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

August 10, 2017

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

RE: **Notice of Exempt Modification for Sprint 2.5 Rework Crown Site BU: 841290**
Sprint Site ID: CT03XC342
363 Riversville Road, Greenwich, CT 06831
Latitude: 41° 3' 58.6" / Longitude: -73° 40' 17.4"

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 122-foot level of the existing 160-foot monopole at 363 Riversville Road in Greenwich, CT. The tower is owned by Crown Castle. The property is owned by the Greenwich Council Boy Scouts of America. Sprint intends to install three (3) antennas, three (3) RRHs, and one (1) hybrid cable.

In communications with the Town of Greenwich, the original Zoning Approval for this tower is unavailable.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Mr. Peter J. Tesei, First Selectman for the Town of Greenwich, as well as the property owner, and Town Planner; Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

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

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

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mr. Peter J. Tesei
Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

Planning and Zoning
Town of Greenwich
101 Field Point Road
Greenwich, CT 06830

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

Terry, Dashanna

From: Patrick LaRow <Patrick.LaRow@greenwichct.org>
Sent: Thursday, January 21, 2016 12:08 PM
To: Terry, Dashanna
Cc: Barbadora, Jeff
Subject: Re: Zoning Documents - Tower at 363 Riversville Road

The Planning and Zoning office does not have any documents related to a telecommunications facility at this address.

Patrick LaRow, AICP
Deputy Director / Assistant Town Planner

Town of Greenwich
Planning and Zoning
101 Field Point Road
Greenwich, CT 06830

Phone: (203) 622-7894 Fax: (203) 622-3795
Patrick.LaRow@greenwichct.org

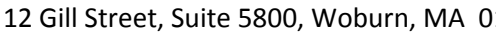
From: "Terry, Dashanna" <Dashanna.Terry@crowncastle.com>
To: "patrick.larow@greenwichct.org" <patrick.larow@greenwichct.org>
Cc: "Barbadora, Jeff" <Jeff.Barbadora@crowncastle.com>
Date: 01/21/2016 10:29 AM
Subject:Zoning Documents - Tower at 363 Riversville Road

Hello Patrick,

Thank you for speaking with me this morning regarding zoning documents for the tower at 363 Riversville Road. Could you please confirm here that you do not have original zoning documents for this tower?

Best,
Dashanna

DASHANNA TERRY
Real Estate Project Coordinator
T: (781) 970-0067| M: (571) 241-0984



12 Gill Street, Suite 5800, Woburn, MA 01801 Crowncastle.com

Headquarters	Greenwich, Connecticut
Country	United States
Founded	1912
Website	reenwichscouting.org

Greenwich Council: Camps

It owns and operates the Ernest Thompson Seton Scout Reservation, a 249-acre (1.01 km) camp located off 363 Riversville Road in Greenwich and named for Ernest Thompson Seton.

Greenwich Council: Order of the Arrow

Achewon Netopalis Lodge No. 427 is the Order of the Arrow lodge for the Greenwich Council. The lodge's name translates to "Spiritual Warrior" in the Algonquian language. The lodge totem is a green witch. Founded in 1949, it is still in existence. In 1977, the lodge received the E. Urner Goodman Award for its effectiveness in promoting and increasing Scout camping in its council.

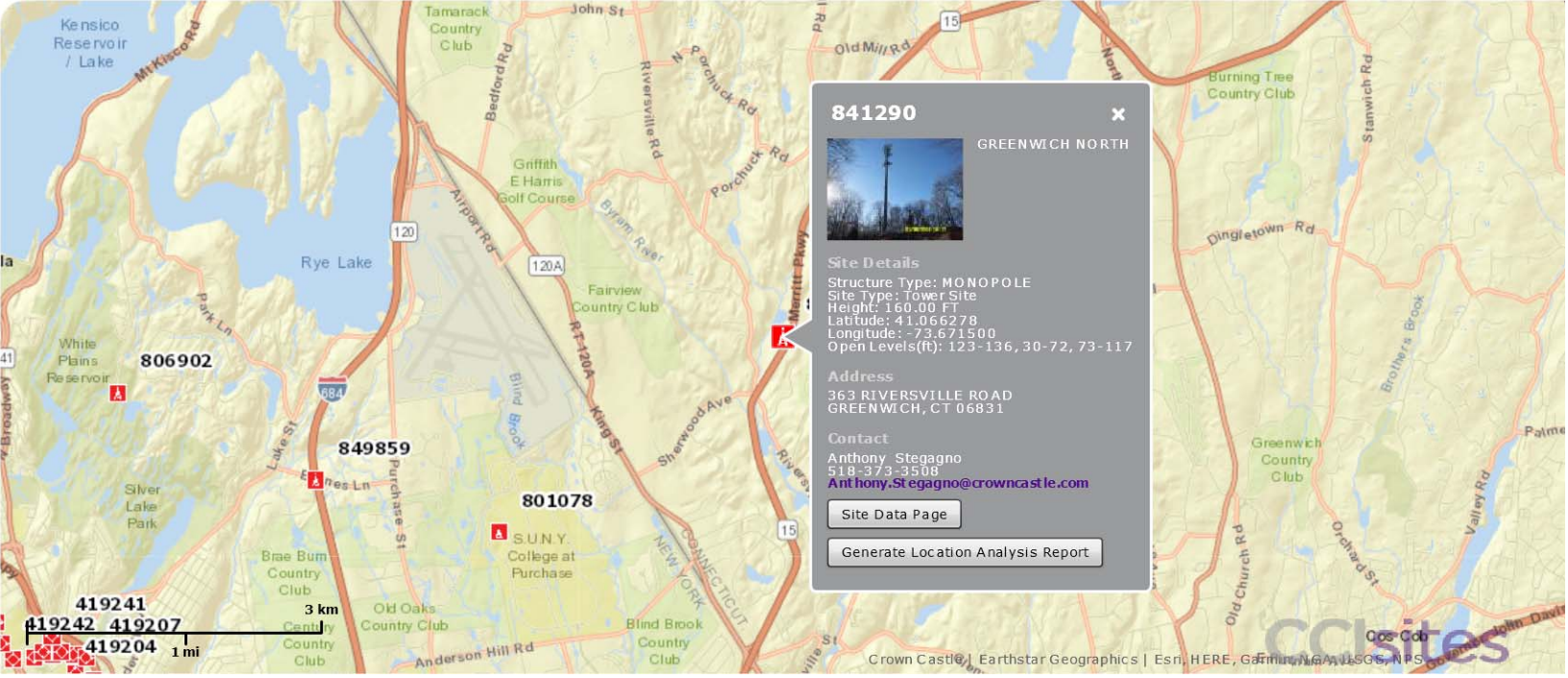
Greenwich Council: See also

- Scouting in Connecticut

Greenwich Council: References

Boy Scouts of America Organization

- Boy Scouts of America
- Cub Scouting
- Boy Scouting
- Varsity Scouting
- Venturing
- Sea Scouting
- Order of the Arrow
- National Eagle Scout Association
- Learning for Life
- Exploring


841290
GREENWICH NORTH
Site Details
Structure Type: MONOPOLE
Site Type: Tower Site
Height: 160.00 FT
Latitude: 41.066278
Longitude: -73.671500
Open Levels(ft): 123-136, 30-72, 73-117
Address
363 RIVERSVILLE ROAD
GREENWICH, CT 06831
Contact
Anthony Stegagno
518-373-3508
Anthony.Stegagno@crowncastle.com
Site Data Page
Generate Location Analysis Report
806902
849859
801078
419241
419242
419207
419204
3 km
1 mi
Rye Lake
Kensico Reservoir / Lake
White Plains Reservoir
Silver Lake Park
Fairview Country Club
Griffith E Harris Golf Course
Tamarack Country Club
Brae Burn Country Club
Old Oaks Country Club
Century Country Club
Blind Brook Country Club
Burning Tree Country Club
Greenwich Country Club
S.U.N.Y. College at Purchase
Crown Castle | Earthstar Geographics | Esri, HERE, Garmin, NGA, USGS, NPS

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

APPROVED
By Jason D'Amico at 9:41 am, Jul 06, 2017

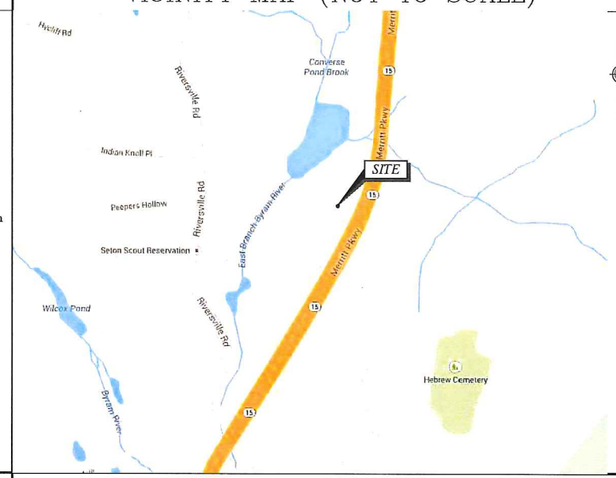
APPROVED
By Jeff Barbadora at 10:09 pm, Aug 02, 2014

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

SHT. NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
SP-1	GENERAL NOTES
SP-2	GENERAL NOTES
A-1	SITE PLAN
A-2	ELEVATION
A-3	ENLARGED EQUIPMENT LAYOUT PLANS
A-4	ANTENNA LAYOUT PLANS
A-5	RAN WIRING DIAGRAM
A-6	CABLE DETAILS
S-1	EQUIPMENT DETAILS
S-2	EQUIPMENT SCHEMATIC DETAILS
E-1	ELECTRICAL & GROUNDING PLANS
E-2	GROUNDING DETAILS & NOTES

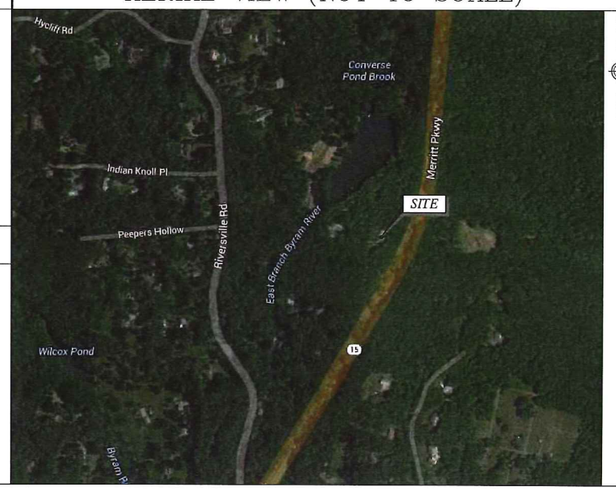
GENERAL NOTES

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: _____

CALL TOLL FREE FOR CONNECTICUT
1-800-922-4455 OR DIAL 811
CALL TWO FULL WORKING DAYS IN ADVANCE TO LOCATE BURIED UTILITY PIPES AND CABLES

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	JMG

SEAL

STATE OF CONNECTICUT
ANANDKUMAR SARAVANAN
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.

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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	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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DATE	REVIEWED BY
8/11/14	JMG

STATE OF CONNECTICUT MANOUKIAN BRIAN 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

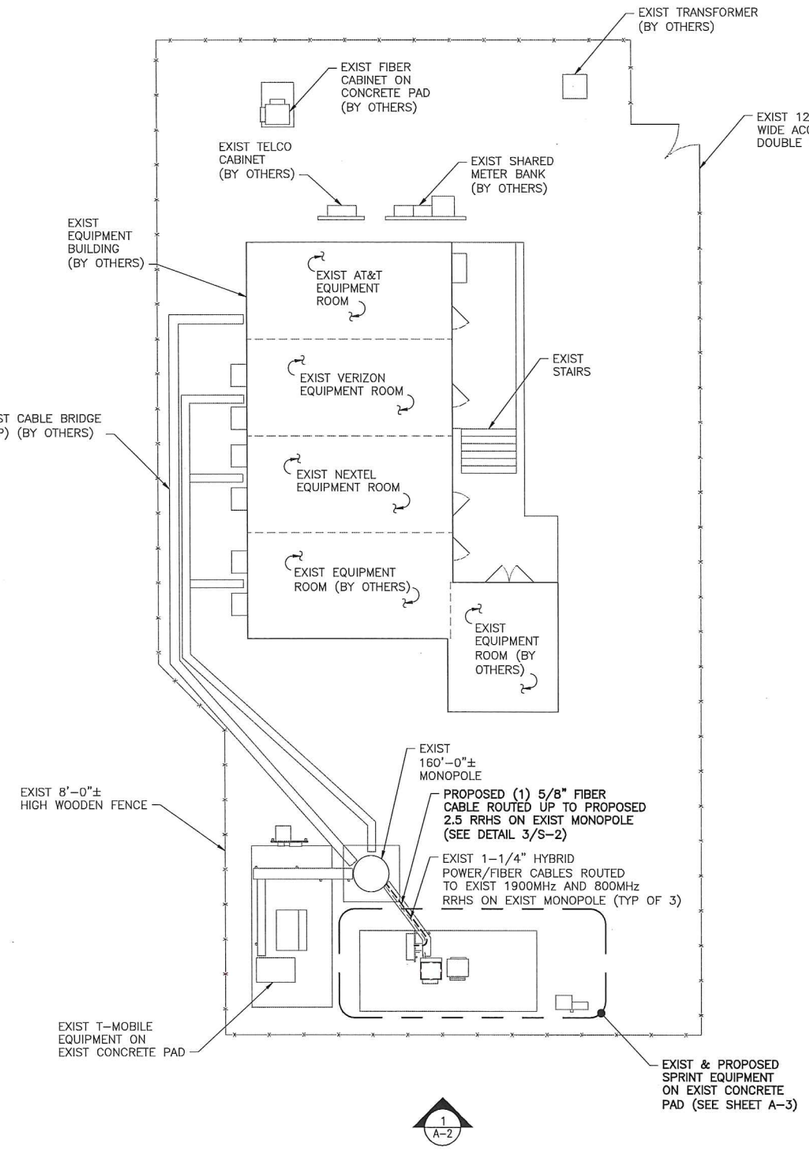
SHEET NO:
SP–2

N

APPROX.

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-2

1 / A-1 SITE PLAN

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

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DATE	REVIEWED BY
8/7/14	JMQ

STATE OF CONNECTICUT — ANOKUMAR SUTHARSAN — No. 22038 — LICENSED PROFESSIONAL ENGINEER

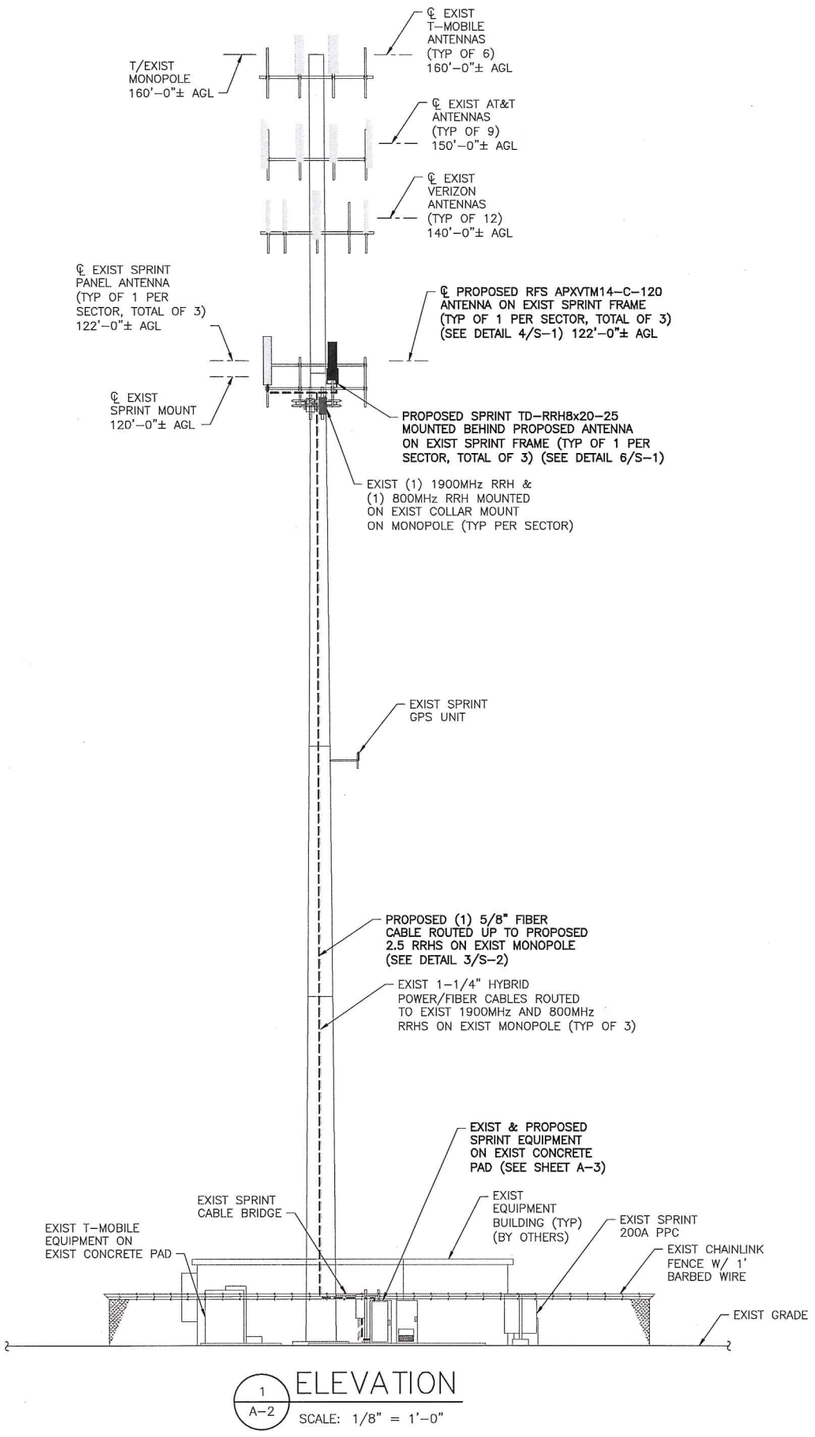
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
SITE PLAN

SHEET NO:
A-1

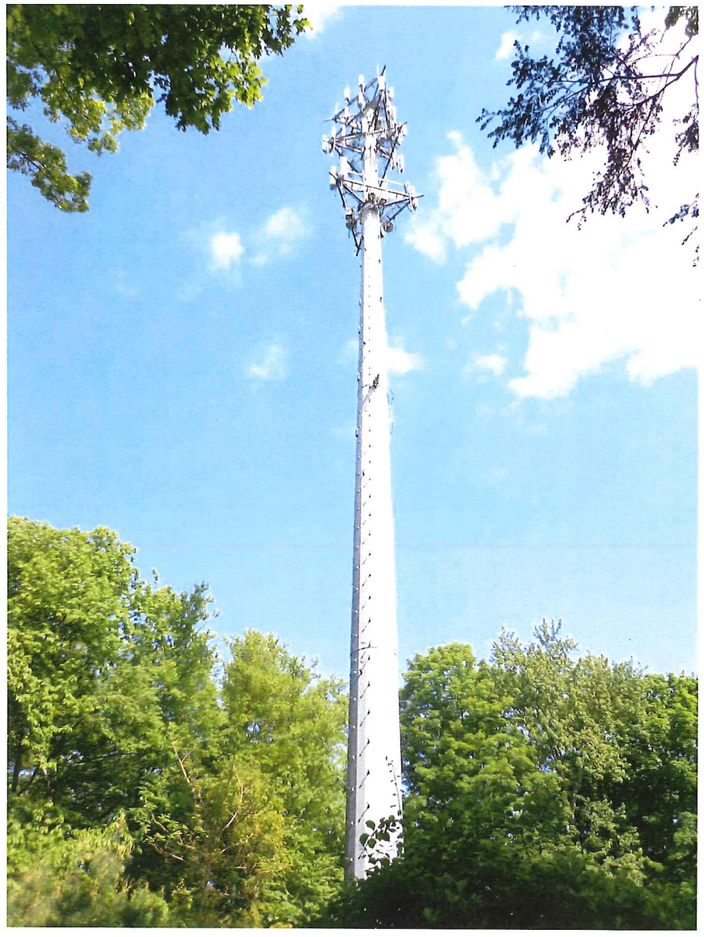


1 / A–2 ELEVATION

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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2.5 EQUIPMENT DEPLOYMENT

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SEAL

STATE OF CONNECTICUT
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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:

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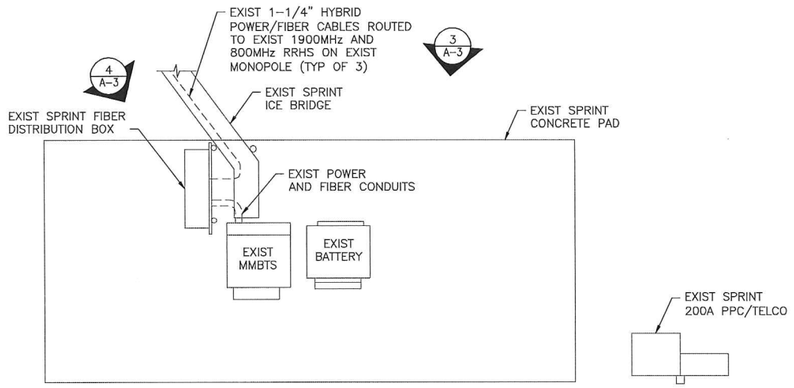
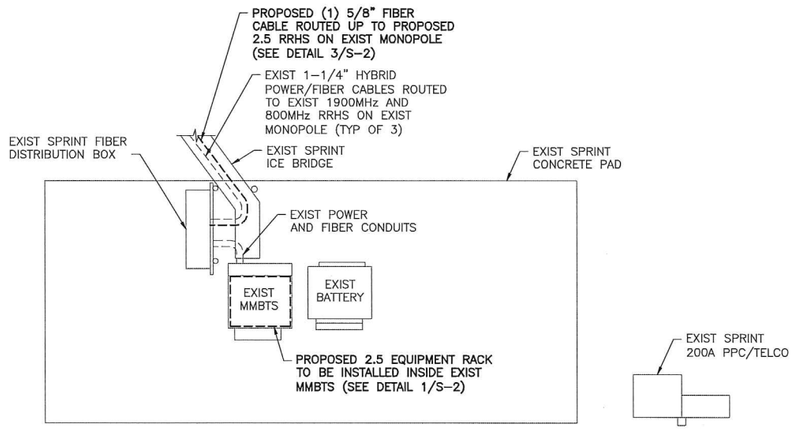


1 A-3 ENLARGED EQUIPMENT LAYOUT PLAN (EXIST)

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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2.5 EQUIPMENT DEPLOYMENT

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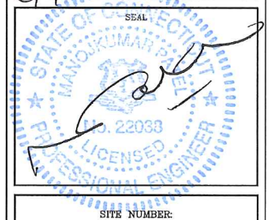

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BOY SCOUTS/SNET

SITE ADDRESS:
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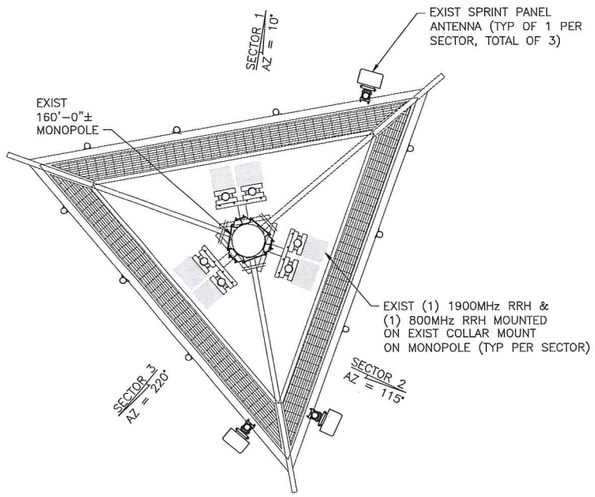
GREENWICH, CT 06831

SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
A-3

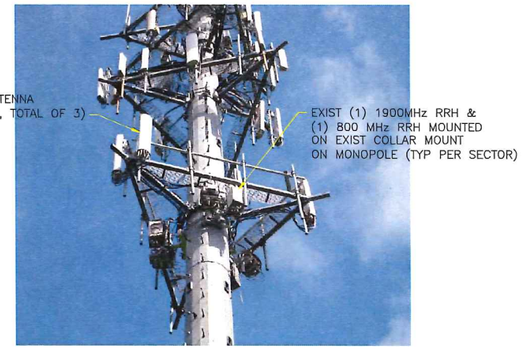
N

APPROX.



1 / A-4 ANTENNA LAYOUT PLAN (EXIST)

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



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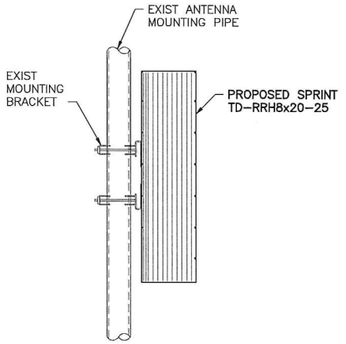
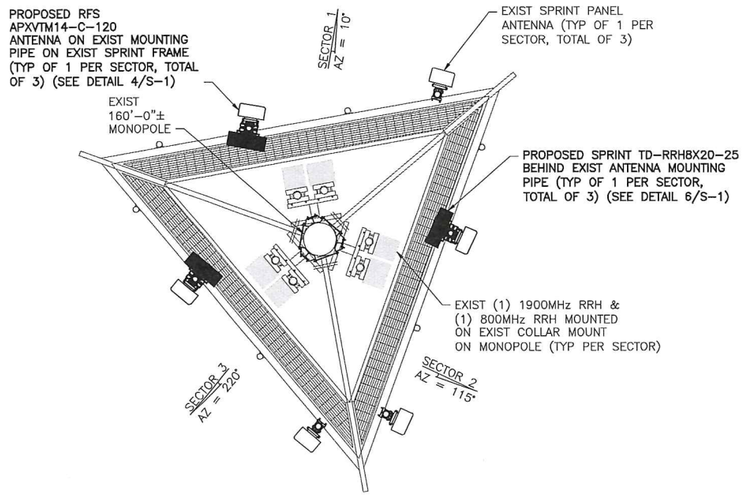


3 / A-4 RRH MOUNTING DETAIL

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



2 / A-4 ANTENNA LAYOUT PLAN (FINAL)

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

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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8/1/14	JMG

SEAL: STATE OF CONNECTICUT · MANOHKUMAR TRIKAMJI · No. 22063 · LICENSED PROFESSIONAL ENGINEER

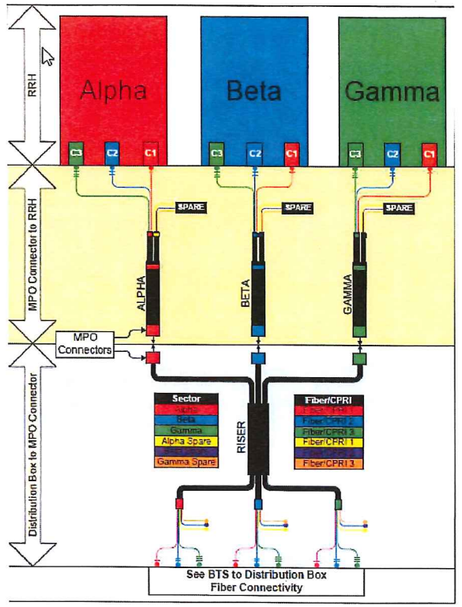
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

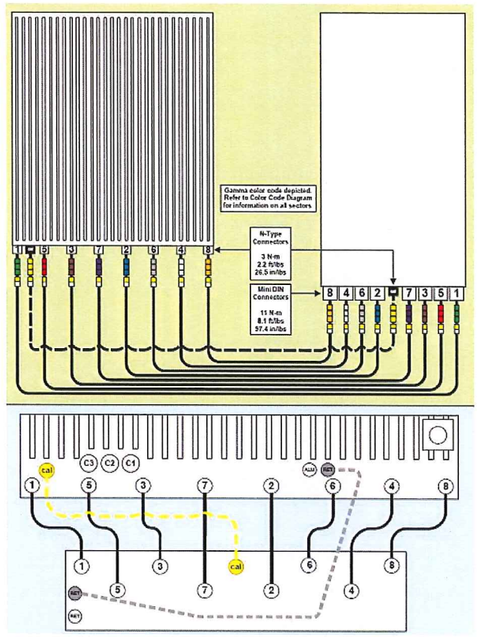
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



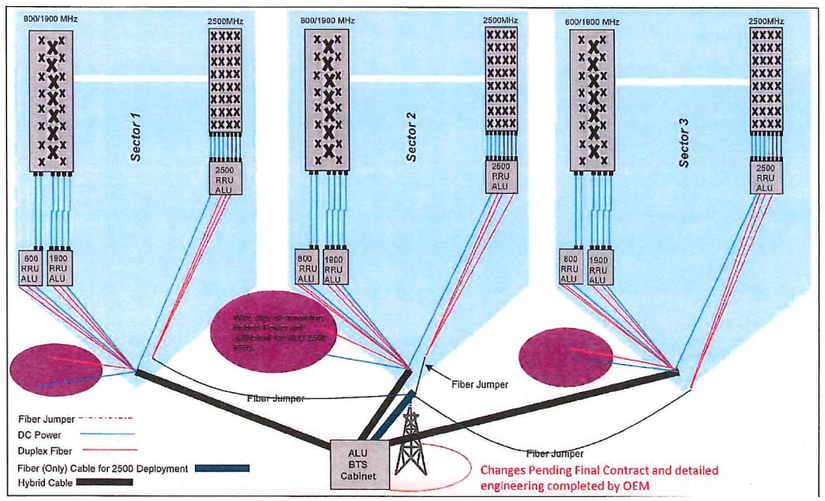
1 / A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



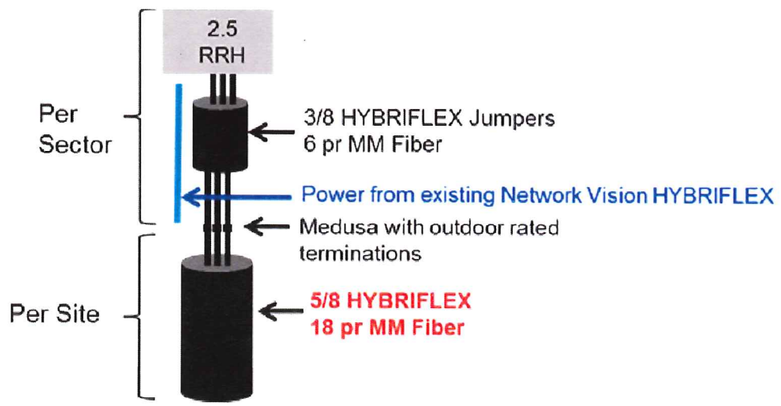
2 / A–5 RRH CONNECTIVITY

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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PROJECT NO: 7225.CT03XC342

NO	DATE	DESCRIPTION	BY
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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 · MANOJKUMAR PATEL · No. 22039 · LICENSED PROFESSIONAL ENGINEER

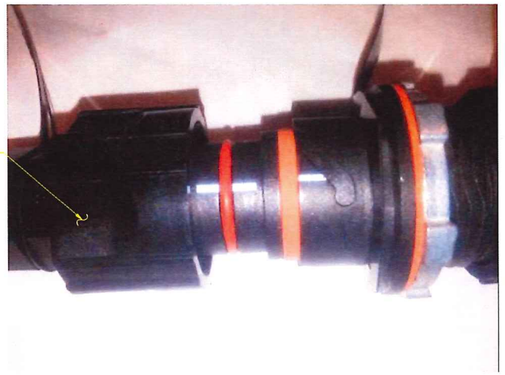
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

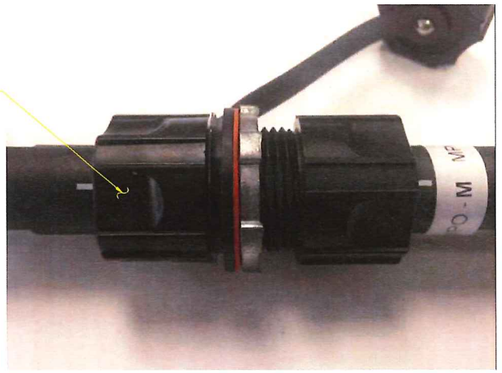
SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
RAN WIRING DIAGRAM

SHEET NO:
A–5



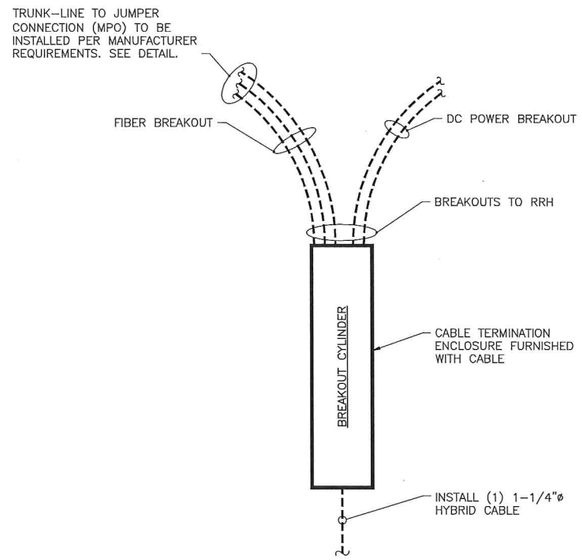
IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION



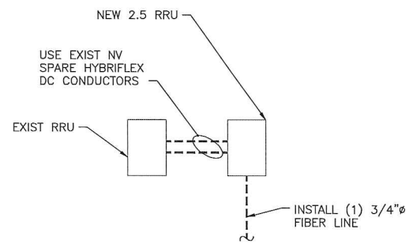
IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

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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DATE	REVIEWED BY
8/1/14	JMA

SEAL

STATE OF CONNECTICUT
MICHAEL PUSATERI
No. 22031
LICENSED PROFESSIONAL ENGINEER

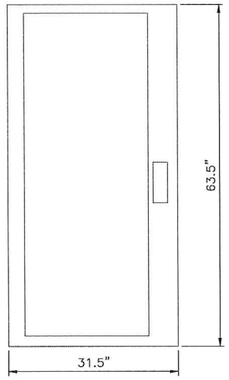
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

SHEET TITLE:
CABLE DETAILS

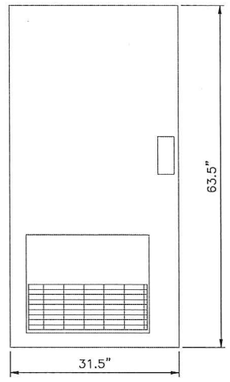
SHEET NO:
A-6



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

1 S-1 (EXIST) MMBTS CABINET

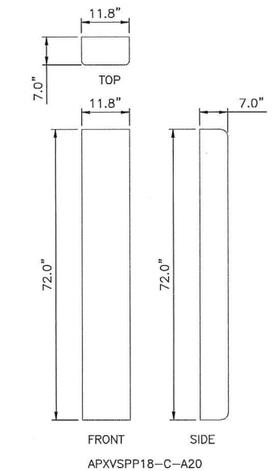
SCALE: 1" = 1'-0"



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

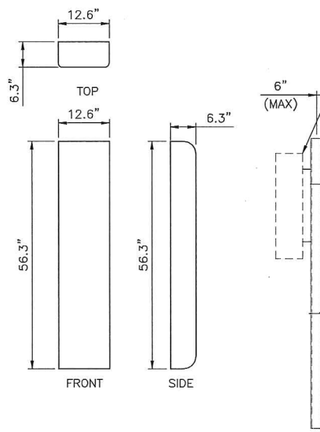
2 S-1 (EXIST) BATTERY CABINET

SCALE: 1" = 1'-0"



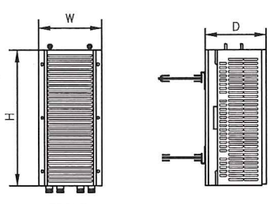
3 S-1 (EXIST) ANTENNA DETAIL

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

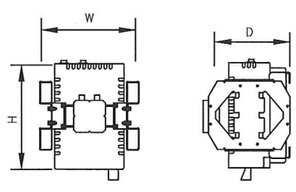


4 S-1 (PROPOSED) ANTENNA DETAIL

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



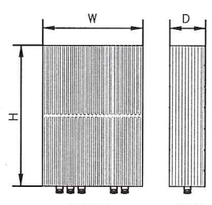
TYPE: 1900 MHz 4x45W
MODEL #: RRH 1900 4X45 65MHz
HEIGHT: 25.0"
WIDTH: 11.1"
DEPTH: 11.4"
WEIGHT: ±60 LBS.



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

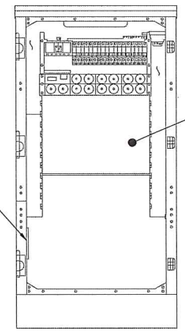
SITE NAME:
BOY SCOUTS/SNET

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.

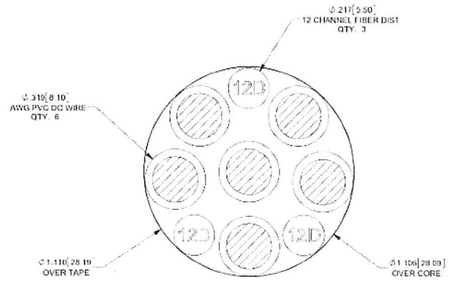
RFS HYBRIFLEX RISER CABLES SCHEDULE

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

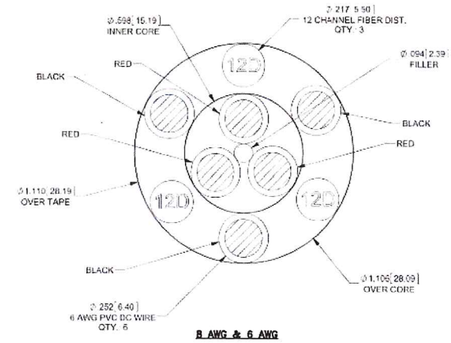
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

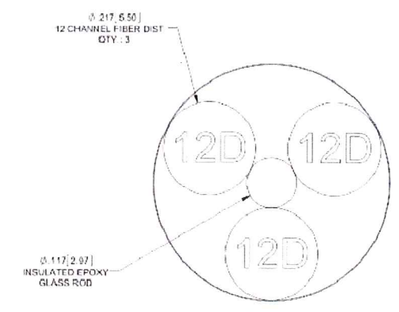
HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG

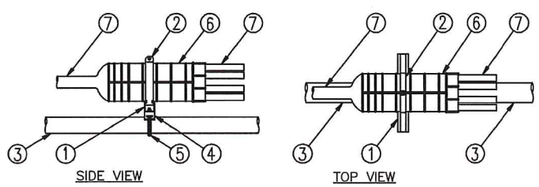


FIBER ONLY

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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8/1/14	JMG

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

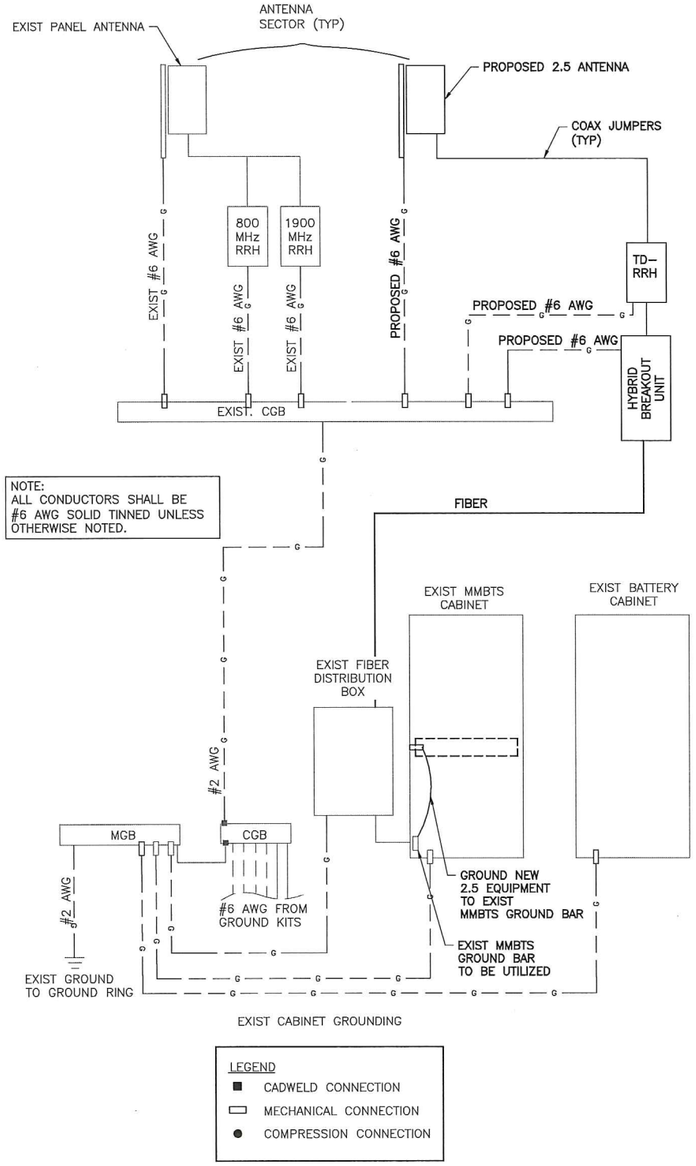
SITE NUMBER:
CT03XC342

SITE NAME:
BOY SCOUTS/SNET

SITE ADDRESS:
363 RIVERSVILLE ROAD
GREENWICH, CT 06831

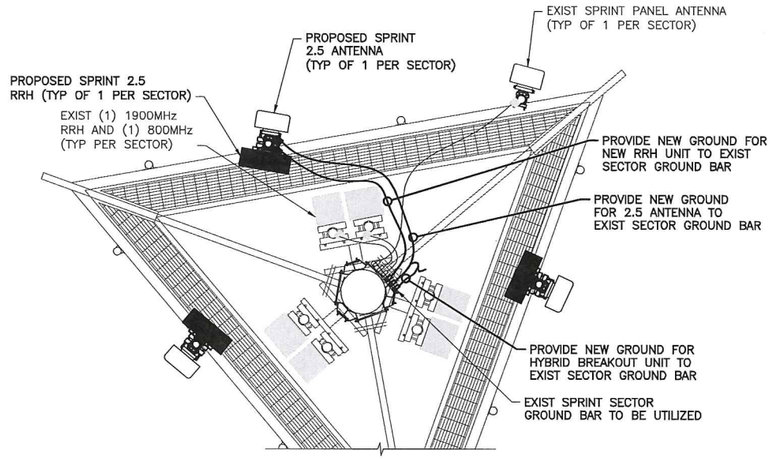
SHEET TITLE:
EQUIPMENT SCHEMATIC DETAILS

SHEET NO:
S–2



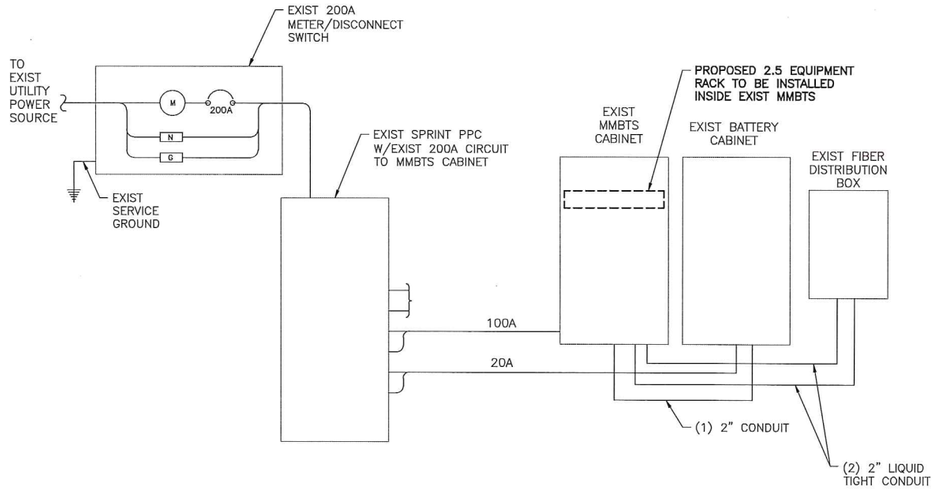
1 / E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

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
8/7/14	JMO

SEAL

STATE OF CONNECTICUT — JOSEPH M. OLIVIERI — No. 22023 — LICENSED PROFESSIONAL ENGINEER

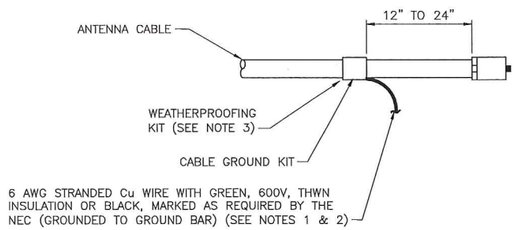
SITE NUMBER:
CT03XC342

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:

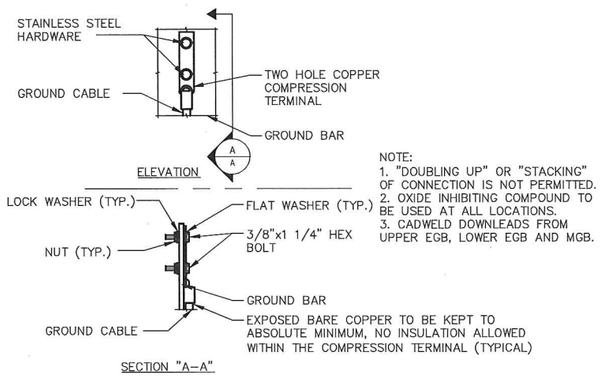
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

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

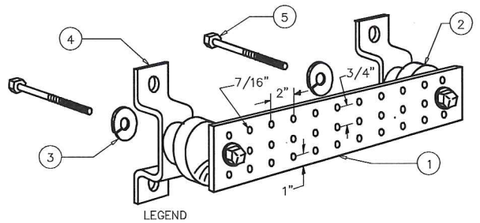
SCALE: N.T.S.



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



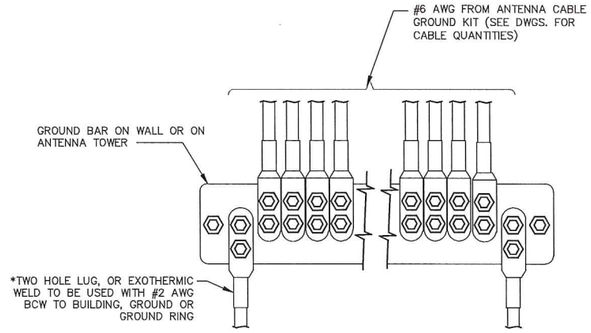
LEGEND

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

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

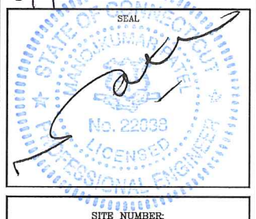
SUBMITTALS

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	TMQ

SEAL



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: **June 14, 2017**

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

Crown Castle
2000 Corporate Dr.
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC342
	Carrier Site Name:	CT03XC342
Crown Castle Designation:	**Crown Castle BU Number:**	841290
	Crown Castle Site Name:	GREENWICH NORTH
	Crown Castle JDE Job Number:	442005
	Crown Castle Work Order Number:	1417422
	Crown Castle Application Number:	393521 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1417422
Site Data:	**363 RIVERSVILLE ROAD, GREENWICH, Fairfield County, CT** **Latitude *41° 3' 58.6"*, Longitude *-73° 40' 17.4"*** **160 Foot - Monopole Tower**	

Dear Cheryl Schultz,

Crown Castle 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 1417422, in accordance with application 393521, revision 0.

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

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

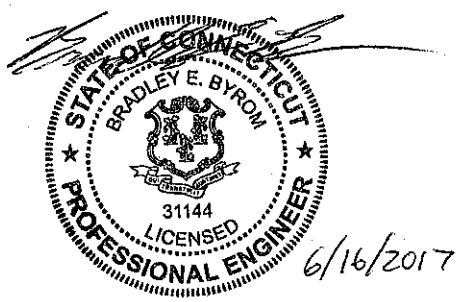
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 120 mph converted to a nominal 3-second gust wind speed of 93 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

We at *Crown Castle* 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: Mark E. Mlynarski, E.I.T. / SCK / DLT

Respectfully submitted by:



6/16/2017

Bradley E. Byrom, P.E., S.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC. in April of 2003. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	122.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
		3	rfs celwave	APXVTM14-ALU-I20 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
160.0	163.0	3	commscope	LNX-6515DS-VTM w/ Mount Pipe	13	1-5/8	1
		3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe			
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	RRUS 11 B12			
		3	rfs celwave	ATMAA1412D-1A20			
	160.0	1	tower mounts	Platform Mount [LP 1201-1]			
153.0	153.0	3	ericsson	TME-RRUS-11	2	3/8	1
		1	raycap	TME-DC6-48-60-18-8F			
		1	tower mounts	Side Arm Mount [SO 102-3]			
149.0	149.0	3	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	1 2	3/8 7/8	2
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 32 B2			
		1	raycap	DC6-48-60-18-8F			
		6	powerwave technologies	7770.00 w/ Mount Pipe	1 2 1 12	3/8 7/8 Conduit 1-5/8	1
		12	powerwave technologies	LGP21401			
		1	tower mounts	Platform Mount [LP 1201-1]			
140.0	142.0	3	alcatel lucent	B13 RRH 4X30	2	1-5/8	2
		3	alcatel lucent	RRH2X60-AWS			
		3	amphenol	QUAD656C0000G w/ Mount Pipe			
		3	amphenol	WWX063X19G00 w/ Mount Pipe			
		1	commscope	RC2DC-3315-PF-48			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	alcatel lucent	RRH2X60-PCS	18	1-5/8	1
		3	amphenol	WWX063X19G00 w/ Mount Pipe			
		1	commscope	RC2DC-3315-PF-48			
		2	decibel	DB844H80E-XY w/ Mount Pipe			
		4	rfs celwave	APL868013-42T0 w/ Mount Pipe			
	140.0	1	tower mounts	Platform Mount [LP 1201-1]			
122.0	122.0	1	tower mounts	Miscellaneous [NA 510-1]	2 3	1/2 1-1/4	1
120.0	122.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	120.0	1	tower mounts	Platform Mount [LP 1201-1]			
119.0	122.0	3	alcatel lucent	1900MHz RRH	-	-	1
		3	alcatel lucent	800MHZ RRH			
	119.0	1	tower mounts	Side Arm Mount [SO 102-3]			
72.0	73.0	2	gps	GPS_A	1	1/2	1
	72.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) 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	-	-
140	140	12	Allgon	ALP 11011	-	-
130	130	12	Allgon	ALP 11011	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	WEI Geotechnical Engineers	5121535	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	WEI Geotechnical Engineers (Mapping)	4468638	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineered Endeavors, Inc.	5121537	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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	-4.59	1135.55	7.4	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-21.52	1934.28	39.2	Pass
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-29.70	2892.94	51.8	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-44.20	5028.09	45.4	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-64.56	6604.55	45.9	Pass
							Summary	
						Pole (L3)	51.8	Pass
						RATING =	51.8	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Flange Bolts	152	9.6	Pass
1	Flange Plate		7.3	Pass
1	Anchor Rods	0	43.0	Pass
1	Base Plate	0	50.6	Pass
1	Base Foundation (Structure)	0	69.0	Pass
1	Base Foundation (Soil Interaction)	0	39.7	Pass

Structure Rating (max from all components) =	**69.0%**

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

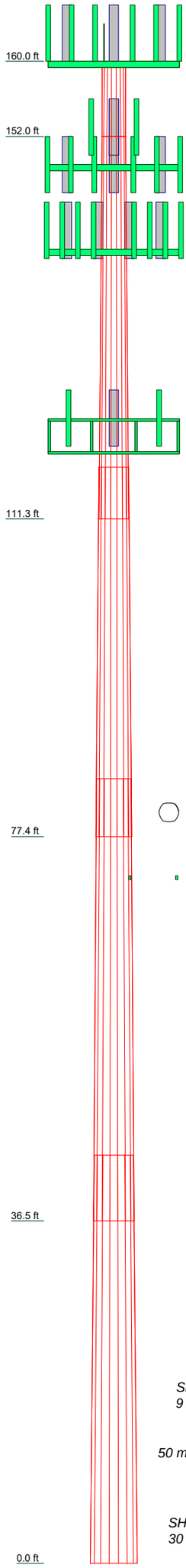
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

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



ALL REACTIONS ARE FACTORED

AXIAL 101 K

SHEAR 9 K *MOMENT 1070 kip-ft*

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 65 K

SHEAR 30 K *MOMENT 3570 kip-ft*

TORQUE 1 kip-ft

REACTIONS - 93 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	160	(2) APL868013-42T0 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	(2) APL868013-42T0 w/ Mount Pipe	140
		WWX063X19G00 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	WWX063X19G00 w/ Mount Pipe	140
		WWX063X19G00 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	(2) DB844H80E-XY w/ Mount Pipe	140
		RC2DC-3315-PF-48	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	RRH2X60-PCS	140
		RRH2X60-PCS	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	RRH2X60-PCS	140
		Platform Mount [LP 1201-1]	140
LNX-6515DS-VTM w/ Mount Pipe	160	QUAD656C0000G w/ Mount Pipe	140
LNX-6515DS-VTM w/ Mount Pipe	160	QUAD656C0000G w/ Mount Pipe	140
LNX-6515DS-VTM w/ Mount Pipe	160	QUAD656C0000G w/ Mount Pipe	140
ATMAA1412D-1A20	160	WWX063X19G00 w/ Mount Pipe	140
ATMAA1412D-1A20	160	WWX063X19G00 w/ Mount Pipe	140
ATMAA1412D-1A20	160	WWX063X19G00 w/ Mount Pipe	140
RRUS 11 B12	160	B13 RRH 4X30	140
RRUS 11 B12	160	B13 RRH 4X30	140
RRUS 11 B12	160	B13 RRH 4X30	140
Platform Mount [LP 1201-1]	160	RRH2X60-AWS	140
6' x 2" Mount Pipe	160	RRH2X60-AWS	140
6' x 2" Mount Pipe	160	RRH2X60-AWS	140
6' x 2" Mount Pipe	160	RC2DC-3315-PF-48	140
TME-DC6-48-60-18-8F	153	Miscellaneous [NA 510-1]	122
TME-RRUS-11	153	APXVSPP18-C-A20 w/ Mount Pipe	120
TME-RRUS-11	153	APXVSPP18-C-A20 w/ Mount Pipe	120
TME-RRUS-11	153	APXVTM14-ALU-I20 w/ Mount Pipe	120
Side Arm Mount [SO 102-3]	153	APXVTM14-ALU-I20 w/ Mount Pipe	120
(2) 7770.00 w/ Mount Pipe	149	APXVTM14-ALU-I20 w/ Mount Pipe	120
(2) 7770.00 w/ Mount Pipe	149	TD-RRH8x20-25	120
(2) 7770.00 w/ Mount Pipe	149	TD-RRH8x20-25	120
(4) LGP21401	149	TD-RRH8x20-25	120
(4) LGP21401	149	APXVSPP18-C-A20 w/ Mount Pipe	120
(4) LGP21401	149	Platform Mount [LP 1201-1]	120
Platform Mount [LP 1201-1]	149	(2) 6' x 2" Mount Pipe	120
HPA-65R-BUU-H6 w/ Mount Pipe	149	(2) 6' x 2" Mount Pipe	120
HPA-65R-BUU-H6 w/ Mount Pipe	149	(2) 6' x 2" Mount Pipe	120
HPA-65R-BUU-H6 w/ Mount Pipe	149	TME-800MHZ RRH	119
RRUS 11	149	TME-800MHZ RRH	119
RRUS 11	149	TME-800MHZ RRH	119
RRUS 11	149	TME-1900MHz RRH (65MHz)	119
RRUS 32 B2	149	TME-1900MHz RRH (65MHz)	119
RRUS 32 B2	149	TME-1900MHz RRH (65MHz)	119
RRUS 32 B2	149	Side Arm Mount [SO 102-3]	119
DC6-48-60-18-8F	149	Side Arm Mount [SO 701-1]	72
		(2) GPS_A	72

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 Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 51.8%

CROWN CASTLE
The Foundation for a Wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job: ***BU# 841290***			
Project:			
Client: Crown Castle	Drawn by: SKasera		App'd:
Code: TIA-222-G	Date: 06/15/17		Scale: NTS
Path: R:\SA Models - Letters\Work Area\MMlynarski\WIP\841290 WO 1417422\Pre QA - SCK\841290.eri			Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 93 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.7500 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) 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		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
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
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	Double Angle Stitch Bolt Spacing Redundants 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 Round Or Flat

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

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
***								
LDF7-50A(1-5/8)	C	No	Inside Pole	160.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
MLE Hybrid 9Power/18Fiber RL 2(1-5/8)	C	No	Inside Pole	160.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07
***								
LDF2-50(3/8)	C	No	Inside Pole	153.00 - 0.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	0.08
***								
LDF7-50A(1-5/8)	C	No	Inside Pole	149.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRDA(7/8)	C	No	Inside Pole	149.00 - 0.00	2	No Ice	0.00	0.68
						1/2" Ice	0.00	0.68
						1" Ice	0.00	0.68
FB-L98B-034-XXX(3/8)	C	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRDA(7/8)	C	No	Inside Pole	149.00 - 0.00	2	No Ice	0.00	0.68
						1/2" Ice	0.00	0.68
						1" Ice	0.00	0.68
2" Rigid Conduit	C	No	Inside Pole	149.00 - 0.00	1	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
***								
LDF7-50A(1-5/8)	C	No	Inside Pole	140.00 - 0.00	18	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	140.00 - 0.00	2	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
***								
LDF4-50A(1/2)	C	No	Inside Pole	120.00 - 0.00	2	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
HB114-1-05U3-S3J(1-1/4)	C	No	Inside Pole	120.00 - 0.00	3	No Ice	0.00	0.90
						1/2" Ice	0.00	0.90
						1" Ice	0.00	0.90
LDF4-50A(1/2)	C	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
HB114-21U3M12-XXXF(1-1/4)	C	No	Inside Pole	120.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
***								

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	0.000	0.00
		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	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.57
L3	111.29-77.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.64
L4	77.42-36.46	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.98
L5	36.46-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.76

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	1.752	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.09
L2	152.00-111.29	A	1.722	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.57
L3	111.29-77.42	A	1.666	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.64
L4	77.42-36.46	A	1.584	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.98
L5	36.46-0.00	A	1.410	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.76

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	0.0000	0.0000	0.0000	0.0000
L2	152.00-111.29	0.0000	0.0000	0.0000	0.0000
L3	111.29-77.42	0.0000	0.0000	0.0000	0.0000
L4	77.42-36.46	0.0000	0.0000	0.0000	0.0000
L5	36.46-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

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
Lightning Rod 5/8x4'	C	From Leg	0.00 0.00 2.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	0.25 0.66 0.97	0.25 0.66 0.97	0.03 0.03 0.04
160									
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00	0.0000	160.00	No Ice 1/2"	6.33 6.78	5.64 6.43	0.11 0.17

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
			3.00			Ice	7.21	7.13	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
ATMAA1412D-1A20	A	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.59	1.00 1.13 1.26	0.01 0.02 0.03
ATMAA1412D-1A20	B	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.59	1.00 1.13 1.26	0.01 0.02 0.03
ATMAA1412D-1A20	C	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.59	1.00 1.13 1.26	0.01 0.02 0.03
RRUS 11 B12	A	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	B	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
RRUS 11 B12	C	From Leg	4.00 0.00 3.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.18 1.33 1.48	0.05 0.07 0.10
Platform Mount [LP 1201-1]	C	None		0.0000	160.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05

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
						1" Ice			
153									
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	1.47 1.67 1.88	1.47 1.67 1.88	0.02 0.04 0.06
TME-RRUS-11	A	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.96 3.23 3.50	1.67 1.98 2.30	0.06 0.08 0.12
TME-RRUS-11	B	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.96 3.23 3.50	1.67 1.98 2.30	0.06 0.08 0.12
TME-RRUS-11	C	From Leg	1.50 0.00 0.00	0.0000	153.00	No Ice 1/2" Ice 1" Ice	2.96 3.23 3.50	1.67 1.98 2.30	0.06 0.08 0.12
Side Arm Mount [SO 102-3]	C	None		0.0000	153.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
149									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(4) LGP21401	A	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(4) LGP21401	B	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
(4) LGP21401	C	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.21 0.27 0.35	0.01 0.02 0.03
Platform Mount [LP 1201-1]	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
HPA-65R-BUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	9.90 10.47 11.01	8.11 9.30 10.21	0.08 0.16 0.25
RRUS 11	A	From Leg	4.00 0.00	0.0000	149.00	No Ice 1/2"	2.78 2.99	1.19 1.33	0.05 0.07

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
			0.00			Ice	3.21	1.49	0.09
						1" Ice			
RRUS 11	B	From Leg	4.00	0.0000	149.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			0.00			Ice	3.21	1.49	0.09
						1" Ice			
RRUS 11	C	From Leg	4.00	0.0000	149.00	No Ice	2.78	1.19	0.05
			0.00			1/2"	2.99	1.33	0.07
			0.00			Ice	3.21	1.49	0.09
						1" Ice			
RRUS 32 B2	A	From Leg	4.00	0.0000	149.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			0.00			Ice	3.18	2.05	0.10
						1" Ice			
RRUS 32 B2	B	From Leg	4.00	0.0000	149.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			0.00			Ice	3.18	2.05	0.10
						1" Ice			
RRUS 32 B2	C	From Leg	4.00	0.0000	149.00	No Ice	2.73	1.67	0.05
			0.00			1/2"	2.95	1.86	0.07
			0.00			Ice	3.18	2.05	0.10
						1" Ice			
DC6-48-60-18-8F	A	From Leg	4.00	0.0000	149.00	No Ice	0.79	0.79	0.02
			0.00			1/2"	1.27	1.27	0.04
			0.00			Ice	1.45	1.45	0.05
						1" Ice			
140									
(2) APL868013-42T0 w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	3.10	4.80	0.02
			0.00			1/2"	3.48	5.42	0.06
			2.00			Ice	3.85	6.04	0.11
						1" Ice			
(2) APL868013-42T0 w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	3.10	4.80	0.02
			0.00			1/2"	3.48	5.42	0.06
			2.00			Ice	3.85	6.04	0.11
						1" Ice			
WWX063X19G00 w/ Mount Pipe	A	From Leg	4.00	0.0000	140.00	No Ice	8.84	7.28	0.06
			0.00			1/2"	9.41	8.50	0.13
			2.00			Ice	9.96	9.47	0.21
						1" Ice			
WWX063X19G00 w/ Mount Pipe	B	From Leg	4.00	0.0000	140.00	No Ice	8.84	7.28	0.06
			0.00			1/2"	9.41	8.50	0.13
			2.00			Ice	9.96	9.47	0.21
						1" Ice			
WWX063X19G00 w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	8.84	7.28	0.06
			0.00			1/2"	9.41	8.50	0.13
			2.00			Ice	9.96	9.47	0.21
						1" Ice			
(2) DB844H80E-XY w/ Mount Pipe	C	From Leg	4.00	0.0000	140.00	No Ice	3.30	4.80	0.03
			0.00			1/2"	3.67	5.42	0.07
			2.00			Ice	4.03	6.04	0.12
						1" Ice			
RC2DC-3315-PF-48	A	From Leg	4.00	0.0000	140.00	No Ice	3.79	2.51	0.03
			0.00			1/2"	4.04	2.72	0.06
			2.00			Ice	4.30	2.94	0.10
						1" Ice			
RRH2X60-PCS	A	From Leg	4.00	0.0000	140.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			2.00			Ice	2.59	2.09	0.10
						1" Ice			
RRH2X60-PCS	B	From Leg	4.00	0.0000	140.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08
			2.00			Ice	2.59	2.09	0.10
						1" Ice			
RRH2X60-PCS	C	From Leg	4.00	0.0000	140.00	No Ice	2.20	1.72	0.06
			0.00			1/2"	2.39	1.90	0.08

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
			2.00			Ice	2.59	2.09	0.10
						1" Ice			
Platform Mount [LP 1201-1]	C	None		0.0000	140.00	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
QUAD656C0000G w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
QUAD656C0000G w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
QUAD656C0000G w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	13.48 14.10 14.68	7.33 8.55 9.50	0.08 0.17 0.28
WWX063X19G00 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
WWX063X19G00 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
WWX063X19G00 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.84 9.41 9.96	7.28 8.50 9.47	0.06 0.13 0.21
B13 RRH 4X30	A	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	B	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	C	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
RRH2X60-AWS	A	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	B	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RRH2X60-AWS	C	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.50 3.76 4.03	1.82 2.05 2.29	0.06 0.08 0.11
RC2DC-3315-PF-48	C	From Leg	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.79 4.04 4.30	2.51 2.72 2.94	0.03 0.06 0.10
120									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00 0.00	0.0000	120.00	No Ice 1/2"	8.26 8.82	6.95 8.13	0.08 0.15

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
			2.00			Ice	9.35	9.02	0.23
						1" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	6.58 7.03 7.47	4.96 5.75 6.47	0.08 0.13 0.19
TD-RRH8x20-25	A	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	B	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	C	From Leg	4.00 0.00 2.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
Miscellaneous [NA 510-1]	C	None		0.0000	122.00	No Ice 1/2" Ice 1" Ice	6.00 8.50 11.00	6.00 8.50 11.00	0.26 0.34 0.42
Platform Mount [LP 1201-1]	C	None		0.0000	120.00	No Ice 1/2" Ice 1" Ice	23.10 26.80 30.50	23.10 26.80 30.50	2.10 2.50 2.90
(2) 6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
(2) 6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
(2) 6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	1.43 1.92 2.29	1.43 1.92 2.29	0.02 0.03 0.05
119									
TME-800MHZ RRH	A	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
TME-800MHZ RRH	B	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
TME-800MHZ RRH	C	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
TME-1900MHz RRH (65MHz)	A	From Leg	1.50 0.00	0.0000	119.00	No Ice 1/2"	2.70 2.94	2.77 3.01	0.06 0.08

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
			3.00			Ice 1" Ice	3.18	3.26	0.11
TME-1900MHz RRH (65MHz)	B	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.70 2.94 3.18	2.77 3.01 3.26	0.06 0.08 0.11
TME-1900MHz RRH (65MHz)	C	From Leg	1.50 0.00 3.00	0.0000	119.00	No Ice 1/2" Ice 1" Ice	2.70 2.94 3.18	2.77 3.01 3.26	0.06 0.08 0.11
Side Arm Mount [SO 102-3] ***73***	C	None		0.0000	119.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
Side Arm Mount [SO 701-1]	B	None		0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09
(2) GPS_A *** 	B	From Leg	3.00 0.00 1.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	0.26 0.32 0.39	0.26 0.32 0.39	0.00 0.00 0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 152	Pole	Max Tension	26	0.00	0.00	0.00
			Max. Compression	26	-10.53	0.06	0.23
			Max. Mx	20	-4.59	49.36	0.04
			Max. My	2	-4.59	0.04	49.37
			Max. Vy	20	-5.62	49.36	0.04
			Max. Vx	2	-5.62	0.04	49.37
			Max. Torque	20			-0.13
L2	152 - 111.29	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.23	0.95	1.07
			Max. Mx	20	-21.52	567.39	-0.43
			Max. My	2	-21.52	-0.31	567.66
			Max. Vy	20	-21.19	567.39	-0.43
			Max. Vx	2	-21.21	-0.31	567.66
			Max. Torque	19			-0.61
L3	111.29 - 77.42	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.53	0.95	1.07
			Max. Mx	20	-29.70	1313.72	-1.23
			Max. My	2	-29.70	-1.11	1314.49
			Max. Vy	20	-23.82	1313.72	-1.23
			Max. Vx	2	-23.83	-1.11	1314.49
			Max. Torque	19			-0.61
L4	77.42 - 36.46	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.21	0.79	0.98
			Max. Mx	20	-44.20	2332.77	-2.21
			Max. My	2	-44.20	-2.09	2334.14
			Max. Vy	20	-26.92	2332.77	-2.21
			Max. Vx	2	-26.93	-2.09	2334.14
			Max. Torque	19			-0.61
L5	36.46 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-101.08	0.79	0.98
			Max. Mx	20	-64.56	3565.22	-3.25
			Max. My	2	-64.56	-3.13	3567.23
			Max. Vy	20	-29.57	3565.22	-3.25
			Max. Vx	2	-29.59	-3.13	3567.23
			Max. Torque	19			-0.54

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	101.08	-0.00	8.94
	Max. H_x	20	64.57	29.55	-0.02
	Max. H_z	2	64.57	-0.02	29.56
	Max. M_x	2	3567.23	-0.02	29.56
	Max. M_z	8	3564.55	-29.55	0.02
	Max. Torsion	7	0.54	-25.60	14.80
	Min. Vert	11	48.43	-25.58	-14.76
	Min. H_x	8	64.57	-29.55	0.02
	Min. H_z	14	64.57	0.02	-29.56
	Min. M_x	14	-3566.80	0.02	-29.56
	Min. M_z	20	-3565.22	29.55	-0.02
	Min. Torsion	19	-0.54	25.60	-14.80

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	53.81	0.00	0.00	-0.17	0.26	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	64.57	0.02	-29.56	-3567.23	-3.13	-0.32
0.9 Dead+1.6 Wind 0 deg - No Ice	48.43	0.02	-29.56	-3531.61	-3.18	-0.32
1.2 Dead+1.6 Wind 30 deg - No Ice	64.57	14.79	-25.61	-3091.08	-1785.11	-0.50
0.9 Dead+1.6 Wind 30 deg - No Ice	48.43	14.79	-25.61	-3060.19	-1767.39	-0.50
1.2 Dead+1.6 Wind 60 deg - No Ice	64.57	25.60	-14.80	-1786.72	-3088.69	-0.54
0.9 Dead+1.6 Wind 60 deg - No Ice	48.43	25.60	-14.80	-1768.85	-3057.97	-0.54
1.2 Dead+1.6 Wind 90 deg - No Ice	64.57	29.55	-0.02	-3.67	-3564.55	-0.44
0.9 Dead+1.6 Wind 90 deg - No Ice	48.43	29.55	-0.02	-3.58	-3529.10	-0.44
1.2 Dead+1.6 Wind 120 deg - No Ice	64.57	25.58	14.76	1780.31	-3085.23	-0.22
0.9 Dead+1.6 Wind 120 deg - No Ice	48.43	25.58	14.76	1762.61	-3054.55	-0.22
1.2 Dead+1.6 Wind 150 deg - No Ice	64.57	14.75	25.59	3087.20	-1779.12	0.05
0.9 Dead+1.6 Wind 150 deg - No Ice	48.43	14.75	25.59	3056.46	-1761.47	0.05
1.2 Dead+1.6 Wind 180 deg - No Ice	64.57	-0.02	29.56	3566.80	3.79	0.31
0.9 Dead+1.6 Wind 180 deg - No Ice	48.43	-0.02	29.56	3531.29	3.67	0.32
1.2 Dead+1.6 Wind 210 deg - No Ice	64.57	-14.79	25.61	3090.65	1785.77	0.49
0.9 Dead+1.6 Wind 210 deg - No Ice	48.43	-14.79	25.61	3059.88	1767.88	0.50
1.2 Dead+1.6 Wind 240 deg - No Ice	64.57	-25.60	14.80	1786.30	3089.35	0.54
0.9 Dead+1.6 Wind 240 deg - No Ice	48.43	-25.60	14.80	1768.54	3058.45	0.54
1.2 Dead+1.6 Wind 270 deg - No Ice	64.57	-29.55	0.02	3.25	3565.22	0.44
0.9 Dead+1.6 Wind 270 deg - No Ice	48.43	-29.55	0.02	3.27	3529.58	0.44
1.2 Dead+1.6 Wind 300 deg - No Ice	64.57	-25.58	-14.76	-1780.73	3085.90	0.23
0.9 Dead+1.6 Wind 300 deg	48.43	-25.58	-14.76	-1762.92	3055.04	0.22

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
- No Ice 1.2 Dead+1.6 Wind 330 deg	64.57	-14.75	-25.59	-3087.63	1779.78	-0.05
- No Ice 0.9 Dead+1.6 Wind 330 deg	48.43	-14.75	-25.59	-3056.78	1761.95	-0.06
- No Ice 1.2 Dead+1.0 Ice+1.0 Temp	101.08	0.00	0.00	-0.98	0.79	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101.08	0.00	-8.94	-1070.34	0.23	-0.07
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	101.08	4.47	-7.75	-927.45	-534.04	-0.12
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	101.08	7.75	-4.48	-536.35	-924.97	-0.14
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101.08	8.94	-0.00	-1.84	-1067.80	-0.12
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	101.08	7.74	4.47	532.85	-924.27	-0.07
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	101.08	4.47	7.74	924.46	-532.83	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101.08	-0.00	8.94	1068.05	1.63	0.07
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	101.08	-4.47	7.75	925.15	535.90	0.12
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	101.08	-7.75	4.48	534.06	926.83	0.14
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	101.08	-8.94	0.00	-0.45	1069.66	0.12
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	101.08	-7.74	-4.47	-535.14	926.13	0.07
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	101.08	-4.47	-7.74	-926.75	534.69	-0.00
Dead+Wind 0 deg - Service	53.81	0.01	-6.88	-825.40	-0.53	-0.07
Dead+Wind 30 deg - Service	53.81	3.44	-5.96	-715.24	-412.79	-0.12
Dead+Wind 60 deg - Service	53.81	5.96	-3.45	-413.48	-714.37	-0.13
Dead+Wind 90 deg - Service	53.81	6.88	-0.01	-0.98	-824.46	-0.10
Dead+Wind 120 deg - Service	53.81	5.95	3.44	411.74	-713.57	-0.05
Dead+Wind 150 deg - Service	53.81	3.43	5.96	714.09	-411.40	0.01
Dead+Wind 180 deg - Service	53.81	-0.01	6.88	825.05	1.07	0.07
Dead+Wind 210 deg - Service	53.81	-3.44	5.96	714.89	413.33	0.12
Dead+Wind 240 deg - Service	53.81	-5.96	3.45	413.13	714.91	0.13
Dead+Wind 270 deg - Service	53.81	-6.88	0.01	0.62	825.01	0.10
Dead+Wind 300 deg - Service	53.81	-5.95	-3.44	-412.10	714.11	0.05
Dead+Wind 330 deg - Service	53.81	-3.43	-5.96	-714.44	411.95	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-53.81	0.00	0.00	53.81	0.00	0.000%
2	0.02	-64.57	-29.56	-0.02	64.57	29.56	0.000%
3	0.02	-48.43	-29.56	-0.02	48.43	29.56	0.000%
4	14.79	-64.57	-25.61	-14.79	64.57	25.61	0.000%
5	14.79	-48.43	-25.61	-14.79	48.43	25.61	0.000%
6	25.60	-64.57	-14.80	-25.60	64.57	14.80	0.000%
7	25.60	-48.43	-14.80	-25.60	48.43	14.80	0.000%
8	29.55	-64.57	-0.02	-29.55	64.57	0.02	0.000%
9	29.55	-48.43	-0.02	-29.55	48.43	0.02	0.000%
10	25.58	-64.57	14.76	-25.58	64.57	-14.76	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
11	25.58	-48.43	14.76	-25.58	48.43	-14.76	0.000%
12	14.75	-64.57	25.59	-14.75	64.57	-25.59	0.000%
13	14.75	-48.43	25.59	-14.75	48.43	-25.59	0.000%
14	-0.02	-64.57	29.56	0.02	64.57	-29.56	0.000%
15	-0.02	-48.43	29.56	0.02	48.43	-29.56	0.000%
16	-14.79	-64.57	25.61	14.79	64.57	-25.61	0.000%
17	-14.79	-48.43	25.61	14.79	48.43	-25.61	0.000%
18	-25.60	-64.57	14.80	25.60	64.57	-14.80	0.000%
19	-25.60	-48.43	14.80	25.60	48.43	-14.80	0.000%
20	-29.55	-64.57	0.02	29.55	64.57	-0.02	0.000%
21	-29.55	-48.43	0.02	29.55	48.43	-0.02	0.000%
22	-25.58	-64.57	-14.76	25.58	64.57	14.76	0.000%
23	-25.58	-48.43	-14.76	25.58	48.43	14.76	0.000%
24	-14.75	-64.57	-25.59	14.75	64.57	25.59	0.000%
25	-14.75	-48.43	-25.59	14.75	48.43	25.59	0.000%
26	0.00	-101.08	0.00	0.00	101.08	0.00	0.000%
27	0.00	-101.08	-8.94	-0.00	101.08	8.94	0.000%
28	4.47	-101.08	-7.75	-4.47	101.08	7.75	0.000%
29	7.75	-101.08	-4.48	-7.75	101.08	4.48	0.000%
30	8.94	-101.08	-0.00	-8.94	101.08	0.00	0.000%
31	7.74	-101.08	4.47	-7.74	101.08	-4.47	0.000%
32	4.47	-101.08	7.74	-4.47	101.08	-7.74	0.000%
33	-0.00	-101.08	8.94	0.00	101.08	-8.94	0.000%
34	-4.47	-101.08	7.75	4.47	101.08	-7.75	0.000%
35	-7.75	-101.08	4.48	7.75	101.08	-4.48	0.000%
36	-8.94	-101.08	0.00	8.94	101.08	-0.00	0.000%
37	-7.74	-101.08	-4.47	7.74	101.08	4.47	0.000%
38	-4.47	-101.08	-7.74	4.47	101.08	7.74	0.000%
39	0.01	-53.81	-6.88	-0.01	53.81	6.88	0.000%
40	3.44	-53.81	-5.96	-3.44	53.81	5.96	0.000%
41	5.96	-53.81	-3.45	-5.96	53.81	3.45	0.000%
42	6.88	-53.81	-0.01	-6.88	53.81	0.01	0.000%
43	5.95	-53.81	3.44	-5.95	53.81	-3.44	0.000%
44	3.43	-53.81	5.96	-3.43	53.81	-5.96	0.000%
45	-0.01	-53.81	6.88	0.01	53.81	-6.88	0.000%
46	-3.44	-53.81	5.96	3.44	53.81	-5.96	0.000%
47	-5.96	-53.81	3.45	5.96	53.81	-3.45	0.000%
48	-6.88	-53.81	0.01	6.88	53.81	-0.01	0.000%
49	-5.95	-53.81	-3.44	5.95	53.81	3.44	0.000%
50	-3.43	-53.81	-5.96	3.43	53.81	5.96	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00031537
3	Yes	4	0.00000001	0.00017634
4	Yes	5	0.00000001	0.00066223
5	Yes	5	0.00000001	0.00031813
6	Yes	5	0.00000001	0.00067916
7	Yes	5	0.00000001	0.00032686
8	Yes	4	0.00000001	0.00042055
9	Yes	4	0.00000001	0.00025784
10	Yes	5	0.00000001	0.00066243
11	Yes	5	0.00000001	0.00031859
12	Yes	5	0.00000001	0.00066534
13	Yes	5	0.00000001	0.00032005
14	Yes	4	0.00000001	0.00035842
15	Yes	4	0.00000001	0.00021014
16	Yes	5	0.00000001	0.00067874
17	Yes	5	0.00000001	0.00032659
18	Yes	5	0.00000001	0.00066157
19	Yes	5	0.00000001	0.00031778
20	Yes	4	0.00000001	0.00037039

21	Yes	4	0.00000001	0.00022043
22	Yes	5	0.00000001	0.00067082
23	Yes	5	0.00000001	0.00032271
24	Yes	5	0.00000001	0.00066815
25	Yes	5	0.00000001	0.00032133
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00035599
28	Yes	5	0.00000001	0.00042719
29	Yes	5	0.00000001	0.00042852
30	Yes	5	0.00000001	0.00035424
31	Yes	5	0.00000001	0.00042436
32	Yes	5	0.00000001	0.00042475
33	Yes	5	0.00000001	0.00035423
34	Yes	5	0.00000001	0.00042812
35	Yes	5	0.00000001	0.00042666
36	Yes	5	0.00000001	0.00035572
37	Yes	5	0.00000001	0.00042913
38	Yes	5	0.00000001	0.00042886
39	Yes	4	0.00000001	0.00004919
40	Yes	4	0.00000001	0.00020884
41	Yes	4	0.00000001	0.00022503
42	Yes	4	0.00000001	0.00005065
43	Yes	4	0.00000001	0.00021083
44	Yes	4	0.00000001	0.00021336
45	Yes	4	0.00000001	0.00004935
46	Yes	4	0.00000001	0.00022452
47	Yes	4	0.00000001	0.00020847
48	Yes	4	0.00000001	0.00005045
49	Yes	4	0.00000001	0.00021896
50	Yes	4	0.00000001	0.00021628

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	16.014	47	0.8706	0.0007
L2	152 - 111.29	14.560	47	0.8629	0.0007
L3	116.71 - 77.42	8.585	40	0.7173	0.0004
L4	83.59 - 36.46	4.312	40	0.4888	0.0002
L5	43.54 - 0	1.174	40	0.2424	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	Lightning Rod 5/8x4'	47	16.014	0.8706	0.0007	63182
153.00	TME-DC6-48-60-18-8F	47	14.741	0.8643	0.0007	45624
149.00	(2) 7770.00 w/ Mount Pipe	47	14.019	0.8577	0.0007	30470
140.00	(2) APL868013-42T0 w/ Mount Pipe	47	12.420	0.8330	0.0006	18091
122.00	Miscellaneous [NA 510-1]	40	9.405	0.7490	0.0004	9985
120.00	APXVSPP18-C-A20 w/ Mount Pipe	40	9.091	0.7373	0.0004	9519
119.00	TME-800MHZ RRH	40	8.936	0.7314	0.0004	9319
72.00	Side Arm Mount [SO 701-1]	40	3.169	0.4124	0.0001	8556

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 152	69.270	4	3.7687	0.0030
L2	152 - 111.29	62.985	4	3.7357	0.0030
L3	116.71 - 77.42	37.144	4	3.1058	0.0015
L4	83.59 - 36.46	18.653	4	2.1158	0.0007
L5	43.54 - 0	5.079	4	1.0485	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	Lightning Rod 5/8x4'	4	69.270	3.7687	0.0030	14835
153.00	TME-DC6-48-60-18-8F	4	63.768	3.7415	0.0030	10707
149.00	(2) 7770.00 w/ Mount Pipe	4	60.645	3.7133	0.0029	7135
140.00	(2) APL868013-42T0 w/ Mount Pipe	4	53.731	3.6065	0.0026	4220
122.00	Miscellaneous [NA 510-1]	4	40.690	3.2427	0.0018	2322
120.00	APXVSPP18-C-A20 w/ Mount Pipe	4	39.332	3.1923	0.0017	2213
119.00	TME-800MHZ RRH	4	38.660	3.1665	0.0016	2167
72.00	Side Arm Mount [SO 701-1]	4	13.708	1.7846	0.0005	1980

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	160 - 152 (1)	TP30.62x29x0.1875	8.00	0.00	0.0	18.1111	-4.59	1135.55	0.004
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	40.71	0.00	0.0	29.7665	-21.52	1934.28	0.011
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	39.29	0.00	0.0	43.1945	-29.70	2892.94	0.010
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	47.13	0.00	0.0	70.5044	-44.20	5028.09	0.009
L5	36.46 - 0 (5)	TP59x50.3353x0.5	43.54	0.00	0.0	92.8395	-64.56	6604.55	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	160 - 152 (1)	TP30.62x29x0.1875	49.38	711.82	0.069	0.00	711.82	0.000
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	567.92	1493.86	0.380	0.00	1493.86	0.000
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	1315.33	2592.38	0.507	0.00	2592.38	0.000
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	2335.68	5245.66	0.445	0.00	5245.66	0.000
L5	36.46 - 0 (5)	TP59x50.3353x0.5	3569.51	7939.54	0.450	0.00	7939.54	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 152 (1)	TP30.62x29x0.1875	5.63	567.77	0.010	0.05	1425.37	0.000
L2	152 - 111.29 (2)	TP38.86x30.62x0.25	21.22	967.14	0.022	0.57	2991.37	0.000
L3	111.29 - 77.42 (3)	TP45.09x37.263x0.3125	23.85	1446.47	0.016	0.57	5191.10	0.000
L4	77.42 - 36.46 (4)	TP52.62x43.2359x0.4375	26.95	2514.05	0.011	0.50	10504.17	0.000
L5	36.46 - 0 (5)	TP59x50.3353x0.5	29.61	3302.27	0.009	0.50	15898.50	0.000

Pole Interaction Design Data

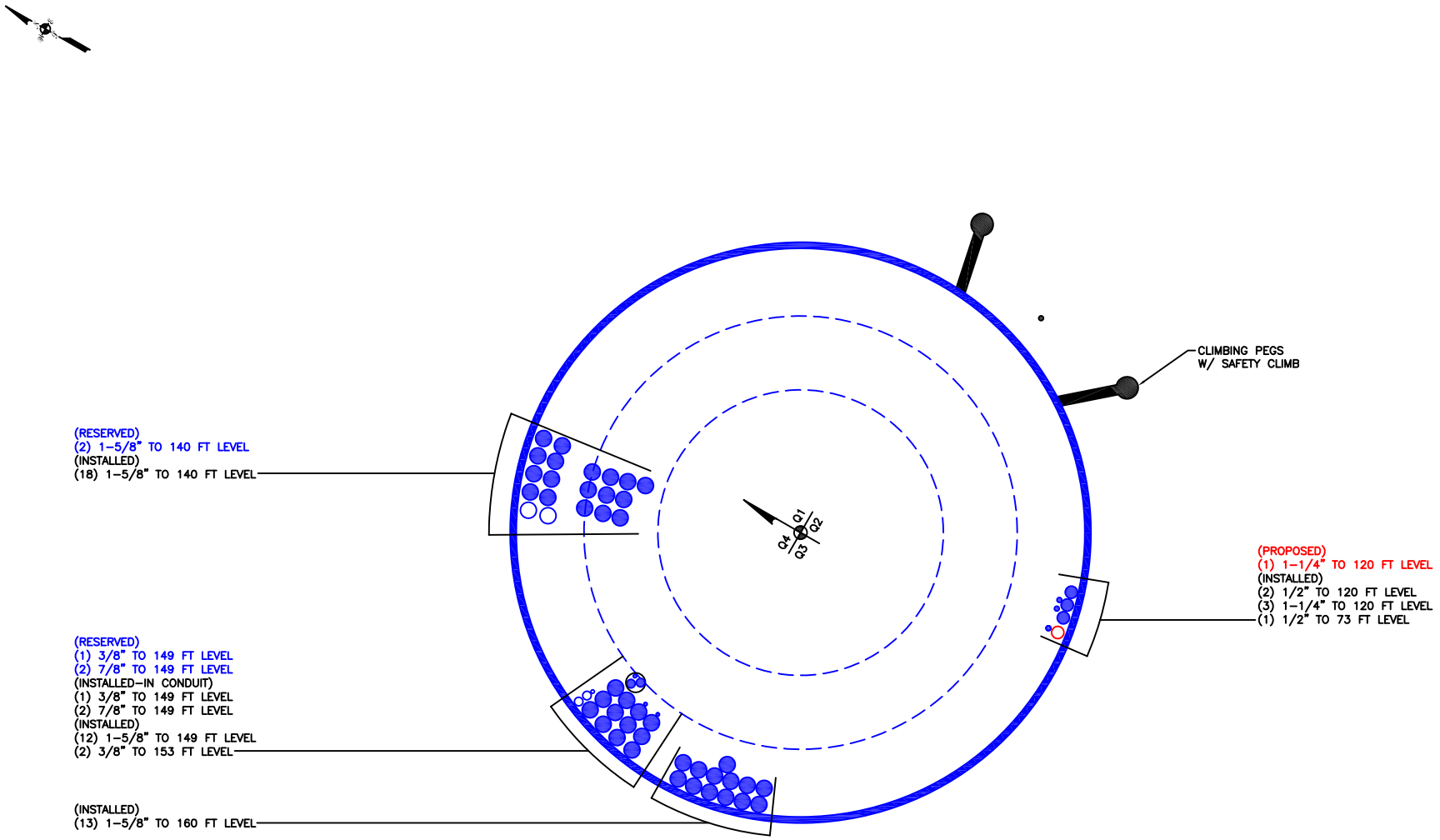
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 152 (1)	0.004	0.069	0.000	0.010	0.000	0.074	1.000	4.8.2
L2	152 - 111.29 (2)	0.011	0.380	0.000	0.022	0.000	0.392	1.000	4.8.2
L3	111.29 - 77.42 (3)	0.010	0.507	0.000	0.016	0.000	0.518	1.000	4.8.2
L4	77.42 - 36.46 (4)	0.009	0.445	0.000	0.011	0.000	0.454	1.000	4.8.2
L5	36.46 - 0 (5)	0.010	0.450	0.000	0.009	0.000	0.459	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	160 - 152	Pole	TP30.62x29x0.1875	1	-4.59	1135.55	7.4	Pass
L2	152 - 111.29	Pole	TP38.86x30.62x0.25	2	-21.52	1934.28	39.2	Pass
L3	111.29 - 77.42	Pole	TP45.09x37.263x0.3125	3	-29.70	2892.94	51.8	Pass
L4	77.42 - 36.46	Pole	TP52.62x43.2359x0.4375	4	-44.20	5028.09	45.4	Pass
L5	36.46 - 0	Pole	TP59x50.3353x0.5	5	-64.56	6604.55	45.9	Pass
							Summary	
						Pole (L3)	51.8	Pass
						RATING =	**51.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 841290 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *841290*
Site Name: *GREENWICH NORTH*
App #: *393521 Rev. 0*

Reactions		
Mu	49.38	ft-kips
Axial, Pu:	4.59	kips
Shear, Vu:	5.63	kips
Elevation:	152	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-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	
N/A:	75	<-- Disregard	
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

Flange Bolt Results

Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	Rigid
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φ*Tn
Max Bolt directly applied Tu:	5.26	Kips	φTn[(1-(Vu/φVn)^2]^0.5
Min. PL "tc" for **B** cap. **w/o** Pry:	0.825	in	
Min PL "treq" for actual **T w/ Pry**:	0.188	in	
Min PL "t1" for actual **T w/o Pry**:	0.256	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	5.26	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	9.6%	**Pass**	

Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	3.9	ksi	Rigid
Allowable Plate Stress:	54.0	ksi	TIA G
Compression Plate Stress Ratio:	7.3%	**Pass**	φ*Fy
No Prying			Comp. Y.L. Length:
Tension Side Stress Ratio, (treq/t)^2:	3.5%	**Pass**	16.95

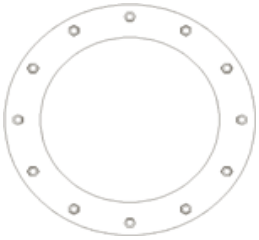
n/a

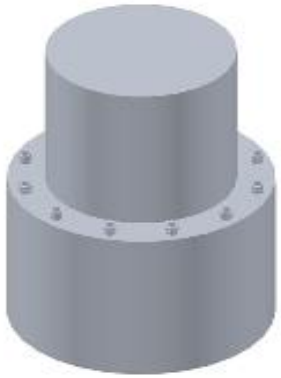
Stiffener Results

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

Site Data

BU#: *841290*
Site Name: *GREENWICH NORTH*
App #: *393521 Rev. 0*

Pole Manufacturer:	*Other*

Reactions		
Mu:	3570	ft-kips
Axial, Pu:	65	kips
Shear, Vu:	30	kips
Eta Factor, ɳ	0.5	TIA G (Fig. 4-4)

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

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

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ɳ):	111.7 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	43.0% **Pass**	

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

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	27.3 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	50.6% **Pass**	Y.L. Length: 31.75

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

n/a

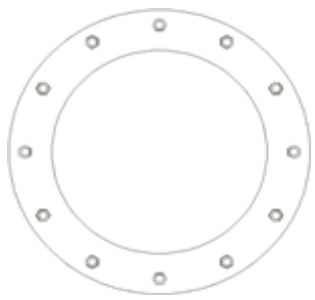
Stiffener Results

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

Pole Results

Pole Punching Shear Check:	n/a

Pole Data		
Diam:	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



* 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

Pier and Pad Foundation

BU # :	841290
Site Name:	GREENWICH NOF
App. Number:	393521 Rev. 0

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?: ☐

Superstructure Analysis Reactions

Compression, P_{comp}:	65	kips
Base Shear, Vu_comp:	30	kips
Moment, M_u:	3570	ft-kips
Tower Height, **H**:	160	ft
BP Dist. Above Fdn, bp_{dist}:	2.75	in

Pier Properties

Pier Shape:	Square	
Pier Diameter, **dpier**:	7.0	ft
Ext. Above Grade, **E**:	0.5	ft
Pier Rebar Size, **Sc**:	11	
Pier Rebar Quantity, **mc**:	22	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	9	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	4	in

Pad Properties

Depth, **D**:	9.5	ft
Pad Width, **W**:	25.0	ft
Pad Thickness, **T**:	4.5	ft
Pad Rebar Size, **Sp**:	10	
Pad Rebar Quantity, **mp**:	23	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	120	pcf
Ultimate Gross Bearing, Qult:	20.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, N_{blows}:	16	
Base Friction, μ:	0.2	
Neglected Depth, **N**:	5.0	ft
Groundwater Depth, **gw**:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	376.03	30.00	**8.0%**	**Pass**
Bearing Pressure (ksf)	15.00	2.65	**17.7%**	**Pass**
*Overturning (kip*ft)*	9753.39	3876.88	**39.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	5411.48	3735.00	**69.0%**	**Pass**
Pier Compression (kip)	23390.64	113.51	**0.5%**	**Pass**
*Pad Flexure (kip*ft)*	6302.72	1250.87	**19.8%**	**Pass**
Pad Shear - 1-way (kips)	1210.07	159.58	**13.2%**	**Pass**
Pad Shear - 2-way (kips)	4294.78	113.51	**2.6%**	**Pass**

Soil Rating:	**39.7%**
Structural Rating:	**69.0%**

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

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

Site Data

BU#: *841290*
Site Name: *GREENWICH NORTH*
App #: *393521 Rev. 0*

Loads Already Factored	
For M (WL):	1.00
For P (DL):	1.00

Pier Properties

Concrete:

Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2

Reinforcement:

Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	4	
Vert. Cage Diameter =	6.13	ft
Vert. Cage Diameter =	73.59	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	22	
As Total=	34.32	in^2
A s/ Aconc, Rho:	0.0062	0.62%

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

(3)*(Sqrt(f'c)/Fy:	0.0027
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.62%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8373.66	kips
at Mu=(ϕ=0.65)Mn=	5070.92	ft-kips
Max Tu, (φ=0.9) Tn =	1853.28	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	G	
Max. Factored Shaft Mu:	3735	ft-kips **(* Note)**
Max. Factored Shaft Pu:	65	kips
Max Axial Force Type:	Comp.	

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

Load Factor	Shaft Factored Loads		
1.00	Mu:	3735	ft-kips
1.00	Pu:	65	kips

Material Properties

Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

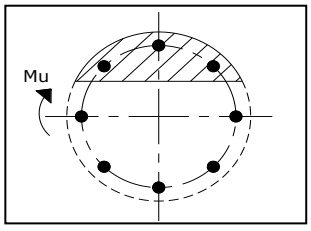
ACI 318 Code

Select Analysis ACI Code=	2005	

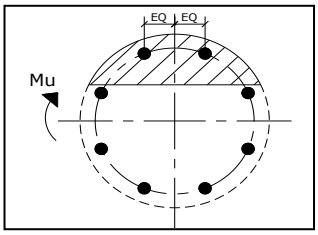
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**14.30**	in
Extreme Steel Strain, ϵt:	**0.0134**	
ϵt > 0.0050, Tension Controlled		
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	58.50	kips
Drilled Shaft Moment Capacity, φMn:	**5411.48**	ft-kips
Drilled Shaft Superimposed Mu:	**3735.00**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**69.0%**

CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU:	841290
Work Order:	1417422
Application:	393521 Rev. 0

	Degrees	Minutes	Seconds		
Site Latitude =	41	3	58.60	41.0663	degrees
Site Longitude =	-73	40	17.39	-73.6715	degrees
Ground Supported Structure =	Yes				
Structure Class =	II			*(Table 2-1)*	
Site Class =	D - Stiff Soil			*(Table 2-11)*	

Spectral response acceleration short periods, S_S =	0.259	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.070	

Importance Factor, I =	1.0	*(Table 2-3)*
Acceleration-based site coefficient, F_a =	1.6	*(Table 2-12)*
Velocity-based site coefficient, F_v =	2.4	*(Table 2-13)*

Design spectral response acceleration short period, S_{DS} =	0.275	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.112	*(2.7.6)*

Seismic Design Category - Short Period Response =	B	*ASCE 7-05 Table 11.6-1*
Seismic Design Category - 1s Period Response =	B	*ASCE 7-05 Table 11.6-2*

Worst Case Seismic Design Category =	B	*ASCE 7-05 Tables 11.6-1 and 6-2*

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT03XC342

Boy Scouts/SNet
363 Riversville Road
Greenwich, CT 06831

July 25, 2017

EBI Project Number: 6217003222

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	10.82 %

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

EBI Consulting
environmental | engineering | due diligence

July 25, 2017

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

Emissions Analysis for Site: **CT03XC342 – Boy Scouts/SNet**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **363 Riversville Road, Greenwich, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) 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 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. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **122 feet** above ground level (AGL) for **Sector A**, **122 feet** above ground level (AGL) for **Sector B** and **122 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**122 feet**	Height (AGL):	**122 feet**	Height (AGL):	**122 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**2.28 %**	Antenna B1 MPE%	**2.28 %**	Antenna C1 MPE%	**2.28 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**122 feet**	Height (AGL):	**122 feet**	Height (AGL):	**122 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.66 %**	Antenna B2 MPE%	**1.66 %**	Antenna C2 MPE%	**1.66 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.94 %**
AT&T	2.05 %
T-Mobile	1.63 %
Verizon Wireless	2.83 %
Nextel	0.37 %
Site Total MPE %:	**10.82 %**

SPRINT Sector A Total:	3.94 %
SPRINT Sector B Total:	3.94 %
SPRINT Sector C Total:	3.94 %
Site Total:	10.82 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	122	1.17	850 MHz	567	0.21%
Sprint 850 MHz LTE	2	437.55	122	2.34	850 MHz	567	0.41%
Sprint 1900 MHz (PCS) CDMA	5	622.47	122	8.32	1900 MHz (PCS)	1000	0.83%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	122	8.32	1900 MHz (PCS)	1000	0.83%
Sprint 2500 MHz (BRS) LTE	8	778.09	122	16.63	2500 MHz (BRS)	1000	1.66%
						Total:	**3.94%**

Summary

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

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	3.94 %
Sector B:	3.94 %
Sector C:	3.94 %
SPRINT Maximum Total (per sector):	3.94 %
Site Total:	10.82 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.82 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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