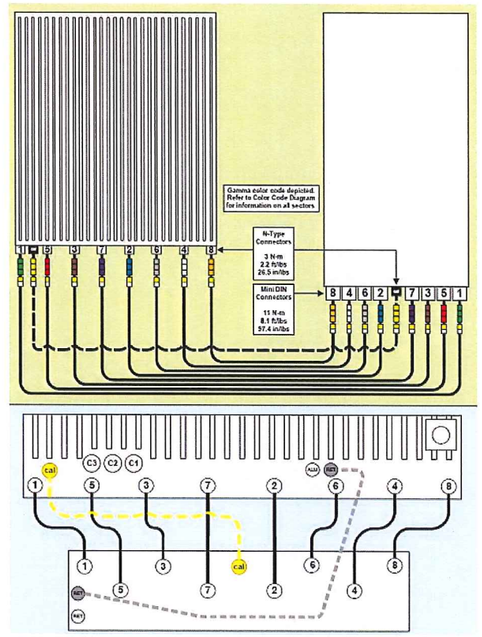
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



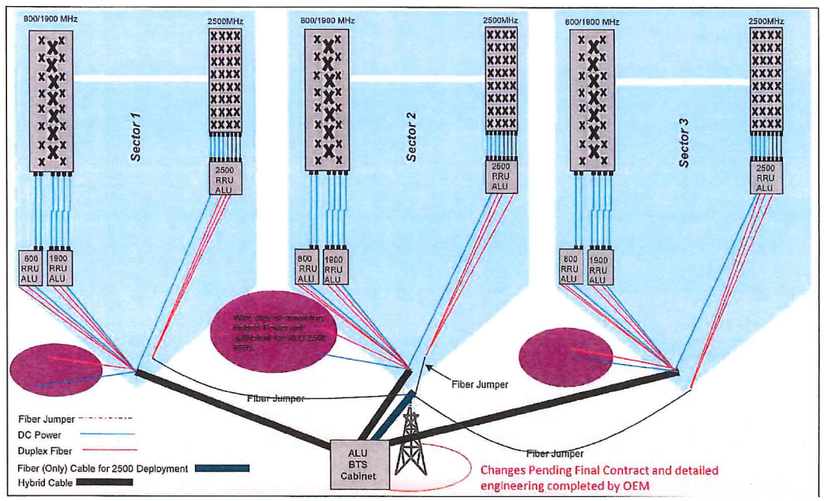
1 / A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



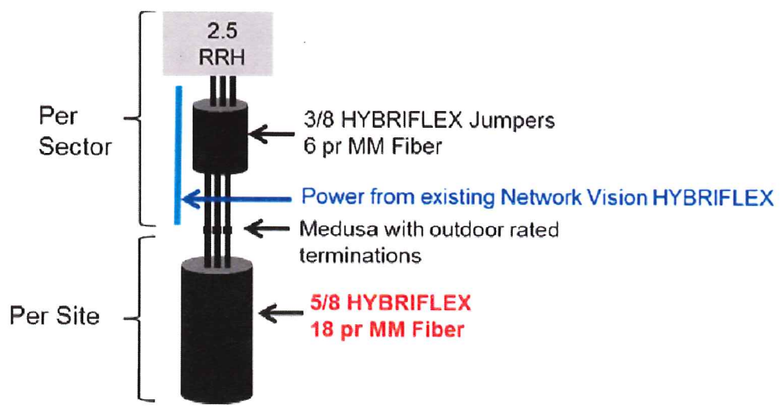
2 / A–5 RRH CONNECTIVITY

SCALE: N.T.S.



3 / A–5 RAN WIRING

SCALE: N.T.S.



4 / A–5 CABLE SCENARIO

SCALE: N.T.S.

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SUBMITTALS

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DATE	REVIEWED BY
8/1/14	JMQ

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22039
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

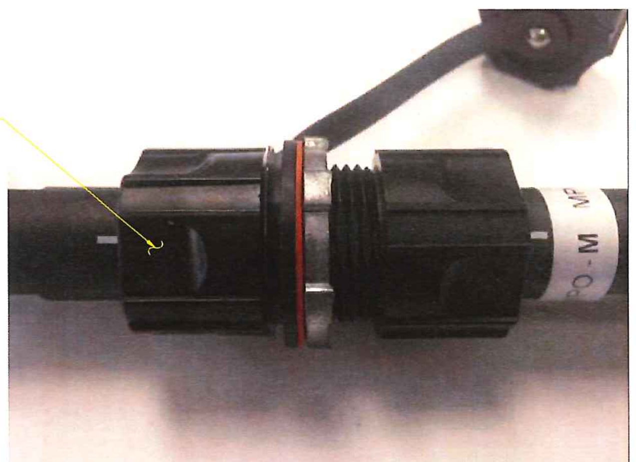
SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
RAN WIRING DIAGRAM

SHEET NO:
A–5

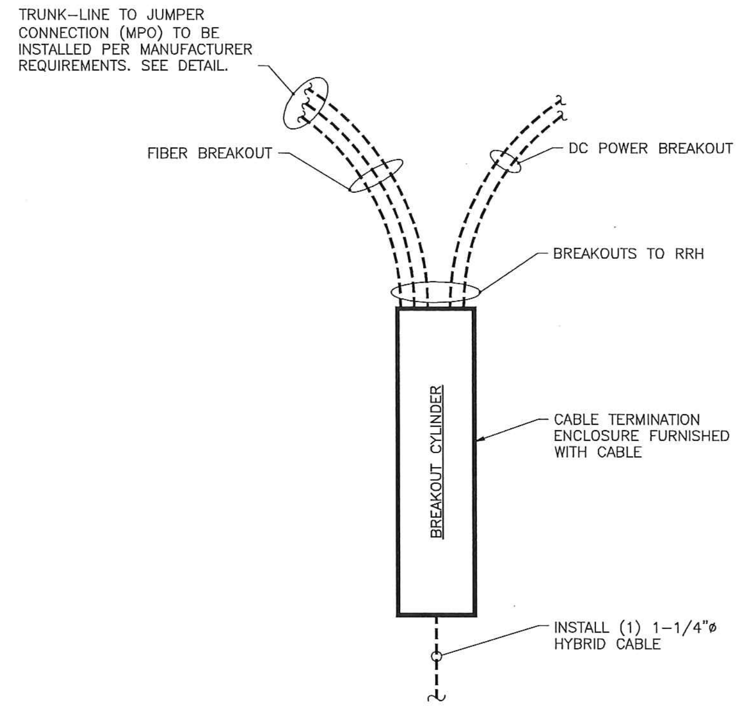
IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION

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

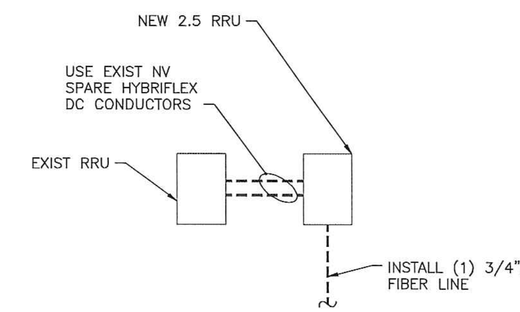


1 / A-6 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS

SCALE: N.T.S.



2.5 HYBRID CABLE W/FIBER & DC FEEDERS



FIBER ONLY TRUNK LINES

2 / A-6 TRUNK LINE DETAILS (TYPICAL)

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 CORDED 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.

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2.5 EQUIPMENT DEPLOYMENT

6580 SPRINT PARKWAY
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SUBMITTALS

PROJECT NO: 7225.CT03XC342

NO	DATE	DESCRIPTION	BY
0	07/02/14	FOR COMMENT	MP
1	07/28/14	FOR CONSTRUCTION	MP
2	08/01/14	PER COMMENTS	MP

DATE	REVIEWED BY
8/1/14	JMQ

SEAL

STATE OF CONNECTICUT · LICENSED PROFESSIONAL ENGINEER · No. 22038

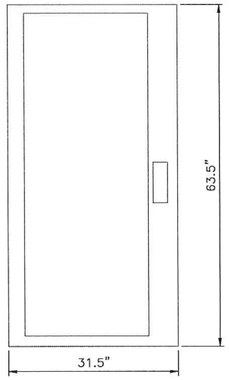
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
CABLE DETAILS

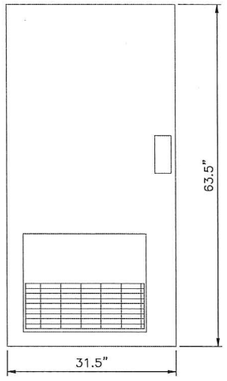
SHEET NO:
A-6



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

1 S-1 (EXIST) MMBTS CABINET

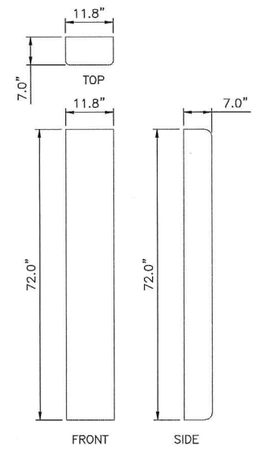
SCALE: 1" = 1'-0"



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

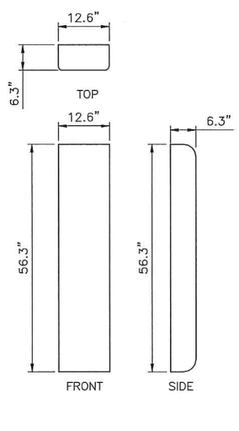
2 S-1 (EXIST) BATTERY CABINET

SCALE: 1" = 1'-0"



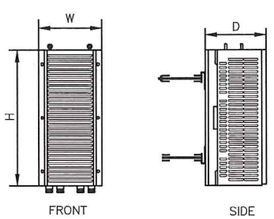
3 S-1 (EXIST) ANTENNA DETAIL

SCALE: 3/4" = 1'-0"

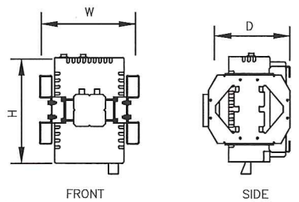


4 S-1 (PROPOSED) ANTENNA DETAIL

SCALE: 3/4" = 1'-0"



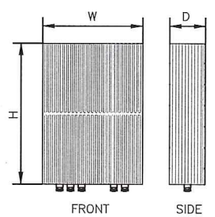
TYPE:	1900 MHz 4x45W
MODEL #:	RRH 1900 4X45 65MHz
HEIGHT:	25.0"
WIDTH:	11.1"
DEPTH:	11.4"
WEIGHT:	±60 LBS.



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

5 S-1 (EXIST) RRH DETAIL

SCALE: 1 1/2" = 1'-0"



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

6 S-1 (PROPOSED) RRH DETAIL

SCALE: 1" = 1'-0"

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8/1/14	JMQ

SEAL

STATE OF CONNECTICUT — JOSEPH M. QUINN — No. 22033 — LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC342

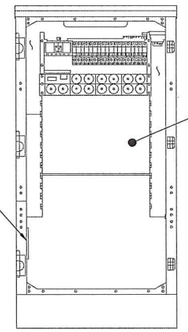
SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NO:
S-1

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.



FRONT ELEVATION
(CABINET INTERIOR)

1 S–2 MMBTS INTERIOR DETAIL

SCALE: N.T.S.

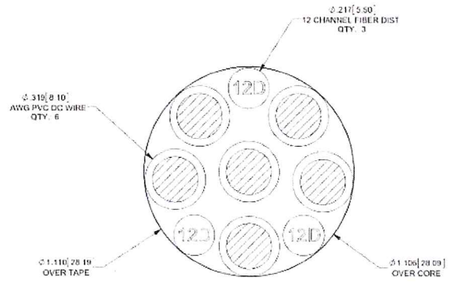
RFS HYBRIFLEX RISER CABLES SCHEDULE

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 6 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

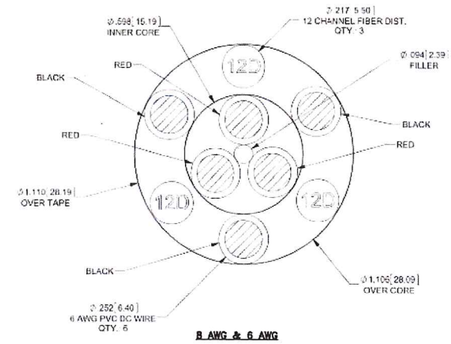
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

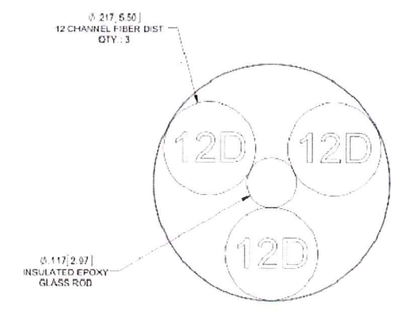
HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG

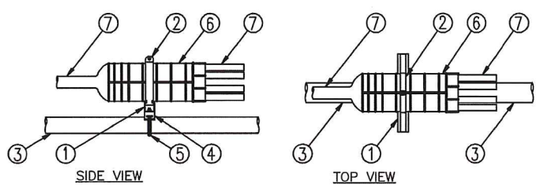


FIBER ONLY

3 S–2 2.5 HYBRID CABLE X–SECTION AND DATA

SCALE: NTS

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.



2 S–2 MEDUSA HEAD DETAIL

SCALE: NTS

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DATE	REVIEWED BY
8/1/14	JMG

SEAL
STATE OF CONNECTICUT
JOSEPH M. GRAVELLE
No. 22003
LICENSED PROFESSIONAL ENGINEER

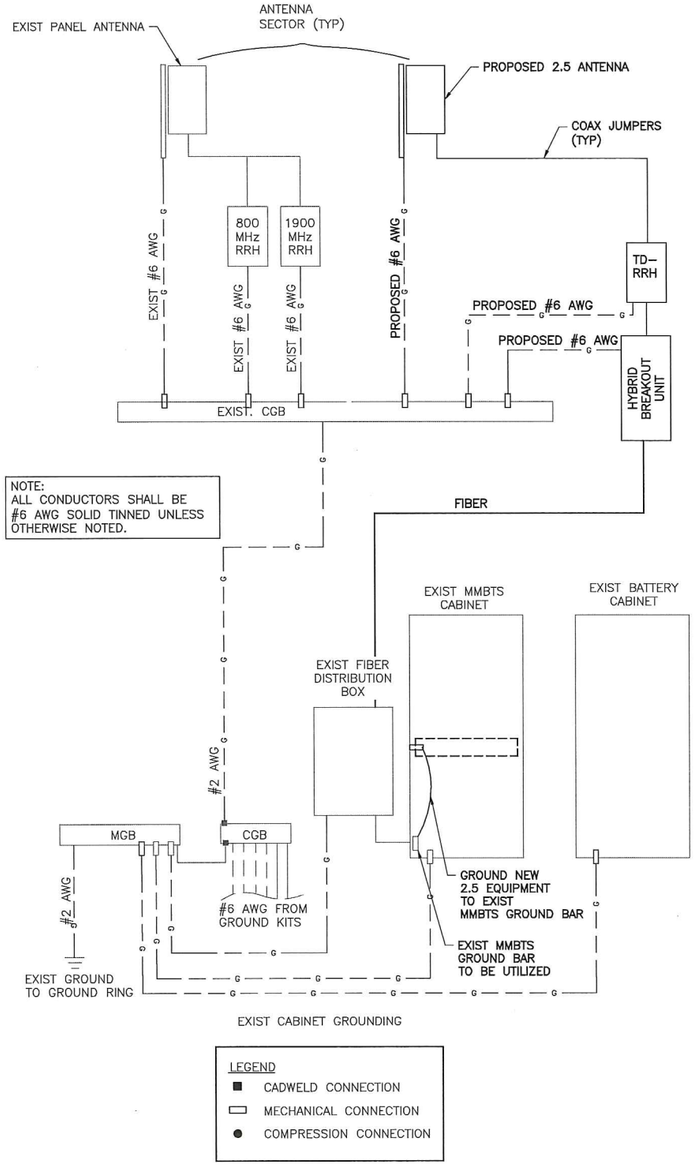
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

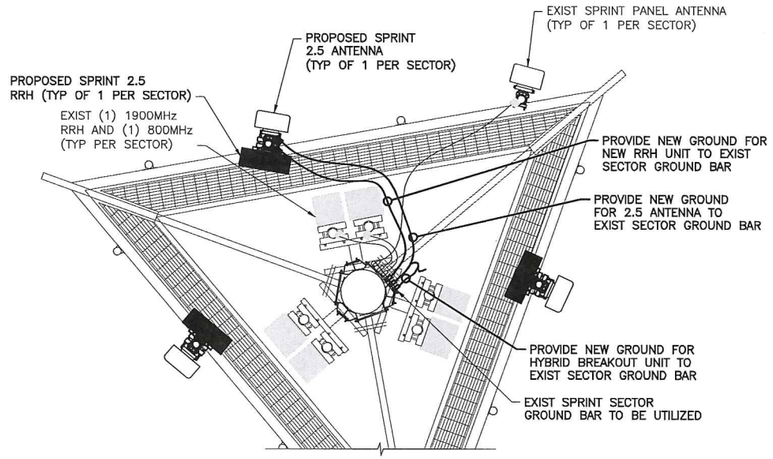
SHEET TITLE:
EQUIPMENT SCHEMATIC DETAILS

SHEET NO:
S–2



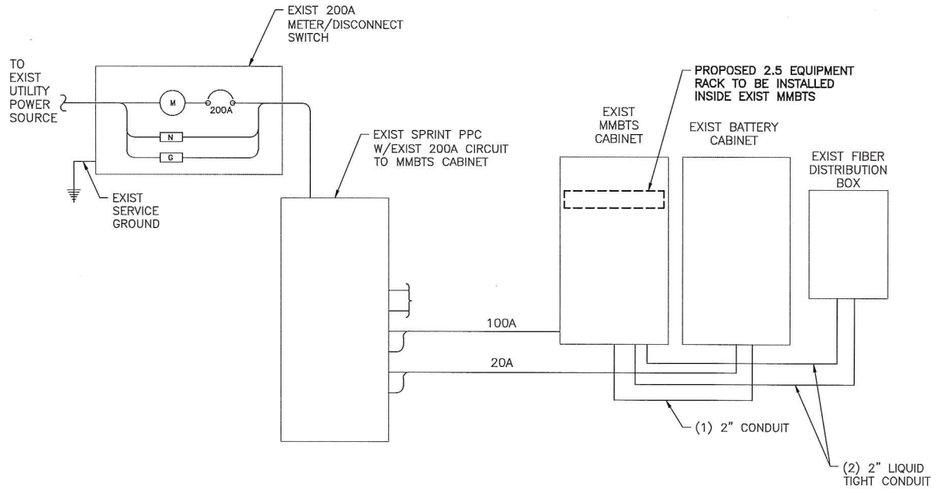
1 / E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 / E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS



3 / E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

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DATE	REVIEWED BY
8/11/14	JMO

SEAL
STATE OF CONNECTICUT
No. 22023
LICENSED PROFESSIONAL ENGINEER

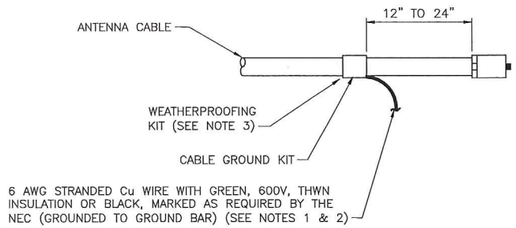
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

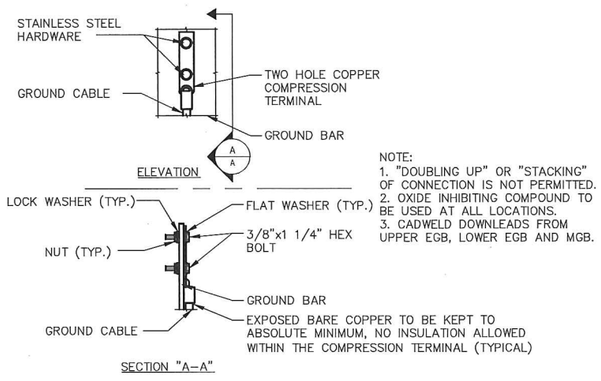
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

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 E-2 CABLE GROUNDING KIT DETAIL

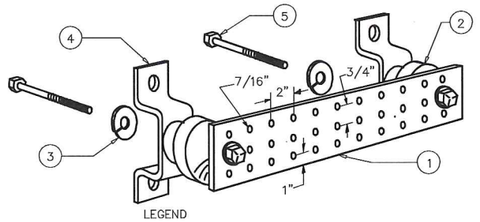
SCALE: N.T.S.



NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

2 E-2 GROUNDING BAR CONN. DETAIL

SCALE: NTS



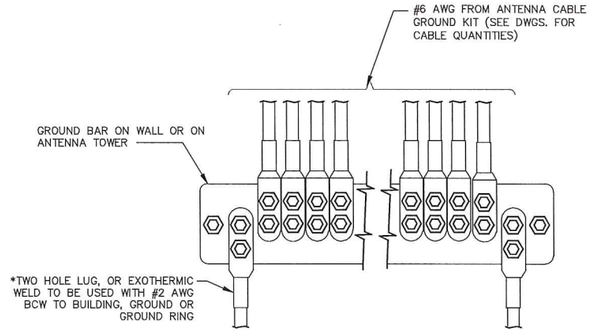
LEGEND

1– COPPER TINNED GROUND BAR, 1/4"X 4"X 20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2– INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4 OR EQUAL
3– 5/8" LOCKWASHERS OR EQUAL
4– WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056 OR EQUAL
5– 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 E-2 GROUNDING BAR DETAIL

SCALE: NTS



* – 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 E-2 ANTENNA GROUND BAR DETAIL

SCALE: NTS

GROUNDING NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250–GROUNDING AND BONDING.
2. ALL GROUND WIRES SHALL BE #2 AWG UNLESS NOTED OTHERWISE.
3. 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.
4. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
5. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
6. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
7. ALL CONDUITS SHALL BE RIGID GALVANIZED STEEL AND SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
8. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
9. WHEN CABLE LENGTH IS OVER 20' THE MANUFACTURERS GROUND KIT MUST BE INSTALLED PER THE MANUFACTURERS SPECIFICATIONS.
10. REFER TO "ANTI–THEFT UPDATE TO SPRINT GROUNDING 082412.PDF" FOR GUIDELINE TO SUSPECTED OR ACTUAL THEFT OF GROUNDING.
11. 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:

1. 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.
2. 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.
3. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI–CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH PROJECT MANAGER.
4. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
5. INSTALL GROUND BUSHING ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.
6. 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.
7. GROUND HYBRID CABLE SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. 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.
4. BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
5. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THNN INSULATION.
6. 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.
7. 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.
8. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
9. GROUNDING SHALL COMPLY WITH NEC ART. 250.
10. GROUND HYBRID CABLE SHIELDS AT 3 LOCATIONS USING MANUFACTURER'S HYBRID CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
11. 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.
12. 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.
13. 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.
14. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
15. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
16. BOND ANTENNA MOUNTING BRACKETS, HYBRID CABLE GROUND KITS, AND RRHs TO EGB PLACED NEAR THE ANTENNA LOCATION.
17. BOND ANTENNA EGB'S AND MGB TO GROUND RING.
18. CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULT FOR PROJECT CLOSE–OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
19. 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.
20. 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.
21. 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.
22. 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.

Sprint
2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC342

NO	DATE	DESCRIPTION	BY
0	07/02/14	FOR COMMENT	MP
1	07/28/14	FOR CONSTRUCTION	MP
2	08/01/14	PER COMMENTS	MP

DATE	REVIEWED BY
8/1/14	TMQ

SEAL

STATE OF CONNECTICUT
No. 22033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E–2

Date: **July 7th, 2014**

Sean Dempsey
Crown Castle
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Charlotte, NC 28277
(704) 405-6565

GPD Group
520 South Main Street, Suite 2531
Akron, OH 44311
(614) 859-1607
dpalkovic@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5B
	Carrier Site Number:	CT03XC342
Crown Castle Designation:	**Crown Castle BU Number:**	841290
	Crown Castle Site Name:	GREENWICH NORTH
	Crown Castle JDE Job Number:	290764
	Crown Castle Work Order Number:	779689
	Crown Castle Application Number:	248825, Rev. 2
Engineering Firm Designation:	**GPD Group Project Number:**	2014777.841290.01
Site Data:	**363 Riversville Road, Greenwich, CT 06831, Fairfield County** **Latitude *41° 3' 58.6"*, Longitude *-73° 40' 17.4"*** **160 Foot - EEI Monopole Tower**	

Dear Sean Dempsey,

GPD Group 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 662854, in accordance with application 248825, revision 2.

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 the 2005 Connecticut (CT) State Building Code based upon a wind speed of 85 mph fastest mile.

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

Structural analysis prepared by: Elizabeth Boaz, E.I.

Respectfully submitted by:

07/07/2014

John N. Kabak, P.E.
Connecticut #: PEN.0028336

TABLE OF CONTENTS

1) INTRODUCTION

The existing 160' monopole consists of five major sections that are connected with slip joints and a bolted flange connection at the 152' elevation. It has an 18-sided cross section and is evenly tapered from 59" (flat-flat) at the base to 29" (flat-flat) at the top. The structure is galvanized and does not have aviation lighting.

The tower was designed for the URS Corporation by Engineered Endeavors, Incorporated (EEI) of Mentor, Ohio in April of 2003. The tower was also designed for a basic wind speed of 85 mph with ½" radial ice (with a 25% reduction in wind speed when wind and ice loads were considered simultaneously) in accordance with the TIA/EIA-222-F standard.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the 2005 Connecticut (CT) State Building Code using a fastest mile wind speed of 85 mph with no ice, 38 mph with a ¾" ice thickness (in accordance with ASCE 7-05 ice conditions), and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120	122	3	Alcatel Lucent	TD-RRH8x20-25	1	1-1/4	1
		3	RFS/Celwave	APXVTM14-C-120			

Notes:
1) Refer to Appendix B for the proposed coax layout.

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
160	163	3	Ericsson	ERICSSON AIR 21 B2A B4P	1	1-1/4	1
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	RFS/Celwave	ATMAA1412D-1A20			
		3	EMS Wireless	RR90-17-02DP	12	1-5/8	
	160	1		Platform Mount [LP 1201-1]			
153	153	3	Ericsson	TME-RRUS-11	2	3/8	
		1	Raycap	TME-DC6-48-60-18-8F			
		1		Side Arm Mount [SO 102-3]			
149	151	6	Powerwave Tech.	7770.00	12	1-5/8	
		6	Powerwave Tech.	LGP21401			
	149	6	Powerwave Tech.	LGP21401			
		3	Powerwave Tech.	P65-16-XLH-RR			
		1		Platform Mount [LP 1201-1]			
140	142	3	Alcatel Lucent	RRH2X40-AWS	1	1-5/8	1
		2	Decibel	DB844H80E-XY			
		1	RFS/Celwave	DB-T1-6Z-8AB-0Z			
		3	Rymsa Wireless	MG D3-800Tx			
		3	Powerwave Tech.	P65-16-XL-M	18	1-5/8	
		4	RFS/Celwave	APL868013-42T0			
		3	Rymsa Wireless	MG D3-800Tx			
	140	1		Platform Mount [LP 1201-1]			
120	122	3	RFS/Celwave	APXVSPP18-C-A20	3 2	1-1/4 1/2	
		1		Handrail Kit [NA 510-1]			
	120	1		Platform Mount [LP 1201-1]			
119	117	3	Alcatel Lucent	TME-1900MHz 4X40W RRH			
		3	Alcatel Lucent	TME-800MHZ RRH			
		1		Side Arm Mount [SO 102-3]			
72	73	2	GPS	GPS_A	2	1/2	
	72	1		Side Arm Mount [SO 701-1]			

Notes:
1) Reserved Equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
160	160	3		Panel Antenna		
150	150	12	Allgon	ALP 11011		
		1		Low Profile Platform		
140	140	12	Allgon	ALP 11011		
		1		Low Profile Platform		
130	130	12	Allgon	ALP 11011		
		1		Low Profile Platform		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings / Specifications	EEI Project #: 5590, Dated 04/10/2003	Doc ID #: 5121537	CCIsites
Foundation Drawings / Specifications	EEI Project #: 5590, Dated 04/10/2003	Doc ID #: 5121536	CCIsites
Foundation Exploration Report	WEI Project #: 2009-895, Dated 09/04/2009	Doc ID #: 4468638	CCIsites
Geotechnical Report	WEI Project #: 2009-895, Dated 09/04/2009	Doc ID #: 5121535	CCIsites

3.1) Analysis Method

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

3.2) Assumptions

1) The tower and structures were built and have been maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. *GPD Group* 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	160 - 152	Pole	TP30.62x29x0.1875	1	-3.52	908.48	8.8	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-16.46	1547.47	52.8	Pass
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-23.25	2245.56	74.5	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-35.35	3665.31	70.6	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-52.03	4826.45	71.9	Pass
							Summary	
							Pole (L3)	74.5	Pass
							Rating =	74.5	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	152	11.2	Pass
1	Flange Plate	152	10.5	Pass
1	Anchor Rods	0	61.8	Pass
1	Base Plate	0	78.0	Pass
1	Base Foundation (Reinforcement)	0	21.7	Pass
1	Base Foundation (Soil Interaction)	0	49.2	Pass

Structure Rating (Maximum From All Components) =	**78.0%**

Notes:
1) See additional documentation in “Appendix C - Additional Calculations” for calculations supporting the % capacity consumed.

4.1) Recommendations

The existing tower and its foundation are sufficient for the proposed loading configuration and do not require modifications.

5) DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

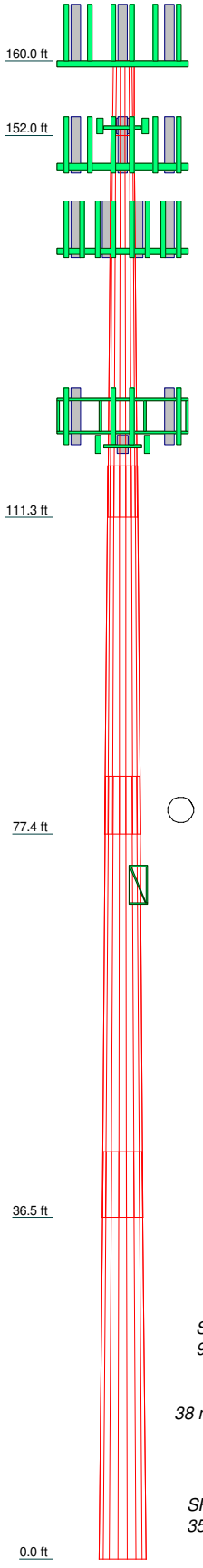
Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

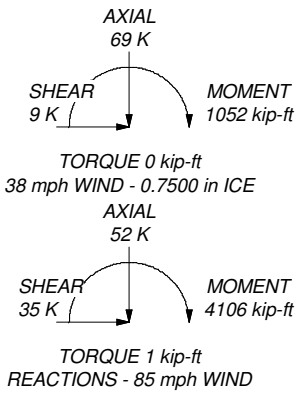
GPD GROUP makes no warranties, expressed and/or implied, in connection with this report, and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	8.00	18	0.1875		29.0000	30.6200		0.5
2	40.71	18	0.2500	5.42	30.6200	38.8600		3.8
3	39.29	18	0.3125	6.17	37.2630	45.0900		5.4
4	47.13	18	0.4375	7.08	43.2359	52.6200		10.6
5	43.54	18	0.5000		50.3353	59.0000		12.7
							A572-65	33.0





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 1201-1]	160	P65-16-XL-M w/ 8' x 2" Mount Pipe	140
RR90-17-02DP w/ 8' x 2" Mount Pipe	160	(2) APL868013-42T0 w/ 8' x 2" Mount Pipe	140
RR90-17-02DP w/ 8' x 2" Mount Pipe	160	(2) APL868013-42T0 w/ 8' x 2" Mount Pipe	140
RR90-17-02DP w/ 8' x 2" Mount Pipe	160	(2) MG D3-800Tx w/ 8' x 2" Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ 8' x 2" Mount Pipe	160	(2) MG D3-800Tx w/ 8' x 2" Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ 8' x 2" Mount Pipe	160	(2) MG D3-800Tx w/ 8' x 2" Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ 8' x 2" Mount Pipe	160	RRH2X40-AWS	140
ERICSSON AIR 21 B4A B2P w/ 8' x 2" Mount Pipe	160	RRH2X40-AWS	140
ERICSSON AIR 21 B4A B2P w/ 8' x 2" Mount Pipe	160	RRH2X40-AWS	140
ERICSSON AIR 21 B4A B2P w/ 8' x 2" Mount Pipe	160	DB-T1-6Z-8AB-0Z	140
ATMAA1412D-1A20	160	Miscellaneous [NA 510-1]	122
ATMAA1412D-1A20	160	Platform Mount [LP 1201-1]	120
ATMAA1412D-1A20	160	APXVSPP18-C-A20 w/ 6' x 2" Mount Pipe	120
8' x 2" Mount Pipe	160	APXVSPP18-C-A20 w/ 6' x 2" Mount Pipe	120
8' x 2" Mount Pipe	160	APXVSPP18-C-A20 w/ 6' x 2" Mount Pipe	120
8' x 2" Mount Pipe	160	APXVTM14-C-120 w/ 6' x 2" Mount Pipe	120
Side Arm Mount [SO 102-3]	153	APXVTM14-C-120 w/ 6' x 2" Mount Pipe	120
TME-RRUS-11	153	APXVTM14-C-120 w/ 6' x 2" Mount Pipe	120
TME-RRUS-11	153	TD-RRH8x20-25	120
TME-RRUS-11	153	TD-RRH8x20-25	120
TME-DC6-48-60-18-8F	153	TD-RRH8x20-25	120
Platform Mount [LP 1201-1]	149	(2) 6' x 2" Mount Pipe	120
(2) 7770.00 w/ 8' x 2" Mount Pipe	149	(2) 6' x 2" Mount Pipe	120
(2) 7770.00 w/ 8' x 2" Mount Pipe	149	(2) 6' x 2" Mount Pipe	120
(2) 7770.00 w/ 8' x 2" Mount Pipe	149	Side Arm Mount [SO 102-3]	119
P65-16-XLH-RR w/ 8' x 2" Mount Pipe	149	TME-1900MHz RRH w/ 4' x 2" Mount Pipe	119
P65-16-XLH-RR w/ 8' x 2" Mount Pipe	149	TME-1900MHz RRH w/ 4' x 2" Mount Pipe	119
P65-16-XLH-RR w/ 8' x 2" Mount Pipe	149	TME-1900MHz RRH w/ 4' x 2" Mount Pipe	119
(2) LGP21401	149	TME-800MHZ RRH	119
(2) LGP21401	149	TME-800MHZ RRH	119
(2) LGP21401	149	TME-800MHZ RRH	119
(2) LGP21401	149	Side Arm Mount [SO 701-1]	72
(2) LGP21401	149	(2) GPS_A	72
(2) LGP21401	149		
Platform Mount [LP 1201-1]	140		
(2) DB844H80E-XY w/ 8' x 2" Mount Pipe	140		
P65-16-XL-M w/ 8' x 2" Mount Pipe	140		
P65-16-XL-M w/ 8' x 2" Mount Pipe	140		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.

GPD GROUP
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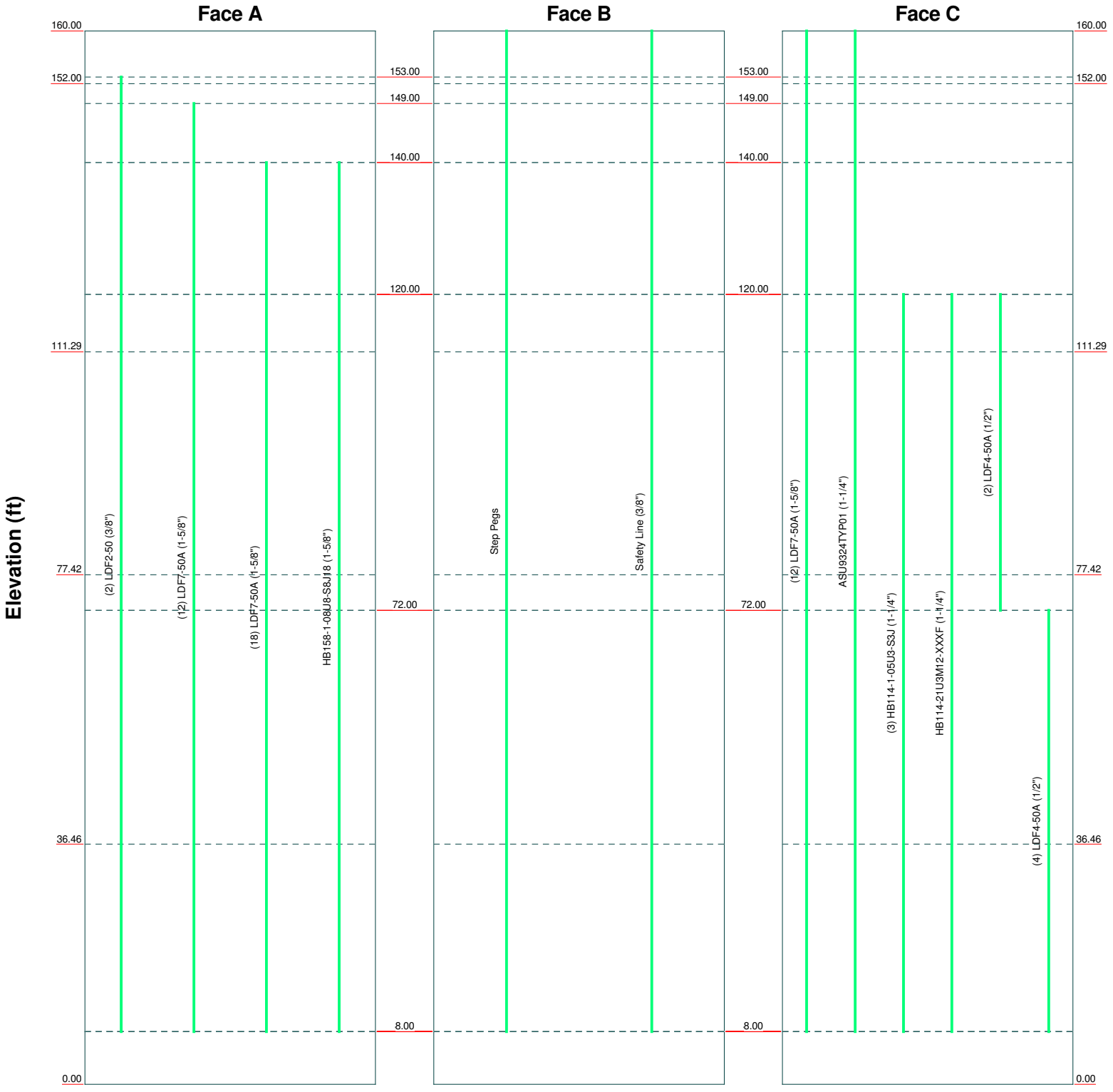
Job: ***GREENWICH NORTH (BU #: 841290)***			
Project: ***2014777.841290.01***			
Client: Crown Castle USA, Inc.	Drawn by: sarmstrong	App'd:	
Code: TIA/EIA-222-F	Date: 07/07/14	Scale: NTS	
Path: T:\Crown\841290\01\tnxTower\841290.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 160'

Round | Flat | App In Face | App Out Face | Truss Leg



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520 South Main Street, Suite 2531
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Phone: (330) 572-2100
FAX: (330) 572-2101

Job: ***GREENWICH NORTH (BU #: 841290)***			
Project: ***2014777.841290.01***			
Client: Crown Castle USA, Inc.	Drawn by: sarmstrong	App'd:	
Code: TIA/EIA-222-F	Date: 07/07/14	Scale: NTS	
Path: T:\Crown\841290\01\tnxTower\841290.eri		Dwg No. E-7	

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 Fairfield County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
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

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

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	160.00-152.00	8.00	0.00	18	29.0000	30.6200	0.1875	0.7500	A572-65 (65 ksi)
L2	152.00-111.29	40.71	5.42	18	30.6200	38.8600	0.2500	1.0000	A572-65 (65 ksi)
L3	111.29-77.42	39.29	6.17	18	37.2630	45.0900	0.3125	1.2500	A572-65 (65 ksi)
L4	77.42-36.46	47.13	7.08	18	43.2359	52.6200	0.4375	1.7500	A572-65 (65 ksi)
L5	36.46-0.00	43.54		18	50.3353	59.0000	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	It/Q in^2	w in	w/t
L1	29.4474	17.1470	1798.4090	10.2284	14.7320	122.0750	3599.1844	8.5751	4.7740	25.461
	31.0924	18.1111	2119.1346	10.8035	15.5550	136.2353	4241.0576	9.0573	5.0591	26.982
L2	31.0924	24.0986	2808.1400	10.7814	15.5550	180.5302	5619.9750	12.0516	4.9491	19.796
	39.4595	30.6370	5770.1059	13.7066	19.7409	292.2922	11547.8043	15.3214	6.3994	25.597

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L3	38.9342	36.6502	6321.9882	13.1174	18.9296	333.9740	12652.2950	18.3286	6.0083	19.226
	45.7856	44.4137	11250.5543	15.8960	22.9057	491.1679	22515.9125	22.2111	7.3858	23.635
L4	45.1503	59.4309	13753.2024	15.1934	21.9638	626.1754	27524.5016	29.7211	6.8395	15.633
	53.4317	72.4619	24928.5533	18.5248	26.7310	932.5723	49889.9082	36.2378	8.4911	19.408
L5	52.5425	79.0886	24815.6300	17.6915	25.5703	970.4855	49663.9131	39.5518	7.9790	15.958
	59.9102	92.8395	40140.4258	20.7675	29.9720	1339.2642	80333.6694	46.4286	9.5040	19.008

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 160.00-152.00				1	1	1		
L2 152.00-111.29				1	1	1		
L3 111.29-77.42				1	1	1		
L4 77.42-36.46				1	1	1		
L5 36.46-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Step Pegs	B	No	CaAa (Out Of Face)	160.00 - 8.00	1	No Ice	0.08	2.72
						1/2" Ice	0.18	3.51
						1" Ice	0.28	4.92
						2" Ice	0.48	9.56
						4" Ice	0.88	26.18
Safety Line (3/8")	B	No	CaAa (Out Of Face)	160.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
LDF7-50A (1-5/8")	C	No	Inside Pole	160.00 - 8.00	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
						4" Ice	0.00	0.82
ASU9324TYP01 (1-1/4")	C	No	Inside Pole	160.00 - 8.00	1	No Ice	0.00	1.05
						1/2" Ice	0.00	1.05
						1" Ice	0.00	1.05
						2" Ice	0.00	1.05
						4" Ice	0.00	1.05
LDF2-50 (3/8")	A	No	Inside Pole	153.00 - 8.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
LDF7-50A (1-5/8")	A	No	Inside Pole	149.00 - 8.00	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
						4" Ice	0.00	0.82
LDF7-50A (1-5/8")	A	No	Inside Pole	140.00 - 8.00	18	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
						4" Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HB158-1-08U8-S8J18 (1-5/8")	A	No	Inside Pole	140.00 - 8.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
						2" Ice	0.00	1.30
						4" Ice	0.00	1.30
HB114-1-05U3-S3J (1-1/4")	C	No	Inside Pole	120.00 - 8.00	3	No Ice	0.00	0.90
						1/2" Ice	0.00	0.90
						1" Ice	0.00	0.90
						2" Ice	0.00	0.90
						4" Ice	0.00	0.90
HB114-21U3M12-XXXF (1-1/4")	C	No	Inside Pole	120.00 - 8.00	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
						4" Ice	0.00	1.22
LDF4-50A (1/2")	C	No	Inside Pole	120.00 - 72.00	2	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
						4" Ice	0.00	0.15
LDF4-50A (1/2")	C	No	Inside Pole	72.00 - 8.00	4	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
						4" Ice	0.00	0.15

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.00-152.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.940	0.02
		C	0.000	0.000	0.000	0.000	0.09
L2	152.00-111.29	A	0.000	0.000	0.000	0.000	0.84
		B	0.000	0.000	0.000	4.783	0.12
		C	0.000	0.000	0.000	0.000	0.48
L3	111.29-77.42	A	0.000	0.000	0.000	0.000	0.88
		B	0.000	0.000	0.000	3.980	0.10
		C	0.000	0.000	0.000	0.000	0.51
L4	77.42-36.46	A	0.000	0.000	0.000	0.000	1.07
		B	0.000	0.000	0.000	4.813	0.12
		C	0.000	0.000	0.000	0.000	0.63
L5	36.46-0.00	A	0.000	0.000	0.000	0.000	0.74
		B	0.000	0.000	0.000	3.344	0.08
		C	0.000	0.000	0.000	0.000	0.44

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	160.00-152.00	A	0.904	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	3.832	0.05
		C		0.000	0.000	0.000	0.000	0.09

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L2	152.00-111.29	A	0.885	0.000	0.000	0.000	0.000	0.84
		B		0.000	0.000	0.000	19.195	0.23
		C		0.000	0.000	0.000	0.000	0.48
L3	111.29-77.42	A	0.851	0.000	0.000	0.000	0.000	0.88
		B		0.000	0.000	0.000	15.970	0.19
		C		0.000	0.000	0.000	0.000	0.51
L4	77.42-36.46	A	0.801	0.000	0.000	0.000	0.000	1.07
		B		0.000	0.000	0.000	18.748	0.23
		C		0.000	0.000	0.000	0.000	0.63
L5	36.46-0.00	A	0.750	0.000	0.000	0.000	0.000	0.74
		B		0.000	0.000	0.000	12.459	0.15
		C		0.000	0.000	0.000	0.000	0.44

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.00-152.00	0.1457	0.0841	0.4964	0.2866
L2	152.00-111.29	0.1467	0.0847	0.5046	0.2913
L3	111.29-77.42	0.1476	0.0852	0.5199	0.3002
L4	77.42-36.46	0.1483	0.0856	0.5178	0.2990
L5	36.46-0.00	0.1151	0.0665	0.3967	0.2290

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 1201-1]	C	None		0.0000	160.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70
						4" Ice	52.70	52.70	5.30
RR90-17-02DP w/ 8' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 3.00	0.0000	160.00	No Ice	5.15	3.87	0.04
						1/2" Ice	5.91	5.04	0.09
						1" Ice	6.62	6.06	0.14
						2" Ice	7.92	7.77	0.26
						4" Ice	10.66	11.39	0.64
RR90-17-02DP w/ 8' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 3.00	0.0000	160.00	No Ice	5.15	3.87	0.04
						1/2" Ice	5.91	5.04	0.09
						1" Ice	6.62	6.06	0.14
						2" Ice	7.92	7.77	0.26
						4" Ice	10.66	11.39	0.64
RR90-17-02DP w/ 8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 3.00	0.0000	160.00	No Ice	5.15	3.87	0.04
						1/2" Ice	5.91	5.04	0.09
						1" Ice	6.62	6.06	0.14
						2" Ice	7.92	7.77	0.26
						4" Ice	10.66	11.39	0.64

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
ERICSSON AIR 21 B2A	A	From	4.00	0.0000	160.00	No Ice	7.38	6.20	0.12
B4P w/ 8' x 2" Mount Pipe		Centroid-Leg	0.00			1/2" Ice	8.17	7.43	0.18
			3.00			1" Ice	8.90	8.53	0.25
						2" Ice	10.25	10.41	0.42
						4" Ice	13.10	14.37	0.89
ERICSSON AIR 21 B2A	B	From	4.00	0.0000	160.00	No Ice	7.38	6.20	0.12
B4P w/ 8' x 2" Mount Pipe		Centroid-Leg	0.00			1/2" Ice	8.17	7.43	0.18
			3.00			1" Ice	8.90	8.53	0.25
						2" Ice	10.25	10.41	0.42
						4" Ice	13.10	14.37	0.89
ERICSSON AIR 21 B2A	C	From	4.00	0.0000	160.00	No Ice	7.38	6.20	0.12
B4P w/ 8' x 2" Mount Pipe		Centroid-Leg	0.00			1/2" Ice	8.17	7.43	0.18
			3.00			1" Ice	8.90	8.53	0.25
						2" Ice	10.25	10.41	0.42
						4" Ice	13.10	14.37	0.89
ERICSSON AIR 21 B4A	A	From	4.00	0.0000	160.00	No Ice	7.37	6.19	0.12
B2P w/ 8' x 2" Mount Pipe		Centroid-Leg	0.00			1/2" Ice	8.16	7.42	0.18
			3.00			1" Ice	8.90	8.52	0.25
						2" Ice	10.24	10.40	0.42
						4" Ice	13.09	14.36	0.89
ERICSSON AIR 21 B4A	B	From	4.00	0.0000	160.00	No Ice	7.37	6.19	0.12
B2P w/ 8' x 2" Mount Pipe		Centroid-Leg	0.00			1/2" Ice	8.16	7.42	0.18
			3.00			1" Ice	8.90	8.52	0.25
						2" Ice	10.24	10.40	0.42
						4" Ice	13.09	14.36	0.89
ERICSSON AIR 21 B4A	C	From	4.00	0.0000	160.00	No Ice	7.37	6.19	0.12
B2P w/ 8' x 2" Mount Pipe		Centroid-Leg	0.00			1/2" Ice	8.16	7.42	0.18
			3.00			1" Ice	8.90	8.52	0.25
						2" Ice	10.24	10.40	0.42
						4" Ice	13.09	14.36	0.89
ATMAA1412D-1A20	A	From	4.00	0.0000	160.00	No Ice	1.17	0.47	0.01
		Centroid-Leg	0.00			1/2" Ice	1.31	0.57	0.02
			3.00			1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMAA1412D-1A20	B	From	4.00	0.0000	160.00	No Ice	1.17	0.47	0.01
		Centroid-Leg	0.00			1/2" Ice	1.31	0.57	0.02
			3.00			1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMAA1412D-1A20	C	From	4.00	0.0000	160.00	No Ice	1.17	0.47	0.01
		Centroid-Leg	0.00			1/2" Ice	1.31	0.57	0.02
			3.00			1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
8' x 2" Mount Pipe	A	From	4.00	0.0000	160.00	No Ice	1.90	1.90	0.04
		Centroid-Leg	0.00			1/2" Ice	2.73	2.73	0.05
			2.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
						4" Ice	6.50	6.50	0.31
8' x 2" Mount Pipe	B	From	4.00	0.0000	160.00	No Ice	1.90	1.90	0.04
		Centroid-Leg	0.00			1/2" Ice	2.73	2.73	0.05
			2.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
						4" Ice	6.50	6.50	0.31

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.90 2.73 3.40 4.40 6.50	1.90 2.73 3.40 4.40 6.50	0.04 0.05 0.07 0.12 0.31
Side Arm Mount [SO 102-3]	C	None		0.0000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
TME-RRUS-11	A	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
TME-RRUS-11	B	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
TME-RRUS-11	C	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
TME-DC6-48-60-18-8F	A	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.47 1.67 1.88 2.33 3.38	1.47 1.67 1.88 2.33 3.38	0.02 0.04 0.06 0.11 0.24
Platform Mount [LP 1201-1]	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.10 26.80 30.50 37.90 52.70	23.10 26.80 30.50 37.90 52.70	2.10 2.50 2.90 3.70 5.30
(2) 7770.00 w/ 8' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.69 7.48 8.21 9.54 12.36	4.83 6.00 7.03 8.75 12.56	0.06 0.12 0.18 0.32 0.75
(2) 7770.00 w/ 8' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.69 7.48 8.21 9.54 12.36	4.83 6.00 7.03 8.75 12.56	0.06 0.12 0.18 0.32 0.75
(2) 7770.00 w/ 8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.69 7.48 8.21 9.54 12.36	4.83 6.00 7.03 8.75 12.56	0.06 0.12 0.18 0.32 0.75
P65-16-XLH-RR w/ 8' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	0.08 0.15 0.23 0.41 0.92

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
P65-16-XLH-RR w/ 8' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	0.08 0.15 0.23 0.41 0.92
P65-16-XLH-RR w/ 8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	0.08 0.15 0.23 0.41 0.92
(2) LGP21401	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
Platform Mount [LP 1201-1]	C	None		0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.10 26.80 30.50 37.90 52.70	23.10 26.80 30.50 37.90 52.70	2.10 2.50 2.90 3.70 5.30
(2) DB844H80E-XY w/ 8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.01 4.75 5.46 6.71 9.38	5.63 6.83 7.88 9.65 13.41	0.04 0.09 0.14 0.27 0.66
P65-16-XL-M w/ 8' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	0.07 0.14 0.22 0.40 0.91

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
P65-16-XL-M w/ 8' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	0.07 0.14 0.22 0.40 0.91
P65-16-XL-M w/ 8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.88 9.63 10.36 11.75 14.66	6.60 7.88 9.00 10.93 15.02	0.07 0.14 0.22 0.40 0.91
(2) APL868013-42T0 w/ 8' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.82 4.54 5.22 6.47 9.13	5.63 6.83 7.88 9.65 13.41	0.09 0.14 0.19 0.32 0.71
(2) APL868013-42T0 w/ 8' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.82 4.54 5.22 6.47 9.13	5.63 6.83 7.88 9.65 13.41	0.09 0.14 0.19 0.32 0.71
(2) MG D3-800Tx w/ 8' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.19 4.90 5.55 6.81 9.49	4.04 5.19 6.19 7.87 11.48	0.04 0.08 0.13 0.25 0.61
(2) MG D3-800Tx w/ 8' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.19 4.90 5.55 6.81 9.49	4.04 5.19 6.19 7.87 11.48	0.04 0.08 0.13 0.25 0.61
(2) MG D3-800Tx w/ 8' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.19 4.90 5.55 6.81 9.49	4.04 5.19 6.19 7.87 11.48	0.04 0.08 0.13 0.25 0.61
RRH2X40-AWS	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.50 4.61	1.59 1.80 2.01 2.46 3.48	0.04 0.06 0.08 0.13 0.28
DB-T1-6Z-8AB-0Z	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.60 5.92 6.24 6.91 8.37	2.33 2.56 2.79 3.28 4.37	0.04 0.08 0.12 0.21 0.45

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Miscellaneous [NA 510-1]	C	None		0.0000	122.00	No Ice	6.00	6.00	0.23
						1/2" Ice	8.50	8.50	0.34
						1" Ice	11.00	11.00	0.45
						2" Ice	16.00	16.00	0.68
						4" Ice	26.00	26.00	1.14
Platform Mount [LP 1201-1]	C	None		0.0000	120.00	No Ice	23.10	23.10	2.10
						1/2" Ice	26.80	26.80	2.50
						1" Ice	30.50	30.50	2.90
						2" Ice	37.90	37.90	3.70
						4" Ice	52.70	52.70	5.30
APXVSPP18-C-A20 w/ 6' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
APXVSPP18-C-A20 w/ 6' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
APXVSPP18-C-A20 w/ 6' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
APXVTM14-C-120 w/ 6' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	7.21	5.03	0.08
						1/2" Ice	7.77	5.89	0.13
						1" Ice	8.31	6.63	0.20
						2" Ice	9.42	8.20	0.34
						4" Ice	11.77	11.67	0.76
APXVTM14-C-120 w/ 6' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	7.21	5.03	0.08
						1/2" Ice	7.77	5.89	0.13
						1" Ice	8.31	6.63	0.20
						2" Ice	9.42	8.20	0.34
						4" Ice	11.77	11.67	0.76
APXVTM14-C-120 w/ 6' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	7.21	5.03	0.08
						1/2" Ice	7.77	5.89	0.13
						1" Ice	8.31	6.63	0.20
						2" Ice	9.42	8.20	0.34
						4" Ice	11.77	11.67	0.76
TD-RRH8x20-25	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
TD-RRH8x20-25	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) 6' x 2" Mount Pipe	A	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	B	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
(2) 6' x 2" Mount Pipe	C	From Centroid-Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Side Arm Mount [SO 102-3]	C	None		0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.48 3.96 4.92 6.84	3.00 3.48 3.96 4.92 6.84	0.08 0.11 0.14 0.20 0.32
TME-1900MHz RRH w/ 4' x 2" Mount Pipe	A	From Leg	1.50 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.36 3.72 4.10 4.90 6.73	4.67 5.18 5.70 6.81 9.38	0.06 0.10 0.15 0.26 0.57
TME-1900MHz RRH w/ 4' x 2" Mount Pipe	B	From Leg	1.50 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.36 3.72 4.10 4.90 6.73	4.67 5.18 5.70 6.81 9.38	0.06 0.10 0.15 0.26 0.57
TME-1900MHz RRH w/ 4' x 2" Mount Pipe	C	From Leg	1.50 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.36 3.72 4.10 4.90 6.73	4.67 5.18 5.70 6.81 9.38	0.06 0.10 0.15 0.26 0.57
TME-800MHZ RRH	A	From Leg	1.50 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	B	From Leg	1.50 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
TME-800MHZ RRH	C	From Leg	1.50 0.00 0.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.49 2.71 2.93 3.41 4.46	2.07 2.27 2.48 2.93 3.93	0.05 0.07 0.10 0.16 0.32
Side Arm Mount [SO 701-1]	B	From Leg	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.85 1.14 1.43 2.01 3.17	1.67 2.34 3.01 4.35 7.03	0.07 0.08 0.09 0.12 0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) GPS_A	B	From Leg	3.00 0.00 1.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.30 0.37 0.46 0.65 1.15	0.30 0.37 0.46 0.65 1.15	0.00 0.00 0.01 0.02 0.08

Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	27.174	27	1.4614	0.0010
L2	152 - 111.29	24.733	27	1.4505	0.0010
L3	116.71 - 77.42	14.656	27	1.2161	0.0005
L4	83.59 - 36.46	7.386	27	0.8348	0.0002
L5	43.54 - 0	2.018	33	0.4159	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Platform Mount [LP 1201-1]	27	27.174	1.4614	0.0010	42561
153.00	Side Arm Mount [SO 102-3]	27	25.037	1.4525	0.0010	30579
149.00	Platform Mount [LP 1201-1]	27	23.823	1.4426	0.0010	19953
140.00	Platform Mount [LP 1201-1]	27	21.132	1.4038	0.0009	11387
122.00	Miscellaneous [NA 510-1]	27	16.044	1.2680	0.0006	6125
120.00	Platform Mount [LP 1201-1]	27	15.512	1.2489	0.0005	5830
119.00	Side Arm Mount [SO 102-3]	27	15.249	1.2392	0.0005	5704
72.00	Side Arm Mount [SO 701-1]	27	5.433	0.7055	0.0002	5048

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	78.380	2	4.2155	0.0028
L2	152 - 111.29	71.344	2	4.1839	0.0028
L3	116.71 - 77.42	42.294	2	3.5093	0.0013
L4	83.59 - 36.46	21.323	2	2.4096	0.0006
L5	43.54 - 0	5.826	8	1.2010	0.0002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Platform Mount [LP 1201-1]	2	78.380	4.2155	0.0028	14947
153.00	Side Arm Mount [SO 102-3]	2	72.221	4.1898	0.0028	10738
149.00	Platform Mount [LP 1201-1]	2	68.722	4.1612	0.0028	7006
140.00	Platform Mount [LP 1201-1]	2	60.966	4.0495	0.0025	3990
122.00	Miscellaneous [NA 510-1]	2	46.296	3.6586	0.0016	2142
120.00	Platform Mount [LP 1201-1]	2	44.763	3.6037	0.0015	2038
119.00	Side Arm Mount [SO 102-3]	2	44.005	3.5755	0.0015	1994
72.00	Side Arm Mount [SO 701-1]	2	15.686	2.0368	0.0005	1754

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	160 - 152	TP30.62x29x0.1875	8.00	0.00	0.0	37.630	18.1111	-3.52	681.53	0.005
L2	152 - 111.29	TP38.86x30.62x0.25	40.71	0.00	0.0	39.000	29.7665	-16.46	1160.89	0.014
L3	111.29 - 77.42	TP45.09x37.263x0.3125	39.29	0.00	0.0	39.000	43.1945	-23.25	1684.59	0.014
L4	77.42 - 36.46	TP52.62x43.2359x0.4375	47.13	0.00	0.0	39.000	70.5044	-35.35	2749.67	0.013
L5	36.46 - 0	TP59x50.3353x0.5	43.54	0.00	0.0	39.000	92.8395	-52.03	3620.74	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	160 - 152	TP30.62x29x0.1875	47.81	4.212	37.630	0.112	0.00	0.000	37.630	0.000
L2	152 - 111.29	TP38.86x30.62x0.25	616.94	26.837	39.000	0.688	0.00	0.000	39.000	0.000
L3	111.29 - 77.42	TP45.09x37.263x0.3125	1476.88	38.155	39.000	0.978	0.00	0.000	39.000	0.000
L4	77.42 - 36.46	TP52.62x43.2359x0.4375	2660.79	36.174	39.000	0.928	0.00	0.000	39.000	0.000
L5	36.46 - 0	TP59x50.3353x0.5	4106.38	36.794	39.000	0.943	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 $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	160 - 152	TP30.62x29x0.1875	5.71	0.315	26.000	0.024	0.09	0.004	26.000	0.000
L2	152 - 111.29	TP38.86x30.62x0.25	24.32	0.817	26.000	0.063	0.03	0.001	26.000	0.000
L3	111.29 - 77.42	TP45.09x37.263x0.3125	27.56	0.638	26.000	0.049	0.07	0.001	26.000	0.000
L4	77.42 - 36.46	TP52.62x43.2359x0.4375	31.41	0.445	26.000	0.034	0.33	0.002	26.000	0.000
L5	36.46 - 0	TP59x50.3353x0.5	34.90	0.376	26.000	0.029	0.38	0.002	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 152	0.005	0.112	0.000	0.024	0.000	0.117 ✔	1.333	H1-3+VT ✔
L2	152 - 111.29	0.014	0.688	0.000	0.063	0.000	0.703 ✔	1.333	H1-3+VT ✔
L3	111.29 - 77.42	0.014	0.978	0.000	0.049	0.000	0.993 ✔	1.333	H1-3+VT ✔
L4	77.42 - 36.46	0.013	0.928	0.000	0.034	0.000	0.941 ✔	1.333	H1-3+VT ✔
L5	36.46 - 0	0.014	0.943	0.000	0.029	0.000	0.958 ✔	1.333	H1-3+VT ✔

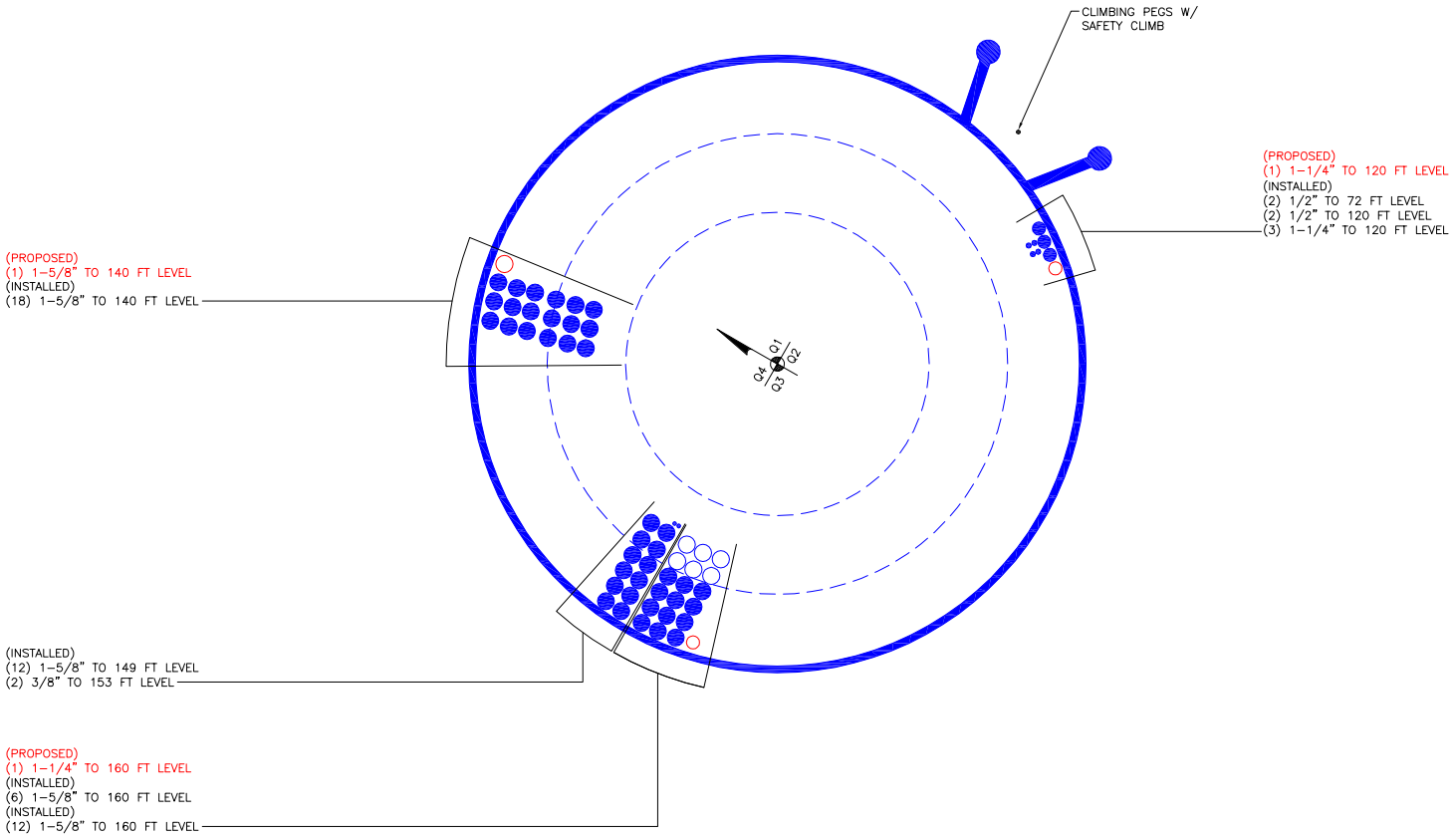
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass / Fail
L1	160 - 152	Pole	TP30.62x29x0.1875	1	-3.52	908.48	8.8	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-16.46	1547.47	52.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass / Fail
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-23.25	2245.56	74.5	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-35.35	3665.31	70.6	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-52.03	4826.45	71.9	Pass
						Summary	ELC:	Load Case 7
						Pole (L3)	74.5	Pass
						Rating =	74.5	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841290 TOWER ID: C_BASELEVEL

CROWN REGION ADDRESS

USA

1	20/03/14	NEW BUILD PER WORK ORDER # 730920	DW
2	09/06/14	UPDATED PER WORK ORDER # 779459	SLW

DRAWN BY: **RJC**
CHECKED BY:
DRAWING DATE: **20/03/14**

SITE NUMBER:
SITE NAME:

SITE NAME

GREENWICH NORTH

BUSINESS UNIT NUMBER

841290

SITE ADDRESS

363 RIVERSVILLE ROAD
GREENWICH, CT 06831
FAIRFIELD COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

BASE LEVEL DRAWING | 1" = 1'-0" | 1

PLOT DATE: 6/10/2014 FILE NAME: 841290_BASELEVEL.dwg

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *841290*
Site Name: *GREENWICH NORTH*
App #: *248825, Rev. 2*

Pole Manufacturer:	Other

Reactions		
Moment:	47.81	ft-kips
Axial:	3.52	kips
Shear:	5.71	kips
Elevation:	152	feet

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

Bolt Data			
Qty:	12		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	35		

Plate Data		
Diam:	38	in
Thick, t:	1	in
Grade (Fy):	60	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	8.10	in

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

Pole Data		
Diam:	30.62	in
Thick:	0.1875	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	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	46.07	kips	Service, ASD
Max Bolt directly applied T:	5.17	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	0.986	in	
Min PL "treq" for actual **T w/ Pry**:	0.242	in	
Min PL "t1" for actual **T w/o Pry**:	0.330	in	
T allowable w/o Prying:	46.07	kips	α'<0 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	5.17	kips	
Non-Prying Bolt Stress Ratio, T/B:	11.2%	**Pass**	

Exterior Flange Plate Results

	Flexural Check		Rigid
Compression Side Plate Stress:	6.3	ksi	Service ASD
Allowable Plate Stress:	60.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	10.5%	**Pass**	Comp. Y.L. Length:
No Prying			16.95
Tension Side Stress Ratio, (treq/t)^2:	5.8%	**Pass**	

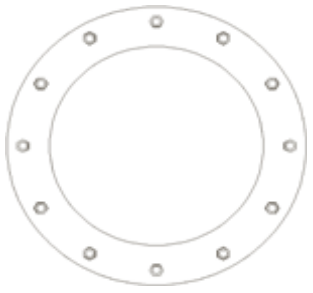
n/a

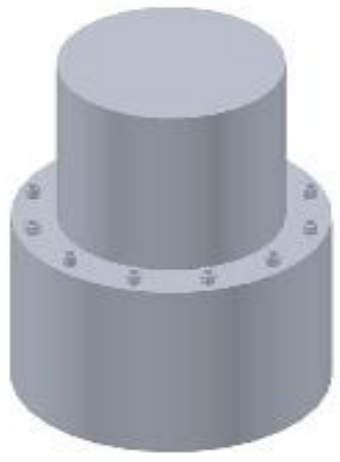
Stiffener Results

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





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

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

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

TIA Rev F

Site Data

BU#: *841290*
Site Name: *GREENWICH NORTH*
App #: *248825, Rev. 2*

Pole Manufacturer:	*Other*

Reactions		
Moment:	4106	ft-kips
Axial:	52	kips
Shear:	35	kips

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	67	in

Plate Data		
Diam:	73	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	7.80	in

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

Pole Data		
Diam:	59	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	

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

Anchor Rod Results

			Rigid
Maximum Rod Tension:	120.4	Kips	Service, ASD
Allowable Tension:	195.0	Kips	Fty*ASIF
Anchor Rod Stress Ratio:	61.8%	**Pass**	

Base Plate Results

	Flexural Check		Rigid
Base Plate Stress:	46.8	ksi	Service ASD
Allowable Plate Stress:	60.0	ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	78.0%	**Pass**	Y.L. Length: 31.75

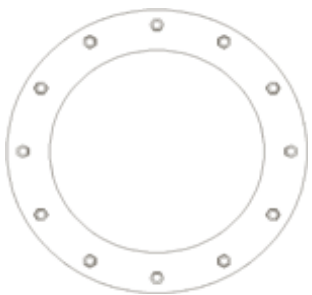
n/a

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



* 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

Mat Foundation Analysis
GREENWICH NORTH (BU #: 841290)
2014777.841290.01 - Bearing & Overturning

General Info	
Code	TIA/EIA-222-F (LRFD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Square
Reinforcing Known	Yes
Max Capacity	1.1

Tower Reactions		
Moment, M	4106.37	k-ft
Axial, P	52.05	k
Shear, V	34.87	k

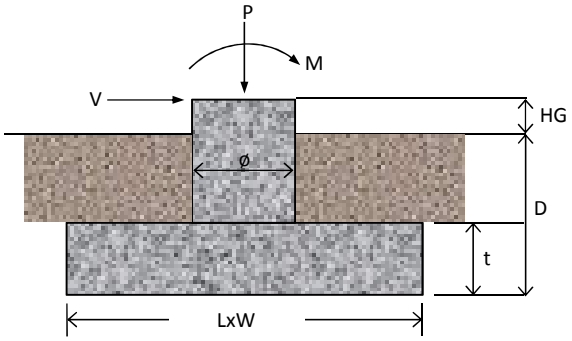
Pad & Pier Geometry		
Pier Width, ø	7	ft
Pad Length, L	25	ft
Pad Width, W	25	ft
Pad Thickness, t	4.5	ft
Depth, D	9.5	ft
Height Above Grade, HG	0.5	ft

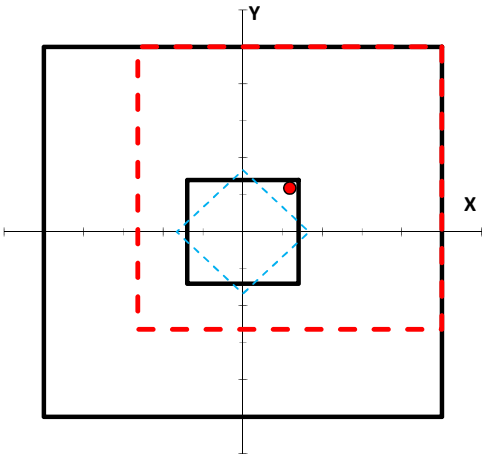
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	3	ksi
Clear Cover	3.5	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 11	
Pad Quantity Per Layer	19	
Pier Rebar Size	# 11	
Pier Quantity of Rebar	23	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	120	pcf
Angle of Friction, ø	34	°
Bearing Type	Net	
Ultimate Bearing	30	ksf
Water Table Depth	99	ft
Frost Depth	5	ft

Bearing Summary			Load Case
Qxmax	2.64	ksf	1.2D+1.6W
Qymax	2.64	ksf	1.2D+1.6W
Qmax @ 45°	2.83	ksf	1.2D+1.6W
$Q_{(all)\ Gross}$	23.36	ksf	
Controlling Capacity	**12.1%**	**Pass**	

Overturning Summary (Required FS=1.0)			Load Case
FS(ot)x	2.03	≥1.0	0.9D+1.6W
FS(ot)y	2.03	≥1.0	0.9D+1.6W
Controlling Capacity	**49.2%**	**Pass**	





Mat Foundation Analysis
GREENWICH NORTH (BU #: 841290)
2014777.841290.01 - Reinforcement

General Info	
Code	TIA/EIA-222-F (ASD)
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Square
Reinforcing Known	Yes
Max Capacity	1.1

Tower Reactions		
Moment, M	5338.28	k-ft
Axial, P	67.67	k
Shear, V	45.33	k

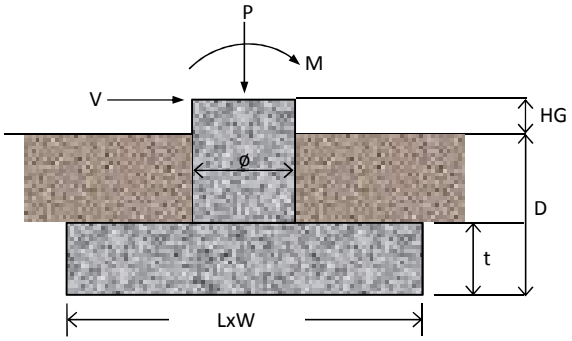
Pad & Pier Geometry		
Pier Width, ø	7	ft
Pad Length, L	25	ft
Pad Width, W	25	ft
Pad Thickness, t	4.5	ft
Depth, D	9.5	ft
Height Above Grade, HG	0.5	ft

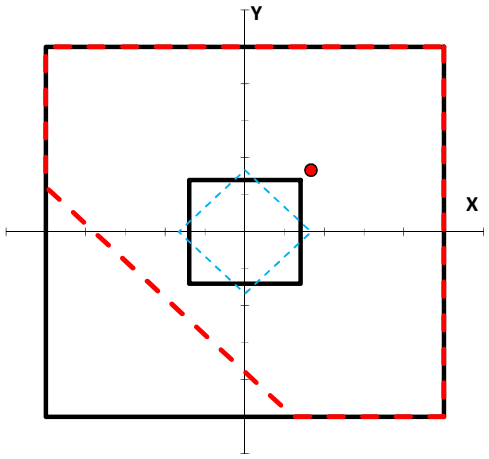
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	3	ksi
Clear Cover	3.5	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 11	
Pad Quantity Per Layer	19	
Pier Rebar Size	# 11	
Pier Quantity of Rebar	23	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	120	pcf
Angle of Friction, ø	34	°
Bearing Type	Net	
Ultimate Bearing	30	ksf
Water Table Depth	99	ft
Frost Depth	5	ft

Bearing Summary			Load Case
Qxmax	3.55	ksf	1D+1W
Qymax	3.55	ksf	1D+1W
Qmax @ 45°	4.61	ksf	1D+1W
$Q_{(all)\ Gross}$	15.57	ksf	
Controlling Capacity	**29.6%**	**Pass**	

Overturning Summary (Required FS=1.5)			Load Case
FS(ot)x	2.11	≥1.5	1D+1W
FS(ot)y	2.11	≥1.5	1D+1W
Controlling Capacity	**71.2%**	**Pass**	





GPD GROUP

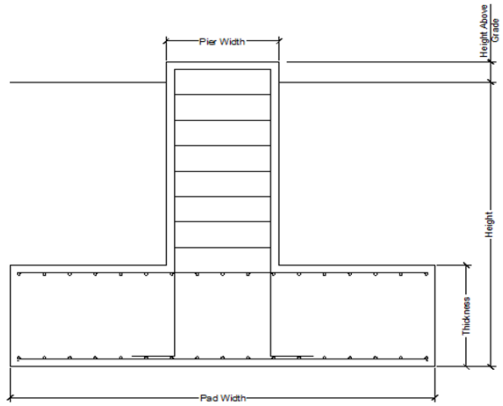
Base Foundation Reinforcement Check
GREENWICH NORTH (BU #: 841290)
2014777.841290.01

Code
TIA/EIA-222-F

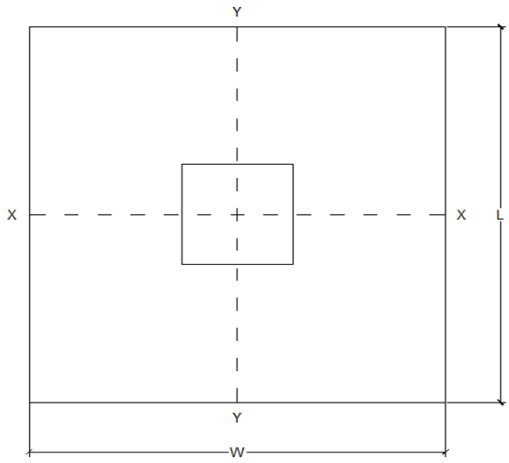
Tower Reactions		
Moment, M	4106.37	k-ft
Axial, P	52.05	k
Shear, V	34.87	k

Overall Capacities		
Reinforcement Capacity	21.7%	**OK**
A_s Minimum Met?	Yes	
Controlling Capacity	**21.7%**	**OK**

Pad & Pier Geometry		
Height	9.5	ft
Height Above Grade	0.5	ft
Pad Length, L	25	ft
Pad Width, W	25	ft
Pad Thickness, t	4.5	ft
Pier Shape	Square	
Square Pier Width	7	ft



Pad & Pier Reinforcing		
Reinforcing Known	Yes	
f'_c	3	ksi
Clear Cover	3.5	in
Rebar Fy	60	ksi
Pad Rebar Size	# 11	
Pad Rebar Quantity	19	
Pier Rebar Size	# 11	
Pier Rebar Quantity	23	



Unit Weights		
Concrete Unit Weight	150	pcf
Soil Unit Weight	120	pcf

Orthogonal Bearing		
Q_{max}	3.55	ksf
Q_{min}	0.00	ksf
Bearing Length	19.71	ft

Reinforcing Calculations		
Pad Moment Capacity		
ϕ (Bending)=	0.90	
M_u=	54.76	k-ft
ϕM_n=	251.94	k-ft
Moment Capacity	21.7%	**OK**
One-Way (Wide-Beam) Shear		
V_u=	12.36	psi
ϕV_n=	82.16	psi
Shear Capacity	15.0%	**OK**
Two-Way (Punching) Shear		
V_u=	25.92	psi
ϕV_n=	164.32	psi
Shear Capacity	15.8%	**OK**
Pier Compression		
P_u=	67.67	k
ϕP_n=	10428.14	k
Compression Capacity	0.6%	**OK**

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

Sprint Existing Facility

Site ID: CT03XC342

Boy Scouts / SNET

363 Riversville Road
Greenwich, CT 06831

September 6, 2014

EBI Project Number: 62144512

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

EBI Consulting
environmental | engineering | due diligence

September 6, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC342 - Boy Scouts / SNET

Site Total: 31.76% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at **363 Riversville Road, Greenwich, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of µW/cm2 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 ($\mu W/cm^2$). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at **363 Riversville Road, Greenwich, 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 **122 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	CT03XC342 - Boy Scouts / SNET
Site Addresss	363 Riversville Road, Greenwich, CT, 06831
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	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	122	116	1/2 "	0.5	0	138.69	0.37%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	122	116	1/2 "	0.5	0	39.00	0.18%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	122	116	1/2 "	0.5	0	138.69	0.65%
														Sector total Power Density Value:		1.21%

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	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	122	116	1/2 "	0.5	0	138.69	0.37%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	122	116	1/2 "	0.5	0	39.00	0.18%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	122	116	1/2 "	0.5	0	138.69	0.65%
														Sector total Power Density Value:		1.21%

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	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	5.9	122	116	1/2 "	0.5	0	138.69	0.37%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	122	116	1/2 "	0.5	0	39.00	0.18%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	122	116	1/2 "	0.5	0	138.69	0.65%
														Sector total Power Density Value:		1.21%

Site Composite MPE %	
Carrier	MPE %
Sprint	3.62%
AT&T	12.71%
T-Mobile	0.13%
Verizon Wireless	11.92%
Nextel	3.38%
Total Site MPE %	**31.76%**

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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 **3.62% (1.21% from sector 1, 1.21% from sector 2 and 1.21% 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 **31.76%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director

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