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

August 11, 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: 876373**
Sprint Site ID: CT33XC078
136 Wright Road, Torrington, CT 06790
Latitude: 41° 49′ 38.34″ / Longitude: -73° 10′ 13.97″

Dear Ms. Bachman:

AT&T currently maintains three (3) antennas at the 148-foot level of the existing 148-foot monopole at 136 Wright Road in Torrington, CT. The tower is owned by Crown Castle. The property is owned by John Jay and Diane Wright and William and Jill Jobert. Sprint intends to install three (3) antennas, three (3) RRHs, and one (1) hybrid cable.

A request for original zoning documents was sent to the City of Torrington but has not been answered.

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 The Honorable Elinor Carbone, Mayor, City of Torrington, the Planning & Zoning Commission, as well as the property owners.

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: The Honorable Elinor Carbone
Torrington City Hall
140 Main Street
Torrington, CT 06790

Planning & Zoning Commission
Torrington City Hall
140 Main Street Room 324
Torrington, CT 06790

John Jay & Diane Wright
100 Stage Road
Nottingham, NH 03290

William A. and Jill Jobert
108 Springfield Drive
Advance, NC 27006

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2014.

Information on the Property Records for the Municipality of Torrington was last updated on 8/2/2017.

Parcel Information

Location:	136 WRIGHT RD	Property Use:	Residential	Primary Use:	Residential
Unique ID:	12325	Map Block Lot:	215/005/001	Acres:	19.39
490 Acres:	18.39	Zone:	R-WP	Volume / Page:	0385/0645
Developers Map / Lot:		Census:	3108-2N		

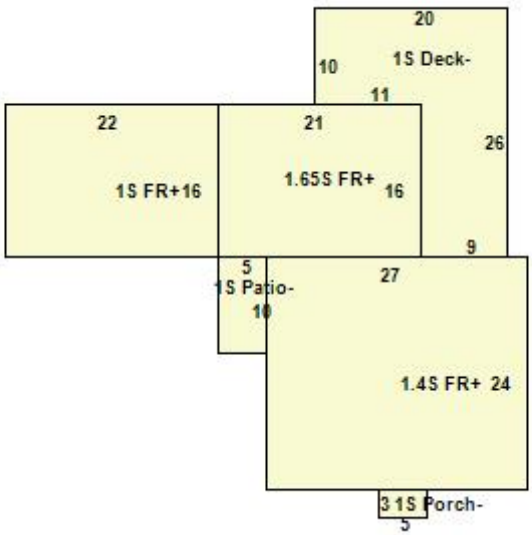
Value Information

	Appraised Value	70% Assessed Value
Land	58,661	41,060
Buildings	89,199	62,440
Detached Outbuildings	557	390
Total	148,417	103,890

Owner's Information

Owner's Data
WRIGHT JAMES N & CAROL E SURV 104 WRIGHT RD TORRINGTON CT 06790

Building 1



Building Use:	Single Family	Style:	Cape	Living Area:	1,814
Stories:	1.65	Construction:	Wood Frame	Year Built:	1941
Total Rooms:	9	Bedrooms:	4	Full Baths:	3
Half Baths:	0	Fireplaces:	1	Heating:	FHA
Fuel:	Oil	Cooling Percent:	0	Basement Area:	1,336

City of Torrington, Connecticut - Assessment Parcel Map

Map/Block/Lot 215-005-001 **Address:** 136 WRIGHT RD

Approximate Scale: 1 inch = 300 feet

Map Produced May 2017

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user.
The City of Torrington and its mapping contractors assume no legal responsibility for the information contained herein.

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:

CT33XC078

SITE NAME:

LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:

136 WRIGHT RD
TORRINGTON, CT 06790

CROWN ID#: 876373

CROWN SITE NAME: LONG EDDY/WRIGHT PROPERTY

APPROVED
By Jason D'Amico at 11:09 am, Jul 06, 2017

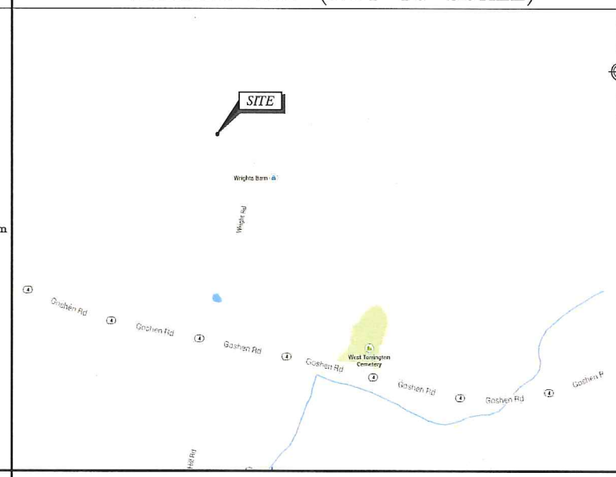
APPROVED
By Ray Perry at 11:25 am, Sep 23, 2014

SHEET INFORMATION

SITE NUMBER:	CT33XC078
SITE NAME:	LONG EDDY/WRIGHT PROPERTY
SITE ADDRESS:	136 WRIGHT RD TORRINGTON, CT 06790
COUNTY:	LITCHFIELD
COORDINATES: (NAD 83)	41° 49' 38.34" N 73° 10' 13.87" W
GROUND ELEV:	1090'± AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	148'-0"± AGL
STRUCTURE RAD CENTER:	148'-0"± AGL
ZONING CLASSIFICATION:	R-WP (WATERSHED PROTECTED ZONE)
MAP-BLOCK-LOT:	214/2/5

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:	AT&T

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 1-1/4" HYBRID CABLE.
5. (3) NEW FIBER JUMPERS.

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

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SUBMITTALS

PROJECT NO: 7225.CT33XC078

NO	DATE	DESCRIPTION	BY
0	07/17/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	SMQ

SEAL

STATE OF CONNECTICUT · JOSHUA M. QUICKSELL · No. 22038 · LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

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._15720111042855492.DOCM.
20. REFER TO: COLOR CODING–SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09–08–11.PDF
21. REFER TO LATEST DOCUMENTATION REVISION.

DIVISION 03000–CONCRETE

1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)

A. AC1–301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.
B. ACI–347 GUIDE TO FORM WORK FOR CONCRETE.
C. ASTM C33– CONCRETE AGGREGATE
D. ASTM C94 – READY MIXED CONCRETE e. ASTM C150 – PORTLAND CEMENT.
E. ASTM C260 – AIR–ENTRAINING ADMIXTURES FOR CONCRETE
F. ASTM C309– LIQUID MEMBRANE FORMING COMPOUNDS FOR CURING CONCRETE.
H. ASTM C494 – CHEMICAL ADMIXTURES FOR CONCRETE
I. ASTM A615– DEFORMED AND PLAIN BILLET–STEEL BARS FOR CONCRETE REINFORCEMENT
J. ASTM A185– STEEL WELDED WIRE FABRIC (PLAIN) FOR CONCRETE REINFORCEMENT

1.04 QUALITY ASSURANCE

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

3.04 SURFACE FINISHES

A. SURFACES AGAINST WHICH BACKFILL OR CONCRETE SHALL BE PLACED REQUIRE NO TREATMENT EXCEPT REPAIR OF DEFECTIVE AREAS.

B. SURFACES THAT WILL BE PERMANENTLY EXPOSED SHALL PRESENT A UNIFORM FINISH PROVIDED BY THE REMOVAL OF FINS AND THE FILLING HOLES AND OTHER IRREGULARITIES WITH DRY PACK GROUT, OR BY SACKING WITH UTILITY OR ORDINARY GROUT.

C. SURFACES THAT WOULD NORMALLY BE LEVEL AND WHICH WILL BE PERMANENTLY EXPOSED TO THE WEATHER SHALL BE SLOPED FOR DRAINAGE. UNLESS ENGINEER'S DESIGN DRAWING SPECIFIES A HORIZONTAL SURFACE OR SURFACES SUCH AS STAIR TREADS, WALLS, CURBS, AND PARAPETS SHALL BE SLOPED APPROXIMATELY 1/4" PER FOOT.

D. SURFACES THAT WILL BE COVERED BY BACKFILL OR CONCRETE SHALL BE SMOOTH SCREENED.

E. EXPOSED SLAB SURFACES SHALL BE CONSOLIDATED, SCREENED, FLOATED, AND STEEL TROWELED. HAND OR POWER–DRIVEN EQUIPMENT MAY BE USED FOR FLOATING. FLOATING SHALL BE STARTED AS SOON AS THE SCREENED SURFACE HAS ATTAINED A STIFFNESS TO PERMIT FINISHING OPERATIONS. OPERATIONS. ALL EDGES MUST HAVE A 3/4" CHAMFER.

1.04 QUALITY ASSURANCE CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER.

3.05 PATCHING

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON REMOVAL OF THE FORMS TO OBSERVE CONCRETE SURFACE CONDITIONS. IMPERFECTIONS SHALL BE PATCHED ACCORDING TO THE ENGINEER'S DIRECTION.

3.06 DEFECTIVE CONCRETE

THE CONTRACTOR SHALL NOTIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LEVELS AND LINES, DETAILS, AND ELEVATIONS AS SPECIFIED IN ACI 301.

3.07 PROTECTION

A. IMMEDIATELY AFTER PLACEMENT. THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.

B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.

C. ALL CONCRETE SHALL BE WATER CURED PER ACCEPTABLE PRACTICES SPECIFIED BY ACI CODE (LATEST EDITION)

DIVISION 05000 – METALS

PART 1 – GENERAL

1.01 WORK INCLUDED

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

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

1.02 REFERENCE STANDARDS

A. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

1. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS IN BUILDING CODES" OR LATEST EDITION.
2. AWS: AMERICAN WELDING SOCIETY CODE OR LATEST EDITION.
3. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

PART 2 – PRODUCTS

2.01 MATERIALS

A. STRUCTURAL STEEL: SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A36 AND A992 FOR STRUCTURAL STEEL.

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

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

2.02 WELDING

A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.

B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM 1–233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN THE SUBMERGED ARC PROCESS SHALL CONFORM TO AISC SPECIFICATIONS.

C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS VISUAL INSPECTION IS ACCEPTABLE.

D. STUD WELDING SHALL BE ACCOMPLISHED BY CAPACITOR DISCHARGE (CD) WELDING TECHNIQUE USING CAPACITOR DISCHARGE STUD WELDER.

E. PROVIDE STUD FASTENERS OF MATERIALS AND SIZES SHOWN ON DRAWINGS OR AS RECOMMENDED BY THE MANUFACTURER FOR STRUCTURAL LOADINGS REQUIRED.

F. FOLLOW MANUFACTURERS SPECIFICATIONS AND INSTRUCTIONS TO PROPERLY SELECT AND INSTALL STUD WELDS.

2.03 BOLTING

A. BOLTS SHALL BE CONFORMING TO ASTM A35 HIGH STRENGTH HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4" (MINIMUM) CONFORMING TO ASTM A325, HOT DIP GALVANIZED, ASTM A153 NUTS SHALL BE HEAVY HEX TYPE.

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

D. EXCEPT WHERE SHOWN, ALL BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS TO BE DOUBLE ANGLED CONNECTIONS WITH HIGH STRENGTH BOLTS (THREADS EXCLUDED FROM SHEAR PLANE) AND HARDENED WASHERS.

E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.

F. SNUG–TIGHT STRENGTH BEARING BOLTS MAY BE USED IN STANDARD HOLES CONFORMING TO ACIS, USING THE TURN OF THE NUT METHOD.

H. FULLY–TENSIONED HIGH STRENGTH (SLIP CRITICAL) SHALL BE USED IN OVERSIZED SLOT HOLES (RESPECTIVE OF SLOT ORIENTATION).

I. ALL BRACED CONNECTION, MOMENT CONNECTION AND CONNECTIONS NOTED AS "SLIP CRITICAL" SHALL BE BE SLIP CRITICAL JOINTS WITH CLASS A SURFACE CONDITIONS, UNLESS OTHERWISE NOTED.

J. EPOXY ANCHOR ASSEMBLIES SHALL BE AS MANUFACTURED BY HILTI OR ENGINEER APPROVED EQUAL, AS FOLLOWS:

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

2.04 FABRICATION

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

2.05 FINISH

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

2.06 PROTECTION

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

PART 3 – ERECTION

A. PROVIDE ALL ERECTION, EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION, BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING

C. TEMPORARY BRACING, GUYING, AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SET AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC • PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 Route 300
Newburgh, NY 12550

Phone: (845) 567–6656
Fax: (845) 567–8703

www.tectonicengineering.com

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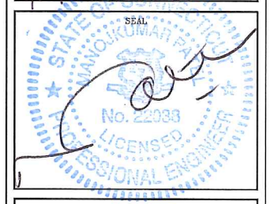
SUBMITTALS

PROJECT NO: 7225.CT33XC078

NO	DATE	DESCRIPTION	BY
0	07/17/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMQ

SEAL



SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

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
—OHW—OHW—OHW—OHW—OHW—	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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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
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SUBMITTALS

PROJECT NO: 7225.CT33XC078

NO	DATE	DESCRIPTION	BY
0	07/17/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMG

SEAL
STATE OF CONNECTICUT
MANOJKUMAR GOHIL
No. 22038
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

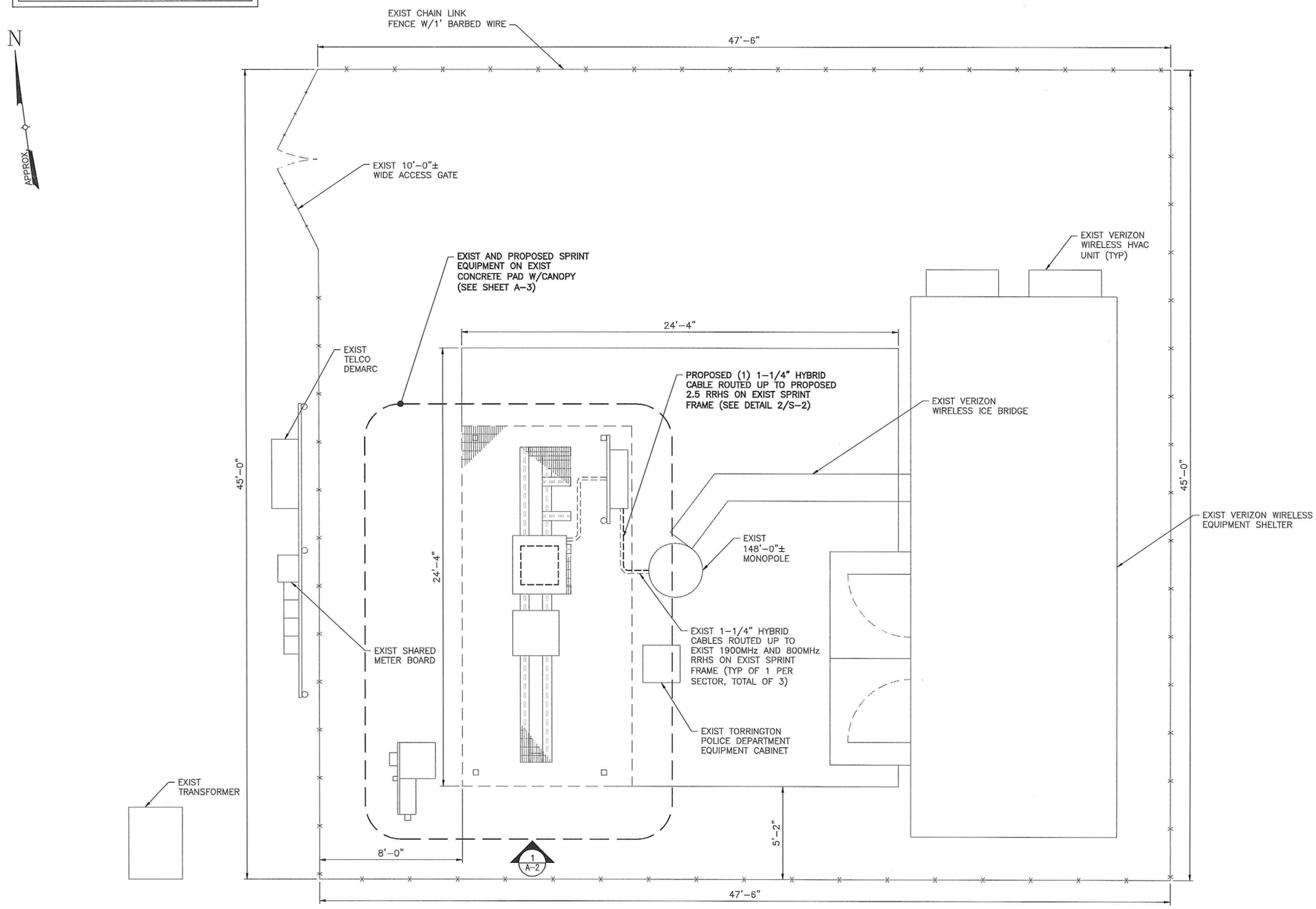
SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

SHEET TITLE:
GENERAL NOTES

SHEET NO:
SP–2

NORTH NOTE:

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



1 / A-1 SITE PLAN

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

Sprint

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OVERLAND PARK, KANSAS 66251

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9/22/14	DMQ

SEAL

STATE OF CONNECTICUT
ANOOKUMAR M. PATEL
No. 22038
LICENSED PROFESSIONAL ENGINEER

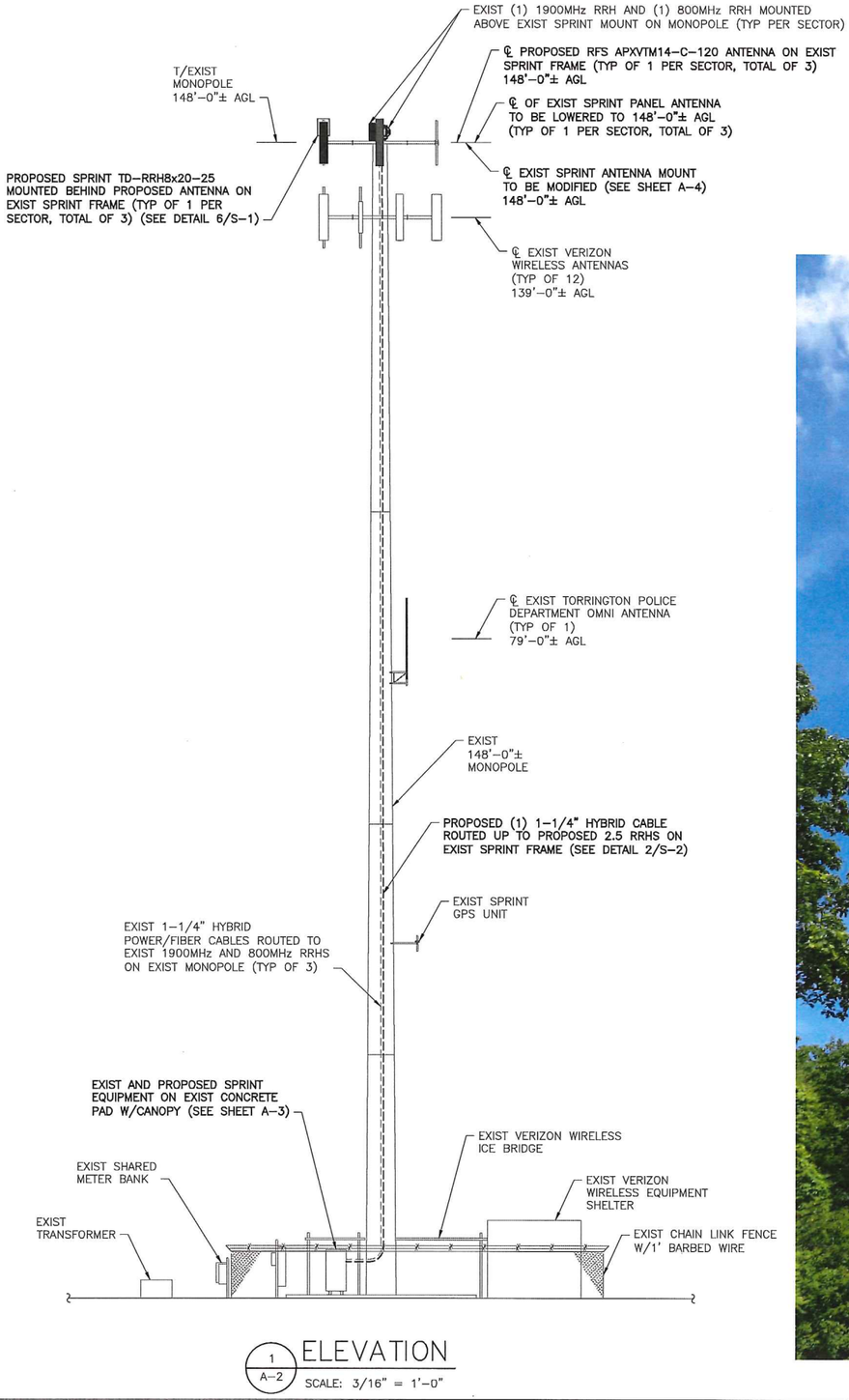
SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

SHEET TITLE:
SITE PLAN

SHEET NO:
A-1



1 / A-2 ELEVATION

SCALE: 3/16" = 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 ONCE THE PROPOSED MODIFICATIONS HAVE BEEN COMPLETED AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 09/22/14, REV 1.

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SEAL

STATE OF CONNECTICUT
MANOJKUMAR R. MEHTA
No. 22038
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

SHEET TITLE:
ELEVATION

SHEET NO:
A-2

NORTH NOTE:

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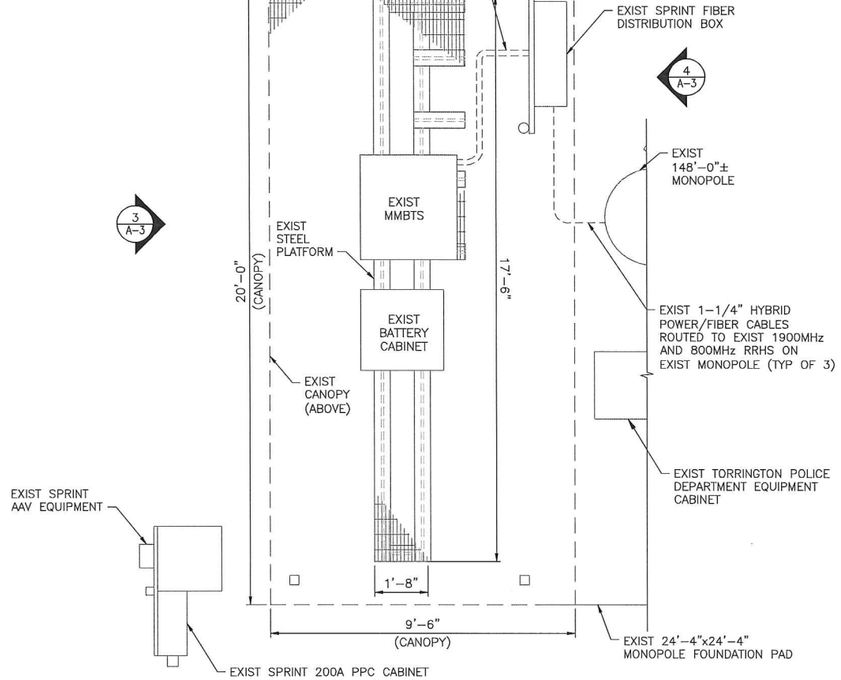
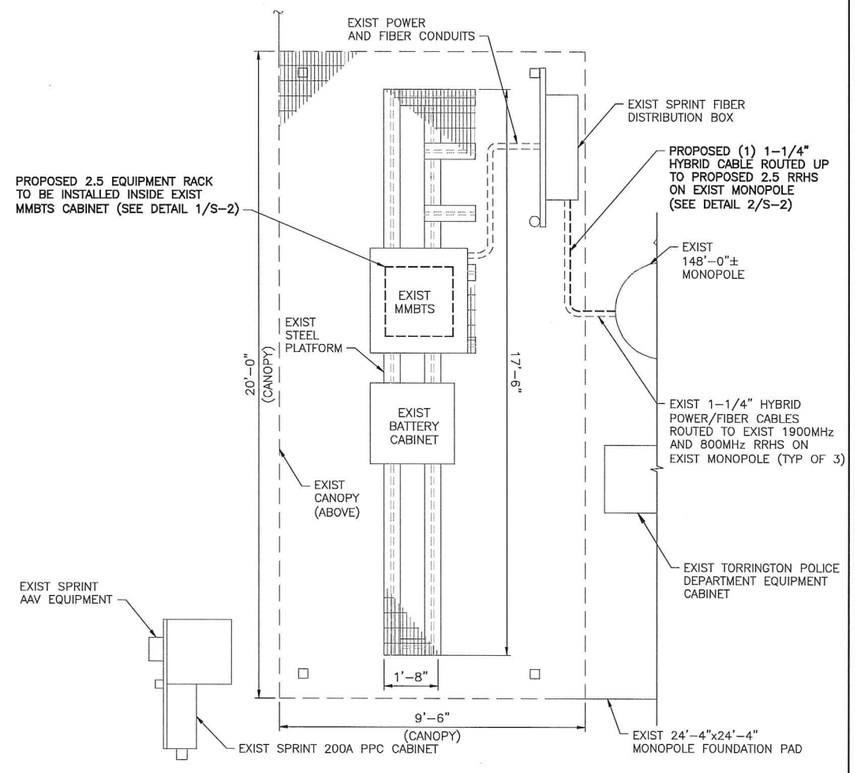


1 A-3 ENLARGED EQUIP. LAYOUT PLAN (EXIST)

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

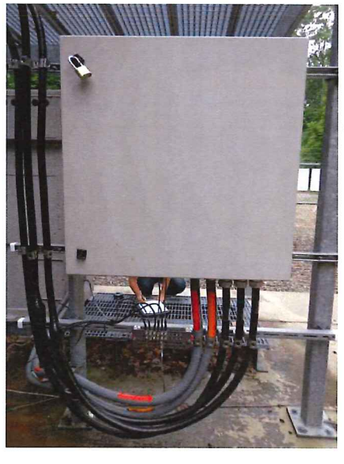
3 A-3 EXIST EQUIPMENT PAD

SCALE: NTS



2 A-3 ENLARGED EQUIP. LAYOUT PLAN (FINAL)

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



4 A-3 EXIST FIBER DISTRIBUTION BOX

SCALE: NTS

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2.5 EQUIPMENT DEPLOYMENT
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9/23/14	JWG

SEAL:
STATE OF CONNECTICUT
ANNOUKUMAR PATEL
No. 22038
LICENSED PROFESSIONAL ENGINEER

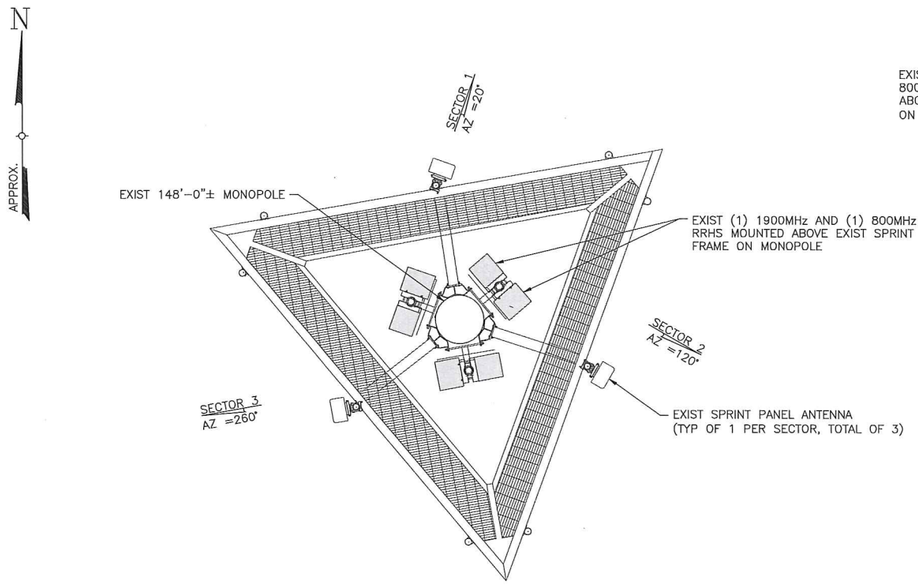
SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

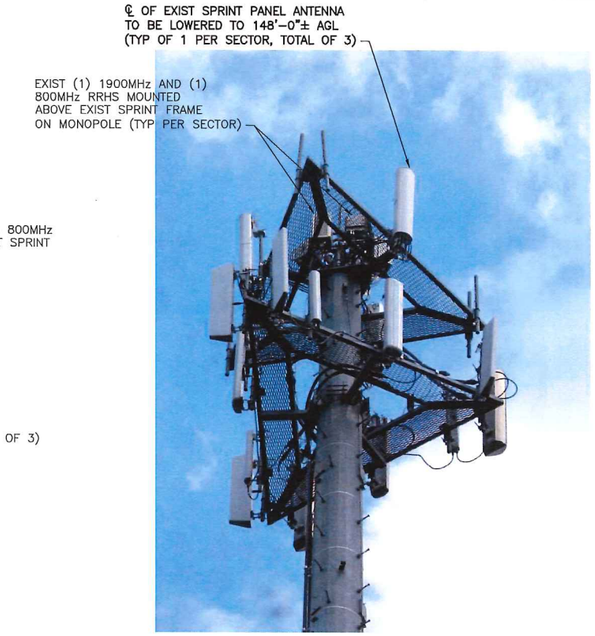
SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

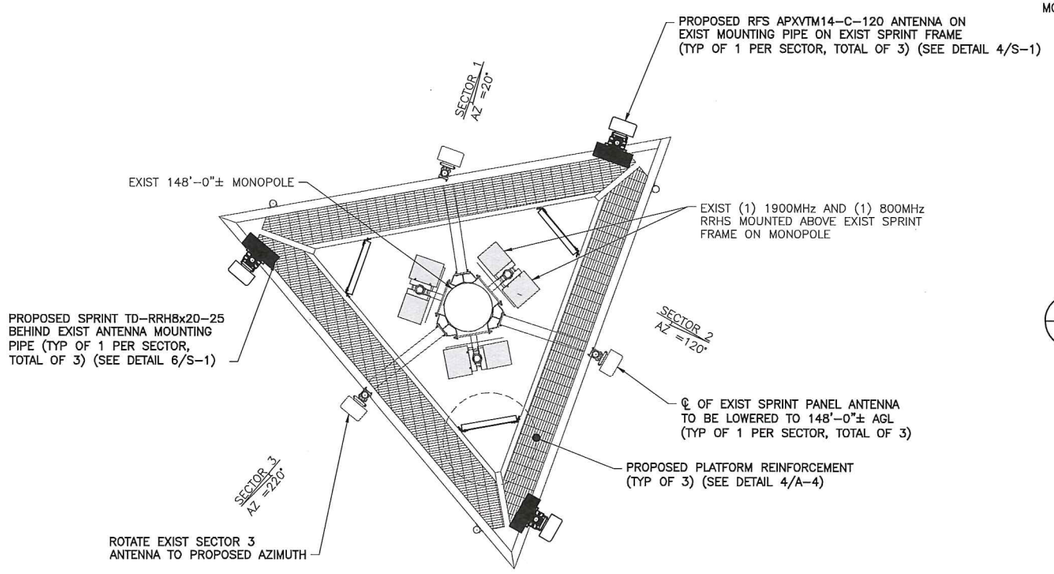
SHEET NO:
A-3



1 / A-4 ANTENNA LAYOUT PLAN (EXIST)

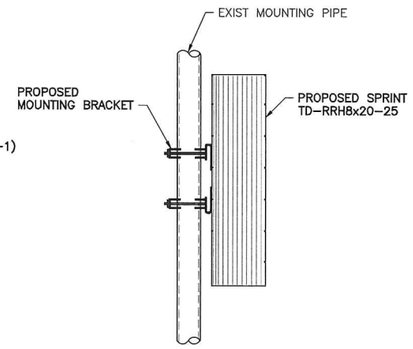
SCALE: 3/8" = 1'-0"





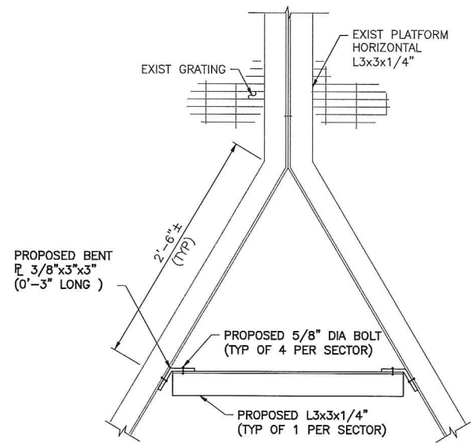
2 / A-4 ANTENNA LAYOUT PLAN (FINAL)

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



3 / A-4 RRH MOUNTING DETAIL

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



4 / A-4 REINFORCEMENT DETAIL

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

ANTENNA DATA

Status	Exist **(Proposed)**	**Proposed**
Antenna Manufacturer	RFS-CELWAVE	**RFS-CELWAVE**
Antenna Model Number	APXVSPP18-C-A20	**APXVTM14-C-120**
Number of Antennas	3	**3**
Antenna RAD Center	148'	**148'**
Antenna Azimuth	20/120/260 **(20/120/220)**	**20/120/220**
Antenna RRH Model Number	800MHz/1900MHz	**TD-RRH8x20-25**
Number of RRH	6	**3**

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2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

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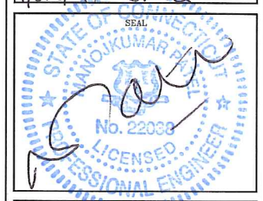


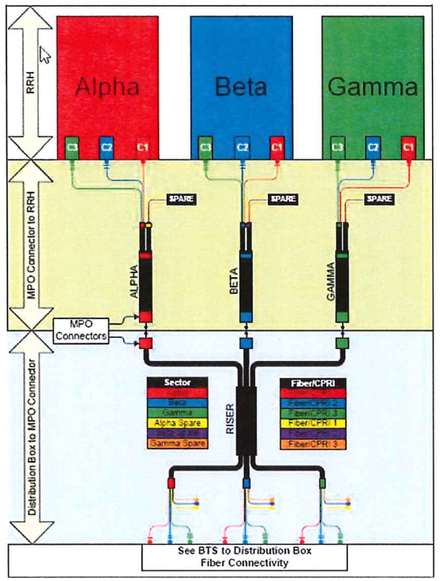
SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

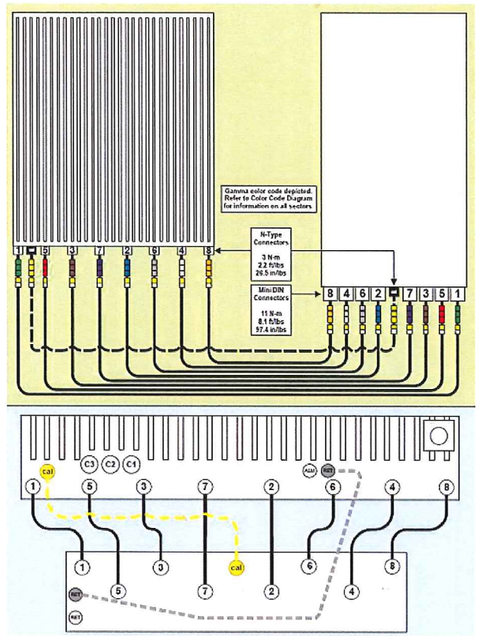
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



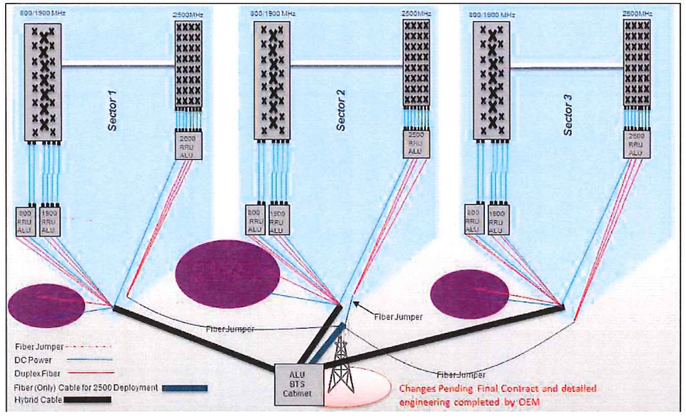
1 A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



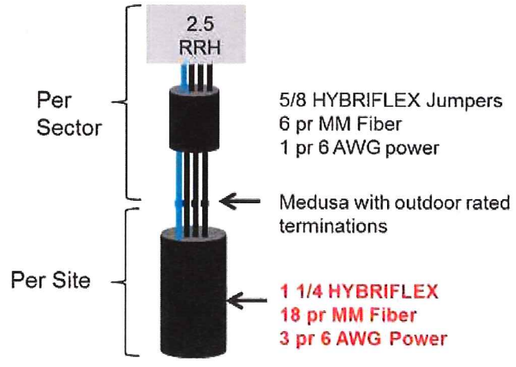
2 A–5 RRH CONNECTIVITY

SCALE: N.T.S.



3 A–5 RAN WIRING

SCALE: N.T.S.



4 A–5 CABLE SCENARIO

SCALE: N.T.S.

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SUBMITTALS

PROJECT NO: 7225.CT33XC078

NO	DATE	DESCRIPTION	BY
0	07/17/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	DMQ

SEAL

STATE OF CONNECTICUT
ANANDKUMAR R. SAINI
No. 22038
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

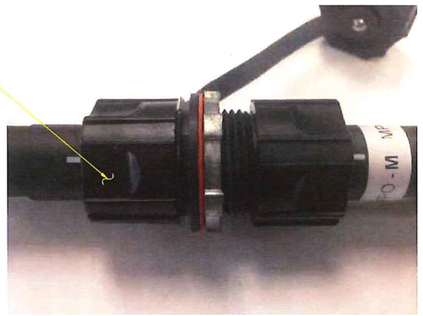
SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

SHEET TITLE:
RAN WIRING DIAGRAM

SHEET NO:
A–5

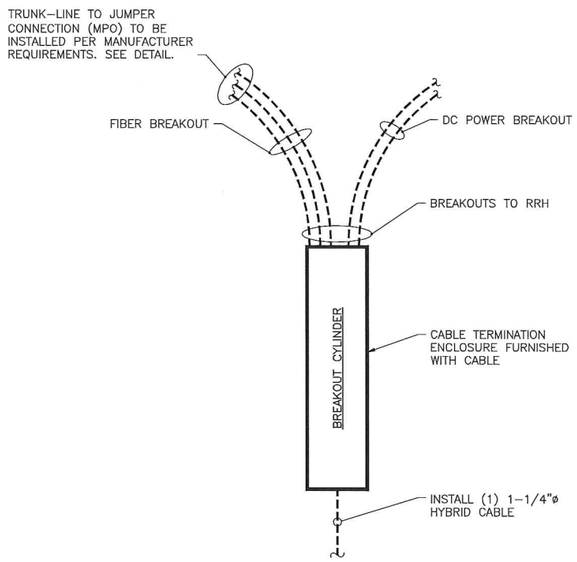
IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION

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

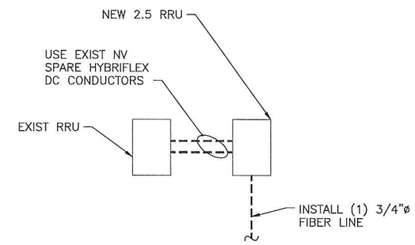


1 A-6 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS

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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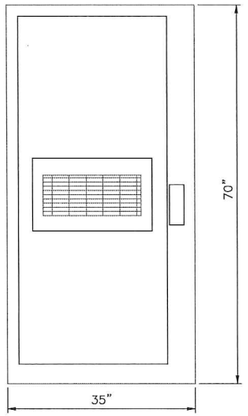
TORRINGTON, CT 06790

SHEET TITLE:
CABLE DETAILS

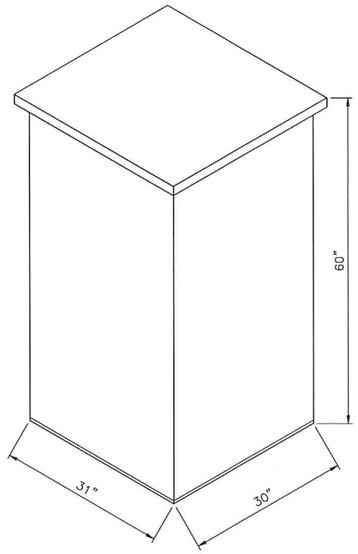
SHEET NO:
A-6



CABINET FRONT 9927 MMBTS MODULAR CELL
SPECIFICATIONS:
HEIGHT: 70" WIDTH: 35" DEPTH: 37.8" WEIGHT: 1090 LBS.

1 S-1 (EXIST) MMBTS CABINET

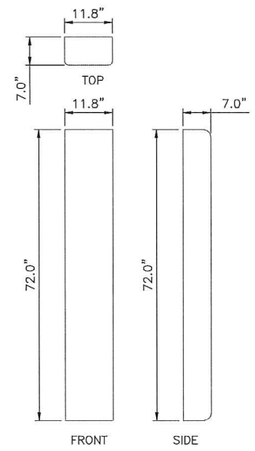
SCALE: 1" = 1'-0"



ANDREW 60ECv2
SPECIFICATIONS:
HEIGHT: 60" WIDTH: 31" DEPTH: 30" WEIGHT: 2430 LBS.

2 S-1 (EXIST) BATTERY CABINET

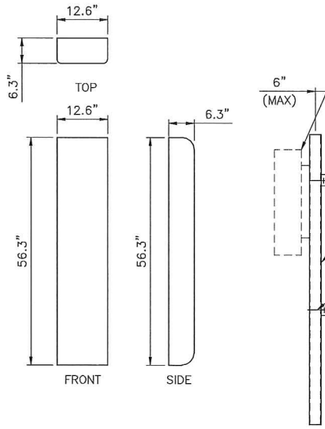
SCALE: 1" = 1'-0"



APXVSPP18-C-A20

3 S-1 (EXIST) ANTENNA DETAILS

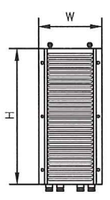
SCALE: 3/4"=1'-0"

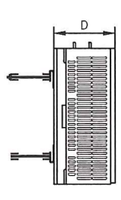


APXVTM14-C-120

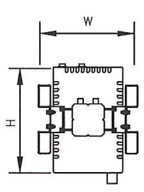
4 S-1 (PROPOSED) ANTENNA DETAIL

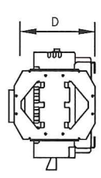
SCALE: 3/4"=1'-0"





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

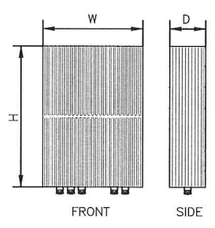




TYPE: 800 MHz 2x50W MODEL #: FD-RRH-2x50-800 HEIGHT: 19.7" WIDTH: 13" DEPTH: 10.8" WEIGHT: ±53 LBS

5 S-1 (EXIST) RRH DETAILS

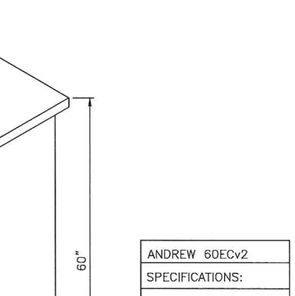
SCALE: 1 1/2"=1'-0"



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: N.T.S.



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SEAL

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CT33XC078

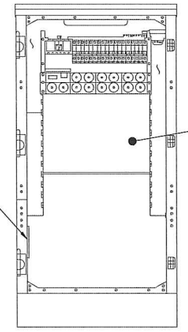
SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

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.



EXIST GROUND BAR TO BE UTILIZED

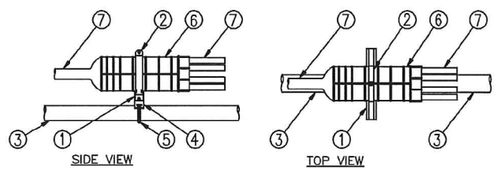
INSTALL NEW 2.5 EQUIPMENT IN EXIST MMBTS CABINET INCLUDING BUT NOT LIMITED TO BASE BAND UNIT, CELL SITE ROUTER AND SURGE ARRESTORS. GROUND EQUIPMENT TO EXIST INTERIOR CABINET GROUND BAR

FRONT ELEVATION
(CABINET INTERIOR)

1 / S-2 MMBTS INTERIOR DETAIL

SCALE: N.T.S.

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



3 / S-2 MEDUSA HEAD DETAIL

SCALE: NTS

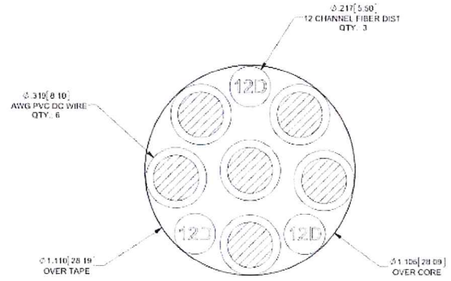
RFS HYBRIFLEX RISER CABLES SCHEDULE

Fiber Only (Existing DC Power)	**Hybrid cable** MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft
8 AWG Power	**Hybrid cable** MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	**Hybrid cable** MN: HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable,225ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	**Hybrid cable** MN: HB114-21U3M12-225F 3x 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

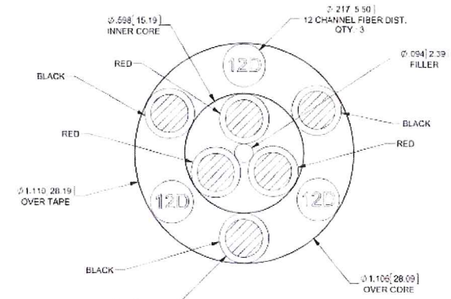
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

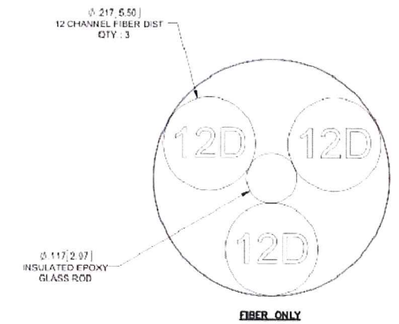
HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG



FIBER ONLY

2 / S-2 2.5 HYBRID CABLE X-SECTION AND DATA

SCALE: NTS

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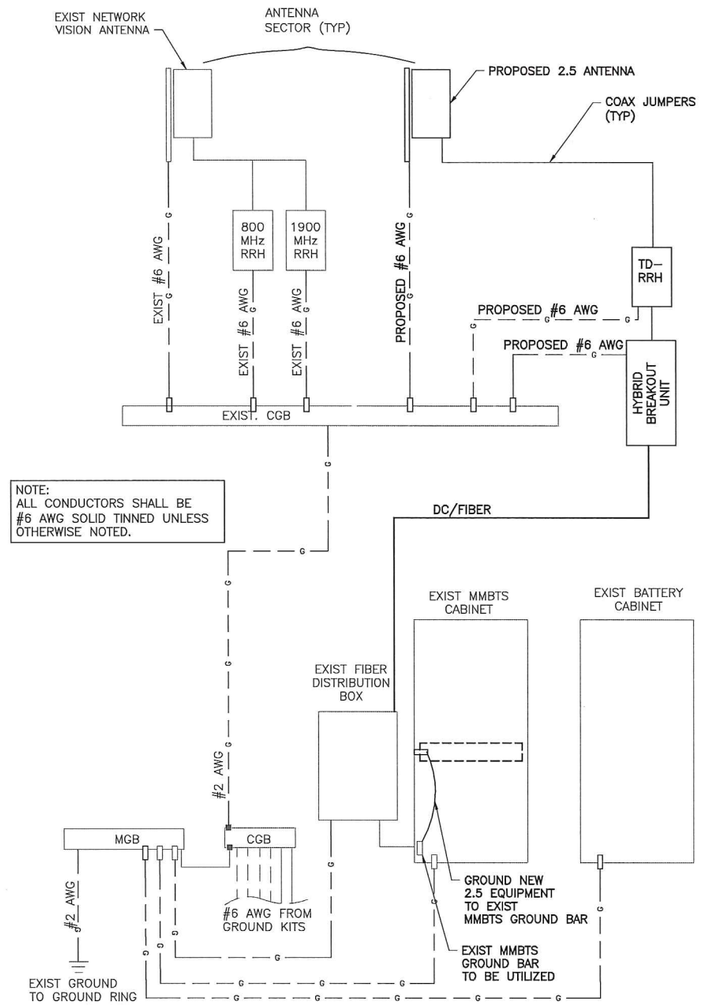
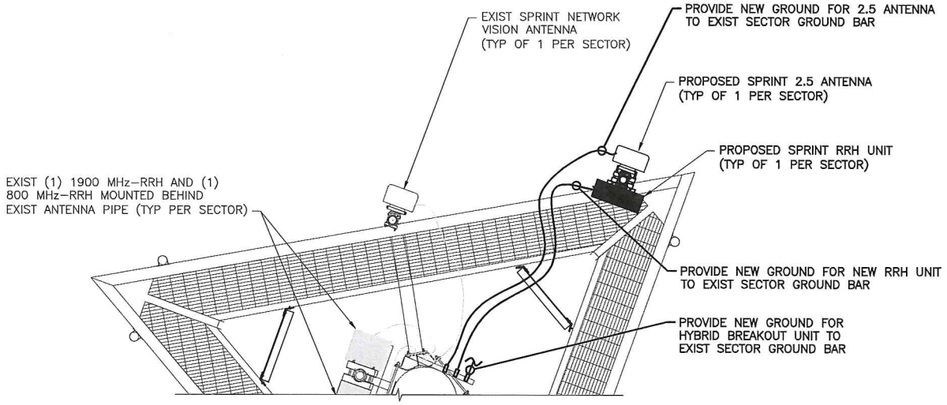
EQUIPMENT
SCHEMATIC DETAILS

SHEET NO:
S-2



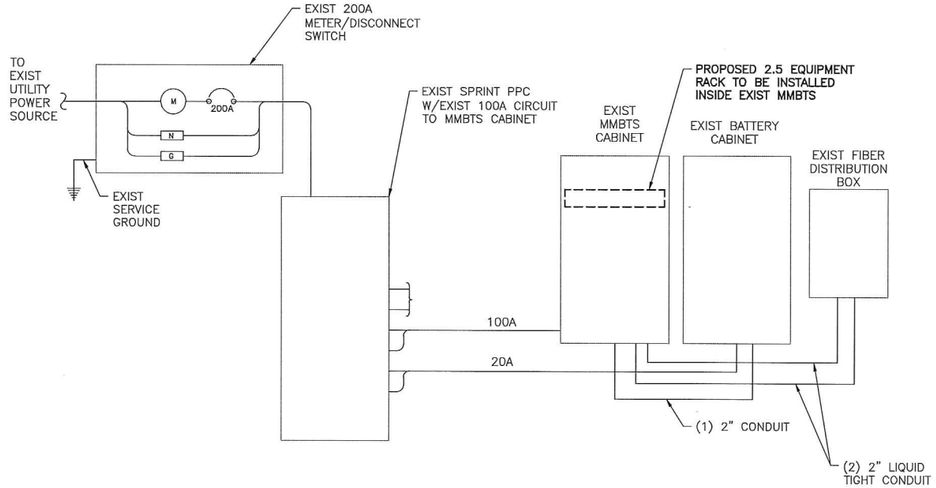
1 E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS



3 E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

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SUBMITTALS

PROJECT NO: 7225.CT33XC078

NO	DATE	DESCRIPTION	BY
0	07/17/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	JMQ

SEAL
STATE OF CONNECTICUT
JAMES M. QUINN
No. 22038
LICENSED PROFESSIONAL ENGINEER

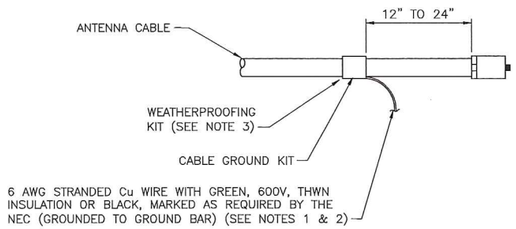
SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

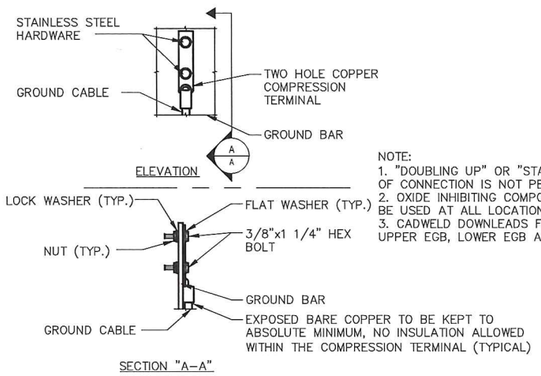
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

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

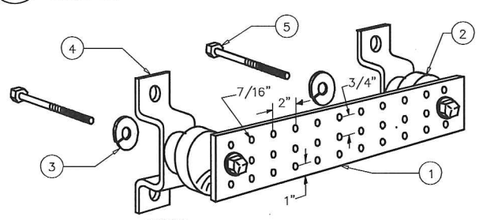
SCALE: N.T.S.



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



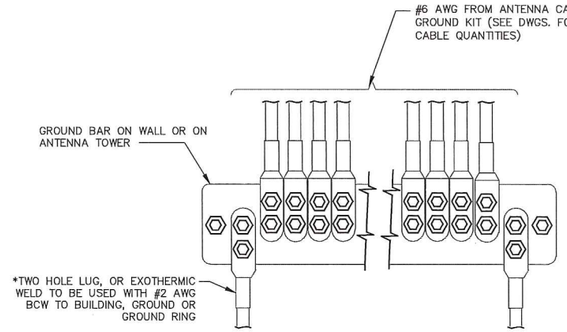
LEGEND

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

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SUBMITTALS

PROJECT NO: 7225.CT33XC078

NO	DATE	DESCRIPTION	BY
0	07/17/14	FOR COMMENT	JT
1	09/22/14	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
9/22/14	SMA

SEAL
STATE OF CONNECTICUT
SHOUKUMAR
No. 22039
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC078

SITE NAME:
LONG EDDY/WRIGHT PROPERTY

SITE ADDRESS:
136 WRIGHT RD
TORRINGTON, CT 06790

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E-2

June 16, 2017

Cheryl Schultz
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Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate** **Carrier Site Number:**	 CT33XC078
Crown Castle Designation:	**Crown Castle BU Number:** **Crown Castle Site Name:** **Crown Castle JDE Job Number:** **Crown Castle Work Order Number:** **Crown Castle Application Number:**	876373 Long Eddy / Wright Property 442171 1418706 393600 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	89028.007.01
Site Data:	**136 Wright Rd., Torrington, Litchfield County, CT** **Latitude *41° 49' 38.34"*, Longitude *-73° 10' 13.97"*** **148 Foot - Monopole Tower**	

Dear Cheryl Schultz,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1047778, in accordance with application 393600, revision 1.

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

LC7: Existing + Reserved + SLA Equipment + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 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 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 *B+T Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:
B+T Engineering, Inc.

Krista Loyd, E.I.T.
Project Engineer

Scott S. Vance, P.E.
Engineer of Record
COA: PEC.0001564 Expires: 02/10/2018

STATE OF CONNECTICUT
SCOTT S. VANCE
31627
LICENSED
PROFESSIONAL ENGINEER
6/16/17

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1) INTRODUCTION

This tower is a 148 ft. Monopole tower designed by Summit manufacturing in June of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.This tower has been modified by B+T Group in February of 2014 and those modifications are incorporated in our Analysis.

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, 40 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1 and crest height of 0 feet.

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
148.0	150.0	3	RFS Celwave	APXVTM14-ALU-I20	1	1-1/4	--
	148.0	3	Alcatel Lucent	TD-RRH8x20-25			

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
149.0	150.0	3	Alcatel Lucent	1900MHz RRH (65MHz)	--	--	1
		3	Alcatel Lucent	800 EXTERNAL NOTCH FILTER			
		3	Alcatel Lucent	800MHZ RRH			
	149.0	1	--	Pipe Mount [PM 601-3]			
148.0	150.0	3	Rfs Celwave	APXVSPP18-C-A20	3	1-1/4	1
	148.0	9	Rfs Celwave	ACU-A20-N			
		1	--	Platform Mount [LP 712-1]			
138.0	138.0	1	Antel	BXA-171063-8BF-2	18	1-5/8	1
		2	Antel	BXA-171085-8BF-EDIN-2			
		3	Antel	BXA-70063-6CF-2			
		2	Antel	LPA-80063/6CF			
		4	Antel	LPA-80080/6CF			
		1	--	Platform Mount [LP 712-1]			
128.0	128.0	3	CCI Antennas	HPA-65R-BUU-H8	5 1	3/4 3/8	2
		9	Ericsson	RRU-11			
		2	Raycap	DC6-48-60-18-8F			
		1	--	Sector Mount [SM 406-3]			
		12	CCI Antennas	HPA-65R-BUU-H8	8 3 2	3/4 5/16 3/8	3
		3	Ericsson	KRF 102 361/1			
		9	Ericsson	RRU-11			
		6	Ericsson	RRUS 12-B2			
		6	Ericsson	RRUS A2			
		3	Ericsson	RRUS E2 B29			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	Ericsson	RRUS-32 B30			
		4	Raycap	DC6-48-60-18-8F			
79.0	84.0	1	Rfs Celwave	PD1109E	1	1/2	1
	79.0	1	--	Side Arm Mount [SO 701-1]			
45.0	45.0	1	GPS	GPS_A	1	1/2	1
		1	--	Side Arm Mount [SO 701-1]			
13.0	13.0	1	GPS	GPS_A	1	1/2	1
		1	--	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) SLA Equipment; Considered in This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
148	148	12	Dapa	48000 PCS Panel	--	--
		1	Generic	14' LP Platform		
140	140	12	Dapa	48000 PCS Panel	--	--
		1	Generic	14' LP Platform		
130	130	12	Dapa	48000 PCS Panel	--	--
		1	Generic	14' LP Platform		
120	120	12	Dapa	48000 PCS Panel	--	--
		1	Generic	14' LP Platform		
76	76	1	Generic	GPS Antenna	--	--
		1	Generic	GPS Stand-on Mount		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Sprint/Nextel Property Services Co-locate, Revision# 1	393600	CCI Sites
Tower Manufacturer Drawing	Summit, Date: 06/23/2000	1631601	CCI Sites
Tower Modification Drawing	B+T Group, Project No. 89028.003.01, Date: 02/25/2014	4491592	CCI Sites
Post Modification Inspection	TEP, Project No. 52429.14747, Date: 07/31/2014	5215998	CCI Sites
Foundation Drawing	Summit, Job No. 10185	1634518	CCI Sites
Geotech Report	Clerence Welti Assoc. Inc., Date: 05/12/2000	1531964	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 06/14/2017	CCI Sites

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.
4) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	148 - 116.5	Pole	TP29.48x24x0.219	1	-11.932	1273.620	39.5	Pass
L2	116.5 - 98.5	Pole	TP32.175x28.39x0.25	2	-15.292	1751.620	62.9	Pass
L3	98.5 - 80.25	Pole	TP35.35x32.175x0.434	3	-18.347	2234.540	64.6	Pass
L4	80.25 - 70.5	Pole	TP36.547x34.067x0.487	4	-22.924	2652.040	67.6	Pass
L5	70.5 - 39.75	Pole	TP41.9x36.547x0.591	5	-31.182	3872.250	59.9	Pass
L6	39.75 - 31.75	Pole	TP42.666x40.361x0.643	6	-37.733	4392.170	59.4	Pass
L7	31.75 - 17.75	Pole	TP45.102x42.666x0.626	7	-43.129	4536.430	62.9	Pass
L8	17.75 - 14.25	Pole	TP45.711x45.102x0.728	8	-44.739	4899.110	59.7	Pass
L9	14.25 - 0	Pole	TP48.19x45.711x0.619	9	-50.858	4666.760	67.3	Pass
							Summary	
						Pole (L4)	67.6	Pass
						Rating =	67.6	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rod Bracket	Base	64.0	Pass
1	Anchor Rods	Base	53.4	Pass
1	Base Plate	Base	52.1	Pass
1	Base Foundation(Structure)	Base	52.4	Pass
1	Base Foundation (Soil Interaction)	Base	80.8	Pass

Structure Rating (max from all components) =	80.8%

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

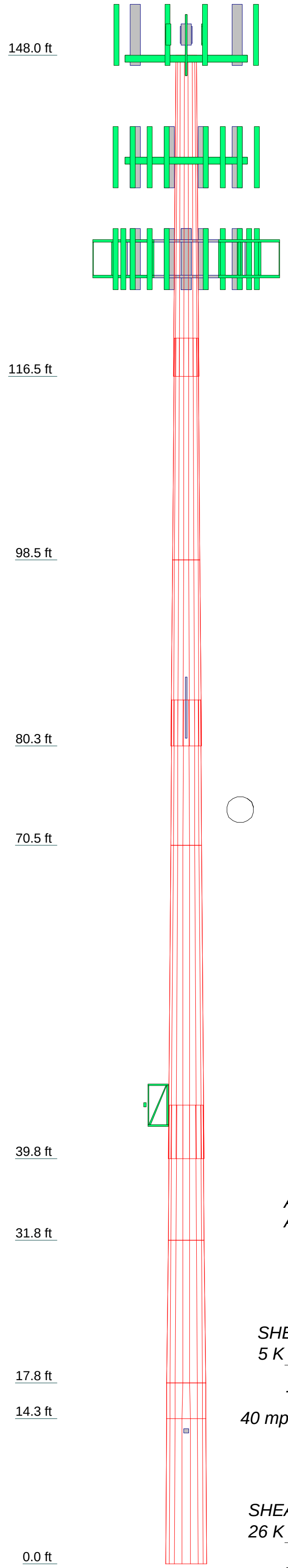
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the final load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	31.500	18	0.219	3.750	24.000	29.480	A607-60	2.0
2	21.750	18	0.250		28.390	32.175	A607-65	1.8
3	18.250	18	0.434	4.500	32.175	35.350	41.576197ksi	2.7
4	14.250	18	0.487		34.067	36.547	41.638714ksi	2.5
5	30.750	18	0.591	5.250	36.547	41.900	44.687644ksi	7.2
6	13.250	18	0.643		40.361	42.666	44.784736ksi	3.6
7	14.000	18	0.626		42.666	45.102	44.884505ksi	3.9
8	3.500	18	0.728		45.102	45.711		1.2
9	14.250	18	0.619		45.711	48.190	41.253151ksi / 43.698539ksi	4.5
								29.5



DESIGNED APPURTENANCE LOADING

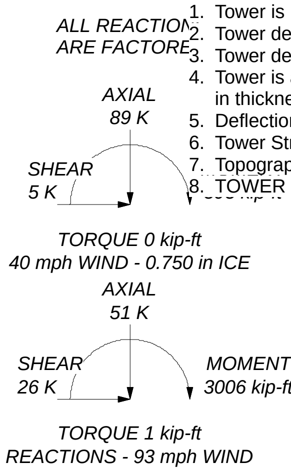
TYPE	ELEVATION	TYPE	ELEVATION
Top Hat (E)	149.5	HPA-65R-BUU-H8 w/ Mount Pipe (R)	128
800MHZ RRH (E)	149	HPA-65R-BUU-H8 w/ Mount Pipe (R)	128
800MHZ RRH (E)	149	(3) RRU-11 (R)	128
800MHZ RRH (E)	149	(3) RRU-11 (R)	128
800 EXTERNAL NOTCH FILTER (E)	149	(3) RRU-11 (R)	128
800 EXTERNAL NOTCH FILTER (E)	149	(2) DC6-48-60-18-8F (R)	128
800 EXTERNAL NOTCH FILTER (E)	149	(4) HPA-65R-BUU-H8 w/ Mount Pipe (ATT--SLA)	128
1900MHz RRH (65MHz) (E)	149	(4) HPA-65R-BUU-H8 w/ Mount Pipe (SLA)	128
1900MHz RRH (65MHz) (E)	149	(4) HPA-65R-BUU-H8 w/ Mount Pipe (SLA)	128
1900MHz RRH (65MHz) (E)	149	(3) RRU-11 (SLA)	128
Pipe Mount [PM 601-3] (E)	149	(3) RRU-11 (SLA)	128
APXVSPP18-C-A20 w/ Mount Pipe (E)	148	(3) RRU-11 (SLA)	128
APXVSPP18-C-A20 w/ Mount Pipe (E)	148	RRUS E2 B29 (SLA)	128
APXVSPP18-C-A20 w/ Mount Pipe (E)	148	RRUS E2 B29 (SLA)	128
(3) ACU-A20-N (E)	148	RRUS E2 B29 (SLA)	128
(3) ACU-A20-N (E)	148	DC6-48-60-18-8F (SLA)	128
(3) ACU-A20-N (E)	148	(2) DC6-48-60-18-8F (SLA)	128
APXVTM14-ALU-I20 w/ Mount Pipe (P)	148	DC6-48-60-18-8F (SLA)	128
APXVTM14-ALU-I20 w/ Mount Pipe (P)	148	RRUS-32 B30 (SLA)	128
APXVTM14-ALU-I20 w/ Mount Pipe (P)	148	RRUS-32 B30 (SLA)	128
(2) TD-RRH8x20-25 (P)	148	RRUS-32 B30 (SLA)	128
TD-RRH8x20-25 (P)	148	(2) RRUS A2 (SLA)	128
6' x 2" Mount Pipe (E)	148	(2) RRUS A2 (SLA)	128
6' x 2" Mount Pipe (E)	148	(2) RRUS A2 (SLA)	128
6' x 2" Mount Pipe (E)	148	(2) RRUS 12-B2 (SLA)	128
Platform Mount [LP 712-1] (E-12'/TIA)	148	(2) RRUS 12-B2 (SLA)	128
(2) LPA-80063/6CF w/ Mount Pipe (E)	138	(2) RRUS 12-B2 (SLA)	128
(2) LPA-80080/6CF w/ Mount Pipe (E)	138	KRF 102 361/1 (SLA)	128
(2) LPA-80080/6CF w/ Mount Pipe (E)	138	KRF 102 361/1 (SLA)	128
BXA-70063-6CF-2 w/ Mount Pipe (E)	138	KRF 102 361/1 (SLA)	128
BXA-70063-6CF-2 w/ Mount Pipe (E)	138	Sector Mount [SM 406-3] (R)	128
BXA-70063-6CF-2 w/ Mount Pipe (E)	138	PD1109E (E-CL/TIA)	79
BXA-171085-8BF-EDIN-2 w/ Mount Pipe (E)	138	Side Arm Mount [SO 701-1] (E)	79
BXA-171085-8BF-EDIN-2 w/ Mount Pipe (E)	138	GPS_A (E)	45
BXA-171063-8BF-2 w/ Mount Pipe (E)	138	Side Arm Mount [SO 701-1] (E)	45
Platform Mount [LP 712-1] (E-12'/TIA)	138	GPS_A (E-CL/TIA)	13
HPA-65R-BUU-H8 w/ Mount Pipe (ATT--R)	128	Side Arm Mount [SO 701-1] (E-Mount Ht./TIA)	13

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	44.784736ksi	45 ksi	60 ksi
A607-65	65 ksi	80 ksi	44.884505ksi	45 ksi	60 ksi
41.576197ksi	42 ksi	57 ksi	41.253151ksi	41 ksi	56 ksi
41.638714ksi	42 ksi	57 ksi	43.698539ksi	44 ksi	59 ksi
44.687644ksi	45 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield 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 40 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 0.000 ft
8. TOWER RATING: 67.6%



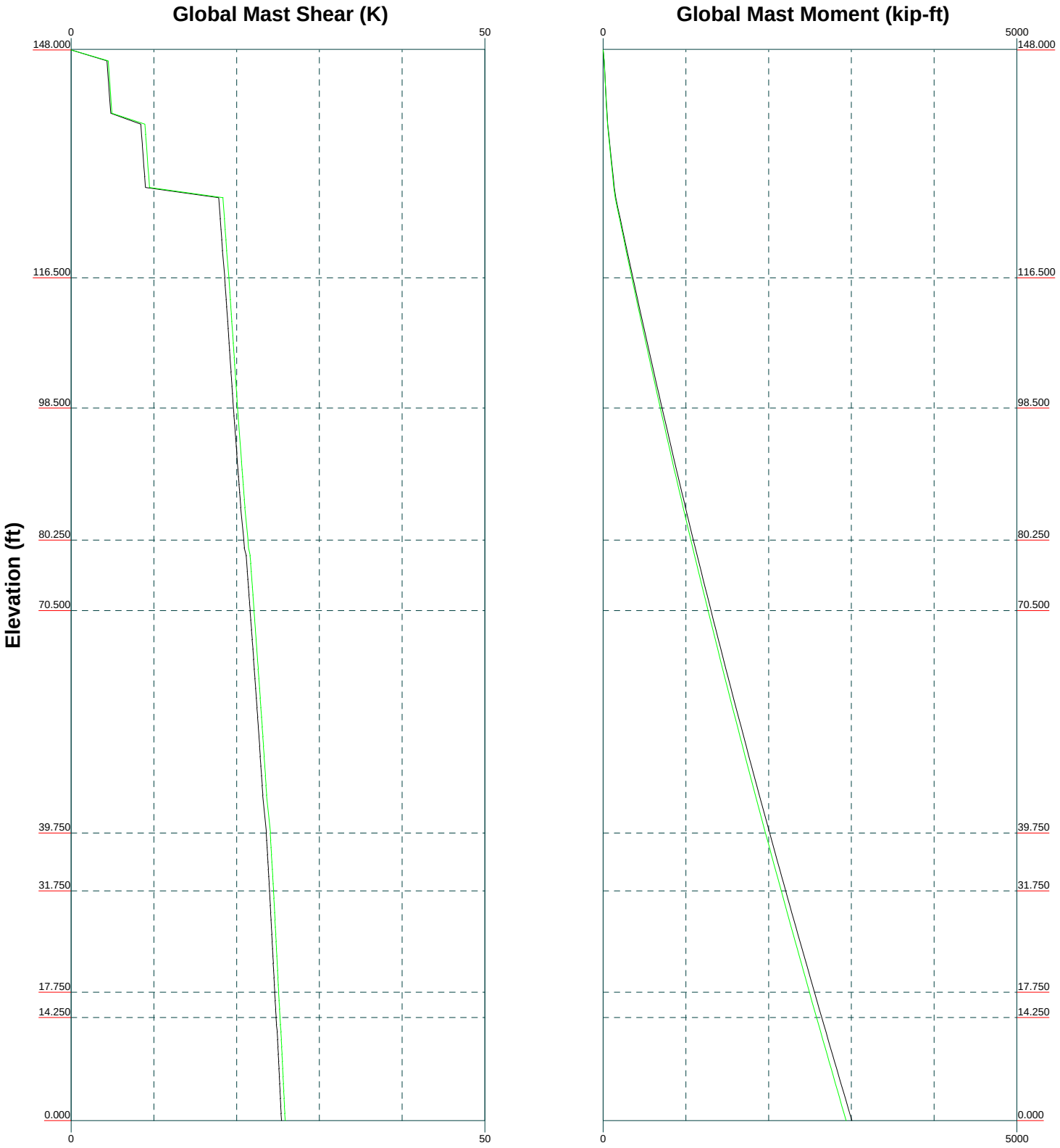
B+T Group 1717 S.Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job: **89028.007.01 - LONG EDDY / WRIGHT PROPERTY, CT (BU# 87637**

Project:		
Client: Crown Castle	Drawn by: Pavan Pai	App'd:
Code: TIA-222-G	Date: 06/16/17	Scale: NTS
Path: C:\Users\PAVAN\Desktop\QCD\Compile_89028_876373_Long Eddy Wright Property----Pavan----Anand-----QCD\Tnx_007_01\89028_007_01_LONG EDDY_WRIGHT PROPERTY_CT_AS.eri		Dwg No. E-1

TIA-222-G - 93 mph/40 mph 0.750 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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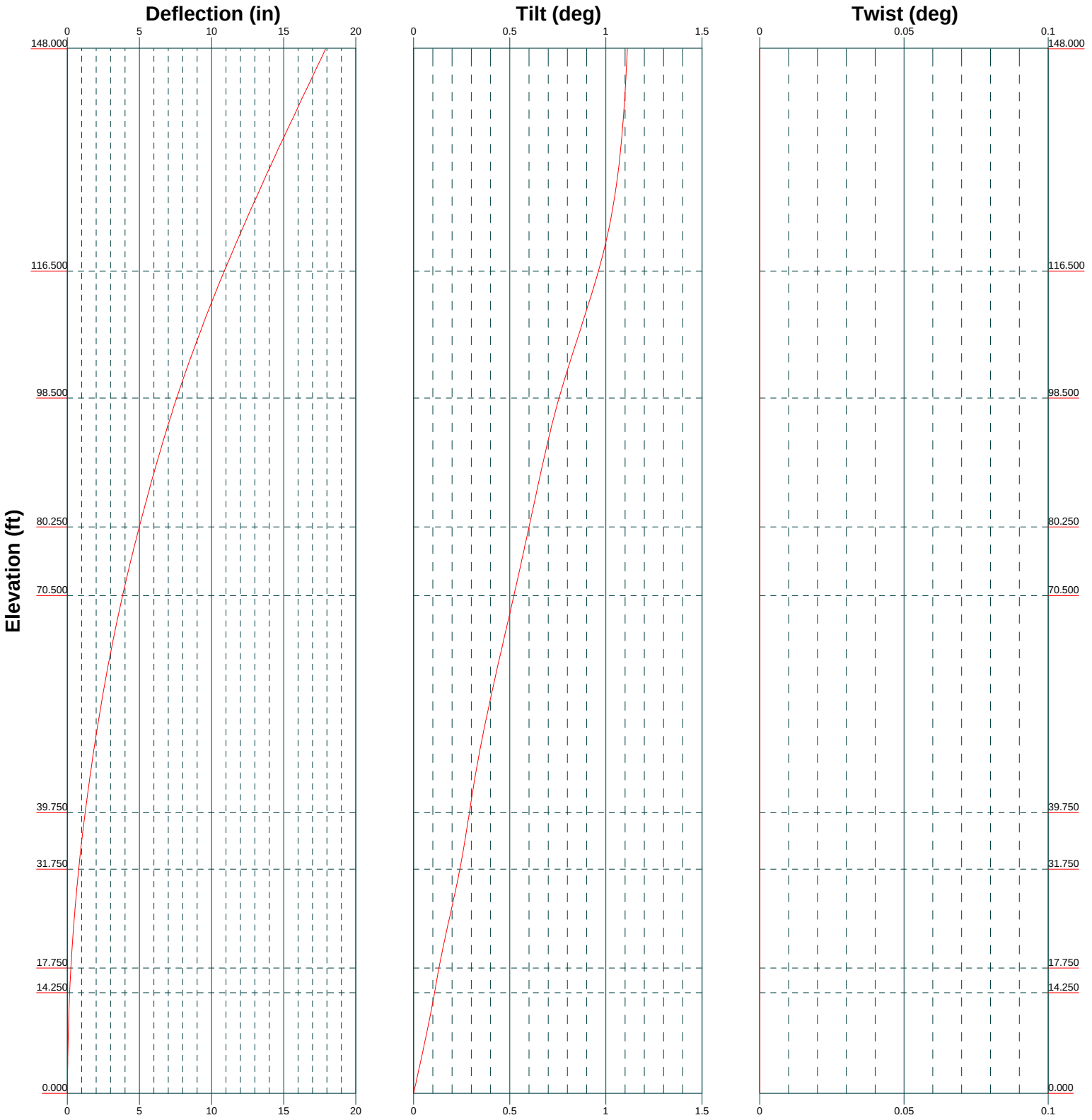
FAX: (918) 295-0265

Job: 89028.007.01 - LONG EDDY / WRIGHT PROPERTY, CT (BU# 87637		
Project:		
Client: Crown Castle	Drawn by: Pavan Pai	App'd:
Code: TIA-222-G	Date: 06/16/17	Scale: NTS
Path:		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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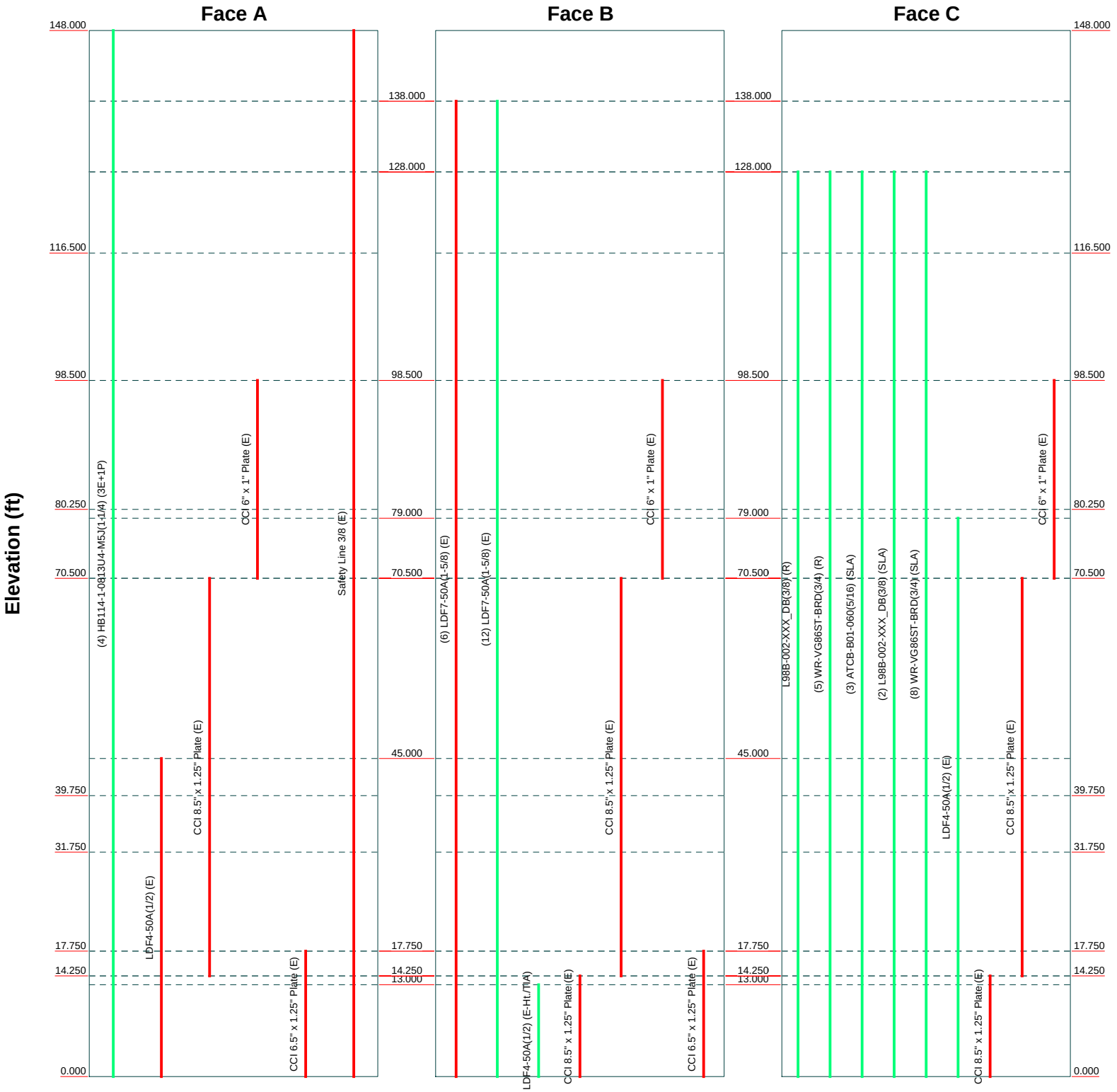
FAX: (918) 295-0265

Job: ***89028.007.01 - LONG EDDY / WRIGHT PROPERTY, CT (BU# 87637***			
Project:			
Client: Crown Castle	Drawn by: Pavan Pai	App'd:	
Code: TIA-222-G	Date: 06/16/17	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 148'

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



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Job:	***89028.007.01 - LONG EDDY / WRIGHT PROPERTY, CT (BU# 87637***		
Project:			
Client: Crown Castle	Drawn by: Pavan Pai	App'd:	
Code: TIA-222-G	Date: 06/16/17	Scale: NTS	
Path:		Dwg No. E-7	

Tower Input Data

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

Tower is located in Litchfield County, Connecticut.
Basic wind speed of 93 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 40 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
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* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	148.000-116.500 0	31.500	3.750	18	24.000	29.480	0.219	0.875	A607-60 (60 ksi)
L2	116.500-98.500	21.750	0.000	18	28.390	32.175	0.250	1.000	A607-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	98.500-80.250	18.250	4.500	18	32.175	35.350	0.434	1.736	41.576197ksi (42 ksi)
L4	80.250-70.500	14.250	0.000	18	34.067	36.547	0.487	1.947	41.638714ksi (42 ksi)
L5	70.500-39.750	30.750	5.250	18	36.547	41.900	0.591	2.365	44.687644ksi (45 ksi)
L6	39.750-31.750	13.250	0.000	18	40.361	42.666	0.643	2.573	44.784736ksi (45 ksi)
L7	31.750-17.750	14.000	0.000	18	42.666	45.102	0.626	2.506	44.884505ksi (45 ksi)
L8	17.750-14.250	3.500	0.000	18	45.102	45.711	0.728	2.911	41.253151ksi (41 ksi)
L9	14.250-0.000	14.250		18	45.711	48.190	0.619	2.475	43.698539ksi (44 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	24.370	16.512	1179.768	8.442	12.192	96.766	2361.088	8.257	3.839	17.55
	29.935	20.316	2197.713	10.388	14.976	146.751	4398.319	10.160	4.803	21.959
L2	29.491	22.329	2233.892	9.990	14.422	154.893	4470.723	11.167	4.557	18.227
	32.671	25.332	3261.812	11.333	16.345	199.564	6527.916	12.668	5.223	20.891
L3	32.671	43.726	5565.479	11.268	16.345	340.507	11138.281	21.867	4.899	11.287
	35.895	48.100	7408.540	12.395	17.958	412.553	14826.827	24.055	5.458	12.575
L4	35.388	51.890	7392.471	11.921	17.306	427.161	14794.670	25.950	5.139	10.555
	37.111	55.723	9154.622	12.802	18.566	493.082	18321.290	27.867	5.575	11.452
L5	37.111	67.480	11022.014	12.764	18.566	593.663	22058.531	33.747	5.392	9.119
	42.546	77.526	16713.430	14.665	21.285	785.214	33448.852	38.770	6.334	10.712
L6	41.911	81.096	16162.580	14.100	20.503	788.285	32346.427	40.556	5.971	9.282
	43.325	85.803	19143.219	14.918	21.674	883.214	38311.628	42.910	6.377	9.913
L7	43.325	83.582	18662.634	14.924	21.674	861.042	37349.825	41.799	6.407	10.228
	45.798	88.424	22097.930	15.789	22.912	964.478	44224.937	44.221	6.836	10.913
L8	45.798	102.493	25497.284	15.753	22.912	1112.845	51028.117	51.256	6.657	9.148
	46.416	103.899	26561.387	15.969	23.221	1143.846	53157.724	51.960	6.764	9.295
L9	46.416	88.564	22750.786	16.008	23.221	979.745	45531.507	44.291	6.956	11.241
	48.933	93.434	26713.350	16.888	24.481	1091.208	53461.849	46.726	7.392	11.946

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 148.000-116.500				1	1	1			
L2 116.500-98.500				1	1	1			
L3 98.500-80.250				1	1	0.962717			
L4 80.250-70.500				1	1	0.968696			
L5 70.500-39.750				1	1	0.953422			

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
L6 39.750-31.750				1	1	0.958861			
L7 31.750-17.750				1	1	0.963264			
L8 17.750-14.250				1	1	0.983373			
L9 14.250-0.000				1	1	1.01129			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
/>									
LDF7-50A(1-5/8) (E)	B	Surface Ar (CaAa)	138.000 - 0.000	6	6	-0.350 -0.200	1.980		0.001
/>									
LDF4-50A(1/2) (E)	A	Surface Ar (CaAa)	45.000 - 0.000	1	1	-0.210 -0.200	0.630		0.000
/>									
CCI 8.5" x 1.25" Plate (E)	B	Surface Af (CaAa)	14.250 - 0.000	1	1	0.000 0.000	8.500	19.500	0.000
CCI 8.5" x 1.25" Plate (E)	C	Surface Af (CaAa)	14.250 - 0.000	1	1	0.000 0.000	8.500	19.500	0.000
/>									
CCI 8.5" x 1.25" Plate (E)	A	Surface Af (CaAa)	70.500 - 14.250	1	1	0.000 0.000	8.500	19.500	0.000
CCI 8.5" x 1.25" Plate (E)	B	Surface Af (CaAa)	70.500 - 14.250	1	1	0.000 0.000	8.500	19.500	0.000
CCI 8.5" x 1.25" Plate (E)	C	Surface Af (CaAa)	70.500 - 14.250	1	1	0.000 0.000	8.500	19.500	0.000
/>									
CCI 6" x 1" Plate (E)	A	Surface Af (CaAa)	98.500 - 70.500	1	1	0.000 0.000	6.000	14.000	0.000
CCI 6" x 1" Plate (E)	B	Surface Af (CaAa)	98.500 - 70.500	1	1	0.000 0.000	6.000	14.000	0.000
CCI 6" x 1" Plate (E)	C	Surface Af (CaAa)	98.500 - 70.500	1	1	0.000 0.000	6.000	14.000	0.000
/>									
CCI 6.5" x 1.25" Plate (E)	A	Surface Af (CaAa)	17.750 - 0.000	1	1	0.000 0.000	6.500	15.500	0.000
CCI 6.5" x 1.25" Plate (E)	B	Surface Af (CaAa)	17.750 - 0.000	1	1	0.000 0.000	6.500	15.500	0.000
/>									
Safety Line 3/8 (E)	A	Surface Ar (CaAa)	148.000 - 0.000	1	1	-0.210 -0.200	0.375		0.000
/>									

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 klf
HB114-1-0813U4-M5J(1-1/4) (3E+1P)	A	No	Inside Pole	148.000 - 0.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
LDF7-50A(1-5/8) (E)	B	No	Inside Pole	138.000 - 0.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
/>								
L98B-002-XXX_DB(3/8) (R)	C	No	Inside Pole	128.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (R)	C	No	Inside Pole	128.000 - 0.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
ATCB-B01-060(5/16) (SLA)	C	No	Inside Pole	128.000 - 0.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
L98B-002-XXX_DB(3/8) (SLA)	C	No	Inside Pole	128.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (SLA)	C	No	Inside Pole	128.000 - 0.000	8	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
/>								
LDF4-50A(1/2) (E)	C	No	Inside Pole	79.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
/>								
LDF4-50A(1/2) (E-Ht./TIA)	B	No	Inside Pole	13.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
/>								

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	148.000-116.500	A	0.000	0.000	1.181	0.000	0.158
		B	0.000	0.000	25.542	0.000	0.317
		C	0.000	0.000	0.000	0.000	0.092
L2	116.500-98.500	A	0.000	0.000	0.675	0.000	0.090
		B	0.000	0.000	21.384	0.000	0.266
		C	0.000	0.000	0.000	0.000	0.144
L3	98.500-80.250	A	0.000	0.000	18.934	0.000	0.092
		B	0.000	0.000	39.931	0.000	0.269
		C	0.000	0.000	18.250	0.000	0.146
L4	80.250-70.500	A	0.000	0.000	10.116	0.000	0.049
		B	0.000	0.000	21.333	0.000	0.144
		C	0.000	0.000	9.750	0.000	0.079
L5	70.500-39.750	A	0.000	0.000	45.046	0.000	0.155
		B	0.000	0.000	80.094	0.000	0.454
		C	0.000	0.000	43.563	0.000	0.250
L6	39.750-31.750	A	0.000	0.000	12.137	0.000	0.041
		B	0.000	0.000	20.837	0.000	0.118
		C	0.000	0.000	11.333	0.000	0.065
L7	31.750-17.750	A	0.000	0.000	21.240	0.000	0.072
		B	0.000	0.000	36.465	0.000	0.207
		C	0.000	0.000	19.833	0.000	0.114

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
L8	17.750-14.250	A	0.000	0.000	9.102	0.000	0.018
		B	0.000	0.000	12.908	0.000	0.052
		C	0.000	0.000	4.958	0.000	0.028
L9	14.250-0.000	A	0.000	0.000	16.870	0.000	0.074
		B	0.000	0.000	52.554	0.000	0.212
		C	0.000	0.000	20.188	0.000	0.116

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	148.000-116.500	A	1.723	0.000	0.000	12.035	0.000	0.297
		B		0.000	0.000	41.188	0.000	0.805
		C		0.000	0.000	0.000	0.000	0.092
L2	116.500-98.500	A	1.688	0.000	0.000	6.877	0.000	0.170
		B		0.000	0.000	34.483	0.000	0.674
		C		0.000	0.000	0.000	0.000	0.144
L3	98.500-80.250	A	1.657	0.000	0.000	31.030	0.000	0.405
		B		0.000	0.000	58.958	0.000	0.905
		C		0.000	0.000	24.298	0.000	0.384
L4	80.250-70.500	A	1.629	0.000	0.000	16.577	0.000	0.216
		B		0.000	0.000	31.498	0.000	0.483
		C		0.000	0.000	12.981	0.000	0.207
L5	70.500-39.750	A	1.579	0.000	0.000	66.124	0.000	0.774
		B		0.000	0.000	111.074	0.000	1.570
		C		0.000	0.000	53.272	0.000	0.731
L6	39.750-31.750	A	1.512	0.000	0.000	19.716	0.000	0.231
		B		0.000	0.000	28.897	0.000	0.408
		C		0.000	0.000	13.860	0.000	0.190
L7	31.750-17.750	A	1.457	0.000	0.000	33.480	0.000	0.369
		B		0.000	0.000	49.803	0.000	0.671
		C		0.000	0.000	23.913	0.000	0.312
L8	17.750-14.250	A	1.395	0.000	0.000	12.976	0.000	0.127
		B		0.000	0.000	17.090	0.000	0.202
		C		0.000	0.000	5.935	0.000	0.076
L9	14.250-0.000	A	1.286	0.000	0.000	27.778	0.000	0.299
		B		0.000	0.000	65.256	0.000	0.768
		C		0.000	0.000	20.497	0.000	0.290

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	148.000-116.500	0.397	-0.863	0.193	-0.942
L2	116.500-98.500	0.538	-1.134	0.354	-1.212
L3	98.500-80.250	0.318	-0.670	0.227	-0.766
L4	80.250-70.500	0.327	-0.690	0.235	-0.795
L5	70.500-39.750	0.288	-0.622	0.198	-0.753
L6	39.750-31.750	0.267	-0.645	0.067	-0.780
L7	31.750-17.750	0.274	-0.662	0.085	-0.802
L8	17.750-14.250	0.227	-1.095	0.078	-1.198
L9	14.250-0.000	0.984	-0.857	0.699	-1.092

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	3	LDF7-50A(1-5/8)	116.50 - 138.00	1.0000	1.0000
L1	32	Safety Line 3/8	116.50 - 148.00	1.0000	1.0000
L3	3	LDF7-50A(1-5/8)	80.25 - 98.50	1.0000	1.0000
L3	25	CCI 6" x 1" Plate	80.25 - 98.50	1.0000	1.0000
L3	26	CCI 6" x 1" Plate	80.25 - 98.50	1.0000	1.0000
L3	27	CCI 6" x 1" Plate	80.25 - 98.50	1.0000	1.0000
L3	32	Safety Line 3/8	80.25 - 98.50	1.0000	1.0000
L5	3	LDF7-50A(1-5/8)	39.75 - 70.50	1.0000	1.0000
L5	14	LDF4-50A(1/2)	39.75 - 45.00	1.0000	1.0000
L5	21	CCI 8.5" x 1.25" Plate	39.75 - 70.50	1.0000	1.0000
L5	22	CCI 8.5" x 1.25" Plate	39.75 - 70.50	1.0000	1.0000
L5	23	CCI 8.5" x 1.25" Plate	39.75 - 70.50	1.0000	1.0000
L5	32	Safety Line 3/8	39.75 - 70.50	1.0000	1.0000
L7	3	LDF7-50A(1-5/8)	17.75 - 31.75	1.0000	1.0000
L7	14	LDF4-50A(1/2)	17.75 - 31.75	1.0000	1.0000
L7	21	CCI 8.5" x 1.25" Plate	17.75 - 31.75	1.0000	1.0000
L7	22	CCI 8.5" x 1.25" Plate	17.75 - 31.75	1.0000	1.0000
L7	23	CCI 8.5" x 1.25" Plate	17.75 - 31.75	1.0000	1.0000
L7	32	Safety Line 3/8	17.75 - 31.75	1.0000	1.0000
L8	3	LDF7-50A(1-5/8)	14.25 - 17.75	1.0000	1.0000
L8	14	LDF4-50A(1/2)	14.25 - 17.75	1.0000	1.0000
L8	21	CCI 8.5" x 1.25" Plate	14.25 - 17.75	1.0000	1.0000
L8	22	CCI 8.5" x 1.25" Plate	14.25 - 17.75	1.0000	1.0000
L8	23	CCI 8.5" x 1.25" Plate	14.25 - 17.75	1.0000	1.0000
L8	29	CCI 6.5" x 1.25" Plate	14.25 - 17.75	1.0000	1.0000
L8	30	CCI 6.5" x 1.25" Plate	14.25 - 17.75	1.0000	1.0000
L8	32	Safety Line 3/8	14.25 - 17.75	1.0000	1.0000
L9	3	LDF7-50A(1-5/8)	0.00 - 14.25	1.0000	1.0000
L9	14	LDF4-50A(1/2)	0.00 - 14.25	1.0000	1.0000
L9	18	CCI 8.5" x 1.25" Plate	0.00 - 14.25	1.0000	1.0000
L9	19	CCI 8.5" x 1.25" Plate	0.00 - 14.25	1.0000	1.0000
L9	29	CCI 6.5" x 1.25" Plate	0.00 - 14.25	1.0000	1.0000
L9	30	CCI 6.5" x 1.25" Plate	0.00 - 14.25	1.0000	1.0000
L9	32	Safety Line 3/8	0.00 - 14.25	1.0000	1.0000

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
Top Hat	C	None		0.000	149.500	No Ice	3.000	3.000	0.081

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
(E)						1/2" Ice	3.480	3.480	0.111
						1" Ice	3.960	3.960	0.141
/>									
800MHZ RRH	A	From Leg	1.000	0.000	149.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			1.000			1" Ice	2.512	2.127	0.098
800MHZ RRH	B	From Leg	1.000	0.000	149.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			1.000			1" Ice	2.512	2.127	0.098
800MHZ RRH	C	From Leg	1.000	0.000	149.000	No Ice	2.134	1.773	0.053
(E)			0.000			1/2" Ice	2.320	1.946	0.074
			1.000			1" Ice	2.512	2.127	0.098
800 EXTERNAL NOTCH	A	From Leg	1.000	0.000	149.000	No Ice	0.660	0.321	0.011
FILTER			0.000			1/2" Ice	0.763	0.398	0.017
(E)			1.000			1" Ice	0.873	0.483	0.024
800 EXTERNAL NOTCH	B	From Leg	1.000	0.000	149.000	No Ice	0.660	0.321	0.011
FILTER			0.000			1/2" Ice	0.763	0.398	0.017
(E)			1.000			1" Ice	0.873	0.483	0.024
800 EXTERNAL NOTCH	C	From Leg	1.000	0.000	149.000	No Ice	0.660	0.321	0.011
FILTER			0.000			1/2" Ice	0.763	0.398	0.017
(E)			1.000			1" Ice	0.873	0.483	0.024
1900MHz RRH (65MHz)	A	From Leg	1.000	0.000	149.000	No Ice	2.313	2.375	0.060
(E)			0.000			1/2" Ice	2.517	2.581	0.084
			1.000			1" Ice	2.728	2.794	0.111
1900MHz RRH (65MHz)	B	From Leg	1.000	0.000	149.000	No Ice	2.313	2.375	0.060
(E)			0.000			1/2" Ice	2.517	2.581	0.084
			1.000			1" Ice	2.728	2.794	0.111
1900MHz RRH (65MHz)	C	From Leg	1.000	0.000	149.000	No Ice	2.313	2.375	0.060
(E)			0.000			1/2" Ice	2.517	2.581	0.084
			1.000			1" Ice	2.728	2.794	0.111
Pipe Mount [PM 601-3]	C	None		0.000	149.000	No Ice	4.390	4.390	0.195
(E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
/>									
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	148.000	No Ice	8.262	6.946	0.083
Mount Pipe			0.000			1/2" Ice	8.822	8.127	0.151
(E)			2.000			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	148.000	No Ice	8.262	6.946	0.083
Mount Pipe			0.000			1/2" Ice	8.822	8.127	0.151
(E)			2.000			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	148.000	No Ice	8.262	6.946	0.083
Mount Pipe			0.000			1/2" Ice	8.822	8.127	0.151
(E)			2.000			1" Ice	9.346	9.021	0.227
(3) ACU-A20-N	A	From Leg	4.000	0.000	148.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			0.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	B	From Leg	4.000	0.000	148.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			0.000			1" Ice	0.148	0.215	0.004
(3) ACU-A20-N	C	From Leg	4.000	0.000	148.000	No Ice	0.067	0.117	0.001
(E)			0.000			1/2" Ice	0.104	0.162	0.002
			0.000			1" Ice	0.148	0.215	0.004
APXVTM14-ALU-I20 w/	A	From Leg	4.000	0.000	148.000	No Ice	6.580	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.031	5.754	0.132
(P)			2.000			1" Ice	7.473	6.472	0.193
APXVTM14-ALU-I20 w/	B	From Leg	4.000	0.000	148.000	No Ice	6.580	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.031	5.754	0.132

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(P)			2.000			1" Ice	7.473	6.472	0.193
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.000 0.000	0.000	148.000	No Ice 1/2" Ice	6.580 7.031	4.959 5.754	0.077 0.132
(P)			2.000			1" Ice	7.473	6.472	0.193
(2) TD-RRH8x20-25 (P)	A	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	4.045 4.298 4.557	1.535 1.714 1.901	0.070 0.097 0.128
TD-RRH8x20-25 (P)	B	From Leg	4.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	4.045 4.298 4.557	1.535 1.714 1.901	0.070 0.097 0.128
6' x 2" Mount Pipe (E)	A	From Leg	4.000 0.000 1.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe (E)	B	From Leg	4.000 0.000 1.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
6' x 2" Mount Pipe (E)	C	From Leg	4.000 0.000 1.000	0.000	148.000	No Ice 1/2" Ice 1" Ice	1.425 1.925 2.294	1.425 1.925 2.294	0.022 0.033 0.048
Platform Mount [LP 712-1] (E-12'/TIA)	C	None		0.000	148.000	No Ice 1/2" Ice 1" Ice	24.530 29.940 35.350	24.530 29.940 35.350	1.335 1.646 1.956
/>									
(2) LPA-80063/6CF w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	9.831 10.400 10.933	10.215 11.384 12.269	0.052 0.145 0.246
(2) LPA-80080/6CF w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	4.564 5.105 5.612	10.259 11.427 12.312	0.046 0.113 0.187
(2) LPA-80080/6CF w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	4.564 5.105 5.612	10.259 11.427 12.312	0.046 0.113 0.187
BXA-70063-6CF-2 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	7.806 8.357 8.872	5.801 6.953 7.819	0.042 0.103 0.171
BXA-70063-6CF-2 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	7.806 8.357 8.872	5.801 6.953 7.819	0.042 0.103 0.171
BXA-70063-6CF-2 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	7.806 8.357 8.872	5.801 6.953 7.819	0.042 0.103 0.171
BXA-171085-8BF-EDIN-2 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	3.179 3.555 3.930	3.353 3.971 4.595	0.029 0.061 0.099
BXA-171085-8BF-EDIN-2 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	3.179 3.555 3.930	3.353 3.971 4.595	0.029 0.061 0.099
BXA-171063-8BF-2 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	138.000	No Ice 1/2" Ice 1" Ice	3.179 3.555 3.930	3.353 3.971 4.595	0.029 0.061 0.099
Platform Mount [LP 712-1] (E-12'/TIA)	C	None		0.000	138.000	No Ice 1/2" Ice 1" Ice	24.530 29.940 35.350	24.530 29.940 35.350	1.335 1.646 1.956
/>									
HPA-65R-BUU-H8 w/ Mount Pipe (AT&T--R)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	13.213 13.899 14.587	9.582 11.052 12.496	0.100 0.196 0.303

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
HPA-65R-BUU-H8 w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	13.213 13.899 14.587	9.582 11.052 12.496	0.100 0.196 0.303
HPA-65R-BUU-H8 w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	13.213 13.899 14.587	9.582 11.052 12.496	0.100 0.196 0.303
(3) RRU-11 (R)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	1.639 1.802 1.972	1.262 1.410 1.566	0.044 0.060 0.078
(3) RRU-11 (R)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	1.639 1.802 1.972	1.262 1.410 1.566	0.044 0.060 0.078
(3) RRU-11 (R)	C	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	1.639 1.802 1.972	1.262 1.410 1.566	0.044 0.060 0.078
(2) DC6-48-60-18-8F (R)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	0.917 1.458 1.643	0.917 1.458 1.643	0.019 0.037 0.057
(4) HPA-65R-BUU-H8 w/ Mount Pipe (AT&T--SLA)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	13.213 13.899 14.587	9.582 11.052 12.496	0.100 0.196 0.303
(4) HPA-65R-BUU-H8 w/ Mount Pipe (SLA)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	13.213 13.899 14.587	9.582 11.052 12.496	0.100 0.196 0.303
(4) HPA-65R-BUU-H8 w/ Mount Pipe (SLA)	C	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	13.213 13.899 14.587	9.582 11.052 12.496	0.100 0.196 0.303
(3) RRU-11 (SLA)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	1.639 1.802 1.972	1.262 1.410 1.566	0.044 0.060 0.078
(3) RRU-11 (SLA)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	1.639 1.802 1.972	1.262 1.410 1.566	0.044 0.060 0.078
(3) RRU-11 (SLA)	C	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	1.639 1.802 1.972	1.262 1.410 1.566	0.044 0.060 0.078
RRUS E2 B29 (SLA)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	3.145 3.365 3.592	1.285 1.438 1.600	0.060 0.083 0.110
RRUS E2 B29 (SLA)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	3.145 3.365 3.592	1.285 1.438 1.600	0.060 0.083 0.110
RRUS E2 B29 (SLA)	C	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	3.145 3.365 3.592	1.285 1.438 1.600	0.060 0.083 0.110
DC6-48-60-18-8F (SLA)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	0.917 1.458 1.643	0.917 1.458 1.643	0.019 0.037 0.057
(2) DC6-48-60-18-8F (SLA)	B	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	0.917 1.458 1.643	0.917 1.458 1.643	0.019 0.037 0.057
DC6-48-60-18-8F (SLA)	C	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	0.917 1.458 1.643	0.917 1.458 1.643	0.019 0.037 0.057
RRUS-32 B30 (SLA)	A	From Leg	4.000 0.000 0.000	0.000	128.000	No Ice 1/2" Ice 1" Ice	3.314 3.558 3.809	2.424 2.638 2.860	0.077 0.105 0.136

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
RRUS-32 B30	B	From Leg	4.000	0.000	128.000	No Ice	3.314	2.424	0.077
(SLA)			0.000			1/2" Ice	3.558	2.638	0.105
			0.000			1" Ice	3.809	2.860	0.136
RRUS-32 B30	C	From Leg	4.000	0.000	128.000	No Ice	3.314	2.424	0.077
(SLA)			0.000			1/2" Ice	3.558	2.638	0.105
			0.000			1" Ice	3.809	2.860	0.136
(2) RRUS A2	A	From Leg	4.000	0.000	128.000	No Ice	2.066	0.498	0.022
(SLA)			0.000			1/2" Ice	2.245	0.607	0.035
			0.000			1" Ice	2.431	0.724	0.050
(2) RRUS A2	B	From Leg	4.000	0.000	128.000	No Ice	2.066	0.498	0.022
(SLA)			0.000			1/2" Ice	2.245	0.607	0.035
			0.000			1" Ice	2.431	0.724	0.050
(2) RRUS A2	C	From Leg	4.000	0.000	128.000	No Ice	2.066	0.498	0.022
(SLA)			0.000			1/2" Ice	2.245	0.607	0.035
			0.000			1" Ice	2.431	0.724	0.050
(2) RRUS 12-B2	A	From Leg	4.000	0.000	128.000	No Ice	3.143	1.282	0.058
(SLA)			0.000			1/2" Ice	3.363	1.434	0.081
			0.000			1" Ice	3.590	1.595	0.108
(2) RRUS 12-B2	B	From Leg	4.000	0.000	128.000	No Ice	3.143	1.282	0.058
(SLA)			0.000			1/2" Ice	3.363	1.434	0.081
			0.000			1" Ice	3.590	1.595	0.108
(2) RRUS 12-B2	C	From Leg	4.000	0.000	128.000	No Ice	3.143	1.282	0.058
(SLA)			0.000			1/2" Ice	3.363	1.434	0.081
			0.000			1" Ice	3.590	1.595	0.108
KRF 102 361/1	A	From Leg	4.000	0.000	128.000	No Ice	1.939	0.552	0.026
(SLA)			0.000			1/2" Ice	2.112	0.655	0.039
			0.000			1" Ice	2.294	0.766	0.055
KRF 102 361/1	B	From Leg	4.000	0.000	128.000	No Ice	1.939	0.552	0.026
(SLA)			0.000			1/2" Ice	2.112	0.655	0.039
			0.000			1" Ice	2.294	0.766	0.055
KRF 102 361/1	C	From Leg	4.000	0.000	128.000	No Ice	1.939	0.552	0.026
(SLA)			0.000			1/2" Ice	2.112	0.655	0.039
			0.000			1" Ice	2.294	0.766	0.055
Sector Mount [SM 406-3]	C	None		0.000	128.000	No Ice	19.830	19.830	0.923
(R)						1/2" Ice	29.410	29.410	1.326
						1" Ice	38.990	38.990	1.729
/>									
PD1109E	A	From Leg	3.000	0.000	79.000	No Ice	2.854	2.854	0.017
(E-CL/TIA)			0.000			1/2" Ice	3.924	3.924	0.038
			5.000			1" Ice	5.010	5.010	0.066
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	79.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
/>									
GPS_A	C	From Leg	3.000	0.000	45.000	No Ice	0.255	0.255	0.001
(E)			0.000			1/2" Ice	0.320	0.320	0.005
			0.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	45.000	No Ice	0.850	1.670	0.065
(E)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093
/>									
GPS_A	A	From Leg	3.000	0.000	13.000	No Ice	0.255	0.255	0.001
(E-CL/TIA)			0.000			1/2" Ice	0.320	0.320	0.005
			0.000			1" Ice	0.393	0.393	0.010
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	13.000	No Ice	0.850	1.670	0.065
(E-Mount Ht./TIA)			0.000			1/2" Ice	1.140	2.340	0.079
			0.000			1" Ice	1.430	3.010	0.093

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
/>								

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
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

Comb. No.	Description
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	148 - 116.5	Pole	Max Tension	26	0.000	0.000	-0.000
			Max. Compression	26	-34.086	-2.414	2.552
			Max. Mx	8	-12.006	-278.394	-0.489
			Max. My	2	-11.932	0.448	288.606
			Max. Vy	8	18.295	-278.394	-0.489
			Max. Vx	2	-18.798	0.448	288.606
			Max. Torque	12			0.689
L2	116.5 - 98.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-39.445	-2.780	3.486
			Max. Mx	8	-15.349	-691.120	-1.234
			Max. My	2	-15.292	1.275	712.351
			Max. Vy	8	19.618	-691.120	-1.234
			Max. Vx	2	-20.120	1.275	712.351
			Max. Torque	12			0.688
L3	98.5 - 80.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.246	-3.013	4.110
			Max. Mx	8	-18.395	-966.905	-1.688
			Max. My	2	-18.347	1.794	995.090
			Max. Vy	8	20.505	-966.905	-1.688
			Max. Vx	2	-21.007	1.794	995.090
			Max. Torque	12			0.687
L4	80.25 - 70.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-51.161	-3.252	5.661
			Max. Mx	8	-22.964	-1268.230	-1.861
			Max. My	2	-22.924	2.332	1303.718
			Max. Vy	8	21.635	-1268.230	-1.861
			Max. Vx	2	-22.109	2.332	1303.718
			Max. Torque	10			1.071
L5	70.5 - 39.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-62.994	-3.634	6.834
			Max. Mx	8	-31.207	-1839.767	-2.679
			Max. My	2	-31.182	3.286	1887.418
			Max. Vy	8	23.172	-1839.767	-2.679
			Max. Vx	2	-23.641	3.286	1887.418
			Max. Torque	10			1.071
L6	39.75 - 31.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-71.952	-3.347	7.172
			Max. Mx	8	-37.752	-2152.616	-3.360
			Max. My	2	-37.733	4.134	2206.807
			Max. Vy	8	23.987	-2152.616	-3.360
			Max. Vx	2	-24.467	4.134	2206.807
			Max. Torque	10			0.899
L7	31.75 - 17.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-79.260	-3.458	7.783
			Max. Mx	8	-43.139	-2492.747	-3.936
			Max. My	2	-43.129	4.794	2553.691
			Max. Vy	8	24.614	-2492.747	-3.936
			Max. Vx	2	-25.088	4.794	2553.691

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	10			0.899
L8	17.75 - 14.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-81.416	-3.487	8.012
			Max. Mx	8	-44.747	-2579.158	-4.077
			Max. My	2	-44.739	4.958	2641.777
			Max. Vy	8	24.780	-2579.158	-4.077
			Max. Vx	2	-25.252	4.958	2641.777
			Max. Torque	10			0.899
L9	14.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-89.431	-3.917	9.202
			Max. Mx	8	-50.858	-2937.112	-4.377
			Max. My	2	-50.857	5.616	3006.482
			Max. Vy	8	25.430	-2937.112	-4.377
			Max. Vx	2	-25.873	5.616	3006.482
			Max. Torque	10			1.054

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	89.431	-0.000	0.000
	Max. H_x	20	50.865	25.416	0.050
	Max. H_z	2	50.865	0.050	25.858
	Max. M_x	2	3006.482	0.050	25.858
	Max. M_z	8	2937.112	-25.416	-0.050
	Max. Torsion	10	1.054	-22.036	-12.973
	Min. Vert	19	38.149	21.986	-12.886
	Min. H_x	8	50.865	-25.416	-0.050
	Min. H_z	14	50.865	-0.050	-25.858
	Min. M_x	14	-3001.945	-0.050	-25.858
	Min. M_z	20	-2935.050	25.416	0.050
	Min. Torsion	22	-1.044	22.036	12.973

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	42.387	0.000	0.000	-1.821	-0.816	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	50.865	-0.050	-25.858	-3006.482	5.616	0.478
0.9 Dead+1.6 Wind 0 deg - No Ice	38.149	-0.050	-25.858	-2977.813	5.818	0.474
1.2 Dead+1.6 Wind 30 deg - No Ice	50.865	12.664	-22.369	-2600.723	-1463.267	-0.049
0.9 Dead+1.6 Wind 30 deg - No Ice	38.149	12.664	-22.369	-2575.843	-1449.366	-0.046
1.2 Dead+1.6 Wind 60 deg - No Ice	50.865	21.986	-12.886	-1498.690	-2540.413	-0.568
0.9 Dead+1.6 Wind 60 deg - No Ice	38.149	21.986	-12.886	-1484.115	-2516.463	-0.558
1.2 Dead+1.6 Wind 90 deg - No	50.865	25.416	0.050	4.377	-2937.112	-0.937

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
Ice 0.9 Dead+1.6 Wind 90 deg - No Ice	38.149	25.416	0.050	4.896	-2909.464	-0.923
1.2 Dead+1.6 Wind 120 deg - No Ice	50.865	22.036	12.973	1505.650	-2547.039	-1.054
0.9 Dead+1.6 Wind 120 deg - No Ice	38.149	22.036	12.973	1492.131	-2523.022	-1.040
1.2 Dead+1.6 Wind 150 deg - No Ice	50.865	12.752	22.419	2602.810	-1474.769	-0.885
0.9 Dead+1.6 Wind 150 deg - No Ice	38.149	12.752	22.419	2579.036	-1460.751	-0.874
1.2 Dead+1.6 Wind 180 deg - No Ice	50.865	0.050	25.858	3001.945	-7.678	-0.476
0.9 Dead+1.6 Wind 180 deg - No Ice	38.149	0.050	25.858	2974.448	-7.340	-0.471
1.2 Dead+1.6 Wind 210 deg - No Ice	50.865	-12.664	22.369	2596.185	1461.207	0.060
0.9 Dead+1.6 Wind 210 deg - No Ice	38.149	-12.664	22.369	2572.478	1447.846	0.057
1.2 Dead+1.6 Wind 240 deg - No Ice	50.865	-21.986	12.886	1494.150	2538.352	0.576
0.9 Dead+1.6 Wind 240 deg - No Ice	38.149	-21.986	12.886	1480.748	2514.942	0.566
1.2 Dead+1.6 Wind 270 deg - No Ice	50.865	-25.416	-0.050	-8.918	2935.050	0.934
0.9 Dead+1.6 Wind 270 deg - No Ice	38.149	-25.416	-0.050	-8.263	2907.942	0.920
1.2 Dead+1.6 Wind 300 deg - No Ice	50.865	-22.036	-12.973	-1510.190	2544.976	1.044
0.9 Dead+1.6 Wind 300 deg - No Ice	38.149	-22.036	-12.973	-1495.498	2521.499	1.029
1.2 Dead+1.6 Wind 330 deg - No Ice	50.865	-12.752	-22.419	-2607.348	1472.706	0.877
0.9 Dead+1.6 Wind 330 deg - No Ice	38.149	-12.752	-22.419	-2582.401	1459.228	0.866
1.2 Dead+1.0 Ice+1.0 Temp	89.431	0.000	-0.000	-9.202	-3.917	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	89.431	-0.008	-5.002	-595.059	-3.024	0.098
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	89.431	2.470	-4.328	-516.108	-291.819	-0.022
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	89.431	4.287	-2.494	-301.378	-503.491	-0.137
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	89.431	4.954	0.008	-8.405	-581.322	-0.215
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	89.431	4.295	2.508	284.308	-504.459	-0.235
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	89.431	2.484	4.336	498.330	-293.495	-0.193
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	89.431	0.008	5.002	576.314	-4.960	-0.099
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	89.431	-2.470	4.328	497.363	283.835	0.022
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	89.431	-4.286	2.494	282.632	495.507	0.136
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	89.431	-4.954	-0.008	-10.341	573.339	0.214
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	89.431	-4.295	-2.508	-303.054	496.474	0.234
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	89.431	-2.484	-4.336	-517.076	285.511	0.192
Dead+Wind 0 deg - Service	42.387	-0.012	-6.019	-697.419	0.684	0.111

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
Dead+Wind 30 deg - Service	42.387	2.948	-5.207	-603.466	-339.391	-0.011
Dead+Wind 60 deg - Service	42.387	5.117	-2.999	-348.319	-588.756	-0.132
Dead+Wind 90 deg - Service	42.387	5.916	0.012	-0.343	-680.593	-0.217
Dead+Wind 120 deg - Service	42.387	5.129	3.020	347.220	-590.294	-0.244
Dead+Wind 150 deg - Service	42.387	2.968	5.218	601.241	-342.055	-0.205
Dead+Wind 180 deg - Service	42.387	0.012	6.019	693.656	-2.393	-0.111
Dead+Wind 210 deg - Service	42.387	-2.948	5.207	599.703	337.682	0.012
Dead+Wind 240 deg - Service	42.387	-5.117	2.999	344.556	587.046	0.132
Dead+Wind 270 deg - Service	42.387	-5.916	-0.012	-3.420	678.883	0.216
Dead+Wind 300 deg - Service	42.387	-5.129	-3.020	-350.983	588.584	0.243
Dead+Wind 330 deg - Service	42.387	-2.968	-5.218	-605.004	340.346	0.205

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	0.000	-42.387	0.000	0.000	42.387	0.000	0.000%
2	-0.050	-50.865	-25.858	0.050	50.865	25.858	0.000%
3	-0.050	-38.149	-25.858	0.050	38.149	25.858	0.000%
4	12.664	-50.865	-22.369	-12.664	50.865	22.369	0.000%
5	12.664	-38.149	-22.369	-12.664	38.149	22.369	0.000%
6	21.986	-50.865	-12.886	-21.986	50.865	12.886	0.000%
7	21.986	-38.149	-12.886	-21.986	38.149	12.886	0.000%
8	25.416	-50.865	0.050	-25.416	50.865	-0.050	0.000%
9	25.416	-38.149	0.050	-25.416	38.149	-0.050	0.000%
10	22.036	-50.865	12.973	-22.036	50.865	-12.973	0.000%
11	22.036	-38.149	12.973	-22.036	38.149	-12.973	0.000%
12	12.752	-50.865	22.419	-12.752	50.865	-22.419	0.000%
13	12.752	-38.149	22.419	-12.752	38.149	-22.419	0.000%
14	0.050	-50.865	25.858	-0.050	50.865	-25.858	0.000%
15	0.050	-38.149	25.858	-0.050	38.149	-25.858	0.000%
16	-12.664	-50.865	22.369	12.664	50.865	-22.369	0.000%
17	-12.664	-38.149	22.369	12.664	38.149	-22.369	0.000%
18	-21.986	-50.865	12.886	21.986	50.865	-12.886	0.000%
19	-21.986	-38.149	12.886	21.986	38.149	-12.886	0.000%
20	-25.416	-50.865	-0.050	25.416	50.865	0.050	0.000%
21	-25.416	-38.149	-0.050	25.416	38.149	0.050	0.000%
22	-22.036	-50.865	-12.973	22.036	50.865	12.973	0.000%
23	-22.036	-38.149	-12.973	22.036	38.149	12.973	0.000%
24	-12.752	-50.865	-22.419	12.752	50.865	22.419	0.000%
25	-12.752	-38.149	-22.419	12.752	38.149	22.419	0.000%
26	0.000	-89.431	0.000	-0.000	89.431	0.000	0.000%
27	-0.008	-89.431	-5.002	0.008	89.431	5.002	0.000%
28	2.470	-89.431	-4.327	-2.470	89.431	4.328	0.000%
29	4.286	-89.431	-2.494	-4.287	89.431	2.494	0.000%
30	4.954	-89.431	0.008	-4.954	89.431	-0.008	0.000%
31	4.294	-89.431	2.508	-4.295	89.431	-2.508	0.000%
32	2.484	-89.431	4.335	-2.484	89.431	-4.336	0.000%
33	0.008	-89.431	5.002	-0.008	89.431	-5.002	0.000%
34	-2.470	-89.431	4.327	2.470	89.431	-4.328	0.000%
35	-4.286	-89.431	2.494	4.286	89.431	-2.494	0.000%
36	-4.954	-89.431	-0.008	4.954	89.431	0.008	0.000%
37	-4.294	-89.431	-2.508	4.295	89.431	2.508	0.000%
38	-2.484	-89.431	-4.335	2.484	89.431	4.336	0.000%
39	-0.012	-42.387	-6.019	0.012	42.387	6.019	0.000%
40	2.948	-42.387	-5.207	-2.948	42.387	5.207	0.000%
41	5.117	-42.387	-2.999	-5.117	42.387	2.999	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
42	5.916	-42.387	0.012	-5.916	42.387	-0.012	0.000%
43	5.129	-42.387	3.020	-5.129	42.387	-3.020	0.000%
44	2.968	-42.387	5.218	-2.968	42.387	-5.218	0.000%
45	0.012	-42.387	6.019	-0.012	42.387	-6.019	0.000%
46	-2.948	-42.387	5.207	2.948	42.387	-5.207	0.000%
47	-5.117	-42.387	2.999	5.117	42.387	-2.999	0.000%
48	-5.916	-42.387	-0.012	5.916	42.387	0.012	0.000%
49	-5.129	-42.387	-3.020	5.129	42.387	3.020	0.000%
50	-2.968	-42.387	-5.218	2.968	42.387	5.218	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	0.00059779
3	Yes	4	0.00000001	0.00035179
4	Yes	6	0.00000001	0.00004253
5	Yes	5	0.00000001	0.00046560
6	Yes	6	0.00000001	0.00004219
7	Yes	5	0.00000001	0.00046227
8	Yes	4	0.00000001	0.00061075
9	Yes	4	0.00000001	0.00035702
10	Yes	5	0.00000001	0.00099219
11	Yes	5	0.00000001	0.00045556
12	Yes	6	0.00000001	0.00004345
13	Yes	5	0.00000001	0.00047594
14	Yes	4	0.00000001	0.00082953
15	Yes	4	0.00000001	0.00051053
16	Yes	5	0.00000001	0.00099783
17	Yes	5	0.00000001	0.00045842
18	Yes	5	0.00000001	0.00098988
19	Yes	5	0.00000001	0.00045590
20	Yes	4	0.00000001	0.00083053
21	Yes	4	0.00000001	0.00050683
22	Yes	6	0.00000001	0.00004312
23	Yes	5	0.00000001	0.00047266
24	Yes	6	0.00000001	0.00004184
25	Yes	5	0.00000001	0.00045816
26	Yes	4	0.00000001	0.00013926
27	Yes	5	0.00000001	0.00060905
28	Yes	5	0.00000001	0.00065557
29	Yes	5	0.00000001	0.00064978
30	Yes	5	0.00000001	0.00059404
31	Yes	5	0.00000001	0.00063251
32	Yes	5	0.00000001	0.00063380
33	Yes	5	0.00000001	0.00058391
34	Yes	5	0.00000001	0.00061939
35	Yes	5	0.00000001	0.00061576
36	Yes	5	0.00000001	0.00057903
37	Yes	5	0.00000001	0.00063805
38	Yes	5	0.00000001	0.00064612
39	Yes	4	0.00000001	0.00008353
40	Yes	4	0.00000001	0.00039615
41	Yes	4	0.00000001	0.00039111
42	Yes	4	0.00000001	0.00008163

43	Yes	4	0.00000001	0.00036923
44	Yes	4	0.00000001	0.00041297
45	Yes	4	0.00000001	0.00008453
46	Yes	4	0.00000001	0.00037554
47	Yes	4	0.00000001	0.00037212
48	Yes	4	0.00000001	0.00008271
49	Yes	4	0.00000001	0.00040831
50	Yes	4	0.00000001	0.00037299

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 116.5	17.913	39	1.112	0.002
L2	120.25 - 98.5	11.663	39	0.999	0.001
L3	98.5 - 80.25	7.583	39	0.757	0.001
L4	84.75 - 70.5	5.577	39	0.633	0.000
L5	70.5 - 39.75	3.831	39	0.522	0.000
L6	45 - 31.75	1.579	39	0.320	0.000
L7	31.75 - 17.75	0.788	39	0.239	0.000
L8	17.75 - 14.25	0.247	39	0.131	0.000
L9	14.25 - 0	0.160	39	0.108	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.500	Top Hat	39	17.913	1.112	0.002	39689
149.000	800MHZ RRH	39	17.913	1.112	0.002	39689
148.000	APXVSPP18-C-A20 w/ Mount Pipe	39	17.913	1.112	0.002	39689
138.000	(2) LPA-80063/6CF w/ Mount Pipe	39	15.593	1.091	0.001	19844
128.000	HPA-65R-BUU-H8 w/ Mount Pipe	39	13.334	1.053	0.001	9922
79.000	PD1109E	39	4.833	0.589	0.000	7625
45.000	GPS_A	39	1.579	0.320	0.000	8975
13.000	GPS_A	39	0.134	0.099	0.000	6451

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	148 - 116.5	77.201	2	4.789	0.007
L2	120.25 - 98.5	50.290	2	4.309	0.004
L3	98.5 - 80.25	32.705	2	3.267	0.002
L4	84.75 - 70.5	24.055	2	2.733	0.002
L5	70.5 - 39.75	16.523	2	2.253	0.001
L6	45 - 31.75	6.811	2	1.381	0.001
L7	31.75 - 17.75	3.396	2	1.029	0.000
L8	17.75 - 14.25	1.065	2	0.563	0.000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L9	14.25 - 0	0.688	2	0.464	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.500	Top Hat	2	77.201	4.789	0.008	9383
149.000	800MHZ RRH	2	77.201	4.789	0.008	9383
148.000	APXVSPP18-C-A20 w/ Mount Pipe	2	77.201	4.789	0.008	9383
138.000	(2) LPA-80063/6CF w/ Mount Pipe	2	67.215	4.703	0.006	4690
128.000	HPA-65R-BUU-H8 w/ Mount Pipe	2	57.487	4.539	0.005	2343
79.000	PD1109E	2	20.846	2.540	0.002	1774
45.000	GPS_A	2	6.811	1.381	0.001	2082
13.000	GPS_A	2	0.579	0.427	0.000	1496

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	148 - 116.5 (1)	TP29.48x24x0.219	31.500	0.000	0.0	19.864	-11.932	1273.620	0.009
L2	116.5 - 98.5 (2)	TP32.175x28.39x0.25	21.750	0.000	0.0	25.332	-15.292	1751.620	0.009
L3	98.5 - 80.25 (3)	TP35.35x32.175x0.434	18.250	0.000	0.0	47.022	-18.347	2234.540	0.008
L4	80.25 - 70.5 (4)	TP36.547x34.067x0.487	14.250	0.000	0.0	55.723	-22.924	2652.040	0.009
L5	70.5 - 39.75 (5)	TP41.9x36.547x0.591	30.750	0.000	0.0	75.811	-31.182	3872.250	0.008
L6	39.75 - 31.75 (6)	TP42.666x40.361x0.643	13.250	0.000	0.0	85.803	-37.733	4392.170	0.009
L7	31.75 - 17.75 (7)	TP45.102x42.666x0.626	14.000	0.000	0.0	88.424	-43.129	4536.430	0.010
L8	17.75 - 14.25 (8)	TP45.711x45.102x0.728	3.500	0.000	0.0	103.899	-44.739	4899.110	0.009
L9	14.25 - 0 (9)	TP48.19x45.711x0.619	14.250	0.000	0.0	93.434	-50.858	4666.760	0.011

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	148 - 116.5 (1)	TP29.48x24x0.219	288.607	749.418	0.385	0.000	749.418	0.000
L2	116.5 - 98.5 (2)	TP32.175x28.39x0.25	712.352	1149.925	0.619	0.000	1149.925	0.000
L3	98.5 - 80.25 (3)	TP35.35x32.175x0.434	995.092	1560.875	0.638	0.000	1560.875	0.000
L4	80.25 - 70.5 (4)	TP36.547x34.067x0.487	1303.717	1955.608	0.667	0.000	1955.608	0.000
L5	70.5 - 39.75 (5)	TP41.9x36.547x0.591	1887.417	3195.000	0.591	0.000	3195.000	0.000

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 $\frac{M_{uy}}{\phi M_{ny}}$
L6	39.75 - 31.75 (6)	TP42.666x40.361x0.643	2206.808	3767.567	0.586	0.000	3767.567	0.000
L7	31.75 - 17.75 (7)	TP45.102x42.666x0.626	2553.692	4123.383	0.619	0.000	4123.383	0.000
L8	17.75 - 14.25 (8)	TP45.711x45.102x0.728	2641.783	4494.583	0.588	0.000	4494.583	0.000
L9	14.25 - 0 (9)	TP48.19x45.711x0.619	3006.483	4541.925	0.662	0.000	4541.925	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	148 - 116.5 (1)	TP29.48x24x0.219	18.799	636.808	0.030	0.652	1500.667	0.000
L2	116.5 - 98.5 (2)	TP32.175x28.39x0.25	20.120	875.812	0.023	0.651	2302.667	0.000
L3	98.5 - 80.25 (3)	TP35.35x32.175x0.434	21.007	1117.270	0.019	0.650	3125.558	0.000
L4	80.25 - 70.5 (4)	TP36.547x34.067x0.487	22.109	1326.020	0.017	0.650	3916.000	0.000
L5	70.5 - 39.75 (5)	TP41.9x36.547x0.591	23.642	1936.120	0.012	0.649	6397.808	0.000
L6	39.75 - 31.75 (6)	TP42.666x40.361x0.643	24.467	2196.090	0.011	0.479	7544.350	0.000
L7	31.75 - 17.75 (7)	TP45.102x42.666x0.626	25.088	2268.210	0.011	0.478	8256.858	0.000
L8	17.75 - 14.25 (8)	TP45.711x45.102x0.728	25.252	2449.550	0.010	0.478	9000.167	0.000
L9	14.25 - 0 (9)	TP48.19x45.711x0.619	25.873	2333.380	0.011	0.478	9094.917	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	148 - 116.5 (1)	0.009	0.385	0.000	0.030	0.000	0.395 ✔	1.000	4.8.2 ✔
L2	116.5 - 98.5 (2)	0.009	0.619	0.000	0.023	0.000	0.629 ✔	1.000	4.8.2 ✔
L3	98.5 - 80.25 (3)	0.008	0.638	0.000	0.019	0.000	0.646 ✔	1.000	4.8.2 ✔
L4	80.25 - 70.5 (4)	0.009	0.667	0.000	0.017	0.000	0.676 ✔	1.000	4.8.2 ✔
L5	70.5 - 39.75 (5)	0.008	0.591	0.000	0.012	0.000	0.599 ✔	1.000	4.8.2 ✔
L6	39.75 - 31.75 (6)	0.009	0.586	0.000	0.011	0.000	0.594 ✔	1.000	4.8.2 ✔
L7	31.75 - 17.75 (7)	0.010	0.619	0.000	0.011	0.000	0.629 ✔	1.000	4.8.2 ✔
L8	17.75 - 14.25 (8)	0.009	0.588	0.000	0.010	0.000	0.597 ✔	1.000	4.8.2 ✔
L9	14.25 - 0 (9)	0.011	0.662	0.000	0.011	0.000	0.673	1.000	4.8.2 ✔

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
							✔		

Section Capacity Table

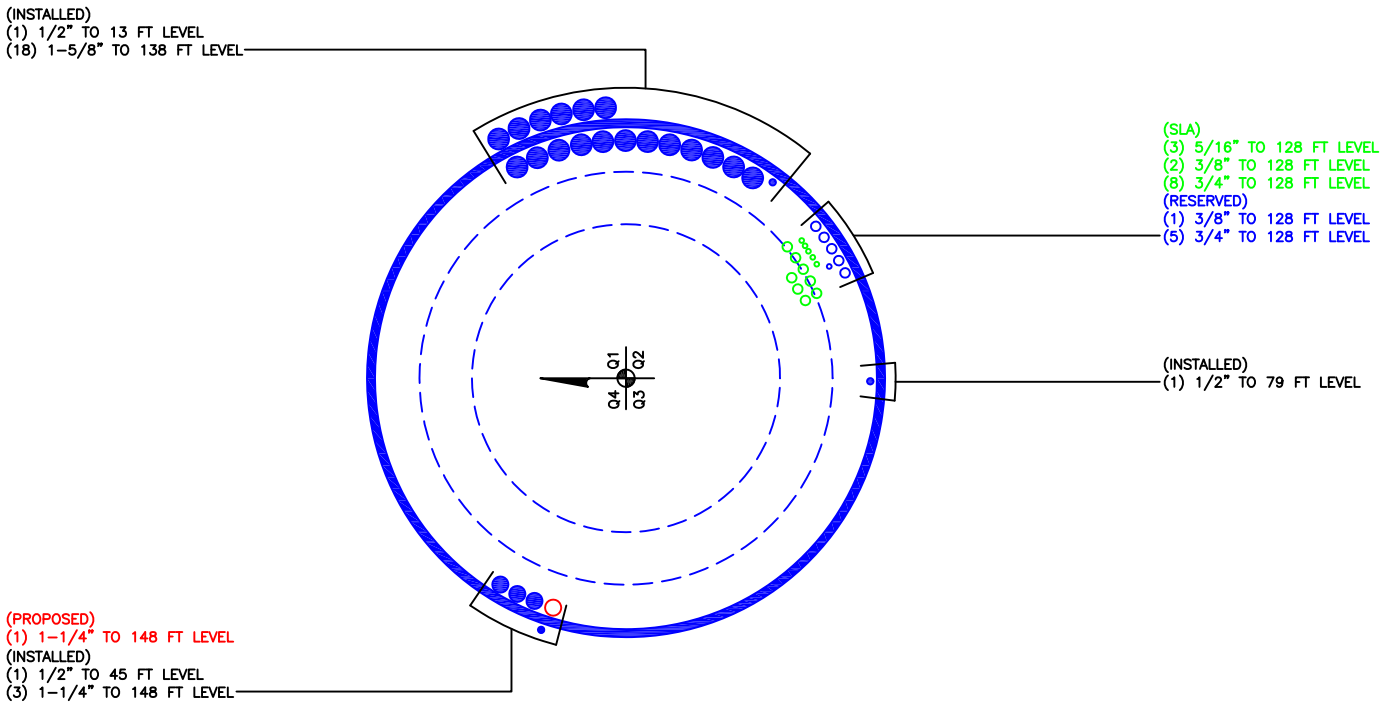
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	148 - 116.5	Pole	TP29.48x24x0.219	1	-11.932	1273.620	**	**
L2	116.5 - 98.5	Pole	TP32.175x28.39x0.25	2	-15.292	1751.620	**	**
L3	98.5 - 80.25	Pole	TP35.35x32.175x0.434	3	-18.347	2234.540	**	**
L4	80.25 - 70.5	Pole	TP36.547x34.067x0.487	4	-22.924	2652.040	**	**
L5	70.5 - 39.75	Pole	TP41.9x36.547x0.591	5	-31.182	3872.250	**	**
L6	39.75 - 31.75	Pole	TP42.666x40.361x0.643	6	-37.733	4392.170	**	**
L7	31.75 - 17.75	Pole	TP45.102x42.666x0.626	7	-43.129	4536.430	**	**
L8	17.75 - 14.25	Pole	TP45.711x45.102x0.728	8	-44.739	4899.110	**	**
L9	14.25 - 0	Pole	TP48.19x45.711x0.619	9	-50.858	4666.760	**	**
						Summary		
						Pole (L4)	**	**
						RATING =	**	**

**Check Additional Calculations

Program Version 7.0.5.1

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876373

APPENDIX C

ADDITIONAL CALCULATIONS

Reinforcement 1

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	14.25	2	CI-XFP-08512	F	0	T&C
14.25	31.75	3	CI-XFP-08512	F	0	T&C
31.75	70.5	3	CI-XFP-08512	F	0	T&C
70.5	98.5	3	CI-XFP-06010	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

1

Reinforcement 2

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0	17.75	2	CI-XFP-06512	F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

1

Reinforcement 3

Bottom	Top	QTY	Type	Position	Gap	Ten/Comp
0				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C
				F	0	T&C

Bottom Elevation	Top Elevation	Original Thickness	Original Yield Stress	Original Ultimate Stress	Reinforced Shaft Capacity	Reinf. 1 QTY	Reinf. 1 Type	Rein. 1 Capacity	Reinf. 2 QTY	Reinf. 2 Type	Rein. 2 Capacity	Reinf. 3 QTY	Reinf. 3 Type	Rein. 3 Capacity	Control Stress Ratio	Top Height	Section Length	Lap Splice	# of Sides	Top Diameter	Bottom Diameter	Equivalent Shaft Thickness	Equivalent Shaft Fy	Equivalent Weight Mult.		Bottom Elevation Failure	Top Elevation Failure	Section Failure %
116.5000	148.0000	0.2188	60	75	39.4%										**39.4%**	148.0000	31.5000	3.7500	18	24.0000	29.4800	0.2188	60.0	1.00	1			
98.5000	120.2500	0.2500	65	80	62.8%										**62.8%**	120.2500	21.7500	0.0000	18	28.3901	32.1746	0.2500	65.0	1.00	2			
80.2500	98.5000	0.2500	65	80	52.1%	3	CI-XFP-06010	64.6%							**64.6%**	98.5000	18.2500	4.5000	18	32.1746	35.3500	0.4340	40.4	0.96	3			
70.5000	84.7500	0.3125	65	80	54.5%	3	CI-XFP-06010	67.6%							**67.6%**	84.7500	14.2500	0.0000	18	34.0670	36.5475	0.4869	40.5	0.97	4			
39.7500	70.5000	0.3125	65	80	52.1%	3	CI-XFP-08512	59.9%							**59.9%**	70.5000	30.7500	5.2500	18	36.5475	41.9000	0.5913	43.4	0.95	5			
31.7500	45.0000	0.3750	65	80	51.7%	3	CI-XFP-08512	59.4%							**59.4%**	45.0000	13.2500	0.0000	18	40.3612	42.6663	0.6433	43.4	0.96	6			
17.7500	31.7500	0.3750	65	80	54.8%	3	CI-XFP-08512	62.9%							**62.9%**	31.7500	14.0000	0.0000	18	42.6663	45.1020	0.6264	43.5	0.96	7			
14.2500	17.7500	0.3750	65	80	52.3%	3	CI-XFP-08512	59.7%	2	CI-XFP-06512	49.3%				**59.7%**	17.7500	3.5000	0.0000	18	45.1020	45.7109	0.7277	45.0	0.98	8			
0.0000	14.2500	0.3750	65	80	58.5%	2	CI-XFP-08512	51.9%	2	CI-XFP-06512	67.3%				**67.3%**	14.2500	14.2500	0.0000	18	45.7109	48.1900	0.6188	42.3	1.01	9			
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Section	Loads					Pole												Unreinforced Pole - Sec. G											Reinforced Pole					Rev. G					Reinforcement 1									Reinforcement 2									Composite							
Section	Elevation (ft)	Moment (ft-kip)	Compress (ion (kip)	Shear (kip)	Torsion (kip-ft)	Number of Sides	OD (in)	Thickness (in)	Yield Strength (ksi)	Flat Width (in)	Area (in²)	Moment of Inertia (in⁴)	Percent of Composite Moment of Inertia	Angle Offset to Axis (Deg	Distance to Extreme Fiber (in)	Section Modulus (in³)	Torsion Constant (in⁴)	Effective Yield Stress (ksi)	Nominal Bending Moment Strength (ft-kip)	Strength Resistance Factor	Design Bending Moment Strength (ft-kip)	Nominal Compressive Strength (kip)	Strength Resistance Factor	Design Compressive Strength (kip)	Nominal Shear Strength (kip)	Strength Resistance Factor	Design Shear Strength (kip)	Nominal Torsion Shear Strength (kip-ft)	Strength Resistance Factor	Design Torsion Shear Strength (kip-ft)	Stress Ratio	Moment in Pole when Reinforcement	Bending Stress (ksi)	Axial Stress (ksi)	Shear Stress (ksi)	Torsion Shear Stress (ksi)	Allowable Bending Stress (ksi)	Allowable Compressive Stress (ksi)	Allowable Shear Stress (ksi)	Allowable Torsion Shear Stress (ksi)	Reinforced Pole Stress Ratio	Rein1	Rein1Model	Position (F-Flat, C-Corner)	Gap Between Pole and Back of Base (in)	Tension only or Tension & Compr.	Total Moment of Inertia (in⁴)	Axial Force (kips)	Stress Ratio	Rein2	Rein2Model	Position (F-Flat, C-Corner)	Gap Between Pole and Back of Base (in)	Tension only or Tension & Compr.	Total Moment of Inertia (in⁴)	Axial Force (kips)	Stress Ratio	Centroid Offset (in)	Area (in²)	Moment of Inertia (in⁴)	Controlling Stress Ratio	Thickness (in)	Weight (lb/linFoot)	Derated Yield Stress (ksi)	% Error in Derated Yield Stress
Section	Elevation	Moment	Compression	Shear	Torsion	PoleSides	PoleOD	PoleT	PoleFy	PoleW	PoleA	PoleI	PolePctMom	PoleOffset	PoleC	PoleS	PoleJ	PoleSeFy	PoleMn	PolePhiMn	PolePn	PolePhiPn	PolePnlm	PolePhiPnlm	PoleVn	PolePhiVn	PoleTn	PolePhiTn	PoleMnPhiTn	PoleSRC	ReinMoment	ReinBending	ReinAxial	ReinShear	ReinTorsion	ReinAllowBend	ReinAllowComp	ReinAllowShear	ReinAllowTorsion	ReinSRC	Rein1	Rein1Model	Rein1Pos	Rein1Gap	Rein1TC	Rein1ITotal	Rein1A	Rein1SR	Rein2	Rein2Model	Rein2Pos	Rein2Gap	Rein2TC	Rein2ITotal	Rein2A	Rein2SR	CentroidOffset	CompositeA	CompositeI	CompositeSR	Thickness	Weight	DeratedYield	PctErrorDerate
1	108	0.0	0.0	0.0	0.0	18	14.0000	0.2188	65	3.85	16.5	1178	100%	TRUE	72.17	97	2186	75.8	607.3	0.9	546.6	1241.6	0.9	1117.4	620.8	0.9	558.7	14688.6	0.9	13220.1	0.000	0.0	0.0	0.00	0.00	0.00	67.7	67.7	67.7	67.7	0.000																					0.000	16.5	1178	0.000	0.2188	1.00	69.0	0.0%
2	120.25	488.6	11.9	18.8	0.7	18	13.6776	0.2188	65	4.70	19.8	2052	100%	TRUE	14.62	140	4067	71.2	832.7	0.9	749.5	1411.1	0.9	1271.9	764.3	0.9	638.2	19666.8	0.9	17695.1	0.395	268.6	24.7	0.00	0.00	0.00	64.1	64.1	64.1	64.1	0.394																					0.000	19.8	2052	0.394	0.2188	1.00	69.0	0.2%
3	116.5	493.6	12.7	19.1	0.7	18	13.6800	0.4688	65	4.77	43.1	4581	100%	TRUE	14.93	307	9051	76.2	1948.1	0.9	1753.3	3264.1	0.9	2937.7	1617.5	0.9	1477.8	46396.7	0.9	41757.1	0.210	454.4	14.1	0.28	0.00	0.00	68.6	68.6	68.6	68.6	0.209																					0.000	43.1	4581	0.209	0.4688	1.00	69.0	0.2%
4	98.5	712.4	15.3	20.1	0.7	18	13.1791	0.5000	65	5.23	25.3	3258	100%	TRUE	16.32	400	6458	76.8	1277.8	0.9	1150.0	3363.6	0.9	3027.2	1666.3	0.9	874.6	30392.1	0.9	27353.1	0.429	712.4	42.8	0.60	0.00	0.00	69.1	69.1	69.1	69.1	0.428																					0.000	25.3	3258	0.428	0.5000	1.00	69.0	0.1%
5	84.75	895.1	18.3	21.0	0.7	18	12.5679	0.5000	65	5.65	27.2	4047	98%	0	17.28	234	8021	65.0	1268.4	0.9	1141.6	3363.6	0.9	3027.2	1666.3	0.9	791.7	30167.1	0.9	27150.4	0.884	895.1	29.8	0.67	0.00	0.00	58.5	58.5	58.5	58.5	0.521	3	CCI-WP-040100	F	0	T&C	2874	184.1	0.646															0.000	45.2	6921	0.646	0.4449	0.96	66.4	3.9%
6	60.25	1060.4	20.3	21.4	0.7	18	15.1500	0.5625	65	5.24	42.0	9478	76%	0	17.68	556	18810	65.0	2934.7	0.9	2641.3	4030.3	0.9	3627.3	2015.5	0.9	1813.9	69717.5	0.9	62720.1	0.423	818.2	18.5	0.33	0.00	0.00	58.5	58.5	58.5	58.5	0.332	3	CCI-WP-060100	F	0	T&C	3001	114.4	0.401															0.000	60.0	12470	0.401	0.7514	0.97	66.4	2.9%
7	70.5	1303.7	22.9	22.1	0.8	18	16.5475	0.7327	65	5.85	55.5	15455	65%	0	18.77	730	30805	65.0	3756.1	0.9	3380.4	4789.3	0.9	4310.3	2394.7	0.9	2156.2	114081.5	0.9	102673.3	0.432	818.2	31.2	0.63	0.00	0.00	58.5	58.5	58.5	58.5	0.345	3	CCI-WP-060100	F	0	T&C	3300	150.5	0.475															0.000	53.9	9155	0.475	0.4803	0.97	66.4	2.9%
8	45	1687.4	31.2	21.6	0.6	18	20.0862	0.3125	65	6.68	49.3	8423	54%	0	20.49	411	16695	65.0	2236.3	0.9	2012.7	2620.4	0.9	2358.3	1310.2	0.9	1179.2	52953.6	0.9	47657.7	0.956	1017.2	29.7	0.77	0.00	0.00	58.5	58.5	58.5	58.5	0.721	3	CCI-WP-080125	F	0	T&C	7306	325.3	0.999															0.000	72.2	15629	0.999	0.5913	0.95	43.4	2.0%
9	89.75	2012.7	34.7	24.1	0.5	18	21.0000	0.6875	65	6.18	89.8	19261	72%	0	20.95	919	38236	65.0	4686.0	0.9	4217.4	5830.4	0.9	5247.4	2918.2	0.9	2626.4	118650.9	0.9	106785.8	0.456	1487.7	16.9	0.39	0.00	0.00	58.5	58.5	58.5	58.5	0.330	3	CCI-WP-080135	F	0	T&C	7537	350.8	0.381															0.000	111.7	26779	0.381	0.9742	0.96	43.4	3.0%
10	91.75	2256.8	37.7	24.5	0.5	18	42.6663	0.3750	65	6.86	93.3	113611	98%	0	73.23	503	22522	65.0	2884.6	0.9	2596.1	2260.1	0.9	2942.2	1634.6	0.9	1471.1	68823.2	0.9	61760.9	0.863	1309.7	29.5	0.75	0.00	0.00	58.5	58.5	58.5	58.5	0.617	3	CCI-WP-080125	F	0	T&C	7782	323.8	0.594															0.000	82.2	19143	0.594	0.6423	0.95	43.4	2.1%
11	12.75	2553.7	43.1	25.1	0.5	18	41.1000	0.3750	65	7.29	93.2	134465	61%	0	72.55	996	36691	65.0	3228.1	0.9	2905.3	5857.4	0.9	5315.8	4728.4	0.9	4255.5	76783.5	0.9	69104.5	0.893	1023.1	31.5	0.81	0.00	0.00	58.5	58.5	58.5	58.5	0.548	3	CCI-WP-080125	F	0	T&C	8658	361.6	0.629															0.000	85.1	22036	0.629	0.6264	0.96	43.4	3.3%
12	14.25	2641.8	44.7	25.3	0.5	18	45.7200	0.3750	65	7.49	93.9	14230	54%	0	74.04	571	27746	65.0	3090.9	0.9	2781.8	3504.7	0.9	3154.2	1752.3	0.9	1577.1	72316.8	0.9	65085.1	0.964	1415.2	26.8	0.83	0.00	0.00	58.5	58.5	58.5	58.5	0.723	3	CCI-WP-060125	F	0	T&C	9021	324.2	0.597	2	CCI-WP-061125	F	0	T&C	3309	184.0	0.493	2.081	492.0	26501	0.7277	0.98	45.0	8.4%
13	0	2656.5	50.9	25.9	0.5	18	46.1900	0.3750	65	7.84	56.9	16440	62%	0	74.67	666	32586	65.0	3609.2	0.9	3248.3	3696.5	0.9	3326.8	1848.2	0.9	1663.4	81749.1	0.9	73574.2	0.941	1650.2	33.5	0.89	0.00	0.00	58.5	58.5	58.5	58.5	0.565	2	CCI-WP-061125	F	0	T&C	4387	261.9	0.519	2	CCI-WP-062125	F	0	T&C	5887	261.6	0.473	0.177	64.4	26710	0.6473	0.6188	1.06	42.3	2.3%
																														0.964									0.628																					0.676									0.676							

Rein1

Bottom	Top	Qty	Model	Position	T or T&C
0	14.25	2	FP-085125	F	T&C
14.25	31.75	3	FP-085125	F	T&C
31.75	70.5	3	FP-085125	F	T&C
70.5	98.5	3	FP-060100	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Flats (Used for relative orientation only. Actual flat numbers may vary.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
											1						1
					1						1						1
					1						1						1
					1						1						1

Rein2

Bottom	Top	Qty	Model	Position	T or T&C
0	17.75	2	FP-065125	F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
			1			1											

Rein3

Bottom	Top	Qty	Model	Position	T or T&C
0				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C
				F	T&C

Reinforcement Capacity

AeroSolutions LLC
Optimizing Your Tower Infrastructure

5500 Flatirons Parkway, Suite 100
Boulder, CO 80301
720-304-6882

Dimensions and Properties														Compression				Axial				
																		ASD-9			LRFD	
Model	Weight (lb/ft)	Area (in^2)	Moment of Inertia (in^4)	Moment of Inertia (in^4)	Centroid from Mating Edge (in)	Centroid from Bolt Hole Center (in)	Web Thickness (in)	Width (in)	Flange Width (in)	Flange Thickness (in)	Hole Diameter (in)	Yield Stress (ksi)	Ultimate Stress (ksi)	Slender. Ratio Coefficient	Unbraced Length (in)	Slender. Ratio Coefficient	Unbraced Length (in)	Allowable Axial (kip)	Allowable Axial w/ increase (kip)	Governing Axial	Design Axial Strength (kip)	Governing Axial
CCI-XFP-060100	20.4	6.00	0.50	18.00	0.5	0	1	6	0	0	1.1875	65	80	0.80	16	1.00	16	189.3	252.3	Compress.	285.0	Rupture
CCI-XFP-065125	27.6	8.13	1.06	28.61	0.625	0	1.25	6.5	0	0	1.1875	65	80	0.80	19	1.00	19	260.4	347.2	Compress.	393.8	Rupture
CCI-XFP-085125	36.2	10.63	1.38	63.97	0.625	0	1.25	8.5	0	0	1.1875	65	80	0.80	17	1.00	17	350.9	467.9	Compress.	543.1	Compress.

Anchor Rod Information for TIA/EIA-222-F and TIA-222-G-2

Site Information	
ID:	876373
Name:	LONG EDDY - WRIGHT PROPERTY
App. #:	393600 Revision # 1

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Base Reactions		
Moment:	3006	ft-kip
Axial:	51	kip
Shear:	26	kip
Base Plate Type:	Square	

Design Information	
TIA Code:	G
ASIF:	1.000
Failure:	105%
eta Factor:	0.50

Original Anchor Rod Data

Quantity:	16	
Diameter:	2.25	in
Material:	A615 GR 75	
Bolt Circle:	55.0	in
Bolt Spacing:	6	in
Bolt Group Area:	63.62	in^2
Bolt Group MOIx:	24055	in^4

Reactions Seen by Original AR Group

Moment:	2428.0	kip-ft
Axial:	50.9	kip
Shear:	25.9	kip

Original AR Capacity Check

Combined Load:	138.8	kip
Allowable load:	259.8	kip
AR Capacity:	53.4%	**Pass**

First Added Anchor Rod Data

Quantity:	3	
Diameter:	2.25	in
Material:	A193 B7	
Bolt Circle:	62.0	in
Bolt Group Area:	11.93	in^2
Bolt Group MOIx:	5732	in^4

Reactions Seen by First Added AR Group

Moment:	578.5	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

First Added AR Capacity Check

Combined Load:	141.2	kip
Allowable load:	324.8	kip
AR Capacity:	43.5%	**Pass**

Second Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Combined Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Third Added Anchor Rod Data

Quantity:		
Diameter:		in
Material:		
Bolt Circle:		in
Bolt Group Area:	0.00	in^2
Bolt Group MOIx:	0	in^4

Reactions Seen by Second Added AR Group

Moment:	0.0	kip-ft
Axial:	0.0	kip
Shear:	0.0	kip

Second Added AR Capacity Check

Combined Load:	0.0	kip
Allowable load:	0.0	kip
AR Capacity:	0.0%	

Rev.4.1

Rev.4.1

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

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

Site Data

BU#: *876373*
Site Name: *LONG EDDY - WRIGHT PI*
App #: *393600 Revision # 1*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	55	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	54	in
Thick:	2.75	in
Grade:	55	ksi
Clip Distance:	6	in

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

Pole Data		
Diam:	48.19	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	2427.98492	ft-kips
Factored Axial, Pu:	50.8576	kips
Factored Shear, Vu:	25.872849	kips

Anchor Rod Results

TIA G --> Max Rod (Cu+ Vu/η):	138.8 Kips
Axial Design Strength, Φ*Fu*Anet:	260.0 Kips
Anchor Rod Stress Ratio:	53.4% **Pass**

Base Plate Results Flexural Check

Base Plate Stress:	25.8 ksi
PL Design Bending Strength, Φ*Fy:	49.5 ksi
Base Plate Stress Ratio:	52.1% **Pass**

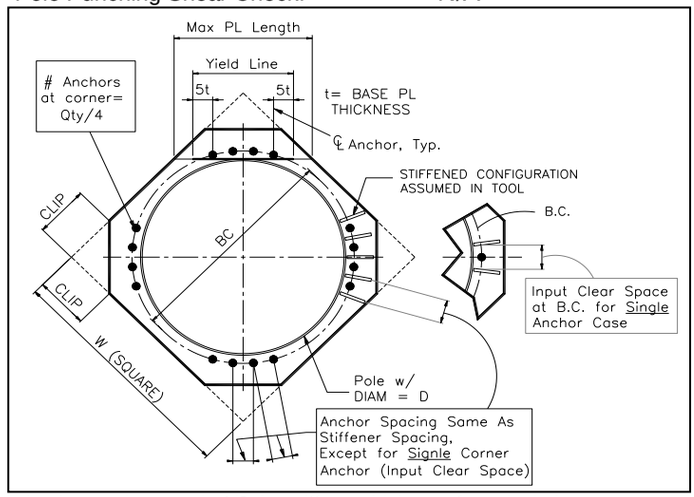
N/A - Unstiffened

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



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

Proj. Number	89028.007.01
Proj. Name	LONG EDDY / WRIGHT PROI
Code	Rev. G

Previously Added Anchor Rods

Diameter	2.25	in
Grade	A193 Gr B7	
Quantity	3	
Bolt Circle	62	in

Existing Mfg Anchor Rods

Diameter	2.25	in
Quantity	16	
Bolt Circle	55	in

Summary Output

- Anchor Rod Bracket Checks

Tube Stress:	**38.7%**
Max. Weld Stress:	**64.0%**

Analysis Criteria

Load for Calcs?	**Current Load**	
Current Load	141.2	kips
Capacity	325	kips

Foundation Properties

Type	Pad	
Pad Thickness	3.5	ft
f'_c	3000	psi
Clear Cover	3	inch
Pad Width	24.5	ft
	10	
	18	
	3	
	60	

Tower Properties

Fy_{pole} =	60	ksi
Fu_{pole} =	75	ksi
Fy_{base} =	55	ksi
Fu_{base} =	75	ksi

Anchor Rod Bracket Properties

Gusset Properties

Thickness	1.25	inch
Pole to Tube CL	6.8125	inch
Height	54	inch
Width at Tube	4.5625	inch
Fy_{plate} =	65	ksi
Fu_{plate} =	80	ksi
Gap =	0	inch
Notch =	0.75	inch

Pipe /Tube Properties

Size	4 XXS Pipe	
L_{pipe} =	14	inch
Length Above Gusset	0	inch
F_{ypipe} =	50	ksi
D_{pipe} =	4.5	inch
t_{pipe} =	0.674	inch
A_{pipe} =	8.101300374	$inch^2$
I_{pipe} =	15.28366215	$inch^4$
r_{pipe} =	1.373524299	inch

Weld Properties

F_{EXX} =	70	ksi	Weld Material Grade
Load Angle	45	degrees	

- Bracket to Tube Weld

Weld Type	Double Bevel+Fillet		
Fillet Size	6		Vertical fillet weld size in sixteenths
Bevel Depth	0.375	inch	Bevel Depth in inches
$l_{vweldpipe}$ =	14	inch	Length of Vertical Weld to Pipe

- Bracket to Pole Weld

Weld Type	Double Fillet		
D_{vpole} =	6		Vertical fillet weld size *in sixteenths*
H =	54	inch	Height of vertical weld from base plate

- Gusset to Base Plate Weld

Weld Type	Double Bevel+Fillet		
Bevel Depth	0.5	inch	Bevel depth in inches
Fillet Size	8		Fillet weld size in sixteenths

Additional Variables

C_1 =	1.00	Electrode Strength Coefficient
k_{rt} =	0	Transverse Reinforcement Index :
ψ_t =	1	Rebar Location Factor :

PROJECT	**876373 - LONG EDDY / WRIGHT PROPERTY, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**06-16-17**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

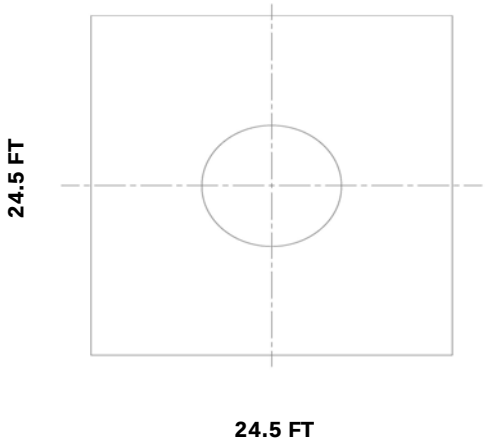
Rev. Type: G

Design Loads:

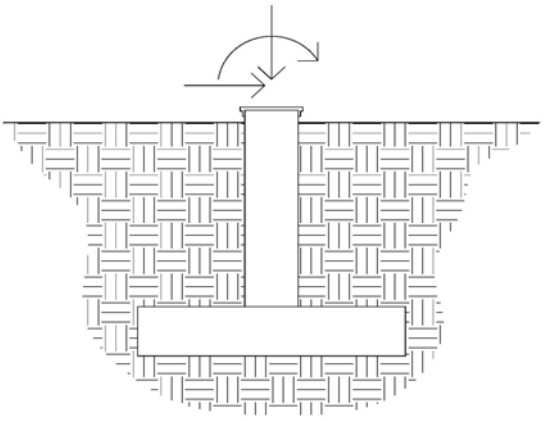
	Input factored loads	
Shear:	26.0	kips
Moment:	3,006.0	ft-kips
Tower Height:	148.0	ft
Tower Weight:	51.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	48.19	in
Bearing Depth:	3.5	ft
Pad Width:	24.5	ft
Neglected Depth:	3.3	ft
Thickness:	4.0	ft
Pier Diameter:	0.0	ft
Pier Height Above Grade:	0.5	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	10	
Pier Rebar Quanity:	57	
Pad Rebar Size:	8	
Pad Rebar Quanity:	26	
Pier Tie Size:	4	
Tie Quanity:	7	
Rebar Yield Strength:	60000	psi
Concrete Strength:	3000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.120	kcf
Ult. Bearing Capacity:	12.000	ksf
Angle of Friction:	30.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.300	

** Notes:

Summary of Results

Req'd Pier Diam.	No Good!
Overturning	80.8%
Shear Capacity	30.7%
Bearing	23.0%
Pad Shear - 1-way	32.2%
Pad Moment Capacity	52.4%

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: CT33XC078

Long Eddy/Wright Property
136 Wright Road
Torrington, CT 06790

July 23, 2017

EBI Project Number: 6217003215

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.76 %

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

EBI Consulting
environmental | engineering | due diligence

July 23, 2017

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

Emissions Analysis for Site: **CT33XC078 – Long Eddy/Wright Property**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **136 Wright Road, Torrington, 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure 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 **136 Wright Road, Torrington, 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 **148 feet** above ground level (AGL) for **Sector A**, **148 feet** above ground level (AGL) for **Sector B** and **148 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 public 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):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 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%	**1.52 %**	Antenna B1 MPE%	**1.52 %**	Antenna C1 MPE%	**1.52 %**
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):	**148 feet**	Height (AGL):	**148 feet**	Height (AGL):	**148 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%	**1.11 %**	Antenna B2 MPE%	**1.11 %**	Antenna C2 MPE%	**1.11 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.63 %**
Verizon Wireless	2.10 %
AT&T	1.03 %
Site Total MPE %:	**5.76 %**

SPRINT Sector A Total:	2.63 %
SPRINT Sector B Total:	2.63 %
SPRINT Sector C Total:	2.63 %
Site Total:	5.76 %

SPRINT _ Max Values per Frequency Band / Technology	# 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	148	0.78	850 MHz	567	0.14%
Sprint 850 MHz LTE	2	437.55	148	1.56	850 MHz	567	0.28%
Sprint 1900 MHz (PCS) CDMA	5	622.47	148	5.55	1900 MHz (PCS)	1000	0.55%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	148	5.55	1900 MHz (PCS)	1000	0.55%
Sprint 2500 MHz (BRS) LTE	8	778.09	148	11.10	2500 MHz (BRS)	1000	1.11%
						Total:	**2.63%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public 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 public exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	2.63 %
Sector B:	2.63 %
Sector C:	2.63 %
SPRINT Maximum Total (per sector):	2.63 %
Site Total:	5.76 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.76 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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