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

September 21, 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: 876355**
Sprint Site ID: CT03XC365
474-480 Main St, Monroe, CT 06468
Latitude: 41° 19′ 31.99″ / Longitude: -73° 15′ 57.05″

Dear Ms. Bachman:

Sprint currently three (3) antennas at the 152-foot level of the existing 191.5-foot monopole at 474-480 Main St in Monroe, CT. The tower and property is owned by Crown Castle. Sprint intends to install three (3) antennas, three (3) RRHs, and one (1) hybrid cable.

This facility was approved by the Town of Monroe; a request for original zoning documents has been sent to the Town of Monroe but original zoning could not be secured. Please see attached correspondence.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments:

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

cc: Mr. Stephen Vavrek
Monroe Town Hall
7 Fan Hill Road
Monroe, CT 06468

Planning and Zoning
Monroe Town Hall Annex
7 Fan Hill Road
Monroe, CT 06468

Hanlon, Dashanna

From: Donna Suszynski <dsuszynski@monroect.org>
Sent: Thursday, September 21, 2017 10:06 AM
To: Hanlon, Dashanna
Subject: FW: Original Zoning - Tower at 474-480 Main Street

Please see response below from Joseph Chapman

From: Joseph Chapman
Sent: Thursday, September 21, 2017 10:02 AM
To: Donna Suszynski; William Agresta; Scott Schatzlein
Subject: RE: Original Zoning - Tower at 474-480 Main Street

This is an existing cell tower, as long as the improvements are on the original tower itself (typical), no additional zoning requirements are activated. The initial application to the Building Department for the work would be closed out by a site inspection by Zoning when completed. Please contact the Building Department for any questions concerning their application. 203/452-2805

Joseph Chapman
Zoning Enforcement Officer, CZEO
Town of Monroe
7 Fan Hill Road
Monroe CT. 06468
203/452-2816 office
jchapman@monroect.org

From: Donna Suszynski
Sent: Thursday, September 21, 2017 9:13 AM
To: William Agresta; Joseph Chapman; Scott Schatzlein
Subject: FW: Original Zoning - Tower at 474-480 Main Street

I am not sure how to respond to this request, there are Zoning Permits issued, but are there "other" requirements that they should know about?

From: Hanlon, Dashanna [mailto:Dashanna.Hanlon@crowncastle.com]
Sent: Wednesday, September 20, 2017 5:25 PM
To: Donna Suszynski
Subject: Original Zoning - Tower at 474-480 Main Street

Good Afternoon,

I have an inquiry regarding original zoning documents for a tower and I am hoping you can provide more information.

We are applying for CSC Zoning Approval for tower modifications and new requirements ask that we procure original zoning documents from the jurisdiction, if possible. However, if these documents are not available, please let me know.

The tower is located at 474-480 Main Street and according to lease documents this was have been approved around 2000– Sprint owned the property at the time the lease was signed.

If you have any questions, please don't hesitate to call or e-mail me.

Thank you,
Dashanna

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

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

474 MAIN ST

Location	474 MAIN ST	**Map/Lot**	045/ 022/ 0Z/ /
Acct#	0450220Z	**Owner**	SPRINT PCS
Assessment	$239,700	**Appraisal**	$342,400
PID	16240	**Building Count**	1
Survey	1676 B		

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$125,000	$217,400	$342,400
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$87,500	$152,200	$239,700

Owner of Record

Owner	SPRINT PCS	**Sale Price**	$0
Co-Owner	GLOBAL SIGNAL ACQ II LLC	**Certificate**	1
Address	PMB 331 4017 WASHINGTON RD MCMURRAY, PA 15317	**Book & Page**	943/ 187
		Sale Date	04/27/2001

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
SPRINT PCS	$0	1	943/ 187	04/27/2001

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0

Building Attributes	
Field	**Description**
Style	Vacant Land
Model	

Stories:	
Occupancy	
Exterior Wall 1	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Rooms:	
Fireplaces	
Basement Gar.	
Basement	
In Law Apt	

Building Photo

(http://images.vgsi.com/photos/MonroeCTPhotos//\00\00\64/02.

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	431
Description	TEL REL TW
Zone	B1
Neighborhood	
Alt Land Approved	No
Category	

Land Line Valuation

Size (Acres)	0.06
Appraised Value	$217,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
TT4	TOWER MONOPOLE			1 UNITS	$125,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$125,000	$217,400	$342,400

2009		$220,000	$381,880

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$87,500	$152,200	$239,700
2009		$154,000	$267,316

Town of Monroe

Map Title

Legend

- Parcels
- Streetname
- Roadways
  - Local
  - Collector
  - Minor Collector
  - Minor Arterial
  - Major Collector
  - PA Other
  - PA Other Expwy
  - PA Interstate

141.9 0 70.97 141.9 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Created by Greater Bridgeport Regional Council

METROCOG
Connecticut Metropolitan Council of Governments

Crown Castle International Corp. Consolidated Subsidiaries as Named Insureds

Entity Name **4/1/2017 Edition**

24/7 Chesapeake Holdings, LLC
24/7 Mid-Atlantic Network, LLC
24/7 Mid-Atlantic Network of Virginia, LLC
Access Fiber Group Holdings LLC
Access Fiber Group, Inc.
AirComm of Avon, L.L.C.
Atlantic Coast Communications LLC
CA - CLEC LLC
CCT2 Holdings LLC
CC Castle International LLC
CC Towers Holding LLC
CC TS LLC
CC FN Holdings LLC
CC Finance LLC
CC Holdings GS V LLC
CC Site Acquisitions II LLC
CC Sunesys Fiber Networks LLC
CC TM PA LLC
CC Towers Guarantor LLC
CCATT Holdings LLC
CCATT LCC
CCATT PR LLC
CCGS Holdings Corp.
CCPR VI Tower Newco LLC
CCS & E LLC
CCTM Holdings LLC
CCTM1 LLC
CCTM2 LLC
CCTMO LLC
ComSite Venture, Inc.
Chesapeake Fiber, LLC
Coastal Antennas LLC
Coverage Plus Antenna Systems LLC
Crown Atlantic Company LLC
Crown Mobile Systems, Inc.
Crown Castle AS LLC
Crown Castle Atlantic LLC
Crown Castle Augusta LLC
Crown Castle BP ATT LLC
Crown Castle CA Corp.
Crown Castle GS III Corp.
Crown Castle GT Company LLC
Crown Castle GT Corp.
Crown Castle GT Holding Sub LLC
Crown Castle International Corp.
Crown Castle International LLC
Crown Castle International Corp. de Puerto Rico
Crown Castle Investment II Corp.
Crown Castle Investment Corp.
Crown Castle MM Holding Corp.
Crown Castle MM Holding LLC
Crown Castle MU LLC
Crown Castle NG Atlantic LLC
Crown Castle NG Central LLC
Crown Castle NG East LLC
Crown Castle NG Networks LLC
Crown Castle NG West LLC
Crown Castle Operating Company
Crown Castle Orlando Corp.
Crown Castle PR LLC
Crown Castle PR Solutions LLC
Crown Castle PT Inc.
Crown Castle Puerto Rico Corp.
Crown Castle Services LLC
Crown Castle Solutions LLC
Crown Castle South LLC
Crown Castle TDC LLC
Crown Castle TLA LLC
Crown Castle Towers 05 LLC
Crown Castle Towers 06-2 LLC
Crown Castle Towers 09 LLC
Crown Castle Towers LLC
Crown Castle MUPA LLC
Crown Castle USA Inc.
Crown Communication LLC
Crown Communication New York, Inc.
DAS Development Corporation
Fibernet Direct Florida LLC
Fibernet Direct Holdings LLC
Fibernet Direct TEL LLC
Fibernet Direct Texas LLC
Global Signal Acquisitions II LLC
Global Signal Acquisitions III LLC
Global Signal Acquisitions IV LLC
Global Signal Acquisitions LLC
Global Signal GP LLC
Global Signal Holdings III LLC
Global Signal Holdings IV LLC
Global Signal Operating Partnership, L.P.
Global Signal Services LLC
GoldenState Towers, LLC
GS Savings Inc.
High Point Management Co. LLC
ICB Towers, LLC
InfraSource FI, LLC
InSITE Fiber of Virginia LLC
InSITE Solutions LLC
Interstate Tower Communications LLC

Crown Castle International Corp. Consolidated Subsidiaries as Named Insureds

Entity Name **4/1/2017 Edition**

Intracoastal City Towers LLC
LL Q1-16, LLC
Mobile Media California LLC
Mobile Media National LLC
Modeo LLC
Md7 Capitol One, LLC
MW Cell REIT 1 LLC
MW Cell TRS 1 LLC
NewPath Networks Holding LLC
NewPath Networks LLC
NY - CLEC LLC
OP 2 LLC
OP LLC
P3 CHB-1, LLC
PA - CLEC LLC
Pinnacle San Antonio L.L.C.
Pinnacle Towers Acquisition Holdings LLC
Pinnacle Towers Acquisition LLC
Pinnacle Towers Asset Holding LLC
Pinnacle Towers Canada, Inc.
Pinnacle Towers III LLC
Pinnacle Towers Limited
Pinnacle Towers LLC
Pinnacle Towers V Inc.
Pinnacle St. Louis LLC
PR Site Development Corporation
PR TDC Corporation
Princeton Ancillary Services II LLC
Princeton Ancillary Services III LLC
Radio Station WGLD LLC
RGP Tower Group, LLC
Shaffer & Associates, Inc.
Sierra Towers, Inc.
Sunesys, LLC
Sunesys Enterprise LLC
Sunesys of Massachusetts, LLC
Sunesys of Virginia, Inc.
Tower Development Corporation
Towers Finco LLC
Towers Finco II LLC
Towers Finco III LLC
Tower Systems LLC
Tower Technology Company of Jacksonville LLC
Tower Ventures III, LLC
TowerOne 2012, LLC
TowerOne Allentown 001, LLC
TowerOne Bethlehem 001, LLC
TowerOne Doylestown, LLC
TowerOne East Rockhill 001, LLC
TowerOne Marple, LLC
TowerOne Middleton 003, LLC
TowerOne Middletown 001, LLC
TowerOne Middletown 002, LLC
TowerOne North Coventry, LLC
TowerOne Partners, LLC
TowerOne Richland, LLC
TowerOne Upper Pottsgrove, LLC
TowerOne Upper Pottsgrove 002, LLC
TowerOne Warminster 001, LLC
TowerOne Warrington 002, LLC
TriStar Investors LLC
TVHT, LLC
WA - CLEC LLC
WCP Wireless Lease Subsidiary, LLC
WCP Wireless Site Funding LLC
WCP Wireless Site Holdco LLC
WCP Wireless Site Non-RE Funding LLC
WCP Wireless Site Non-RE Holdco LLC
WCP Wireless Site RE Funding LLC
WCP Wireless Site RE Holdco LLC
Wireless Funding, LLC
Wireless Realty Holdings II, LLC
Wireless Revenue Properties, LLC

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:
CT03XC365
SITE NAME:
UPPER STEPNEY–TLC
SITE ADDRESS:
474–480 MAIN STREET
MONROE, CT 06468

CROWN ID#: 876355

CROWN SITE NAME: UPPER STEPNEY–TLC

APPROVED
By Craig Koppang at 11:40 am, Aug 09, 2017

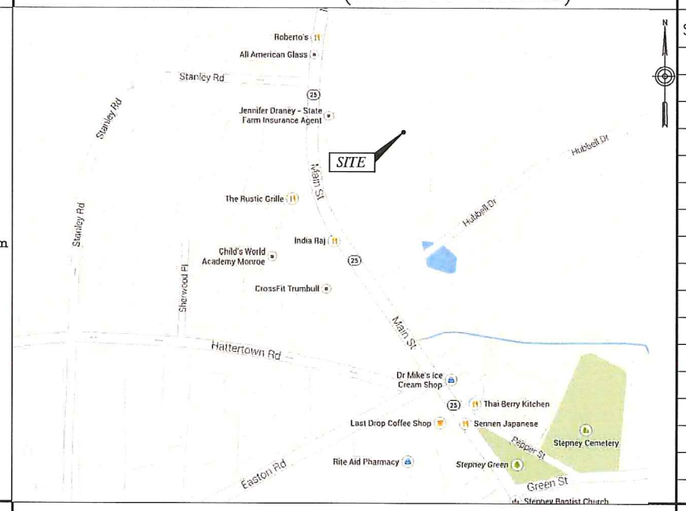
APPROVED
By Susan Vale at 3:58 pm, Jan 09, 2015

SHEET INFORMATION

SITE NUMBER:	CT03XC365
SITE NAME:	UPPER STEPNEY–TLC
SITE ADDRESS:	474–480 MAIN STREET MONROE, CT 06468
COUNTY:	FAIRFIELD
COORDINATES: (NAD 83)	41° 19' 31.99"N 73° 15' 57.05"W
GROUND ELEV:	451'± AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	194'–0"± AGL
STRUCTURE RAD CENTER:	150'–0"± AGL
ZONING CLASSIFICATION:	B1
MAP–BLOCK–LOT:	045 022 0Z

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:	PETER CULBERT (603) 203–6446 Peter.Culbert@sprint.com
CROWN CM:	JASON D'AMICO (860) 209–0104 jason.d'amico@crowncastle.com
AAV:	CHARTER

VICINITY MAP (NOT TO SCALE)



SHEET INDEX

GENERAL NOTES

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

PROJECT DESCRIPTION

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

AERIAL VIEW (NOT TO SCALE)

APPROVALS

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

CONSTRUCTION: _____ DATE: _____

LEASING/
SITE ACQUISITION: _____ DATE: _____

LANDLORD/
PROPERTY OWNER: _____ DATE: _____

R.F. ENGINEER: _____ DATE: _____

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

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

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

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

SITE NUMBER:
CT03XC365
SITE NAME:
UPPER STEPNEY–TLC
SITE ADDRESS:
474–480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
TITLE SHEET

SHEET NO:
T–1

DIVISION 01000–GENERAL NOTES

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE PROJECT OWNER'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

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

7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.

9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.

11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.

12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.

13. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK SHALL BE RELOCATED AS DIRECTED BY THE ARCHITECT/ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. THE CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, D) TRENCHING AND EXCAVATION OF ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES WHICH INTERFERE WITH THE EXECUTION OF THE WORK SHALL BE REMOVED AND OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK SUBJECT TO THE APPROVAL OF THE ARCHITECT/ENGINEER.

14. THE CONTRACTOR SHALL NOTIFY THE PROJECT OWNER'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE LESSEE/LICENSEE REPRESENTATIVE.

15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.

16. THE CONTRACTOR SHALL NOTIFY THE THE RF ENGINEER FOR ANTENNA AZIMUTH VERIFICATION (DURING ANTENNA INSTALLATION) PRIOR TO CONDUCTING SWEEP TESTS.

17. THE CONTRACTOR SHALL SUBMIT AT THE END OF THE PROJECT A COMPLETE SET OF AS–BUILT DRAWINGS TO THE CLIENT REPRESENTATIVE.

18. REFER TO: CONSTRUCTION STANDARDS–SPRINT DOCUMENT EXHIBIT A–STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES REV. 4.0– 02.15.2011.DOCM.

19. REFER TO: WEATHER PROOFING SPECS: EXCERPT EXH A–WIHRPRF–STD CONSTR SPECS._157201110421855492.DOCM.

20. REFER TO: COLOR CODING–SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09–08–11.PDF

21. REFER TO LATEST DOCUMENTATION REVISION.

DIVISION 03000–CONCRETE

1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)

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

1.04 QUALITY ASSURANCE

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

3.04 SURFACE FINISHES

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

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

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

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

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

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

3.05 PATCHING

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

3.06 DEFECTIVE CONCRETE

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

3.07 PROTECTION

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

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

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

DIVISION 05000 – METALS

PART 1 – GENERAL

1.01 WORK INCLUDED

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

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

1.02 REFERENCE STANDARDS

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

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

PART 2 – PRODUCTS

2.01 MATERIALS

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

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

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

2.02 WELDING

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

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

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

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

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

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

2.03 BOLTING

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

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

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

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

E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.

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

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

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

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

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

2.04 FABRICATION

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

2.05 FINISH

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

2.06 PROTECTION

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

PART 3 – ERECTION

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

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

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

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC • PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 Route 300
Newburgh, NY 12550

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

www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMC

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

SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY–TLC

SITE ADDRESS:
474–480 MAIN STREET
MONROE, CT 06468

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

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC • PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 Route 300
Newburgh, NY 12550

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

www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22038
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY–TLC

SITE ADDRESS:
474–480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
GENERAL NOTES

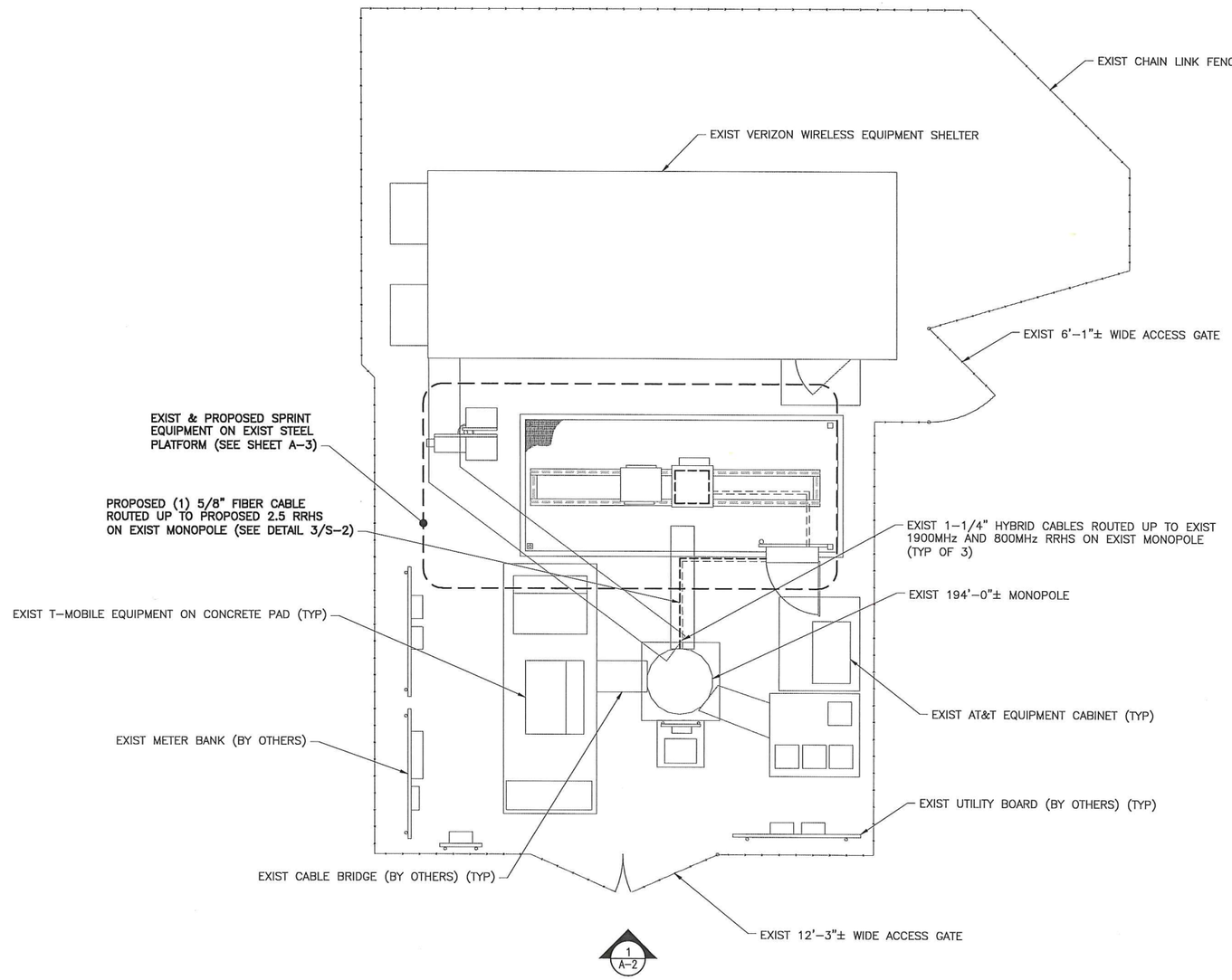
SHEET NO:
SP–2

N

APPROX.

NORTH NOTE:

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



1
A-1
SITE PLAN
SCALE: 1/4" = 1'-0"

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22038
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

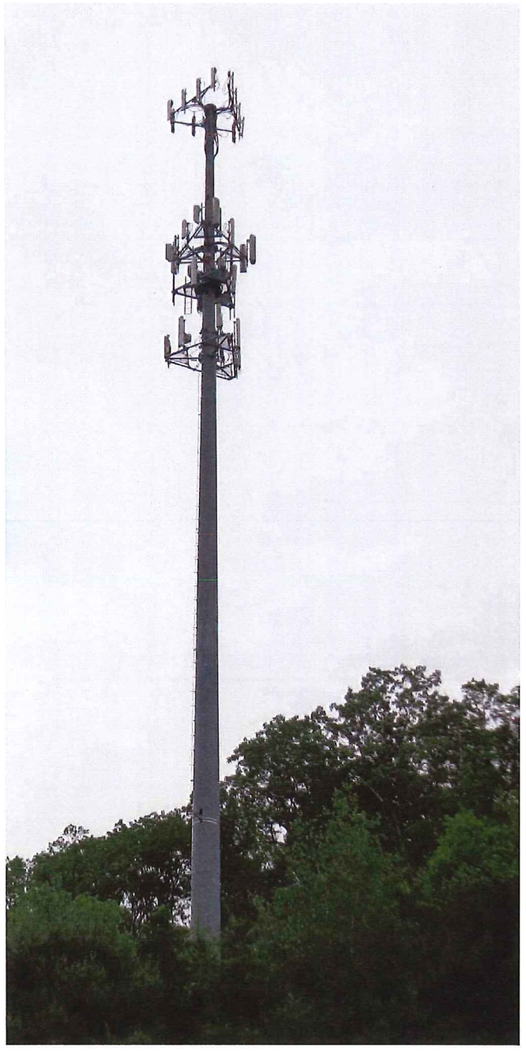
SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

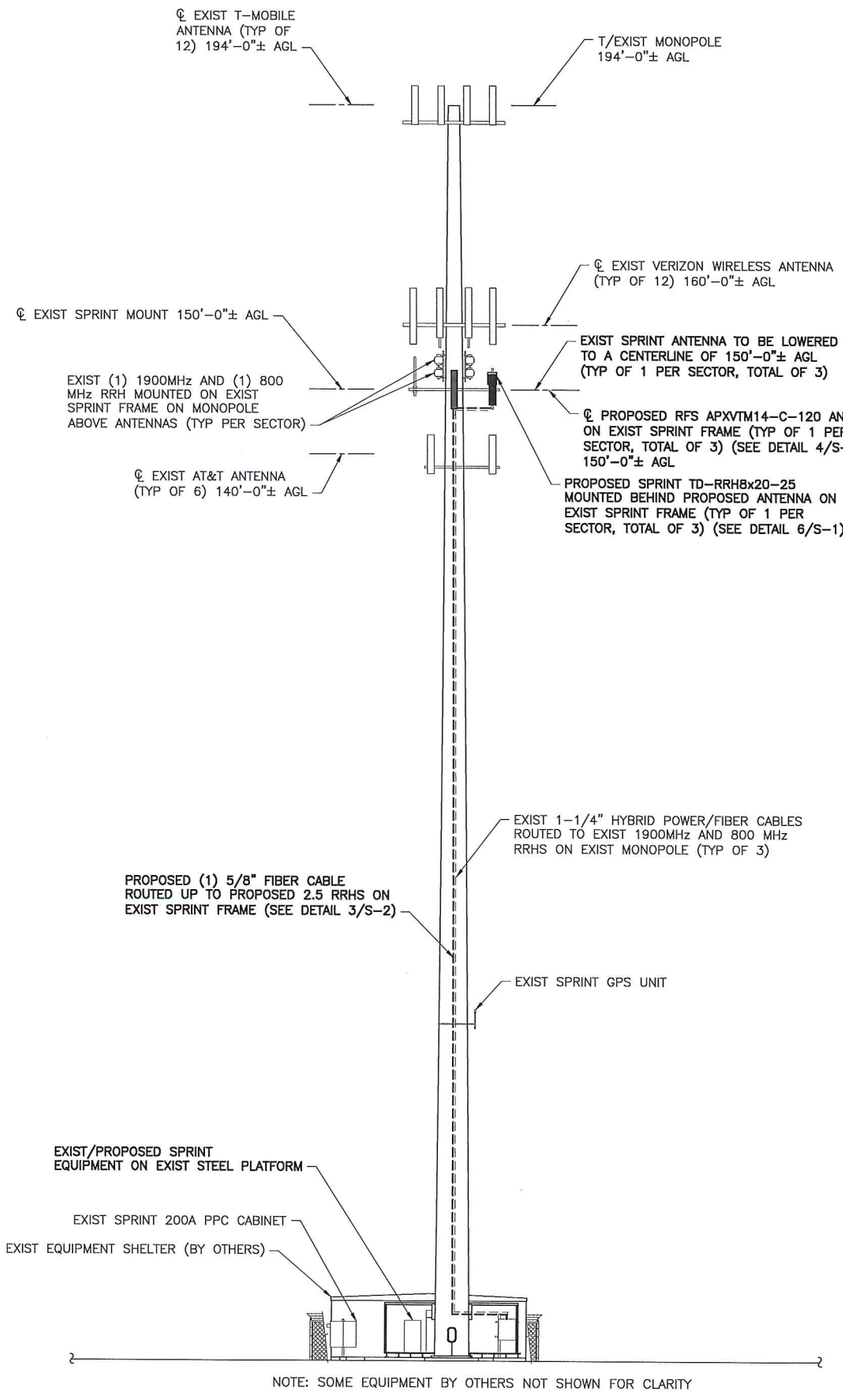
SHEET TITLE:
SITE PLAN

SHEET NO:
A-1

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

THE EXISTING MOUNT HAS BEEN ANALYZED BY TECTONIC ENGINEERING AND FOUND TO BE ADEQUATE TO SUPPORT THE PROPOSED SPRINT UPGRADE AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 01/08/15.





NOTE: SOME EQUIPMENT BY OTHERS NOT SHOWN FOR CLARITY

1 / A–2 ELEVATION

SCALE: 3/16" = 1'–0"

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	MO

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

SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY–TLC

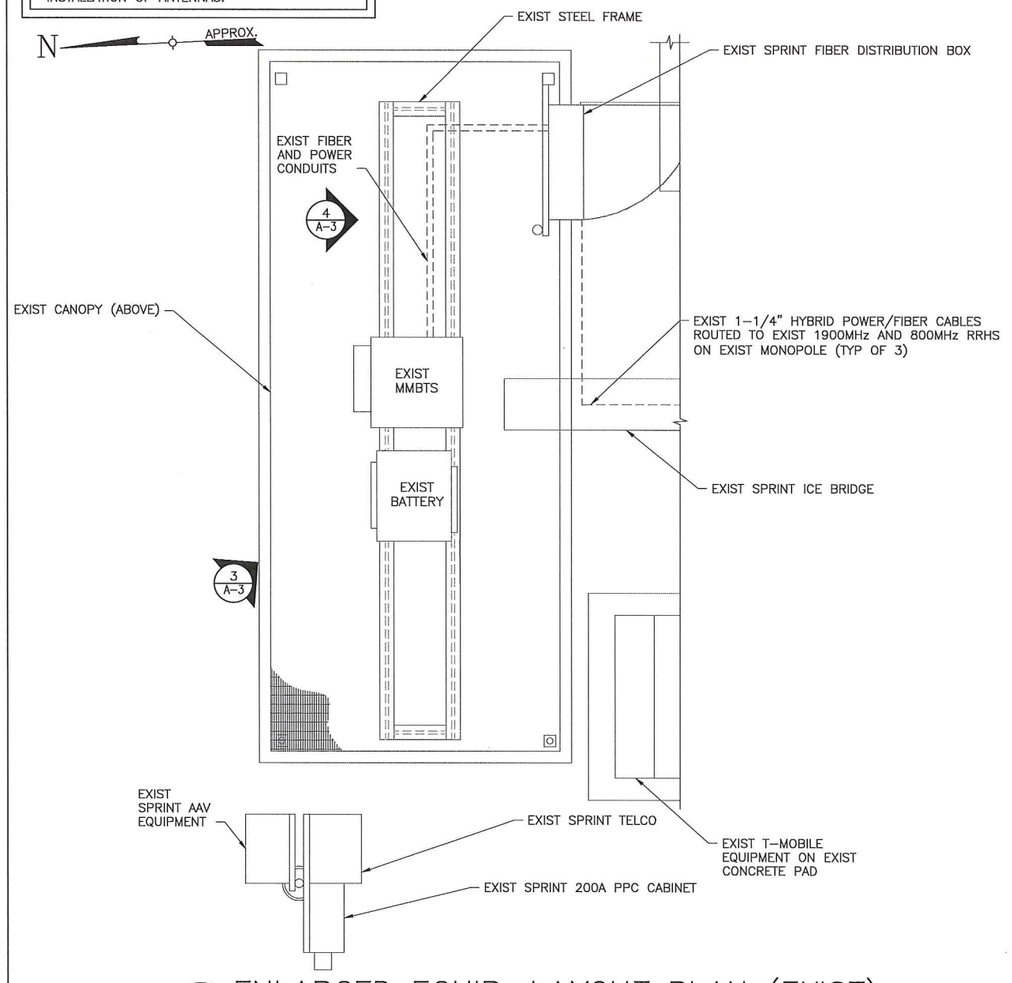
SITE ADDRESS:
474–480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
ELEVATION

SHEET NO:
A–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.

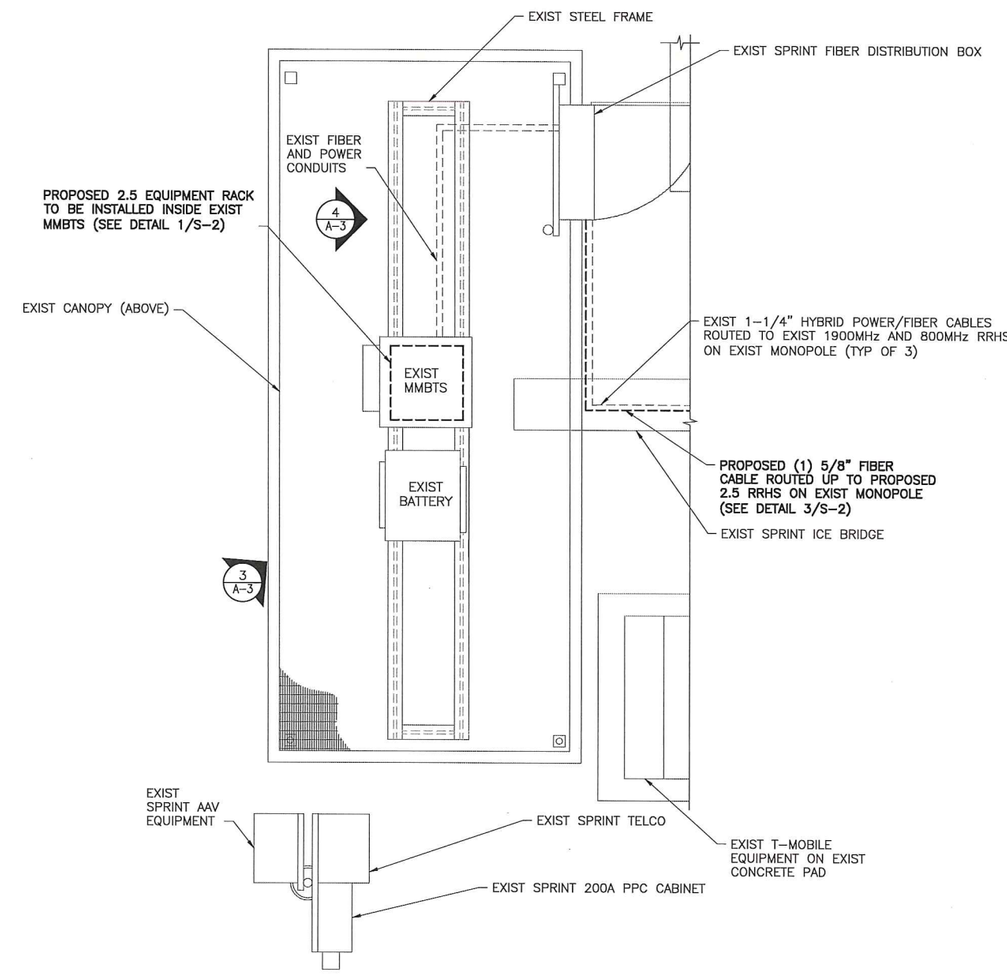


1 A-3 ENLARGED EQUIP. LAYOUT PLAN (EXIST)

SCALE: 3/4" = 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

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 Route 300
Newburgh, NY 12550

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

www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL

STATE OF CONNECTICUT
MANOJKUMAR QUTTY
No. 22038
LICENSED
PROFESSIONAL ENGINEER

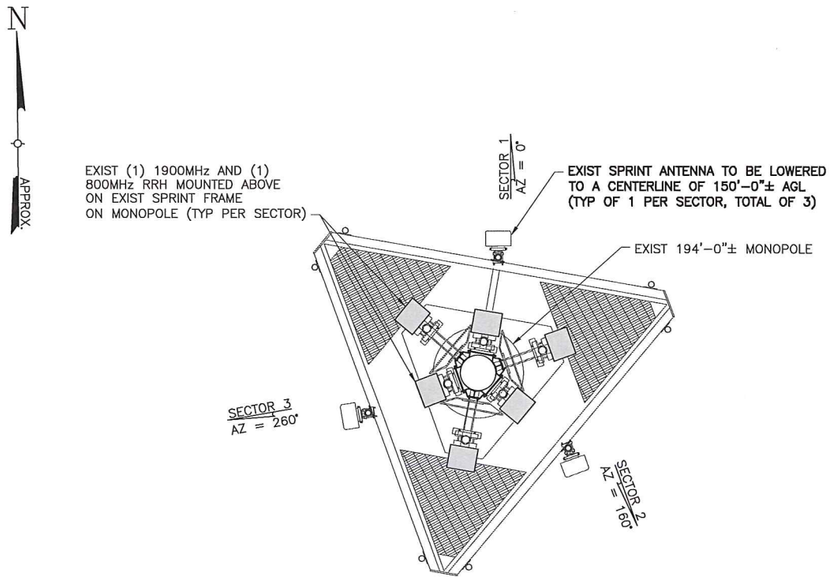
SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

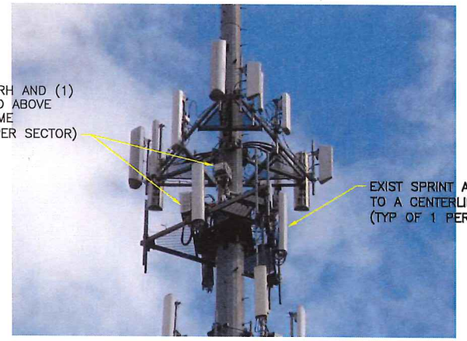
SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
A-3



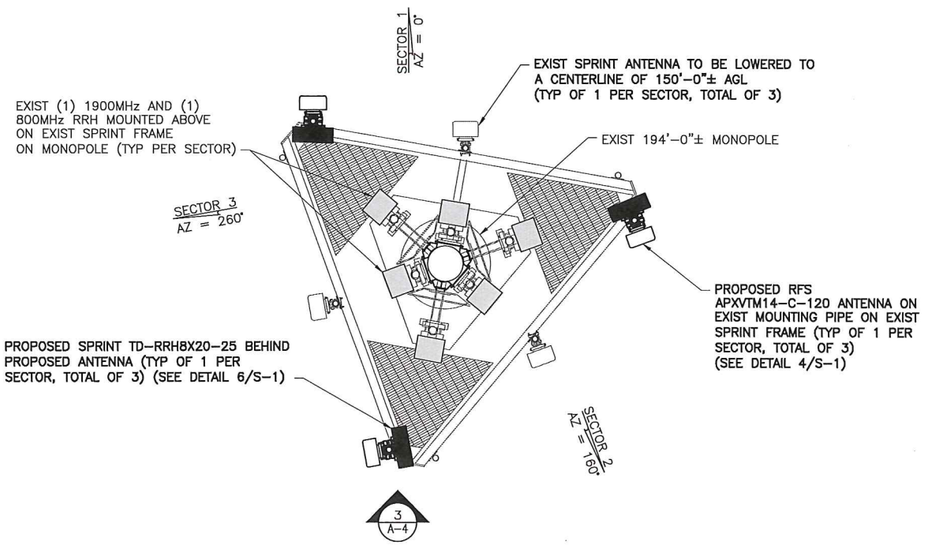
1 A-4 ANTENNA LAYOUT PLAN (EXIST)

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



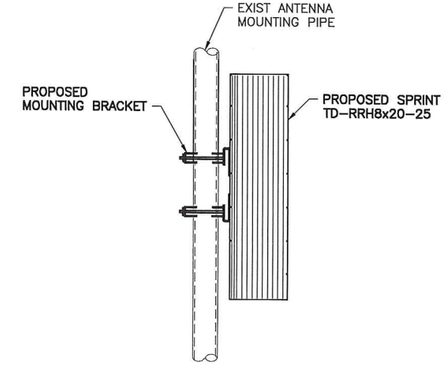
THE EXISTING MONOPOLE SHALL BE ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

THE EXISTING MOUNT HAS BEEN ANALYZED BY TECTONIC ENGINEERING AND FOUND TO BE ADEQUATE TO SUPPORT THE PROPOSED SPRINT UPGRADE AS DETAILED IN THE STRUCTURAL ANALYSIS EVALUATION LETTER DATED 01/08/15.



2 A-4 ANTENNA LAYOUT PLAN (FINAL)

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



3 A-4 RRH MOUNTING DETAIL

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

ANTENNA DATA

Status	Exist **(Proposed)**	**Proposed**
Antenna Manufacturer	RFS-CEL WAVE	**RFS-CEL WAVE**
Antenna Model Number	APXVSPP18C-A20	**APXVTM14-C-120**
Number of Antennas	3	**3**
Antenna RAD Center	152' **(150')**	**150'**
Antenna Azimuth	0/160/260	**0/160/260**
Antenna RRH Model Number	1900MHz/800MHz RRHS	**TD-RRH8x20-25**
Number of RRH	6	**3**

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL
STATE OF CONNECTICUT
ANOJKUMAR PILLAI
No. 22038
LICENSED PROFESSIONAL ENGINEER

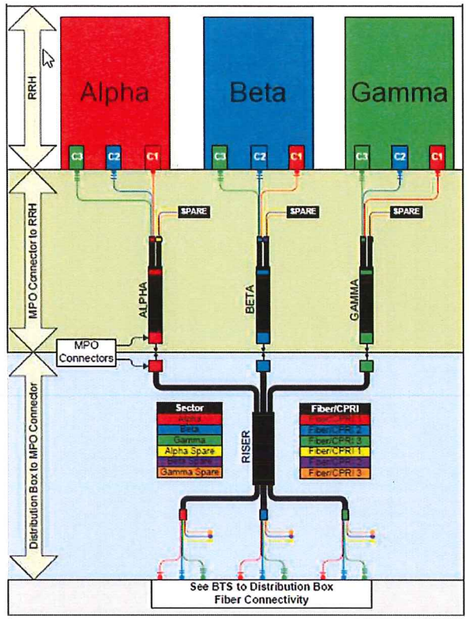
SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

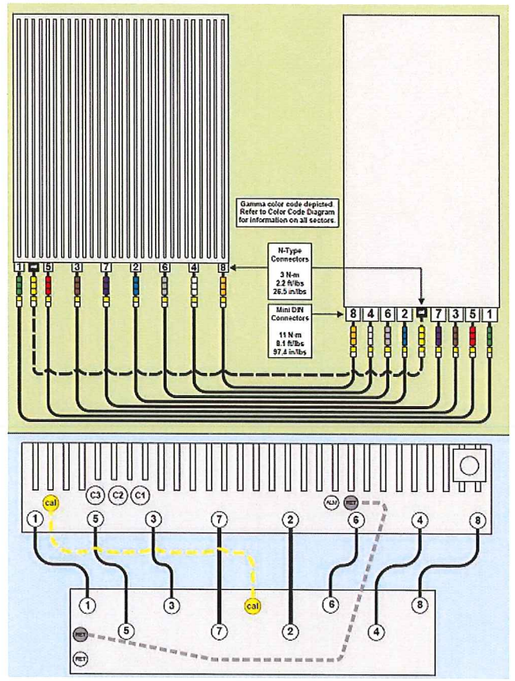
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



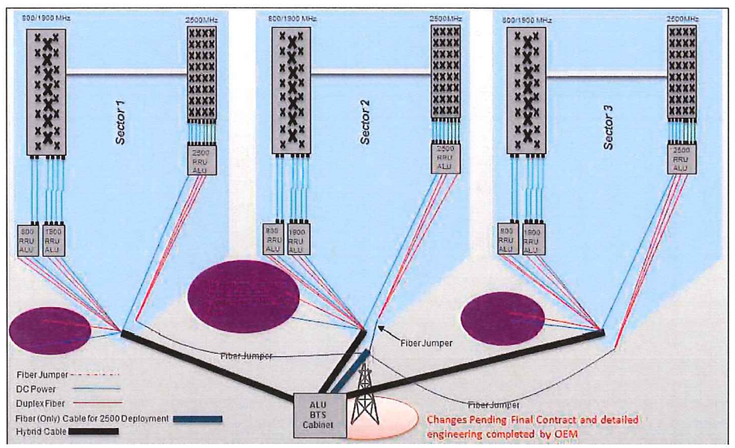
1 / A–5 2.5 CABLE COLOR CODING

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.

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC

• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

TECTONIC Engineering & Surveying Consultants P.C.

1279 Route 300
Newburgh, NY 12550

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

www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22038
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY–TLC

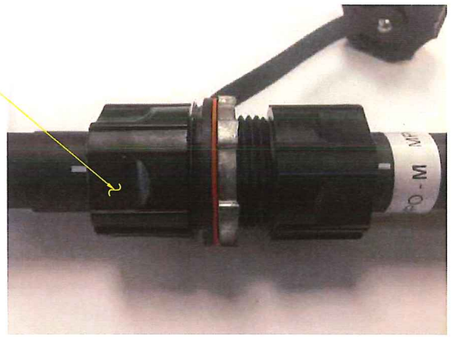
SITE ADDRESS:
474–480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
CABLE COLOR CODING DETAILS

SHEET NO:
A–5

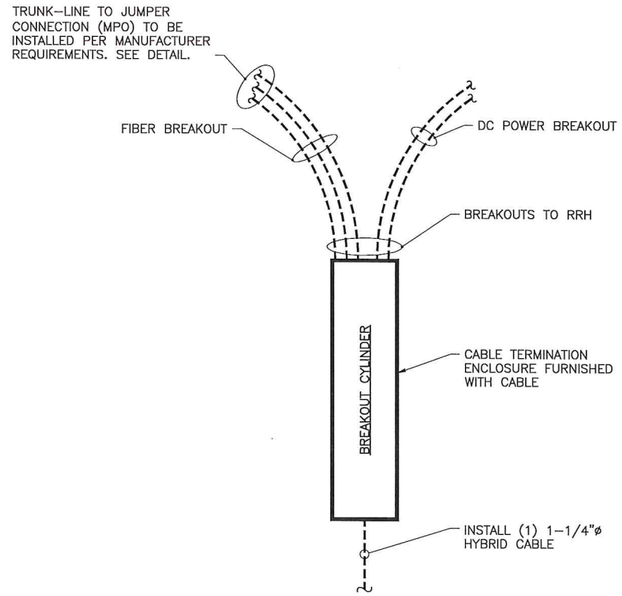
IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION

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

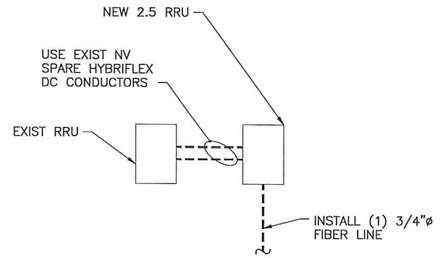


1 / A-6 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS

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.

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

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL

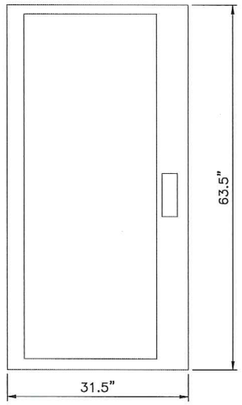
SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
CABLE DETAILS

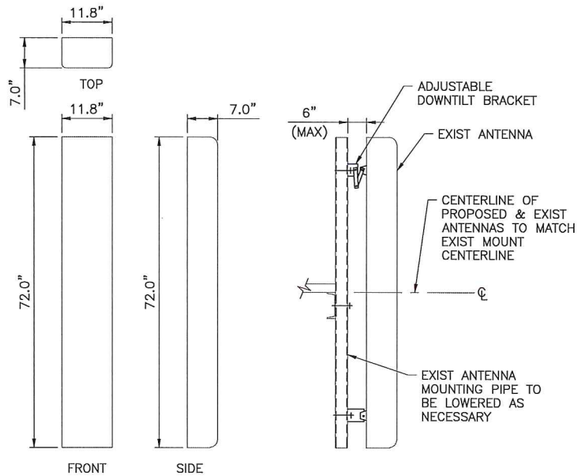
SHEET NO:
A-6



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

1/S-1 (EXIST) MMBTS CABINET

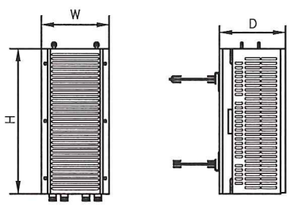
SCALE: 1" = 1'-0"



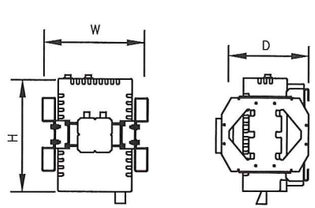
APXVSPP18-C-A20

3/S-1 (EXIST) ANTENNA DETAIL

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



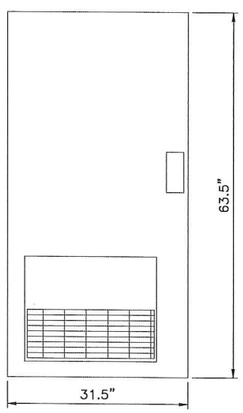
TYPE:	1900 MHz 4x45W
MODEL #:	RRH 1900 4X45 65MHz
HEIGHT:	25.0"
WIDTH:	11.1"
DEPTH:	11.4"
WEIGHT:	±60 LBS.



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

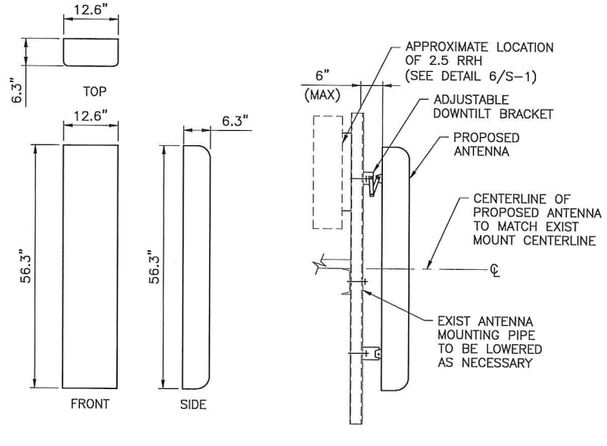
SCALE: 1 1/2"=1'-0"



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

2/S-1 (EXIST) BATTERY CABINET

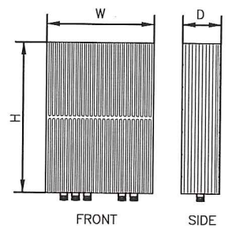
SCALE: 1" = 1'-0"



APXVTM14-C-120

4/S-1 (PROPOSED) ANTENNA DETAIL

SCALE: 3/4"=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.

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

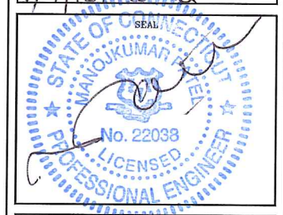
SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL



SITE NUMBER:
CT03XC365

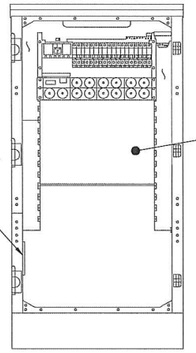
SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NO:
S-1

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

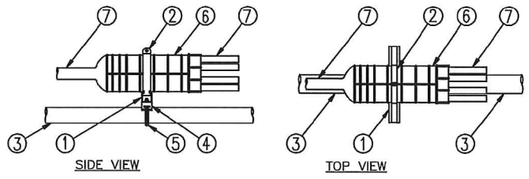


FRONT ELEVATION
(CABINET INTERIOR)

1 S-2 MMBTS INTERIOR DETAIL

SCALE: N.T.S.

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



2 S-2 MEDUSA HEAD DETAIL

SCALE: NTS

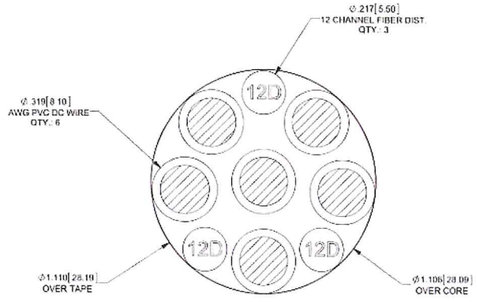
RFS HYBRIFLEX RISER CABLES SCHEDULE

Fiber Only (Existing DC Power)	**Hybrid cable** MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom:LC Connectors, 5/8 cable, 50ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN:HB058-M12-125F	125 ft
	MN:HB058-M12-150F	150 ft
	MN:HB058-M12-175F	175 ft
	MN:HB058-M12-200F	200 ft
8 AWG Power	**Hybrid cable** MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	**Hybrid cable** MN: HB114-13U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable,225ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	**Hybrid cable** MN: HB114-21U3M12-225F 3x 6 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable,225ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

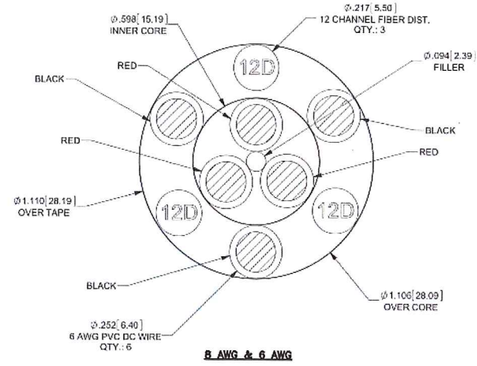
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

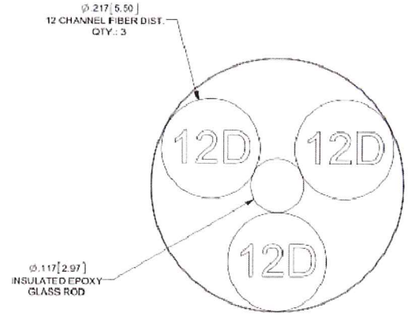
HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG



FIBER ONLY

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

SCALE: NTS

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

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

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

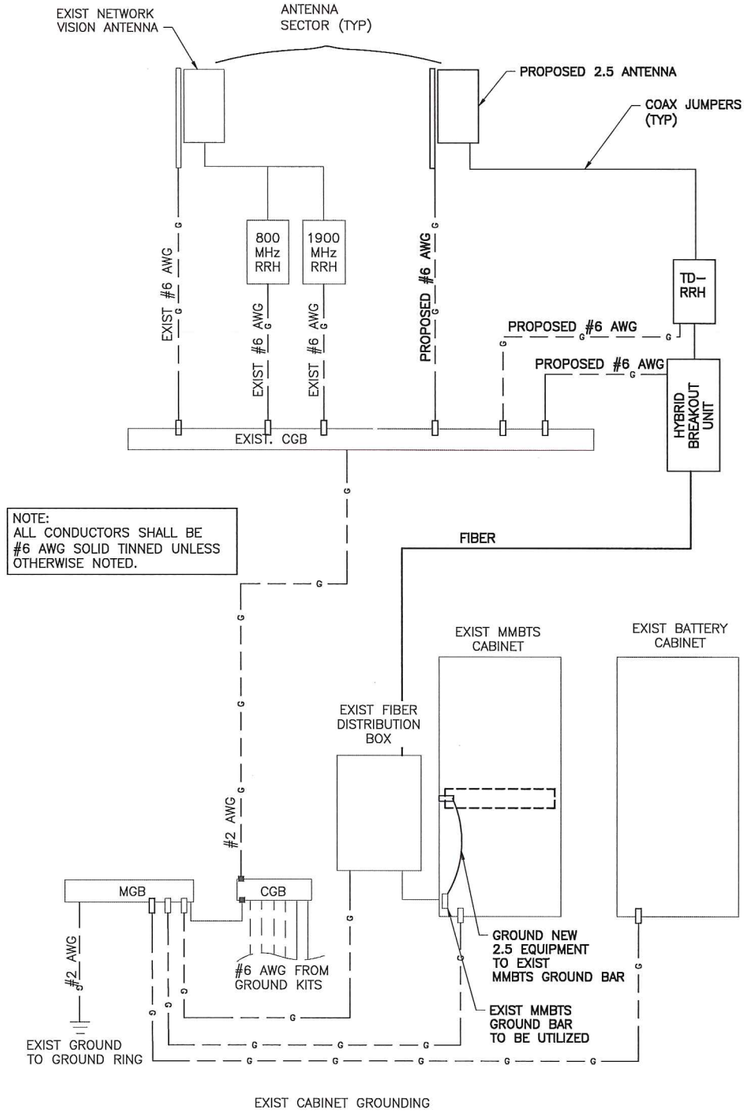
SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

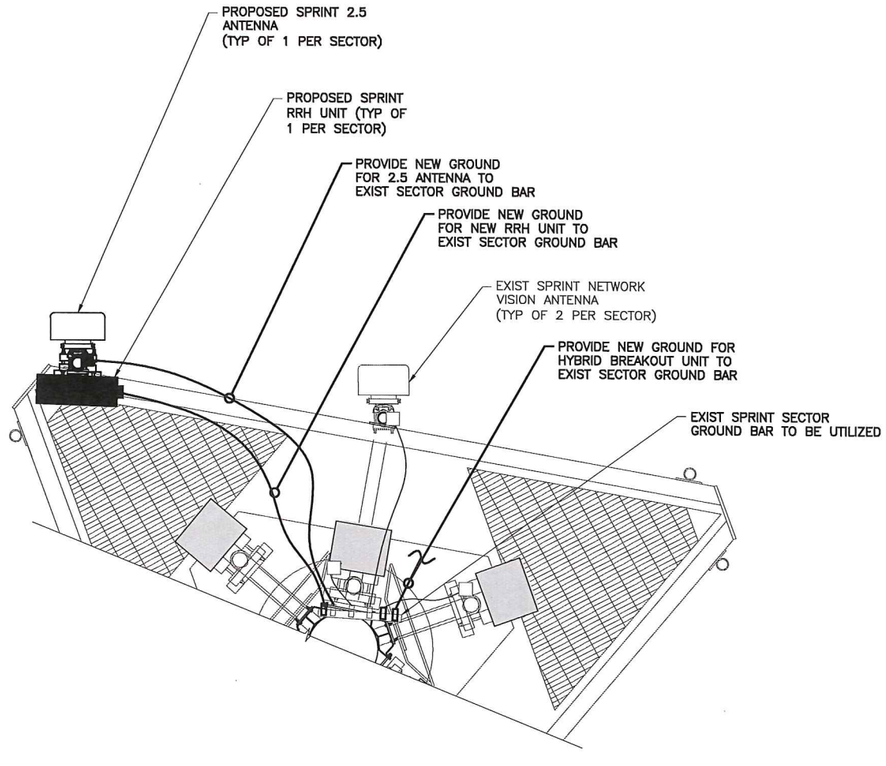
SHEET TITLE:
EQUIPMENT SCHEMATIC DETAILS

SHEET NO:
S-2



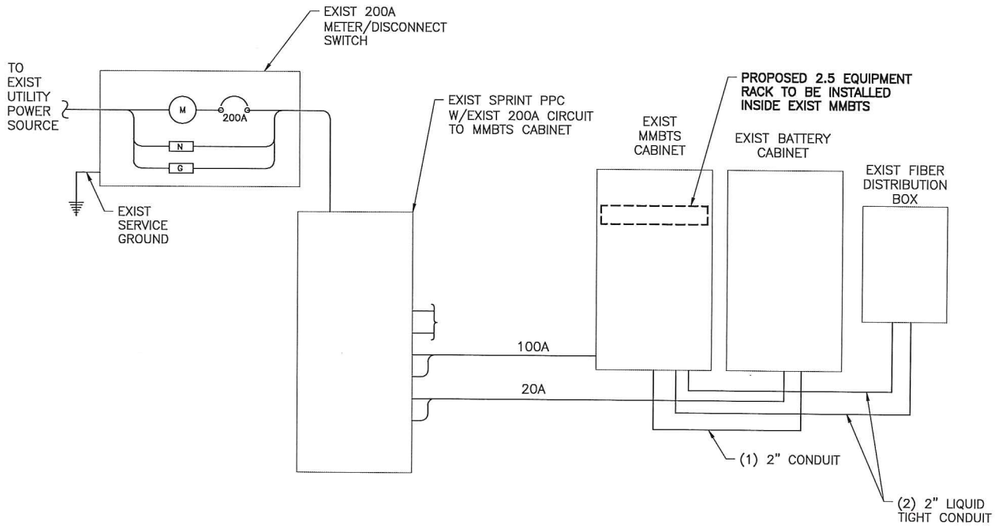
1 E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS



3 E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

CROWN CASTLE

TECTONIC
• PLANNING
• ENGINEERING
• SURVEYING
• CONSTRUCTION MANAGEMENT

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

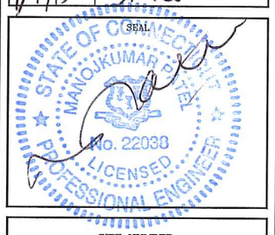
SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	SMQ

SEAL



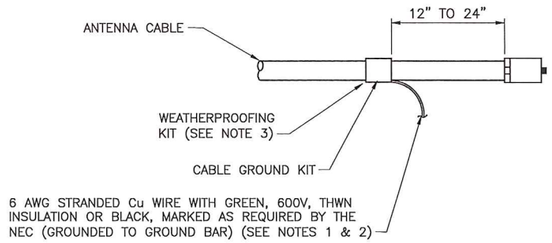
SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

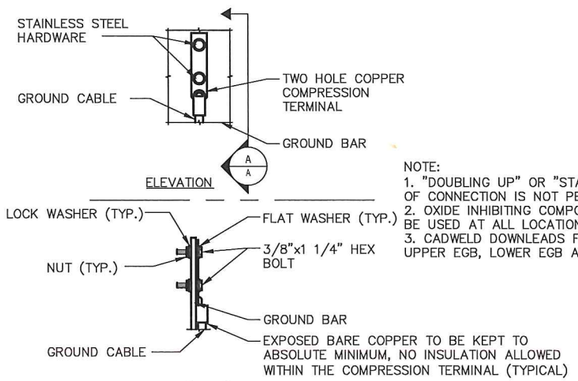
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

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.

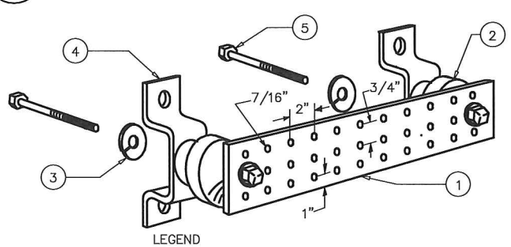


NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

SECTION "A-A"

2 E-2 GROUNDING BAR CONN. DETAIL

SCALE: NTS



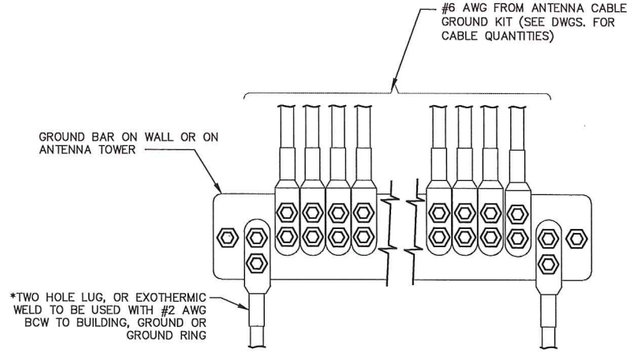
LEGEND

1- COPPER TINNED GROUND BAR, 1/4"X 4"X 20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2- INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3- 5/8" LOCKWASHERS OR EQUAL
4- WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
5- 5/8-11 X 1" H.H.C.S.BOLTS

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

3 E-2 GROUNDING BAR DETAIL

SCALE: NTS



* - GROUND BARS AT THE BOTTOM OF TOWERS/MONOPOLES SHALL ONLY USE EXOTHERMIC WELDS.

- ATTACH "DO NOT DISCONNECT" LABELS TO GROUND BARS. CAN USE BRASS TAG "DO NOT DISCONNECT" AT EACH HYBRID GROUND POINT OR BACK-A-LITE PLATE LABEL ON GROUND BAR.

- CONNECT SEQUENCE- BOLT/WASHER/NO-OX/GROUND BAR/NO-OX/WASHER/LOCK-WASHER/NUT. THIS IS REPEATED FOR EACH LUG CONNECTION POINT.

4 E-2 ANTENNA GROUND BAR DETAIL

SCALE: NTS

GROUNDING NOTES:

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

PROTECTIVE GROUNDING SYSTEM GENERAL NOTES:

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

ELECTRICAL AND GROUNDING NOTES

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

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

CROWN CASTLE

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

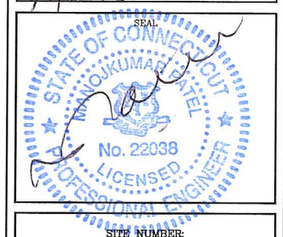
SUBMITTALS

PROJECT NO: 7225.CT03XC365

NO	DATE	DESCRIPTION	BY
0	06/16/14	FOR COMMENT	JT
1	01/09/15	FOR CONSTRUCTION	MP

DATE	REVIEWED BY
1/9/15	JMQ

SEAL:



SITE NUMBER:
CT03XC365

SITE NAME:
UPPER STEPNEY-TLC

SITE ADDRESS:
474-480 MAIN STREET
MONROE, CT 06468

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E-2

Date: **August 02, 2017**

Marianne Dunst
Crown Castle
3530 Toringdon Way
Charlotte, NC 28277

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

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC365
	Carrier Site Name:	CT03XC365
Crown Castle Designation:	**Crown Castle BU Number:**	876355
	Crown Castle Site Name:	UPPER STEPNEY - TLC
	Crown Castle JDE Job Number:	450665
	Crown Castle Work Order Number:	1436426
	Crown Castle Application Number:	399301 Rev. 0
Engineering Firm Designation:	**Crown Castle Project Number:**	1436426
Site Data:	**474-480 Main St., MONROE, Fairfield County, CT** **Latitude *41° 19' 31.99"*, Longitude *-73° 15' 57.05"*** **191.5 Foot - Monopole Tower**	

Dear Marianne Dunst,

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1436426, in accordance with application 399301, revision 0.

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

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B and Risk Category II were used in this analysis.

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

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

Structural analysis prepared by: Mahdis Arianpour/ KB

Respectfully submitted by:

STATE OF CONNECTICUT
TERRY P. STYRAN
31522
LICENSED
PROFESSIONAL ENGINEER

8/3/2017

Terry P. Styran, P.E.
Senior Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 191.5 ft Monopole tower designed by Engineered Endeavors, Inc. in October of 2000. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category B.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150.0	154.0	3	alcatel lucent	TD-RRH8x20-25	1	1-1/4	-
	152.0	3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
192.0	194.0	12	ems wireless	RV65-18-02DPL2 w/ Mount Pipe	24	1-5/8	1
		6	ericsson	KRY 112 144/1			
	192.0	1	tower mounts	T-Arm Mount [TA 602-3]			
160.0	160.0	3	alcatel lucent	AWS4 (B66) 4x45 RRH	1	1-5/8	2
		3	kathrein	742 213 w/ Mount Pipe			
		1	rfs celwave	DB-B1-6C-8AB-0Z			
		2	antel	BXA-171063-12BF w/ Mount Pipe	12	1-5/8	1
		1	antel	BXA-171063-8BF-2 w/ Mount Pipe			
		2	antel	BXA-70063-6CF-2 w/ Mount Pipe			
		1	antel	BXA-70063/4CF w/ Mount Pipe			
		4	antel	LPA-80063/6CF w/ Mount Pipe			
		2	antel	LPA-80080/4CF w/ Mount Pipe			
		6	rfs celwave	FD9R6004/2C-3L			
		1	tower mounts	Platform Mount [LP 303-1]			
154.0	154.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
	152.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER			
		3	alcatel lucent	800MHZ 2X50W RRH			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		1	tower mounts	Side Arm Mount [SO 102-3]			
150.0	152.0	3	alcatel lucent	800 EXTERNAL NOTCH FILTER	-	-	3
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	1
	150.0	9	rfs celwave	ACU-A20-N			
		1	tower mounts	Platform Mount [LP 601-1]			
137.0	140.0	3	ericsson	RRUS-11	6 1 2 1	1-1/4 3/8 5/8 conduit	1
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		3	powerwave technologies	P65-16-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	139.0	6	powerwave technologies	LGP21401			
	137.0	1	tower mounts	Platform Mount [LP 303-1]			
50.0	52.0	1	kathrein	OG-860/1920/GPS-A	1	1/2	1
	50.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not Considered In This Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
191.5	191.5	12	Dapa	48000	-	-
181.5	181.5	12	Dapa	48000	-	-
171.5	171.5	12	Dapa	48000	-	-
161.5	161.5	12	Dapa	48000	-	-
150.0	150.0	12	Dapa	48000	-	-
140.0	140.0	12	Dapa	48000	-	-
50.0	50.0	1	generic	GPS Antenna	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Clarence Welti Associates, Inc.	1531885	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Engineering Endeavors, Inc.	1631625	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Engineering Endeavors, Inc.	1631582	CCISITES

3.1) Analysis Method

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

3.2) Assumptions

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

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	191.5 - 172.46	Pole	TP20.46x15.5x0.188	1	-2.218	852.683	16.5	Pass
L2	172.46 - 127.753	Pole	TP31.6x19.282x0.313	2	-15.180	2220.140	37.9	Pass
L3	127.753 - 83.0833	Pole	TP42.19x29.815x0.438	3	-26.728	4156.060	41.0	Pass
L4	83.0833 - 40.4567	Pole	TP52.59x39.847x0.5	4	-42.598	5916.280	39.5	Pass
L5	40.4567 - 0	Pole	TP62x49.727x0.5	5	-64.859	6834.140	43.2	Pass
							Summary	
						Pole (L5)	43.2	Pass
						Rating =	43.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.5	Pass
1	Base Plate	0	52.0	Pass
1	Base Foundation (Structure)	0	39.5	Pass
1	Base Foundation (Soil Interaction)	0	52.9	Pass

Structure Rating (max from all components) =	**52.9%**

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

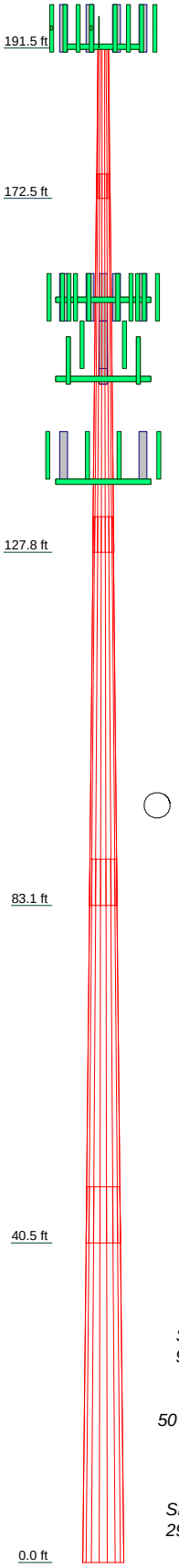
4.1) Recommendations

The tower and its base foundation have sufficient capacity to carry the existing, reserved and proposed loading. 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	19.040	18	0.188	3.083	15.500	20.460		0.7
2	47.790	18	0.313	4.500	19.282	31.600		4.1
3	49.170	18	0.438	5.833	29.815	42.190	A572-65	8.3
4	48.460	18	0.500	7.083	39.847	52.590		12.0
5	47.540	18	0.500		49.727	62.000		14.2
								39.2



ALL REACTIONS ARE FACTORED

AXIAL 98 K

SHEAR 9 K

MOMENT 1140 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 0.750 in ICE

AXIAL 65 K

SHEAR 29 K

MOMENT 3653 kip-ft

TORQUE 1 kip-ft

REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) RV65-18-02DPL2 w/ Mount Pipe	192	800MHZ 2X50W RRH	154
(4) RV65-18-02DPL2 w/ Mount Pipe	192	Side Arm Mount [SO 102-3]	154
(4) RV65-18-02DPL2 w/ Mount Pipe	192	APXVSPP18-C-A20 w/ Mount Pipe	150
(2) KRY 112 144/1	192	APXVSPP18-C-A20 w/ Mount Pipe	150
(2) KRY 112 144/1	192	APXVSPP18-C-A20 w/ Mount Pipe	150
(2) KRY 112 144/1	192	(3) ACU-A20-N	150
T-Arm Mount [TA 602-3]	192	(3) ACU-A20-N	150
Lightning Rod 5/8" x 5'	191.5	(3) ACU-A20-N	150
(2) LPA-80063/6CF w/ Mount Pipe	160	APXVTM14-C-120 w/ Mount Pipe	150
(2) LPA-80063/6CF w/ Mount Pipe	160	APXVTM14-C-120 w/ Mount Pipe	150
(2) LPA-80080/4CF w/ Mount Pipe	160	APXVTM14-C-120 w/ Mount Pipe	150
BXA-70063-6CF-2 w/ Mount Pipe	160	TD-RRH8x20-25	150
BXA-70063-6CF-2 w/ Mount Pipe	160	TD-RRH8x20-25	150
BXA-70063/4CF w/ Mount Pipe	160	TD-RRH8x20-25	150
BXA-171063-12BF w/ Mount Pipe	160	Platform Mount [LP 601-1]	150
BXA-171063-12BF w/ Mount Pipe	160	6' Climbing Ladder (Flat)	150
BXA-171063-8BF-2 w/ Mount Pipe	160	(2) 6' x 2" Mount Pipe	150
(2) FD9R6004/2C-3L	160	(2) 6' x 2" Mount Pipe	150
(2) FD9R6004/2C-3L	160	(2) 6' x 2" Mount Pipe	150
(2) FD9R6004/2C-3L	160	7770.00 w/ Mount Pipe	137
742 213 w/ Mount Pipe	160	7770.00 w/ Mount Pipe	137
742 213 w/ Mount Pipe	160	7770.00 w/ Mount Pipe	137
742 213 w/ Mount Pipe	160	P65-16-XLH-RR w/ Mount Pipe	137
AWS4 (B66) 4x45 RRH	160	P65-16-XLH-RR w/ Mount Pipe	137
AWS4 (B66) 4x45 RRH	160	P65-16-XLH-RR w/ Mount Pipe	137
AWS4 (B66) 4x45 RRH	160	(2) LGP21401	137
DB-B1-6C-8AB-0Z	160	(2) LGP21401	137
Platform Mount [LP 303-1]	160	(2) LGP21401	137
PCS 1900MHz 4x45W-65MHz	154	RRUS-11	137
PCS 1900MHz 4x45W-65MHz	154	RRUS-11	137
PCS 1900MHz 4x45W-65MHz	154	RRUS-11	137
800 EXTERNAL NOTCH FILTER	154	DC6-48-60-18-8F	137
800 EXTERNAL NOTCH FILTER	154	Platform Mount [LP 303-1]	137
800 EXTERNAL NOTCH FILTER	154	OG-860/1920/GPS-A	50
800MHZ 2X50W RRH	154	Side Arm Mount [SO 701-1]	50
800MHZ 2X50W RRH	154		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 43.2%

CROWN CASTLE
The Foundation for a wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX: (724) 416-2254

Job: ***BU# 876355***			
Project:			
Client: Crown Castle	Drawn by: Kibreab Gebremariam		App'd:
Code: TIA-222-G	Date: 08/02/17		Scale: NTS
Path: C:\Users\kgebremariam\Desktop\E\876355.eri			Dwg No. E-1

Tower Input Data

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

1) Tower is located in Fairfield County, Connecticut.
2) Basic wind speed of 97 mph.
3) Structure Class II.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.000 ft.
7) Nominal ice thickness of 0.750 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in pole design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *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	191.500-172.460	19.040	3.083	18	15.500	20.460	0.188	0.750	A572-65 (65 ksi)
L2	172.460-127.753	47.790	4.500	18	19.282	31.600	0.313	1.250	A572-65 (65 ksi)
L3	127.753-83.083	49.170	5.833	18	29.815	42.190	0.438	1.750	A572-65 (65 ksi)
L4	83.083-40.457	48.460	7.083	18	39.847	52.590	0.500	2.000	A572-65 (65 ksi)
L5	40.457-0.000	47.540		18	49.727	62.000	0.500	2.000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.739	9.113	269.950	5.436	7.874	34.284	540.256	4.557	2.398	12.789
	20.776	12.065	626.423	7.197	10.394	60.270	1253.670	6.033	3.271	17.445
L2	20.386	18.815	855.356	6.734	9.795	87.324	1711.837	9.409	2.844	9.099
	32.087	31.033	3838.018	11.107	16.053	239.087	7681.086	15.520	5.012	16.037
L3	31.425	40.794	4448.064	10.429	15.146	293.678	8901.981	20.401	4.477	10.234
	42.841	57.979	12769.382	14.822	21.433	595.795	25555.567	28.995	6.655	15.212
L4	42.019	62.444	12213.654	13.968	20.242	603.375	24443.379	31.228	6.133	12.266
	53.401	82.667	28338.539	18.492	26.716	1060.744	56714.366	41.341	8.376	16.752
L5	52.351	78.124	23918.500	17.476	25.261	946.836	47868.472	39.069	7.872	15.744
	62.956	97.600	46637.979	21.833	31.496	1480.759	93337.326	48.810	10.032	20.064

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 191.500-172.460				1	1	1			
L2 172.460-127.753				1	1	1			
L3 127.753-83.083				1	1	1			
L4 83.083-40.457				1	1	1			
L5 40.457-0.000				1	1	1			

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
HB158-1-08U8-S8J18(1-5/8")	B	Surface Ar (CaAa)	160.000 - 0.000	1	1	0.450 0.500	1.980		0.001
*									

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
*								
Climbing Ladder (Flat)	A	No	CaAa (Out Of Face)	152.000 - 144.000	1	No Ice 1/2" Ice 1" Ice	0.584 1.030 1.476	0.005 0.007 0.010
*								
LDF7-50A(1-5/8")	A	No	Inside Pole	191.500 - 0.000	24	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*								
AVA7-50(1-5/8")	B	No	Inside Pole	160.000 - 0.000	12	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*								
HB114-1-0813U4-	A	No	Inside Pole	150.000 - 0.000	3	No Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
M5J(1-1/4)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
HB114-21U3M12-XXXF(1-1/4)	A	No	Inside Pole	150.000 - 0.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
*								
LDF6-50A(1-1/4")	B	No	Inside Pole	137.000 - 0.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
FB-L98B-002-75000(3/8")	B	No	Inside Pole	137.000 - 0.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG82ST-BRDA(5/8")	C	No	Inside Pole	137.000 - 0.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
2" Rigid Conduit	C	No	Inside Pole	137.000 - 0.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
*								
LDF4-50A(1/2")	A	No	Inside Pole	50.000 - 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	191.500-172.460	A	0.000	0.000	0.000	0.000	0.375
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	172.460-127.753	A	0.000	0.000	0.000	4.675	1.026
		B	0.000	0.000	6.385	0.000	0.350
		C	0.000	0.000	0.000	0.000	0.032
L3	127.753-83.083	A	0.000	0.000	0.000	0.000	1.094
		B	0.000	0.000	8.845	0.000	0.613
		C	0.000	0.000	0.000	0.000	0.153
L4	83.083-40.457	A	0.000	0.000	0.000	0.000	1.046
		B	0.000	0.000	8.440	0.000	0.585
		C	0.000	0.000	0.000	0.000	0.146
L5	40.457-0.000	A	0.000	0.000	0.000	0.000	0.997
		B	0.000	0.000	8.010	0.000	0.555
		C	0.000	0.000	0.000	0.000	0.138

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	191.500-172.460	A	1.779	0.000	0.000	0.000	0.000	0.375
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	172.460-127.753	A	1.744	0.000	0.000	0.000	17.366	1.127
		B		0.000	0.000	17.857	0.000	0.613
		C		0.000	0.000	0.000	0.000	0.032
L3	127.753-83.083	A	1.683	0.000	0.000	0.000	0.000	1.094
		B		0.000	0.000	24.423	0.000	0.967
		C		0.000	0.000	0.000	0.000	0.153
L4	83.083-40.457	A	1.596	0.000	0.000	0.000	0.000	1.046
		B		0.000	0.000	22.792	0.000	0.906
		C		0.000	0.000	0.000	0.000	0.146
L5	40.457-0.000	A	1.424	0.000	0.000	0.000	0.000	0.997

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
		B		0.000	0.000	20.926	0.000	0.837
		C		0.000	0.000	0.000	0.000	0.138

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	191.500-172.460	0.000	0.000	0.000	0.000
L2	172.460-127.753	0.192	-0.044	0.400	-0.188
L3	127.753-83.083	0.258	0.132	0.597	0.304
L4	83.083-40.457	0.259	0.132	0.609	0.310
L5	40.457-0.000	0.259	0.132	0.606	0.309

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	8	HB158-1-08U8-S8J18(1-5/8")	172.46 - 160.00	1.0000	1.0000
L2	8	HB158-1-08U8-S8J18(1-5/8")	127.75 - 160.00	1.0000	1.0000
L3	8	HB158-1-08U8-S8J18(1-5/8")	83.08 - 127.75	1.0000	1.0000
L4	8	HB158-1-08U8-S8J18(1-5/8")	40.46 - 83.08	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 5/8" x 5'	C	From Leg	0.000 0.000 2.000	0.000	191.500	No Ice 1/2" Ice 1" Ice	0.313 0.826 1.322	0.313 0.826 1.322	0.006 0.010 0.016
***									
(4) RV65-18-02DPL2 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	192.000	No Ice 1/2" Ice 1" Ice	3.537 3.954 4.368	3.294 4.020 4.696	0.031 0.064 0.103
(4) RV65-18-02DPL2 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	192.000	No Ice 1/2" Ice 1" Ice	3.537 3.954 4.368	3.294 4.020 4.696	0.031 0.064 0.103
(4) RV65-18-02DPL2 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	192.000	No Ice 1/2" Ice	3.537 3.954 4.368	3.294 4.020 4.696	0.031 0.064 0.103

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) KRY 112 144/1	A	From Leg	4.000 0.000 2.000	0.000	192.000	No Ice 1/2" Ice 1" Ice	0.350 0.426 0.509	0.175 0.234 0.301	0.011 0.014 0.019
(2) KRY 112 144/1	B	From Leg	4.000 0.000 2.000	0.000	192.000	No Ice 1/2" Ice 1" Ice	0.350 0.426 0.509	0.175 0.234 0.301	0.011 0.014 0.019
(2) KRY 112 144/1	C	From Leg	4.000 0.000 2.000	0.000	192.000	No Ice 1/2" Ice 1" Ice	0.350 0.426 0.509	0.175 0.234 0.301	0.011 0.014 0.019
T-Arm Mount [TA 602-3]	C	None		0.000	192.000	No Ice 1/2" Ice 1" Ice	11.590 15.440 19.290	11.590 15.440 19.290	0.774 0.990 1.206
***									
(2) LPA-80063/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	160.000	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-80063/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	160.000	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-80080/4CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	2.856 3.220 3.592	6.569 7.195 7.837	0.030 0.076 0.128
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	160.000	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	B	From Leg	4.000 0.000 0.000	0.000	160.000	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-70063/4CF w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	4.945 5.324 5.712	3.616 4.217 4.834	0.028 0.070 0.118
BXA-171063-12BF w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	4.971 5.521 6.036	5.228 6.389 7.261	0.040 0.086 0.139
BXA-171063-12BF w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	4.971 5.521 6.036	5.228 6.389 7.261	0.040 0.086 0.139
BXA-171063-8BF-2 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	160.000	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
(2) FD9R6004/2C-3L	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	0.314 0.386 0.466	0.076 0.119 0.169	0.003 0.005 0.009
(2) FD9R6004/2C-3L	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	0.314 0.386 0.466	0.076 0.119 0.169	0.003 0.005 0.009
(2) FD9R6004/2C-3L	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice	0.314 0.386 0.466	0.076 0.119 0.169	0.003 0.005 0.009

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
742 213 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	5.373 5.950 6.501	4.620 6.000 6.982	0.049 0.094 0.146
742 213 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	5.373 5.950 6.501	4.620 6.000 6.982	0.049 0.094 0.146
742 213 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	5.373 5.950 6.501	4.620 6.000 6.982	0.049 0.094 0.146
AWS4 (B66) 4x45 RRH	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	2.660 2.878 3.104	1.586 1.769 1.959	0.064 0.084 0.108
AWS4 (B66) 4x45 RRH	B	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	2.660 2.878 3.104	1.586 1.769 1.959	0.064 0.084 0.108
AWS4 (B66) 4x45 RRH	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	2.660 2.878 3.104	1.586 1.769 1.959	0.064 0.084 0.108
DB-B1-6C-8AB-0Z	C	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice	4.800 5.070 5.348	2.000 2.193 2.393	0.044 0.080 0.120
Platform Mount [LP 303-1]	C	None		0.000	160.000	No Ice 1/2" Ice 1" Ice	14.660 18.870 23.080	14.660 18.870 23.080	1.250 1.481 1.713
***									
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.060 0.083 0.110
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.060 0.083 0.110
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.000 0.000 0.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.322 2.527 2.739	2.238 2.441 2.651	0.060 0.083 0.110
800 EXTERNAL NOTCH FILTER	A	From Leg	2.000 0.000 -2.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER	B	From Leg	2.000 0.000 -2.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800 EXTERNAL NOTCH FILTER	C	From Leg	2.000 0.000 -2.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	0.660 0.763 0.873	0.321 0.398 0.483	0.011 0.017 0.024
800MHZ 2X50W RRH	A	From Leg	2.000 0.000 -2.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.053 0.074 0.098
800MHZ 2X50W RRH	B	From Leg	2.000 0.000 -2.000	0.000	154.000	No Ice 1/2" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.053 0.074 0.098

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
						1" Ice			
800MHZ 2X50W RRH	C	From Leg	2.000 0.000 -2.000	0.000	154.000	No Ice 1/2" Ice 1" Ice	2.134 2.320 2.512	1.773 1.946 2.127	0.053 0.074 0.098
Side Arm Mount [SO 102-3]	C	None		0.000	154.000	No Ice 1/2" Ice 1" Ice	3.000 3.480 3.960	3.000 3.480 3.960	0.081 0.111 0.141
*									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	8.262 8.822 9.346	6.946 8.127 9.021	0.083 0.151 0.227
(3) ACU-A20-N	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.067 0.104 0.148	0.117 0.162 0.215	0.001 0.002 0.004
(3) ACU-A20-N	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.067 0.104 0.148	0.117 0.162 0.215	0.001 0.002 0.004
(3) ACU-A20-N	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	0.067 0.104 0.148	0.117 0.162 0.215	0.001 0.002 0.004
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	6.580 7.031 7.473	4.959 5.754 6.472	0.074 0.128 0.190
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	6.580 7.031 7.473	4.959 5.754 6.472	0.074 0.128 0.190
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	150.000	No Ice 1/2" Ice 1" Ice	6.580 7.031 7.473	4.959 5.754 6.472	0.074 0.128 0.190
TD-RRH8x20-25	A	From Leg	4.000 0.000 4.000	0.000	150.000	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	B	From Leg	4.000 0.000 4.000	0.000	150.000	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	C	From Leg	4.000 0.000 4.000	0.000	150.000	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
Platform Mount [LP 601-1]	C	None		0.000	150.000	No Ice 1/2" Ice 1" Ice	28.470 33.590 38.710	28.470 33.590 38.710	1.122 1.514 1.905
6' Climbing Ladder (Flat)	C	From Leg	2.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice	5.844 10.300 14.756	5.844 10.300 14.756	0.048 0.071 0.094

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
(2) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
(2) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022
			0.000			1/2"	1.925	1.925	0.033
			2.000			Ice	2.294	2.294	0.048
						1" Ice			
***									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	137.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			3.000			Ice	6.607	5.711	0.157
						1" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	137.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			3.000			Ice	6.607	5.711	0.157
						1" Ice			
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	137.000	No Ice	5.746	4.254	0.055
			0.000			1/2"	6.179	5.014	0.103
			3.000			Ice	6.607	5.711	0.157
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	A	From Leg	4.000	0.000	137.000	No Ice	8.371	6.362	0.079
			0.000			1/2"	8.931	7.538	0.144
			3.000			Ice	9.457	8.427	0.218
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	B	From Leg	4.000	0.000	137.000	No Ice	8.371	6.362	0.079
			0.000			1/2"	8.931	7.538	0.144
			3.000			Ice	9.457	8.427	0.218
						1" Ice			
P65-16-XLH-RR w/ Mount Pipe	C	From Leg	4.000	0.000	137.000	No Ice	8.371	6.362	0.079
			0.000			1/2"	8.931	7.538	0.144
			3.000			Ice	9.457	8.427	0.218
						1" Ice			
(2) LGP21401	A	From Leg	4.000	0.000	137.000	No Ice	1.104	0.207	0.014
			0.000			1/2"	1.239	0.274	0.021
			2.000			Ice	1.381	0.348	0.030
						1" Ice			
(2) LGP21401	B	From Leg	4.000	0.000	137.000	No Ice	1.104	0.207	0.014
			0.000			1/2"	1.239	0.274	0.021
			2.000			Ice	1.381	0.348	0.030
						1" Ice			
(2) LGP21401	C	From Leg	4.000	0.000	137.000	No Ice	1.104	0.207	0.014
			0.000			1/2"	1.239	0.274	0.021
			2.000			Ice	1.381	0.348	0.030
						1" Ice			
RRUS-11	A	From Leg	4.000	0.000	137.000	No Ice	2.784	1.187	0.048
			0.000			1/2"	2.992	1.334	0.068
			3.000			Ice	3.207	1.490	0.092
						1" Ice			
RRUS-11	B	From Leg	4.000	0.000	137.000	No Ice	2.784	1.187	0.048
			0.000			1/2"	2.992	1.334	0.068
			3.000			Ice	3.207	1.490	0.092
						1" Ice			
RRUS-11	C	From Leg	4.000	0.000	137.000	No Ice	2.784	1.187	0.048
			0.000			1/2"	2.992	1.334	0.068
			3.000			Ice	3.207	1.490	0.092
						1" Ice			
DC6-48-60-18-8F	C	From Leg	4.000	0.000	137.000	No Ice	0.791	0.791	0.020
			0.000			1/2"	1.274	1.274	0.035
			3.000			Ice	1.450	1.450	0.053

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount [LP 303-1]	C	None			0.000	137.000	1" Ice No Ice 1/2" Ice 1" Ice	14.660 18.870 23.080	14.660 18.870 23.080	1.250 1.481 1.713
***										
OG-860/1920/GPS-A	A	From Leg	2.000 0.000 2.000		0.000	50.000	No Ice 1/2" Ice 1" Ice	0.308 0.395 0.490	0.367 0.457 0.555	0.003 0.007 0.011
Side Arm Mount [SO 701-1]	A	From Leg	2.000 0.000 0.000		0.000	50.000	No Ice 1/2" Ice 1" Ice	0.850 1.140 1.430	1.670 2.340 3.010	0.065 0.079 0.093
******										

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	0.686	A	1	0.65	0.027	1	1	28.968	0.555	0.029	C
			B	1	0.65		1	1	28.968			
			C	1	0.65		1	1	28.968			
L2 172.460-127.753	1.407	4.053	A	1	0.65	0.025	1	1	97.747	1.898	0.042	C
			B	1	0.65		1	1	97.747			
			C	1	0.65		1	1	97.747			
L3 127.753-83.083	1.860	8.263	A	1	0.65	0.023	1	1	138.227	2.259	0.051	C
			B	1	0.65		1	1	138.227			
			C	1	0.65		1	1	138.227			
L4 83.083-40.457	1.776	11.964	A	1	0.65	0.020	1	1	169.477	2.371	0.056	C
			B	1	0.65		1	1	169.477			
			C	1	0.65		1	1	169.477			
L5 40.457-0.000	1.690	14.213	A	1	0.65	0.016	1	1	194.374	2.229	0.055	C
			B	1	0.65		1	1	194.374			
			C	1	0.65		1	1	194.374			
Sum Weight:	7.108	39.180						OTM	808.857 kip-ft	9.313		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	0.686	A	1	0.65	0.027	1	1	28.968	0.555	0.029	C
			B	1	0.65		1	1	28.968			
			C	1	0.65		1	1	28.968			
L2 172.460-127.753	1.407	4.053	A	1	0.65	0.025	1	1	97.747	1.898	0.042	C
			B	1	0.65		1	1	97.747			
			C	1	0.65		1	1	97.747			
L3 127.753-83.083	1.860	8.263	A	1	0.65	0.023	1	1	138.227	2.259	0.051	C
			B	1	0.65		1	1	138.227			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
			C	1	0.65		1	1	138.227			
L4 83.083-40.457	1.776	11.964	A	1	0.65	0.020	1	1	169.477	2.371	0.056	C
			B	1	0.65		1	1	169.477			
			C	1	0.65		1	1	169.477			
L5 40.457-0.000	1.690	14.213	A	1	0.65	0.016	1	1	194.374	2.229	0.055	C
			B	1	0.65		1	1	194.374			
			C	1	0.65		1	1	194.374			
Sum Weight:	7.108	39.180						OTM	808.857 kip-ft	9.313		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	0.686	A	1	0.65	0.027	1	1	28.968	0.555	0.029	C
			B	1	0.65		1	1	28.968			
			C	1	0.65		1	1	28.968			
L2 172.460-127.753	1.407	4.053	A	1	0.65	0.025	1	1	97.747	1.898	0.042	C
			B	1	0.65		1	1	97.747			
			C	1	0.65		1	1	97.747			
L3 127.753-83.083	1.860	8.263	A	1	0.65	0.023	1	1	138.227	2.259	0.051	C
			B	1	0.65		1	1	138.227			
			C	1	0.65		1	1	138.227			
L4 83.083-40.457	1.776	11.964	A	1	0.65	0.020	1	1	169.477	2.371	0.056	C
			B	1	0.65		1	1	169.477			
			C	1	0.65		1	1	169.477			
L5 40.457-0.000	1.690	14.213	A	1	0.65	0.016	1	1	194.374	2.229	0.055	C
			B	1	0.65		1	1	194.374			
			C	1	0.65		1	1	194.374			
Sum Weight:	7.108	39.180						OTM	808.857 kip-ft	9.313		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	1.512	A	1	1.2	0.007	1	1	34.613	0.326	0.017	C
			B	1	1.2		1	1	34.613			
			C	1	1.2		1	1	34.613			
L2 172.460-127.753	1.772	6.707	A	1	1.2	0.007	1	1	111.001	1.113	0.025	C
			B	1	1.2		1	1	111.001			
			C	1	1.2		1	1	111.001			
L3 127.753-83.083	2.214	11.814	A	1	1.2	0.006	1	1	151.209	1.212	0.027	C
			B	1	1.2		1	1	151.209			
			C	1	1.2		1	1	151.209			
L4 83.083-40.457	2.097	16.044	A	1	1.2	0.005	1	1	181.437	1.245	0.029	C
			B	1	1.2		1	1	181.437			
			C	1	1.2		1	1	181.437			
L5 40.457-0.000	1.973	18.352	A	1	1.2	0.004	1	1	205.137	1.154	0.029	C
			B	1	1.2		1	1	205.137			
			C	1	1.2		1	1	205.137			
Sum Weight:	8.431	54.430						OTM	450.615 kip-ft	5.050		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	1.512	A	1	1.2	0.007	1	1	34.613	0.326	0.017	C
			B	1	1.2		1	1	34.613			
			C	1	1.2		1	1	34.613			
L2 172.460-127.753	1.772	6.707	A	1	1.2	0.007	1	1	111.001	1.113	0.025	C
			B	1	1.2		1	1	111.001			
			C	1	1.2		1	1	111.001			
L3 127.753-83.083	2.214	11.814	A	1	1.2	0.006	1	1	151.209	1.212	0.027	C
			B	1	1.2		1	1	151.209			
			C	1	1.2		1	1	151.209			
L4 83.083-40.457	2.097	16.044	A	1	1.2	0.005	1	1	181.437	1.245	0.029	C
			B	1	1.2		1	1	181.437			
			C	1	1.2		1	1	181.437			
L5 40.457-0.000	1.973	18.352	A	1	1.2	0.004	1	1	205.137	1.154	0.029	C
			B	1	1.2		1	1	205.137			
			C	1	1.2		1	1	205.137			
Sum Weight:	8.431	54.430						OTM	450.615 kip-ft	5.050		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	1.512	A	1	1.2	0.007	1	1	34.613	0.326	0.017	C
			B	1	1.2		1	1	34.613			
			C	1	1.2		1	1	34.613			
L2 172.460-127.753	1.772	6.707	A	1	1.2	0.007	1	1	111.001	1.225	0.027	A
			B	1	1.2		1	1	111.001			
			C	1	1.2		1	1	111.001			
L3 127.753-83.083	2.214	11.814	A	1	1.2	0.006	1	1	151.209	1.212	0.027	C
			B	1	1.2		1	1	151.209			
			C	1	1.2		1	1	151.209			
L4 83.083-40.457	2.097	16.044	A	1	1.2	0.005	1	1	181.437	1.245	0.029	C
			B	1	1.2		1	1	181.437			
			C	1	1.2		1	1	181.437			
L5 40.457-0.000	1.973	18.352	A	1	1.2	0.004	1	1	205.137	1.154	0.029	C
			B	1	1.2		1	1	205.137			
			C	1	1.2		1	1	205.137			
Sum Weight:	8.431	54.430						OTM	467.273 kip-ft	5.162		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 191.500-	0.375	0.686	A	1	0.65	0.009	1	1	28.968	0.190	0.010	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
172.460			B	1	0.65		1	1	28.968			
			C	1	0.65		1	1	28.968			
L2 172.460-127.753	1.407	4.053	A	1	0.65	0.009	1	1	97.747	0.650	0.015	C
			B	1	0.65		1	1	97.747			
			C	1	0.65		1	1	97.747			
L3 127.753-83.083	1.860	8.263	A	1	0.65	0.008	1	1	138.227	0.773	0.017	C
			B	1	0.65		1	1	138.227			
			C	1	0.65		1	1	138.227			
L4 83.083-40.457	1.776	11.964	A	1	0.65	0.007	1	1	169.477	0.812	0.019	C
			B	1	0.65		1	1	169.477			
			C	1	0.65		1	1	169.477			
L5 40.457-0.000	1.690	14.213	A	1	0.65	0.005	1	1	194.374	0.763	0.019	C
			B	1	0.65		1	1	194.374			
			C	1	0.65		1	1	194.374			
Sum Weight:	7.108	39.180						OTM	276.902 kip-ft	3.188		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	0.686	A	1	0.65	0.009	1	1	28.968	0.190	0.010	C
			B	1	0.65		1	1	28.968			
			C	1	0.65		1	1	28.968			
L2 172.460-127.753	1.407	4.053	A	1	0.65	0.009	1	1	97.747	0.650	0.015	C
			B	1	0.65		1	1	97.747			
			C	1	0.65		1	1	97.747			
L3 127.753-83.083	1.860	8.263	A	1	0.65	0.008	1	1	138.227	0.773	0.017	C
			B	1	0.65		1	1	138.227			
			C	1	0.65		1	1	138.227			
L4 83.083-40.457	1.776	11.964	A	1	0.65	0.007	1	1	169.477	0.812	0.019	C
			B	1	0.65		1	1	169.477			
			C	1	0.65		1	1	169.477			
L5 40.457-0.000	1.690	14.213	A	1	0.65	0.005	1	1	194.374	0.763	0.019	C
			B	1	0.65		1	1	194.374			
			C	1	0.65		1	1	194.374			
Sum Weight:	7.108	39.180						OTM	276.902 kip-ft	3.188		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 191.500-172.460	0.375	0.686	A	1	0.65	0.009	1	1	28.968	0.190	0.010	C
			B	1	0.65		1	1	28.968			
			C	1	0.65		1	1	28.968			
L2 172.460-127.753	1.407	4.053	A	1	0.65	0.009	1	1	97.747	0.650	0.015	C
			B	1	0.65		1	1	97.747			
			C	1	0.65		1	1	97.747			
L3 127.753-83.083	1.860	8.263	A	1	0.65	0.008	1	1	138.227	0.773	0.017	C
			B	1	0.65		1	1	138.227			
			C	1	0.65		1	1	138.227			
L4 83.083-	1.776	11.964	A	1	0.65	0.007	1	1	169.477	0.812	0.019	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
40.457			B	1	0.65		1	1	169.477			
			C	1	0.65		1	1	169.477			
L5 40.457-0.000	1.690	14.213	A	1	0.65	0.005	1	1	194.374	0.763	0.019	C
			B	1	0.65		1	1	194.374			
			C	1	0.65		1	1	194.374			
Sum Weight:	7.108	39.180						OTM	276.902 kip-ft	3.188		

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
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	191.5 - 172.46	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-5.910	0.006	-0.007
			Max. Mx	20	-2.220	55.359	0.012
			Max. My	14	-2.219	-0.013	-55.366
			Max. Vy	8	3.547	-55.351	-0.005
			Max. Vx	2	-3.548	0.005	55.361
			Max. Torque	32			-0.010
L2	172.46 - 127.753	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-34.921	-1.196	0.477
			Max. Mx	20	-15.195	507.009	1.972
			Max. My	14	-15.185	-1.939	-509.335
			Max. Vy	8	18.285	-506.833	-2.129
			Max. Vx	14	18.370	-1.939	-509.335
			Max. Torque	25			-1.725
L3	127.753 - 83.0833	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.206	-1.758	0.206
			Max. Mx	8	-26.738	-1375.234	-5.369
			Max. My	14	-26.731	-5.257	-1381.377
			Max. Vy	8	21.788	-1375.234	-5.369
			Max. Vx	14	21.873	-5.257	-1381.377
			Max. Torque	25			-0.831
L4	83.0833 - 40.4567	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-70.521	-2.425	0.447
			Max. Mx	8	-42.602	-2349.418	-8.138
			Max. My	2	-42.599	8.189	2358.947
			Max. Vy	8	25.281	-2349.418	-8.138
			Max. Vx	2	-25.336	8.189	2358.947
			Max. Torque	11			1.054
L5	40.4567 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-98.185	-3.295	0.003
			Max. Mx	8	-64.859	-3634.468	-11.632
			Max. My	2	-64.859	11.445	3646.327
			Max. Vy	8	28.697	-3634.468	-11.632
			Max. Vx	2	-28.749	11.445	3646.327
			Max. Torque	11			1.054

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	28	98.185	-4.408	7.634
	Max. H_x	20	64.871	28.670	0.070
	Max. H_z	2	64.871	0.070	28.722
	Max. M_x	2	3646.327	0.070	28.722
	Max. M_z	8	3634.468	-28.670	-0.070
	Max. Torsion	11	1.053	-24.864	-14.422
	Min. Vert	19	48.653	24.794	-14.300
	Min. H_x	8	64.871	-28.670	-0.070
	Min. H_z	14	64.871	-0.070	-28.722
	Min. M_x	14	-3646.140	-0.070	-28.722
	Min. M_z	20	-3633.905	28.670	0.070
	Min. Torsion	23	-1.048	24.864	14.422

Tower Mast Reaction Summary

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 Only	54.059	0.000	0.000	-0.079	-0.230	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	64.871	-0.070	-28.722	-3646.327	11.445	0.617
0.9 Dead+1.6 Wind 0 deg - No Ice	48.653	-0.070	-28.722	-3609.012	11.384	0.622
1.2 Dead+1.6 Wind 30 deg - No Ice	64.871	14.274	-24.839	-3152.001	-1807.230	0.108
0.9 Dead+1.6 Wind 30 deg - No Ice	48.653	14.274	-24.839	-3119.737	-1788.694	0.111
1.2 Dead+1.6 Wind 60 deg - No Ice	64.871	24.794	-14.300	-1813.085	-3141.744	-0.432
0.9 Dead+1.6 Wind 60 deg - No Ice	48.653	24.794	-14.300	-1794.524	-3109.558	-0.432
1.2 Dead+1.6 Wind 90 deg - No Ice	64.871	28.670	0.070	11.633	-3634.468	-0.856
0.9 Dead+1.6 Wind 90 deg - No Ice	48.653	28.670	0.070	11.523	-3597.249	-0.858
1.2 Dead+1.6 Wind 120 deg - No Ice	64.871	24.864	14.422	1833.187	-3153.426	-1.049
0.9 Dead+1.6 Wind 120 deg - No Ice	48.653	24.864	14.422	1814.444	-3121.112	-1.053
1.2 Dead+1.6 Wind 150 deg - No Ice	64.871	14.396	24.909	3163.503	-1827.507	-0.959
0.9 Dead+1.6 Wind 150 deg - No Ice	48.653	14.396	24.909	3131.155	-1808.745	-0.964
1.2 Dead+1.6 Wind 180 deg - No Ice	64.871	0.070	28.722	3646.140	-11.997	-0.612
0.9 Dead+1.6 Wind 180 deg - No Ice	48.653	0.070	28.722	3608.871	-11.795	-0.617
1.2 Dead+1.6 Wind 210 deg - No Ice	64.871	-14.274	24.839	3151.812	1806.671	-0.103
0.9 Dead+1.6 Wind 210 deg - No Ice	48.653	-14.274	24.839	3119.595	1788.277	-0.106
1.2 Dead+1.6 Wind 240 deg - No Ice	64.871	-24.794	14.300	1812.901	3141.180	0.431
0.9 Dead+1.6 Wind 240 deg - No Ice	48.653	-24.794	14.300	1794.386	3109.137	0.432
1.2 Dead+1.6 Wind 270 deg - No Ice	64.871	-28.670	-0.070	-11.809	3633.905	0.851
0.9 Dead+1.6 Wind 270 deg - No Ice	48.653	-28.670	-0.070	-11.656	3596.830	0.854
1.2 Dead+1.6 Wind 300 deg - No Ice	64.871	-24.864	-14.422	-1833.362	3152.871	1.044
0.9 Dead+1.6 Wind 300 deg - No Ice	48.653	-24.864	-14.422	-1814.576	3120.698	1.048
1.2 Dead+1.6 Wind 330 deg - No Ice	64.871	-14.396	-24.909	-3163.683	1826.957	0.959
0.9 Dead+1.6 Wind 330 deg - No Ice	48.653	-14.396	-24.909	-3131.291	1808.335	0.964
1.2 Dead+1.0 Ice+1.0 Temp	98.185	0.000	-0.000	-0.003	-3.295	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	98.185	-0.005	-8.706	-1120.660	-2.733	-0.159
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	98.185	4.408	-7.634	-985.743	-571.998	-0.211
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	98.185	7.542	-4.349	-559.626	-973.316	-0.207
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	98.185	8.712	0.005	0.800	-1123.815	-0.148
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	98.185	7.547	4.357	561.005	-974.143	-0.048
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	98.185	4.360	7.542	970.881	-564.404	0.064
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	98.185	0.005	8.706	1120.605	-4.388	0.159
1.2 Dead+1.0 Wind 210	98.185	-4.408	7.634	985.690	564.878	0.212

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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	98.185	-7.542	4.349	559.573	966.198	0.207
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	98.185	-8.712	-0.005	-0.854	1116.698	0.148
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	98.185	-7.547	-4.357	-561.060	967.025	0.048
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	98.185	-4.360	-7.542	-970.938	557.285	-0.064
Dead+Wind 0 deg - Service	54.059	-0.015	-6.145	-775.505	2.257	0.133
Dead+Wind 30 deg - Service	54.059	3.054	-5.315	-670.372	-384.508	0.048
Dead+Wind 60 deg - Service	54.059	5.305	-3.060	-385.634	-668.307	-0.050
Dead+Wind 90 deg - Service	54.059	6.134	0.015	2.413	-773.097	-0.135
Dead+Wind 120 deg - Service	54.059	5.320	3.086	389.793	-670.798	-0.184
Dead+Wind 150 deg - Service	54.059	3.080	5.330	672.707	-388.823	-0.183
Dead+Wind 180 deg - Service	54.059	0.015	6.145	775.349	-2.725	-0.133
Dead+Wind 210 deg - Service	54.059	-3.054	5.315	670.216	384.040	-0.048
Dead+Wind 240 deg - Service	54.059	-5.305	3.060	385.478	667.839	0.050
Dead+Wind 270 deg - Service	54.059	-6.134	-0.015	-2.569	772.628	0.135
Dead+Wind 300 deg - Service	54.059	-5.320	-3.086	-389.949	670.330	0.184
Dead+Wind 330 deg - Service	54.059	-3.080	-5.330	-672.863	388.354	0.183

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	-54.059	0.000	0.000	54.059	0.000	0.000%
2	-0.070	-64.871	-28.722	0.070	64.871	28.722	0.000%
3	-0.070	-48.653	-28.722	0.070	48.653	28.722	0.000%
4	14.274	-64.871	-24.839	-14.274	64.871	24.839	0.000%
5	14.274	-48.653	-24.839	-14.274	48.653	24.839	0.000%
6	24.794	-64.871	-14.300	-24.794	64.871	14.300	0.000%
7	24.794	-48.653	-14.300	-24.794	48.653	14.300	0.000%
8	28.670	-64.871	0.070	-28.670	64.871	-0.070	0.000%
9	28.670	-48.653	0.070	-28.670	48.653	-0.070	0.000%
10	24.864	-64.871	14.422	-24.864	64.871	-14.422	0.000%
11	24.864	-48.653	14.422	-24.864	48.653	-14.422	0.000%
12	14.396	-64.871	24.909	-14.396	64.871	-24.909	0.000%
13	14.396	-48.653	24.909	-14.396	48.653	-24.909	0.000%
14	0.070	-64.871	28.722	-0.070	64.871	-28.722	0.000%
15	0.070	-48.653	28.722	-0.070	48.653	-28.722	0.000%
16	-14.274	-64.871	24.839	14.274	64.871	-24.839	0.000%
17	-14.274	-48.653	24.839	14.274	48.653	-24.839	0.000%
18	-24.794	-64.871	14.300	24.794	64.871	-14.300	0.000%
19	-24.794	-48.653	14.300	24.794	48.653	-14.300	0.000%
20	-28.670	-64.871	-0.070	28.670	64.871	0.070	0.000%
21	-28.670	-48.653	-0.070	28.670	48.653	0.070	0.000%
22	-24.864	-64.871	-14.422	24.864	64.871	14.422	0.000%
23	-24.864	-48.653	-14.422	24.864	48.653	14.422	0.000%
24	-14.396	-64.871	-24.909	14.396	64.871	24.909	0.000%
25	-14.396	-48.653	-24.909	14.396	48.653	24.909	0.000%
26	0.000	-98.185	0.000	-0.000	98.185	0.000	0.000%
27	-0.005	-98.185	-8.706	0.005	98.185	8.706	0.000%
28	4.408	-98.185	-7.634	-4.408	98.185	7.634	0.000%
29	7.542	-98.185	-4.349	-7.542	98.185	4.349	0.000%
30	8.712	-98.185	0.005	-8.712	98.185	-0.005	0.000%
31	7.547	-98.185	4.357	-7.547	98.185	-4.357	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
32	4.360	-98.185	7.542	-4.360	98.185	-7.542	0.000%
33	0.005	-98.185	8.706	-0.005	98.185	-8.706	0.000%
34	-4.408	-98.185	7.634	4.408	98.185	-7.634	0.000%
35	-7.542	-98.185	4.349	7.542	98.185	-4.349	0.000%
36	-8.712	-98.185	-0.005	8.712	98.185	0.005	0.000%
37	-7.547	-98.185	-4.357	7.547	98.185	4.357	0.000%
38	-4.360	-98.185	-7.542	4.360	98.185	7.542	0.000%
39	-0.015	-54.059	-6.145	0.015	54.059	6.145	0.000%
40	3.054	-54.059	-5.315	-3.054	54.059	5.315	0.000%
41	5.305	-54.059	-3.060	-5.305	54.059	3.060	0.000%
42	6.134	-54.059	0.015	-6.134	54.059	-0.015	0.000%
43	5.320	-54.059	3.086	-5.320	54.059	-3.086	0.000%
44	3.080	-54.059	5.330	-3.080	54.059	-5.330	0.000%
45	0.015	-54.059	6.145	-0.015	54.059	-6.145	0.000%
46	-3.054	-54.059	5.315	3.054	54.059	-5.315	0.000%
47	-5.305	-54.059	3.060	5.305	54.059	-3.060	0.000%
48	-6.134	-54.059	-0.015	6.134	54.059	0.015	0.000%
49	-5.320	-54.059	-3.086	5.320	54.059	3.086	0.000%
50	-3.080	-54.059	-5.330	3.080	54.059	5.330	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	0.00032533
3	Yes	4	0.00000001	0.00018171
4	Yes	5	0.00000001	0.00047558
5	Yes	5	0.00000001	0.00022550
6	Yes	5	0.00000001	0.00047380
7	Yes	5	0.00000001	0.00022466
8	Yes	4	0.00000001	0.00029776
9	Yes	4	0.00000001	0.00015872
10	Yes	5	0.00000001	0.00047060
11	Yes	5	0.00000001	0.00022227
12	Yes	5	0.00000001	0.00049136
13	Yes	5	0.00000001	0.00023287
14	Yes	4	0.00000001	0.00045431
15	Yes	4	0.00000001	0.00027969
16	Yes	5	0.00000001	0.00046907
17	Yes	5	0.00000001	0.00022215
18	Yes	5	0.00000001	0.00046948
19	Yes	5	0.00000001	0.00022244
20	Yes	4	0.00000001	0.00042172
21	Yes	4	0.00000001	0.00025563
22	Yes	5	0.00000001	0.00049016
23	Yes	5	0.00000001	0.00023236
24	Yes	5	0.00000001	0.00047080
25	Yes	5	0.00000001	0.00022231
26	Yes	4	0.00000001	0.00000260
27	Yes	5	0.00000001	0.00030219
28	Yes	5	0.00000001	0.00037207
29	Yes	5	0.00000001	0.00036495
30	Yes	5	0.00000001	0.00030308
31	Yes	5	0.00000001	0.00036440
32	Yes	5	0.00000001	0.00036445
33	Yes	5	0.00000001	0.00030167
34	Yes	5	0.00000001	0.00036904
35	Yes	5	0.00000001	0.00035974
36	Yes	5	0.00000001	0.00030028
37	Yes	5	0.00000001	0.00036183
38	Yes	5	0.00000001	0.00036203
39	Yes	4	0.00000001	0.00002930
40	Yes	4	0.00000001	0.00011844
41	Yes	4	0.00000001	0.00011482

42	Yes	4	0.00000001	0.00002701
43	Yes	4	0.00000001	0.00011120
44	Yes	4	0.00000001	0.00012562
45	Yes	4	0.00000001	0.00003011
46	Yes	4	0.00000001	0.00011141
47	Yes	4	0.00000001	0.00011418
48	Yes	4	0.00000001	0.00002755
49	Yes	4	0.00000001	0.00012416
50	Yes	4	0.00000001	0.00011061

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	191.5 - 172.46	22.030	44	1.103	0.002
L2	175.543 - 127.753	18.433	44	1.037	0.002
L3	132.253 - 83.0833	10.002	44	0.778	0.001
L4	88.9167 - 40.4567	4.273	44	0.470	0.000
L5	47.54 - 0	1.196	44	0.232	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.000	(4) RV65-18-02DPL2 w/ Mount Pipe	44	22.030	1.103	0.002	39404
191.500	Lightning Rod 5/8" x 5'	44	22.030	1.103	0.002	39404
160.000	(2) LPA-80063/6CF w/ Mount Pipe	44	15.136	0.957	0.001	10047
154.000	PCS 1900MHz 4x45W-65MHz	44	13.937	0.921	0.001	9366
150.000	APXVSPP18-C-A20 w/ Mount Pipe	44	13.163	0.897	0.001	8961
137.000	7770.00 w/ Mount Pipe	44	10.802	0.811	0.001	7857
50.000	OG-860/1920/GPS-A	44	1.315	0.244	0.000	8896

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	191.5 - 172.46	103.603	12	5.195	0.008
L2	175.543 - 127.753	86.703	12	4.884	0.009
L3	132.253 - 83.0833	47.066	12	3.664	0.003
L4	88.9167 - 40.4567	20.108	12	2.215	0.001
L5	47.54 - 0	5.629	12	1.091	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.000	(4) RV65-18-02DPL2 w/ Mount Pipe	12	103.603	5.195	0.008	8520
191.500	Lightning Rod 5/8" x 5'	12	103.603	5.195	0.008	8520
160.000	(2) LPA-80063/6CF w/ Mount Pipe	12	71.205	4.505	0.007	2163
154.000	PCS 1900MHz 4x45W-65MHz	12	65.570	4.339	0.006	2015
150.000	APXVSPP18-C-A20 w/ Mount Pipe	12	61.932	4.223	0.006	1927
137.000	7770.00 w/ Mount Pipe	12	50.827	3.819	0.003	1685
50.000	OG-860/1920/GPS-A	12	6.188	1.151	0.001	1891

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	191.5 - 172.46 (1)	TP20.46x15.5x0.188	19.040	0.000	0.0	11.587	-2.218	852.683	0.003
L2	172.46 - 127.753 (2)	TP31.6x19.282x0.313	47.790	0.000	0.0	29.883	-15.180	2220.140	0.007
L3	127.753 - 83.0833 (3)	TP42.19x29.815x0.438	49.170	0.000	0.0	55.940	-26.728	4156.060	0.006
L4	83.0833 - 40.4567 (4)	TP52.59x39.847x0.5	48.460	0.000	0.0	79.711	-42.598	5916.280	0.007
L5	40.4567 - 0 (5)	TP62x49.727x0.5	47.540	0.000	0.0	97.601	-64.859	6834.140	0.009

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	191.5 - 172.46 (1)	TP20.46x15.5x0.188	55.369	340.775	0.162	0.000	340.775	0.000
L2	172.46 - 127.753 (2)	TP31.6x19.282x0.313	510.465	1372.008	0.372	0.000	1372.008	0.000
L3	127.753 - 83.0833 (3)	TP42.19x29.815x0.438	1384.400	3432.575	0.403	0.000	3432.575	0.000
L4	83.0833 - 40.4567 (4)	TP52.59x39.847x0.5	2363.683	6097.891	0.388	0.000	6097.891	0.000
L5	40.4567 - 0 (5)	TP62x49.727x0.5	3653.425	8640.417	0.423	0.000	8640.417	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	191.5 - 172.46 (1)	TP20.46x15.5x0.188	3.550	426.342	0.008	0.010	682.383	0.000
L2	172.46 - 127.753 (2)	TP31.6x19.282x0.313	18.414	1110.070	0.017	0.813	2747.367	0.000

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 $\frac{T_u}{\phi T_n}$
L3	127.753 - 83.0833 (3)	TP42.19x29.815x0.438	21.916	2078.030	0.011	0.825	6873.533	0.000
L4	83.0833 - 40.4567 (4)	TP52.59x39.847x0.5	25.385	2958.140	0.009	0.960	12210.667	0.000
L5	40.4567 - 0 (5)	TP62x49.727x0.5	28.797	3417.070	0.008	0.959	17302.000	0.000

Pole Interaction Design Data

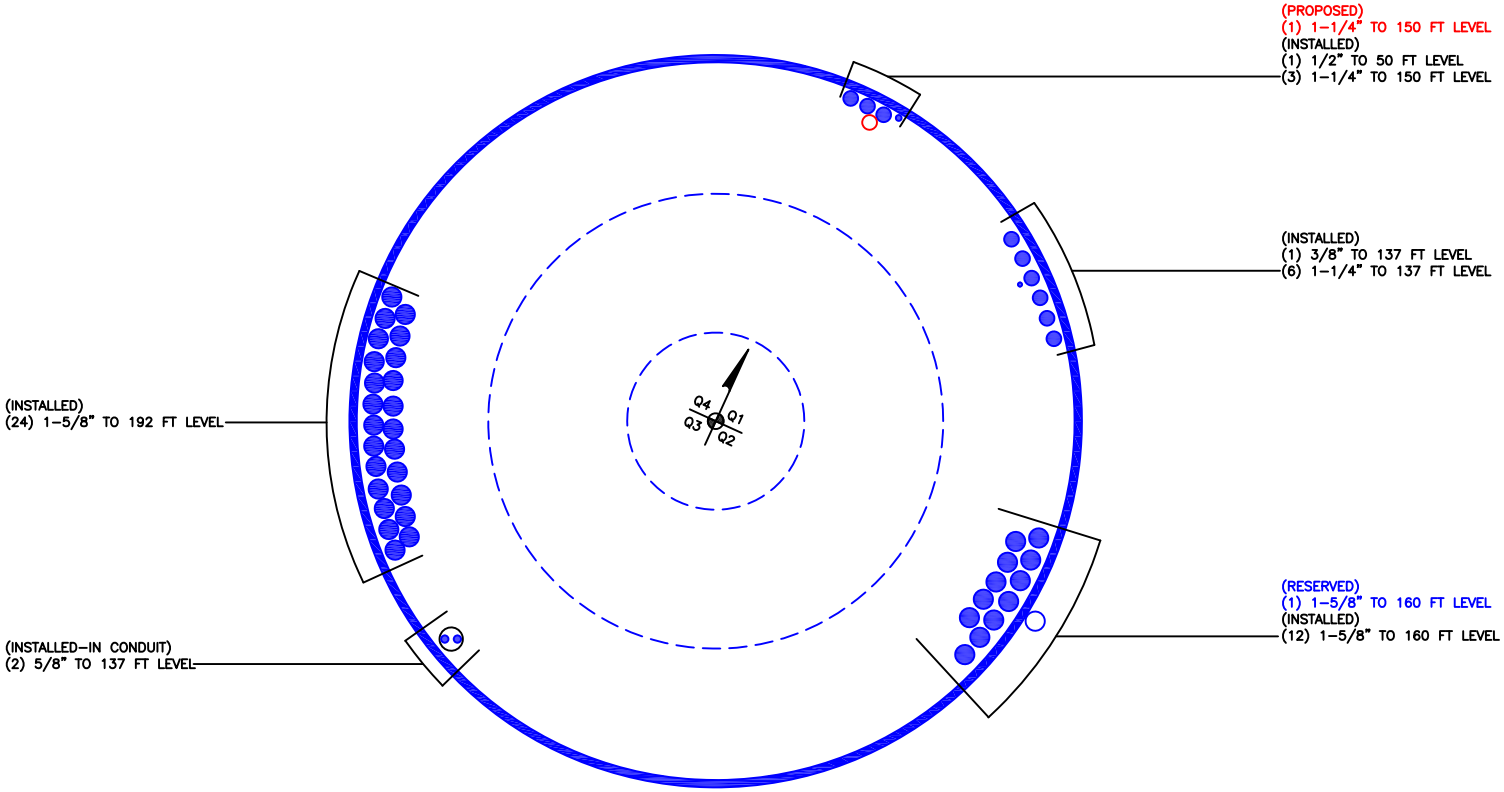
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	191.5 - 172.46 (1)	0.003	0.162	0.000	0.008	0.000	0.165	1.000	4.8.2
L2	172.46 - 127.753 (2)	0.007	0.372	0.000	0.017	0.000	0.379	1.000	4.8.2
L3	127.753 - 83.0833 (3)	0.006	0.403	0.000	0.011	0.000	0.410	1.000	4.8.2
L4	83.0833 - 40.4567 (4)	0.007	0.388	0.000	0.009	0.000	0.395	1.000	4.8.2
L5	40.4567 - 0 (5)	0.009	0.423	0.000	0.008	0.000	0.432	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	191.5 - 172.46	Pole	TP20.46x15.5x0.188	1	-2.218	852.683	16.5	Pass
L2	172.46 - 127.753	Pole	TP31.6x19.282x0.313	2	-15.180	2220.140	37.9	Pass
L3	127.753 - 83.0833	Pole	TP42.19x29.815x0.438	3	-26.728	4156.060	41.0	Pass
L4	83.0833 - 40.4567	Pole	TP52.59x39.847x0.5	4	-42.598	5916.280	39.5	Pass
L5	40.4567 - 0	Pole	TP62x49.727x0.5	5	-64.859	6834.140	43.2	Pass
							Summary	
						Pole (L5)	43.2	Pass
						RATING =	**43.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876355 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

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

Site Data	
BU#:	*876355*
Site Name:	*UPPER STEPNEY - TLC*
App #:	*399301 Rev.0*
Pole Manufacturer:	*Other*

Reactions		
Mu:	3653	ft-kips
Axial, Pu:	65	kips
Shear, Vu:	29	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	71	in

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

Plate Data		
Diam:	77	in
Thick:	2.25	in
Grade:	60	ksi
Single-Rod B-eff:	8.20	in

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

Pole Data		
Diam:	62	in
Thick:	0.5	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Anchor Rod Results

Max Rod (Cu+ Vu/ń):	108.0	Kips	Rigid
Allowable Axial, Φ*Fu*Anet:	260.0	Kips	AISC LRFD
Anchor Rod Stress Ratio:	41.5%	**Pass**	φ*Tn

Base Plate Results Flexural Check

Base Plate Stress:	28.1	ksi	Rigid
Allowable Plate Stress:	54.0	ksi	AISC LRFD
Base Plate Stress Ratio:	52.0%	**Pass**	φ*Fy
			Y.L. Length: 34.60

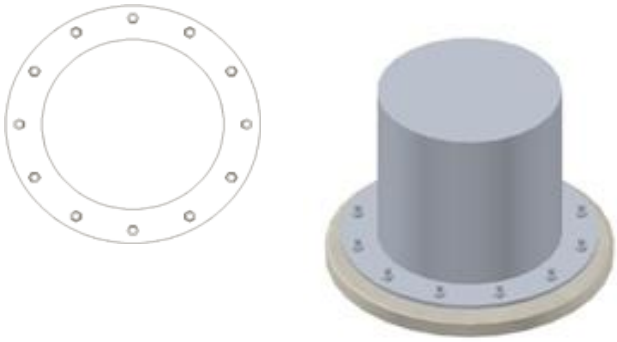
n/a

Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a



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

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

Pier and Pad Foundation

BU # :	876355
Site Name:	UPPER STEPNEY
App. Number:	399301 Rev.0

TIA-222 Revision:	G
Tower Type:	Monopole

Block Foundation?: ☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	65	kips
Base Shear, Vu_comp:	29	kips
Moment, M_u:	3653	ft-kips
Tower Height, **H**:	191.5	ft
BP Dist. Above Fdn, bp_{dist}:	2	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	7.5	ft
Ext. Above Grade, **E**:	1	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	51	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	8	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	5.0	ft
Pad Width, **W**:	30.0	ft
Pad Thickness, **T**:	3.0	ft
Pad Rebar Size, **Sp**:	8	
Pad Rebar Quantity, **mp**:	25	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δc:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	170	pcf
Ultimate Net Bearing, Qnet:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	30	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.7	
Neglected Depth, **N**:	3.5	ft
Groundwater Depth, **gw**:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Lateral (Sliding) (kips)	436.99	29.00	**6.6%**	**Pass**
Bearing Pressure (ksf)	9.64	1.59	**16.5%**	**Pass**
*Overturning (kip*ft)*	9691.46	3831.83	**39.5%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	7067.86	3740.00	**52.9%**	**Pass**
Pier Compression (kip)	28118.83	88.86	**0.3%**	**Pass**
*Pad Flexure (kip*ft)*	2756.54	1349.53	**49.0%**	**Pass**
Pad Shear - 1-way (kips)	1075.81	175.67	**16.3%**	**Pass**
Pad Shear - 2-way (kips)	2281.33	88.86	**3.9%**	**Pass**

Soil Rating:	**39.5%**
Structural Rating:	**52.9%**

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

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

Site Data

BU#: *876355*
Site Name: *UPPER STEPNEY - TLC*
App #: *399301 Rev.0*

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

Pier Properties		
Concrete:		
Pier Diameter =	7.5	ft
Concrete Area =	6361.7	in^2
Reinforcement:		
Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	4	
Vert. Cage Diameter =	6.83	ft
Vert. Cage Diameter =	82.00	in
Vertical Bar Size =	8	
Bar Diameter =	1.00	in
Bar Area =	0.79	in^2
Number of Bars =	51	
As Total=	40.29	in^2
A s/ Aconc, Rho:	0.0063	0.63%

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

(3)*(Sqrt(f'c)/Fy:	0.0032
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.63%	**OK**

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	12433.35	kips
at Mu=(ϕ=0.65)Mn=	8164.12	ft-kips
Max Tu, (φ=0.9) Tn =	2175.66	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces		
TIA Revision:	G	
Max. Factored Shaft Mu:	3740	ft-kips **(* Note)**
Max. Factored Shaft Pu:	65	kips
Max Axial Force Type:	Comp.	

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

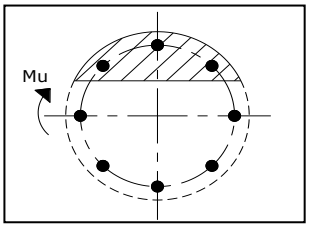
Load Factor	Shaft Factored Loads		
1.00	Mu:	3740	ft-kips
1.00	Pu:	65	kips

Material Properties		
Concrete Comp. strength, f'c =	4000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2005	

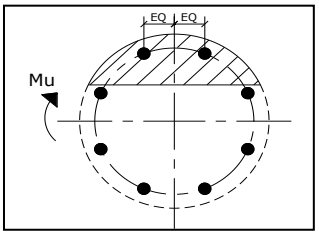
Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1



Case 2

Dist. From Edge to Neutral Axis:	**13.01**	in
Extreme Steel Strain, ϵt:	**0.0168**	
ϵt > 0.0050, Tension Controlled		
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	58.50	kips
Drilled Shaft Moment Capacity, φMn:	**7067.86**	ft-kips
Drilled Shaft Superimposed Mu:	**3740.00**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**52.9%**

Search Results

Query Date: Mon Jul 31 2017
Latitude: 41.3256
Longitude: -73.2658

ASCE 7-10 Windspeeds (3-sec peak gust in mph*):

Risk Category I: 110
Risk Category II: 120
Risk Category III-IV: 129
MRI 10-Year:** 76
MRI 25-Year:** 86
MRI 50-Year:** 91
MRI 100-Year:** 97

ASCE 7-05 Windspeed:
104 (3-sec peak gust in mph)
ASCE 7-93 Windspeed:
80 (fastest mile in mph)

*Miles per hour
**Mean Recurrence Interval

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

Print your results

WINDSPEED WEBSITE DISCLAIMER

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the windspeed report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the windspeed report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the windspeed load report.

CCISeismic - Design Category

Per *2012/2015 IBC*

Site BU: 876355
Work Order: 1436426
Application: 399301 Rev. 0

	Degrees	Minutes	Seconds		
Site Latitude =	41	19	31.99	41.3256	degrees
Site Longitude =	-73	15	57.04	-73.2658	degrees
Ground Supported Structure =	Yes				
Structure Class =	II			*(Table 2-1)*	
Site Class =	D - Stiff Soil			*(Table 2-11)*	

Spectral response acceleration short periods, S_S =	0.209	USGS Seismic Tool
Spectral response acceleration 1 s period, S_1 =	0.065	

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

Design spectral response acceleration short period, S_{DS} =	0.223	*(2.7.6)*
Design spectral response acceleration 1 s period, S_{D1} =	0.104	*(2.7.6)*

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

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

USGS Design Maps Summary Report

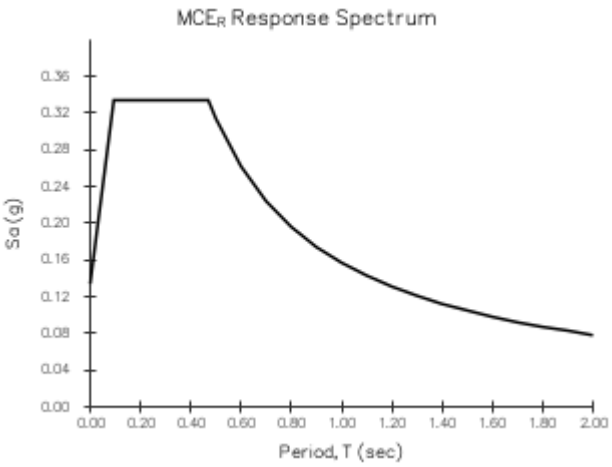
User–Specified Input

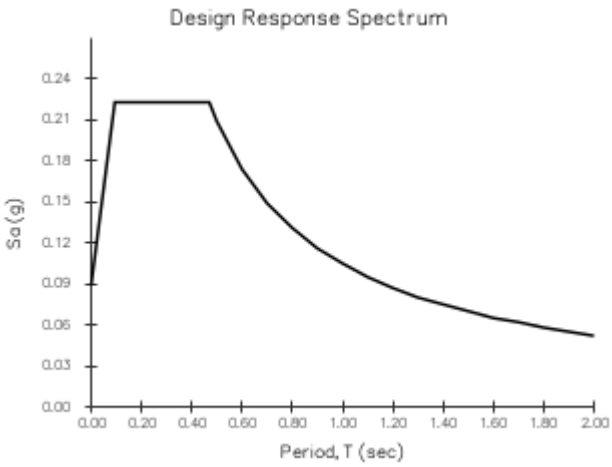
Report Title	876355 Mon July 31, 2017 20:42:23 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.32555°N, 73.26585°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

USGS–Provided Output

S_S =	0.209 g	S_{MS} =	0.334 g	S_{DS} =	0.223 g
S_1 =	0.065 g	S_{M1} =	0.157 g	S_{D1} =	0.105 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





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: CT03XC365

Upper Stepney-TLC
474-480 Main Street
Monroe, CT 06468

September 11, 2017

EBI Project Number: 6217003919

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.00 %

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

EBI Consulting
environmental | engineering | due diligence

September 11, 2017

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

Emissions Analysis for Site: **CT03XC365 – Upper Stepney-TLC**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **474-480 Main Street, Monroe, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **474-480 Main Street, Monroe, 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 the RFS APXVTM14-C-120** 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 **152 feet** above ground level (AGL) for **Sector A**, **152 feet** above ground level (AGL) for **Sector B** and **152 feet** above ground level (AGL) for Sector C.

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

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 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%	**1.44 %**	Antenna B1 MPE%	**1.44 %**	Antenna C1 MPE%	**1.44 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120	Make / Model:	RFS APXVTM14-C-120
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 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%	**1.05 %**	Antenna B2 MPE%	**1.05 %**	Antenna C2 MPE%	**1.05 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.49 %**
T-Mobile	0.20 %
AT&T	1.09 %
Verizon Wireless	3.22 %
Site Total MPE %:	**7.00 %**

SPRINT Sector A Total:	2.49 %
SPRINT Sector B Total:	2.49 %
SPRINT Sector C Total:	2.49 %
Site Total:	7.00 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	152	0.74	850 MHz	567	0.13%
Sprint 850 MHz LTE	2	437.55	152	1.48	850 MHz	567	0.26%
Sprint 1900 MHz (PCS) CDMA	5	622.47	152	5.25	1900 MHz (PCS)	1000	0.52%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	152	5.25	1900 MHz (PCS)	1000	0.52%
Sprint 2500 MHz (BRS) LTE	8	778.09	152	10.50	2500 MHz (BRS)	1000	1.05%
						Total:*	**2.49%**

*NOTE: Totals may vary by 0.01% due to summing of remainders

Summary

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

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

SPRINT Sector	Power Density Value (%)
Sector A:	2.49 %
Sector B:	2.49 %
Sector C:	2.49 %
SPRINT Maximum Total (per sector):	2.49 %
Site Total:	7.00 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.00 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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