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

September 22, 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: 876381**
Sprint Site ID: CT33XC535
2365 Long Hill Rd, Guilford, CT 06437
Latitude: 41° 20′ 47.34″ / Longitude: -72° 43′ 23.15″

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 176-foot level of the existing 176-foot monopole at 2365 Long Hill Rd in Guilford, CT. The tower is owned by Crown Castle. The property is owned by the James Ward Family and Janice Ward Family. Sprint intends to install three (3) antennas, three (3) RRHs, and three (3) hybrid cables.

This facility was approved by the Connecticut Siting Council in Docket No. 238 on May 3, 2009. This approval included the conditions that:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 180 feet above ground level including all appurtenances.
2. The access road shall avoid Wetland 7 and minimize impacts to other wetlands.

This modification complies with the aforementioned condition(s).

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. Joseph S. Mazza, First Selectman, Town of Guilford, the Department of Planning and Development for the City of West Haven, as well as 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. Joseph S. Mazza
Town of Guilford
35 Park Street
Guilford, CT 06437

James or Janice Ward -Trustees
2365 Long Hill Road
Guilford, CT 06437

Planning & Zoning/Inland Wetlands
Town of Guilford
50 Boston Street
Guilford, CT 06437

Connecticut Siting Council
Decisions

DOCKET NO. 238 - Sprint Spectrum, L.P. d/b/a Sprint PCS application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility located at 2381 Long Hill Road, Guilford, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	May 6, 2003

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a wireless telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes **§** 16-50k, be issued to Sprint Spectrum L. P. (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at 2381 Long Hill Road, Guilford, Connecticut with the tower relocated approximately 430 feet to the northwest to keep the tower radius within the property boundaries. The Council will not approve the proposed locations of the tower or access road as proposed in the application.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Sprint and other entities, both public and private, but such tower shall not exceed a height of 180 feet above ground level including all appurtenances.

2. The access road shall avoid Wetland 7 and minimize impacts to other wetlands.

3. The Certificate Holder shall prepare a D&M Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include: a final site plan(s) for site development to include the location of the tower and the access road and specifications for the tower foundation, placement of carrier antennas, tower height, equipment buildings, security fence, access road, and utility line; construction plans for site clearing, tree trimming, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended; landscaping and provisions to protect the existing vegetative buffer that would extend around the facility compound; a tower finish that may include painting; and provisions for the prevention and containment of spills and/or other discharge into surface water and groundwater bodies.

4. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power densities of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

5. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

6. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. If the facility does not initially provide, or permanently ceases to provide wireless services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antenna becomes obsolete and ceases to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes **§** 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant, The New Haven Register, The Guilford Courier, and the Shore Line Times.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
Sprint Spectrum, L.P. d/b/a Sprint PCS	Thomas J. Regan, Esquire Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402
Intervenor	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Daniel F. Leary, Esq. Cuddy & Feder & Worby 90 Maple Avenue White Plains, NY 10601

Content Last Modified on 6/2/2003 11:20:53 AM

Town of Guilford
Property Listing Report

Parcel ID 101023B

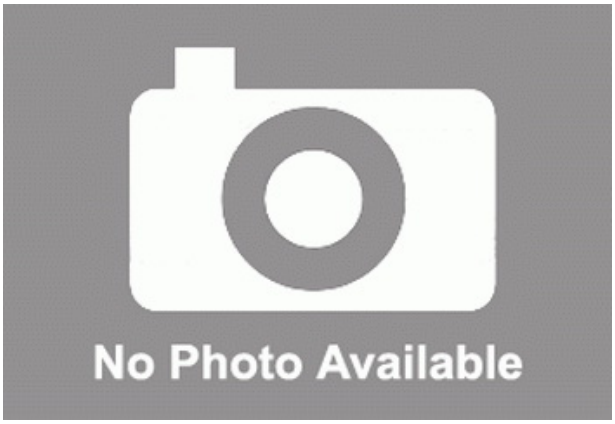
Account

Property Information

Owner	WARD JAMES J FAMILY & JANICE M FAMILY
Address	2365 LONG HILL RD
Mailing Address	2365 LONG HILL RD GUILFORD , CT 06437
Land Use	- SINGLE FAMILY
Land Class	Residential

Census Tract	1903
Neighborhood	59
Zoning	R-5
Acreage	12.96
Utilities	
Lot Setting/ Desc	/

Photo



PARCEL VALUATIONS (Assessed value = 70% of Appraised Value)

	Appraised	Assessed
Buildings	242587	169810
Outbuildings	20251	14180
Improvements		
Extras		
Land	188226	131750
Total	451064	315740
Previous		

Construction Details

Year Built	2004
Stories	1.4
Building Style	1.4
Building Use	Residential
Building Condition	GOOD
Total Rooms	4
Bedrooms	1
Full Bathrooms	2
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	GABLE
Roof Cover	ARCH SHINGLES

EXTERIOR WALLS:	
Primary	VINYL
Secondary	
INTERIOR WALLS:	
Primary	DRYWALL
Secondary	OTHER
FLOORS:	
Primary	OTHER
Secondary	
HEATING/AC:	
Heating Type	HWBB
Heating Fuel	OIL
AC Type	

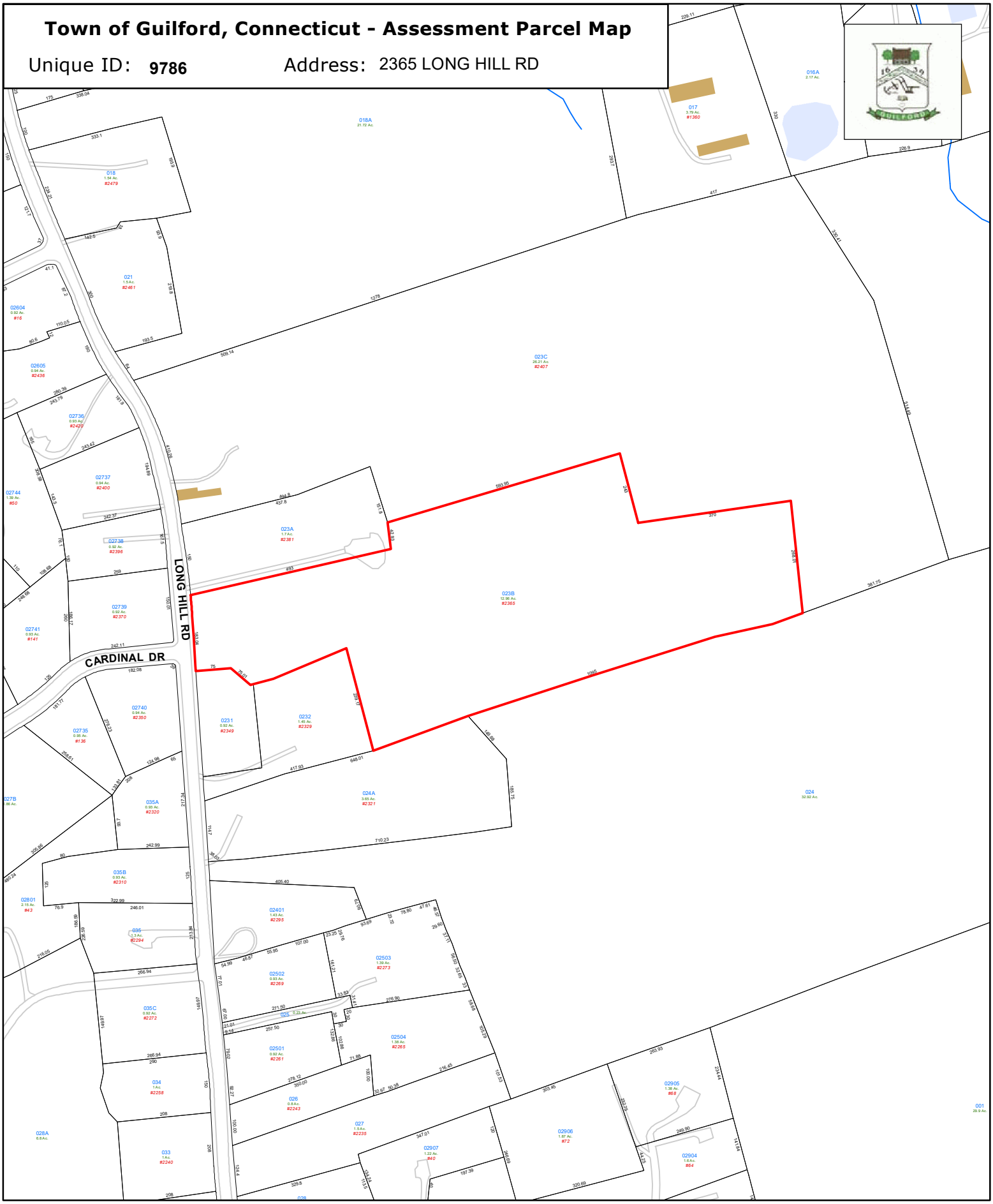
BUILDING AREA:	
Effective Building Area	
Gross Building Area	0
Total Living Area	2521

SALES HISTORY:	
Sale Date	3/17/2005
Sale Price	0
Book/ Page	0689/933+

Report Created On 9/20/2017

Town of Guilford, Connecticut - Assessment Parcel Map

Unique ID: **9786** Address: 2365 LONG HILL RD



Approximate Scale: 1 inch = 300 feet

0 210 420 Feet

Map Produced: August 2016

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

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:

CT33XC535

SITE NAME:

WARD

SITE ADDRESS:

2365 LONG HILL ROAD
GUILFORD, CT 06437

CROWN ID#: 876381

CROWN SITE NAME: WARD

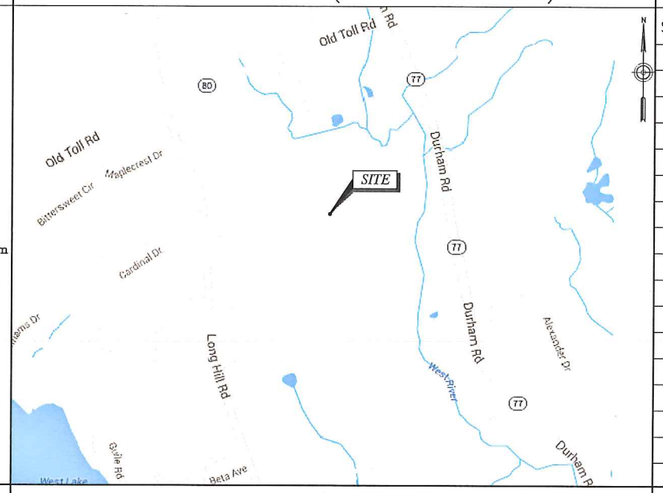
APPROVED
By Ray Perry at 8:29 am, Oct 13, 2014

SHEET INFORMATION

SITE NUMBER:	CT33XC535
SITE NAME:	WARD
SITE ADDRESS:	2365 LONG HILL RD GUILFORD, CT 06437
COUNTY:	NEW HAVEN
COORDINATES: (NAD 83)	41° 20' 47.34" N 72° 43' 23.15" W
GROUND ELEV:	177'± AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	176'-0"± AGL
STRUCTURE RAD CENTER:	178'-0"± AGL
ZONING CLASSIFICATION:	R-5 (RESIDENTIAL)
MAP-BLOCK-LOT:	101023B

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, KS 66251
ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 JQuicksell@tectonicengineering.com
SPRINT CM:	ANDY CLARK Andrew.Clark@sprint.com
CROWN CM:	JASON D'AMICO (860) 209-0104 jason.d'amico@crowncastle.com
AAV:	AT&T

VICINITY MAP (NOT TO SCALE)



SHEET INDEX

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

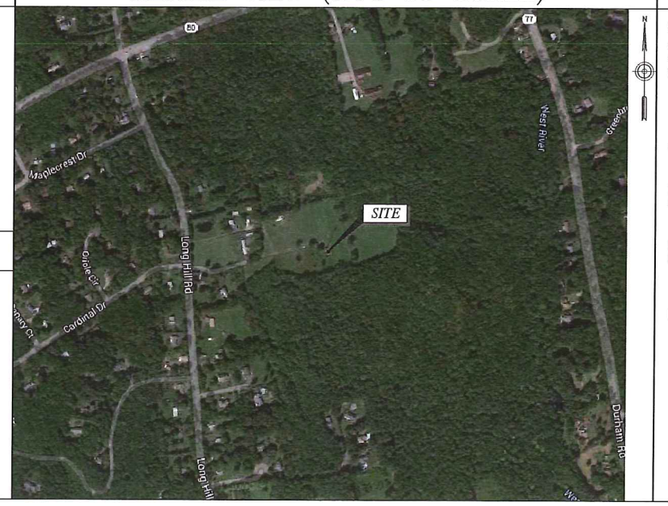
GENERAL NOTES

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

PROJECT DESCRIPTION

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

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, KS 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.CT33XC535

NO	DATE	DESCRIPTION	BY
0	06/24/14	FOR COMMENT	MP
1	07/30/14	FOR CONSTRUCTION	KA
2	08/01/14	PER COMMENTS	KA
3	10/10/14	REVISED ADDRESS	KA

DATE	REVIEWED BY
10/10/14	

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

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._1572011104218554492.DOCM.

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

21. REFER TO LATEST DOCUMENTATION REVISION.

DIVISION 03000–CONCRETE

1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)

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

1.04 QUALITY ASSURANCE

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

3.04 SURFACE FINISHES

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

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

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

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

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

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

3.05 PATCHING

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

3.06 DEFECTIVE CONCRETE

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

3.07 PROTECTION

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

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

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

DIVISION 05000 – METALS

PART 1 – GENERAL

1.01 WORK INCLUDED

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

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

1.02 REFERENCE STANDARDS

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

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

PART 2 – PRODUCTS

2.01 MATERIALS

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

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

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

2.02 WELDING

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

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

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

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

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

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

2.03 BOLTING

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

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

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

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

E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.

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

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

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

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

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

2.04 FABRICATION

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

2.05 FINISH

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

2.06 PROTECTION

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

PART 3 – ERECTION

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

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

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

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2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
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SUBMITTALS

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10/10/2014	

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
GENERAL NOTES

SHEET NO:
SP–1

DIVISION 13000–SPECIAL CONSTRUCTION ANTENNA INSTALLATION

PART 1 – GENERAL

1.01 WORK INCLUDED

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

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

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

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

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

G. ANTENNA AND HYBRIFLEX CABLE GROUNDING:

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

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

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

1.03 REQUIREMENTS OF REGULATOR AGENCIES

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

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

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

DIVISION 13000–EARTHWORK

PART 1 GENERAL

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

1.02 RELATED WORK

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

PART 2 PRODUCTS

2.01 MATERIALS

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

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

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

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

MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS.

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

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

2.02 EQUIPMENT

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

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

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

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

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

3.03 INSTALLATION

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

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

C. DO NOT CREATE DEPRESSIONS WHERE WATER MAY POND.

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

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

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

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

H. RIPRAP SHALL BE APPLIED TO THE SIDE SLOPES OF ALL FENCED AREAS, PARKING AREAS AND TO ALL OTHER SLOPES GREATER THAN 2:1.

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

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

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

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

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

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

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

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

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

3.04 FIELD QUALITY CONTROL

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

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

3.05 PROTECTION

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

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

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

SYMBOLS	ABBREVIATIONS
— — — G — — — G —	GROUND WIRE
— — — E — — — E —	ELECTRIC
— — — T — — — T —	TELEPHONE
OHW OHW OHW OHW OHW	OVERHEAD WIRE
——— — — ———	PROPERTY LINE
—X———X———X———	CHAIN LINK FENCE
A–1	ANTENNA MARK
(E)	EXISTING
(P)	PROPOSED DETAIL
DET # / SHT #	REFERENCE
	SURFACE ELEVATION

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SUBMITTALS

PROJECT NO: 7225.CT33XC535

NO	DATE	DESCRIPTION	BY
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1	07/30/14	FOR CONSTRUCTION	KA
2	08/01/14	PER COMMENTS	KA
3	10/10/14	REVISED ADDRESS	KA

DATE	REVIEWED BY
10/10/14	

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
GENERAL NOTES

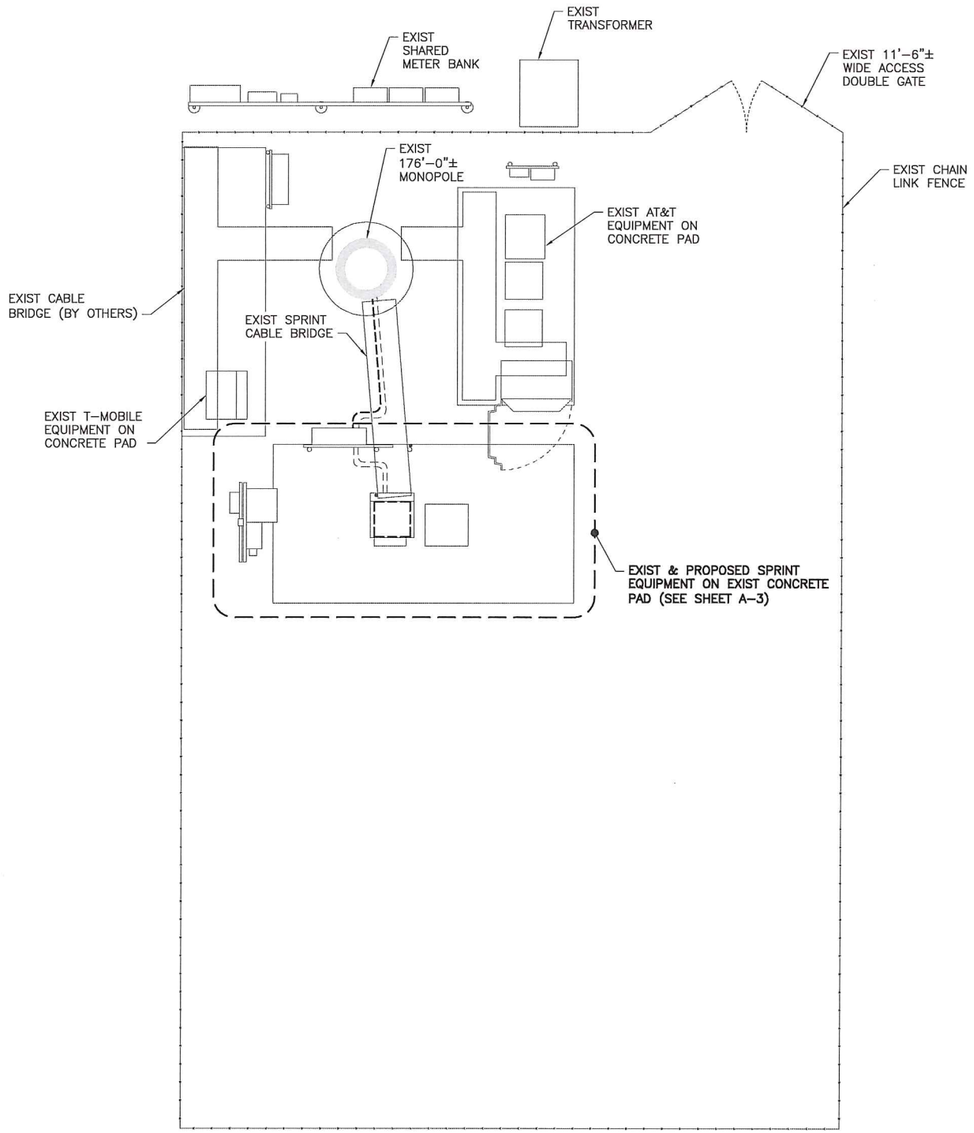
SHEET NO:
SP–2

N

APPROX.

NORTH NOTE:

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



1 / A-2

1 / A-1 SITE PLAN

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

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10/10/14	T.M.Q

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

SITE NAME:
WARD

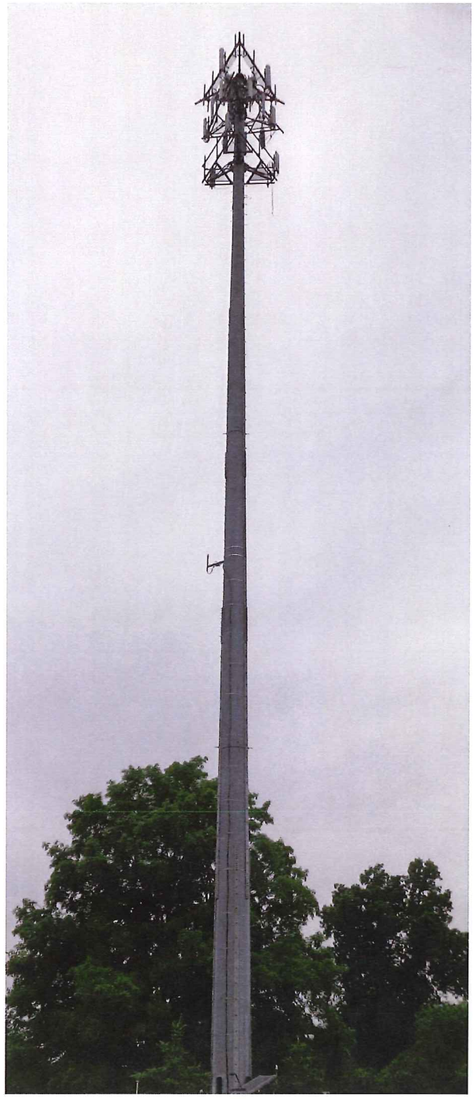
SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

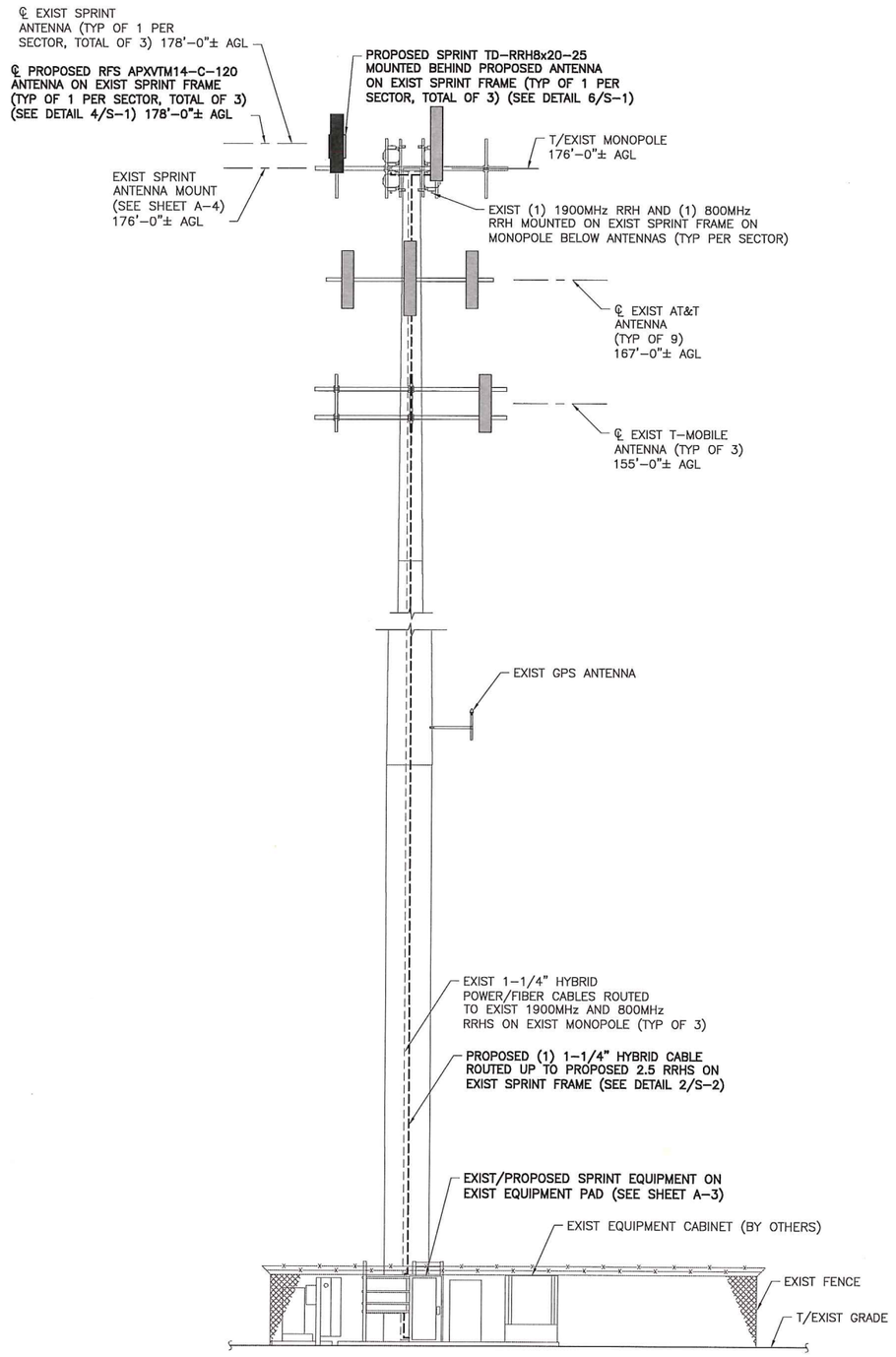
SHEET TITLE:
SITE PLAN

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 7/30/14.





1 / A-2 ELEVATION

SCALE: 3/16" = 1'-0"

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STATE OF CONNECTICUT · ANTONIO A. GUALTIERI · No. 25406 · LICENSED PROFESSIONAL ENGINEER

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SHEET TITLE:
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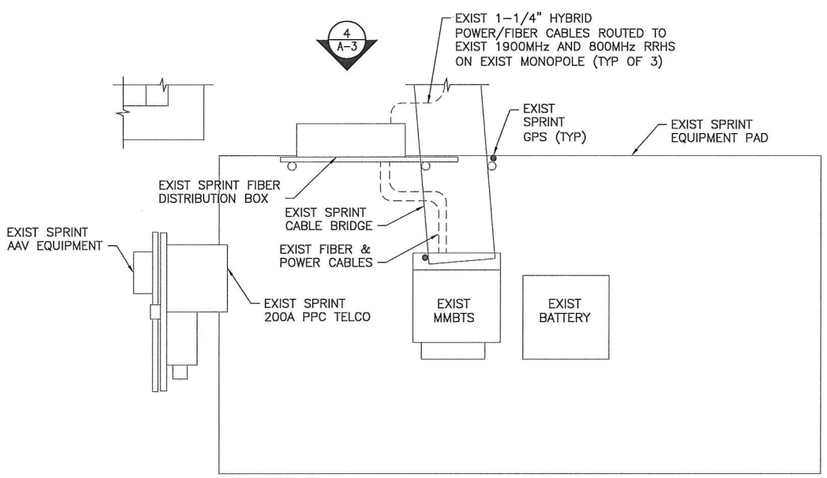
A-2

N

APPROX.

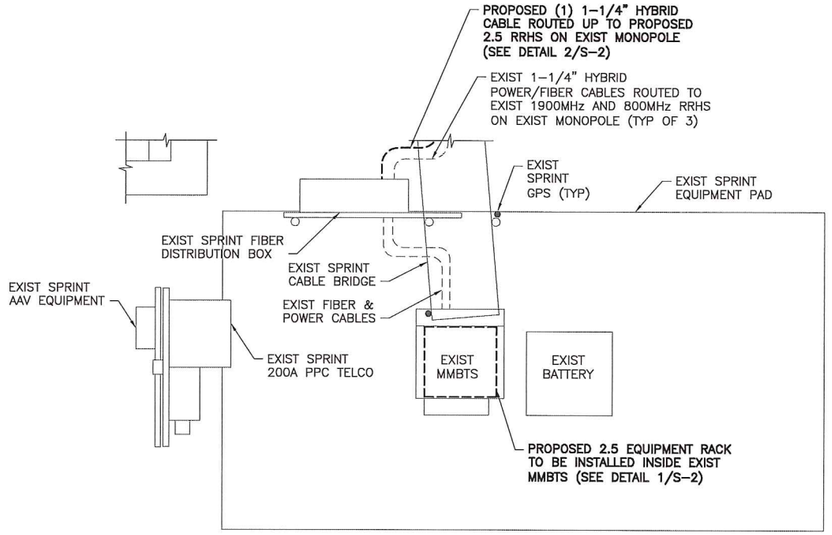
NORTH NOTE:

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-3 ENLARGED EQUIP. LAYOUT PLAN (EXIST)

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



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

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

3 A-3 EXIST EQUIPMENT PAD

SCALE: NTS

4 A-3 EXIST FIBER DISTRIBUTION BOX

SCALE: NTS

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2.5 EQUIPMENT DEPLOYMENT
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STATE OF CONNECTICUT
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No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

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WARD

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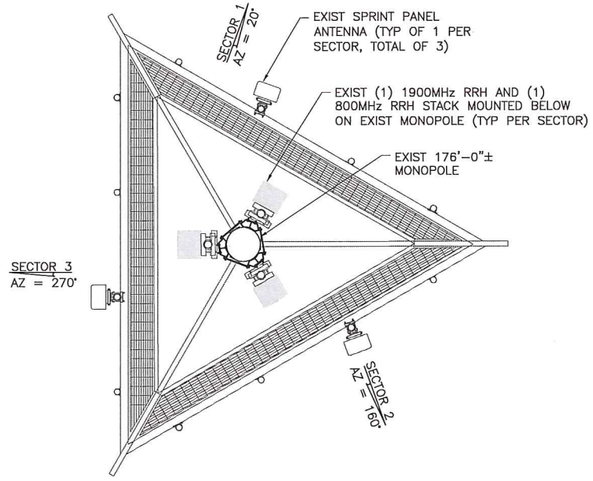
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
A-3

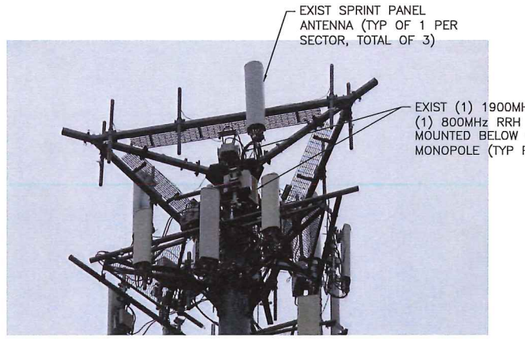
N

APPROX.



1 A-4 ANTENNA LAYOUT PLAN (EXIST)

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



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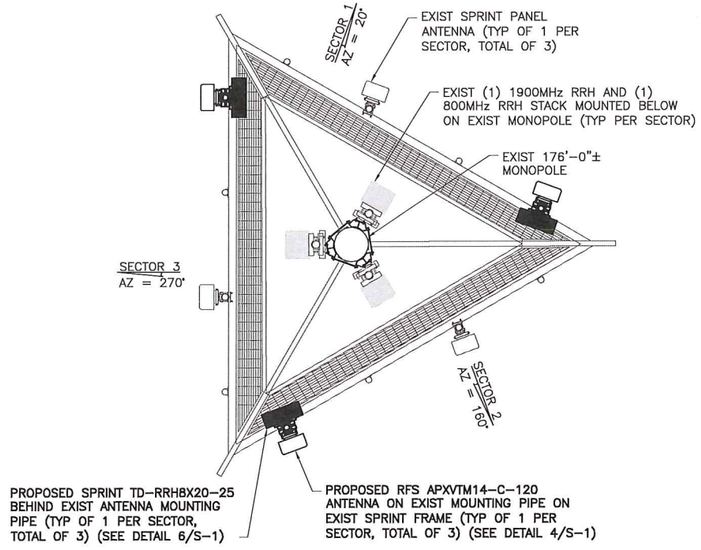
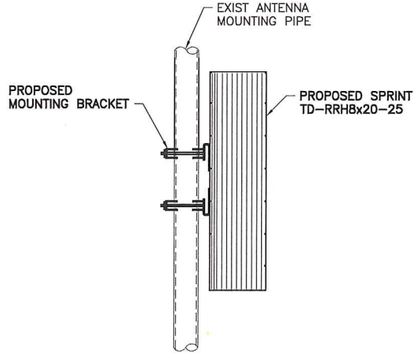


2 A-4 ANTENNA LAYOUT PLAN (FINAL)

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



3 A-4 RRH MOUNTING DETAIL

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

ANTENNA DATA

Status	Exist	Proposed
Antenna Manufacturer	RFS-CEL WAVE	RFS-CEL WAVE
Antenna Model Number	APXVSPP18C-A20	APXVTM14-C-120
Number of Antennas	3	3
Antenna RAD Center	178'	178'
Antenna Azimuth	20/160/270	20/160/270
Antenna RRH Model Number	1900MHz/800MHz RRHS	TD-RRH8x20-25
Number of RRH	6	3

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Fax: (845) 567-8703
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SUBMITTALS

PROJECT NO: 7225.CT33XC535

NO	DATE	DESCRIPTION	BY
0	06/24/14	FOR COMMENT	MP
1	07/30/14	FOR CONSTRUCTION	KA
2	08/01/14	PER COMMENTS	KA
3	10/10/14	REVISED ADDRESS	KA

DATE	REVIEWED BY
10/10/14	

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

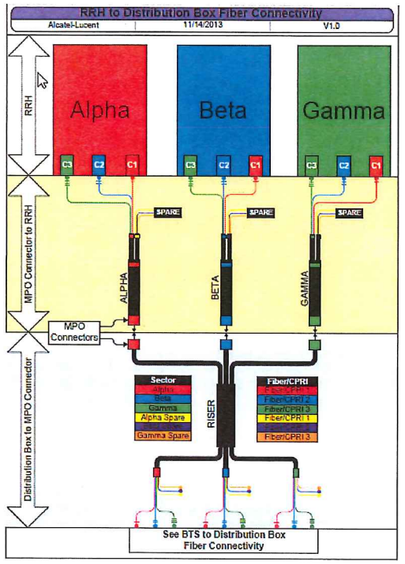
SITE NUMBER:
CT33XC535

SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

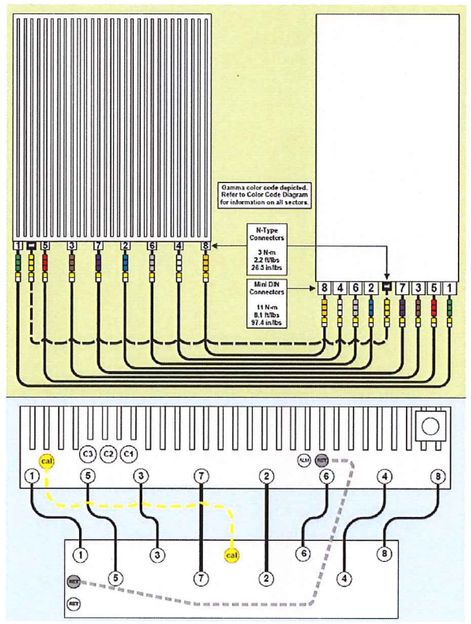
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



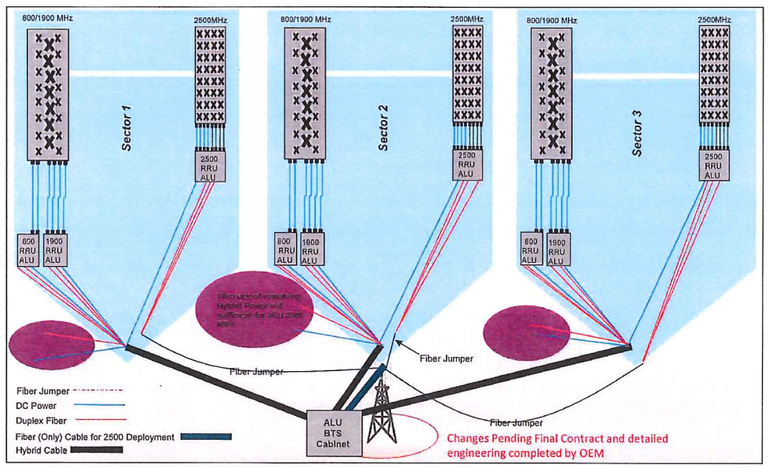
1 / A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



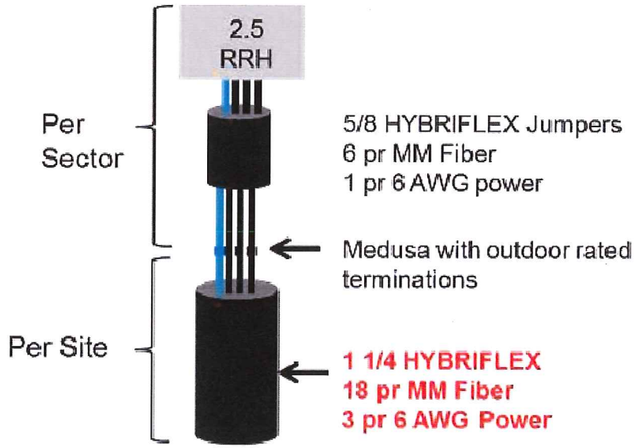
2 / A–5 RRH CONNECTIVITY

SCALE: N.T.S.



3 / A–5 RAN WIRING

SCALE: N.T.S.



4 / A–5 CABLE SCENARIO

SCALE: N.T.S.

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10/10/14	AMG

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

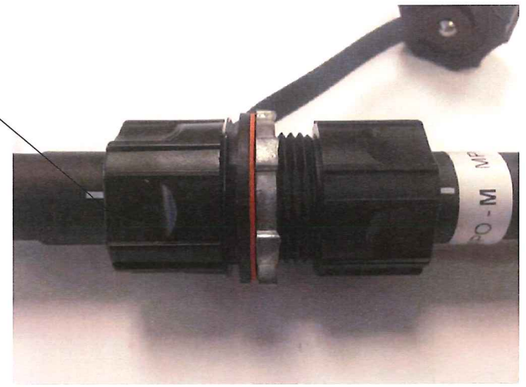
SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
CABLE COLOR CODING DETAILS

SHEET NO:
A–5

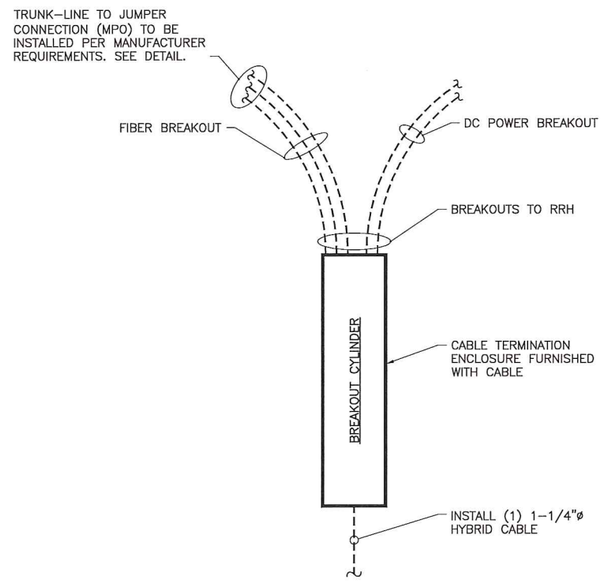
IMPORTANT!! LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAINST THE RED SEAL ON THE RISER CONNECTION



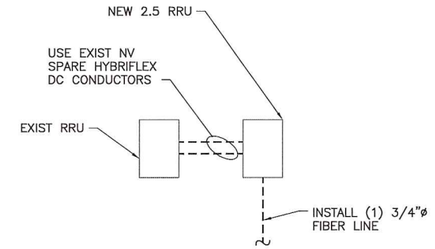
IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

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.

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ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
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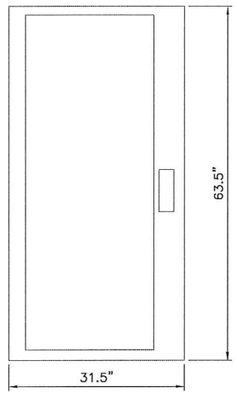
SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
CABLE DETAILS

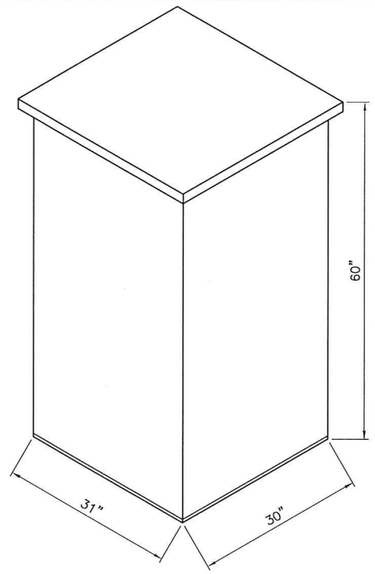
SHEET NO:
A-6



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

1/S-1 (EXIST) MMBTS CABINET

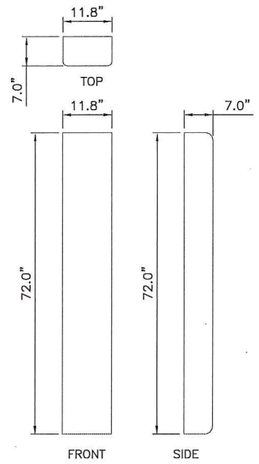
SCALE: 1" = 1'-0"



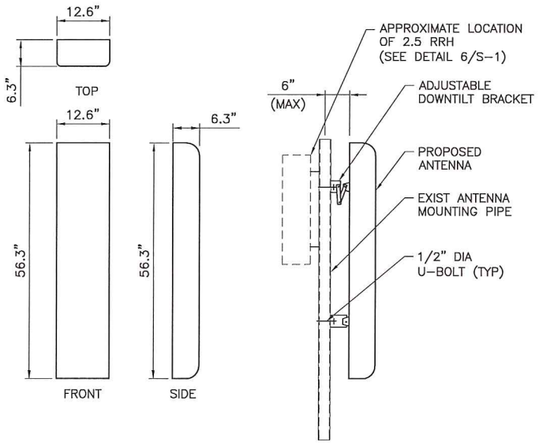
ANDREW 60ECv2
SPECIFICATIONS:
HEIGHT: 60" WIDTH: 31" DEPTH: 30" WEIGHT: 2430 LBS.

2/S-1 (EXIST) BATTERY CABINET

SCALE: 1" = 1'-0"



APXVSPP18-C-A20



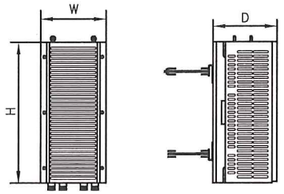
APXVTM14-C-120

3/S-1 (EXIST) ANTENNA DETAILS

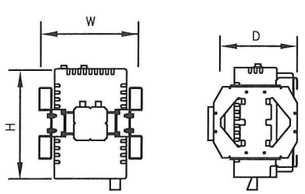
SCALE: 3/4"=1'-0"

4/S-1 (PROPOSED) ANTENNA DETAIL

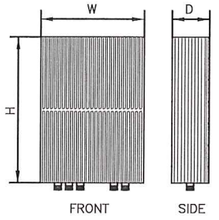
SCALE: 3/4"=1'-0"



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



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



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

5/S-1 (EXIST) RRH DETAILS

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

6/S-1 (PROPOSED) RRH DETAIL

SCALE: N.T.S.

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10/10/14	

STATE OF CONNECTICUT · SEAL · ANTONIO A. GUALTIERI · No. 25406 · LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

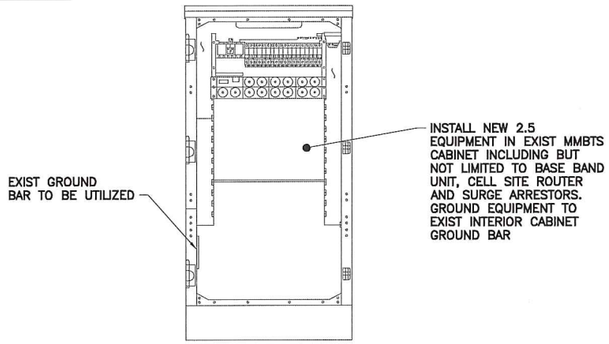
SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NO:
S-1

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



FRONT ELEVATION
(CABINET INTERIOR)

1 / S-2 MMBTS INTERIOR DETAIL

SCALE: N.T.S.

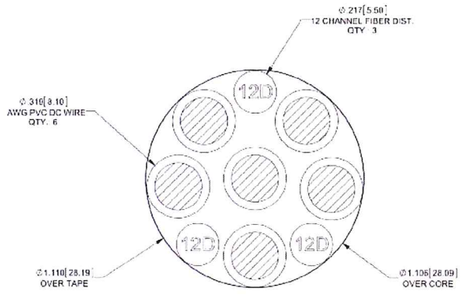
RFS HYBRIFLEX RISER CABLES SCHEDULE

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

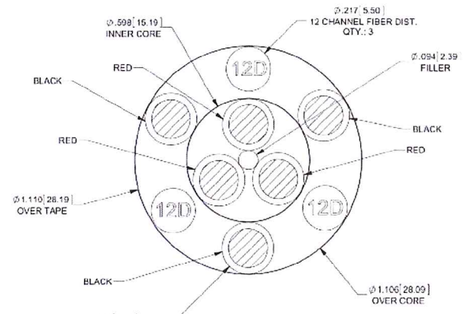
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

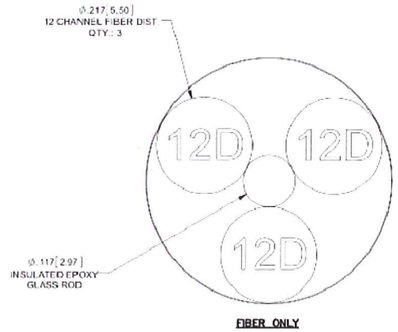
HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG

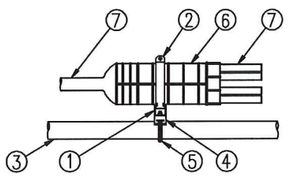


8 AWG & 6 AWG

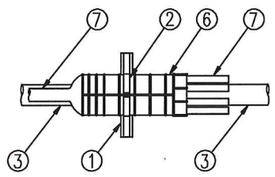


FIBER ONLY

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.



SIDE VIEW



TOP VIEW

3 / S-2 MEDUSA HEAD DETAIL

SCALE: NTS

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

SCALE: NTS

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10/10/14	TOM

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ANTONIO GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
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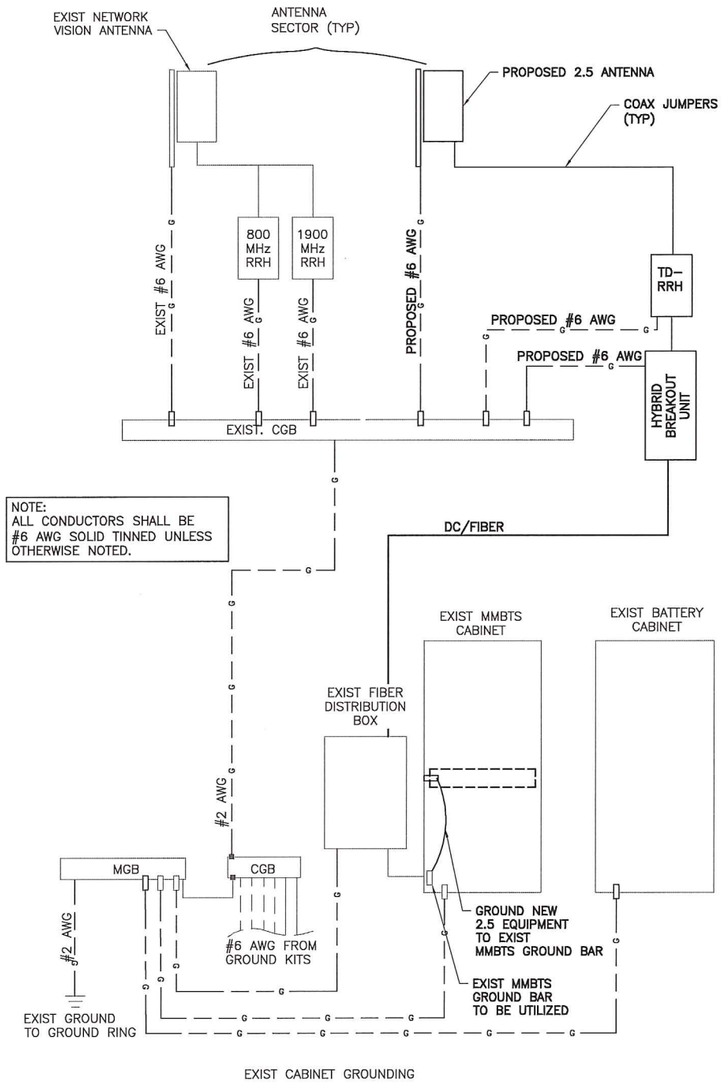
2365 LONG HILL ROAD
GUILFORD, CT 06437

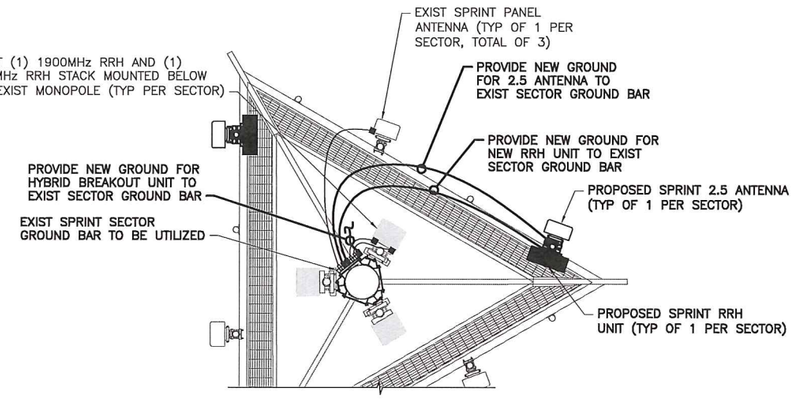
SHEET TITLE:
EQUIPMENT SCHEMATIC DETAILS

SHEET NO:
S-2



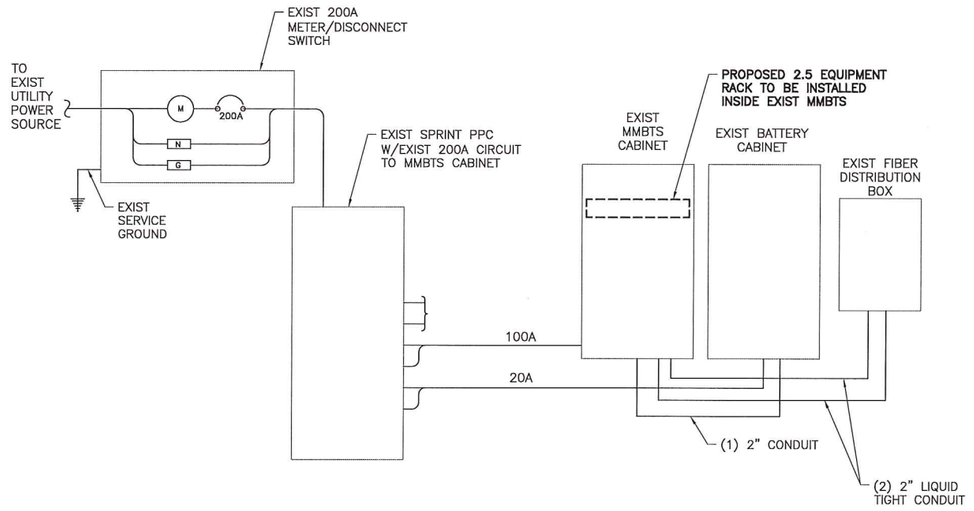
1 E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS



3 E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

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OVERLAND PARK, KS 66251

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SUBMITTALS

PROJECT NO: 7225.CT33XC535

NO	DATE	DESCRIPTION	BY
0	06/24/14	FOR COMMENT	MP
1	07/30/14	FOR CONSTRUCTION	KA
2	08/01/14	PER COMMENTS	KA
3	10/10/14	REVISED ADDRESS	KA

DATE	REVIEWED BY

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

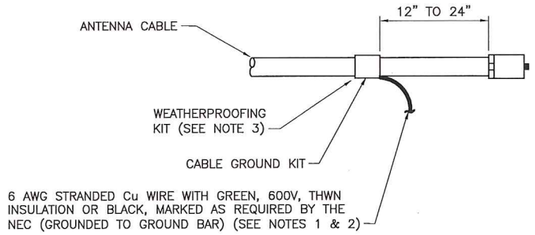
SITE NUMBER:
CT33XC535

SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

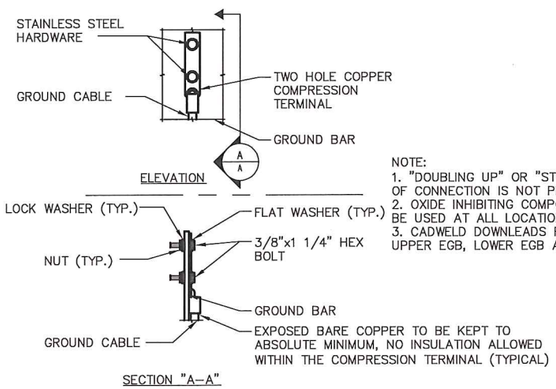
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

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.

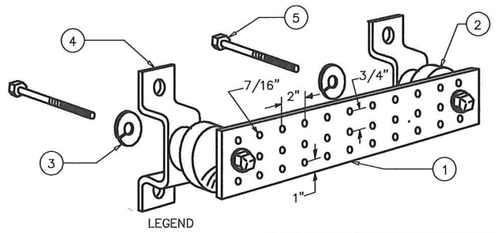


NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.

SECTION "A-A"

2 E-2 GROUNDING BAR CONN. DETAIL

SCALE: NTS



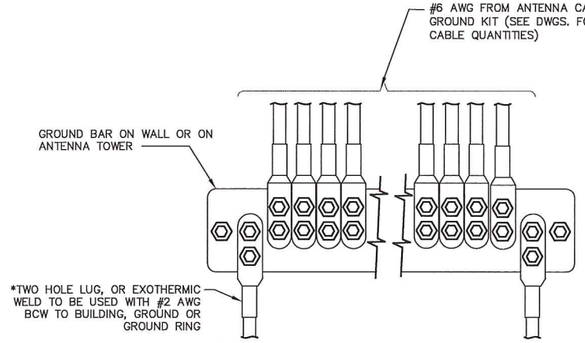
LEGEND

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, KS 66251

CROWN CASTLE

TECTONIC · PLANNING · ENGINEERING · SURVEYING · CONSTRUCTION MANAGEMENT

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SUBMITTALS

PROJECT NO: 7225.CT33XC535

NO	DATE	DESCRIPTION	BY
0	06/24/14	FOR COMMENT	MP
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DATE	REVIEWED BY
10/10/14	

STATE OF CONNECTICUT
ANTONIO A. GUALTIERI
No. 25406
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT33XC535

SITE NAME:
WARD

SITE ADDRESS:
2365 LONG HILL ROAD
GUILFORD, CT 06437

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E-2

Date: **August 9, 2017**

Charles Trask
Crown Castle
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Charlotte, NC 28277
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326 Tryon Road
Raleigh, NC 27603
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crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT33XC535
	Carrier Site Name:	CT33XC535
Crown Castle Designation:	**Crown Castle BU Number:**	876381
	Crown Castle Site Name:	Ward
	Crown Castle JDE Job Number:	450837
	Crown Castle Work Order Number:	1437433
	Crown Castle Application Number:	399431 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	51819.126953
Site Data:	**2365 Long Hill Rd., Guilford, New Haven County, CT 06437** **Latitude *41° 20' 47.34"*, Longitude *-72° 43' 23.15"*** **176 Foot - Monopole Tower**	

Dear Charles Trask,

Tower Engineering Professionals 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 1065821, in accordance with application 399431, revision 1.

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

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

This analysis has been performed in accordance with the 2016 Connecticut State Building Code (2012 International Building Code) based upon an ultimate 3-second gust wind speed of 130 mph converted to a nominal 3-second gust wind speed of 101 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 appurtenances listed in Tables 1 and 2 and the attached drawing for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* 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: Josh Rozina, P.E. / KEH

Respectfully submitted by:

William H. Martin, P.E., S.E.

8/9/17

STATE OF CONNECTICUT
WILLIAM H. MARTIN
0029484
LICENSED
PROFESSIONAL ENGINEER

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 176-ft monopole tower designed by Engineered Endeavors, Inc. in July of 2003. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F for the appurtenances listed in Table 3. The tower has been modified multiple times in the past to accommodate additional loading. TEP visited the site in July of 2014 to perform a post modification inspection. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the ANSI/TIA-222-G-2-2009 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 using a nominal 3-second gust wind speed of 101 mph with no ice, 50 mph with 0.75 inch ice thickness, and 60 mph under service loads with the following design criteria:

Type of Analysis: **Rigorous Structural Analysis**
Classification of Structure: **Class II**
Exposure Category: **Exposure B**
Topographic Category: **Category 1**
Earthquake Category: **Not Considered**
Earthquake effects may be ignored per this standard for site locations where Ss does not exceed 1.0. (New Haven County Max Ss = 0.32).

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
176.0	178.0	3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe	2	1/2	1
	176.0	3	Alcatel Lucent	TD-RRH8x20-25	1	1-1/4	

Notes:
1) See “Appendix B - Base Level Drawing” for assumed feed line configuration.

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
176.0	178.0	3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe	1	1/2	1
	176.0	9	RFS Celwave	ACU-A20-N			
		1	Tower Mounts	Platform Mount [LP 712-1]			
174.0	176.0	3	Alcatel Lucent	800 External Notch Filter	-	-	1
	175.0	3	Alcatel Lucent	800MHZ RRH			
	174.0	1	Tower Mounts	Side Arm Mount [SO 102-3]			
	173.0	3	Alcatel Lucent	PCS 1900MHz 4x45W-65MHz			
169.0	169.0	3	Ericsson	TME-RRUS-11	-	-	1
		1	Tower Mounts	T-Arm Mount [TA 702-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
167.0	167.0	3	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	12 2 1	1-5/8 7/16 3/8	1
		6	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		6	Powerwave Technologies	LGP21901			
		1	Raycap	DC6-48-60-18-8F			
		1	Tower Mounts	Platform Mount [LP 303-1]			
159.0	161.0	1	Lcom	HG2409U-PRO	1	1-5/8	2
	159.0	3	Commscope	S-300			
155.0	155.0	3	Ericsson	AIR 21 B2A B4P w/ Mount Pipe	13	1-5/8	1
		3	Ericsson	KRY 112 144/1			
		3	Ericsson	Air 21 B4A B12P-B8P 4FT w/ Mount Pipe			
		3	Ericsson	RRUS 11 B12			
		1	Tower Mounts	Platform Mount [LP 303-1]			
		1	Tower Mounts	Miscellaneous [NA 507-1]			
145.0	148.0	6	Amphenol	BXA-171063-12CF-EDIN-X w/ Mount Pipe	2	1-1/4	1
		6	Amphenol	BXA-70063-6CF-EDIN-X w/ Mount Pipe			
		3	Alcatel Lucent	RRH2X40-07-U			
		3	Alcatel Lucent	RRH2X40-AWS			
		1	RFS Celwave	DB-B1-6C-8AB-0Z			
	145.0	1	Tower Mounts	Platform Mount [LP 303-1]			
50.0	51.0	1	Lucent	KS24019-L112A	1	1/2	1
	50.0	1	Tower Mounts	Side Arm Mount [SO 701-1]			
10.0	12.0	1	Kathrein	OG-860/1920/GPS-A	1	1/4	1
	10.0	1	Tower Mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment
2) Reserved equipment

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
177.5	177.5	12	Dapa	48000	-	-
167.5	167.5	12	Dapa	48000	-	-
157.5	157.5	12	Dapa	48000	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Report	Jaworski Geotech, Inc.	1532993	CCISites
Tower Foundation Drawings	Engineered Endeavors, Inc.	1614617	CCISites
Tower Manufacturer Drawings	Engineered Endeavors, Inc.	1613550	CCISites
Tower Design Calculations	Engineered Endeavors, Inc.	1614660	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	4318894	CCISites
Post Modification Inspection	Tower Engineering Professionals	5163807	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	5650483	CCISites
Post Modification Inspection	FDH Velocitel	5885207	CCISites
Mount Analysis	Tectonic	7225-Crown-Sprint 2.5	Crown Castle
Construction Document	Tectonic	7225.CT33XC535	Crown Castle

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.

For analysis of monopole shaft reinforcements, the plates are modeled as linear appurtenances along the exterior of the pole. The loads calculated from tnxTower are then exported to a proprietary calculation sheet created by Tower Engineering Professionals, Inc. that analyzes each reinforcing element along each critical axis and presents percent capacities for each element and the pole shaft along each critical axis. The actual percent capacity of the tower structure including the reinforcing elements is reported in Table 5 - Section Capacity (Summary).

3.2) Assumptions

1) The tower and foundation were built in accordance with the manufacturer's specifications.
2) The tower and foundation 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 "Appendix B – Base Level Drawing".
4) All tower components are in sufficient condition to carry their full design capacity.
5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
6) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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)	ΦP_{allow} (K)	% Capacity	Pass / Fail
L1	176.00-144.25	Pole	TP23.65×16.50×0.1875	1	Note 1	Note 1	64.8	Pass
L2	147.75-94.58	Pole	TP34.33×22.49×0.3125	2	Note 1	Note 1	70.4	Pass
L3	99.41-46.95	Pole	TP44.30×32.63×0.3750	3	Note 1	Note 1	53.5	Pass
L4	53.03-0.00	Pole	TP54.00×42.20×0.3750	4	Note 1	Note 1	55.8	Pass
M1b	35.00-0.00	Mod (Ex)	CCI-WSFP-065125	1	Note 1	Note 1	73.7	Pass
M2	64.25-29.25	Mod (Ex)	CCI-SFP-065125	2	Note 1	Note 1	78.6	Pass
M3	89.25-64.25	Mod (Ex)	CCI-SFP-060100	3	Note 1	Note 1	80.8	Pass
M4	119.25-89.25	Mod (Ex)	CCI-SFP-060100	4	Note 1	Note 1	75.9	Pass
M5	129.25-119.25	Mod (Ex)	CCI-SFP-045100	5	Note 1	Note 1	77.4	Pass
							Summary	
						Pole (L2)	70.4	Pass
						Mod (M3)	80.8	Pass
						RATING =	**80.8**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	73.3	Pass
1	Base Plate	-	59.8	Pass
1	Base Foundation Soil Interaction	-	32.1	Pass
1	Base Foundation Structural	-	67.1	Pass

Structure Rating (max from all components) =	80.8%

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

4.1) Recommendations

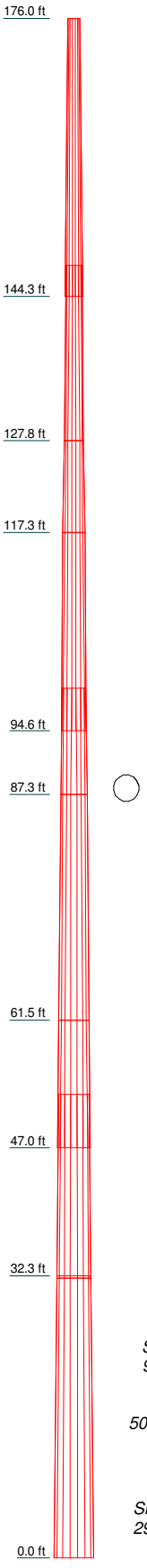
1) If the load differs from that described in Tables 1 and 2 of this report, "Appendix B – Base Level Drawing" or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

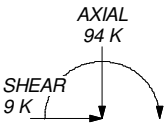
TNXTOWER OUTPUT

Section	1	2	3	4	5	6	7	8	9	10
Length (ft)	31.75	20.00	10.50	22.67	12.16	25.75	14.55	20.78	0.25	32.00
Number of Sides	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.188	0.313	0.481	0.508	0.559	0.529	0.577	0.558	0.797	0.570
Socket Length (ft)	3.50			4.83			6.08			
Top Dia (in)	16.500	22.487	26.942	29.280	32.629	35.334	41.063	42.197	46.822	46.878
Bot Dia (in)	23.650	26.942	29.280	34.330	35.334	41.063	44.300	46.822	46.878	54.000
Grade	MPRF-Fy=65ksi, Density=100%								MPRF-Fy=65ksi, Density=50%	MPRF-Fy=65ksi, Density=100%
Weight (K)	1.3	1.6	1.0	2.4	1.7	3.9	2.5	3.7	0.0	6.5

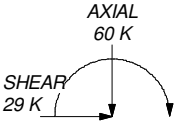
24.7



ALL REACTIONS ARE FACTORED



TORQUE 1 kip-ft
50 mph WIND - 0.750 in ICE



TORQUE 5 kip-ft
REACTIONS - 101 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVSPP18-C-A20 w/ Mount Pipe	176	Platform Mount [LP 303-1]	167
APXVSPP18-C-A20 w/ Mount Pipe	176	HG2409U-PRO	159
APXVSPP18-C-A20 w/ Mount Pipe	176	Side Arm Mount [SO 305-1]	159
APXVTM14-C-120 w/ Mount Pipe	176	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	155
APXVTM14-C-120 w/ Mount Pipe	176	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	155
APXVTM14-C-120 w/ Mount Pipe	176	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	155
(3) ACU-A20-N	176	Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	155
(3) ACU-A20-N	176	Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	155
(3) ACU-A20-N	176	Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	155
TD-RRH8x20-25	176	KRY 112 144/1	155
TD-RRH8x20-25	176	KRY 112 144/1	155
TD-RRH8x20-25	176	KRY 112 144/1	155
(2) 2.4" Dia x 6-ft Pipe	176	RRUS 11 B12	155
(2) 2.4" Dia x 6-ft Pipe	176	RRUS 11 B12	155
(2) 2.4" Dia x 6-ft Pipe	176	RRUS 11 B12	155
Platform Mount [LP 712-1]	176	2.4" Dia x 6-ft Pipe	155
800MHZ RRH	174	2.4" Dia x 6-ft Pipe	155
800MHZ RRH	174	2.4" Dia x 6-ft Pipe	155
800MHZ RRH	174	Miscellaneous [NA 507-1]	155
PCS 1900MHz 4x45W-65MHz	174	Platform Mount [LP 303-1]	155
PCS 1900MHz 4x45W-65MHz	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
PCS 1900MHz 4x45W-65MHz	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
800 EXTERNAL NOTCH FILTER	174	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	145
800 EXTERNAL NOTCH FILTER	174	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
800 EXTERNAL NOTCH FILTER	174	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
2.4" Dia x 6-ft Pipe	174	(2) BXA-70063-6CF-EDIN-X w/ Mount Pipe	145
2.4" Dia x 6-ft Pipe	174	RRH2X40-07-U	145
2.4" Dia x 6-ft Pipe	174	RRH2X40-07-U	145
Side Arm Mount [SO 102-3]	174	RRH2X40-07-U	145
RRUS 11	169	RRH2X40-AWS	145
RRUS 11	169	RRH2X40-AWS	145
RRUS 11	169	RRH2X40-AWS	145
2.4" Dia x 4-ft Mount Pipe	169	DB-B1-6C-8AB-0Z	145
2.4" Dia x 4-ft Mount Pipe	169	Platform Mount [LP 303-1]	145
2.4" Dia x 4-ft Mount Pipe	169	KS24019-L112A	50
T-Arm Mount [TA 702-3]	169	1.9" x 3' Pipe	50
(2) 7770.00 w/ Mount Pipe	167	Side Arm Mount [SO 701-1]	50
(2) 7770.00 w/ Mount Pipe	167	OG-860/1920/GPS-A	10
(2) 7770.00 w/ Mount Pipe	167	1.9" x 3' Pipe	10
AM-X-CD-16-65-00T-RET w/ Mount Pipe	167	Side Arm Mount [SO 701-1]	10
AM-X-CD-16-65-00T-RET w/ Mount Pipe	167		
AM-X-CD-16-65-00T-RET w/ Mount Pipe	167		
(2) LGP21401	167		
(2) LGP21401	167		
(2) LGP21401	167		
(2) LGP21901	167		
(2) LGP21901	167		
(2) LGP21901	167		
DC6-48-60-18-8F	167		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
MPRF-Fy=65ksi Density=100%	65 ksi	80 ksi	MPRF-Fy=65ksi Density=50%	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

Tower Engineering Professionals

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: ***Ward (BU 876381)***			
Project: ***TEP No. 51819.126953***			
Client: Crown Castle	Drawn by: khoiness	App'd:	
Code: TIA-222-G	Date: 08/09/17	Scale: NTS	
Path: C:\Users\khoiness\OneDrive - Tower Engineering Professionals, Inc\Ward\876381_LC7.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:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 101 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	176.00-144.25	31.75	3.50	18	16.500	23.650	0.188	0.750	MPRF-Fy=65ksi, Density=100% (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	144.25-127.75	20.00	0.00	18	22.487	26.942	0.313	1.250	MPRF-Fy=65ksi, Density=100% (65 ksi)
L3	127.75-117.25	10.50	0.00	18	26.942	29.280	0.481	1.923	MPRF-Fy=65ksi, Density=100% (65 ksi)
L4	117.25-94.58	22.67	4.83	18	29.280	34.330	0.508	2.030	MPRF-Fy=65ksi, Density=100% (65 ksi)
L5	94.58-87.25	12.16	0.00	18	32.629	35.334	0.559	2.235	MPRF-Fy=65ksi, Density=100% (65 ksi)
L6	87.25-61.50	25.75	0.00	18	35.334	41.063	0.529	2.118	MPRF-Fy=65ksi, Density=100% (65 ksi)
L7	61.50-46.95	14.55	6.08	18	41.063	44.300	0.577	2.308	MPRF-Fy=65ksi, Density=100% (65 ksi)
L8	46.95-32.25	20.78	0.00	18	42.197	46.822	0.558	2.232	MPRF-Fy=65ksi, Density=100% (65 ksi)
L9	32.25-32.00	0.25	0.00	18	46.822	46.878	0.797	3.187	MPRF-Fy=65ksi, Density=50% (65 ksi)
L10	32.00-0.00	32.00		18	46.878	54.000	0.570	2.281	MPRF-Fy=65ksi, Density=100% (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	16.755	9.708	326.368	5.791	8.382	38.937	653.165	4.855	2.574	13.728
	24.015	13.963	971.110	8.329	12.014	80.830	1943.498	6.983	3.832	20.439
L2	23.625	21.994	1366.296	7.872	11.423	119.606	2734.390	10.999	3.408	10.905
	27.357	26.413	2366.281	9.453	13.686	172.893	4735.676	13.209	4.192	13.414
L3	27.357	40.380	3572.016	9.394	13.686	260.991	7148.732	20.194	3.896	8.102
	29.732	43.949	4605.355	10.224	14.874	309.615	9216.771	21.979	4.307	8.958
L4	29.732	46.354	4848.340	10.214	14.874	325.951	9703.061	23.182	4.260	8.393
	34.860	54.489	7875.135	12.007	17.440	451.565	15760.632	27.250	5.149	10.144
L5	34.224	56.877	7390.625	11.385	16.576	445.873	14790.975	28.444	4.759	8.518
	35.879	61.675	9423.101	12.345	17.950	524.967	18858.602	30.843	5.235	9.37
L6	35.879	58.485	8950.821	12.356	17.950	498.656	17913.420	29.248	5.287	9.987
	41.697	68.111	14137.893	14.389	20.860	677.750	28294.388	34.062	6.295	11.891
L7	41.697	74.143	15353.830	14.373	20.860	736.041	30727.863	37.078	6.212	10.766
	44.983	80.071	19338.845	15.522	22.504	859.336	38703.136	40.043	6.781	11.753
L8	44.222	73.735	16151.829	14.782	21.436	753.481	32324.910	36.875	6.445	11.552
	47.545	81.925	22153.693	16.424	23.786	931.386	44336.537	40.970	7.259	13.011

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
L9	47.545	116.408	31154.118	16.339	23.786	1309.783	62349.230	58.215	6.838	8.582
	47.601	116.549	31267.243	16.359	23.814	1312.978	62575.629	58.285	6.848	8.594
L10	47.601	83.805	22704.767	16.439	23.814	953.422	45439.410	41.911	7.247	12.71
	54.833	96.695	34874.460	18.968	27.432	1271.306	69794.808	48.357	8.500	14.908

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 176.00-144.25				1	1	1			
L2 144.25-127.75				1	1	1			
L3 127.75-117.25				1	1	0.653768			
L4 117.25-94.58				1	1	0.619342			
L5 94.58-87.25				1	1	0.674678			
L6 87.25-61.50				1	1	0.711031			
L7 61.50-46.95				1	1	0.653042			
L8 46.95-32.25				1	1	0.674813			
L9 32.25-32.00				1	1	0.94982			
L10 32.00-0.00				1	1	0.66009			

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 plf
*** 159' ***									
AVA7-50(1-5/8)	B	Surface Ar (CaAa)	159.00 - 0.00	1	1	0.250 0.250	2.010		0.70
Equipment									
Step Pegs (5/8" SR) 7-in. w/30" step	A	Surface Ar (CaAa)	176.00 - 0.00	1	1	-0.250 -0.250	0.350		0.49
Safety Line 3/8	A	Surface Ar (CaAa)	176.00 - 0.00	1	1	-0.250 -0.250	0.375		0.22
***Mods**									
CCI-65FP-065125	A	Surface Ar (CaAa)	35.00 - 0.00	1	1	0.500 0.500	1.250		27.65
CCI-65FP-065125	A	Surface Ar (CaAa)	35.00 - 0.00	1	1	-0.250 -0.250	1.250		27.65
CCI-65FP-065125	C	Surface Ar (CaAa)	35.00 - 0.00	1	1	0.000 0.000	1.250		27.65
*****									
CCI-65FP-065125	A	Surface Ar (CaAa)	64.25 - 35.00	1	1	0.500 0.500	1.250		27.65
CCI-65FP-065125	A	Surface Ar (CaAa)	64.25 - 35.00	1	1	-0.250 -0.250	1.250		27.65
*****									
CCI-65FP-060100	A	Surface Ar (CaAa)	89.25 - 64.25	1	1	0.500 0.500	1.000		20.42
CCI-65FP-060100	A	Surface Ar (CaAa)	89.25 - 64.25	1	1	-0.250 -0.250	1.000		20.42
*****									
CCI-65FP-060100	A	Surface Ar	119.25 - 89.25	1	1	0.500	1.000		20.42

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
		(CaAa)				0.500			
CCI-65FP-060100	A	Surface Ar	119.25 - 89.25	1	1	-0.250	1.000		20.42
		(CaAa)				-0.250			
*****									
CCI-65FP-045100	A	Surface Ar	129.25 - 119.25	1	1	0.500	1.000		15.31
		(CaAa)				0.500			
CCI-65FP-045100	A	Surface Ar	129.25 - 119.25	1	1	-0.250	1.000		15.31
		(CaAa)				-0.250			
*****									

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
176*								
HB114-21U3M12-XXX F(1-1/4)	C	No	Inside Pole	176.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
HYBRIFLEX RRH 1-SECTOR(1/2)	C	No	Inside Pole	176.00 - 0.00	3	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
174*								
HB114-21U3M12-XXX F(1-1/4")	C	No	Inside Pole	174.00 - 0.00	3	No Ice	0.00	1.22
						1/2" Ice	0.00	1.22
						1" Ice	0.00	1.22
*** 167' ***								
LDF7-50A(1-5/8")	B	No	Inside Pole	167.00 - 0.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	B	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG122ST-BRDA(7/ 16)	B	No	Inside Pole	167.00 - 0.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.14
						1" Ice	0.00	0.14
2" Flexible Conduit	B	No	Inside Pole	167.00 - 0.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
*** 155' ***								
LDF7-50A(1-5/8")	C	No	Inside Pole	155.00 - 0.00	13	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
*** 145' ***								
MLE Hybrid 3Power/6Fiber RL 2(1 1/4")	C	No	Inside Pole	145.00 - 0.00	2	No Ice	0.00	0.68
						1/2" Ice	0.00	0.68
						1" Ice	0.00	0.68
*** 50' ***								
LDF4P-50A(1/2")	C	No	CaAa (Out Of Face)	50.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
*** 10' ***								
LDF1-50A(1/4)	C	No	Inside Pole	10.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
CCI-65FP-065125	B	No	CaAa (Out Of Face)	35.00 - 0.00	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
CCI-65FP-065125	A	No	CaAa (Out Of Face)	35.00 - 29.25	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
CCI-65FP-065125	B	No	CaAa (Out Of Face)	35.00 - 29.25	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
CCI-65FP-065125	C	No	CaAa (Out Of Face)	64.25 - 29.25	1	No Ice	0.00	27.65
						1/2" Ice	0.00	28.73
						1" Ice	0.00	30.15
CCI-65FP-060100	C	No	CaAa (Out Of Face)	89.25 - 64.25	1	No Ice	0.00	20.42
						1/2" Ice	0.00	21.37
						1" Ice	0.00	22.66
CCI-65FP-060100	C	No	CaAa (Out Of Face)	119.25 - 89.25	1	No Ice	0.00	20.42
						1/2" Ice	0.00	21.37
						1" Ice	0.00	22.66
***								
CCI-65FP-045100	C	No	CaAa (Out Of Face)	129.25 - 119.25	1	No Ice	0.00	15.31
						1/2" Ice	0.00	16.17
						1" Ice	0.00	17.36
*****								

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	176.00-144.25	A	0.000	0.000	2.302	0.000	0.02
		B	0.000	0.000	2.965	0.000	0.25
		C	0.000	0.000	0.000	0.000	0.28
L2	144.25-127.75	A	0.000	0.000	1.496	0.000	0.06
		B	0.000	0.000	3.317	0.000	0.19
		C	0.000	0.000	0.000	0.000	0.31
L3	127.75-117.25	A	0.000	0.000	2.861	0.000	0.35
		B	0.000	0.000	2.111	0.000	0.12
		C	0.000	0.000	0.000	0.000	0.35
L4	117.25-94.58	A	0.000	0.000	6.178	0.000	0.94
		B	0.000	0.000	4.557	0.000	0.25
		C	0.000	0.000	0.000	0.000	0.86
L5	94.58-87.25	A	0.000	0.000	1.997	0.000	0.30
		B	0.000	0.000	1.473	0.000	0.08
		C	0.000	0.000	0.000	0.000	0.28
L6	87.25-61.50	A	0.000	0.000	7.154	0.000	1.11
		B	0.000	0.000	5.176	0.000	0.29
		C	0.000	0.000	0.000	0.000	0.99
L7	61.50-46.95	A	0.000	0.000	4.692	0.000	0.81
		B	0.000	0.000	2.925	0.000	0.16
		C	0.000	0.000	0.000	0.000	0.66
L8	46.95-32.25	A	0.000	0.000	4.741	0.000	0.90
		B	0.000	0.000	2.955	0.000	0.32
		C	0.000	0.000	0.344	0.000	0.74
L9	32.25-32.00	A	0.000	0.000	0.081	0.000	0.02
		B	0.000	0.000	0.050	0.000	0.02
		C	0.000	0.000	0.031	0.000	0.02
L10	32.00-0.00	A	0.000	0.000	10.320	0.000	1.87
		B	0.000	0.000	6.432	0.000	1.32
		C	0.000	0.000	4.000	0.000	1.52

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	176.00-144.25	A	1.756	0.000	0.000	24.600	0.000	0.31
		B		0.000	0.000	8.144	0.000	0.37
		C		0.000	0.000	0.000	0.000	0.28
L2	144.25-127.75	A	1.728	0.000	0.000	14.138	0.000	0.23
		B		0.000	0.000	9.110	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.32
L3	127.75-117.25	A	1.710	0.000	0.000	17.226	0.000	0.56
		B		0.000	0.000	5.702	0.000	0.20
		C		0.000	0.000	0.000	0.000	0.40
L4	117.25-94.58	A	1.685	0.000	0.000	36.738	0.000	1.38
		B		0.000	0.000	12.197	0.000	0.43
		C		0.000	0.000	0.000	0.000	0.96
L5	94.58-87.25	A	1.660	0.000	0.000	11.879	0.000	0.45
		B		0.000	0.000	3.944	0.000	0.14
		C		0.000	0.000	0.000	0.000	0.31
L6	87.25-61.50	A	1.626	0.000	0.000	40.656	0.000	1.58
		B		0.000	0.000	13.551	0.000	0.47
		C		0.000	0.000	0.000	0.000	1.11
L7	61.50-46.95	A	1.576	0.000	0.000	23.038	0.000	1.08
		B		0.000	0.000	7.511	0.000	0.26
		C		0.000	0.000	0.000	0.000	0.74
L8	46.95-32.25	A	1.527	0.000	0.000	23.276	0.000	1.18
		B		0.000	0.000	7.588	0.000	0.44
		C		0.000	0.000	1.211	0.000	0.89
L9	32.25-32.00	A	1.496	0.000	0.000	0.380	0.000	0.03
		B		0.000	0.000	0.125	0.000	0.02
		C		0.000	0.000	0.106	0.000	0.02
L10	32.00-0.00	A	1.392	0.000	0.000	45.953	0.000	2.36
		B		0.000	0.000	15.340	0.000	1.64
		C		0.000	0.000	12.908	0.000	1.80

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	176.00-144.25	0.051	0.000	-0.400	0.000
L2	144.25-127.75	0.173	-0.013	-0.193	-0.037
L3	127.75-117.25	0.047	-0.128	-0.466	-0.332
L4	117.25-94.58	0.047	-0.130	-0.491	-0.349
L5	94.58-87.25	0.046	-0.131	-0.511	-0.362
L6	87.25-61.50	0.042	-0.136	-0.524	-0.374
L7	61.50-46.95	0.011	-0.166	-0.555	-0.405
L8	46.95-32.25	0.011	-0.134	-0.560	-0.329
L9	32.25-32.00	0.010	0.000	-0.519	0.000
L10	32.00-0.00	0.010	0.000	-0.507	0.000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	12	AVA7-50(1-5/8)	144.25 - 159.00	1.0000	1.0000
L1	23	Step Pegs (5/8" SR) 7-in. w/30" step	144.25 - 176.00	1.0000	1.0000
L1	24	Safety Line 3/8	144.25 - 176.00	1.0000	1.0000
L1	50	CCI-65FP-045100	144.25 - 129.25	1.0000	1.0000
L1	51	CCI-65FP-045100	144.25 - 129.25	1.0000	1.0000
L3	12	AVA7-50(1-5/8)	117.25 - 127.75	1.0000	1.0000
L3	23	Step Pegs (5/8" SR) 7-in. w/30" step	117.25 - 127.75	1.0000	1.0000
L3	24	Safety Line 3/8	117.25 - 127.75	1.0000	1.0000
L3	42	CCI-65FP-060100	117.25 - 119.25	1.0000	1.0000
L3	43	CCI-65FP-060100	117.25 - 119.25	1.0000	1.0000
L3	50	CCI-65FP-045100	119.25 - 127.75	1.0000	1.0000
L3	51	CCI-65FP-045100	119.25 - 127.75	1.0000	1.0000
L4	12	AVA7-50(1-5/8)	94.58 - 117.25	1.0000	1.0000
L4	23	Step Pegs (5/8" SR) 7-in. w/30" step	94.58 - 117.25	1.0000	1.0000
L4	24	Safety Line 3/8	94.58 - 117.25	1.0000	1.0000
L4	42	CCI-65FP-060100	94.58 - 117.25	1.0000	1.0000
L4	43	CCI-65FP-060100	94.58 - 117.25	1.0000	1.0000
L4	38	CCI-65FP-060100	94.58 - 89.25	1.0000	1.0000
L4	39	CCI-65FP-060100	94.58 - 89.25	1.0000	1.0000
L6	12	AVA7-50(1-5/8)	61.50 - 87.25	1.0000	1.0000
L6	23	Step Pegs (5/8" SR) 7-in. w/30" step	61.50 - 87.25	1.0000	1.0000
L6	24	Safety Line 3/8	61.50 - 87.25	1.0000	1.0000
L6	31	CCI-65FP-065125	61.50 - 64.25	1.0000	1.0000
L6	34	CCI-65FP-065125	61.50 - 64.25	1.0000	1.0000
L6	38	CCI-65FP-060100	64.25 - 87.25	1.0000	1.0000
L6	39	CCI-65FP-060100	64.25 - 87.25	1.0000	1.0000
L7	12	AVA7-50(1-5/8)	46.95 - 61.50	1.0000	1.0000
L7	23	Step Pegs (5/8" SR) 7-in. w/30" step	46.95 - 61.50	1.0000	1.0000
L7	24	Safety Line 3/8	46.95 - 61.50	1.0000	1.0000
L7	31	CCI-65FP-065125	46.95 - 61.50	1.0000	1.0000
L7	34	CCI-65FP-065125	46.95 - 61.50	1.0000	1.0000
L7	26	CCI-65FP-065125	46.95 - 35.00	1.0000	1.0000
L7	27	CCI-65FP-065125	46.95 - 35.00	1.0000	1.0000
L7	29	CCI-65FP-065125	46.95 - 35.00	1.0000	1.0000
L9	12	AVA7-50(1-5/8)	32.00 - 32.25	1.0000	1.0000
L9	23	Step Pegs (5/8" SR) 7-in. w/30" step	32.00 - 32.25	1.0000	1.0000
L9	24	Safety Line 3/8	32.00 - 32.25	1.0000	1.0000
L9	26	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L9	27	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L9	29	CCI-65FP-065125	32.00 - 32.25	1.0000	1.0000
L10	12	AVA7-50(1-5/8)	0.00 - 32.00	1.0000	1.0000
L10	23	Step Pegs (5/8" SR) 7-in. w/30" step	0.00 - 32.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L10	24	Safety Line 3/8	0.00 - 32.00	1.0000	1.0000
L10	26	CCI-65FP-065125	0.00 - 32.00	1.0000	1.0000
L10	27	CCI-65FP-065125	0.00 - 32.00	1.0000	1.0000
L10	29	CCI-65FP-065125	0.00 - 32.00	1.0000	1.0000

Discrete Tower Loads

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
*** 176' ***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 -2.00 2.00	20.000	176.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00 -2.00 2.00	40.000	176.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Leg	4.00 -2.00 2.00	30.000	176.00	No Ice 1/2" Ice 1" Ice	8.26 8.82 9.35	6.95 8.13 9.02	0.08 0.15 0.23
APXVTM14-C-120 w/ Mount Pipe	A	From Centroid-Leg	4.00 6.00 2.00	20.000	176.00	No Ice 1/2" Ice 1" Ice	6.34 6.72 7.10	3.61 3.97 4.33	0.06 0.10 0.14
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Leg	4.00 -6.00 2.00	40.000	176.00	No Ice 1/2" Ice 1" Ice	6.34 6.72 7.10	3.61 3.97 4.33	0.06 0.10 0.14
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Leg	4.00 6.00 2.00	30.000	176.00	No Ice 1/2" Ice 1" Ice	6.34 6.72 7.10	3.61 3.97 4.33	0.06 0.10 0.14
(3) ACU-A20-N	A	From Centroid-Leg	4.00 -2.00 0.00	20.000	176.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	B	From Centroid-Leg	4.00 -2.00 0.00	40.000	176.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
(3) ACU-A20-N	C	From Centroid-Leg	4.00 -2.00 0.00	30.000	176.00	No Ice 1/2" Ice 1" Ice	0.07 0.10 0.15	0.12 0.16 0.21	0.00 0.00 0.00
TD-RRH8x20-25	A	From Centroid-Leg	4.00 6.00 0.00	20.000	176.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	B	From Centroid-Leg	4.00 -6.00 0.00	40.000	176.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
TD-RRH8x20-25	C	From Centroid-Leg	4.00 6.00 0.00	30.000	176.00	No Ice 1/2" Ice 1" Ice	4.05 4.30 4.56	1.53 1.71 1.90	0.07 0.10 0.13
(2) 2.4" Dia x 6-ft Pipe	A	From Centroid-Leg	4.00 -2.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
(2) 2.4" Dia x 6-ft Pipe	B	From	4.00	0.000	176.00	No Ice	1.43	1.43	0.02

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
		Centroid-Leg	4.00 0.00			1/2" Ice 1" Ice	1.93 2.30	1.93 2.30	0.03 0.05
(2) 2.4" Dia x 6-ft Pipe	C	From Centroid-Leg	4.00 -2.00 0.00	0.000	176.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
Platform Mount [LP 712-1]	C	None		0.000	176.00	No Ice 1/2" Ice 1" Ice	24.53 29.94 35.35	24.53 29.94 35.35	1.34 1.65 1.96
*** 174' ***									
800MHZ RRH	A	From Leg	1.50 0.00 1.00	20.000	174.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
800MHZ RRH	B	From Leg	1.50 0.00 1.00	40.000	174.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
800MHZ RRH	C	From Leg	1.50 0.00 1.00	30.000	174.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.77 1.95 2.13	0.05 0.07 0.10
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.50 0.00 -1.00	20.000	174.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.50 0.00 -1.00	40.000	174.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.50 0.00 -1.00	30.000	174.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
800 EXTERNAL NOTCH FILTER	A	From Leg	1.50 0.00 2.00	20.000	174.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	B	From Leg	1.50 0.00 2.00	40.000	174.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
800 EXTERNAL NOTCH FILTER	C	From Leg	1.50 0.00 2.00	30.000	174.00	No Ice 1/2" Ice 1" Ice	0.66 0.76 0.87	0.32 0.40 0.48	0.01 0.02 0.02
2.4" Dia x 6-ft Pipe	A	From Leg	1.50 0.00 0.00	0.000	174.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
2.4" Dia x 6-ft Pipe	B	From Leg	1.50 0.00 0.00	0.000	174.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
2.4" Dia x 6-ft Pipe	C	From Leg	1.50 0.00 0.00	0.000	174.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
Side Arm Mount [SO 102-3]	C	None		0.000	174.00	No Ice 1/2" Ice 1" Ice	3.00 3.48 3.96	3.00 3.48 3.96	0.08 0.11 0.14
*** 169' ***									
RRUS 11	A	From Leg	3.00 -1.50 0.00	30.000	169.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 11	B	From Leg	3.00 -1.50 0.00	40.000	169.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 11	C	From Leg	3.00 -1.50	40.000	169.00	No Ice 1/2" Ice	2.79 3.00	1.19 1.34	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	3.21	1.50	0.10
2.4" Dia x 4-ft Mount Pipe	A	From Leg	3.00	0.000	169.00	No Ice	0.87	0.87	0.01
			-1.50			1/2" Ice	1.12	1.12	0.02
			0.00			1" Ice	1.37	1.37	0.03
2.4" Dia x 4-ft Mount Pipe	B	From Leg	3.00	0.000	169.00	No Ice	0.87	0.87	0.01
			-1.50			1/2" Ice	1.12	1.12	0.02
			0.00			1" Ice	1.37	1.37	0.03
2.4" Dia x 4-ft Mount Pipe	C	From Leg	3.00	0.000	169.00	No Ice	0.87	0.87	0.01
			-1.50			1/2" Ice	1.12	1.12	0.02
			0.00			1" Ice	1.37	1.37	0.03
T-Arm Mount [TA 702-3]	C	None		0.000	169.00	No Ice	5.64	5.64	0.34
						1/2" Ice	6.55	6.55	0.43
						1" Ice	7.46	7.46	0.52
*** 167' ***									
(2) 7770.00 w/ Mount Pipe	A	From Centroid-Leg	4.00	30.000	167.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
(2) 7770.00 w/ Mount Pipe	B	From Centroid-Leg	4.00	40.000	167.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
(2) 7770.00 w/ Mount Pipe	C	From Centroid-Leg	4.00	40.000	167.00	No Ice	5.75	4.25	0.06
			0.00			1/2" Ice	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Centroid-Leg	4.00	30.000	167.00	No Ice	8.26	6.30	0.07
			0.00			1/2" Ice	8.82	7.48	0.14
			0.00			1" Ice	9.35	8.37	0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Centroid-Leg	4.00	40.000	167.00	No Ice	8.26	6.30	0.07
			0.00			1/2" Ice	8.82	7.48	0.14
			0.00			1" Ice	9.35	8.37	0.21
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Leg	4.00	40.000	167.00	No Ice	8.26	6.30	0.07
			0.00			1/2" Ice	8.82	7.48	0.14
			0.00			1" Ice	9.35	8.37	0.21
(2) LGP21401	A	From Centroid-Leg	4.00	30.000	167.00	No Ice	1.10	0.21	0.01
			-3.00			1/2" Ice	1.24	0.27	0.02
			0.00			1" Ice	1.38	0.35	0.03
(2) LGP21401	B	From Centroid-Leg	4.00	40.000	167.00	No Ice	1.10	0.21	0.01
			-3.00			1/2" Ice	1.24	0.27	0.02
			0.00			1" Ice	1.38	0.35	0.03
(2) LGP21401	C	From Centroid-Leg	4.00	40.000	167.00	No Ice	1.10	0.21	0.01
			-3.00			1/2" Ice	1.24	0.27	0.02
			0.00			1" Ice	1.38	0.35	0.03
(2) LGP21901	A	From Centroid-Leg	4.00	30.000	167.00	No Ice	0.23	0.16	0.01
			3.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
(2) LGP21901	B	From Centroid-Leg	4.00	40.000	167.00	No Ice	0.23	0.16	0.01
			3.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
(2) LGP21901	C	From Centroid-Leg	4.00	40.000	167.00	No Ice	0.23	0.16	0.01
			3.00			1/2" Ice	0.29	0.21	0.01
			0.00			1" Ice	0.36	0.28	0.01
DC6-48-60-18-8F	B	From Centroid-Leg	4.00	40.000	167.00	No Ice	0.92	0.92	0.02
			0.00			1/2" Ice	1.46	1.46	0.04
			0.00			1" Ice	1.64	1.64	0.06
Platform Mount [LP 303-1]	C	None		0.000	167.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
*159									

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
HG2409U-PRO	C	From Leg	4.00 0.00 2.00	-30.000	159.00	No Ice 1/2" Ice 1" Ice	0.38 0.54 0.72	0.38 0.54 0.72	0.00 0.01 0.01
Side Arm Mount [SO 305-1]	C	From Leg	2.00 0.00 0.00	-30.000	159.00	No Ice 1/2" Ice 1" Ice	0.94 1.48 2.02	1.41 2.17 2.93	0.03 0.04 0.06
155'									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Centroid-Leg	4.00 -6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Centroid-Leg	4.00 -6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Centroid-Leg	4.00 -6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	6.33 6.78 7.21	5.64 6.43 7.13	0.11 0.17 0.23
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	A	From Centroid-Leg	4.00 6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	7.89 8.37 8.83	6.69 7.54 8.29	0.15 0.21 0.29
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	B	From Centroid-Leg	4.00 6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	7.89 8.37 8.83	6.69 7.54 8.29	0.15 0.21 0.29
Ericsson Air 21 B4A B12P-B8P 4FT w/ Mount Pipe	C	From Centroid-Leg	4.00 6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	7.89 8.37 8.83	6.69 7.54 8.29	0.15 0.21 0.29
KRY 112 144/1	A	From Centroid-Leg	4.00 -6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	B	From Centroid-Leg	4.00 -6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
KRY 112 144/1	C	From Centroid-Leg	4.00 -6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	0.35 0.43 0.51	0.16 0.22 0.28	0.01 0.01 0.02
RRUS 11 B12	A	From Centroid-Leg	4.00 6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 11 B12	B	From Centroid-Leg	4.00 6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 11 B12	C	From Centroid-Leg	4.00 6.00 0.00	30.000	155.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
2.4" Dia x 6-ft Pipe	A	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
2.4" Dia x 6-ft Pipe	B	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
2.4" Dia x 6-ft Pipe	C	From Centroid-Leg	4.00 0.00 0.00	0.000	155.00	No Ice 1/2" Ice 1" Ice	1.43 1.93 2.30	1.43 1.93 2.30	0.02 0.03 0.05
Miscellaneous [NA 507-1]	C	None		0.000	155.00	No Ice 1/2" Ice 1" Ice	4.80 6.70 8.60	4.80 6.70 8.60	0.25 0.29 0.34
Platform Mount [LP 303-1]	C	None		0.000	155.00	No Ice 1/2" Ice	14.66 18.87	14.66 18.87	1.25 1.48

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
						1" Ice	23.08	23.08	1.71
*** 145' ***									
(2)	A	From	4.00	20.000	145.00	No Ice	5.03	5.29	0.04
BXA-171063-12CF-EDIN-X w/ Mount Pipe		Centroid-Le g	-2.00 3.00			1/2" Ice 1" Ice	5.58 6.10	6.46 7.35	0.09 0.14
(2)	B	From	4.00	20.000	145.00	No Ice	5.03	5.29	0.04
BXA-171063-12CF-EDIN-X w/ Mount Pipe		Centroid-Le g	-2.00 3.00			1/2" Ice 1" Ice	5.58 6.10	6.46 7.35	0.09 0.14
(2)	C	From	4.00	30.000	145.00	No Ice	5.03	5.29	0.04
BXA-171063-12CF-EDIN-X w/ Mount Pipe		Centroid-Le g	-2.00 3.00			1/2" Ice 1" Ice	5.58 6.10	6.46 7.35	0.09 0.14
(2)	A	From	4.00	20.000	145.00	No Ice	7.81	5.80	0.04
BXA-70063-6CF-EDIN-X w/ Mount Pipe		Centroid-Le g	2.00 3.00			1/2" Ice 1" Ice	8.36 8.87	6.95 7.82	0.10 0.17
(2)	B	From	4.00	20.000	145.00	No Ice	7.81	5.80	0.04
BXA-70063-6CF-EDIN-X w/ Mount Pipe		Centroid-Le g	2.00 3.00			1/2" Ice 1" Ice	8.36 8.87	6.95 7.82	0.10 0.17
(2)	C	From	4.00	30.000	145.00	No Ice	7.81	5.80	0.04
BXA-70063-6CF-EDIN-X w/ Mount Pipe		Centroid-Le g	2.00 3.00			1/2" Ice 1" Ice	8.36 8.87	6.95 7.82	0.10 0.17
RRH2X40-07-U	A	From	4.00	20.000	145.00	No Ice	1.93	1.05	0.05
		Centroid-Le g	-6.00 3.00			1/2" Ice 1" Ice	2.10 2.28	1.19 1.33	0.07 0.09
RRH2X40-07-U	B	From	4.00	20.000	145.00	No Ice	1.93	1.05	0.05
		Centroid-Le g	-6.00 3.00			1/2" Ice 1" Ice	2.10 2.28	1.19 1.33	0.07 0.09
RRH2X40-07-U	C	From	4.00	30.000	145.00	No Ice	1.93	1.05	0.05
		Centroid-Le g	-6.00 3.00			1/2" Ice 1" Ice	2.10 2.28	1.19 1.33	0.07 0.09
RRH2X40-AWS	A	From	4.00	20.000	145.00	No Ice	2.16	1.42	0.04
		Centroid-Le g	6.00 3.00			1/2" Ice 1" Ice	2.36 2.57	1.59 1.77	0.06 0.08
RRH2X40-AWS	B	From	4.00	20.000	145.00	No Ice	2.16	1.42	0.04
		Centroid-Le g	6.00 3.00			1/2" Ice 1" Ice	2.36 2.57	1.59 1.77	0.06 0.08
RRH2X40-AWS	C	From	4.00	30.000	145.00	No Ice	2.16	1.42	0.04
		Centroid-Le g	6.00 3.00			1/2" Ice 1" Ice	2.36 2.57	1.59 1.77	0.06 0.08
DB-B1-6C-8AB-0Z	A	From	4.00	20.000	145.00	No Ice	4.80	2.00	0.04
		Centroid-Le g	-2.00 3.00			1/2" Ice 1" Ice	5.07 5.35	2.19 2.39	0.08 0.12
Platform Mount [LP 303-1]	C	None		0.000	145.00	No Ice	14.66	14.66	1.25
						1/2" Ice	18.87	18.87	1.48
						1" Ice	23.08	23.08	1.71
*** 50' ***									
KS24019-L112A	A	From Leg	3.00	0.000	50.00	No Ice	0.08	0.08	0.01
			0.00			1/2" Ice	0.13	0.13	0.01
			1.00			1" Ice	0.19	0.19	0.01
1.9" x 3' Pipe	A	From Leg	3.00	0.000	50.00	No Ice	0.51	0.51	0.01
			0.00			1/2" Ice	0.69	0.69	0.01
			0.00			1" Ice	0.89	0.89	0.02
Side Arm Mount [SO 701-1]	A	From Leg	1.50	0.000	50.00	No Ice	0.85	1.67	0.07
			0.00			1/2" Ice	1.14	2.34	0.08
			0.00			1" Ice	1.43	3.01	0.09
******									
OG-860/1920/GPS-A	A	From Leg	3.00	0.000	10.00	No Ice	0.14	0.14	0.00
			0.00			1/2" Ice	0.22	0.22	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
1.9" x 3' Pipe	A	From Leg	2.00 3.00 0.00	0.000	10.00	1" Ice No Ice 1/2" Ice	0.30 0.51 0.69	0.30 0.51 0.69	0.01 0.01 0.01
Side Arm Mount [SO 701-1]	A	From Leg	0.00 1.50 0.00 0.00	0.000	10.00	1" Ice No Ice 1/2" Ice 1" Ice	0.89 0.85 1.14 1.43	0.89 1.67 2.34 3.01	0.02 0.07 0.08 0.09

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

Comb. No.	Description
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	176 - 144.25	Pole	Max Tension	26	0.00	-0.00	-0.00
			Max. Compression	26	-23.93	-2.06	3.61
			Max. Mx	8	-9.50	-273.72	0.58
			Max. My	2	-9.42	0.13	282.19
			Max. Vy	20	-14.11	272.21	1.67
			Max. Vx	2	-14.42	0.13	282.19
			Max. Torque	24			-5.02
L2	144.25 - 127.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-35.06	-1.52	4.71
			Max. Mx	8	-14.69	-650.70	0.27
			Max. My	2	-14.61	0.79	667.58
			Max. Vy	20	-19.59	649.54	2.61
			Max. Vx	2	-20.01	0.79	667.58
			Max. Torque	24			-4.46
L3	127.75 - 117.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.23	-0.89	5.00
			Max. Mx	8	-16.98	-859.77	0.12
			Max. My	2	-16.90	1.56	882.06
			Max. Vy	20	-20.35	859.57	3.12
			Max. Vx	2	-20.84	1.56	882.06
			Max. Torque	24			-4.44
L4	117.25 - 94.58	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-44.21	0.54	5.57
			Max. Mx	20	-21.37	1235.53	4.05
			Max. My	2	-21.30	3.22	1266.52
			Max. Vy	20	-21.70	1235.53	4.05
			Max. Vx	2	-22.25	3.22	1266.52
			Max. Torque	24			-4.44
L5	94.58 - 87.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-49.80	1.57	5.95
			Max. Mx	20	-25.44	1506.71	4.70
			Max. My	2	-25.38	4.40	1544.10
			Max. Vy	20	-22.73	1506.71	4.70
			Max. Vx	2	-23.32	4.40	1544.10
			Max. Torque	24			-4.43
L6	87.25 - 61.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.24	4.10	6.82
			Max. Mx	20	-33.42	2117.90	6.12
			Max. My	2	-33.37	7.23	2168.85
			Max. Vy	20	-24.63	2117.90	6.12

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-25.21	7.23	2168.85
			Max. Torque	24			-4.43
L7	61.5 - 46.95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.09	5.25	7.17
			Max. Mx	20	-36.39	2329.90	6.66
			Max. My	2	-36.35	8.46	2385.06
			Max. Vy	20	-25.23	2329.90	6.66
			Max. Vx	2	-25.81	8.46	2385.06
			Max. Torque	24			-4.42
L8	46.95 - 32.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.26	7.86	8.35
			Max. Mx	20	-45.64	2874.05	8.14
			Max. My	2	-45.62	11.25	2939.34
			Max. Vy	20	-26.79	2874.05	8.14
			Max. Vx	2	-27.33	11.25	2939.34
			Max. Torque	24			-4.56
L9	32.25 - 32	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.42	7.87	8.35
			Max. Mx	20	-45.78	2880.74	8.14
			Max. My	2	-45.76	11.26	2946.16
			Max. Vy	20	-26.80	2880.74	8.14
			Max. Vx	2	-27.34	11.26	2946.16
			Max. Torque	24			-4.56
L10	32 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-93.94	8.52	7.57
			Max. Mx	20	-59.78	3768.66	8.33
			Max. My	2	-59.78	12.62	3849.73
			Max. Vy	20	-28.74	3768.66	8.33
			Max. Vx	2	-29.24	12.62	3849.73
			Max. Torque	22			-4.71

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	33	93.94	0.00	-8.94
	Max. H_x	20	59.80	28.72	0.03
	Max. H_z	2	59.80	0.03	29.21
	Max. M_x	2	3849.73	0.03	29.21
	Max. M_z	8	3753.80	-28.72	-0.03
	Max. Torsion	10	4.69	-24.88	-14.53
	Min. Vert	11	44.85	-24.88	-14.53
	Min. H_x	8	59.80	-28.72	-0.03
	Min. H_z	14	59.80	-0.03	-29.21
	Min. M_x	14	-3843.23	-0.03	-29.21
	Min. M_z	20	-3768.66	28.72	0.03
	Min. Torsion	22	-4.71	24.88	14.53

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	49.83	-0.00	-0.00	-2.63	6.06	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	59.80	-0.03	-29.21	-3849.73	12.62	3.43
0.9 Dead+1.6 Wind 0 deg - No Ice	44.85	-0.03	-29.21	-3796.03	10.60	3.40
1.2 Dead+1.6 Wind 30 deg - No Ice	59.80	14.33	-25.11	-3311.43	-1868.61	1.24
0.9 Dead+1.6 Wind 30 deg - No Ice	44.85	14.33	-25.11	-3265.05	-1844.81	1.24
1.2 Dead+1.6 Wind 60 deg - No Ice	59.80	24.85	-14.48	-1910.37	-3247.28	-1.28
0.9 Dead+1.6 Wind 60 deg - No Ice	44.85	24.85	-14.48	-1883.26	-3204.56	-1.25
1.2 Dead+1.6 Wind 90 deg - No Ice	59.80	28.72	0.03	1.88	-3753.80	-3.45
0.9 Dead+1.6 Wind 90 deg - No Ice	44.85	28.72	0.03	2.66	-3704.12	-3.40
1.2 Dead+1.6 Wind 120 deg - No Ice	59.80	24.88	14.53	1912.72	-3252.32	-4.69
0.9 Dead+1.6 Wind 120 deg - No Ice	44.85	24.88	14.53	1887.21	-3209.53	-4.64
1.2 Dead+1.6 Wind 150 deg - No Ice	59.80	14.38	25.14	3310.00	-1877.39	-4.68
0.9 Dead+1.6 Wind 150 deg - No Ice	44.85	14.38	25.14	3265.29	-1853.47	-4.63
1.2 Dead+1.6 Wind 180 deg - No Ice	59.80	0.03	29.21	3843.23	2.42	-3.43
0.9 Dead+1.6 Wind 180 deg - No Ice	44.85	0.03	29.21	3791.27	0.55	-3.40
1.2 Dead+1.6 Wind 210 deg - No Ice	59.80	-14.33	25.11	3304.87	1883.58	-1.25
0.9 Dead+1.6 Wind 210 deg - No Ice	44.85	-14.33	25.11	3260.25	1855.91	-1.25
1.2 Dead+1.6 Wind 240 deg - No Ice	59.80	-24.85	14.48	1903.83	3262.17	1.26
0.9 Dead+1.6 Wind 240 deg - No Ice	44.85	-24.85	14.48	1878.47	3215.59	1.24
1.2 Dead+1.6 Wind 270 deg - No Ice	59.80	-28.72	-0.03	-8.32	3768.66	3.45
0.9 Dead+1.6 Wind 270 deg - No Ice	44.85	-28.72	-0.03	-7.38	3715.14	3.40
1.2 Dead+1.6 Wind 300 deg - No Ice	59.80	-24.88	-14.53	-1919.10	3267.25	4.71
0.9 Dead+1.6 Wind 300 deg - No Ice	44.85	-24.88	-14.53	-1891.88	3220.60	4.65
1.2 Dead+1.6 Wind 330 deg - No Ice	59.80	-14.38	-25.14	-3316.42	1892.42	4.70
0.9 Dead+1.6 Wind 330 deg - No Ice	44.85	-14.38	-25.14	-3269.99	1864.61	4.65
1.2 Dead+1.0 Ice+1.0 Temp	93.94	-0.00	-0.00	-7.57	8.52	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	93.94	0.00	-8.94	-1182.53	8.69	0.61
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	93.94	3.93	-6.82	-923.21	-516.07	0.12
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	93.94	6.80	-3.94	-536.24	-900.23	-0.40
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	93.94	7.85	-0.00	-7.65	-1040.85	-0.82
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	93.94	6.80	3.94	520.93	-900.26	-1.01
1.2 Dead+1.0 Wind 150	93.94	3.92	6.82	907.87	-516.13	-0.93

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	93.94	-0.00	8.94	1167.15	8.62	-0.61
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	93.94	-3.93	6.82	907.83	533.37	-0.11
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	93.94	-6.80	3.94	520.87	917.52	0.41
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	93.94	-7.85	0.00	-7.72	1058.14	0.82
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	93.94	-6.80	-3.94	-536.30	917.55	1.01
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	93.94	-3.92	-6.82	-923.23	533.43	0.93
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	49.83	-0.01	-5.77	-756.29	7.17	0.69
Dead+Wind 30 deg - Service	49.83	2.83	-4.96	-650.79	-361.38	0.25
Dead+Wind 60 deg - Service	49.83	4.90	-2.86	-376.30	-631.45	-0.25
Dead+Wind 90 deg - Service	49.83	5.67	0.01	-1.69	-730.66	-0.69
Dead+Wind 120 deg - Service	49.83	4.91	2.87	372.64	-632.44	-0.94
Dead+Wind 150 deg - Service	49.83	2.84	4.96	646.40	-363.11	-0.94
Dead+Wind 180 deg - Service	49.83	0.01	5.77	750.90	5.17	-0.69
Dead+Wind 210 deg - Service	49.83	-2.83	4.96	645.40	373.72	-0.25
Dead+Wind 240 deg - Service	49.83	-4.90	2.86	370.91	643.79	0.25
Dead+Wind 270 deg - Service	49.83	-5.67	-0.01	-3.69	743.00	0.69
Dead+Wind 300 deg - Service	49.83	-4.91	-2.87	-378.02	644.78	0.94
Dead+Wind 330 deg - Service	49.83	-2.84	-4.96	-651.79	375.45	0.94

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-49.83	0.00	0.00	49.83	0.00	0.000%
2	-0.03	-59.80	-29.21	0.03	59.80	29.21	0.000%
3	-0.03	-44.85	-29.21	0.03	44.85	29.21	0.000%
4	14.33	-59.80	-25.11	-14.33	59.80	25.11	0.000%
5	14.33	-44.85	-25.11	-14.33	44.85	25.11	0.000%
6	24.85	-59.80	-14.48	-24.85	59.80	14.48	0.000%
7	24.85	-44.85	-14.48	-24.85	44.85	14.48	0.000%
8	28.72	-59.80	0.03	-28.72	59.80	-0.03	0.000%
9	28.72	-44.85	0.03	-28.72	44.85	-0.03	0.000%
10	24.88	-59.80	14.53	-24.88	59.80	-14.53	0.000%
11	24.88	-44.85	14.53	-24.88	44.85	-14.53	0.000%
12	14.38	-59.80	25.14	-14.38	59.80	-25.14	0.000%
13	14.38	-44.85	25.14	-14.38	44.85	-25.14	0.000%
14	0.03	-59.80	29.21	-0.03	59.80	-29.21	0.000%
15	0.03	-44.85	29.21	-0.03	44.85	-29.21	0.000%
16	-14.33	-59.80	25.11	14.33	59.80	-25.11	0.000%
17	-14.33	-44.85	25.11	14.33	44.85	-25.11	0.000%
18	-24.85	-59.80	14.48	24.85	59.80	-14.48	0.000%
19	-24.85	-44.85	14.48	24.85	44.85	-14.48	0.000%
20	-28.72	-59.80	-0.03	28.72	59.80	0.03	0.000%
21	-28.72	-44.85	-0.03	28.72	44.85	0.03	0.000%
22	-24.88	-59.80	-14.53	24.88	59.80	14.53	0.000%
23	-24.88	-44.85	-14.53	24.88	44.85	14.53	0.000%
24	-14.38	-59.80	-25.14	14.38	59.80	25.14	0.000%
25	-14.38	-44.85	-25.14	14.38	44.85	25.14	0.000%
26	0.00	-93.94	0.00	0.00	93.94	0.00	0.000%
27	0.00	-93.94	-8.94	-0.00	93.94	8.94	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
28	3.93	-93.94	-6.82	-3.93	93.94	6.82	0.000%
29	6.80	-93.94	-3.94	-6.80	93.94	3.94	0.000%
30	7.85	-93.94	-0.00	-7.85	93.94	0.00	0.000%
31	6.80	-93.94	3.94	-6.80	93.94	-3.94	0.000%
32	3.92	-93.94	6.82	-3.92	93.94	-6.82	0.000%
33	-0.00	-93.94	8.94	0.00	93.94	-8.94	0.000%
34	-3.93	-93.94	6.82	3.93	93.94	-6.82	0.000%
35	-6.80	-93.94	3.94	6.80	93.94	-3.94	0.000%
36	-7.85	-93.94	0.00	7.85	93.94	-0.00	0.000%
37	-6.80	-93.94	-3.94	6.80	93.94	3.94	0.000%
38	-3.92	-93.94	-6.82	3.92	93.94	6.82	0.000%
39	-0.01	-49.83	-5.77	0.01	49.83	5.77	0.000%
40	2.83	-49.83	-4.96	-2.83	49.83	4.96	0.000%
41	4.90	-49.83	-2.86	-4.90	49.83	2.86	0.000%
42	5.67	-49.83	0.01	-5.67	49.83	-0.01	0.000%
43	4.91	-49.83	2.87	-4.91	49.83	-2.87	0.000%
44	2.84	-49.83	4.96	-2.84	49.83	-4.96	0.000%
45	0.01	-49.83	5.77	-0.01	49.83	-5.77	0.000%
46	-2.83	-49.83	4.96	2.83	49.83	-4.96	0.000%
47	-4.90	-49.83	2.86	4.90	49.83	-2.86	0.000%
48	-5.67	-49.83	-0.01	5.67	49.83	0.01	0.000%
49	-4.91	-49.83	-2.87	4.91	49.83	2.87	0.000%
50	-2.84	-49.83	-4.96	2.84	49.83	4.96	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000401
2	Yes	5	0.00000001	0.00065973
3	Yes	5	0.00000001	0.00031226
4	Yes	6	0.00000001	0.00049341
5	Yes	6	0.00000001	0.00015744
6	Yes	6	0.00000001	0.00048644
7	Yes	6	0.00000001	0.00015510
8	Yes	5	0.00000001	0.00062284
9	Yes	5	0.00000001	0.00028755
10	Yes	6	0.00000001	0.00045409
11	Yes	6	0.00000001	0.00014342
12	Yes	6	0.00000001	0.00051866
13	Yes	6	0.00000001	0.00016663
14	Yes	5	0.00000001	0.00071396
15	Yes	5	0.00000001	0.00033762
16	Yes	6	0.00000001	0.00047152
17	Yes	6	0.00000001	0.00014927
18	Yes	6	0.00000001	0.00047398
19	Yes	6	0.00000001	0.00015075
20	Yes	5	0.00000001	0.00067826
21	Yes	5	0.00000001	0.00031309
22	Yes	6	0.00000001	0.00051836
23	Yes	6	0.00000001	0.00016621
24	Yes	6	0.00000001	0.00045774
25	Yes	6	0.00000001	0.00014365
26	Yes	4	0.00000001	0.00077602
27	Yes	7	0.00000001	0.00015103
28	Yes	7	0.00000001	0.00015171

29	Yes	7	0.00000001	0.00015065
30	Yes	6	0.00000001	0.00092893
31	Yes	6	0.00000001	0.00099982
32	Yes	7	0.00000001	0.00014791
33	Yes	6	0.00000001	0.00099806
34	Yes	7	0.00000001	0.00014781
35	Yes	7	0.00000001	0.00014769
36	Yes	6	0.00000001	0.00093325
37	Yes	7	0.00000001	0.00015198
38	Yes	7	0.00000001	0.00015193
39	Yes	4	0.00000001	0.00065679
40	Yes	5	0.00000001	0.00008753
41	Yes	5	0.00000001	0.00008404
42	Yes	4	0.00000001	0.00060800
43	Yes	5	0.00000001	0.00007335
44	Yes	5	0.00000001	0.00010147
45	Yes	4	0.00000001	0.00065311
46	Yes	5	0.00000001	0.00007741
47	Yes	5	0.00000001	0.00007794
48	Yes	4	0.00000001	0.00062037
49	Yes	5	0.00000001	0.00010296
50	Yes	5	0.00000001	0.00007677

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	176 - 144.25	26.394	39	1.603	0.026
L2	147.75 - 127.75	17.559	39	1.304	0.007
L3	127.75 - 117.25	12.600	39	1.036	0.004
L4	117.25 - 94.58	10.444	39	0.924	0.003
L5	99.41 - 87.25	7.330	39	0.744	0.002
L6	87.25 - 61.5	5.535	39	0.652	0.002
L7	61.5 - 46.95	2.662	39	0.418	0.001
L8	53.03 - 32.25	1.979	39	0.352	0.001
L9	32.25 - 32	0.710	39	0.215	0.000
L10	32 - 0	0.698	39	0.214	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	APXVSPP18-C-A20 w/ Mount Pipe	39	26.394	1.603	0.026	19528
174.00	800MHZ RRH	39	25.736	1.584	0.024	19528
169.00	RRUS 11	39	24.097	1.537	0.020	13948
167.00	(2) 7770.00 w/ Mount Pipe	39	23.447	1.517	0.019	10848
159.00	HG2409U-PRO	39	20.900	1.436	0.013	5743
155.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	39	19.673	1.392	0.010	4649
145.00	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	39	16.802	1.268	0.006	3582
50.00	KS24019-L112A	39	1.757	0.330	0.001	9866
10.00	OG-860/1920/GPS-A	39	0.115	0.073	0.000	17877

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	176 - 144.25	133.881	2	8.083	0.129
L2	147.75 - 127.75	89.254	2	6.627	0.035
L3	127.75 - 117.25	64.088	2	5.270	0.019
L4	117.25 - 94.58	53.134	2	4.702	0.015
L5	99.41 - 87.25	37.298	2	3.787	0.010
L6	87.25 - 61.5	28.169	2	3.321	0.008
L7	61.5 - 46.95	13.546	2	2.127	0.004
L8	53.03 - 32.25	10.072	2	1.793	0.003
L9	32.25 - 32	3.612	2	1.097	0.002
L10	32 - 0	3.555	2	1.090	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	APXVSPP18-C-A20 w/ Mount Pipe	2	133.881	8.083	0.131	4061
174.00	800MHZ RRH	2	130.561	7.993	0.123	4061
169.00	RRUS 11	2	122.292	7.766	0.102	2900
167.00	(2) 7770.00 w/ Mount Pipe	2	119.010	7.673	0.094	2255
159.00	HG2409U-PRO	2	106.149	7.279	0.065	1191
155.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	99.947	7.063	0.053	963
145.00	(2) BXA-171063-12CF-EDIN-X w/ Mount Pipe	2	85.419	6.444	0.031	736
50.00	KS24019-L112A	2	8.945	1.681	0.003	1942
10.00	OG-860/1920/GPS-A	2	0.585	0.373	0.001	3513

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	176 - 144.25 (1)	TP23.65x16.5x0.188	31.75	0.00	0.0	13.494	-9.42	950.08	0.010
L2	144.25 - 127.75 (2)	TP26.942x22.487x0.313	20.00	0.00	0.0	26.413	-14.61	1962.34	0.007
L3	127.75 - 117.25 (3)	TP29.28x26.942x0.481	10.50	0.00	0.0	43.949	-16.90	3265.21	0.005
L4	117.25 - 94.58 (4)	TP34.33x29.28x0.508	22.67	0.00	0.0	52.756	-21.30	3919.51	0.005
L5	94.58 - 87.25 (5)	TP35.334x32.629x0.559	12.16	0.00	0.0	61.674	-25.38	4582.11	0.006
L6	87.25 - 61.5 (6)	TP41.063x35.334x0.529	25.75	0.00	0.0	68.111	-33.37	5060.29	0.007
L7	61.5 - 46.95 (7)	TP44.3x41.063x0.577	14.55	0.00	0.0	77.593	-36.35	5764.80	0.006

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L8	46.95 - 32.25 (8)	TP46.822x42.197x0.558	20.78	0.00	0.0	76.545	-40.26	5686.92	0.007
L9	32.25 - 32 (9)	TP46.878x46.822x0.797	0.25	0.00	0.0	116.408	-45.63	8648.52	0.005
L10	32 - 0 (10)	TP54x46.878x0.57	32.00	0.00	0.0	83.805	-45.77	6226.33	0.007

Pole Bending Design Data

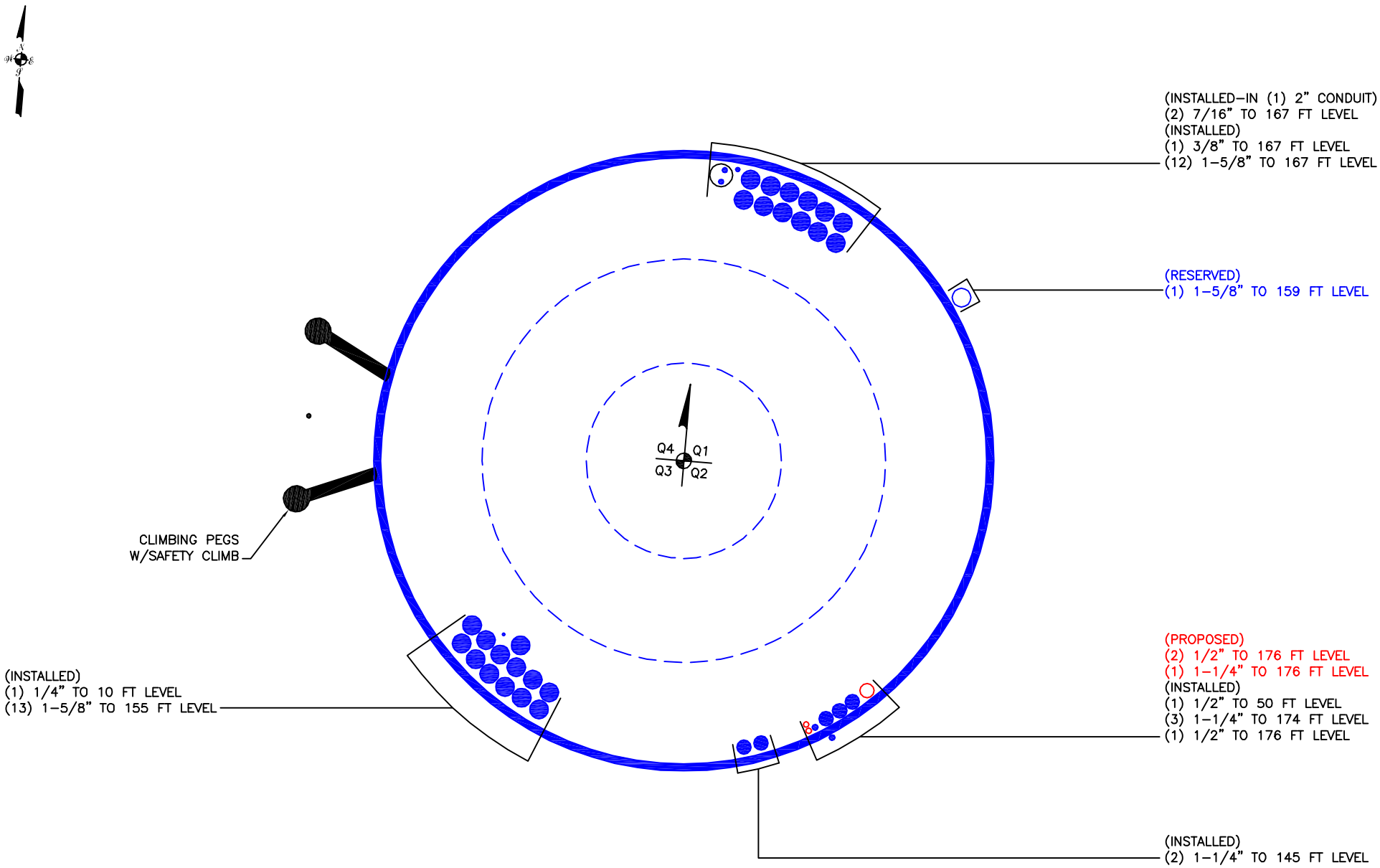
Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	176 - 144.25 (1)	TP23.65x16.5x0.188	282.19	442.80	0.637	0.00	442.80	0.000
L2	144.25 - 127.75 (2)	TP26.942x22.487x0.313	667.59	1070.43	0.624	0.00	1070.43	0.000
L3	127.75 - 117.25 (3)	TP29.28x26.942x0.481	882.06	1916.90	0.460	0.00	1916.90	0.000
L4	117.25 - 94.58 (4)	TP34.33x29.28x0.508	1266.53	2619.45	0.484	0.00	2619.45	0.000
L5	94.58 - 87.25 (5)	TP35.334x32.629x0.559	1544.10	3250.21	0.475	0.00	3250.21	0.000
L6	87.25 - 61.5 (6)	TP41.063x35.334x0.529	2168.87	4196.13	0.517	0.00	4196.13	0.000
L7	61.5 - 46.95 (7)	TP44.3x41.063x0.577	2385.07	4994.20	0.478	0.00	4994.20	0.000
L8	46.95 - 32.25 (8)	TP46.822x42.197x0.558	2572.06	5029.77	0.511	0.00	5029.77	0.000
L9	32.25 - 32 (9)	TP46.878x46.822x0.797	2939.36	8109.19	0.362	0.00	8109.19	0.000
L10	32 - 0 (10)	TP54x46.878x0.57	2946.18	5902.87	0.499	0.00	5902.87	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	176 - 144.25 (1)	TP23.65x16.5x0.188	14.42	470.24	0.031	3.94	886.69	0.004
L2	144.25 - 127.75 (2)	TP26.942x22.487x0.313	20.01	981.17	0.020	3.46	2143.47	0.002
L3	127.75 - 117.25 (3)	TP29.28x26.942x0.481	20.84	1632.60	0.013	3.45	3838.49	0.001
L4	117.25 - 94.58 (4)	TP34.33x29.28x0.508	22.25	1959.76	0.011	3.44	5245.31	0.001
L5	94.58 - 87.25 (5)	TP35.334x32.629x0.559	23.32	2291.06	0.010	3.44	6508.36	0.001
L6	87.25 - 61.5 (6)	TP41.063x35.334x0.529	25.21	2530.15	0.010	3.43	8402.50	0.000
L7	61.5 - 46.95 (7)	TP44.3x41.063x0.577	25.81	2882.40	0.009	3.43	10000.58	0.000
L8	46.95 - 32.25 (8)	TP46.822x42.197x0.558	26.55	2858.83	0.009	3.43	10071.83	0.000
L9	32.25 - 32 (9)	TP46.878x46.822x0.797	27.34	4329.49	0.006	3.43	16238.25	0.000
L10	32 - 0 (10)	TP54x46.878x0.57	27.45	3137.10	0.009	3.43	11820.17	0.000

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876381 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Mod #	Modification Type	Termination Length (ft)	Bot. Elevation (ft)	Top Elevation (ft)	Termination Length (ft)	Modification Location (° or Flat/Point #)	Location (F/P)	Lateral Offset (in)
1a	CCI-WSFP-065125	0.00	0.00	35.00		2 11	Flats	-1.50
1b	CCI-WSFP-065125	0.00	0.00	35.00		6 15	Flats	1.50
2	CCI-SFP-065125		29.25	64.25		1 7 13	Flats	0.00
3	CCI-SFP-060100	-2.75	64.25	89.25		1 7 13	Flats	0.00
4	CCI-SFP-060100	-2.00	89.25	119.25		1 7 13	Flats	0.00
5	CCI-SFP-045100		119.25	129.25		1 7 13	Flats	0.00

MODIFICATION PROPERTIES

#	Modification	Default Termination (ft)	Stitch (in)	k	Drill Hole (in)	Bolt/Weld Capacity (k)	A_G (in^2)	F_Y (ksi)	F_U (ksi)
1	CCI-WSFP-065125	2.75	19.00	0.80	1.1875	36.0	8.13	65.0	80.0
2	CCI-SFP-065125	2.75	19.00	0.80	1.1875	36.0	8.13	65.0	80.0
3	CCI-SFP-060100	2.00	16.00	0.80	1.1875	36.0	6.00	65.0	80.0
5	CCI-SFP-045100	1.50	20.00	0.80	1.1875	36.0	4.50	65.0	80.0

Section No.	*Elevation (ft)*	*Type*	*Size*	*Critical Element*	*Pu (k)*	*φPn (k)*	*% Capacity*	*Pass/Fail*
L1	176.00-144.25	Pole	TP23.65×16.50×0.1875	1	Note 1	Note 1	64.8	Pass
L2	147.75-94.58	Pole	TP34.33×22.49×0.3125	2	Note 1	Note 1	70.4	Pass
L3	99.41-46.95	Pole	TP44.30×32.63×0.3750	3	Note 1	Note 1	53.5	Pass
L4	53.03-0.00	Pole	TP54.00×42.20×0.3750	4	Note 1	Note 1	55.8	Pass
M1b	35.00-0.00	Mod (Ex)	CCI-WSFP-065125	1	Note 1	Note 1	73.7	Pass
M2	64.25-29.25	Mod (Ex)	CCI-SFP-065125	2	Note 1	Note 1	78.6	Pass
M3	89.25-64.25	Mod (Ex)	CCI-SFP-060100	3	Note 1	Note 1	80.8	Pass
M4	119.25-89.25	Mod (Ex)	CCI-SFP-060100	4	Note 1	Note 1	75.9	Pass
M5	129.25-119.25	Mod (Ex)	CCI-SFP-045100	5	Note 1	Note 1	77.4	Pass

	Summary	
Pole (L2)	70.4	Pass
Mod (M3)	80.8	Pass
RATING =	**80.8**	**Pass**

*Note 1: See additional documentation in following sheets for details.

Tower Engineering Professionals, Inc.
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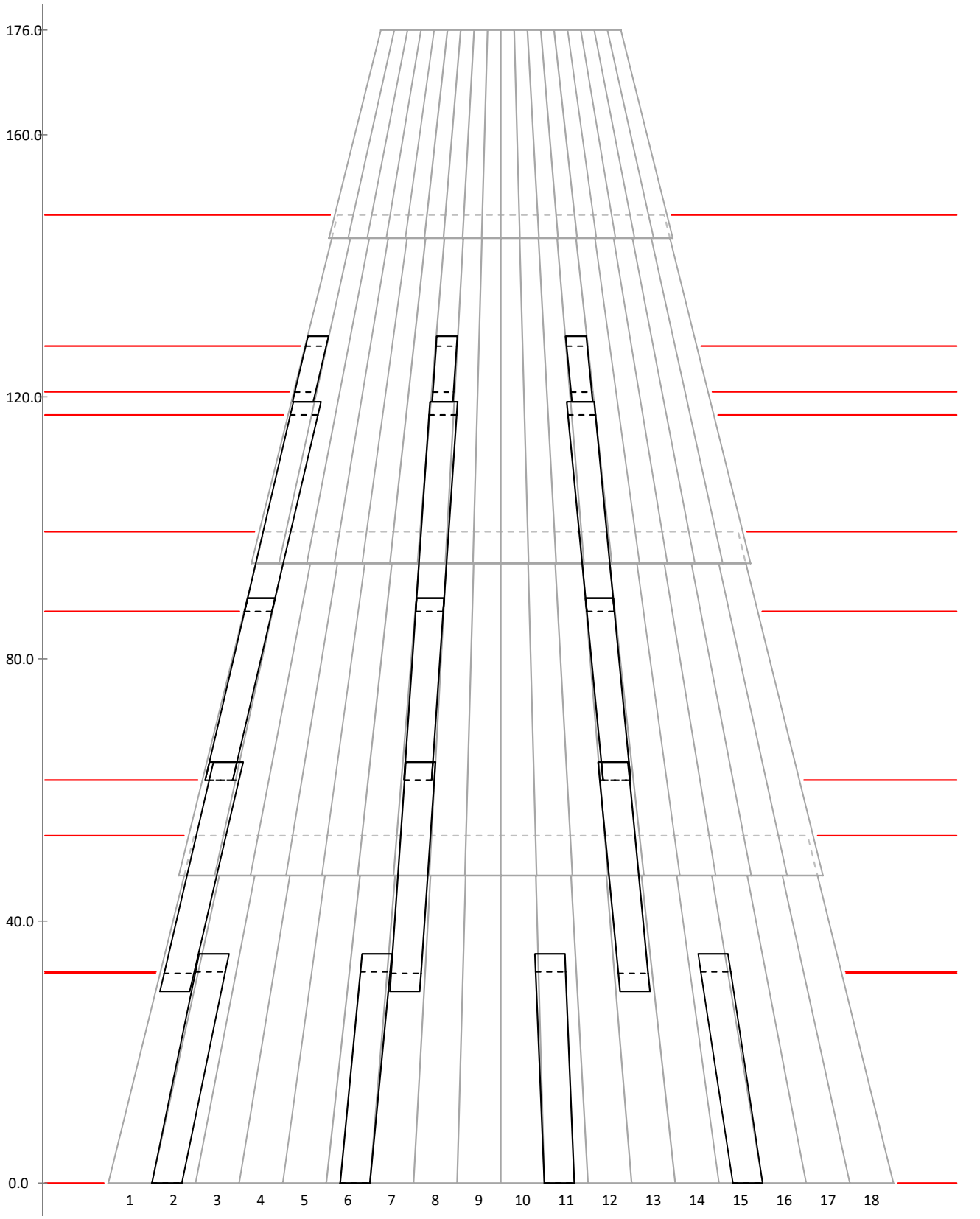
Reinforcement Layout



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Loads	
Axial:	59.8 k
Moment:	3,849.8 k·ft
Shear:	29.2 k
Torsion:	3.4 k·ft

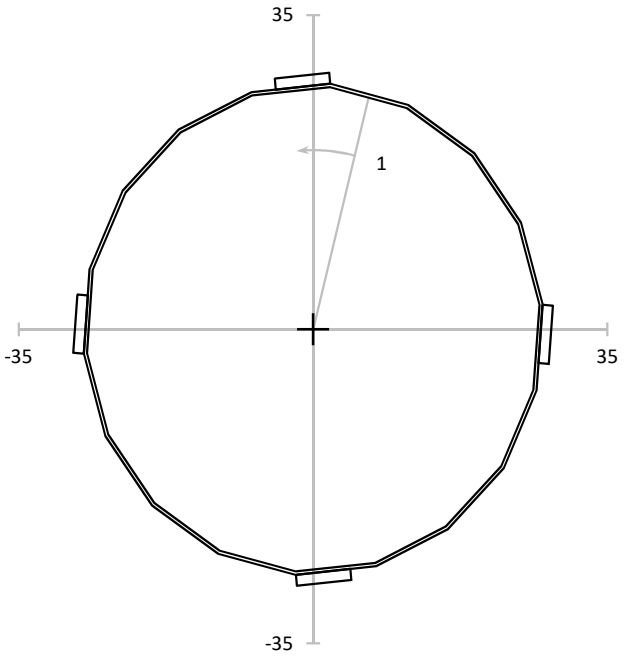
Equivalent Loads to Pole	
Axial:	39.6 k
Moment:	2,559.8 k·ft
Shear:	19.4 k
Torsion:	3.4 k·ft

Shear Flow	
Controlling Mod:	1
q:	0.184 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	195.55 in
Stitch:	19.00 in
Capacity:	**9.7%**

Pole Info	
OD:	54.00 in
t:	0.3750 in
Pole A_G:	63.83 in^2
Pole I_G:	23,188.8 in^4

Controlling	
Angle:	**14.30°**
I_{CONT}:	35,665.9 in^4
A_G:	96.33 in^2

Minimum	
Angle:	**150.00°**
I_{MIN}:	34,874.4 in^4
t_{EFF}:	0.5702 in



Pole Segment: L4, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
150.00	27.43	34874.4	0.621	36.338	0.304	0.024	66.296	66.296	33.148	66.296	**55.8%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
1a	1	**14.30**	27.64	35665.9	0.621	35.798	0.304	49.421	48.462	29.250	**73.7%**
1a	2	**194.30**	27.64	35665.9	0.621	35.798	0.304	49.421	48.462	29.250	**73.7%**
1b	1	**105.70**	27.64	35665.9	0.621	35.798	0.304	49.421	48.462	29.250	**73.7%**
1b	2	**285.70**	27.64	35665.9	0.621	35.798	0.304	49.421	48.462	29.250	**73.7%**

Elevation: 32.00-ft

Loads	
Axial:	45.8 k
Moment:	2,946.2 k·ft
Shear:	27.3 k
Torsion:	3.4 k·ft

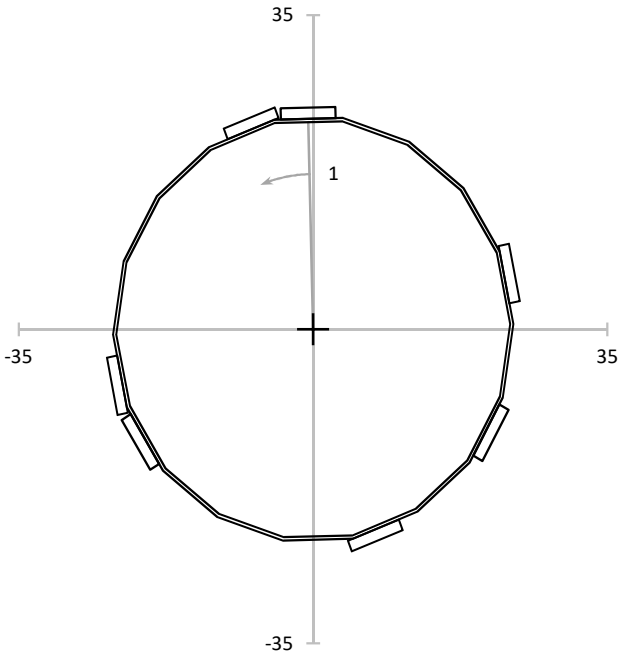
Pole Info	
OD:	46.88 in
t:	0.3750 in
Pole A_G:	55.35 in^2
Pole I_G:	15,122.0 in^4

Equivalent Loads to Pole	
Axial:	22.6 k
Moment:	1,424.9 k·ft
Shear:	13.5 k
Torsion:	3.4 k·ft

Controlling	
Angle:	**358.60°**
I_G:	31,479.0 in^4
A_G:	112.22 in^2

Shear Flow	
Controlling Mod:	3
q:	0.170 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	212.09 in
Stitch:	19.00 in
Capacity:	**9.0%**

Minimum	
Angle:	**150.00°**
I_{MIN}:	31,266.9 in^4
t_{EFF}:	0.7969 in



Pole Segment: L4, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
150.00	23.81	31266.9	0.408	26.927	0.244	0.032	69.834	69.834	34.917	69.834	**39.1%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
1a	1	**14.75**	24.10	31725.6	0.408	26.857	0.244	49.421	48.462	29.250	**55.2%**
1a	2	**194.75**	24.10	31725.6	0.408	26.857	0.244	49.421	48.462	29.250	**55.2%**
1b	1	**105.25**	24.10	31725.6	0.408	26.857	0.244	49.421	48.462	29.250	**55.2%**
1b	2	**285.25**	24.10	31725.6	0.408	26.857	0.244	49.421	48.462	29.250	**55.2%**
2	1	**358.60**	24.06	31479.0	0.408	27.018	0.244	49.421	48.462	29.250	**55.5%**
2	2	**121.40**	24.06	31479.0	0.408	27.018	0.244	49.421	48.462	29.250	**55.5%**
2	3	**240.00**	24.06	32192.5	0.408	26.427	0.244	49.421	48.462	29.250	**54.3%**

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Elevation: 32.25-ft

Loads	
Axial:	45.6 k
Moment:	2,939.4 k·ft
Shear:	27.3 k
Torsion:	3.4 k·ft

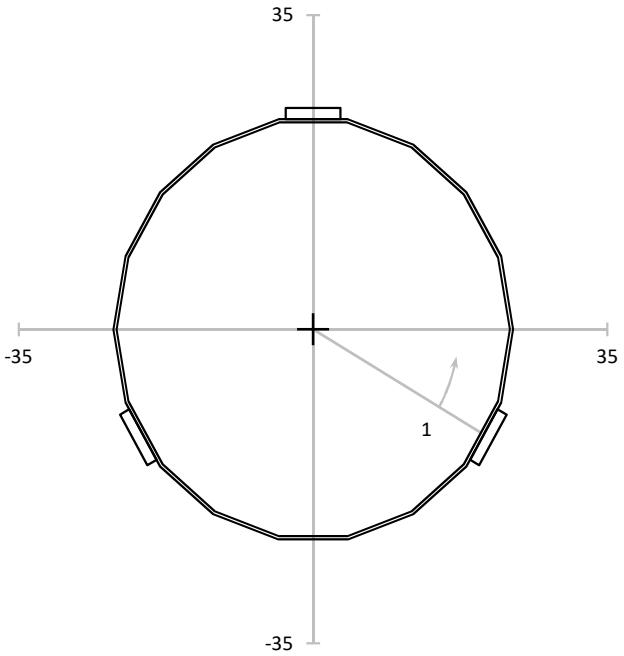
Pole Info	
OD:	46.82 in
t:	0.3750 in
Pole A_G:	55.28 in^2
Pole I_G:	15,067.8 in^4

Equivalent Loads to Pole	
Axial:	31.7 k
Moment:	1,999.2 k·ft
Shear:	19.0 k
Torsion:	3.4 k·ft

Controlling	
Angle:	**120.00°**
I_G:	22,153.4 in^4
A_G:	79.66 in^2

Shear Flow	
Controlling Mod:	3
q:	0.241 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	149.43 in
Stitch:	19.00 in
Capacity:	**12.7%**

Minimum	
Angle:	**120.20°**
I_{MIN}:	22,153.4 in^4
t_{EFF}:	0.5579 in



Pole Segment: L4, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
110.00	23.79	22153.4	0.573	37.871	0.343	0.032	69.862	69.862	34.931	69.862	**55.0%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	**0.00**	24.04	22153.4	0.573	38.270	0.343	49.421	48.462	29.250	**78.6%**
2	2	**120.00**	24.04	22153.4	0.573	38.270	0.343	49.421	48.462	29.250	**78.6%**
2	3	**240.00**	24.04	22153.4	0.573	38.270	0.343	49.421	48.462	29.250	**78.6%**

Elevation: 53.03-ft

Loads	
Axial:	36.4 k
Moment:	2,385.1 k·ft
Shear:	25.8 k
Torsion:	3.4 k·ft

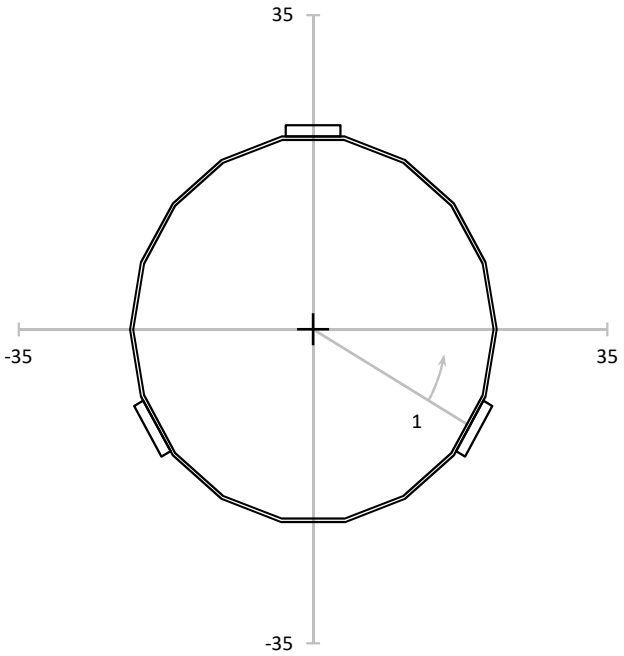
Pole Info	
OD:	42.95 in
t:	0.3750 in
Pole A_G:	50.67 in^2
Pole I_G:	11,602.7 in^4

Equivalent Loads to Pole	
Axial:	24.5 k
Moment:	1,572.4 k·ft
Shear:	17.4 k
Torsion:	3.4 k·ft

Controlling	
Angle:	**120.00°**
I_G:	17,599.0 in^4
A_G:	75.05 in^2

Shear Flow	
Controlling Mod:	3
q:	0.263 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	136.71 in
Stitch:	19.00 in
Capacity:	**13.9%**

Minimum	
Angle:	**103.70°**
I_{MIN}:	17,599.0 in^4
t_{EFF}:	0.5770 in



Pole Segment: L3, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
110.00	21.82	17599.0	0.484	35.481	0.344	0.039	71.787	71.787	35.893	71.787	**50.1%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
2	1	**360.00**	22.10	17599.0	0.484	35.939	0.344	49.421	48.462	29.250	**73.7%**
2	2	**120.00**	22.10	17599.0	0.484	35.939	0.344	49.421	48.462	29.250	**73.7%**
2	3	**240.00**	22.10	17599.0	0.484	35.939	0.344	49.421	48.462	29.250	**73.7%**

Elevation: 61.50-ft

Loads	
Axial:	33.4 k
Moment:	2,168.9 k·ft
Shear:	25.2 k
Torsion:	3.4 k·ft

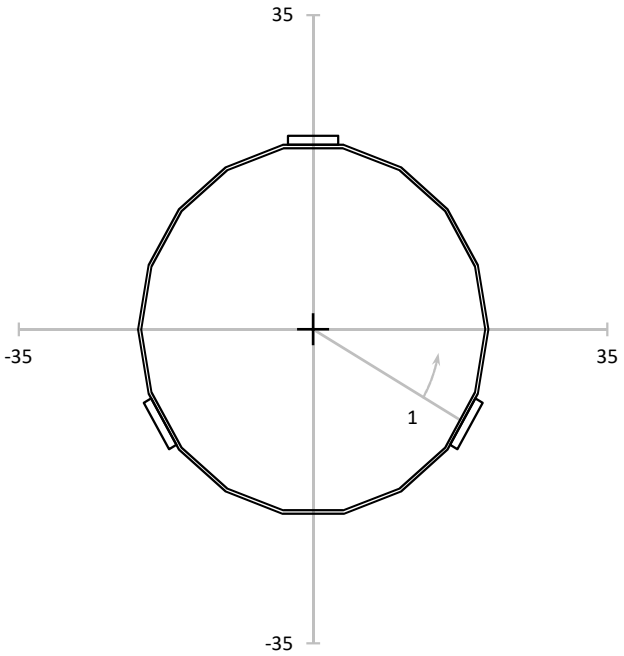
Pole Info	
OD:	41.06 in
t:	0.3750 in
Pole A_G:	48.43 in^2
Pole I_G:	10,129.2 in^4

Equivalent Loads to Pole	
Axial:	24.3 k
Moment:	1,553.9 k·ft
Shear:	18.4 k
Torsion:	3.4 k·ft

Controlling	
Angle:	**120.00°**
I_G:	14,137.9 in^4
A_G:	66.43 in^2

Shear Flow	
Controlling Mod:	4
q:	0.225 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	159.99 in
Stitch:	16.00 in
Capacity:	**10.0%**

Minimum	
Angle:	**109.20°**
I_{MIN}:	14,137.9 in^4
t_{EFF}:	0.5294 in



Pole Segment: L3, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
110.00	20.86	14137.9	0.502	38.401	0.380	0.042	72.723	72.723	36.361	72.723	**53.5%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
3	1	**0.00**	21.03	14137.9	0.502	38.717	0.380	48.528	47.500	29.250	**80.8%**
3	2	**120.00**	21.03	14137.9	0.502	38.717	0.380	48.528	47.500	29.250	**80.8%**
3	3	**240.00**	21.03	14137.9	0.502	38.717	0.380	48.528	47.500	29.250	**80.8%**

Elevation: 87.25-ft

Loads	
Axial:	25.4 k
Moment:	1,544.1 k·ft
Shear:	23.3 k
Torsion:	3.4 k·ft

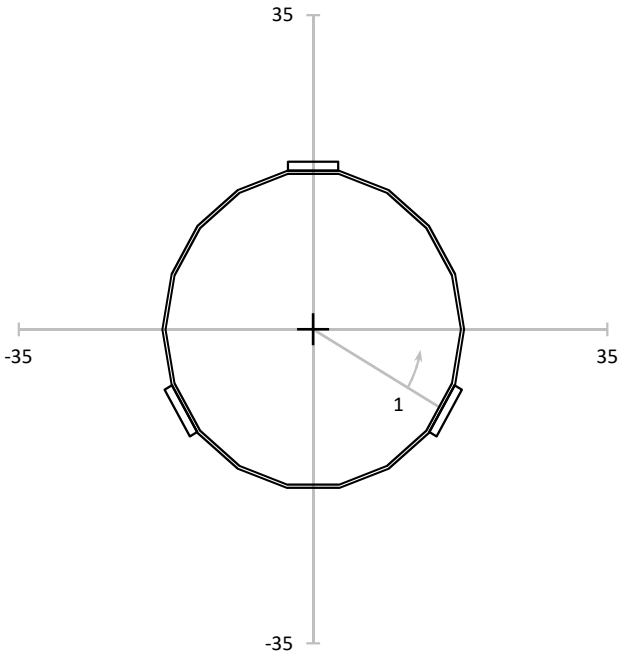
Pole Info	
OD:	35.33 in
t:	0.3750 in
Pole A_G:	41.61 in^2
Pole I_G:	6,424.9 in^4

Equivalent Loads to Pole	
Axial:	17.7 k
Moment:	1,052.8 k·ft
Shear:	16.3 k
Torsion:	3.4 k·ft

Controlling	
Angle:	**120.00°**
I_G:	9,423.0 in^4
A_G:	59.61 in^2

Shear Flow	
Controlling Mod:	5
q:	0.270 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	133.47 in
Stitch:	16.00 in
Capacity:	**12.0%**

Minimum	
Angle:	**101.50°**
I_{MIN}:	9,423.0 in^4
t_{EFF}:	0.5588 in



Pole Segment: L3, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
110.00	17.95	9423.0	0.426	35.296	0.391	0.058	74.295	74.295	37.148	74.295	**48.1%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
4	1	**0.00**	18.17	9423.0	0.426	35.724	0.391	48.528	47.500	29.250	**74.5%**
4	2	**120.00**	18.17	9423.0	0.426	35.724	0.391	48.528	47.500	29.250	**74.5%**
4	3	**240.00**	18.17	9423.0	0.426	35.724	0.391	48.528	47.500	29.250	**74.5%**

Elevation: 99.41-ft

Loads	
Axial:	21.3 k
Moment:	1,266.5 k·ft
Shear:	22.3 k
Torsion:	3.4 k·ft

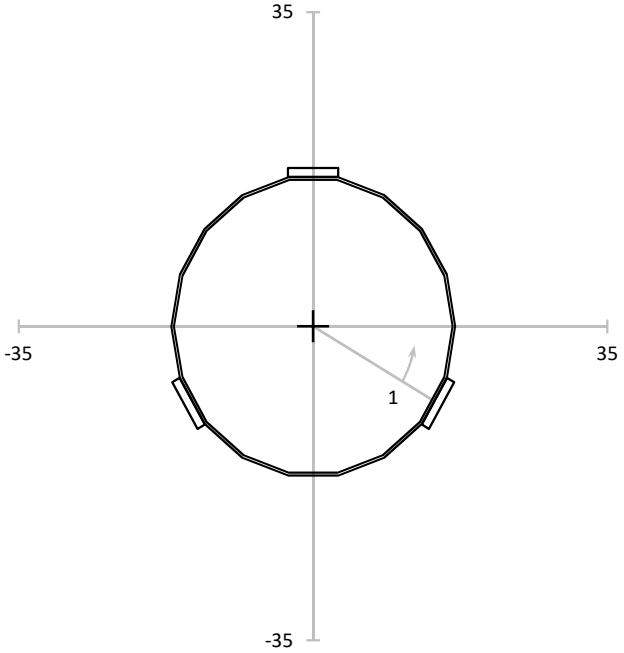
Pole Info	
OD:	33.25 in
t:	0.3125 in
Pole A_G:	32.67 in^2
Pole I_G:	4,479.5 in^4

Equivalent Loads to Pole	
Axial:	13.7 k
Moment:	793.8 k·ft
Shear:	14.3 k
Torsion:	3.4 k·ft

Controlling	
Angle:	**120.00°**
I_G:	7,147.3 in^4
A_G:	50.67 in^2

Shear Flow	
Controlling Mod:	5
q:	0.320 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	112.51 in
Stitch:	16.00 in
Capacity:	**14.2%**

Minimum	
Angle:	**124.80°**
I_{MIN}:	7,147.3 in^4
t_{EFF}:	0.5076 in



Pole Segment: L2, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
110.00	16.89	7147.3	0.420	35.922	0.439	0.078	73.298	73.298	36.649	73.298	**49.6%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
4	1	**0.00**	17.13	7147.3	0.420	36.420	0.439	48.528	47.500	29.250	**75.9%**
4	2	**120.00**	17.13	7147.3	0.420	36.420	0.439	48.528	47.500	29.250	**75.9%**
4	3	**240.00**	17.13	7147.3	0.420	36.420	0.439	48.528	47.500	29.250	**75.9%**

Elevation: 117.25-ft

Loads	
Axial:	16.9 k
Moment:	882.1 k·ft
Shear:	20.8 k
Torsion:	3.5 k·ft

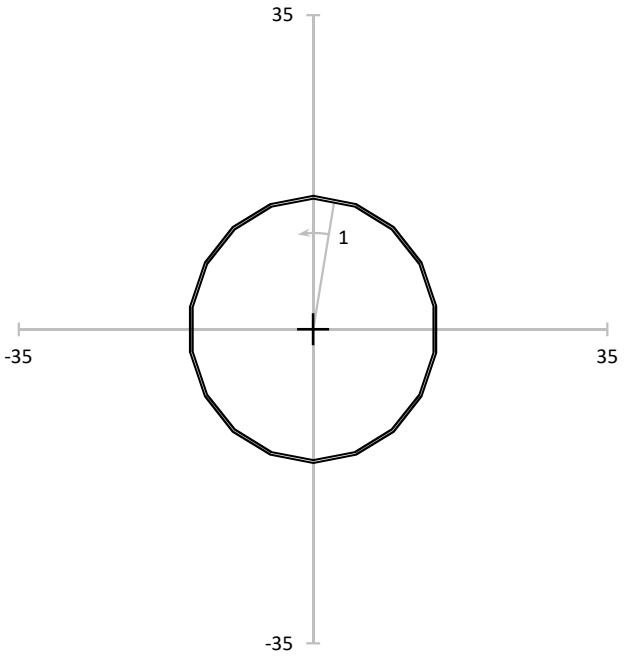
Equivalent Loads to Pole	
Axial:	16.9 k
Moment:	882.1 k·ft
Shear:	20.8 k
Torsion:	3.5 k·ft

Shear Flow N/A

Pole Info	
OD:	29.28 in
t:	0.3125 in
Pole A_G:	28.73 in^2
Pole I_G:	3,046.1 in^4

Controlling	
Angle:	**10.00°**
I_G:	3,046.1 in^4
A_G:	28.73 in^2

Minimum	
Angle:	**0.00°**
I_{MIN}:	3,046.1 in^4
t_{EFF}:	0.3125 in



Pole Segment: L2, F_Y = 65 ksi

POLE CAPACITY											
Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
10.00	14.87	3046.1	0.588	51.686	0.725	0.101	74.295	74.295	37.148	74.295	**70.4%**

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity

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Elevation: 120.75-ft

Loads	
Axial:	16.1 k
Moment:	809.6 k·ft
Shear:	20.6 k
Torsion:	3.5 k·ft

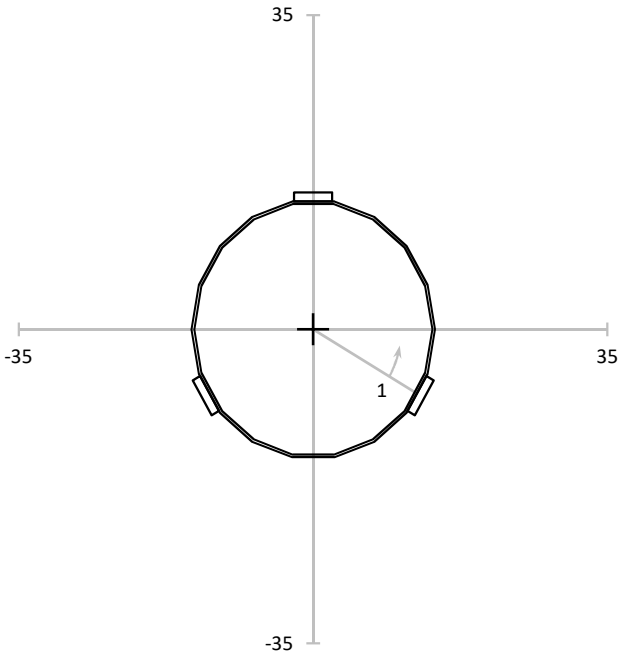
Pole Info	
OD:	28.50 in
t:	0.3125 in
Pole A_G:	27.96 in^2
Pole I_G:	2,806.8 in^4

Equivalent Loads to Pole	
Axial:	10.9 k
Moment:	530.0 k·ft
Shear:	13.9 k
Torsion:	3.5 k·ft

Controlling	
Angle:	**120.00°**
I_G:	4,287.4 in^4
A_G:	41.46 in^2

Shear Flow	
Controlling Mod:	6
q:	0.318 k/in
Bolt/Weld Cap:	36.0 k/bolt
Max Spacing:	113.09 in
Stitch:	20.00 in
Capacity:	**17.7%**

Minimum	
Angle:	**117.20°**
I_{MIN}:	4,287.4 in^4
t_{EFF}:	0.4863 in



Pole Segment: L2, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
110.00	14.48	4287.4	0.389	32.808	0.496	0.107	74.295	74.295	37.148	74.295	**44.7%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
5	1	**0.00**	14.75	4287.4	0.389	33.424	0.496	43.686	43.333	29.250	**77.4%**
5	2	**120.00**	14.75	4287.4	0.389	33.424	0.496	43.686	43.333	29.250	**77.4%**
5	3	**240.00**	14.75	4287.4	0.389	33.424	0.496	43.686	43.333	29.250	**77.4%**

Elevation: 127.75-ft

Loads	
Axial:	14.6 k
Moment:	667.6 k·ft
Shear:	20.0 k
Torsion:	3.5 k·ft

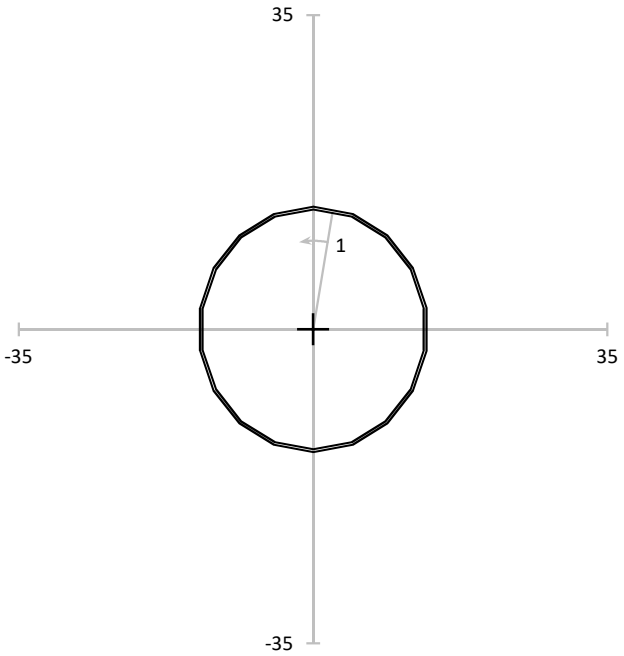
Equivalent Loads to Pole	
Axial:	14.6 k
Moment:	667.6 k·ft
Shear:	20.0 k
Torsion:	3.5 k·ft

Shear Flow N/A

Pole Info	
OD:	26.94 in
t:	0.3125 in
Pole A_G:	26.41 in^2
Pole I_G:	2,366.3 in^4

Controlling	
Angle:	**10.00°**
I_G:	2,366.3 in^4
A_G:	26.41 in^2

Minimum	
Angle:	**0.00°**
I_{MIN}:	2,366.3 in^4
t_{EFF}:	0.3125 in



Pole Segment: L2, F_Y = 65 ksi

POLE CAPACITY											
Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
10.00	13.69	2366.3	0.553	46.335	0.757	0.120	74.295	74.295	37.148	74.295	**63.2%**

MODIFICATION CAPACITIES											
Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity

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Elevation: 147.75-ft

Loads	
Axial:	9.4 k
Moment:	282.2 k·ft
Shear:	14.4 k
Torsion:	3.9 k·ft

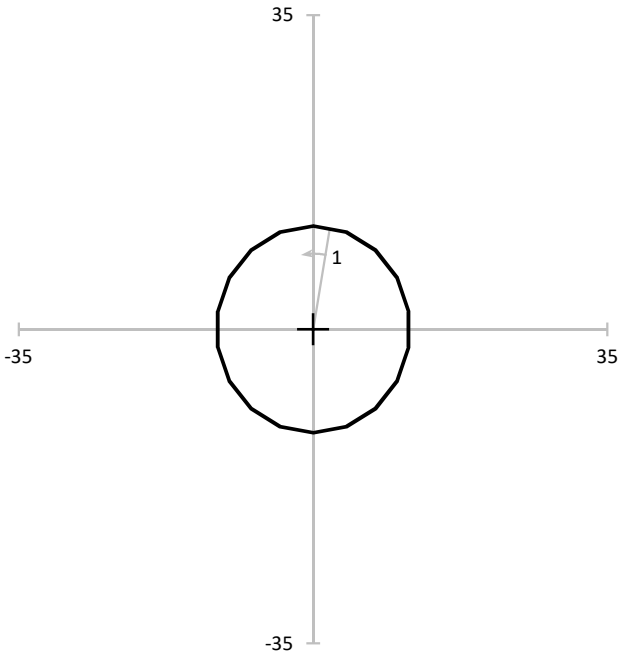
Pole Info	
OD:	22.86 in
t:	0.1875 in
Pole A_G:	13.49 in^2
Pole I_G:	876.5 in^4

Equivalent Loads to Pole	
Axial:	9.4 k
Moment:	282.2 k·ft
Shear:	14.4 k
Torsion:	3.9 k·ft

Controlling	
Angle:	**10.00°**
I_G:	876.5 in^4
A_G:	13.49 in^2

Shear Flow N/A

Minimum	
Angle:	**0.00°**
I_{MIN}:	876.5 in^4
t_{EFF}:	0.1875 in



Pole Segment: L1, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	σ_T (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	ϕF_T (ksi)	Capacity
10.00	11.61	876.5	0.698	44.870	1.069	0.313	70.407	70.407	35.204	70.407	**64.8%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in^4)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity

Tower Engineering Professionals, Inc.
326 Tryon Road|Raleigh, NC 27603-3530|Office: (919) 661-6351|Fax: (919) 661-6350|www.tepgroup.net

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#:	*876381*
Site Name:	*Ward*
App #:	*399431 Rev. 1*
Pole Manufacturer:	*Other*

Reactions		
Mu:	3850	ft-kips
Axial, Pu:	60	kips
Shear, Vu:	29	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	63	in

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

Plate Data		
Diam:	69	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	10.71	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Both	
Groove Depth:	0.375	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	6.5	in
Height:	15	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	65	ksi
Weld str.:	80	ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Anchor Rod Results

		Stiffened
Max Rod (Cu+ Vu/ή):	190.7 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	73.3% **Pass**	

Base Plate Results Flexural Check

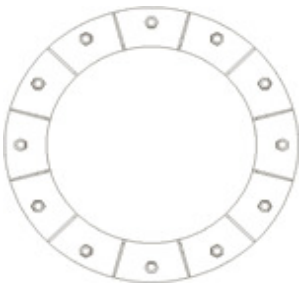
		Stiffened
Base Plate Stress:	30.6 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	56.7% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	51.0% **Pass**
Vertical Weld:	59.8% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	21.2% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2	51.4% **Pass**
Plate Comp. (AISC Bracket):	59.8% **Pass**

Pole Results

Pole Punching Shear Check:	20.5% **Pass**



* 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

		PASS	PASS		Ward (BU 876381)
	Results Summary:	LC1	LC2	TEP #:	51819.126953
	Soil Interaction:	32.1%	9.9%	Analysis:	JDR 8/9/2017
Drilled Caisson Tool - Input	Foundation Structural:	67.1%	20.4%	Check:	KEH 8/9/2017

Code Revisions: TIA-222-G ACI 318-11

Tower Type: Monopole

	LC1	LC2	
Moment:	3,850.00	1,183.00	kip-ft
Axial (download):	60.00	94.00	kip
Shear:	29.00	9.00	kip
Axial (uplift):			kip

Shaft Information

Diameter:	7.00	ft
Projection:	1.00	ft
Caisson Length:	30.00	ft
f'c:	4.000	ksi
Max εc:	0.003	in/in

Cage 1 Reinforcement

Tie Bar Size:	5	*(fy = 60.0 ksi)*
Clear Cover to Tie:	4.17	*in (Cage Ø = 73.00in)*
Tie Bar Spacing:	12.00	in
Vertical Bar Size:	11	
Vertical Bar Quantity:	24	*(ρ =0.676%)*
fy:	60.0	ksi
E:	29,000	ksi

Design Parameters

Soil Layer	Soil Type	Depth (ft) from	Depth (ft) to	Eff. Unit Weight (pcf)	Cohesion (psf)	Friction Angle ϕ (°)	All. Skin Friction (psf) Download	All. Skin Friction (psf) Uplift
1	Clay	0.00	3.50	130.0	0			
2	Sand	3.50	9.00	130.0		35.0		
3	Sand	9.00	30.00	67.6		35.0		

Notes: 1) Neglect lateral soil strength to a depth of:

i) ~~1/2 Pier Ø = 7.00ft / 2 = 3.50ft~~

ii) ~~Frost Depth = 40.0in / (12in/ft) = 3.33ft~~

iii) **Geotech Recommendation = 3.50ft**

2) Groundwater = 9.00ft

TOWER ENGINEERING PROFESSIONALS

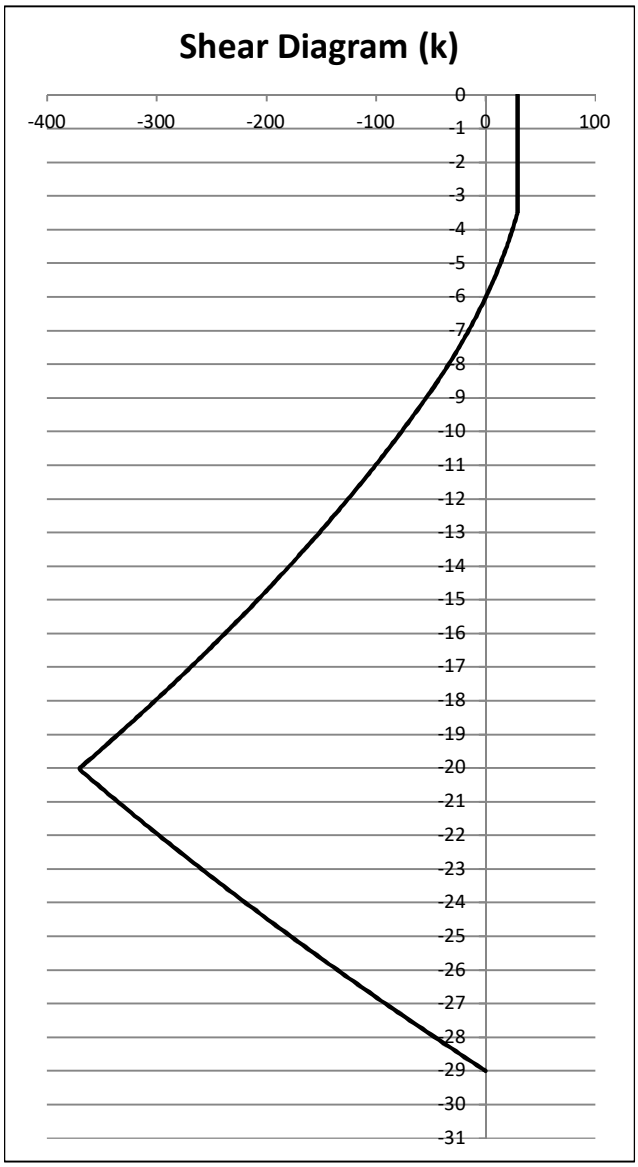
Ward (BU 876381)

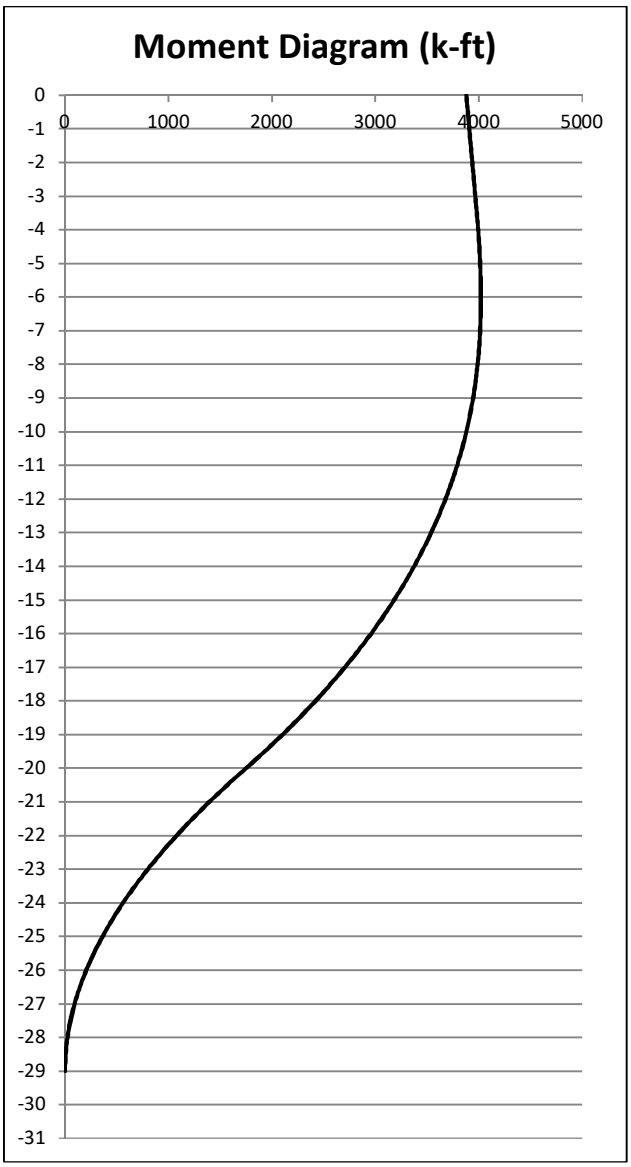
TEP #: 51819.126953

Analysis: JDR 8/9/2017

Check: KEH 8/9/2017

Soil Interaction: LC1





Max Unfactored Moment: **4020.2** **kip-ft**

@ **6.02** **ft below grade**

Additional Factor of Safety: **4.16**

Capacity = **32.1%** **PASS**

TOWER ENGINEERING PROFESSIONALS

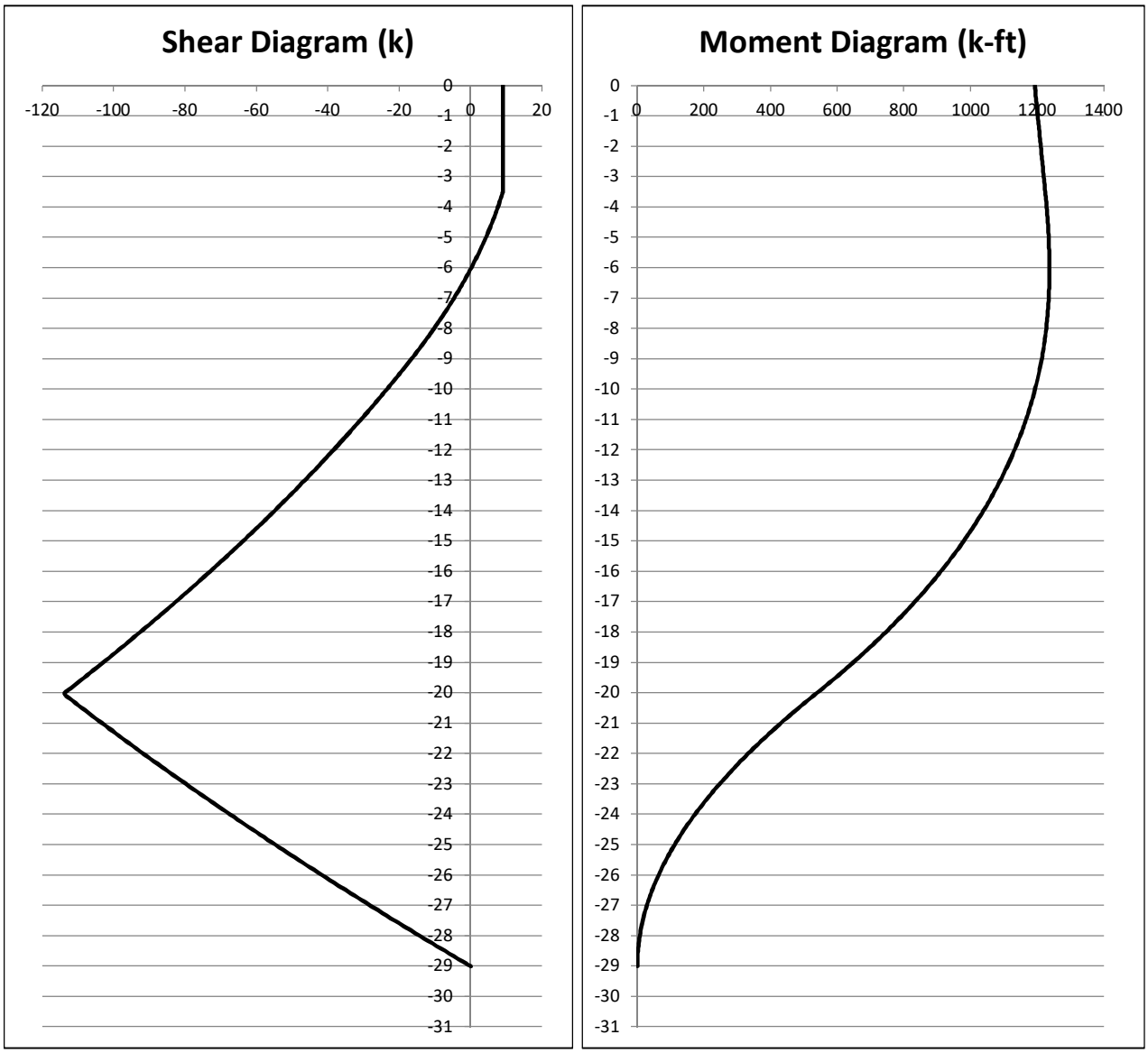
Ward (BU 876381)

TEP #: 51819.126953

Analysis: JDR 8/9/2017

Check: KEH 8/9/2017

Soil Interaction: LC2



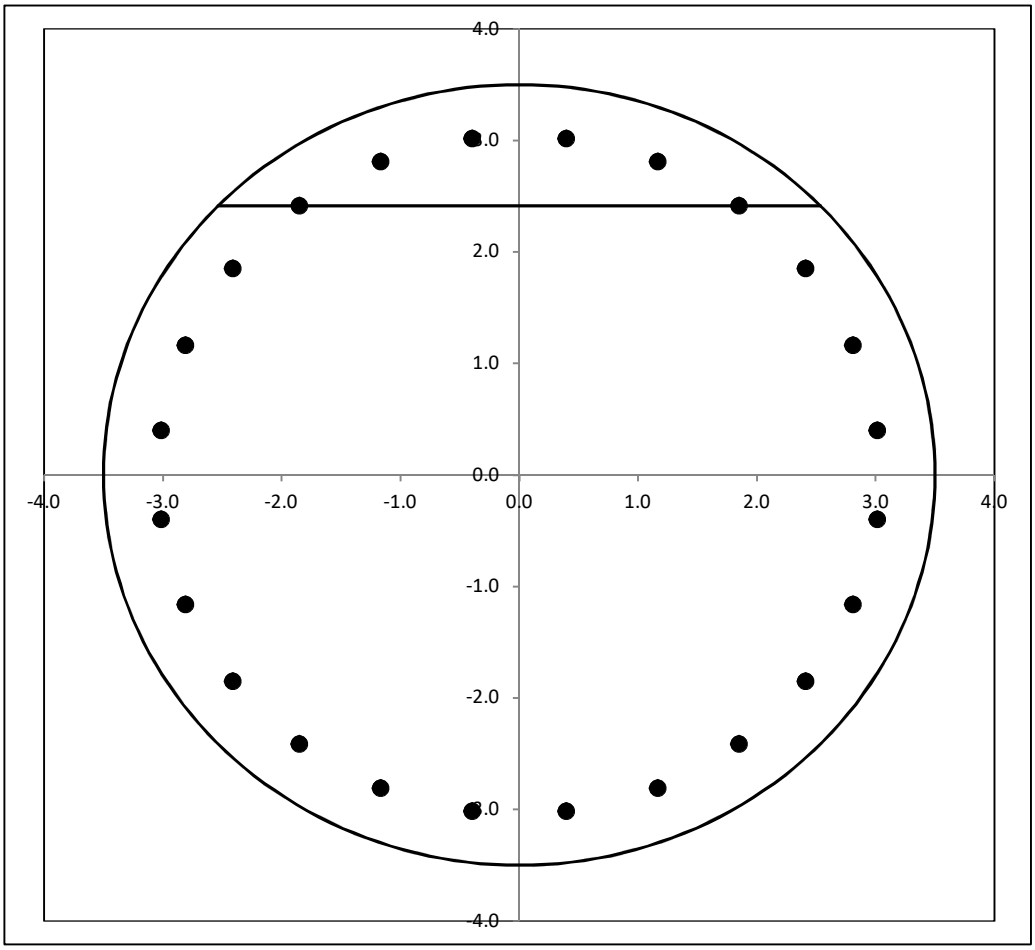
Max Unfactored Moment: **1235.9** **kip-ft**

@ **6.03** **ft below grade**

Additional Factor of Safety: **13.52**

Capacity = **9.9%** **PASS**

Reinforcement Capacity



		LC1	LC2	
	Vu =	371.0	114.1	kip
	Vc =	704.8	706.9	kip
fy,tie = 60.0	**Vs =**	242.4	242.4	kip
	ϕVn =	710.4	712.0	kip
	Capacity =	**52.2%**	**16.0%**	
		PASS	**PASS**	

	LC1	LC2	
Mu =	4020.2	1235.9	kip-ft
ϕMn =	5987.3	6072.0	kip-ft
Capacity =	**67.1%**	**20.4%**	
	PASS	**PASS**	

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

SPRINT Existing Facility

Site ID: CT33XC535

Ward
2365 Long Hill Road
Guilford, CT 06437

September 10, 2017

EBI Project Number: 6217003917

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.31 %

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

EBI Consulting
environmental | engineering | due diligence

September 10, 2017

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

Emissions Analysis for Site: **CT33XC535 – Ward**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **2365 Long Hill Road, Guilford, 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 **2365 Long Hill Road, Guilford, 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 **178 feet** above ground level (AGL) for **Sector A**, **178 feet** above ground level (AGL) for **Sector B** and **178 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):	**178 feet**	Height (AGL):	**178 feet**	Height (AGL):	**178 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%	**1.04 %**	Antenna B1 MPE%	**1.04 %**	Antenna C1 MPE%	**1.04 %**
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):	**178 feet**	Height (AGL):	**178 feet**	Height (AGL):	**178 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%	**0.76 %**	Antenna B2 MPE%	**0.76 %**	Antenna C2 MPE%	**0.76%**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.79 %**
AT&T	1.24 %
T-Mobile	1.95 %
Verizon Wireless	2.33 %
Site Total MPE %:	**7.31 %**

SPRINT Sector A Total:	1.79 %
SPRINT Sector B Total:	1.79 %
SPRINT Sector C Total:	1.79 %
Site Total:	7.31 %

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	178	0.53	850 MHz	567	0.09%
Sprint 850 MHz LTE	2	437.55	178	1.06	850 MHz	567	0.19%
Sprint 1900 MHz (PCS) CDMA	5	622.47	178	3.78	1900 MHz (PCS)	1000	0.38%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	178	3.78	1900 MHz (PCS)	1000	0.38%
Sprint 2500 MHz (BRS) LTE	8	778.09	178	7.56	2500 MHz (BRS)	1000	0.76%
						Total*:	**1.79%**

*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:	1.79 %
Sector B:	1.79 %
Sector C:	1.79 %
SPRINT Maximum Total (per sector):	1.79 %
Site Total:	7.31 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.31 %** 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.