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

August 8, 2014

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

RE: **Sprint PCS-Exempt Modification - Crown Site BU: 876314**
Sprint PCS Site ID: CT03XC017
Located at: 214 Russian Village Road, Southbury, CT 06488

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of Sprint PCS (Sprint). Sprint is making modifications to certain existing sites in its Connecticut system in order to implement their 2.5GHz LTE technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mr. Ed Edelson, First Selectman for Town of Southbury, and Thomas and Mieke Crider, Property Owners.

Sprint plans to modify the existing wireless communications facility owned by Crown Castle and located at **214 Russian Village Road, Southbury, CT 06488**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Sprint's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Sprint's additional antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. A Structural Modification Report confirming that the tower and foundation can support Sprint's proposed modifications is included as Exhibit-2.

5. The operation of the additional antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Sprint's modified facility is included as Exhibit-3.

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

Sincerely,

Jeff Barbadora
Real Estate Specialist

Enclosures

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

cc: Mr. Ed Edelson, First Selectman
Town of Southbury
Southbury Town Hall
501 Main Street South
Southbury, CT 06488

Mr. and Mrs. Thomas Crider
100 Russian Village Road
Southbury, CT 06488

Sprint

2.5 EQUIPMENT DEPLOYMENT

SITE NUMBER:
CT03XC017
SITE NAME:
HORSE HILL
SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

CROWN ID#: 876314
CROWN SITE NAME: HORSE HILL

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

CROWN CASTLE

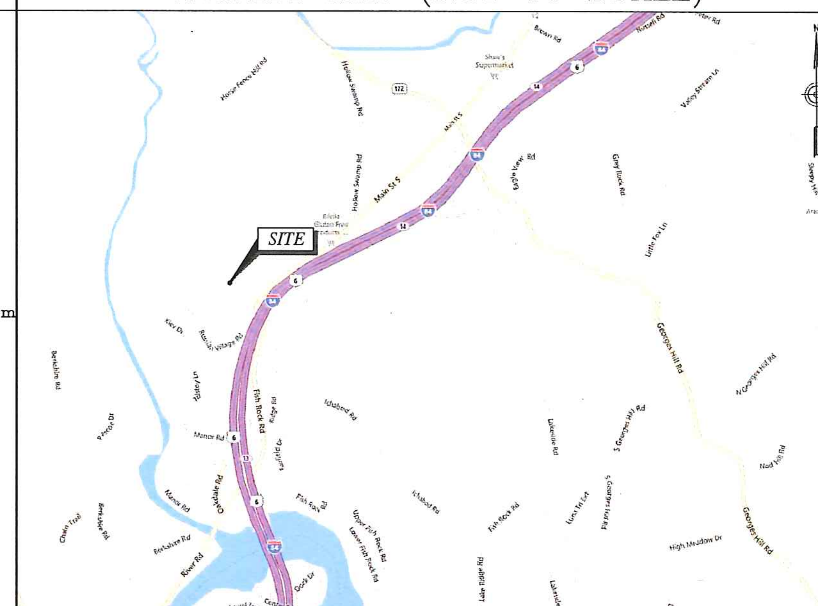
TECTONIC
• PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703
www.tectonicengineering.com

SHEET INFORMATION

SITE NUMBER:	CT03XC017
SITE NAME:	HORSE HILL
SITE ADDRESS:	100 RUSSIAN VILLAGE RD SOUTHBURY, CT 06488
COUNTY:	NEW HAVEN
COORDINATES: (NAD 83)	41° 27' 7.97" N 73° 15' 1.25" W
GROUND ELEV:	415'± AMSL
STRUCTURE TYPE:	MONOPOLE
STRUCTURE HEIGHT:	120'-0"± AGL
STRUCTURE RAD CENTER:	120'-0"± AGL
ZONING CLASSIFICATION:	R
MAP-BLOCK-LOT:	19-92-45

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, KS 66251
ENGINEER:	JAMES QUICKSELL (845) 567-6656 EXT. 2835 JQuicksell@tectonicengineering.com
SPRINT CM:	GARY WOOD (860) 940-9168 gary.wood@sprint.com
CROWN CM:	JASON D'AMICO (860) 209-0104 jason.d'amico @crowncastle.com
AAV:	AT&T

VICINITY MAP (NOT TO SCALE)



SHEET INDEX

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

SUBMITTALS

PROJECT NO: 7225.CT03XC017

NO	DATE	DESCRIPTION	BY
0	06/10/14	FOR COMMENT	DC
1	07/28/14	FOR CONSTRUCTION	DC
2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/1/14	JMG

SEAL
STATE OF CONNECTICUT
No. 23008
LICENSED PROFESSIONAL ENGINEER

GENERAL NOTES

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

PROJECT DESCRIPTION

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

AERIAL VIEW (NOT TO SCALE)

APPROVALS

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

CONSTRUCTION: ______________________ DATE: ____________

LEASING/ SITE ACQUISITION: ______________________ DATE: ____________

LANDLORD/ PROPERTY OWNER: ______________________ DATE: ____________

R.F. ENGINEER: ______________________ DATE: ____________

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

SITE NUMBER:
CT03XC017
SITE NAME:
HORSE HILL
SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

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._15720111042185549 2.DOCM.
20. REFER TO: COLOR CODING–SPRINT NEXTEL ANT AND LINE COLOR CODING (DRAFT) V3 09–08–11.PDF
21. REFER TO LATEST DOCUMENTATION REVISION.

DIVISION 03000–CONCRETE

1.03 APPLICABLE STANDARDS (USE LATEST EDITIONS)

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

1.04 QUALITY ASSURANCE

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

3.04 SURFACE FINISHES

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

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

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

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

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

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

3.05 PATCHING

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

3.06 DEFECTIVE CONCRETE

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

3.07 PROTECTION

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

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

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

DIVISION 05000 – METALS

PART 1 – GENERAL

1.01 WORK INCLUDED

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

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

1.02 REFERENCE STANDARDS

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

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

PART 2 – PRODUCTS

2.01 MATERIALS

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

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

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

2.02 WELDING

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

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

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

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

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

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

2.03 BOLTING

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

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

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

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

E. STANDARD, OVERSIZED OR HORIZONTAL SHORT SLOTTED HOLES.

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

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

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

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

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

2.04 FABRICATION

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

2.05 FINISH

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

2.06 PROTECTION

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

PART 3 – ERECTION

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

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

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

Sprint

2.5 EQUIPMENT DEPLOYMENT
6580 SPRINT PARKWAY
OVERLAND PARK, 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.CT03XC017

NO	DATE	DESCRIPTION	BY
0	06/10/14	FOR COMMENT	DC
1	07/28/14	FOR CONSTRUCTION	DC
2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/1/14	JMA

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 23038
LICENSED
PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

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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OVERLAND PARK, KS 66251

CROWN CASTLE

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Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703
www.tectonicengineering.com

SUBMITTALS

PROJECT NO: 7225.CT03XC017

NO	DATE	DESCRIPTION	BY
0	06/10/14	FOR COMMENT	DC
1	07/28/14	FOR CONSTRUCTION	DC
2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/1/14	JMG

SEAL

STATE OF CONNECTICUT · NOJUKUMAR ... · No. 22058 · LICENSED · PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
GENERAL NOTES

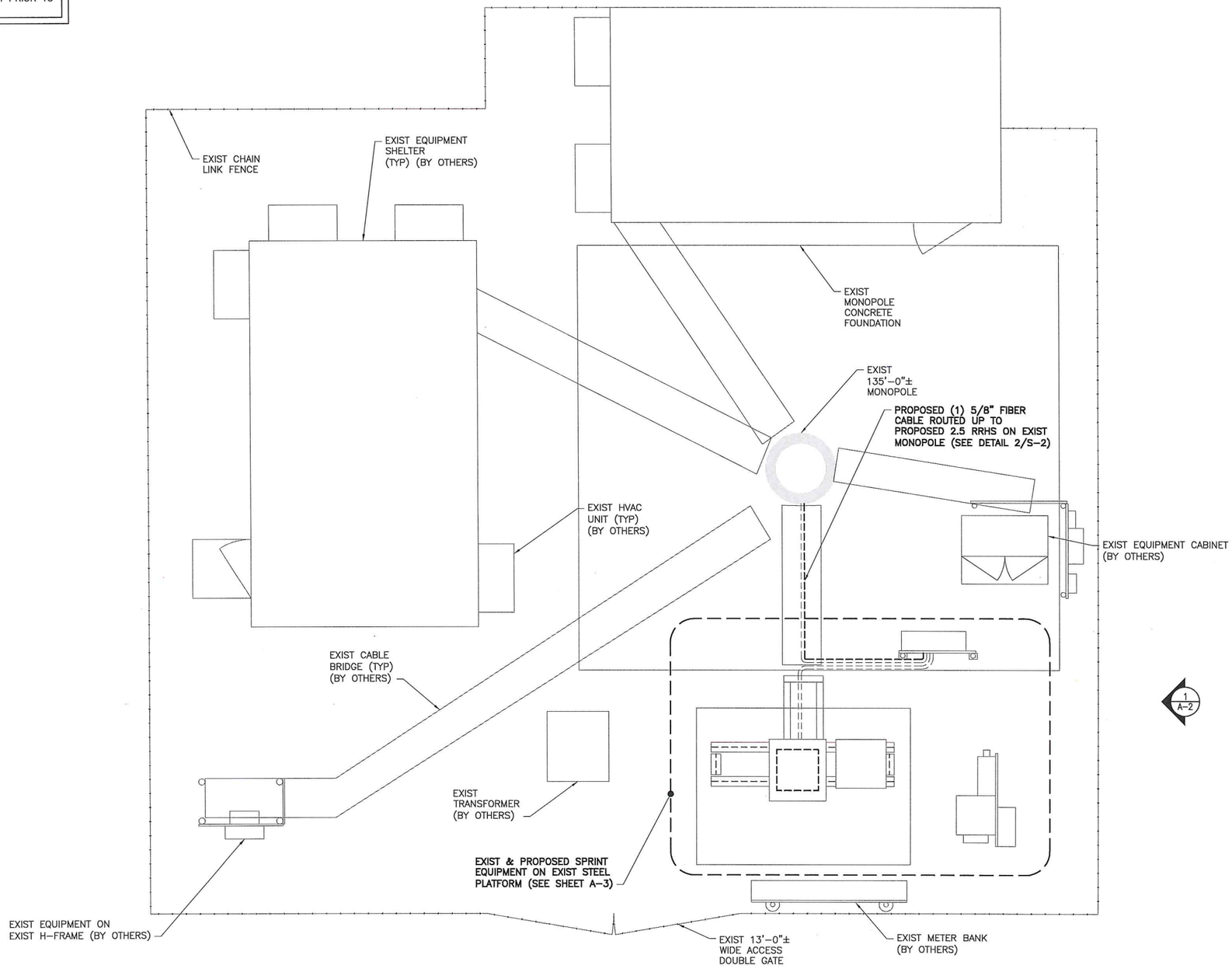
SHEET NO:
SP-2

N

APPROX.

NORTH NOTE:

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



1 A-1 SITE PLAN

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

Sprint

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DATE	REVIEWED BY
8/1/14	JMG

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 23033
LICENSED PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

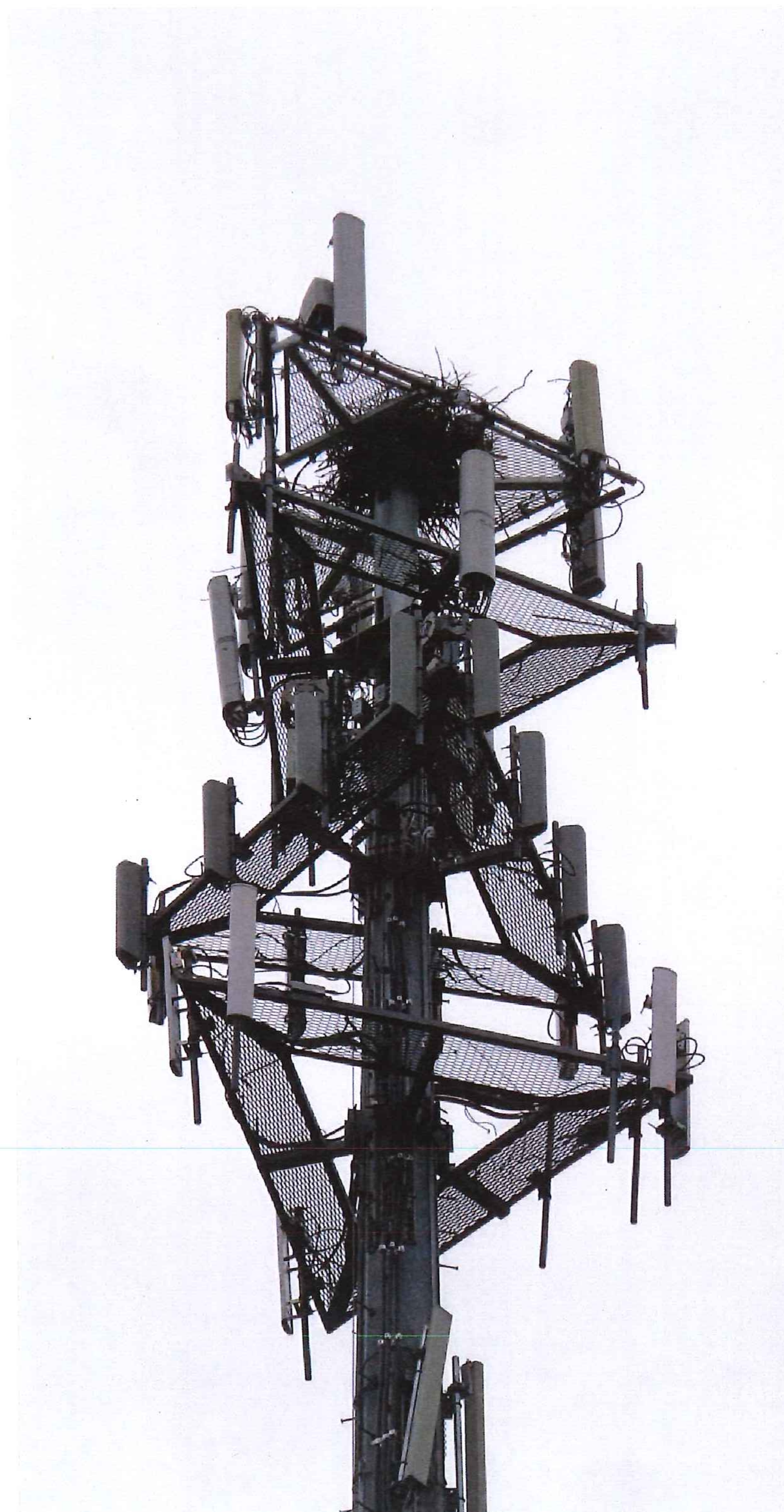
SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
SITE PLAN

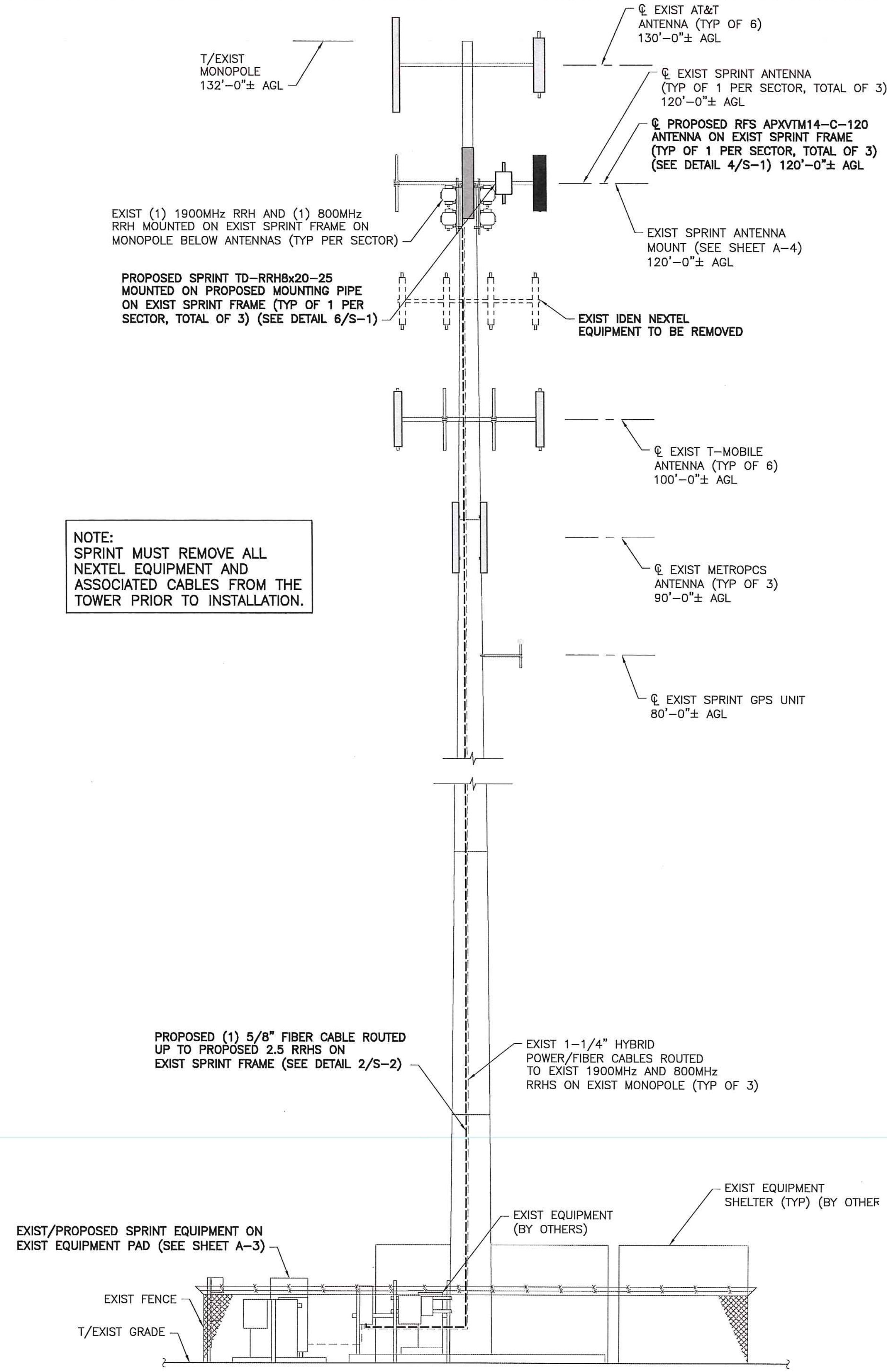
SHEET NO:
A-1

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 7/28/14.



NOTE:
SPRINT MUST REMOVE ALL NEXTEL EQUIPMENT AND ASSOCIATED CABLES FROM THE TOWER PRIOR TO INSTALLATION.



1/A-2 ELEVATION
SCALE: 3/16" = 1'-0"

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8/1/14	JMQ

SEAL

STATE OF CONNECTICUT · MANOJKUMAR ... · No. 22... · LICENSED · PROFESSIONAL ENGINEER

SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
ELEVATION

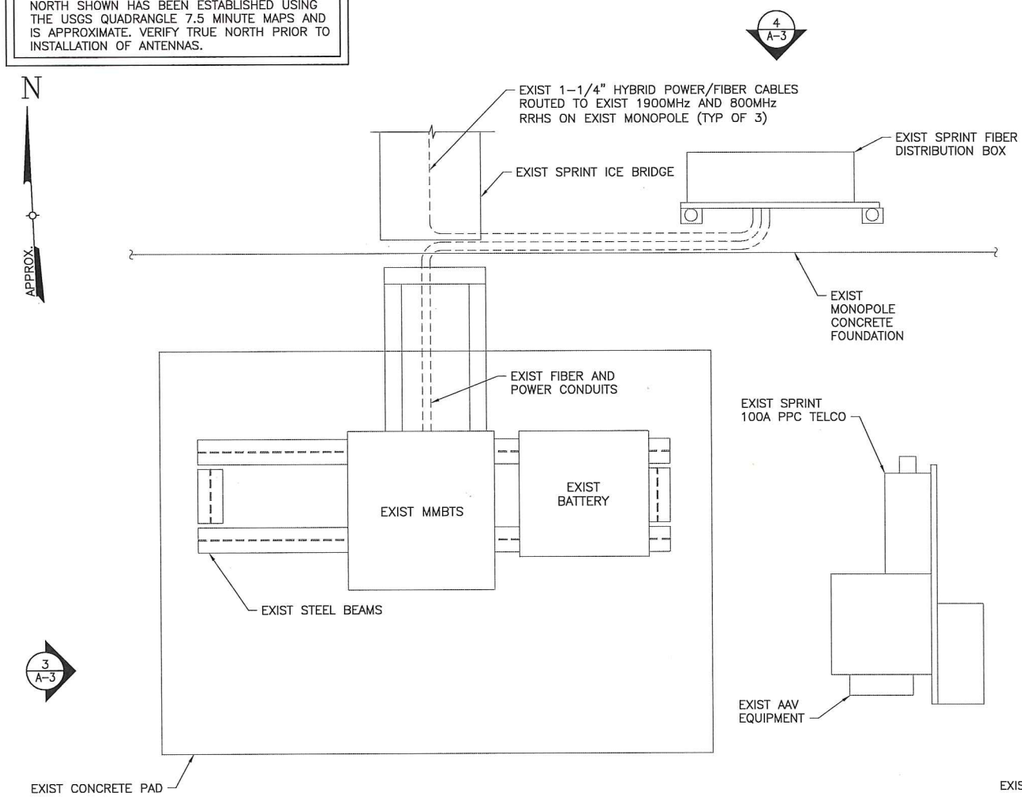
SHEET NO:
A-2

NORTH NOTE:

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

N

APPROX.

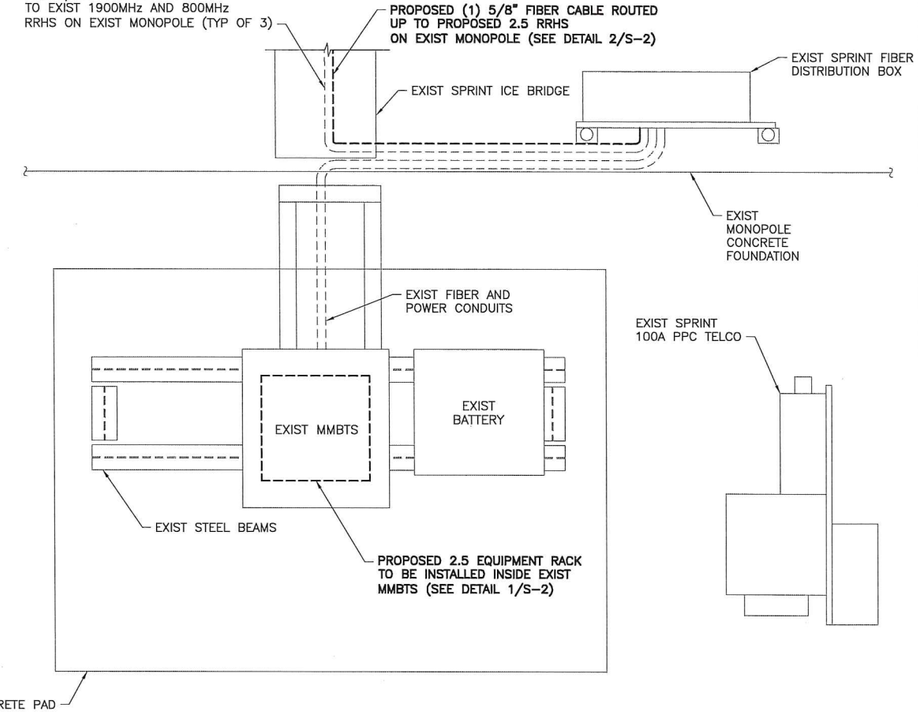


1 A-3 ENLARGED EQUIP. LAYOUT PLAN (EXIST)

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

3 A-3 EXIST EQUIPMENT PAD

SCALE: NTS



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

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

4 A-3 EXIST FIBER DISTRIBUTION BOX

SCALE: NTS

Sprint

2.5 EQUIPMENT DEPLOYMENT
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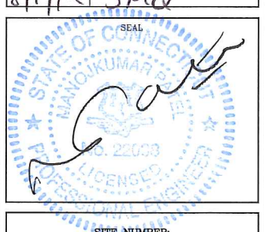


SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

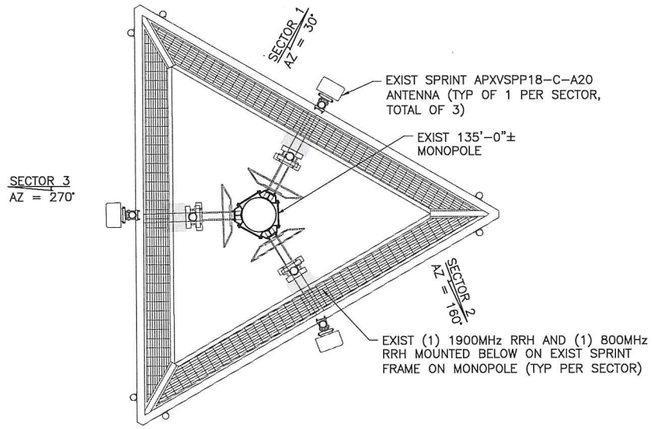
SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
ENLARGED EQUIPMENT LAYOUT PLANS

SHEET NO:
A-3

N

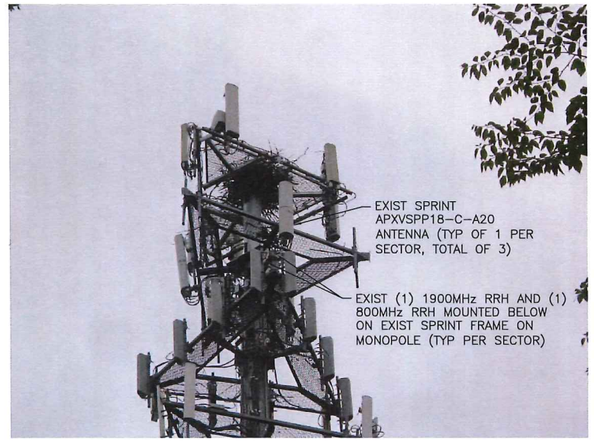
APPROX.

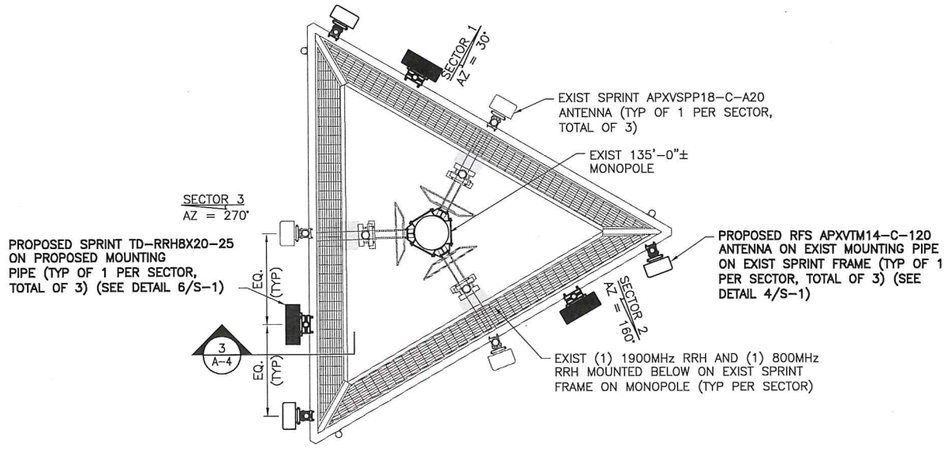


1 A-4 ANTENNA LAYOUT PLAN (EXIST)

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

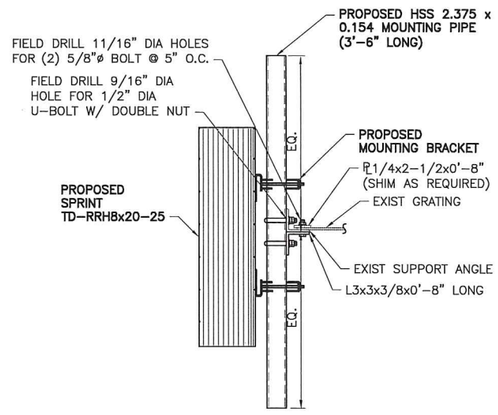
NOTE:
SPRINT MUST REMOVE ALL NEXTEL EQUIPMENT AND ASSOCIATED CABLES FROM THE TOWER PRIOR TO INSTALLATION.





2 A-4 ANTENNA LAYOUT PLAN (FINAL)

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



3 A-4 RRH MOUNTING DETAIL

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

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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	119'	120'
Antenna Azimuth	30/160/270	30/160/270
Antenna RRH Model Number	1900MHz/800MHz RRHS	2.5GHz RRH-V3
Number of RRH	3	3

Sprint

2.5 EQUIPMENT DEPLOYMENT
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DATE	REVIEWED BY
8/11/14	JMQ

SEAL

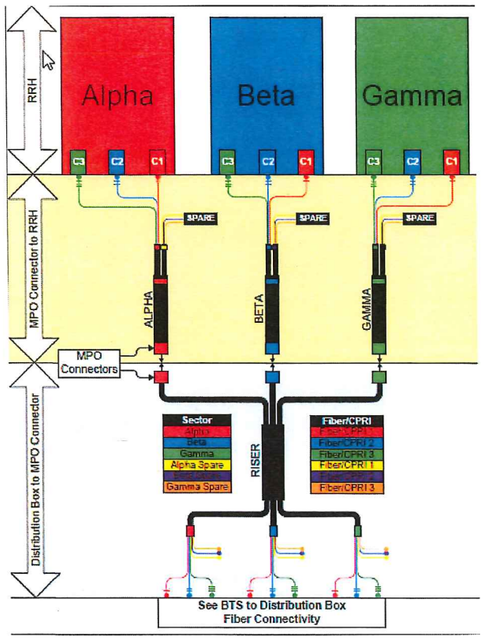
SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

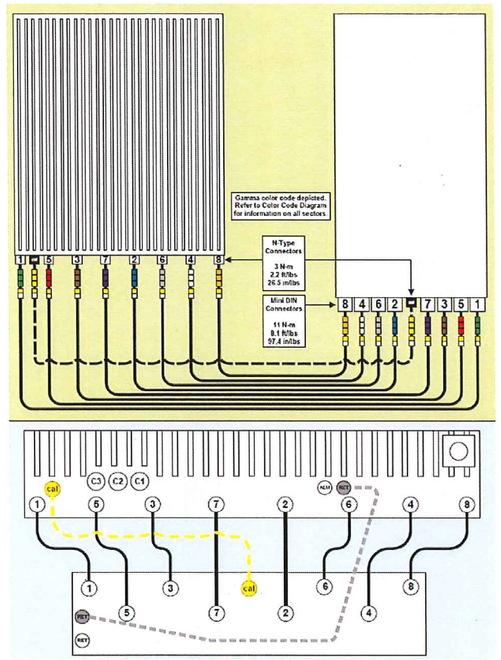
SHEET TITLE:
ANTENNA LAYOUT PLANS

SHEET NO:
A-4



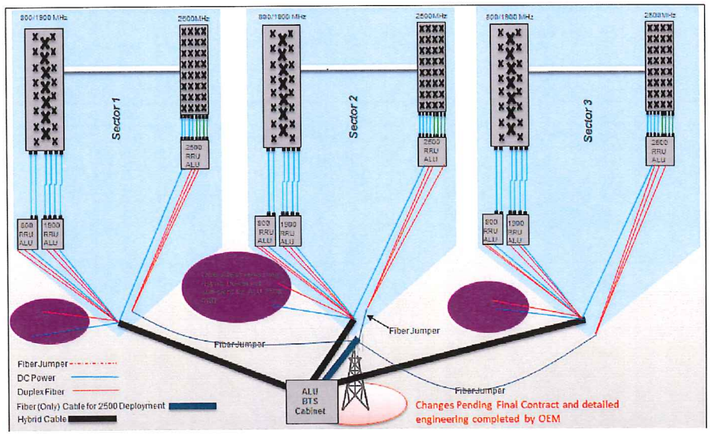
1 A–5 2.5 CABLE COLOR CODING

SCALE: N.T.S.



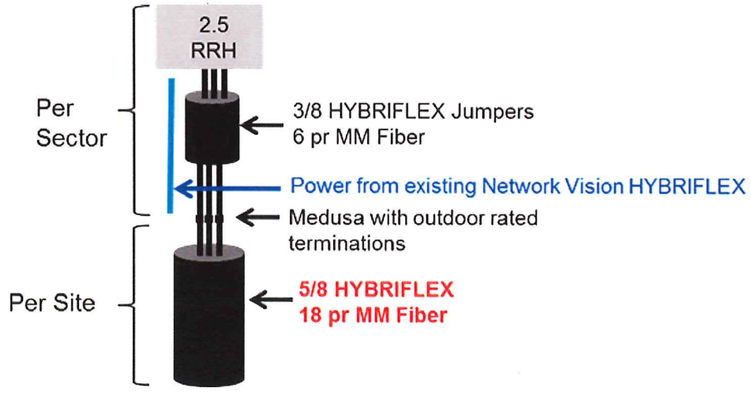
2 A–5 RRH CONNECTIVITY

SCALE: N.T.S.



3 A–5 RAN WIRING

SCALE: N.T.S.



4 A–5 CABLE SCENARIO

SCALE: N.T.S.

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SUBMITTALS

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NO	DATE	DESCRIPTION	BY
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2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/1/14	JMG

SEAL

STATE OF ARIZONA · YAVAPAI · COCONINO · MARICOPA · PINAL · GILA · PIMA · KINGMAN · No. 22033 · Licensed · Professional Engineer

SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
RAN WIRING DIAGRAM

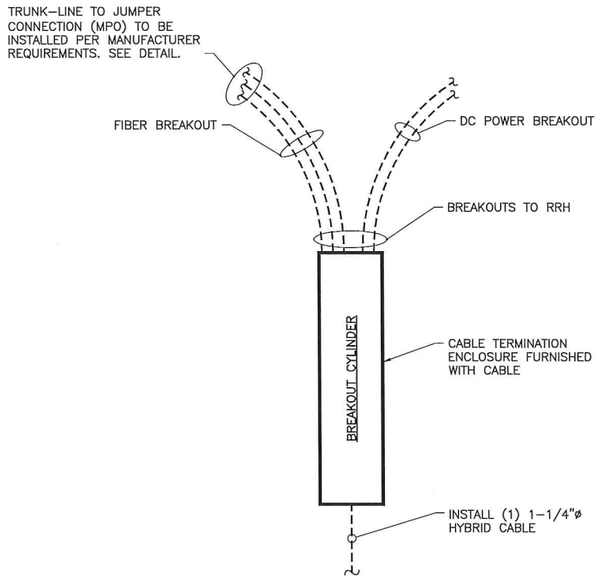
SHEET NO:
A–5

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

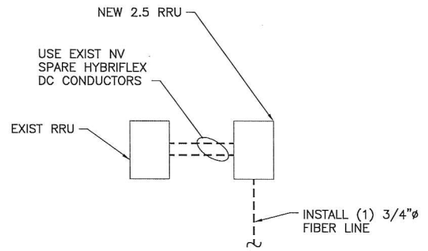
IMPORTANT!! ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL A CLICK SOUND IS HEARD TO ENSURE A GOOD CONNECTION

1 A-6 HYBRIFLEX RISER/JUMPER CONNECTION DETAILS

SCALE: N.T.S.



2.5 HYBRID CABLE W/FIBER & DC FEEDERS



FIBER ONLY TRUNK LINES

2 A-6 TRUNK LINE DETAILS (TYPICAL)

SCALE: N.T.S.

SPECIAL NOTES: CABLE MARKINGS AT RAD CENTER AND ALL WALL/BLDG. PENETRATIONS

- ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) WRAPS OF TAPE.
- ALL COLOR BANDS INSTALLED AT THE TOWER TOP SHALL BE A MINIMUM OF 3" WIDE AND SHALL HAVE A MINIMUM OF 3/4" OF SPACING BETWEEN EACH COLOR.
- ALL COLOR BANDS INSTALLED AT OR NEAR THE GROUND MAY BE ONLY 3/4" WIDE. EACH TOP-JUMPER SHALL BE COLOR CORDED WITH (1) SET OF 3" WIDE BANDS.
- EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH 3/4" COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
- ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" BANDS ON EACH END OF THE BOTTOM JUMPER.
- ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
- EACH COLOR BAND SHALL HAVE A MINIMUM OF (3) WRAPS AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT AS TO AVOID UNRAVELING.
- X-POLE ANTENNAS SHOULD USE "XX-1" FOR THE "+45" PORT, "XX-2" FOR THE "-45" PORT.
- COLOR BAND #4 REFERS TO THE FREQUENCY BAND: ORANGE=850, VIOLET=1900. USED ON JUMPERS ONLY.
- RF FEEDLINE SHALL BE IDENTIFIED WITH A METAL TAG (STAINLESS OR BRASS) AND STAMPED WITH THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER.
- ANTENNAS MUST BE IDENTIFIED, USING THE SECTOR LETTER AND ANTENNA NUMBER, WITH A BLACK MARKER PRIOR TO INSTALLATION.

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SUBMITTALS

PROJECT NO: 7225.CT03XC017

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0	06/10/14	FOR COMMENT	DC
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2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/1/14	JMQ

SEAL

STATE OF CONNECTICUT
JAMES M. QUINN
No. 22830
LICENSED PROFESSIONAL ENGINEER

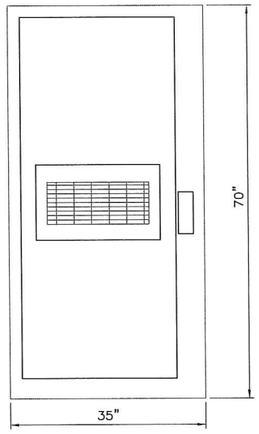
SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
CABLE DETAILS

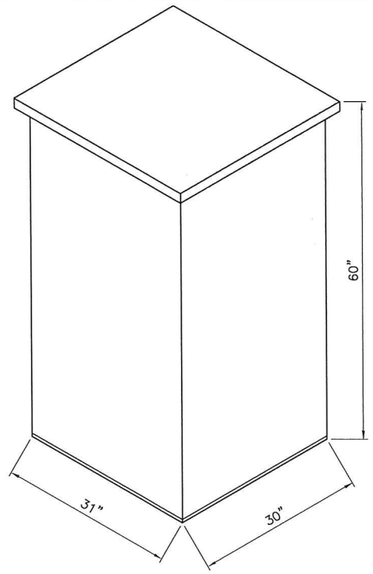
SHEET NO:
A-6



CABINET FRONT 9928 MMBTS MODULAR CELL
SPECIFICATIONS:
HEIGHT: 70" WIDTH: 35" DEPTH: 37.8" WEIGHT: 1090 LBS.

1/S-1 (EXIST) MMBTS CABINET

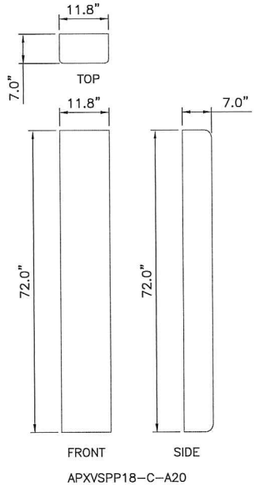
SCALE: 1" = 1'-0"



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

2/S-1 (EXIST) BATTERY CABINET

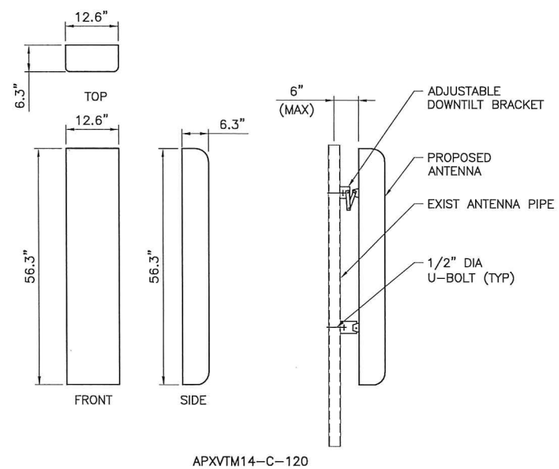
SCALE: 1" = 1'-0"



APXVSPP18-C-A20

3/S-1 (EXIST) ANTENNA DETAIL

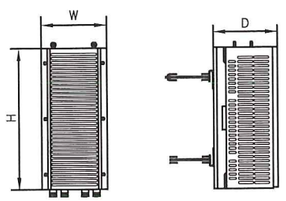
SCALE: 3/4"=1'-0"



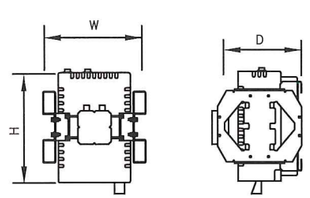
APXVTM14-C-120

4/S-1 (PROPOSED) ANTENNA DETAIL

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



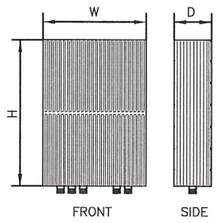
TYPE: 1900 MHz 4x45W MODEL #: RRH 1900 4X45 65MHz HEIGHT: 25.0" WIDTH: 11.1" DEPTH: 11.4" WEIGHT: ±60 LBS.



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

5/S-1 (EXIST) RRH DETAILS

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



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

6/S-1 (PROPOSED) RRH DETAIL

SCALE: N.T.S.

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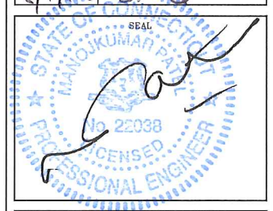
DATE	REVIEWED BY
8/1/14	SMW



SITE NUMBER:
CT03XC017

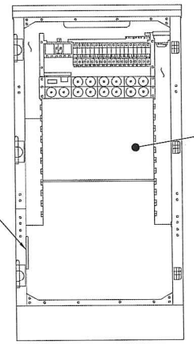
SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
EQUIPMENT DETAILS

SHEET NO:
S-1

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



EXIST GROUND BAR TO BE UTILIZED

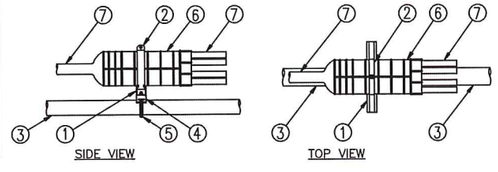
INSTALL NEW 2.5 EQUIPMENT IN EXIST MMBTS CABINET INCLUDING BUT NOT LIMITED TO BASE BAND UNIT, CELL SITE ROUTER AND SURGE ARRESTORS. GROUND EQUIPMENT TO EXIST INTERIOR CABINET GROUND BAR

FRONT ELEVATION
(CABINET INTERIOR)

1 S-2 MMBTS INTERIOR DETAIL

SCALE: N.T.S.

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



3 S-2 MEDUSA HEAD DETAIL

SCALE: NTS

RFS HYBRIFLEX RISER CABLES SCHEDULE

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

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

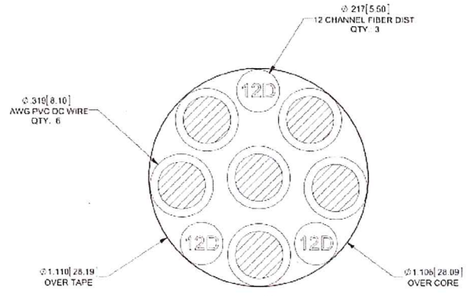
Fiber Only	**Hybrid Jumper cable** MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	**Hybrid Jumper cable** MN: HBF058-08U1M3-5F1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

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

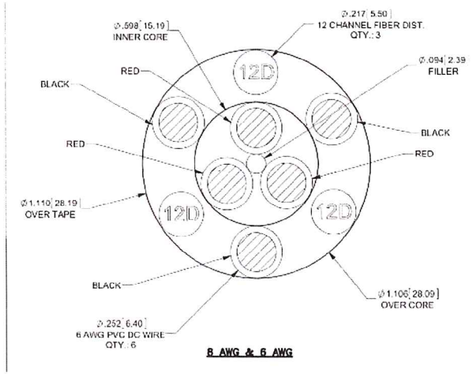
SCALE: NTS

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE

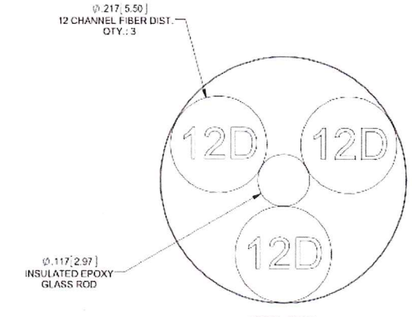
MANUF:	RFS		
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	7/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"



4 AWG



8 AWG & 6 AWG



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2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/1/14	JMQ

SEAL

STATE OF CONNECTICUT
MANOJKUMAR PATEL
No. 22038
LICENSED PROFESSIONAL ENGINEER

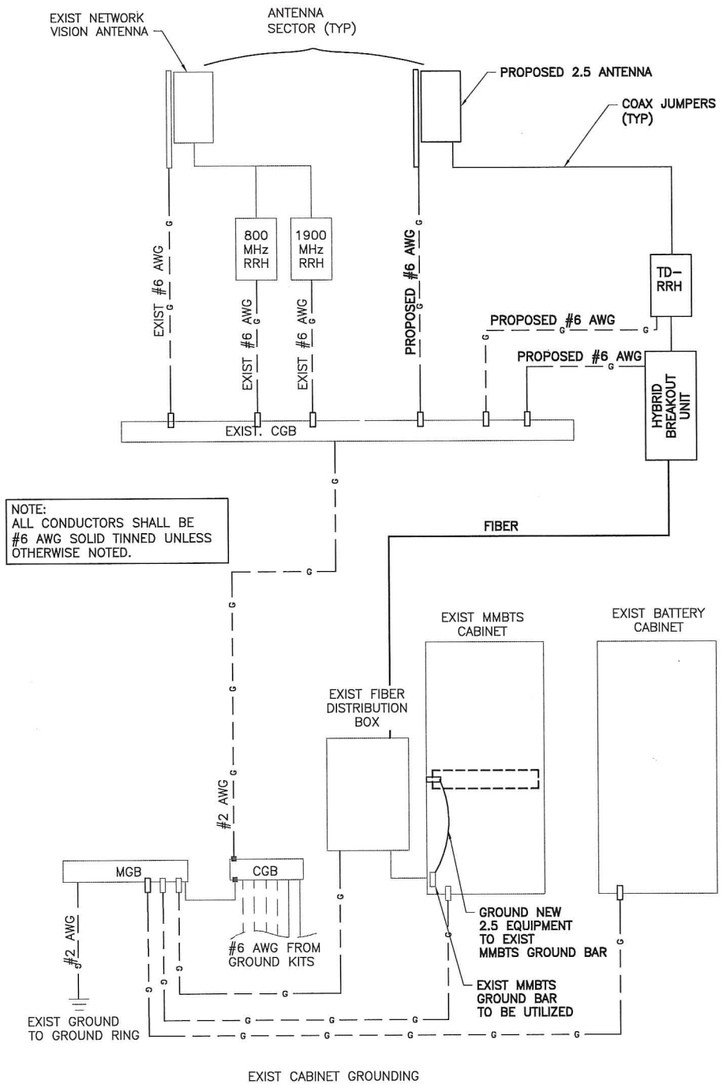
SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

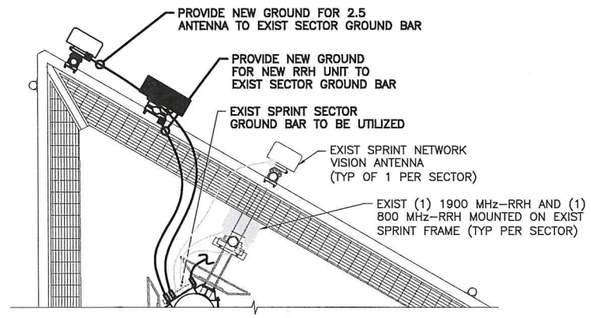
SHEET TITLE:
EQUIPMENT
SCHEMATIC DETAILS

SHEET NO:
S-2



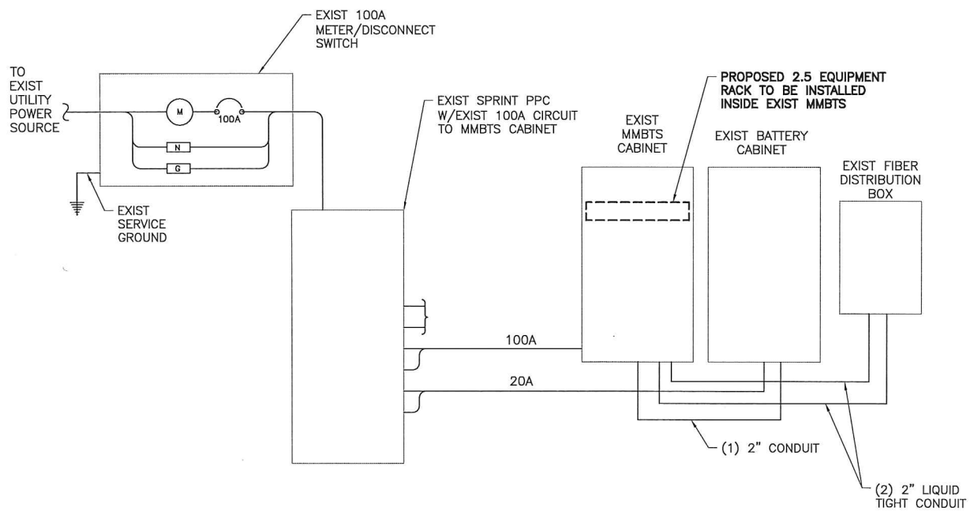
1 E-1 TYPICAL GROUNDING ONE LINE DIAGRAM

SCALE: NTS



2 E-1 TYPICAL ANTENNA GROUNDING PLAN

SCALE: NTS



3 E-1 TYPICAL ELECTRICAL & TELCO PLAN

SCALE: NTS

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DATE	REVIEWED BY
8/1/14	SMG

STATE OF CONNECTICUT · MANOJ GUPTA · No. 23033 · LICENSED PROFESSIONAL ENGINEER · SEAL

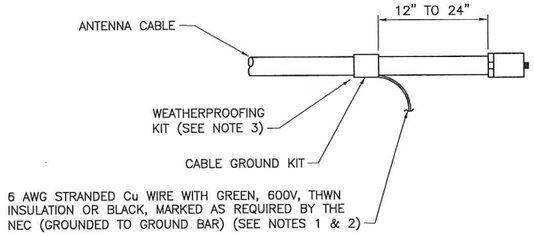
SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
ELECTRICAL & GROUNDING PLANS

SHEET NO:
E-1



CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NOTES:

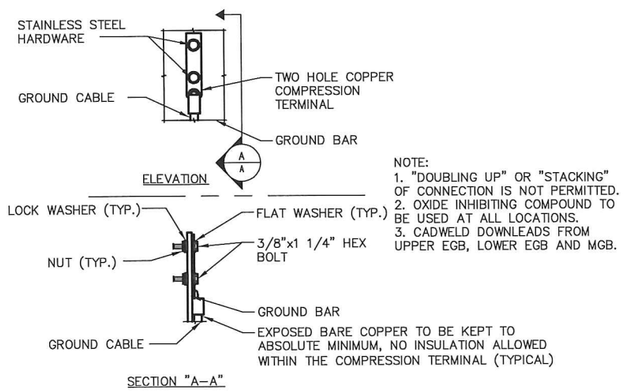
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

WEATHER PROOFING SHALL BE (TYPE AND PART NUMBER) AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER AND APPROVED BY CONTRACTOR.

1 E-2 CABLE GROUNDING KIT DETAIL

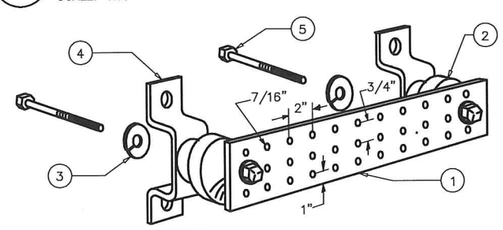
SCALE: N.T.S.



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

2 E-2 GROUNDING BAR CONN. DETAIL

SCALE: NTS



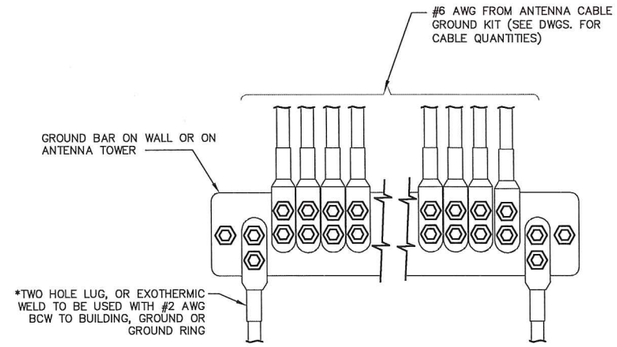
LEGEND

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

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

3 E-2 GROUNDING BAR DETAIL

SCALE: NTS



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

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

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

4 E-2 ANTENNA GROUND BAR DETAIL

SCALE: NTS

GROUNDING NOTES:

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

PROTECTIVE GROUNDING SYSTEM GENERAL NOTES:

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

ELECTRICAL AND GROUNDING NOTES

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

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

CROWN CASTLE

TECTONIC
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1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656
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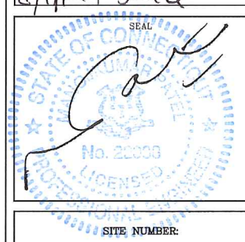
SUBMITTALS

PROJECT NO: 7225.CT03XC017

NO	DATE	DESCRIPTION	BY
0	06/10/14	FOR COMMENT	DC
1	07/28/14	FOR CONSTRUCTION	DC
2	08/01/14	PER COMMENTS	KA

DATE	REVIEWED BY
8/11/14	JMQ

SEAL



SITE NUMBER:
CT03XC017

SITE NAME:
HORSE HILL

SITE ADDRESS:
100 RUSSIAN VILLAGE RD
SOUTHBURY, CT 06488

SHEET TITLE:
GROUNDING DETAILS & NOTES

SHEET NO:
E–2

Date: **June 24, 2014**

Charles Trask
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(980) 209-8228

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
crown@tepgroup.net

Subject: Structural Analysis Report

Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5A
	Carrier Site Number:	CT03XC017
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	876314
	Crown Castle Site Name:	Horse Hill
	Crown Castle JDE Job Number:	288077
	Crown Castle Work Order Number:	773648
	Crown Castle Application Number:	245531 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	25675.20592
Site Data:	**214 Russian Village Rd, Southbury, New Haven County, CT 06488** **Latitude *41° 27' 7.97"*, Longitude *-73° 15' 1.25"*** **130 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 657669, in accordance with application 245531, revision 0.

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

LC11: 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 TIA/EIA-222-F standard and 2005 Connecticut State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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: Rahul Tayal E.I. / JEJ

Respectfully submitted by:

Graham M. Andres, P.E.

STATE OF CONNECTICUT
GRAHAM M. ANDRES
29538
LICENSED
PROFESSIONAL ENGINEER
6/24/14

Electronic Copy

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a monopole tower that was originally 120' and was extended to 130', designed by Summit Manufacturing Inc. in January of 1998. 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 per reinforcement drawings prepared by GPD Group in August of 2012. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

The analysis has been performed in accordance with the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and ASCE 7-05 Minimum Design Loads for Buildings and Other Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch escalating ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	120.0	3	Alcatel Lucent	TD-RRH8x20-25	1	1-1/4	1
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			

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
130.0	130.0	1	Andrew	SBNH-1D6565C w/ Mount Pipe	6 2 1	1-5/8 3/4 3/8	1
		3	Ericsson	RRUS-11			
		1	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		3	Powerwave Technologies	7770.00 w/ Mount Pipe			
		6	Powerwave Technologies	LGP21401			
		1	Powerwave Technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	Raycap	DC6-48-60-18-8F			
		1	Tower Mounts	Platform Mount [LP 303-1]			
120.0	120.0	3	Alcatel Lucent	800 External Notch Filter	3	1-1/4	1
		9	RFS Celwave	ACU-A20-N			
		3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		1	Tower Mounts	Platform Mount [LP 712-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
118.0	119.0	3	Alcatel Lucent	TME-1900MHz RRH(65MHz)	-	-	1
	118.0	1	Tower Mounts	Pipe Mount [PM 601-3]			
	117.0	3	Alcatel Lucent	TME-800MHZ RRH			
110.0	110.0	12	Decibel	DB844H90E-SX w/ Mount Pipe	12	7/8	2
		1	Tower Mounts	Platform Mount [LP 712-1]			
100.0	100.0	3	RFS Celwave	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	4	1-5/8	3
		3	RFS Celwave	ATMAA1412D-1A20			
		3	RFS Celwave	ATMPP1412D-1CWA			
		3	EMS Wireless	RR90-17-02DP w/ Mount Pipe	8	1-5/8	1
		1	Tower Mounts	Platform Mount [LP 712-1]			
90.0	90.0	2	RFS Celwave	APXV18-206517S-C w/ Mount Pipe	6	1-5/8	1
80.0	80.0	1	GPS	GPS_A	1	1/2	1
		1	Tower Mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment
2) Existing equipment; to be removed
3) 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)
120.0	120.0	12	Swedcom	ALPS 9212-N	-	-
110.0	110.0	12	Swedcom	ALPS 9212-N	-	-
100.0	100.0	12	Swedcom	ALPS 9212-N	-	-
80.0	80.0	1	Generic	1-GPS	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Geotechnical Reports	Clarence Welti Assoc. Inc.	1529735	CCISites
Tower Foundation Drawing	Paul J Ford and Company	1611741	CCISites
Tower Manufacturer Drawing	Summit	1529812	CCISites
Post Modification Inspection	Tower Engineering Professionals	3797830	CCISites
Tower Reinforcement Drawings	GPD Group	3797841	CCISites

3.1) Analysis Method

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

3.2) Assumptions

1) The tower and 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) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by the standard.
5) All tower components are in sufficient condition to carry their full design capacity.
6) 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.
7) 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 perform a site visit to verify the size, condition or capacity of the antenna mounts and 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 (lb)	SF*P_{allow} (lb)	% Capacity	Pass / Fail
L1	130.00-120.00	Pole	TP16.00×16.00×0.3750	1	Note 1	Note 1	19.2	Pass
L2	120.00-91.50	Pole	TP22.98×16.00×0.1875	2	Note 1	Note 1	61.6	Pass
L3	94.50-64.50	Pole	TP29.22×21.87×0.2500	3	Note 1	Note 1	89.2	Pass
L4	68.25-42.50	Pole	TP34.11×27.80×0.3125	4	Note 1	Note 1	63.3	Pass
L5	46.75-20.25	Pole	TP38.94×32.44×0.3438	5	Note 1	Note 1	93.7	Pass
L6	25.25-0.00	Pole	TP43.21×37.03×0.3750	6	Note 1	Note 1	74.6	Pass
M1	15.50-0.50	Mod	(Aero) MP304	1	Note 1	Note 1	79.2	Pass
M2	42.67-12.67	Mod	(Aero) MP304	2	Note 1	Note 1	77.5	Pass
M3	70.33-40.33	Mod	(Aero) MP304	3	Note 1	Note 1	73.5	Pass
M4	88.17-68.17	Mod	(Aero) MP303	4	Note 1	Note 1	87.4	Pass
M5	73.17-68.17	Mod	(Aero) MP303	5	Note 1	Note 1	77.4	Pass
M6	89.50-79.50	Mod	(Aero) MP303	6	Note 1	Note 1	70.0	Pass
M7	116.17-86.17	Mod	(Aero) MP303	7	Note 1	Note 1	69.4	Pass
M8	97.67-87.67	Mod	(Aero) MP303	8	Note 1	Note 1	59.3	Pass
M9	105.17-95.17	Mod	(Aero) MP303	9	Note 1	Note 1	46.1	Pass
M10	110.83-102.83	Mod	(Aero) MP303	10	Note 1	Note 1	42.2	Pass
M11	116.17-108.17	Mod	(Aero) MP303	11	Note 1	Note 1	27.2	Pass
							Summary	

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_{allow} (lb)	% Capacity	Pass / Fail
						Pole (L3)	93.7	Pass
						Mod (M4)	87.4	Pass
						RATING =	**93.7**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	-	61.1	Pass
1	Base Plate	-	81.3	Pass
1	Flange Connection	120.0	42.7	Pass
1	Base Foundation Soil Interaction	-	82.6	Pass
1	Base Foundation Structural	-	26.2	Pass

Structure Rating (max from all components) =	**93.7%**

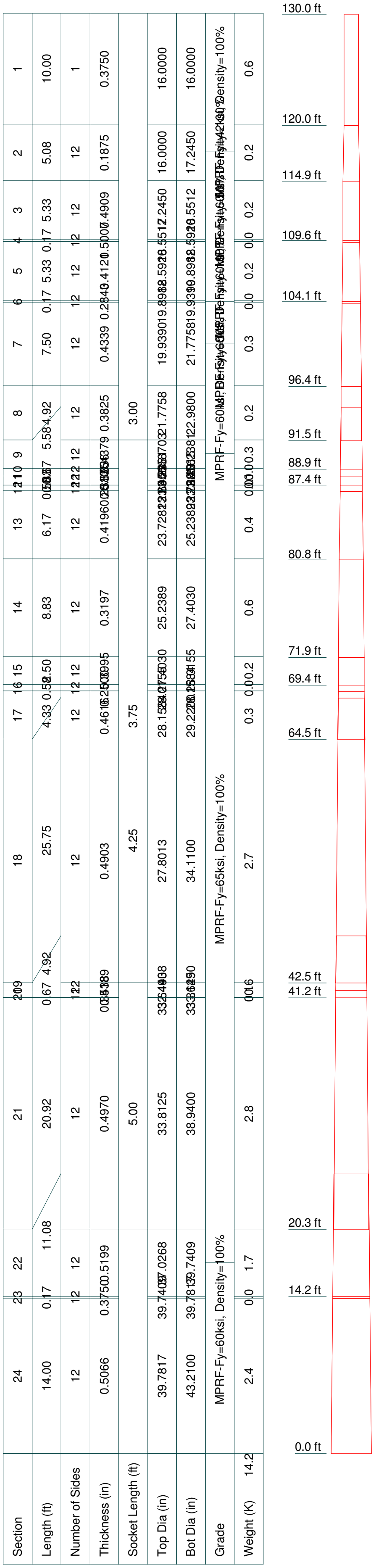
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

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 existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

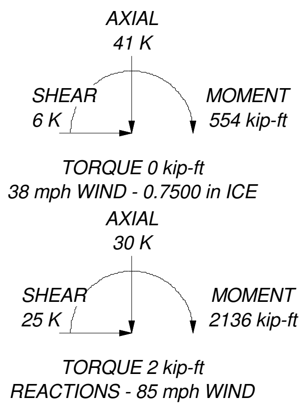
TYPE	ELEVATION	TYPE	ELEVATION
7770.00 w/ Mount Pipe	130	5' Mount Pipe (2" Diameter)	120
7770.00 w/ Mount Pipe	130	5' Mount Pipe (2" Diameter)	120
7770.00 w/ Mount Pipe	130	Platform Mount [LP 712-1]	120
(2) LGP21401	130	TME-800MHZ RRH	118
(2) LGP21401	130	TME-800MHZ RRH	118
(2) LGP21401	130	TME-800MHZ RRH	118
SBNH-1D6565C w/ Mount Pipe	130	1900MHz RRH (65MHz)	118
AM-X-CD-16-65-00T-RET w/ Mount Pipe	130	1900MHz RRH (65MHz)	118
		1900MHz RRH (65MHz)	118
P65-17-XLH-RR w/ Mount Pipe	130	Pipe Mount [PM 601-3]	118
RRUS-11	130	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	100
RRUS-11	130		
RRUS-11	130	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	100
DC6-48-60-18-8F	130		
Platform Mount [LP 303-1]	130	APX16DWV-16DWV-S-E-A20 w/ Mount Pipe	100
APXVTM14-C-120 w/ Mount Pipe	120		
APXVTM14-C-120 w/ Mount Pipe	120	ATMPP1412D-1CWA	100
APXVTM14-C-120 w/ Mount Pipe	120	ATMPP1412D-1CWA	100
TD-RRH8x20-25	120	ATMPP1412D-1CWA	100
TD-RRH8x20-25	120	ATMAA1412D-1A20	100
TD-RRH8x20-25	120	ATMAA1412D-1A20	100
APXVSPP18-C-A20 w/ Mount Pipe	120	ATMAA1412D-1A20	100
APXVSPP18-C-A20 w/ Mount Pipe	120	RR90-17-02DP w/ Mount Pipe	100
APXVSPP18-C-A20 w/ Mount Pipe	120	RR90-17-02DP w/ Mount Pipe	100
(3) ACU-A20-N	120	RR90-17-02DP w/ Mount Pipe	100
(3) ACU-A20-N	120	Platform Mount [LP 712-1]	100
(3) ACU-A20-N	120	APXV18-206517S-C w/ Mount Pipe	90
800 EXTERNAL NOTCH FILTER	120	APXV18-206517S-C w/ Mount Pipe	90
800 EXTERNAL NOTCH FILTER	120	Side Arm Mount [SO 701-1]	80
800 EXTERNAL NOTCH FILTER	120	GPS_A	80
5' Mount Pipe (2" Diameter)	120		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
MPRF-Fy=42ks Density=100%	42 ksi	58 ksi	MPRF-Fy=60ks Density=50%	60 ksi	75 ksi
MPRF-Fy=60ks Density=100%	60 ksi	75 ksi	MPRF-Fy=65ks Density=100%	65 ksi	80 ksi

TOWER DESIGN NOTES

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



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

Job: Horse Hill (BU 876314)			
Project: TEP No. 25675.20592			
Client: Crown Castle	Drawn by: eadams	App'd:	
Code: TIA/EIA-222-F	Date: 06/24/14	Scale: NTS	
Path: \\tep-vm-file01_TowersExtended\25675\20592_876314 Horse Hill SA\tnxTower\876314_LC11.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	130.00-120.00	10.00	0.00	Round	16.0000	16.0000	0.3750		MPRF-Fy=42ksi, Density=100% (42 ksi)
L2	120.00-114.92	5.08	0.00	12	16.0000	17.2450	0.1875	0.7500	MPRF-Fy=60ksi, Density=100% (60 ksi)
L3	114.92-109.58	5.33	0.00	12	17.2450	18.5512	0.4909	1.9635	MPRF-Fy=60ks

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
									i, Density=50% (60 ksi)
L4	109.58-109.42	0.17	0.00	12	18.5512	18.5920	0.5007	2.0028	MPRF-Fy=60ksi, Density=50% (60 ksi)
L5	109.42-104.08	5.33	0.00	12	18.5920	19.8982	0.4121	1.6485	MPRF-Fy=60ksi, Density=50% (60 ksi)
L6	104.08-103.92	0.17	0.00	12	19.8982	19.9390	0.2843	1.1373	MPRF-Fy=60ksi, Density=100% (60 ksi)
L7	103.92-96.42	7.50	0.00	12	19.9390	21.7758	0.4339	1.7354	MPRF-Fy=60ksi, Density=50% (60 ksi)
L8	96.42-91.50	4.92	3.00	12	21.7758	22.9800	0.3825	1.5299	MPRF-Fy=60ksi, Density=50% (60 ksi)
L9	91.50-88.92	5.58	0.00	12	21.8703	23.2381	0.4379	1.7516	MPRF-Fy=65ksi, Density=100% (65 ksi)
L10	88.92-88.25	0.67	0.00	12	23.2381	23.4015	0.3336	1.3343	MPRF-Fy=65ksi, Density=100% (65 ksi)
L11	88.25-87.42	0.83	0.00	12	23.4015	23.6056	0.3875	1.5499	MPRF-Fy=65ksi, Density=100% (65 ksi)
L12	87.42-86.92	0.50	0.00	12	23.6056	23.7281	0.2513	1.0051	MPRF-Fy=65ksi, Density=100% (65 ksi)
L13	86.92-80.75	6.17	0.00	12	23.7281	25.2389	0.4196	1.6785	MPRF-Fy=65ksi, Density=100% (65 ksi)
L14	80.75-71.92	8.83	0.00	12	25.2389	27.4030	0.3197	1.2788	MPRF-Fy=65ksi, Density=100% (65 ksi)
L15	71.92-69.42	2.50	0.00	12	27.4030	28.0155	0.3995	1.5981	MPRF-Fy=65ksi, Density=100% (65 ksi)
L16	69.42-68.83	0.58	0.00	12	28.0155	28.1584	0.2500	1.0000	MPRF-Fy=65ksi, Density=100% (65 ksi)
L17	68.83-64.50	4.33	3.75	12	28.1584	29.2200	0.4616	1.8462	MPRF-Fy=65ksi, Density=100% (65 ksi)
L18	64.50-42.50	25.75	4.25	12	27.8013	34.1100	0.4903	1.9611	MPRF-Fy=65ksi, Density=100% (65 ksi)
L19	42.50-41.83	4.92	0.00	12	32.4438	33.6490	0.5189	2.0757	MPRF-Fy=65ksi, Density=100%

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
L20	41.83-41.17	0.67	0.00	12	33.6490	33.8125	0.3438	1.3750	(65 ksi) MPRF-Fy=65ksi, Density=100% (65 ksi)
L21	41.17-20.25	20.92	5.00	12	33.8125	38.9400	0.4970	1.9878	MPRF-Fy=65ksi, Density=100% (65 ksi)
L22	20.25-14.17	11.08	0.00	12	37.0268	39.7409	0.5199	2.0797	MPRF-Fy=60ksi, Density=100% (60 ksi)
L23	14.17-14.00	0.17	0.00	12	39.7409	39.7817	0.3750	1.5000	MPRF-Fy=60ksi, Density=100% (60 ksi)
L24	14.00-0.00	14.00		12	39.7817	43.2100	0.5066	2.0266	MPRF-Fy=60ksi, Density=100% (60 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	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
L2	16.5644	9.5468	304.6805	5.6609	8.2880	36.7616	617.3654	4.6986	3.7855	20.189
	17.8533	10.2984	382.4609	6.1066	8.9329	42.8149	774.9694	5.0686	4.1192	21.969
L3	17.8533	26.4824	948.8217	5.9980	8.9329	106.2166	1922.5700	13.0338	3.3061	6.735
	19.2056	28.5470	1188.4918	6.4656	9.6095	123.6788	2408.2066	14.0500	3.6561	7.448
L4	19.2056	29.1019	1210.2775	6.4621	9.6095	125.9459	2452.3503	14.3231	3.6298	7.25
	19.2478	29.1678	1218.5066	6.4767	9.6306	126.5238	2469.0247	14.3555	3.6408	7.271
L5	19.2478	24.1252	1017.7443	6.5084	9.6306	105.6776	2062.2258	11.8737	3.8782	9.41
	20.6001	25.8586	1253.2539	6.9760	10.3073	121.5894	2539.4322	12.7268	4.2282	10.26
L6	20.6001	17.9563	881.7159	7.0218	10.3073	85.5432	1786.5955	8.8375	4.5708	16.076
	20.6424	17.9936	887.2323	7.0364	10.3284	85.9022	1797.7731	8.8559	4.5817	16.115
L7	20.6424	27.2490	1323.2271	6.9828	10.3284	128.1153	2681.2168	13.4111	4.1809	9.637
	22.5440	29.8150	1733.3703	7.6404	11.2799	153.6691	3512.2781	14.6741	4.6732	10.771
L8	22.5440	26.3467	1539.1142	7.6588	11.2799	136.4476	3118.6626	12.9670	4.8109	12.579
	23.7906	27.8296	1813.9096	8.0899	11.9036	152.3828	3675.4727	13.6969	5.1336	13.423
L9	23.4027	30.2202	1771.8385	7.6728	11.3288	156.4013	3590.2252	14.8735	4.6877	10.705
	24.0579	32.1490	2133.2006	8.1625	12.0374	177.2151	4322.4428	15.8227	5.0543	11.542
L10	24.0579	24.6021	1647.4119	8.1998	12.0374	136.8583	3338.1031	12.1084	5.3338	15.99
	24.2270	24.7776	1682.9057	8.2583	12.1220	138.8312	3410.0232	12.1948	5.3776	16.121
L11	24.2270	28.7145	1941.2008	8.2390	12.1220	160.1392	3933.3990	14.1324	5.2331	13.505
	24.4383	28.9692	1993.3223	8.3121	12.2277	163.0168	4039.0115	14.2578	5.2878	13.647
L12	24.4383	18.8962	1315.5148	8.3609	12.2277	107.5847	2665.5896	9.3001	5.6529	22.497
	24.5652	18.9953	1336.3234	8.4047	12.2912	108.7223	2707.7536	9.3489	5.6857	22.627
L13	24.5652	31.4949	2184.0083	8.3444	12.2912	177.6893	4425.3930	15.5008	5.2345	12.474
	26.1292	33.5363	2636.8105	8.8853	13.0737	201.6874	5342.8930	16.5056	5.6394	13.439
L14	26.1292	25.6531	2033.2600	8.9211	13.0737	155.5224	4119.9359	12.6257	5.9072	18.477
	28.3697	27.8809	2610.3268	9.6958	14.1947	183.8939	5289.2298	13.7221	6.4872	20.291
L15	28.3697	34.7388	3233.2533	9.6672	14.1947	227.7782	6551.4477	17.0974	6.2733	15.702
	29.0037	35.5267	3458.2858	9.8865	14.5120	238.3051	7007.4246	17.4852	6.4374	16.113

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
L16	29.0037	22.3512	2199.3606	9.9400	14.5120	151.5545	4456.5009	11.0006	6.8381	27.353
	29.1517	22.4662	2233.4966	9.9912	14.5860	153.1257	4525.6696	11.0572	6.8764	27.506
L17	29.1517	41.1633	4030.4702	9.9155	14.5860	276.3239	8166.8253	20.2593	6.3095	13.67
	30.2508	42.7411	4511.9302	10.2955	15.1360	298.0934	9142.3939	21.0359	6.5940	14.286
L18	29.7332	43.1160	4104.8736	9.7773	14.4011	285.0396	8317.5868	21.2204	6.1368	12.517
	35.3133	53.0756	7657.1847	12.0359	17.6690	433.3688	15515.5322	26.1222	7.8275	15.965
L19	34.6668	53.3452	6939.6659	11.4291	16.8059	412.9312	14061.6446	26.2549	7.3042	14.075
	34.8360	55.3592	7755.7069	11.8606	17.4302	444.9580	15715.1650	27.2461	7.6272	14.698
L20	34.8360	36.8648	5219.4405	11.9233	17.4302	299.4481	10576.0016	18.1437	8.0967	23.554
	35.0052	37.0457	5296.6526	11.9818	17.5149	302.4092	10732.4541	18.2328	8.1405	23.681
L21	35.0052	53.3119	7552.7157	11.9269	17.5149	431.2177	15303.8496	26.2385	7.7299	15.554
	40.3137	61.5171	11604.2551	13.7626	20.1709	575.2963	23513.3668	30.2768	9.1041	18.319
L22	39.6005	61.1181	10396.9187	13.0695	19.1799	542.0743	21066.9761	30.0804	8.5298	16.406
	41.1428	65.6618	12892.4427	14.0411	20.5858	626.2793	26123.5843	32.3168	9.2572	17.805
L23	41.1428	47.5343	9402.2714	14.0930	20.5858	456.7364	19051.5510	23.3949	9.6456	25.721
	41.1850	47.5836	9431.5455	14.1076	20.6069	457.6884	19110.8681	23.4192	9.6565	25.751
L24	41.1850	64.0726	12615.1215	14.0605	20.6069	612.1791	25561.6563	31.5346	9.3037	18.364
	44.7343	69.6654	16215.3915	15.2878	22.3828	724.4583	32856.7795	34.2872	10.2225	20.177

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 130.00-120.00				1	1	1		
L2 120.00-114.92				1	1	1		
L3 114.92-109.58				1	1	0.776757		
L4 109.58-109.42				1	1	0.761917		
L5 109.42-104.08				1	1	0.920416		
L6 104.08-103.92				1	1	0.662733		
L7 103.92-96.42				1	1	0.874322		
L8 96.42-91.50				1	1	0.989229		
L9 91.50-88.92				1	1	0.575615		
L10 88.92-88.25				1	1	0.752169		
L11 88.25-87.42				1	1	0.649009		
L12 87.42-86.92				1	1	0.994975		
L13 86.92-80.75				1	1	0.59983		
L14 80.75-71.92				1	1	0.783985		
L15 71.92-69.42				1	1	0.629137		
L16 69.42-68.83				1	1	1		
L17 68.83-64.50				1	1	0.545762		
L18 64.50-42.50				1	1	0.640868		
L19 42.50-41.83				1	1	0.665919		
L20				1	1	1		

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
41.83-41.17 L21				1	1	0.694551		
41.17-20.25 L22				1	1	0.723925		
20.25-14.17 L23				1	1	1		
14.17-14.00 L24 14.00-0.00				1	1	0.742452		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
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Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Step Pegs (5/8" SR) 7-in. w/30" step	C	No	CaAa (Out Of Face)	130.00 - 8.00	1	No Ice	0.01	0.24
						1/2" Ice	0.11	0.64
						1" Ice	0.21	1.64
						2" Ice	0.41	5.49
						4" Ice	0.81	20.51
Safety Line 3/8	C	No	CaAa (Out Of Face)	130.00 - 8.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
A LDF7-50A(1-5/8")	A	No	Inside Pole	130.00 - 8.00	6	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
FB-L98B-002-75000(3/8")	A	No	Inside Pole	130.00 - 8.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
						2" Ice	0.00	0.06
						4" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	A	No	Inside Pole	130.00 - 8.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
						2" Ice	0.00	0.59
						4" Ice	0.00	0.59
2" Flexible Conduit	A	No	Inside Pole	130.00 - 8.00	1	No Ice	0.00	0.34
						1/2" Ice	0.00	0.34
						1" Ice	0.00	0.34
						2" Ice	0.00	0.34
						4" Ice	0.00	0.34

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	A	No	Inside Pole	100.00 - 0.00	4	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
B								
LDF7-50A(1-5/8")	B	No	Inside Pole	100.00 - 8.00	8	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	90.00 - 8.00	1	No Ice	0.00	0.82
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						2" Ice	0.00	10.54
						4" Ice	0.00	30.04
LDF7-50A (1-5/8 FOAM)	B	No	CaAa (Out Of Face)	90.00 - 8.00	5	No Ice	0.00	0.82
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
						2" Ice	0.00	0.00
						4" Ice	0.00	0.00
HB114-1-0813U4-M5J(1 1/4")	B	No	CaAa (Out Of Face)	120.00 - 0.00	3	No Ice	0.00	1.20
						1/2" Ice	0.00	2.45
						1" Ice	0.00	4.30
						2" Ice	0.00	9.85
						4" Ice	0.00	28.27
HB114-21U3M12-XXX F(1-1/4")	B	No	CaAa (Out Of Face)	116.17 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	2.47
						1" Ice	0.00	4.32
						2" Ice	0.00	9.87
						4" Ice	0.00	28.29
HB114-21U3M12-XXX F(1-1/4")	B	No	CaAa (Out Of Face)	120.00 - 116.70	1	No Ice	0.15	1.22
						1/2" Ice	0.25	2.47
						1" Ice	0.35	4.32
						2" Ice	0.55	9.87
						4" Ice	0.95	28.29
C								
LDF4-50A(1/2")	C	No	Inside Pole	80.00 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
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Aero MP3-04	A	No	CaAa (Out Of Face)	15.50 - 0.50	1	No Ice	0.27	14.10
						1/2" Ice	0.38	15.30
						1" Ice	0.49	16.85
						2" Ice	0.71	20.99
						4" Ice	1.16	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	15.50 - 0.50	1	No Ice	0.27	14.10
						1/2" Ice	0.38	15.30
						1" Ice	0.49	16.85
						2" Ice	0.71	20.99
						4" Ice	1.16	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	15.50 - 0.50	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	C	No	CaAa (Out Of Face)	15.50 - 0.50	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
***								
Aero MP3-04	A	No	CaAa (Out Of Face)	42.67 - 15.50	1	No Ice	0.27	14.10
						1/2" Ice	0.38	15.30
						1" Ice	0.49	16.85
						2" Ice	0.71	20.99
						4" Ice	1.16	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	42.67 - 15.50	1	No Ice	0.27	14.10
						1/2" Ice	0.38	15.30
						1" Ice	0.49	16.85
						2" Ice	0.71	20.99
						4" Ice	1.16	33.40
Aero MP3-04	C	No	CaAa (Out Of Face)	15.50 - 12.67	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	C	No	CaAa (Out Of Face)	15.50 - 12.67	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	A	No	CaAa (Out Of Face)	42.67 - 12.67	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	42.67 - 12.67	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
***								
Aero MP3-04	A	No	CaAa (Out Of Face)	70.33 - 42.67	1	No Ice	0.27	14.10
						1/2" Ice	0.38	15.30
						1" Ice	0.49	16.85
						2" Ice	0.71	20.99
						4" Ice	1.16	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	70.33 - 42.67	1	No Ice	0.27	14.10
						1/2" Ice	0.38	15.30
						1" Ice	0.49	16.85
						2" Ice	0.71	20.99
						4" Ice	1.16	33.40
Aero MP3-04	A	No	CaAa (Out Of Face)	42.67 - 40.33	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	42.67 - 40.33	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	B	No	CaAa (Out Of Face)	70.33 - 40.33	1	No Ice	0.00	14.10
						1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
Aero MP3-04	C	No	CaAa (Out Of	70.33 - 40.33	1	No Ice	0.00	14.10

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
			Face)			1/2" Ice	0.00	15.30
						1" Ice	0.00	16.85
						2" Ice	0.00	20.99
						4" Ice	0.00	33.40
***								
Aero MP3-03	A	No	CaAa (Out Of Face)	88.17 - 70.33	1	No Ice	0.26	9.90
						1/2" Ice	0.37	11.06
						1" Ice	0.48	12.57
						2" Ice	0.71	16.63
						4" Ice	1.15	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	88.17 - 70.33	1	No Ice	0.26	9.90
						1/2" Ice	0.37	11.06
						1" Ice	0.48	12.57
						2" Ice	0.71	16.63
						4" Ice	1.15	28.88
Aero MP3-03	A	No	CaAa (Out Of Face)	70.33 - 68.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	70.33 - 68.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	73.17 - 68.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	C	No	CaAa (Out Of Face)	89.50 - 79.50	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	C	No	CaAa (Out Of Face)	88.17 - 68.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
***								
Aero MP3-03	A	No	CaAa (Out Of Face)	116.17 - 88.17	1	No Ice	0.26	9.90
						1/2" Ice	0.37	11.06
						1" Ice	0.48	12.57
						2" Ice	0.71	16.63
						4" Ice	1.15	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	116.17 - 88.17	1	No Ice	0.26	9.90
						1/2" Ice	0.37	11.06
						1" Ice	0.48	12.57
						2" Ice	0.71	16.63
						4" Ice	1.15	28.88
Aero MP3-03	C	No	CaAa (Out Of Face)	88.17 - 86.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	C	No	CaAa (Out Of Face)	88.17 - 86.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Aero MP3-03	C	No	CaAa (Out Of Face)	116.17 - 86.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
**								
Aero MP3-03	B	No	CaAa (Out Of Face)	97.67 - 87.67	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	105.17 - 95.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	105.17 - 95.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	110.83 - 102.83	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	116.17 - 108.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88
Aero MP3-03	B	No	CaAa (Out Of Face)	116.17 - 108.17	1	No Ice	0.00	9.90
						1/2" Ice	0.00	11.06
						1" Ice	0.00	12.57
						2" Ice	0.00	16.63
						4" Ice	0.00	28.88

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	130.00-120.00	A	0.000	0.000	0.000	0.000	0.06
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.521	0.00
L2	120.00-114.92	A	0.000	0.000	0.000	0.328	0.05
		B	0.000	0.000	0.000	0.836	0.06
		C	0.000	0.000	0.000	0.265	0.01
L3	114.92-109.58	A	0.000	0.000	0.000	1.396	0.09
		B	0.000	0.000	0.000	1.396	0.20
		C	0.000	0.000	0.000	0.278	0.06
L4	109.58-109.42	A	0.000	0.000	0.000	0.044	0.00
		B	0.000	0.000	0.000	0.044	0.01
		C	0.000	0.000	0.000	0.009	0.00
L5	109.42-104.08	A	0.000	0.000	0.000	1.396	0.09
		B	0.000	0.000	0.000	1.396	0.18
		C	0.000	0.000	0.000	0.278	0.06
L6	104.08-103.92	A	0.000	0.000	0.000	0.044	0.00

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
		B	0.000	0.000	0.000	0.044	0.01
		C	0.000	0.000	0.000	0.009	0.00
L7	103.92-96.42	A	0.000	0.000	0.000	1.963	0.13
		B	0.000	0.000	0.000	1.963	0.31
		C	0.000	0.000	0.000	0.391	0.08
L8	96.42-91.50	A	0.000	0.000	0.000	1.287	0.10
		B	0.000	0.000	0.000	1.287	0.18
		C	0.000	0.000	0.000	0.256	0.05
L9	91.50-88.92	A	0.000	0.000	0.000	0.676	0.05
		B	0.000	0.000	0.000	0.676	0.09
		C	0.000	0.000	0.000	0.135	0.03
L10	88.92-88.25	A	0.000	0.000	0.000	0.174	0.01
		B	0.000	0.000	0.000	0.174	0.02
		C	0.000	0.000	0.000	0.035	0.01
L11	88.25-87.42	A	0.000	0.000	0.000	0.218	0.02
		B	0.000	0.000	0.000	0.218	0.03
		C	0.000	0.000	0.000	0.043	0.04
L12	87.42-86.92	A	0.000	0.000	0.000	0.131	0.01
		B	0.000	0.000	0.000	0.131	0.01
		C	0.000	0.000	0.000	0.026	0.02
L13	86.92-80.75	A	0.000	0.000	0.000	1.614	0.12
		B	0.000	0.000	0.000	1.614	0.16
		C	0.000	0.000	0.000	0.321	0.15
L14	80.75-71.92	A	0.000	0.000	0.000	2.311	0.17
		B	0.000	0.000	0.000	2.311	0.24
		C	0.000	0.000	0.000	0.460	0.11
L15	71.92-69.42	A	0.000	0.000	0.000	0.660	0.06
		B	0.000	0.000	0.000	0.660	0.12
		C	0.000	0.000	0.000	0.130	0.04
L16	69.42-68.83	A	0.000	0.000	0.000	0.157	0.02
		B	0.000	0.000	0.000	0.157	0.04
		C	0.000	0.000	0.000	0.030	0.01
L17	68.83-64.50	A	0.000	0.000	0.000	1.163	0.11
		B	0.000	0.000	0.000	1.163	0.21
		C	0.000	0.000	0.000	0.226	0.07
L18	64.50-42.50	A	0.000	0.000	0.000	5.903	0.53
		B	0.000	0.000	0.000	5.903	0.98
		C	0.000	0.000	0.000	1.146	0.32
L19	42.50-41.83	A	0.000	0.000	0.000	0.179	0.03
		B	0.000	0.000	0.000	0.179	0.05
		C	0.000	0.000	0.000	0.035	0.01
L20	41.83-41.17	A	0.000	0.000	0.000	0.179	0.03
		B	0.000	0.000	0.000	0.179	0.05
		C	0.000	0.000	0.000	0.035	0.01
L21	41.17-20.25	A	0.000	0.000	0.000	5.613	0.81
		B	0.000	0.000	0.000	5.613	0.95
		C	0.000	0.000	0.000	1.090	0.02
L22	20.25-14.17	A	0.000	0.000	0.000	1.632	0.23
		B	0.000	0.000	0.000	1.632	0.29
		C	0.000	0.000	0.000	0.317	0.06
L23	14.17-14.00	A	0.000	0.000	0.000	0.045	0.01
		B	0.000	0.000	0.000	0.045	0.01
		C	0.000	0.000	0.000	0.009	0.01
L24	14.00-0.00	A	0.000	0.000	0.000	3.622	0.29
		B	0.000	0.000	0.000	3.622	0.54
		C	0.000	0.000	0.000	0.313	0.23

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	130.00-120.00	A	0.880	0.000	0.000	0.000	0.000	0.06
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.041	0.03
L2	120.00-114.92	A	0.873	0.000	0.000	0.000	0.571	0.05
		B		0.000	0.000	0.000	1.656	0.12
		C		0.000	0.000	0.000	2.041	0.03
L3	114.92-109.58	A	0.869	0.000	0.000	0.000	2.425	0.10
		B		0.000	0.000	0.000	2.425	0.29
		C		0.000	0.000	0.000	2.131	0.08
L4	109.58-109.42	A	0.866	0.000	0.000	0.000	0.076	0.00
		B		0.000	0.000	0.000	0.076	0.01
		C		0.000	0.000	0.000	0.066	0.00
L5	109.42-104.08	A	0.863	0.000	0.000	0.000	2.419	0.10
		B		0.000	0.000	0.000	2.419	0.27
		C		0.000	0.000	0.000	2.120	0.08
L6	104.08-103.92	A	0.861	0.000	0.000	0.000	0.075	0.00
		B		0.000	0.000	0.000	0.075	0.01
		C		0.000	0.000	0.000	0.066	0.00
L7	103.92-96.42	A	0.857	0.000	0.000	0.000	3.391	0.15
		B		0.000	0.000	0.000	3.391	0.44
		C		0.000	0.000	0.000	2.961	0.11
L8	96.42-91.50	A	0.850	0.000	0.000	0.000	2.216	0.11
		B		0.000	0.000	0.000	2.216	0.26
		C		0.000	0.000	0.000	1.928	0.07
L9	91.50-88.92	A	0.846	0.000	0.000	0.000	1.164	0.06
		B		0.000	0.000	0.000	1.164	0.12
		C		0.000	0.000	0.000	1.013	0.04
L10	88.92-88.25	A	0.844	0.000	0.000	0.000	0.300	0.01
		B		0.000	0.000	0.000	0.300	0.03
		C		0.000	0.000	0.000	0.260	0.02
L11	88.25-87.42	A	0.843	0.000	0.000	0.000	0.374	0.02
		B		0.000	0.000	0.000	0.374	0.04
		C		0.000	0.000	0.000	0.325	0.05
L12	87.42-86.92	A	0.843	0.000	0.000	0.000	0.224	0.01
		B		0.000	0.000	0.000	0.224	0.02
		C		0.000	0.000	0.000	0.195	0.03
L13	86.92-80.75	A	0.839	0.000	0.000	0.000	2.763	0.13
		B		0.000	0.000	0.000	2.763	0.23
		C		0.000	0.000	0.000	2.390	0.19
L14	80.75-71.92	A	0.829	0.000	0.000	0.000	3.939	0.19
		B		0.000	0.000	0.000	3.939	0.34
		C		0.000	0.000	0.000	3.390	0.14
L15	71.92-69.42	A	0.822	0.000	0.000	0.000	1.117	0.07
		B		0.000	0.000	0.000	1.117	0.15
		C		0.000	0.000	0.000	0.952	0.05
L16	69.42-68.83	A	0.820	0.000	0.000	0.000	0.263	0.02
		B		0.000	0.000	0.000	0.263	0.05
		C		0.000	0.000	0.000	0.222	0.02
L17	68.83-64.50	A	0.816	0.000	0.000	0.000	1.949	0.12
		B		0.000	0.000	0.000	1.949	0.26
		C		0.000	0.000	0.000	1.640	0.09
L18	64.50-42.50	A	0.794	0.000	0.000	0.000	9.893	0.58
		B		0.000	0.000	0.000	9.893	1.27
		C		0.000	0.000	0.000	8.327	0.41
L19	42.50-41.83	A	0.772	0.000	0.000	0.000	0.297	0.04
		B		0.000	0.000	0.000	0.297	0.06
		C		0.000	0.000	0.000	0.247	0.01
L20	41.83-41.17	A	0.771	0.000	0.000	0.000	0.293	0.04
		B		0.000	0.000	0.000	0.293	0.06
		C		0.000	0.000	0.000	0.240	0.01

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
L21	41.17-20.25	A	0.750	0.000	0.000	0.000	9.099	0.89
		B		0.000	0.000	0.000	9.099	1.19
		C		0.000	0.000	0.000	7.365	0.06
L22	20.25-14.17	A	0.750	0.000	0.000	0.000	2.646	0.26
		B		0.000	0.000	0.000	2.646	0.36
		C		0.000	0.000	0.000	2.142	0.08
L23	14.17-14.00	A	0.750	0.000	0.000	0.000	0.073	0.01
		B		0.000	0.000	0.000	0.073	0.01
		C		0.000	0.000	0.000	0.059	0.01
L24	14.00-0.00	A	0.750	0.000	0.000	0.000	5.872	0.32
		B		0.000	0.000	0.000	5.872	0.70
		C		0.000	0.000	0.000	2.113	0.27

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-120.00	-0.0651	0.0376	-0.3715	0.2145
L2	120.00-114.92	0.1219	0.0526	-0.0572	0.2176
L3	114.92-109.58	0.1964	-0.1134	0.0363	-0.0209
L4	109.58-109.42	0.1985	-0.1146	0.0373	-0.0215
L5	109.42-104.08	0.2004	-0.1157	0.0383	-0.0221
L6	104.08-103.92	0.2022	-0.1167	0.0393	-0.0227
L7	103.92-96.42	0.2045	-0.1181	0.0406	-0.0235
L8	96.42-91.50	0.2080	-0.1201	0.0429	-0.0248
L9	91.50-88.92	0.2092	-0.1208	0.0433	-0.0250
L10	88.92-88.25	0.2100	-0.1213	0.0445	-0.0257
L11	88.25-87.42	0.2104	-0.1215	0.0448	-0.0259
L12	87.42-86.92	0.2108	-0.1217	0.0450	-0.0260
L13	86.92-80.75	0.2124	-0.1226	0.0463	-0.0267
L14	80.75-71.92	0.2157	-0.1245	0.0491	-0.0283
L15	71.92-69.42	0.2201	-0.1271	0.0532	-0.0307
L16	69.42-68.83	0.2244	-0.1296	0.0571	-0.0329
L17	68.83-64.50	0.2254	-0.1301	0.0581	-0.0335
L18	64.50-42.50	0.2293	-0.1324	0.0600	-0.0347
L19	42.50-41.83	0.2321	-0.1340	0.0651	-0.0376
L20	41.83-41.17	0.2322	-0.1341	0.0692	-0.0399
L21	41.17-20.25	0.2352	-0.1358	0.0746	-0.0430
L22	20.25-14.17	0.2378	-0.1373	0.0761	-0.0440
L23	14.17-14.00	0.2385	-0.1377	0.0766	-0.0442
L24	14.00-0.00	0.2658	-0.1535	0.2667	-0.1540

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K

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
130									
7770.00 w/ Mount Pipe	A	From Centroid-Face	4.00 -6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	B	From Centroid-Face	4.00 -6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
7770.00 w/ Mount Pipe	C	From Centroid-Face	4.00 -6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.63 7.13 8.16 10.36	4.25 5.01 5.71 7.16 10.41	0.06 0.10 0.16 0.29 0.66
(2) LGP21401	A	From Centroid-Face	4.00 -6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	B	From Centroid-Face	4.00 -6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
(2) LGP21401	C	From Centroid-Face	4.00 -6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.29 1.45 1.61 1.97 2.79	0.23 0.31 0.40 0.61 1.12	0.01 0.02 0.03 0.05 0.14
SBNH-1D6565C w/ Mount Pipe	B	From Centroid-Face	4.00 6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.69 12.42 13.16 14.63 17.92	9.85 11.38 12.94 15.31 20.19	0.10 0.19 0.29 0.52 1.17
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Centroid-Face	4.00 6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
P65-17-XLH-RR w/ Mount Pipe	A	From Centroid-Face	4.00 6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.70 12.42 13.15 14.64 17.91	8.94 10.45 11.99 14.31 19.14	0.09 0.18 0.27 0.50 1.13
RRUS-11	A	From Centroid-Face	4.00 6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	B	From Centroid-Face	4.00 6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
RRUS-11	C	From	4.00	-10.0000	130.00	No Ice	2.94	1.25	0.06

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
		Centroid-Face	6.00 0.00			1/2" Ice 1" Ice 2" Ice 4" Ice	3.17 3.41 3.91 5.02	1.41 1.59 1.96 2.82	0.07 0.10 0.15 0.30
DC6-48-60-18-8F	B	From Centroid-Face	4.00 6.00 0.00	-10.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.27 1.46 1.66 2.09 3.10	1.27 1.46 1.66 2.09 3.10	0.02 0.04 0.05 0.10 0.21
Platform Mount [LP 303-1]	C	None		0.0000	130.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.66 18.87 23.08 31.50 48.34	14.66 18.87 23.08 31.50 48.34	1.25 1.48 1.71 2.18 3.10
120									
APXVTM14-C-120 w/ Mount Pipe	A	From Centroid-Leg	4.00 -6.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	B	From Centroid-Leg	4.00 -6.00 0.00	40.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
APXVTM14-C-120 w/ Mount Pipe	C	From Centroid-Leg	4.00 -6.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.13 7.66 8.18 9.26 11.53	4.96 5.75 6.47 8.01 11.41	0.08 0.13 0.19 0.34 0.75
TD-RRH8x20-25	A	From Centroid-Leg	4.00 -6.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	B	From Centroid-Leg	4.00 -6.00 0.00	40.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
TD-RRH8x20-25	C	From Centroid-Leg	4.00 -6.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	0.07 0.10 0.13 0.20 0.40
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Leg	4.00 0.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	B	From Centroid-Leg	4.00 0.00 0.00	40.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	0.08 0.15 0.23 0.41 0.91
APXVSPP18-C-A20 w/ Mount Pipe	C	From Centroid-Le	4.00 0.00	30.0000	120.00	No Ice 1/2" Ice	8.50 9.15	6.95 8.13	0.08 0.15

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
		g	0.00			1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.91
(3) ACU-A20-N	A	From Centroid-Le g	4.00 0.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	B	From Centroid-Le g	4.00 0.00 0.00	40.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
(3) ACU-A20-N	C	From Centroid-Le g	4.00 0.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.08 0.12 0.17 0.30 0.67	0.14 0.19 0.25 0.40 0.80	0.00 0.00 0.00 0.01 0.04
800 EXTERNAL NOTCH FILTER	A	From Centroid-Le g	4.00 0.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	B	From Centroid-Le g	4.00 0.00 0.00	40.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
800 EXTERNAL NOTCH FILTER	C	From Centroid-Le g	4.00 0.00 0.00	30.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.77 0.89 1.02 1.30 1.97	0.37 0.46 0.56 0.79 1.34	0.01 0.02 0.02 0.04 0.11
5' Mount Pipe (2" Diameter)	A	From Centroid-Le g	4.00 6.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.70 2.35 3.78	1.00 1.39 1.70 2.35 3.78	0.02 0.02 0.03 0.07 0.18
5' Mount Pipe (2" Diameter)	B	From Centroid-Le g	4.00 6.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.70 2.35 3.78	1.00 1.39 1.70 2.35 3.78	0.02 0.02 0.03 0.07 0.18
5' Mount Pipe (2" Diameter)	C	From Centroid-Le g	4.00 6.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.00 1.39 1.70 2.35 3.78	1.00 1.39 1.70 2.35 3.78	0.02 0.02 0.03 0.07 0.18
Platform Mount [LP 712-1]	C	None		0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
118 TME-800MHZ RRH	A	From Leg	1.00 0.00 -1.00	30.0000	118.00	No Ice 1/2" Ice 1" Ice	2.49 2.71 2.93	2.07 2.27 2.48	0.05 0.07 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
TME-800MHZ RRH	B	From Leg	1.00	40.0000	118.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			-1.00			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
TME-800MHZ RRH	C	From Leg	1.00	30.0000	118.00	No Ice	2.49	2.07	0.05
			0.00			1/2" Ice	2.71	2.27	0.07
			-1.00			1" Ice	2.93	2.48	0.10
						2" Ice	3.41	2.93	0.16
						4" Ice	4.46	3.93	0.32
1900MHz RRH (65MHz)	A	From Leg	1.00	30.0000	118.00	No Ice	2.70	2.77	0.06
			0.00			1/2" Ice	2.94	3.01	0.08
			1.00			1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
1900MHz RRH (65MHz)	B	From Leg	1.00	40.0000	118.00	No Ice	2.70	2.77	0.06
			0.00			1/2" Ice	2.94	3.01	0.08
			1.00			1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
1900MHz RRH (65MHz)	C	From Leg	1.00	30.0000	118.00	No Ice	2.70	2.77	0.06
			0.00			1/2" Ice	2.94	3.01	0.08
			1.00			1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
Pipe Mount [PM 601-3]	C	None		0.0000	118.00	No Ice	4.39	4.39	0.20
						1/2" Ice	5.48	5.48	0.24
						1" Ice	6.57	6.57	0.28
						2" Ice	8.75	8.75	0.36
						4" Ice	13.11	13.11	0.53
110									
100									
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	A	From Centroid-Face	4.00 6.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.47 7.99 8.52 9.59 11.87	3.49 4.26 4.96 6.40 9.49	0.06 0.11 0.16 0.30 0.68
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	B	From Centroid-Face	4.00 6.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.47 7.99 8.52 9.59 11.87	3.49 4.26 4.96 6.40 9.49	0.06 0.11 0.16 0.30 0.68
APX16DWV-16DWV-S-E-A 20 w/ Mount Pipe	C	From Centroid-Face	4.00 6.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.47 7.99 8.52 9.59 11.87	3.49 4.26 4.96 6.40 9.49	0.06 0.11 0.16 0.30 0.68
ATMPP1412D-1CWA	A	From Centroid-Face	4.00 -6.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.17 1.32 1.48 1.82 2.61	0.42 0.53 0.65 0.92 1.57	0.01 0.02 0.03 0.05 0.13
ATMPP1412D-1CWA	B	From Centroid-Face	4.00 -6.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.17 1.32 1.48	0.42 0.53 0.65	0.01 0.02 0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	1.82	0.92	0.05
						4" Ice	2.61	1.57	0.13
ATMPP1412D-1CWA	C	From Centroid-Face	4.00 -6.00 0.00	0.0000	100.00	No Ice	1.17	0.42	0.01
						1/2" Ice	1.32	0.53	0.02
						1" Ice	1.48	0.65	0.03
						2" Ice	1.82	0.92	0.05
						4" Ice	2.61	1.57	0.13
ATMAA1412D-1A20	A	From Centroid-Face	4.00 6.00 0.00	0.0000	100.00	No Ice	1.17	0.47	0.01
						1/2" Ice	1.31	0.57	0.02
						1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMAA1412D-1A20	B	From Centroid-Face	4.00 6.00 0.00	0.0000	100.00	No Ice	1.17	0.47	0.01
						1/2" Ice	1.31	0.57	0.02
						1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
ATMAA1412D-1A20	C	From Centroid-Face	4.00 6.00 0.00	0.0000	100.00	No Ice	1.17	0.47	0.01
						1/2" Ice	1.31	0.57	0.02
						1" Ice	1.47	0.69	0.03
						2" Ice	1.81	0.95	0.06
						4" Ice	2.58	1.57	0.14
RR90-17-02DP w/ Mount Pipe	A	From Centroid-Face	4.00 0.00 0.00	0.0000	100.00	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
RR90-17-02DP w/ Mount Pipe	B	From Centroid-Face	4.00 0.00 0.00	0.0000	100.00	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
RR90-17-02DP w/ Mount Pipe	C	From Centroid-Face	4.00 0.00 0.00	0.0000	100.00	No Ice	4.59	3.32	0.03
						1/2" Ice	5.09	4.09	0.07
						1" Ice	5.58	4.78	0.12
						2" Ice	6.59	6.23	0.22
						4" Ice	8.73	9.31	0.56
Platform Mount [LP 712-1]	C	None		0.0000	100.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
90									
APXV18-206517S-C w/ Mount Pipe	B	From Leg	1.00 0.00 0.00	-30.0000	90.00	No Ice	5.40	4.70	0.05
						1/2" Ice	5.96	5.86	0.10
						1" Ice	6.48	6.73	0.15
						2" Ice	7.55	8.51	0.28
						4" Ice	9.92	12.28	0.68
APXV18-206517S-C w/ Mount Pipe	C	From Leg	1.00 0.00 0.00	-60.0000	90.00	No Ice	5.40	4.70	0.05
						1/2" Ice	5.96	5.86	0.10
						1" Ice	6.48	6.73	0.15
						2" Ice	7.55	8.51	0.28
						4" Ice	9.92	12.28	0.68
80									
Side Arm Mount [SO 701-1]	A	From Leg	1.50 0.00 0.00	0.0000	80.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09

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
GPS_A	A	From Leg	3.00 0.00 0.00	0.0000	80.00	2" Ice 4" Ice No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.01 3.17 0.30 0.37 0.46 0.65 1.15	4.35 7.03 0.30 0.37 0.46 0.65 1.15	0.12 0.18 0.00 0.00 0.01 0.02 0.08
****									

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 120	Pole	Max Tension	14	0.00	0.00	0.00
			Max. Compression	14	-4.19	-0.74	0.01
			Max. Mx	5	-2.30	-37.04	-0.22
			Max. My	8	-2.30	-0.37	-36.58
			Max. Vy	5	3.89	-37.04	-0.22
			Max. Vx	8	3.88	-0.37	-36.58
			Max. Torque	7			1.41
L2	120 - 114.917	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.11	-0.81	-0.04
			Max. Mx	5	-4.82	-80.09	-0.11
			Max. My	8	-4.81	-0.30	-79.97
			Max. Vy	5	9.01	-80.09	-0.11
			Max. Vx	8	9.08	-0.30	-79.97
			Max. Torque	8			1.58
L3	114.917 - 109.583	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.88	-0.97	-0.13
			Max. Mx	5	-5.33	-129.64	-0.06
			Max. My	8	-5.32	-0.30	-129.86
			Max. Vy	5	9.54	-129.64	-0.06
			Max. Vx	8	9.61	-0.30	-129.86
			Max. Torque	8			1.58
L4	109.583 - 109.417	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-9.91	-0.97	-0.14
			Max. Mx	5	-5.35	-131.23	-0.06
			Max. My	8	-5.34	-0.30	-131.46
			Max. Vy	5	9.56	-131.23	-0.06
			Max. Vx	8	9.63	-0.30	-131.46
			Max. Torque	8			1.58
L5	109.417 - 104.083	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-10.68	-1.12	-0.23
			Max. Mx	5	-5.87	-183.71	0.00
			Max. My	8	-5.86	-0.29	-184.29
			Max. Vy	5	10.10	-183.71	0.00
			Max. Vx	8	10.17	-0.29	-184.29
			Max. Torque	8			1.59
L6	104.083 - 103.917	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-10.71	-1.12	-0.23
			Max. Mx	5	-5.89	-185.40	0.00
			Max. My	8	-5.88	-0.29	-185.99
			Max. Vy	5	10.12	-185.40	0.00
			Max. Vx	8	10.19	-0.29	-185.99
			Max. Torque	8			1.59
L7	103.917 - 96.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-14.68	-1.38	-0.39
			Max. Mx	5	-8.19	-273.64	0.06
			Max. My	8	-8.19	-0.31	-274.70
			Max. Vy	5	13.50	-273.64	0.06
			Max. Vx	8	13.57	-0.31	-274.70
			Max. Torque	8			1.60
L8	96.4167 - 91.5	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-14.98	-1.43	-0.42
			Max. Mx	5	-8.41	-299.72	0.09
			Max. My	8	-8.40	-0.30	-300.92
			Max. Vy	5	13.70	-299.72	0.09
			Max. Vx	8	13.77	-0.30	-300.92
			Max. Torque	8			1.61
L9	91.5 - 88.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.43	-1.57	-0.79
			Max. Mx	5	-9.34	-378.48	0.08
			Max. My	8	-9.33	-0.28	-380.15
			Max. Vy	5	14.75	-378.48	0.08
			Max. Vx	8	14.82	-0.28	-380.15
			Max. Torque	8			1.61
L10	88.9167 - 88.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.56	-1.58	-0.80
			Max. Mx	5	-9.44	-388.34	0.08
			Max. My	8	-9.43	-0.27	-390.06
			Max. Vy	5	14.82	-388.34	0.08
			Max. Vx	8	14.89	-0.27	-390.06
			Max. Torque	8			1.57
L11	88.25 - 87.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.74	-1.57	-0.83
			Max. Mx	5	-9.58	-400.71	0.08
			Max. My	8	-9.57	-0.24	-402.53
			Max. Vy	5	14.91	-400.71	0.08
			Max. Vx	8	14.98	-0.24	-402.53
			Max. Torque	8			1.57
L12	87.4167 - 86.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-16.84	-1.56	-0.85
			Max. Mx	5	-9.67	-408.16	0.08
			Max. My	8	-9.66	-0.22	-410.04
			Max. Vy	5	14.96	-408.16	0.08
			Max. Vx	8	15.03	-0.22	-410.04
			Max. Torque	8			1.57
L13	86.9167 - 80.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-17.97	-1.58	-0.98
			Max. Mx	5	-10.55	-502.40	0.13
			Max. My	8	-10.54	-0.08	-504.82
			Max. Vy	5	15.63	-502.40	0.13
			Max. Vx	8	15.70	-0.08	-504.82
			Max. Torque	8			1.58
L14	80.75 - 71.9167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-19.63	-1.73	-0.85
			Max. Mx	5	-11.88	-645.23	0.41
			Max. My	8	-11.87	0.01	-647.84
			Max. Vy	5	16.65	-645.23	0.41
			Max. Vx	8	16.69	0.01	-647.84
			Max. Torque	8			1.60
L15	71.9167 - 69.4167	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.16	-1.83	-0.90
			Max. Mx	5	-12.31	-687.24	0.42
			Max. My	8	-12.31	-0.01	-689.92
			Max. Vy	5	16.93	-687.24	0.42
			Max. Vx	8	16.96	-0.01	-689.92
			Max. Torque	8			1.60

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L16	69.4167 - 68.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.31	-1.85	-0.92
			Max. Mx	5	-12.44	-697.15	0.42
			Max. My	8	-12.44	-0.02	-699.84
			Max. Vy	5	16.99	-697.15	0.42
			Max. Vx	8	17.02	-0.02	-699.84
			Max. Torque	8			1.60
L17	68.8333 - 64.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-20.44	-1.88	-0.94
			Max. Mx	5	-12.55	-707.09	0.43
			Max. My	8	-12.54	-0.02	-709.80
			Max. Vy	5	17.05	-707.09	0.43
			Max. Vx	8	17.09	-0.02	-709.80
			Max. Torque	8			1.60
L18	64.5 - 42.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25.98	-2.69	-1.46
			Max. Mx	5	-17.06	-1100.25	0.53
			Max. My	8	-17.06	-0.17	-1103.56
			Max. Vy	5	19.47	-1100.25	0.53
			Max. Vx	8	19.51	-0.17	-1103.56
			Max. Torque	8			1.65
L19	42.5 - 41.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27.92	-2.90	-1.56
			Max. Mx	5	-18.63	-1197.66	0.57
			Max. My	8	-18.62	-0.23	-1201.07
			Max. Vy	5	20.09	-1197.66	0.57
			Max. Vx	8	20.13	-0.23	-1201.07
			Max. Torque	8			1.66
L20	41.8333 - 41.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28.14	-2.95	-1.57
			Max. Mx	5	-18.81	-1211.12	0.59
			Max. My	8	-18.81	-0.26	-1214.51
			Max. Vy	5	20.16	-1211.12	0.59
			Max. Vx	8	20.20	-0.26	-1214.51
			Max. Torque	8			1.66
L21	41.1667 - 20.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.44	-3.94	-1.42
			Max. Mx	5	-22.51	-1545.55	1.12
			Max. My	8	-22.51	-0.74	-1548.55
			Max. Vy	5	21.80	-1545.55	1.12
			Max. Vx	8	21.84	-0.74	-1548.55
			Max. Torque	8			1.70
L22	20.25 - 14.1667	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.68	-4.60	-1.37
			Max. Mx	5	-26.08	-1794.73	1.45
			Max. My	8	-26.08	-1.03	-1797.53
			Max. Vy	5	23.06	-1794.73	1.45
			Max. Vx	8	23.10	-1.03	-1797.53
			Max. Torque	8			1.72
L23	14.1667 - 14	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36.74	-4.60	-1.38
			Max. Mx	5	-26.14	-1798.57	1.44
			Max. My	8	-26.14	-1.03	-1801.39
			Max. Vy	5	23.07	-1798.57	1.44
			Max. Vx	8	23.11	-1.03	-1801.39
			Max. Torque	8			1.72
L24	14 - 0	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-40.97	-5.19	-1.78
			Max. Mx	5	-29.78	-2132.59	1.46
			Max. My	8	-29.78	-1.14	-2135.80
			Max. Vy	5	24.62	-2132.59	1.46
			Max. Vx	8	24.66	-1.14	-2135.80
			Max. Torque	8			1.76

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	40.97	-0.00	-0.00
	Max. H_x	11	29.79	24.61	-0.02
	Max. H_z	2	29.79	-0.02	24.65
	Max. M_x	2	2134.05	-0.02	24.65
	Max. M_z	5	2132.59	-24.61	0.02
	Max. Torsion	8	1.76	0.02	-24.65
	Min. Vert	1	29.79	-0.00	-0.00
	Min. H_x	5	29.79	-24.61	0.02
	Min. H_z	8	29.79	0.02	-24.65
	Min. M_x	8	-2135.80	0.02	-24.65
	Min. M_z	11	-2125.62	24.61	-0.02
	Min. Torsion	2	-1.76	-0.02	24.65

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	29.79	0.00	0.00	0.86	-3.44	-0.00
Dead+Wind 0 deg - No Ice	29.79	0.02	-24.65	-2134.05	-5.82	1.76
Dead+Wind 30 deg - No Ice	29.79	12.32	-21.36	-1849.20	-1070.05	1.49
Dead+Wind 60 deg - No Ice	29.79	21.32	-12.34	-1068.62	-1848.51	0.82
Dead+Wind 90 deg - No Ice	29.79	24.61	-0.02	-1.46	-2132.59	-0.08
Dead+Wind 120 deg - No Ice	29.79	21.30	12.31	1066.32	-1846.17	-0.95
Dead+Wind 150 deg - No Ice	29.79	12.29	21.34	1848.61	-1066.00	-1.57
Dead+Wind 180 deg - No Ice	29.79	-0.02	24.65	2135.80	-1.14	-1.76
Dead+Wind 210 deg - No Ice	29.79	-12.32	21.36	1850.94	1063.09	-1.49
Dead+Wind 240 deg - No Ice	29.79	-21.32	12.34	1070.37	1841.54	-0.82
Dead+Wind 270 deg - No Ice	29.79	-24.61	0.02	3.22	2125.62	0.08
Dead+Wind 300 deg - No Ice	29.79	-21.30	-12.31	-1064.57	1839.21	0.95
Dead+Wind 330 deg - No Ice	29.79	-12.29	-21.34	-1846.86	1059.04	1.56
Dead+Ice+Temp	40.97	0.00	0.00	1.78	-5.19	-0.00
Dead+Wind 0 deg+Ice+Temp	40.97	0.00	-6.14	-548.20	-5.45	0.36
Dead+Wind 30 deg+Ice+Temp	40.97	3.07	-5.32	-474.61	-279.79	0.30
Dead+Wind 60 deg+Ice+Temp	40.97	5.31	-3.07	-273.36	-480.58	0.17
Dead+Wind 90 deg+Ice+Temp	40.97	6.13	-0.00	1.62	-554.00	-0.02
Dead+Wind 120 deg+Ice+Temp	40.97	5.31	3.07	276.65	-480.39	-0.20
Dead+Wind 150 deg+Ice+Temp	40.97	3.06	5.31	478.03	-279.47	-0.32
Dead+Wind 180 deg+Ice+Temp	40.97	-0.00	6.14	551.81	-5.07	-0.36
Dead+Wind 210 deg+Ice+Temp	40.97	-3.07	5.32	478.22	269.27	-0.30
Dead+Wind 240 deg+Ice+Temp	40.97	-5.31	3.07	276.97	470.06	-0.17

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 270 deg+Ice+Temp	40.97	-6.13	0.00	1.99	543.48	0.02
Dead+Wind 300 deg+Ice+Temp	40.97	-5.31	-3.07	-273.04	469.87	0.20
Dead+Wind 330 deg+Ice+Temp	40.97	-3.06	-5.31	-474.42	268.95	0.32
Dead+Wind 0 deg - Service	29.79	0.01	-8.53	-738.56	-4.30	0.62
Dead+Wind 30 deg - Service	29.79	4.26	-7.39	-639.90	-372.90	0.52
Dead+Wind 60 deg - Service	29.79	7.38	-4.27	-369.54	-642.52	0.29
Dead+Wind 90 deg - Service	29.79	8.52	-0.01	0.07	-740.91	-0.03
Dead+Wind 120 deg - Service	29.79	7.37	4.26	369.90	-641.71	-0.33
Dead+Wind 150 deg - Service	29.79	4.25	7.38	640.85	-371.50	-0.55
Dead+Wind 180 deg - Service	29.79	-0.01	8.53	740.32	-2.68	-0.62
Dead+Wind 210 deg - Service	29.79	-4.26	7.39	641.66	365.92	-0.52
Dead+Wind 240 deg - Service	29.79	-7.38	4.27	371.30	635.53	-0.29
Dead+Wind 270 deg - Service	29.79	-8.52	0.01	1.69	733.92	0.03
Dead+Wind 300 deg - Service	29.79	-7.37	-4.26	-368.14	634.72	0.33
Dead+Wind 330 deg - Service	29.79	-4.25	-7.38	-639.09	364.51	0.55

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-29.79	0.00	-0.00	29.79	-0.00	0.000%
2	0.02	-29.79	-24.65	-0.02	29.79	24.65	0.000%
3	12.32	-29.79	-21.36	-12.32	29.79	21.36	0.000%
4	21.32	-29.79	-12.34	-21.32	29.79	12.34	0.000%
5	24.61	-29.79	-0.02	-24.61	29.79	0.02	0.000%
6	21.30	-29.79	12.31	-21.30	29.79	-12.31	0.000%
7	12.29	-29.79	21.34	-12.29	29.79	-21.34	0.000%
8	-0.02	-29.79	24.65	0.02	29.79	-24.65	0.000%
9	-12.32	-29.79	21.36	12.32	29.79	-21.36	0.000%
10	-21.32	-29.79	12.34	21.32	29.79	-12.34	0.000%
11	-24.61	-29.79	0.02	24.61	29.79	-0.02	0.000%
12	-21.30	-29.79	-12.31	21.30	29.79	12.31	0.000%
13	-12.29	-29.79	-21.34	12.29	29.79	21.34	0.000%
14	0.00	-40.97	0.00	-0.00	40.97	-0.00	0.000%
15	0.00	-40.97	-6.14	-0.00	40.97	6.14	0.000%
16	3.07	-40.97	-5.32	-3.07	40.97	5.32	0.000%
17	5.31	-40.97	-3.07	-5.31	40.97	3.07	0.000%
18	6.13	-40.97	-0.00	-6.13	40.97	0.00	0.000%
19	5.31	-40.97	3.07	-5.31	40.97	-3.07	0.000%
20	3.06	-40.97	5.31	-3.06	40.97	-5.31	0.000%
21	-0.00	-40.97	6.14	0.00	40.97	-6.14	0.000%
22	-3.07	-40.97	5.32	3.07	40.97	-5.32	0.000%
23	-5.31	-40.97	3.07	5.31	40.97	-3.07	0.000%
24	-6.13	-40.97	0.00	6.13	40.97	-0.00	0.000%
25	-5.31	-40.97	-3.07	5.31	40.97	3.07	0.000%
26	-3.06	-40.97	-5.31	3.06	40.97	5.31	0.000%
27	0.01	-29.79	-8.53	-0.01	29.79	8.53	0.000%
28	4.26	-29.79	-7.39	-4.26	29.79	7.39	0.000%
29	7.38	-29.79	-4.27	-7.38	29.79	4.27	0.000%
30	8.52	-29.79	-0.01	-8.52	29.79	0.01	0.000%
31	7.37	-29.79	4.26	-7.37	29.79	-4.26	0.000%
32	4.25	-29.79	7.38	-4.25	29.79	-7.38	0.000%
33	-0.01	-29.79	8.53	0.01	29.79	-8.53	0.000%
34	-4.26	-29.79	7.39	4.26	29.79	-7.39	0.000%
35	-7.38	-29.79	4.27	7.38	29.79	-4.27	0.000%
36	-8.52	-29.79	0.01	8.52	29.79	-0.01	0.000%
37	-7.37	-29.79	-4.26	7.37	29.79	4.26	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
38	-4.25	-29.79	-7.38	4.25	29.79	7.38	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000643
2	Yes	5	0.00000001	0.00081283
3	Yes	6	0.00000001	0.00027813
4	Yes	6	0.00000001	0.00025325
5	Yes	5	0.00000001	0.00003864
6	Yes	6	0.00000001	0.00025245
7	Yes	6	0.00000001	0.00027784
8	Yes	5	0.00000001	0.00076899
9	Yes	6	0.00000001	0.00024692
10	Yes	6	0.00000001	0.00026954
11	Yes	5	0.00000001	0.00004333
12	Yes	6	0.00000001	0.00026832
13	Yes	6	0.00000001	0.00024521
14	Yes	4	0.00000001	0.00019660
15	Yes	6	0.00000001	0.00007851
16	Yes	6	0.00000001	0.00011562
17	Yes	6	0.00000001	0.00011184
18	Yes	6	0.00000001	0.00007827
19	Yes	6	0.00000001	0.00011310
20	Yes	6	0.00000001	0.00011686
21	Yes	6	0.00000001	0.00007920
22	Yes	6	0.00000001	0.00010956
23	Yes	6	0.00000001	0.00011243
24	Yes	6	0.00000001	0.00007656
25	Yes	6	0.00000001	0.00011111
26	Yes	6	0.00000001	0.00010835
27	Yes	5	0.00000001	0.00015756
28	Yes	5	0.00000001	0.00062292
29	Yes	5	0.00000001	0.00051425
30	Yes	4	0.00000001	0.00047304
31	Yes	5	0.00000001	0.00051477
32	Yes	5	0.00000001	0.00062495
33	Yes	5	0.00000001	0.00015515
34	Yes	5	0.00000001	0.00048916
35	Yes	5	0.00000001	0.00058016
36	Yes	4	0.00000001	0.00047193
37	Yes	5	0.00000001	0.00057328
38	Yes	5	0.00000001	0.00048138

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	130 - 120 (1)	TP16x16x0.375	10.00	0.00	0.0	25.200	18.4078	-2.30	463.88	0.005
L2	120 - 114.917 (2)	TP17.245x16x0.1875	5.08	0.00	0.0	36.000	10.2984	-4.81	370.74	0.013
L3	114.917 - 109.583 (3)	TP18.5512x17.245x0.4909	5.33	0.00	0.0	36.000	28.5470	-5.33	1027.69	0.005
L4	109.583 - 109.417 (4)	TP18.592x18.5512x0.5007	0.17	0.00	0.0	36.000	29.1678	-5.35	1050.04	0.005
L5	109.417 - 104.083 (5)	TP19.8982x18.592x0.4121	5.33	0.00	0.0	36.000	25.8586	-5.86	930.91	0.006
L6	104.083 - 103.917 (6)	TP19.939x19.8982x0.2843	0.17	0.00	0.0	36.000	17.9936	-5.88	647.77	0.009
L7	103.917 - 96.4167 (7)	TP21.7758x19.939x0.4339	7.50	0.00	0.0	36.000	29.8150	-8.19	1073.34	0.008
L8	96.4167 - 91.5 (8)	TP22.98x21.7758x0.3825	4.92	0.00	0.0	36.000	26.9248	-8.40	969.29	0.009
L9	91.5 - 88.9167 (9)	TP23.2381x21.8703x0.4379	5.58	0.00	0.0	39.000	32.1490	-9.33	1253.81	0.007
L10	88.9167 - 88.25 (10)	TP23.4015x23.2381x0.3336	0.67	0.00	0.0	39.000	24.7776	-9.43	966.33	0.010
L11	88.25 - 87.4167 (11)	TP23.6056x23.4015x0.3875	0.83	0.00	0.0	39.000	28.9692	-9.57	1129.80	0.008
L12	87.4167 - 86.9167 (12)	TP23.7281x23.6056x0.2513	0.50	0.00	0.0	39.000	18.9953	-9.66	740.82	0.013
L13	86.9167 - 80.75 (13)	TP25.2389x23.7281x0.4196	6.17	0.00	0.0	39.000	33.5363	-10.54	1307.92	0.008
L14	80.75 - 71.9167 (14)	TP27.403x25.2389x0.3197	8.83	0.00	0.0	39.000	27.8809	-11.87	1087.35	0.011
L15	71.9167 - 69.4167 (15)	TP28.0155x27.403x0.3995	2.50	0.00	0.0	39.000	35.5267	-12.31	1385.54	0.009
L16	69.4167 - 68.8333 (16)	TP28.1584x28.0155x0.25 H1-3+VT (1.42 CR) - 16	0.58	0.00	0.0	39.000	22.4662	-12.44	876.18	0.014
L17	68.8333 - 64.5 (17)	TP29.22x28.1584x0.4616	4.33	0.00	0.0	39.000	41.3757	-12.54	1613.65	0.008
L18	64.5 - 42.5 (18)	TP34.11x27.8013x0.4903	25.75	0.00	0.0	39.000	51.4318	-17.06	2005.84	0.009
L19	42.5 - 41.8333 (19)	TP33.649x32.4438x0.5189	4.92	0.00	0.0	39.000	55.3592	-18.62	2159.01	0.009
L20	41.8333 - 41.1667 (20)	TP33.8125x33.649x0.3438	0.67	0.00	0.0	39.000	37.0457	-18.81	1444.78	0.013
L21	41.1667 - 20.25 (21)	TP38.94x33.8125x0.497	20.92	0.00	0.0	39.000	59.5557	-22.51	2322.67	0.010
L22	20.25 - 14.1667 (22)	TP39.7409x37.0268x0.5199	11.08	0.00	0.0	36.000	65.6618	-26.08	2363.83	0.011
L23	14.1667 - 14 (23)	TP39.7817x39.7409x0.375	0.17	0.00	0.0	36.000	47.5836	-26.14	1713.01	0.015
L24	14 - 0 (24)	TP43.21x39.7817x0.5066	14.00	0.00	0.0	36.000	69.6654	-29.78	2507.96	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	130 - 120 (1)	TP16x16x0.375	37.11	6.338	27.720	0.229	0.00	0.000	27.720	0.000
L2	120 - 114.917 (2)	TP17.245x16x0.1875	80.15	22.463	36.000	0.624	0.00	0.000	36.000	0.000
L3	114.917 -	TP18.5512x17.245x0.4909	129.88	12.602	36.000	0.350	0.00	0.000	36.000	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L4	109.583 (3) 109.583 - 109.417 (4)	TP18.592x18.5512x0.5007	131.48	12.470	36.000	0.346	0.00	0.000	36.000	0.000
L5	109.417 - 104.083 (5)	TP19.8982x18.592x0.4121	184.29	18.188	36.000	0.505	0.00	0.000	36.000	0.000
L6	104.083 - 103.917 (6)	TP19.939x19.8982x0.2843	185.99	25.982	36.000	0.722	0.00	0.000	36.000	0.000
L7	103.917 - 96.4167 (7)	TP21.7758x19.939x0.4339	274.70	21.451	36.000	0.596	0.00	0.000	36.000	0.000
L8	96.4167 - 91.5 (8)	TP22.98x21.7758x0.3825	300.92	25.331	36.000	0.704	0.00	0.000	36.000	0.000
L9	91.5 - 88.9167 (9)	TP23.2381x21.8703x0.4379	380.15	25.742	39.000	0.660	0.00	0.000	39.000	0.000
L10	88.9167 - 88.25 (10)	TP23.4015x23.2381x0.3336	390.06	33.715	39.000	0.864	0.00	0.000	39.000	0.000
L11	88.25 - 87.4167 (11)	TP23.6056x23.4015x0.3875	402.53	29.631	39.000	0.760	0.00	0.000	39.000	0.000
L12	87.4167 - 86.9167 (12)	TP23.7281x23.6056x0.2513	410.04	45.257	39.000	1.160	0.00	0.000	39.000	0.000
L13	86.9167 - 80.75 (13)	TP25.2389x23.7281x0.4196	504.82	30.036	39.000	0.770	0.00	0.000	39.000	0.000
L14	80.75 - 71.9167 (14)	TP27.403x25.2389x0.3197	647.84	42.275	39.000	1.084	0.00	0.000	39.000	0.000
L15	71.9167 - 69.4167 (15)	TP28.0155x27.403x0.3995	689.92	34.741	39.000	0.891	0.00	0.000	39.000	0.000
L16	69.4167 - 68.8333 (16)	TP28.1584x28.0155x0.25	699.84	54.844	39.000	1.406	0.00	0.000	39.000	0.000
L17	68.8333 - 64.5 (17)	TP29.22x28.1584x0.4616	709.80	30.506	39.000	0.782	0.00	0.000	39.000	0.000
L18	64.5 - 42.5 (18)	TP34.11x27.8013x0.4903	1103.57	32.557	39.000	0.835	0.00	0.000	39.000	0.000
L19	42.5 - 41.8333 (19)	TP33.649x32.4438x0.5189	1201.07	32.392	39.000	0.831	0.00	0.000	39.000	0.000
L20	41.8333 - 41.1667 (20)	TP33.8125x33.649x0.3438	1214.51	48.193	39.000	1.236	0.00	0.000	39.000	0.000
L21	41.1667 - 20.25 (21)	TP38.94x33.8125x0.497	1548.89	34.486	39.000	0.884	0.00	0.000	39.000	0.000
L22	20.25 - 14.1667 (22)	TP39.7409x37.0268x0.5199	1798.40	34.459	36.000	0.957	0.00	0.000	36.000	0.000
L23	14.1667 - 14 (23)	TP39.7817x39.7409x0.375	1802.25	47.253	36.000	1.313	0.00	0.000	36.000	0.000
L24	14 - 0 (24)	TP43.21x39.7817x0.5066	2136.47	35.389	36.000	0.983	0.00	0.000	36.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	130 - 120 (1)	TP16x16x0.375	3.90	0.212	16.800	0.025	1.05	0.088	16.800	0.005
L2	120 - 114.917 (2)	TP17.245x16x0.1875	9.05	0.879	24.000	0.074	1.43	0.189	24.000	0.008
L3	114.917 - 109.583 (3)	TP18.5512x17.245x0.4909	9.58	0.336	24.000	0.028	1.44	0.065	24.000	0.003
L4	109.583 - 109.417 (4)	TP18.592x18.5512x0.5007	9.59	0.329	24.000	0.028	1.44	0.063	24.000	0.003
L5	109.417 - 104.083 (5)	TP19.8982x18.592x0.4121	10.17	0.393	24.000	0.034	1.59	0.073	24.000	0.003

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L6	104.083 - 103.917 (6)	TP19.939x19.8982x0.2843	10.19	0.566	24.000	0.048	1.59	0.104	24.000	0.004
L7	103.917 - 96.4167 (7)	TP21.7758x19.939x0.4339	13.57	0.455	24.000	0.039	1.60	0.058	24.000	0.002
L8	96.4167 - 91.5 (8)	TP22.98x21.7758x0.3825	13.77	0.512	24.000	0.044	1.61	0.063	24.000	0.003
L9	91.5 - 88.9167 (9)	TP23.2381x21.8703x0.4379	14.82	0.461	26.000	0.037	1.61	0.051	26.000	0.002
L10	88.9167 - 88.25 (10)	TP23.4015x23.2381x0.3336	14.89	0.601	26.000	0.047	1.57	0.064	26.000	0.002
L11	88.25 - 87.4167 (11)	TP23.6056x23.4015x0.3875	14.98	0.517	26.000	0.041	1.57	0.054	26.000	0.002
L12	87.4167 - 86.9167 (12)	TP23.7281x23.6056x0.2513	15.03	0.791	26.000	0.062	1.57	0.082	26.000	0.003
L13	86.9167 - 80.75 (13)	TP25.2389x23.7281x0.4196	15.70	0.468	26.000	0.037	1.58	0.044	26.000	0.002
L14	80.75 - 71.9167 (14)	TP27.403x25.2389x0.3197	16.69	0.599	26.000	0.047	1.60	0.049	26.000	0.002
L15	71.9167 - 69.4167 (15)	TP28.0155x27.403x0.3995	16.96	0.478	26.000	0.038	1.60	0.038	26.000	0.001
L16	69.4167 - 68.8333 (16)	TP28.1584x28.0155x0.25	17.02	0.758	26.000	0.060	1.60	0.059	26.000	0.002
L17	68.8333 - 64.5 (17)	TP29.22x28.1584x0.4616	17.09	0.413	26.000	0.032	1.60	0.032	26.000	0.001
L18	64.5 - 42.5 (18)	TP34.11x27.8013x0.4903	19.51	0.379	26.000	0.030	1.65	0.023	26.000	0.001
L19	42.5 - 41.8333 (19)	TP33.649x32.4438x0.5189	20.13	0.364	26.000	0.029	1.66	0.021	26.000	0.001
L20	41.8333 - 41.1667 (20)	TP33.8125x33.649x0.3438	20.20	0.545	26.000	0.043	1.66	0.031	26.000	0.001
L21	41.1667 - 20.25 (21)	TP38.94x33.8125x0.497	21.85	0.367	26.000	0.029	1.45	0.015	26.000	0.001
L22	20.25 - 14.1667 (22)	TP39.7409x37.0268x0.5199	23.10	0.352	24.000	0.030	1.47	0.013	24.000	0.001
L23	14.1667 - 14 (23)	TP39.7817x39.7409x0.375	23.11	0.486	24.000	0.041	1.47	0.018	24.000	0.001
L24	14 - 0 (24)	TP43.21x39.7817x0.5066	24.67	0.354	24.000	0.030	1.49	0.012	24.000	0.000

Section Capacity Table

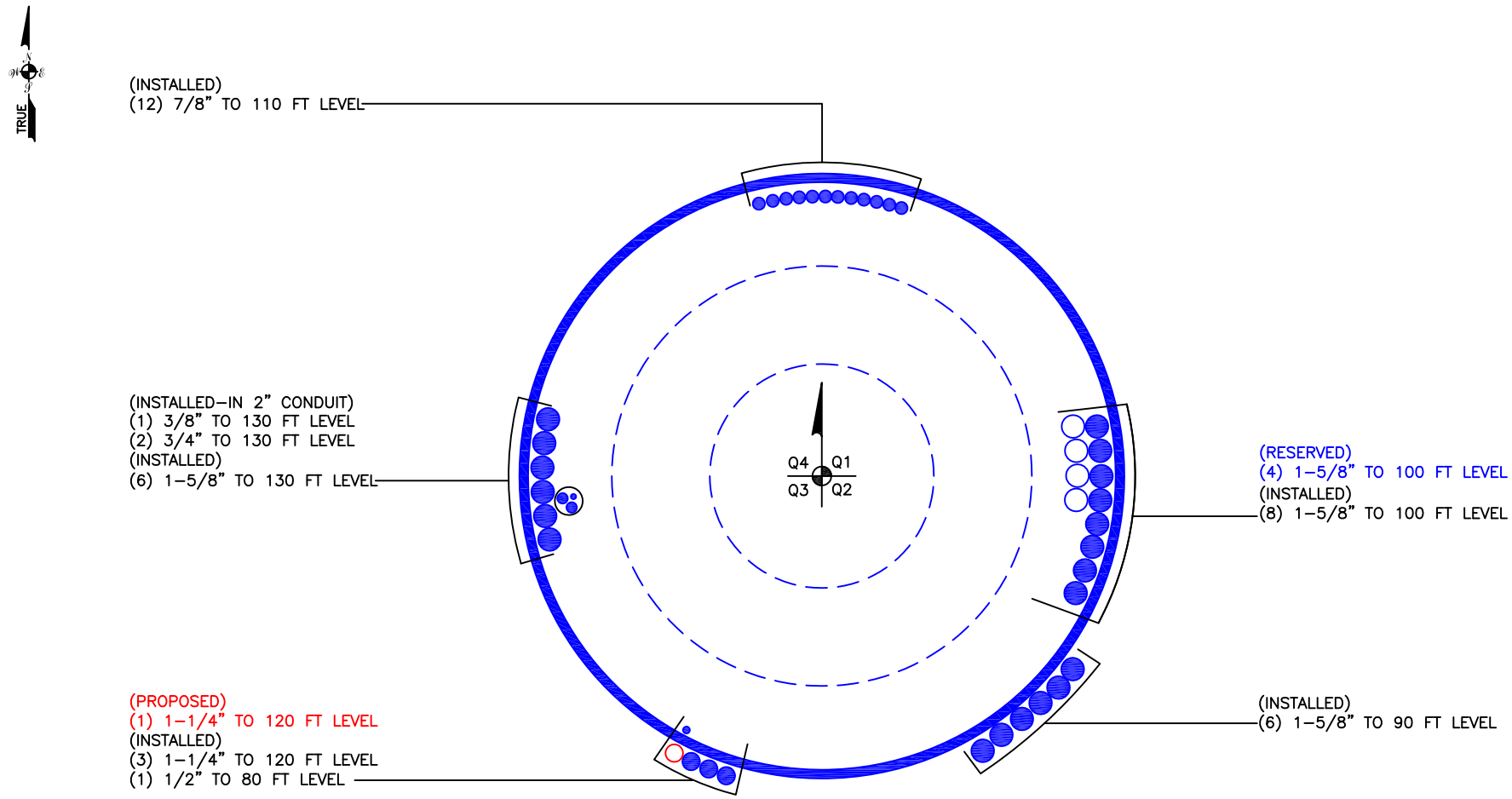
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	130.00-120.00	Pole	TP16.00×16.00×0.3750	1	Note 1	Note 1	19.2	Pass
L2	120.00-91.50	Pole	TP22.98×16.00×0.1875	2	Note 1	Note 1	61.6	Pass
L3	94.50-64.50	Pole	TP29.22×21.87×0.2500	3	Note 1	Note 1	89.2	Pass
L4	68.25-42.50	Pole	TP34.11×27.80×0.3125	4	Note 1	Note 1	63.3	Pass
L5	46.75-20.25	Pole	TP38.94×32.44×0.3438	5	Note 1	Note 1	93.7	Pass
L6	25.25-0.00	Pole	TP43.21×37.03×0.3750	6	Note 1	Note 1	74.6	Pass
M1	15.50-0.50	Mod	(Aero) MP304	1	Note 1	Note 1	79.2	Pass
M2	42.67-12.67	Mod	(Aero) MP304	2	Note 1	Note 1	77.5	Pass
M3	70.33-40.33	Mod	(Aero) MP304	3	Note 1	Note 1	73.5	Pass
M4	88.17-68.17	Mod	(Aero) MP303	4	Note 1	Note 1	87.4	Pass
M5	73.17-68.17	Mod	(Aero) MP303	5	Note 1	Note 1	77.4	Pass
M6	89.50-79.50	Mod	(Aero) MP303	6	Note 1	Note 1	70.0	Pass
M7	116.17-86.17	Mod	(Aero) MP303	7	Note 1	Note 1	69.4	Pass
M8	97.67-87.67	Mod	(Aero) MP303	8	Note 1	Note 1	59.3	Pass
M9	105.17-95.17	Mod	(Aero) MP303	9	Note 1	Note 1	46.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
M10	110.83-102.83	Mod	(Aero) MP303	10	Note 1	Note 1	42.2	Pass
M11	116.17-108.17	Mod	(Aero) MP303	11	Note 1	Note 1	27.2	Pass
							Summary	
						Pole (L3)	93.7	Pass
						Mod (M4)	87.4	Pass
						RATING =	**93.7**	**Pass**

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

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876314 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Pole (L5)	93.7%	Pass
Mod (M4)	87.4%	Pass

Horse Hill (BU 876314)

TEP #: 25675.20592

Analysis: RT 6/24/2014

Check: JEJ 6/24/2014

Monopole Reinforcement_v1.0 - TIA-222-F

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)
1	(Aero) MP304	-0.50	0.50	15.50	-1.33	3 6 9 12	Flats	0.00
2	(Aero) MP304		12.67	42.67		1 4 7 10	Flats	0.00
3	(Aero) MP304		40.33	70.33	-1.50	3 6 9 12	Flats	0.00
4	(Aero) MP303	0.66	68.17	88.17		1 4 10	Flats	0.00
5	(Aero) MP303	0.66	68.17	73.17		7	Flats	0.00
6	(Aero) MP303		79.50	89.50		7	Flats	0.00
7	(Aero) MP303		86.17	116.17		3 9 12	Flats	0.00
8	(Aero) MP303		87.67	97.67		6	Flats	0.00
9	(Aero) MP303		95.17	105.17		5 7	Flats	0.00
10	(Aero) MP303		102.83	110.83		6	Flats	0.00
11	(Aero) MP303		108.17	116.17		5 7	Flats	0.00

MODIFICATION PROPERTIES

#	Modification	Default Termination (ft)	Stitch (in)	k	Drill Hole (in)	Bolt/Weld Capacity (k)	A_G (in²)	F_Y (ksi)	F_U (ksi)
1	(Aero) MP304	1.50	18.00	0.80	1.2188	30.0	4.13	65.0	80.0
4	(Aero) MP303	1.25	18.00	0.80	1.2188	30.0	2.92	65.0	80.0

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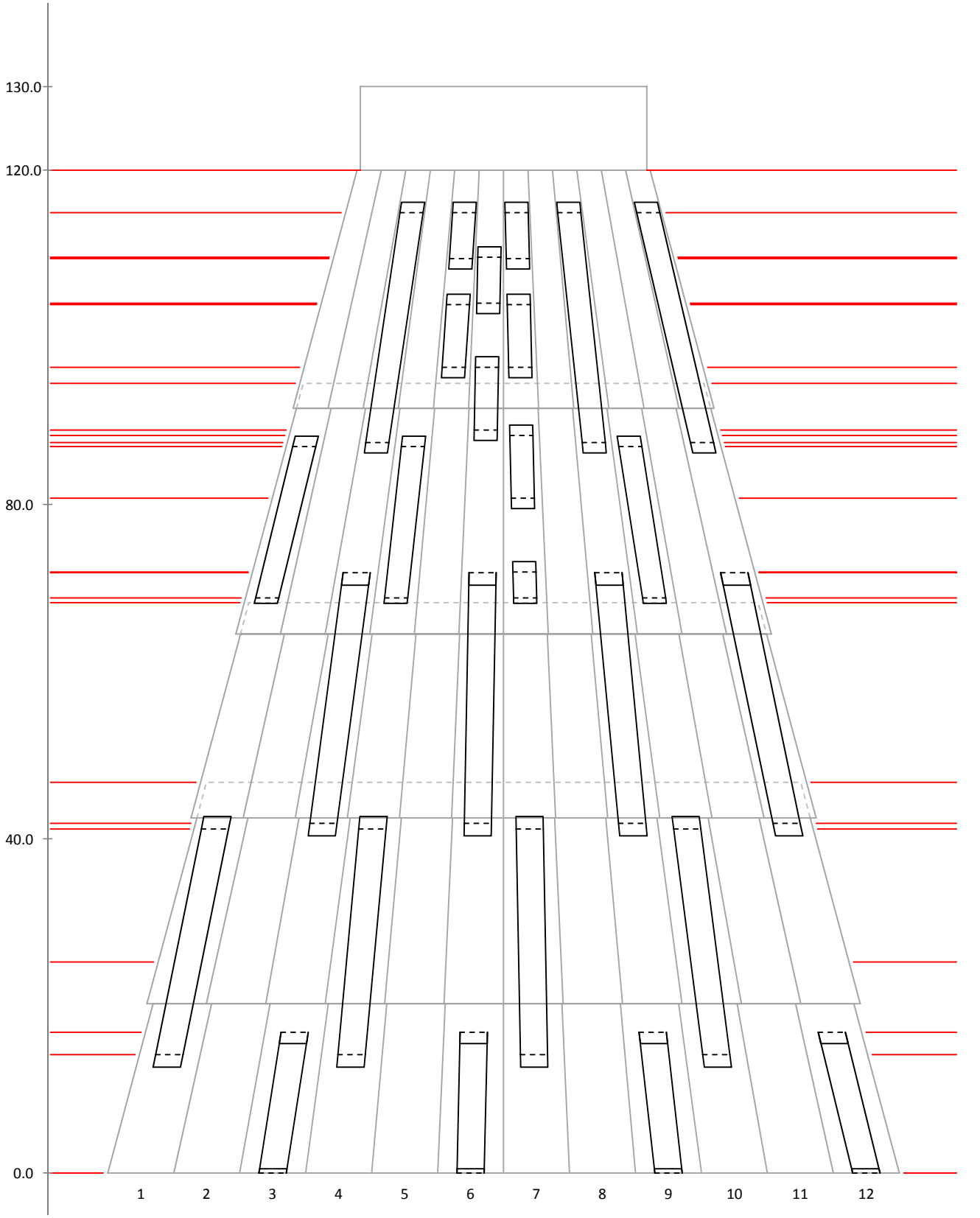
Reinforcement Layout



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Loads	
Axial:	29.8 k
Moment:	2,136.5 k·ft
Shear:	24.7 k
Torsion:	1.5 k·ft

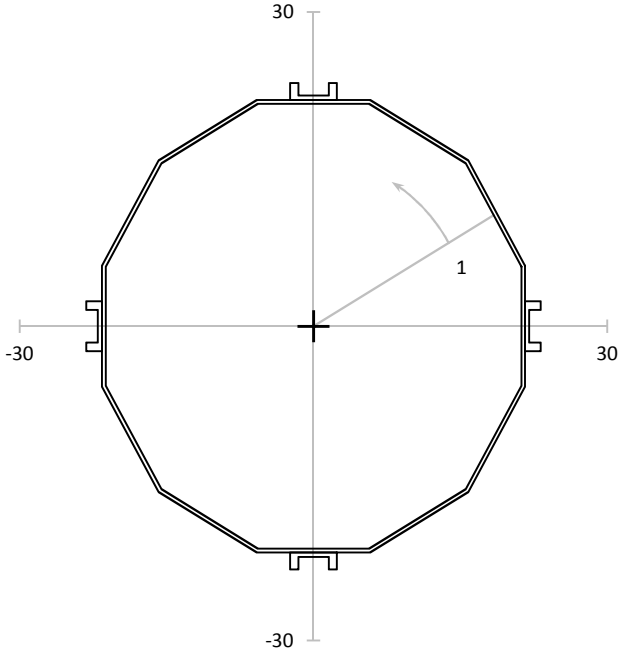
Pole Info	
OD:	43.21 in
t:	0.3750 in
Pole A_G:	51.72 in^2
Pole I_G:	12,113.5 in^4

Equivalent Loads to Pole	
Axial:	22.6 k
Moment:	1,596.0 k·ft
Shear:	18.7 k
Torsion:	1.5 k·ft

Controlling	
Angle:	**60.00°**
I_{CONT}:	16,215.4 in^4
A_G:	68.24 in^2

Shear Flow	
Controlling Mod:	1
q:	0.140 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	214.95 in
Stitch:	18.00 in
Capacity:	8.4%

Minimum	
Angle:	**13.90°**
I_{MIN}:	16,215.4 in^4
t_{EFF}:	0.5066 in



Pole Segment: L6, F_Y = 60 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
15.00	22.38	16215.4	0.436	35.389			48.000	48.000			74.6%

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
1	1	**60.00**	22.22	16215.4	0.436	35.124		45.961	44.339		79.2%
1	2	**150.00**	22.22	16215.4	0.436	35.124		45.961	44.339		79.2%
1	3	**240.00**	22.22	16215.4	0.436	35.124		45.961	44.339		79.2%
1	4	**330.00**	22.22	16215.4	0.436	35.124		45.961	44.339		79.2%

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Loads	
Axial:	26.1 k
Moment:	1,798.5 k·ft
Shear:	23.1 k
Torsion:	1.5 k·ft

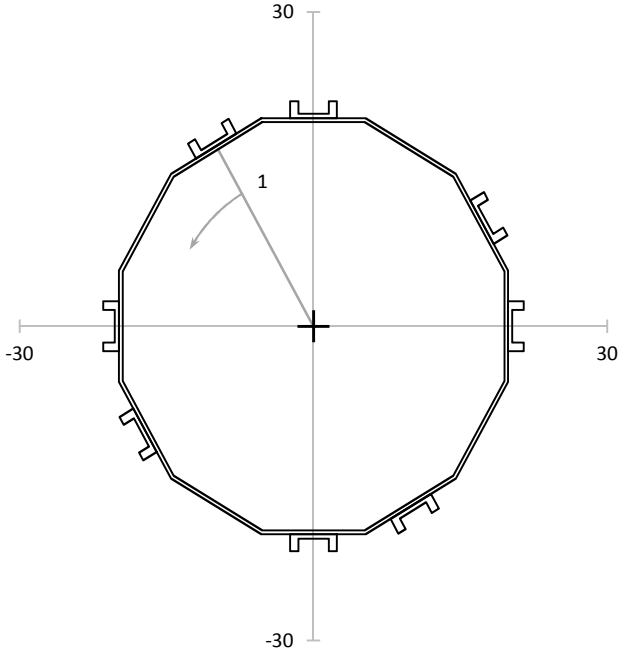
Equivalent Loads to Pole	
Axial:	15.4 k
Moment:	1,032.2 k·ft
Shear:	13.6 k
Torsion:	1.5 k·ft

Shear Flow	
Controlling Mod:	1
q:	0.119 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	251.49 in
Stitch:	18.00 in
Capacity:	7.2%

Pole Info	
OD:	39.74 in
t:	0.3750 in
Pole A_G:	47.53 in^2
Pole I_G:	9,402.3 in^4

Controlling	
Angle:	330.00°
I_G:	16,382.6 in^4
A_G:	80.57 in^2

Minimum	
Angle:	162.40°
I_{MIN}:	16,382.6 in^4
t_{EFF}:	0.6682 in



Pole Segment: L6, F_Y = 60 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
165.00	20.59	16382.6	0.324	27.119			48.000	48.000			**57.2%**

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
1	1	**60.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
1	2	**150.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
1	3	**240.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
1	4	**330.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
2	1	**360.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
2	2	**90.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
2	3	**180.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**
2	4	**270.00**	20.48	16382.6	0.324	26.980		45.961	44.339		**60.8%**

Elevation: 16.83-ft

Loads	
Axial:	25.4 k
Moment:	1,737.2 k·ft
Shear:	22.8 k
Torsion:	1.5 k·ft

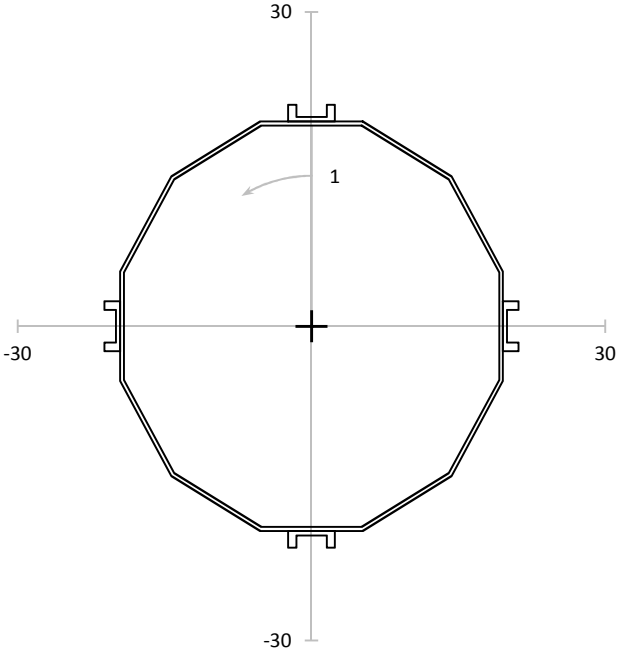
Pole Info	
OD:	39.09 in
t:	0.3750 in
Pole A_G:	46.75 in^2
Pole I_G:	8,942.7 in^4

Equivalent Loads to Pole	
Axial:	18.7 k
Moment:	1,260.6 k·ft
Shear:	16.9 k
Torsion:	1.5 k·ft

Controlling	
Angle:	**0.00°**
I_G:	12,323.4 in^4
A_G:	63.27 in^2

Shear Flow	
Controlling Mod:	2
q:	0.154 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	194.69 in
Stitch:	18.00 in
Capacity:	**9.2%**

Minimum	
Angle:	**134.80°**
I_{MIN}:	12,323.4 in^4
t_{EFF}:	0.5227 in



Pole Segment: L6, F_Y = 60 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
135.00	20.25	12323.4	0.401	34.252			48.000	48.000			**72.2%**

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
2	1	**0.00**	20.15	12323.4	0.401	34.094		45.961	44.339		**76.9%**
2	2	**90.00**	20.15	12323.4	0.401	34.094		45.961	44.339		**76.9%**
2	3	**180.00**	20.15	12323.4	0.401	34.094		45.961	44.339		**76.9%**
2	4	**270.00**	20.15	12323.4	0.401	34.094		45.961	44.339		**76.9%**

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Elevation: 25.25-ft

Loads	
Axial:	22.5 k
Moment:	1,548.9 k·ft
Shear:	21.8 k
Torsion:	1.5 k·ft

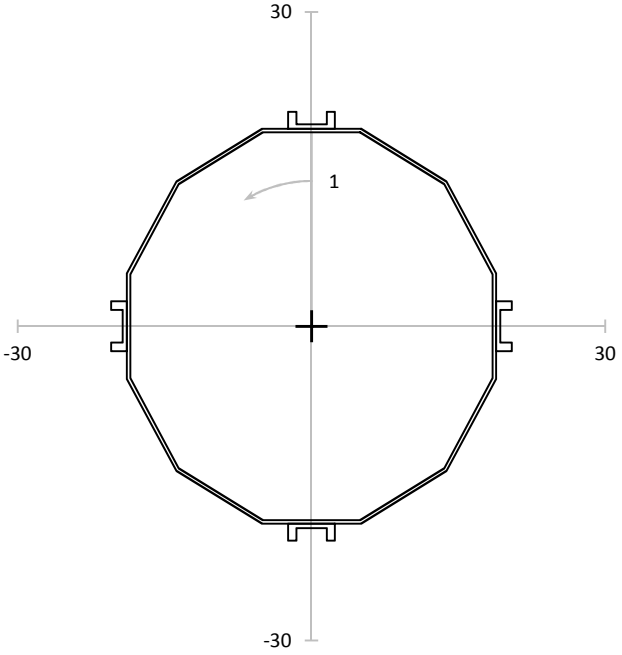
Pole Info	
OD:	37.71 in
t:	0.3438 in
Pole A_G:	41.36 in^2
Pole I_G:	7,373.5 in^4

Equivalent Loads to Pole	
Axial:	16.1 k
Moment:	1,084.7 k·ft
Shear:	15.6 k
Torsion:	1.5 k·ft

Controlling	
Angle:	**0.00°**
I_G:	10,529.3 in^4
A_G:	57.88 in^2

Shear Flow	
Controlling Mod:	2
q:	0.167 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	179.82 in
Stitch:	18.00 in
Capacity:	**10.0%**

Minimum	
Angle:	**112.60°**
I_{MIN}:	10,529.3 in^4
t_{EFF}:	0.4970 in



Pole Segment: L5, 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
135.00	19.54	10529.3	0.389	34.486			52.000	52.000			**67.1%**

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	**0.00**	19.47	10529.3	0.389	34.364		45.961	44.339		**77.5%**
2	2	**90.00**	19.47	10529.3	0.389	34.364		45.961	44.339		**77.5%**
2	3	**180.00**	19.47	10529.3	0.389	34.364		45.961	44.339		**77.5%**
2	4	**270.00**	19.47	10529.3	0.389	34.364		45.961	44.339		**77.5%**

Elevation: 41.17-ft

Loads	
Axial:	18.8 k
Moment:	1,214.6 k·ft
Shear:	20.2 k
Torsion:	1.7 k·ft

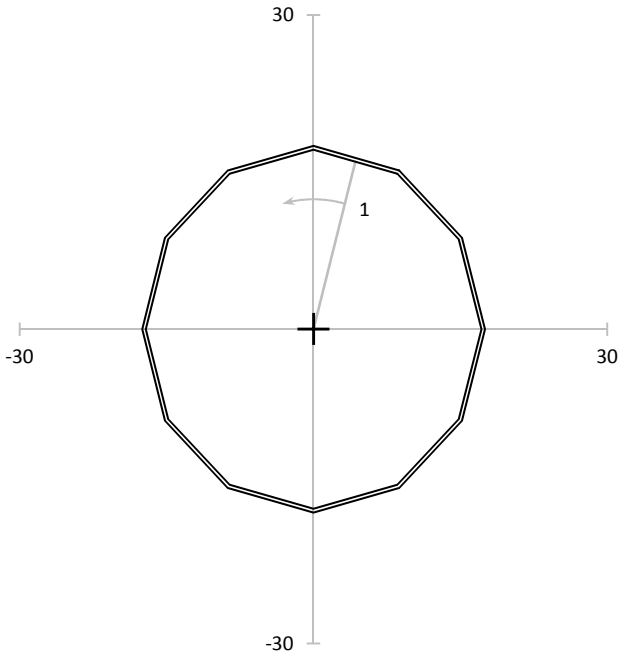
Equivalent Loads to Pole	
Axial:	18.8 k
Moment:	1,214.6 k·ft
Shear:	20.2 k
Torsion:	1.7 k·ft

Shear Flow N/A

Pole Info	
OD:	33.81 in
t:	0.3438 in
Pole A_G:	37.05 in^2
Pole I_G:	5,296.7 in^4

Controlling	
Angle:	**15.00°**
I_G:	5,296.7 in^4
A_G:	37.05 in^2

Minimum	
Angle:	**0.00°**
I_{MIN}:	5,296.7 in^4
t_{EFF}:	0.3437 in



Pole Segment: L5, 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
15.00	17.51	5296.7	0.508	48.196			52.000	52.000			**93.7%**

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

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Loads	
Axial:	18.6 k
Moment:	1,201.0 k·ft
Shear:	20.1 k
Torsion:	1.7 k·ft

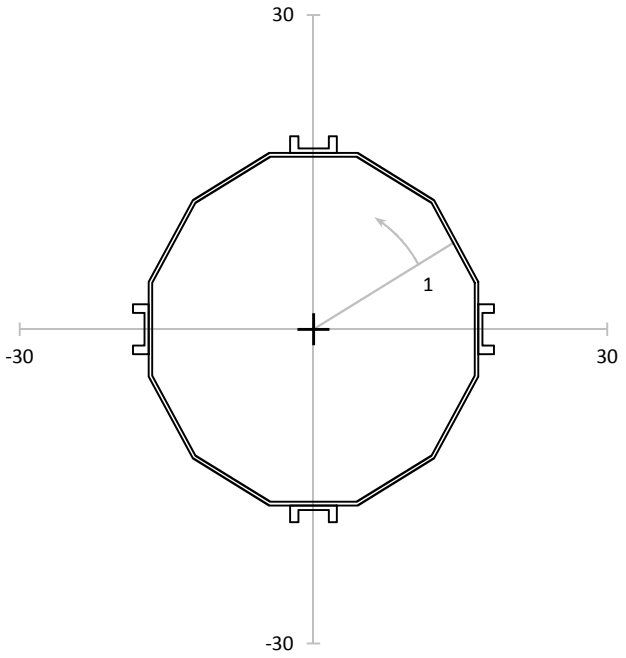
Pole Info	
OD:	33.65 in
t:	0.3438 in
Pole A_G:	36.86 in^2
Pole I_G:	5,219.4 in^4

Equivalent Loads to Pole	
Axial:	12.9 k
Moment:	808.3 k·ft
Shear:	13.9 k
Torsion:	1.7 k·ft

Controlling	
Angle:	60.00°
I_G:	7,755.7 in^4
A_G:	53.38 in^2

Shear Flow	
Controlling Mod:	3
q:	0.187 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	160.54 in
Stitch:	18.00 in
Capacity:	11.2%

Minimum	
Angle:	19.50°
I_{MIN}:	7,755.7 in^4
t_{EFF}:	0.5189 in



Pole Segment: L5, 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
15.00	17.43	7755.7	0.349	32.390			52.000	52.000			63.0%

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
3	1	**60.00**	17.43	7755.7	0.349	32.398		45.961	44.339		73.1%
3	2	**150.00**	17.43	7755.7	0.349	32.398		45.961	44.339		73.1%
3	3	**240.00**	17.43	7755.7	0.349	32.398		45.961	44.339		73.1%
3	4	**330.00**	17.43	7755.7	0.349	32.398		45.961	44.339		73.1%

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Loads	
Axial:	17.1 k
Moment:	1,103.6 k·ft
Shear:	19.5 k
Torsion:	1.7 k·ft

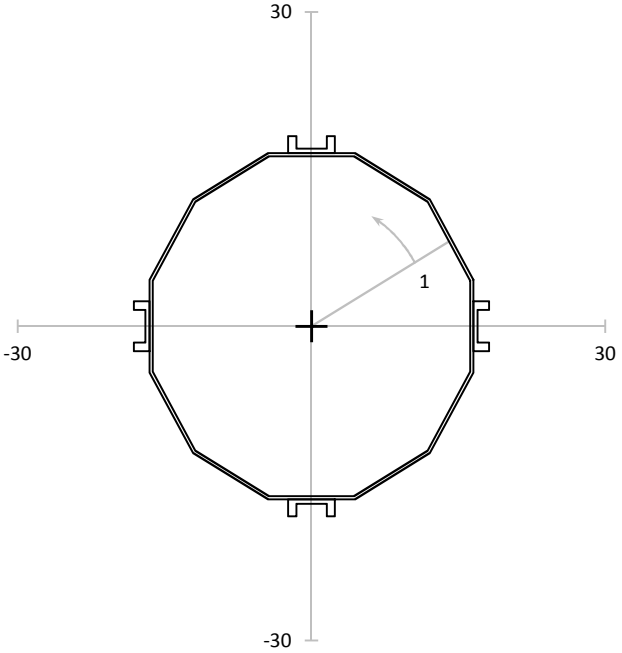
Pole Info	
OD:	33.07 in
t:	0.3125 in
Pole A_G:	32.96 in^2
Pole I_G:	4,514.1 in^4

Equivalent Loads to Pole	
Axial:	11.4 k
Moment:	715.0 k·ft
Shear:	13.0 k
Torsion:	1.7 k·ft

Controlling	
Angle:	**60.00°**
I_G:	6,967.5 in^4
A_G:	49.48 in^2

Shear Flow	
Controlling Mod:	3
q:	0.198 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	151.30 in
Stitch:	18.00 in
Capacity:	**11.9%**

Minimum	
Angle:	**1.25°**
I_{MIN}:	6,967.5 in^4
t_{EFF}:	0.4903 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
195.00	17.13	6967.5	0.345	32.557			52.000	52.000			**63.3%**

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	**60.00**	17.14	6967.5	0.345	32.585		45.961	44.339		**73.5%**
3	2	**150.00**	17.14	6967.5	0.345	32.585		45.961	44.339		**73.5%**
3	3	**240.00**	17.14	6967.5	0.345	32.585		45.961	44.339		**73.5%**
3	4	**330.00**	17.14	6967.5	0.345	32.585		45.961	44.339		**73.5%**

Loads	
Axial:	12.5 k
Moment:	709.8 k·ft
Shear:	17.1 k
Torsion:	1.6 k·ft

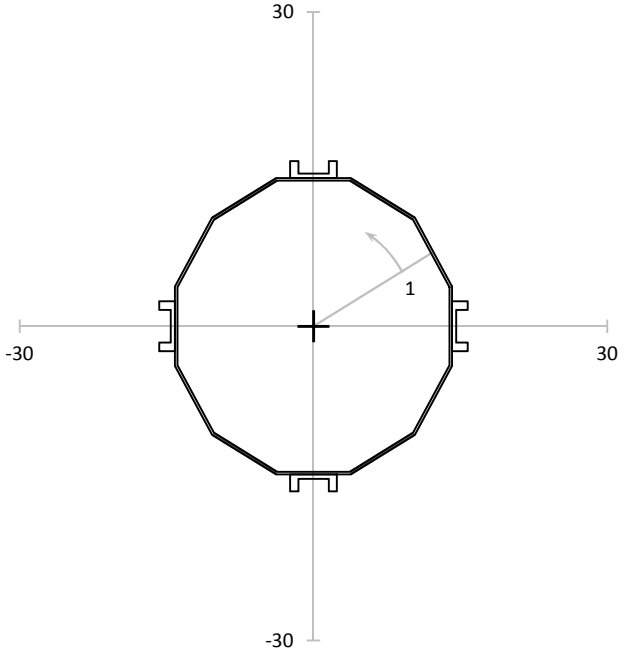
Pole Info	
OD:	28.30 in
t:	0.2500 in
Pole A_G:	22.58 in^2
Pole I_G:	2,268.0 in^4

Equivalent Loads to Pole	
Axial:	7.2 k
Moment:	393.3 k·ft
Shear:	9.9 k
Torsion:	1.6 k·ft

Controlling	
Angle:	60.00°
I_G:	4,093.2 in^4
A_G:	39.10 in^2

Shear Flow	
Controlling Mod:	3
q:	0.254 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	117.89 in
Stitch:	18.00 in
Capacity:	15.3%

Minimum	
Angle:	3.65°
I_{MIN}:	4,093.2 in^4
t_{EFF}:	0.4616 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
195.00	14.66	4093.2	0.321	30.506			52.000	52.000			59.3%

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	**60.00**	14.76	4093.2	0.321	30.716		45.961	44.339		69.3%
3	2	**150.00**	14.76	4093.2	0.321	30.716		45.961	44.339		69.3%
3	3	**240.00**	14.76	4093.2	0.321	30.716		45.961	44.339		69.3%
3	4	**330.00**	14.76	4093.2	0.321	30.716		45.961	44.339		69.3%

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Elevation: 68.83-ft

Loads	
Axial:	12.4 k
Moment:	699.9 k·ft
Shear:	17.0 k
Torsion:	1.6 k·ft

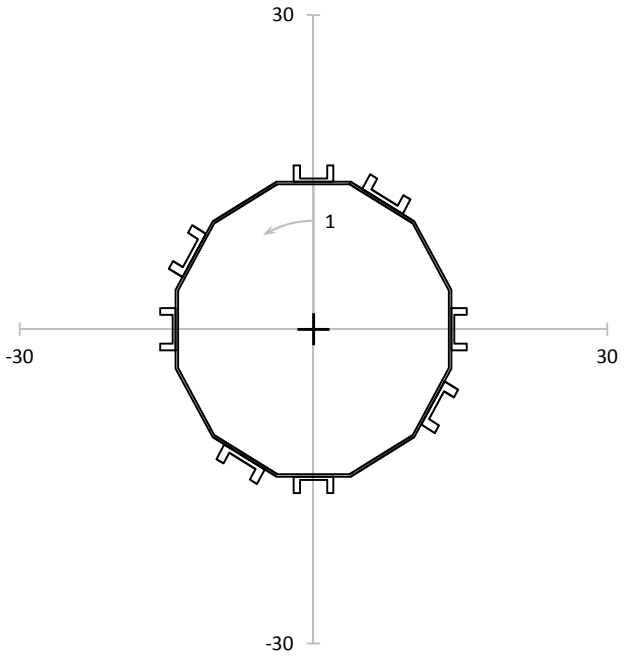
Pole Info	
OD:	28.16 in
t:	0.2500 in
Pole A_G:	22.47 in^2
Pole I_G:	2,233.9 in^4

Equivalent Loads to Pole	
Axial:	5.5 k
Moment:	294.3 k·ft
Shear:	7.5 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**360.00°**
I_G:	5,313.2 in^4
A_G:	50.67 in^2

Shear Flow	
Controlling Mod:	3
q:	0.194 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	154.32 in
Stitch:	18.00 in
Capacity:	**11.7%**

Minimum	
Angle:	**357.35°**
I_{MIN}:	5,313.2 in^4
t_{EFF}:	0.6188 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
165.00	14.59	5313.2	0.245	23.058			52.000	52.000			**44.8%**

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
3	1	**60.00**	14.69	5313.2	0.245	23.221		45.961	44.339		**52.4%**
3	2	**150.00**	14.69	5313.2	0.245	23.221		45.961	44.339		**52.4%**
3	3	**240.00**	14.69	5313.2	0.245	23.221		45.961	44.339		**52.4%**
3	4	**330.00**	14.69	5313.2	0.245	23.221		45.961	44.339		**52.4%**
4	1	**360.00**	14.67	5313.2	0.245	23.190		46.063	44.036		**52.7%**
4	2	**90.00**	14.67	5313.2	0.245	23.190		46.063	44.036		**52.7%**
4	3	**270.00**	14.67	5313.2	0.245	23.190		46.063	44.036		**52.7%**
5	1	**180.00**	14.67	5313.2	0.245	23.190		46.063	44.036		**52.7%**

Elevation: 71.83-ft

Loads	
Axial:	11.9 k
Moment:	649.3 k·ft
Shear:	16.7 k
Torsion:	1.6 k·ft

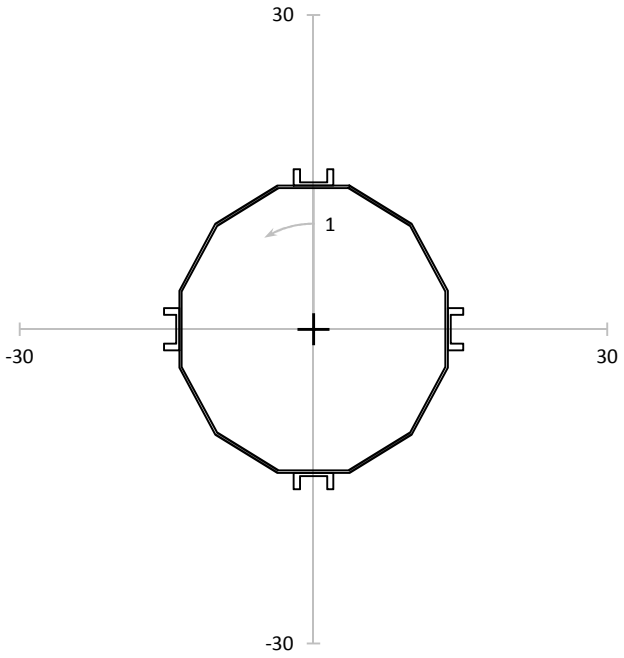
Pole Info	
OD:	27.42 in
t:	0.2500 in
Pole A_G:	21.87 in^2
Pole I_G:	2,061.6 in^4

Equivalent Loads to Pole	
Axial:	7.8 k
Moment:	409.3 k·ft
Shear:	10.9 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**0.00°**
I_G:	3,270.6 in^4
A_G:	33.55 in^2

Shear Flow	
Controlling Mod:	4
q:	0.213 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	140.83 in
Stitch:	18.00 in
Capacity:	**12.8%**

Minimum	
Angle:	**128.00°**
I_{MIN}:	3,270.6 in^4
t_{EFF}:	0.4034 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
135.00	14.21	3270.6	0.355	33.841			52.000	52.000			**65.8%**

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
4	1	**0.00**	14.30	3270.6	0.355	34.071		46.063	44.036		**77.4%**
4	2	**90.00**	14.30	3270.6	0.355	34.071		46.063	44.036		**77.4%**
4	3	**270.00**	14.30	3270.6	0.355	34.071		46.063	44.036		**77.4%**
5	1	**180.00**	14.30	3270.6	0.355	34.071		46.063	44.036		**77.4%**

Elevation: 71.92-ft

Loads	
Axial:	11.9 k
Moment:	647.9 k·ft
Shear:	16.7 k
Torsion:	1.6 k·ft

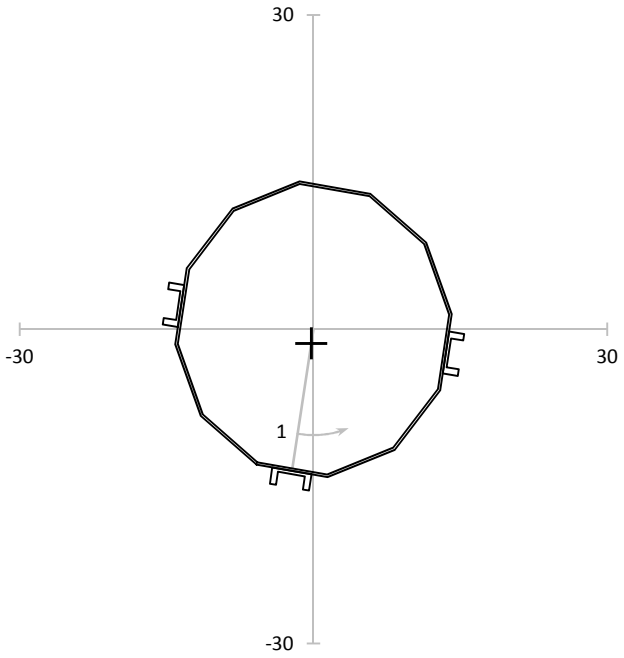
Pole Info	
OD:	27.40 in
t:	0.2500 in
Pole A_G:	21.86 in^2
Pole I_G:	2,057.0 in^4

Equivalent Loads to Pole	
Axial:	8.5 k
Moment:	517.3 k·ft
Shear:	11.9 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**189.25°**
I_G:	2,627.1 in^4
A_G:	30.62 in^2

Shear Flow	
Controlling Mod:	4
q:	0.241 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	124.42 in
Stitch:	18.00 in
Capacity:	**14.5%**

Minimum	
Angle:	**0.00°**
I_{MIN}:	2,610.3 in^4
t_{EFF}:	0.3197 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
189.25	15.47	2627.1	0.388	45.779			52.000	52.000			**88.8%**

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
4	1	**0.00**	12.93	2610.3	0.388	38.507		46.063	44.036		**87.4%**
4	2	**98.95**	14.33	3242.0	0.388	34.364		46.063	44.036		**78.0%**
4	3	**261.05**	14.33	3242.0	0.388	34.364		46.063	44.036		**78.0%**

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Loads	
Axial:	10.5 k
Moment:	504.8 k·ft
Shear:	15.7 k
Torsion:	1.6 k·ft

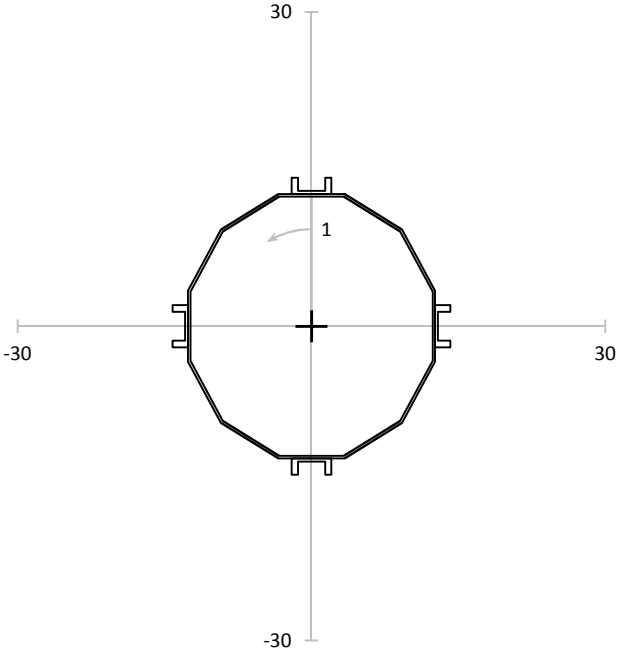
Pole Info	
OD:	25.24 in
t:	0.2500 in
Pole A_G:	20.12 in^2
Pole I_G:	1,603.3 in^4

Equivalent Loads to Pole	
Axial:	6.7 k
Moment:	307.0 k·ft
Shear:	9.9 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**0.00°**
I_G:	2,636.8 in^4
A_G:	31.80 in^2

Shear Flow	
Controlling Mod:	4
q:	0.230 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	130.63 in
Stitch:	18.00 in
Capacity:	**13.8%**

Minimum	
Angle:	**129.60°**
I_{MIN}:	2,636.8 in^4
t_{EFF}:	0.4196 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
135.00	13.07	2636.8	0.331	30.036			52.000	52.000			**58.4%**

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
4	1	**0.00**	13.21	2636.8	0.331	30.348		46.063	44.036		**68.9%**
4	2	**90.00**	13.21	2636.8	0.331	30.348		46.063	44.036		**68.9%**
4	3	**270.00**	13.21	2636.8	0.331	30.348		46.063	44.036		**68.9%**
6	1	**180.00**	13.21	2636.8	0.331	30.348		46.063	44.036		**68.9%**

Elevation: 86.92-ft

Loads	
Axial:	9.7 k
Moment:	410.1 k·ft
Shear:	15.0 k
Torsion:	1.6 k·ft

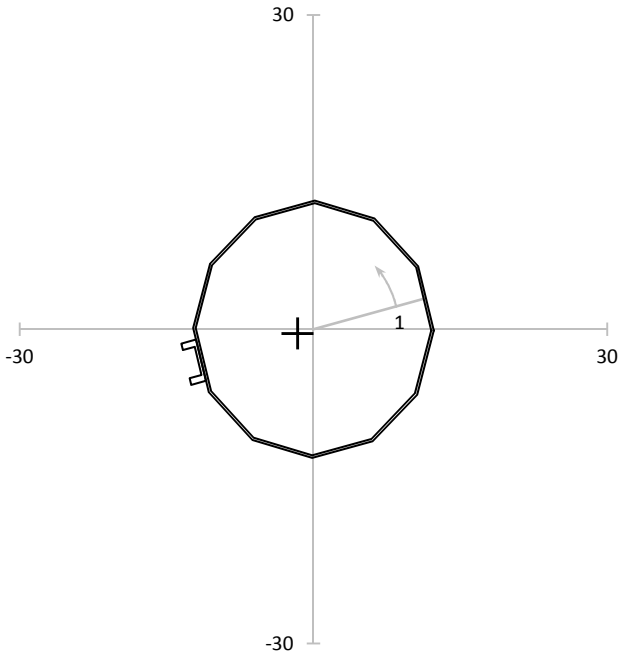
Pole Info	
OD:	23.73 in
t:	0.2500 in
Pole A_G:	18.90 in^2
Pole I_G:	1,329.8 in^4

Equivalent Loads to Pole	
Axial:	8.4 k
Moment:	416.7 k·ft
Shear:	13.0 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**75.60°**
I_G:	1,360.2 in^4
A_G:	21.82 in^2

Shear Flow	
Controlling Mod:	6
q:	0.275 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	109.16 in
Stitch:	18.00 in
Capacity:	**16.5%**

Minimum	
Angle:	**90.00°**
I_{MIN}:	1,336.3 in^4
t_{EFF}:	0.2513 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
75.60	12.70	1360.2	0.443	45.965			52.000	52.000			**89.2%**

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
6	1	**180.00**	10.79	1722.7	0.443	30.815		46.063	44.036		**70.0%**

Elevation: 87.42-ft

Loads	
Axial:	9.6 k
Moment:	402.6 k·ft
Shear:	15.0 k
Torsion:	1.6 k·ft

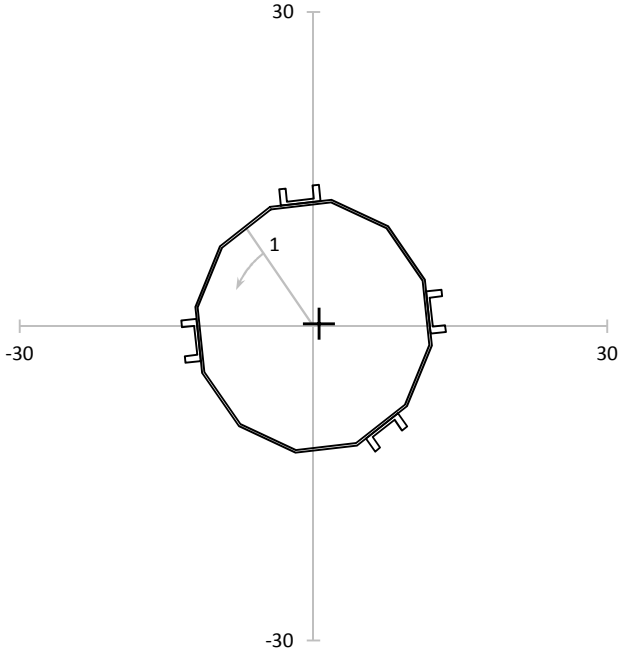
Pole Info	
OD:	23.61 in
t:	0.2500 in
Pole A_G:	18.80 in²
Pole I_G:	1,309.0 in⁴

Equivalent Loads to Pole	
Axial:	5.9 k
Moment:	262.4 k·ft
Shear:	9.2 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**323.65°**
I_G:	2,068.8 in⁴
A_G:	30.48 in²

Shear Flow	
Controlling Mod:	7
q:	0.256 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	117.34 in
Stitch:	18.00 in
Capacity:	**15.3%**

Minimum	
Angle:	**119.25°**
I_{MIN}:	1,993.3 in⁴
t_{EFF}:	0.3875 in



Pole Segment: L3, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in⁴)	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
108.30	12.72	2009.3	0.314	30.585			52.000	52.000			59.4%

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
6	1	**166.00**	12.01	2228.1	0.314	26.048		46.063	44.036		59.2%
7	1	**71.90**	12.74	2232.8	0.314	27.564		46.063	44.036		62.6%
7	2	**250.30**	11.58	2245.1	0.314	24.918		46.063	44.036		56.6%
7	3	**323.65**	12.09	2068.8	0.314	28.238		46.063	44.036		64.1%

Elevation: 88.25-ft

Loads	
Axial:	9.4 k
Moment:	390.1 k·ft
Shear:	14.9 k
Torsion:	1.6 k·ft

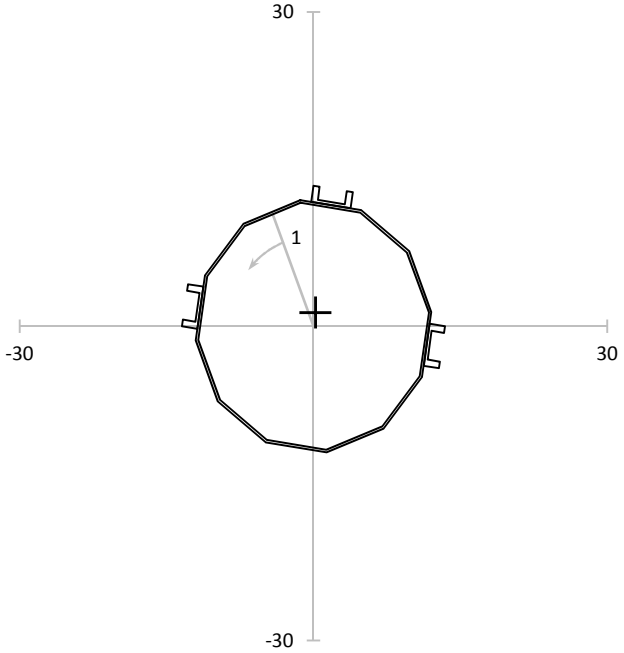
Pole Info	
OD:	23.40 in
t:	0.2500 in
Pole A_G:	18.64 in^2
Pole I_G:	1,275.0 in^4

Equivalent Loads to Pole	
Axial:	6.4 k
Moment:	299.1 k·ft
Shear:	10.1 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**338.70°**
I_G:	1,693.9 in^4
A_G:	27.40 in^2

Shear Flow	
Controlling Mod:	7
q:	0.284 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	105.76 in
Stitch:	18.00 in
Capacity:	**17.0%**

Minimum	
Angle:	**150.00°**
I_{MIN}:	1,682.9 in^4
t_{EFF}:	0.3336 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
338.70	13.34	1693.9	0.344	36.872			52.000	52.000			**71.6%**

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
7	1	**70.80**	12.32	2148.2	0.344	26.841		46.063	44.036		**61.0%**
7	2	**229.20**	12.32	2148.2	0.344	26.841		46.063	44.036		**61.0%**
7	3	**330.00**	10.98	1682.9	0.344	30.541		46.063	44.036		**69.4%**

Loads	
Axial:	9.3 k
Moment:	380.2 k·ft
Shear:	14.8 k
Torsion:	1.6 k·ft

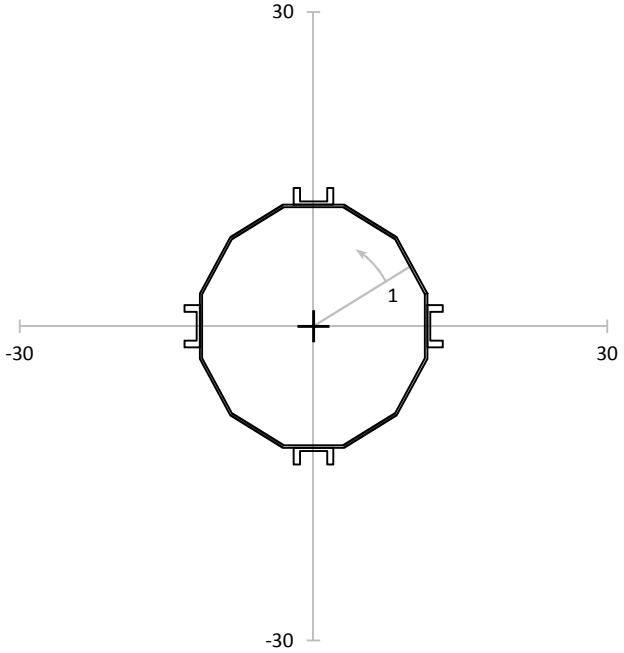
Pole Info	
OD:	23.24 in
t:	0.2500 in
Pole A_G:	18.51 in²
Pole I_G:	1,248.2 in⁴

Equivalent Loads to Pole	
Axial:	5.7 k
Moment:	222.5 k·ft
Shear:	9.1 k
Torsion:	1.6 k·ft

Controlling	
Angle:	60.00°
I_G:	2,133.2 in⁴
A_G:	30.19 in²

Shear Flow	
Controlling Mod:	7
q:	0.248 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	121.13 in
Stitch:	18.00 in
Capacity:	14.9%

Minimum	
Angle:	9.10°
I_{MIN}:	2,133.2 in⁴
t_{EFF}:	0.4379 in



Pole Segment: L3, F_Y = 65 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in⁴)	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
195.00	12.04	2133.2	0.309	25.745			52.000	52.000			50.1%

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
7	1	**60.00**	12.21	2133.2	0.309	26.112		46.063	44.036		59.3%
7	2	**240.00**	12.21	2133.2	0.309	26.112		46.063	44.036		59.3%
7	3	**330.00**	12.21	2133.2	0.309	26.112		46.063	44.036		59.3%
8	1	**150.00**	12.21	2133.2	0.309	26.112		46.063	44.036		59.3%

Loads	
Axial:	8.4 k
Moment:	300.9 k·ft
Shear:	13.8 k
Torsion:	1.6 k·ft

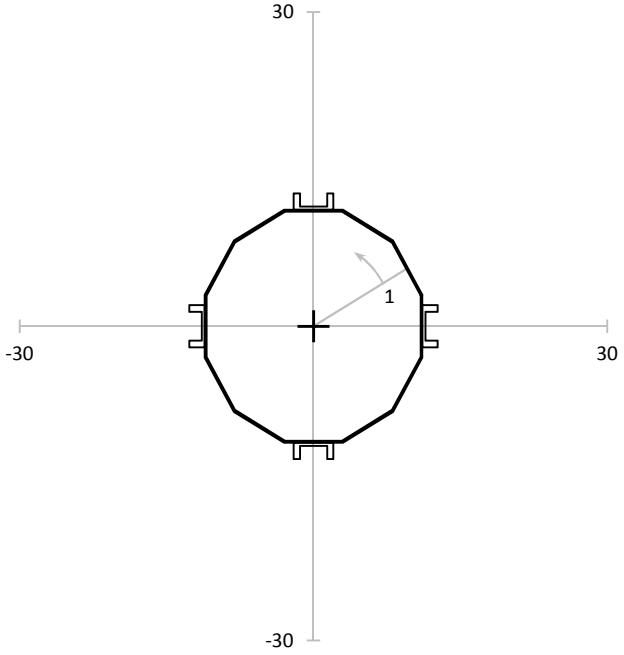
Pole Info	
OD:	22.25 in
t:	0.1875 in
Pole A_G:	13.32 in^2
Pole I_G:	827.0 in^4

Equivalent Loads to Pole	
Axial:	4.5 k
Moment:	151.5 k·ft
Shear:	7.3 k
Torsion:	1.6 k·ft

Controlling	
Angle:	60.00°
I_G:	1,642.7 in^4
A_G:	25.00 in^2

Shear Flow	
Controlling Mod:	7
q:	0.287 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	104.61 in
Stitch:	18.00 in
Capacity:	17.2%

Minimum	
Angle:	7.50°
I_{MIN}:	1,642.7 in^4
t_{EFF}:	0.3825 in



Pole Segment: L2, F_Y = 60 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
195.00	11.52	1642.7	0.336	25.331			48.000	48.000			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
7	1	**60.00**	11.71	1642.7	0.336	25.747		46.063	44.036		58.5%
7	2	**240.00**	11.71	1642.7	0.336	25.747		46.063	44.036		58.5%
7	3	**330.00**	11.71	1642.7	0.336	25.747		46.063	44.036		58.5%
8	1	**150.00**	11.71	1642.7	0.336	25.747		46.063	44.036		58.5%

Elevation: 96.42-ft

Loads	
Axial:	8.2 k
Moment:	274.7 k·ft
Shear:	13.6 k
Torsion:	1.6 k·ft

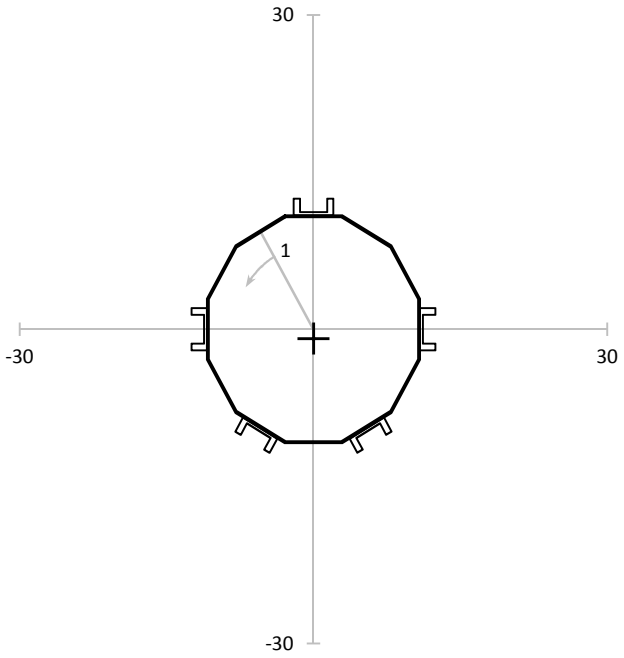
Pole Info	
OD:	21.78 in
t:	0.1875 in
Pole A_G:	13.03 in²
Pole I_G:	775.4 in⁴

Equivalent Loads to Pole	
Axial:	3.9 k
Moment:	124.0 k·ft
Shear:	6.4 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**330.00°**
I_G:	1,733.4 in⁴
A_G:	27.63 in²

Shear Flow	
Controlling Mod:	7
q:	0.283 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	106.11 in
Stitch:	18.00 in
Capacity:	**17.0%**

Minimum	
Angle:	**150.00°**
I_{MIN}:	1,733.4 in⁴
t_{EFF}:	0.4339 in



Pole Segment: L2, F_Y = 60 ksi

POLE CAPACITY

Angle (°)	y_{CONT} (in)	I (in⁴)	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
163.60	12.14	1734.6	0.296	23.074			48.000	48.000			**48.7%**

MODIFICATION CAPACITIES

Mod Number	#	Angle (°)	$\bar{y}_{CONT}$ (in)	I (in⁴)	σ_A (ksi)	σ_B (ksi)	σ_V (ksi)	ϕF_A (ksi)	ϕF_B (ksi)	ϕF_V (ksi)	Capacity
7	1	**55.45**	11.51	1755.0	0.296	21.627		46.063	44.036		**49.1%**
7	2	**244.55**	11.51	1755.0	0.296	21.627		46.063	44.036		**49.1%**
7	3	**330.00**	12.37	1733.4	0.296	23.520		46.063	44.036		**53.4%**
9	1	**118.25**	10.72	1739.4	0.296	20.315		46.063	44.036		**46.1%**
9	2	**181.75**	10.72	1739.4	0.296	20.315		46.063	44.036		**46.1%**

Elevation: 103.92-ft

Loads	
Axial:	5.9 k
Moment:	186.0 k·ft
Shear:	10.2 k
Torsion:	1.6 k·ft

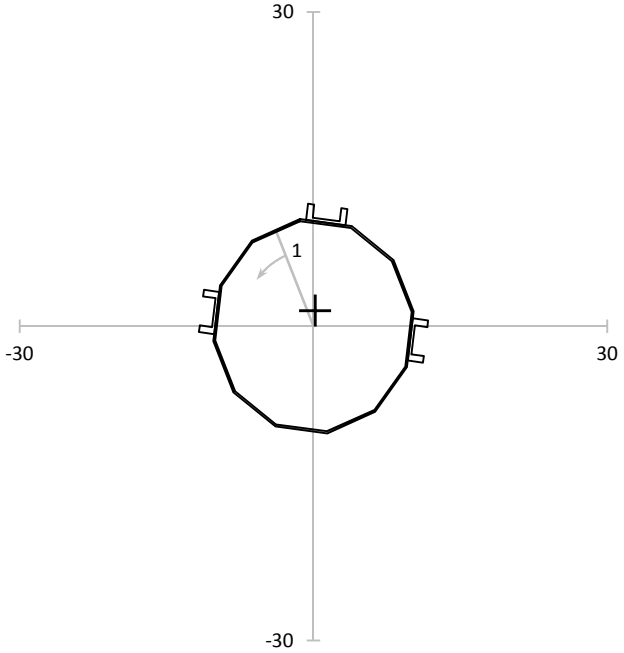
Pole Info	
OD:	19.94 in
t:	0.1875 in
Pole A_G:	11.92 in^2
Pole I_G:	593.8 in^4

Equivalent Loads to Pole	
Axial:	3.4 k
Moment:	127.8 k·ft
Shear:	5.9 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**337.25°**
I_G:	893.1 in^4
A_G:	20.68 in^2

Shear Flow	
Controlling Mod:	7
q:	0.304 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	98.67 in
Stitch:	18.00 in
Capacity:	**18.2%**

Minimum	
Angle:	**150.00°**
I_{MIN}:	887.2 in^4
t_{EFF}:	0.2843 in



Pole Segment: L2, F_Y = 60 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
337.25	11.71	893.1	0.284	29.278			48.000	48.000			**61.6%**

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
7	1	**78.10**	10.50	1217.6	0.284	19.251		46.063	44.036		**43.7%**
7	2	**221.90**	10.50	1217.6	0.284	19.251		46.063	44.036		**43.7%**
7	3	**330.00**	9.07	887.2	0.284	22.818		46.063	44.036		**51.8%**

Elevation: 104.08-ft

Loads	
Axial:	5.9 k
Moment:	184.3 k·ft
Shear:	10.2 k
Torsion:	1.6 k·ft

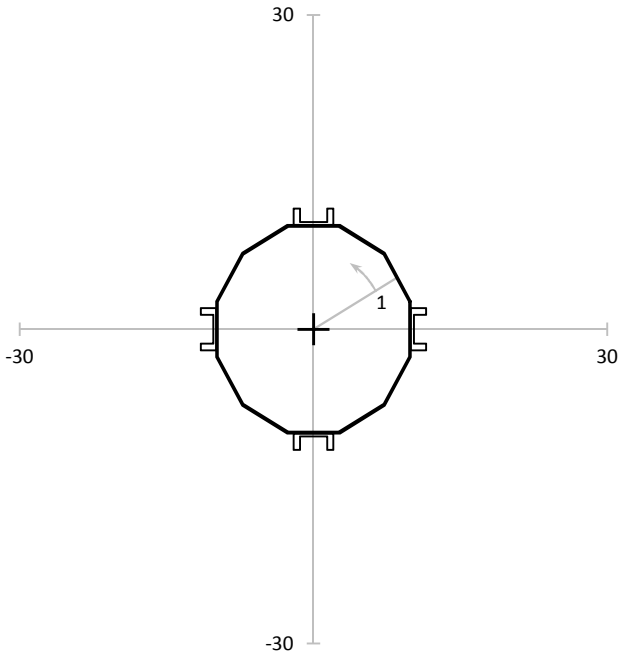
Pole Info	
OD:	19.90 in
t:	0.1875 in
Pole A_G:	11.90 in^2
Pole I_G:	590.1 in^4

Equivalent Loads to Pole	
Axial:	3.0 k
Moment:	86.8 k·ft
Shear:	5.1 k
Torsion:	1.6 k·ft

Controlling	
Angle:	**60.00°**
I_G:	1,253.3 in^4
A_G:	23.58 in^2

Shear Flow	
Controlling Mod:	7
q:	0.250 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	120.12 in
Stitch:	18.00 in
Capacity:	**15.0%**

Minimum	
Angle:	**0.40°**
I_{MIN}:	1,253.3 in^4
t_{EFF}:	0.4121 in



Pole Segment: L2, F_Y = 60 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
195.00	10.31	1253.3	0.249	18.185			48.000	48.000			**38.4%**

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
7	1	**60.00**	10.54	1253.3	0.249	18.594		46.063	44.036		**42.2%**
7	2	**240.00**	10.54	1253.3	0.249	18.594		46.063	44.036		**42.2%**
7	3	**330.00**	10.54	1253.3	0.249	18.594		46.063	44.036		**42.2%**
10	1	**150.00**	10.54	1253.3	0.249	18.594		46.063	44.036		**42.2%**

Elevation: 109.42-ft

Loads	
Axial:	5.3 k
Moment:	131.5 k·ft
Shear:	9.6 k
Torsion:	1.4 k·ft

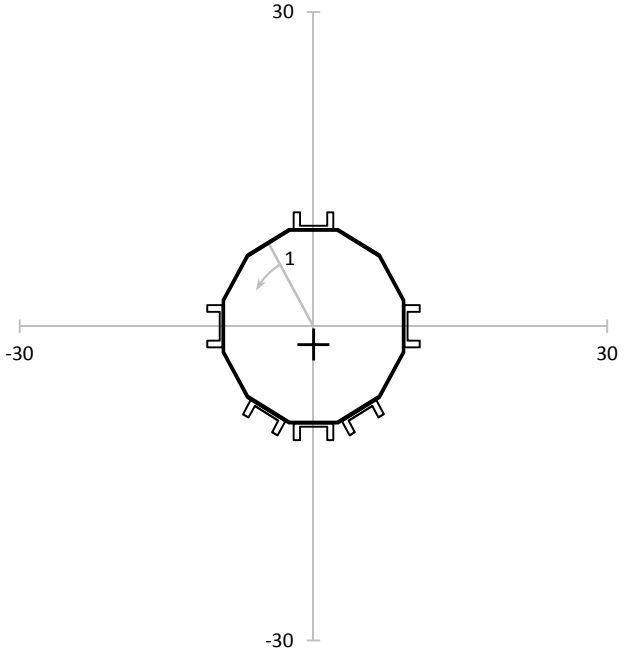
Pole Info	
OD:	18.59 in
t:	0.1875 in
Pole A_G:	11.11 in^2
Pole I_G:	480.4 in^4

Equivalent Loads to Pole	
Axial:	2.1 k
Moment:	50.8 k·ft
Shear:	3.7 k
Torsion:	1.4 k·ft

Controlling	
Angle:	**330.00°**
I_G:	1,410.7 in^4
A_G:	28.63 in^2

Shear Flow	
Controlling Mod:	7
q:	0.231 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	129.85 in
Stitch:	18.00 in
Capacity:	**13.9%**

Minimum	
Angle:	**60.00°**
I_{MIN}:	1,218.5 in^4
t_{EFF}:	0.5007 in



Pole Segment: L2, F_Y = 60 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
196.85	10.82	1308.4	0.187	13.051			48.000	48.000			**27.6%**

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
7	1	**52.35**	10.03	1221.9	0.187	12.955		46.063	44.036		**29.4%**
7	2	**247.65**	10.03	1221.9	0.187	12.955		46.063	44.036		**29.4%**
7	3	**330.00**	11.63	1410.7	0.187	13.014		46.063	44.036		**29.6%**
10	1	**150.00**	8.14	1410.7	0.187	9.106		46.063	44.036		**20.7%**
11	1	**105.75**	8.33	1317.1	0.187	9.982		46.063	44.036		**22.7%**
11	2	**194.25**	8.33	1317.1	0.187	9.982		46.063	44.036		**22.7%**

Loads	
Axial:	5.3 k
Moment:	129.9 k·ft
Shear:	9.6 k
Torsion:	1.4 k·ft

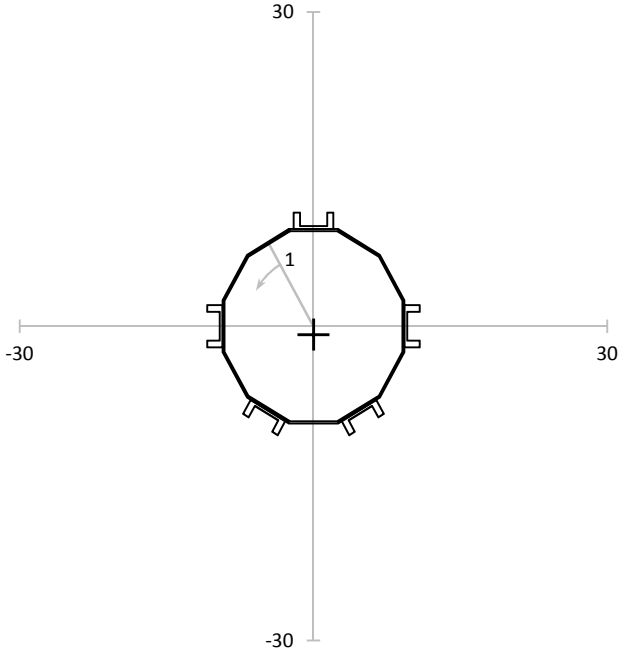
Pole Info	
OD:	18.55 in
t:	0.1875 in
Pole A_G:	11.09 in^2
Pole I_G:	477.2 in^4

Equivalent Loads to Pole	
Axial:	2.3 k
Moment:	52.7 k·ft
Shear:	4.1 k
Torsion:	1.4 k·ft

Controlling	
Angle:	**330.00°**
I_G:	1,188.5 in^4
A_G:	25.69 in^2

Shear Flow	
Controlling Mod:	7
q:	0.251 k/in
Bolt/Weld Cap:	30.0 k/bolt
Max Spacing:	119.31 in
Stitch:	18.00 in
Capacity:	**15.1%**

Minimum	
Angle:	**150.00°**
I_{MIN}:	1,188.5 in^4
t_{EFF}:	0.4909 in



Pole Segment: L2, F_Y = 60 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
343.45	10.40	1189.4	0.207	13.630			48.000	48.000			**28.8%**

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
7	1	**55.10**	9.90	1205.7	0.207	12.794		46.063	44.036		**29.1%**
7	2	**244.90**	9.90	1205.7	0.207	12.794		46.063	44.036		**29.1%**
7	3	**330.00**	10.69	1188.5	0.207	14.011		46.063	44.036		**31.8%**
11	1	**118.20**	9.16	1193.3	0.207	11.965		46.063	44.036		**27.2%**
11	2	**181.80**	9.16	1193.3	0.207	11.965		46.063	44.036		**27.2%**

Elevation: 114.92-ft

Loads	
Axial:	4.8 k
Moment:	80.2 k·ft
Shear:	9.0 k
Torsion:	0.9 k·ft

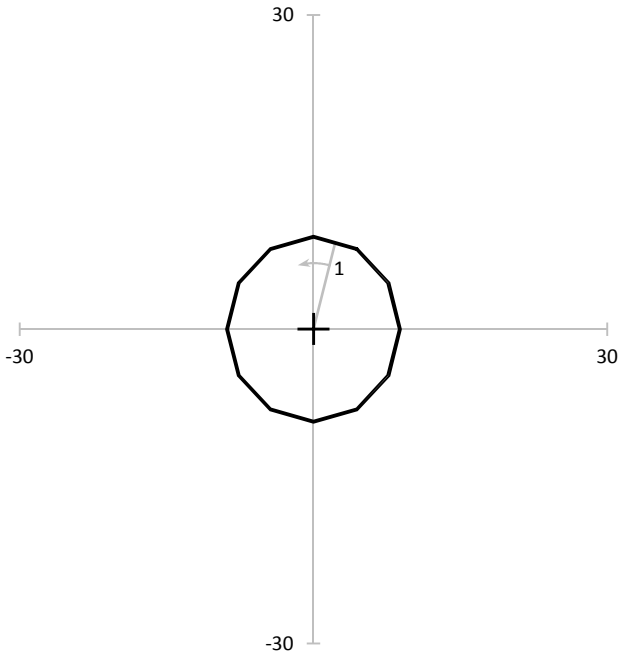
Equivalent Loads to Pole	
Axial:	4.8 k
Moment:	80.2 k·ft
Shear:	9.0 k
Torsion:	0.9 k·ft

Shear Flow N/A

Pole Info	
OD:	17.24 in
t:	0.1875 in
Pole A_G:	10.30 in^2
Pole I_G:	382.5 in^4

Controlling	
Angle:	**15.00°**
I_G:	382.5 in^4
A_G:	10.30 in^2

Minimum	
Angle:	**0.00°**
I_{MIN}:	382.5 in^4
t_{EFF}:	0.1875 in



Pole Segment: L2, F_Y = 60 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
15.00	8.93	382.5	0.468	22.478			48.000	48.000			**47.8%**

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

Elevation: 120.00-ft

Loads	
Axial:	2.3 k
Moment:	37.1 k·ft
Shear:	3.9 k
Torsion:	1.0 k·ft

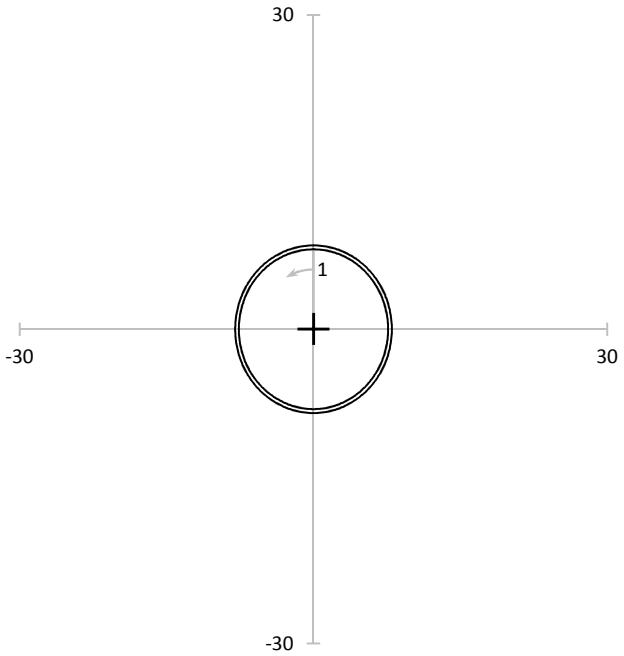
Equivalent Loads to Pole	
Axial:	2.3 k
Moment:	37.1 k·ft
Shear:	3.9 k
Torsion:	1.0 k·ft

Shear Flow N/A

Pole Info	
OD:	16.00 in
t:	0.3750 in
Pole A_G:	18.41 in^2
Pole I_G:	562.1 in^4

Controlling	
Angle:	**0.00°**
I_G:	562.1 in^4
A_G:	18.41 in^2

Minimum	
Angle:	**0.00°**
I_{MIN}:	562.1 in^4
t_{EFF}:	0.3750 in



Pole Segment: L1, F_Y = 42 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
0.00	8.00	562.1	0.125	6.338			33.600	33.600			**19.2%**

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

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

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

Site Data

BU#: *876314*
Site Name: *Horse Hill*
App #: *245531 Rev 0*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	53	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	53	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	7	in

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

Pole Data		
Diam:	43.21	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

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

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	2136	ft-kips
Unfactored Axial, P:	30	kips
Unfactored Shear, V:	25	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	119.0	Kips
Allowable Tension:	195.0	Kips
Anchor Rod Stress Ratio:	61.1%	**Pass**

Base Plate Results — Flexural Check

Base Plate Stress:	40.6	ksi
Allowable PL Bending Stress:	50.0	ksi
Base Plate Stress Ratio:	81.3%	**Pass**

PL Ref. Data
Yield Line (in): 31.74
Max PL Length: 31.74

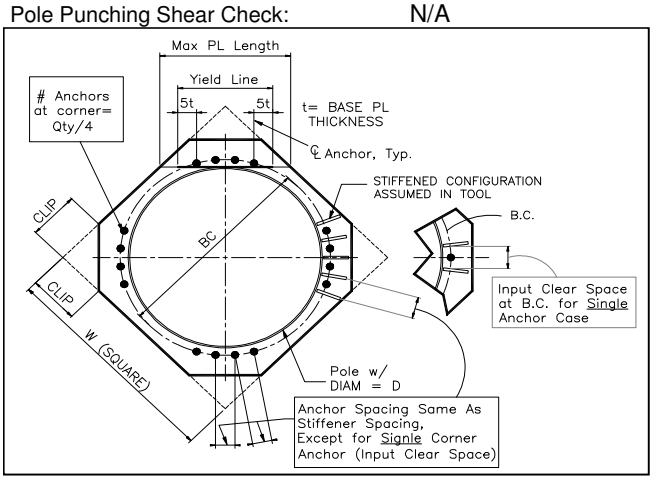
N/A - Unstiffened

Stiffener Results

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

Pole Results

Pole Punching Shear Check: N/A



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

Site Data

BU#: *876314*
Site Name: *Horse Hill*
App #: *245531 Rev. 0*

Pole Manufacturer:	Other

Reactions- Bolts		
Moment:	37.11	ft-kips
Axial:	2.3	kips
Shear:	3.9	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	18		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	19		

Plate Data		
Diam:	24	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.86	in

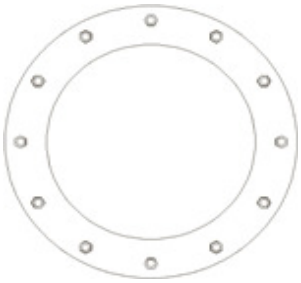
Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

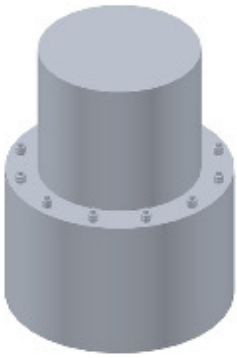
Pole Data		
Diam:	16	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round
Fu	75	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

Bolt Tension Capacity, **B**:	25.91	kips	Rigid
Max Bolt directly applied T:	5.08	Kips	Service, ASD
Min. PL "tc" for **B** cap. **w/o** Pry:	1.319	in	Fty*ASIF
Min PL "treq" for actual **T w/ Pry**:	0.447	in	
Min PL "t1" for actual **T w/o Pry**:	0.584	in	
T allowable w/o Prying:	25.91	kips	α'<0 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	5.08	kips	
Non-Prying Bolt Stress Ratio, T/B:	19.6%	**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

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

Site Data

BU#: *876314*
Site Name: *Horse Hill*
App #: *245531 Rev. 0*

Pole Manufacturer:	Other

Reactions- Upper Plate		
Moment:	31.07	ft-kips
Axial:	2.3	kips
Shear:	3.9	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	15		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	19		

Plate Data		
Diam:	24	in
Thick, t:	1.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.43	in

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

Pole Data		
Diam:	16	in
Thick:	0.375	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round
Fu	75	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Rigid
Bolt Tension Capacity, **B**:	25.91	kips	Service, ASD
Max Bolt directly applied T:	5.08	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.204	in	
Min PL "treq" for actual **T w/ Pry**:	0.402	in	
Min PL "t1" for actual **T w/o Pry**:	0.533	in	
T allowable w/o Prying:	25.91	kips	α'<0 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	5.08	kips	
Non-Prying Bolt Stress Ratio, T/B:	19.6%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	3.8	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	10.7%	**Pass**	Comp. Y.L. Length:
No Prying			10.25
Tension Side Stress Ratio, (treq/t)^2:	7.2%	**Pass**	

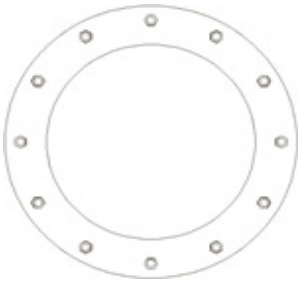
n/a

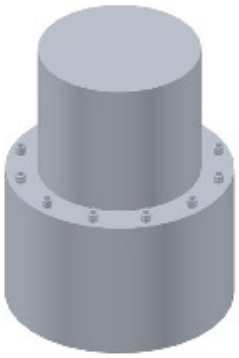
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

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

Site Data

BU#: *876314*
Site Name: *Horse Hill*
App #: *245531 Rev. 0*

Pole Manufacturer:	Other

Reactions- Lower Plate		
Moment:	31.07	ft-kips
Axial:	2.3	kips
Shear:	3.9	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	15		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	Bolt Fty:
N/A:	75	<-- Disregard	44.00
Circle (in.):	19		

Plate Data		
Diam:	24	in
Thick, t:	0.75	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.43	in

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

Pole Data		
Diam:	16	in
Thick:	0.1875	in
Grade:	60	ksi
# of Sides:	12	"0" IF Round
Fu	75	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

			Non-Rigid
Bolt Tension Capacity, **B**:	25.91	kips	Service, ASD
Max Bolt directly applied T:	5.08	Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.204	in	
Min PL "treq" for actual **T w/ Pry**:	0.402	in	
Min PL "t1" for actual **T w/o Pry**:	0.533	in	
T allowable with Prying:	17.66	kips	α'>1 case
Prying Force, Q:	0.00	kips	
Total Bolt Tension=T+Q:	5.08	kips	
Prying Bolt Stress Ratio=(T+Q)/(B):	19.6%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Non-Rigid
Compression Side Plate Stress:	15.4	ksi	Service ASD
Allowable Plate Stress:	36.0	ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	42.7%	**Pass**	Comp. Y.L. Length:
No Prying			10.25
Tension Side Stress Ratio, (treq/t)^2:	28.8%	**Pass**	

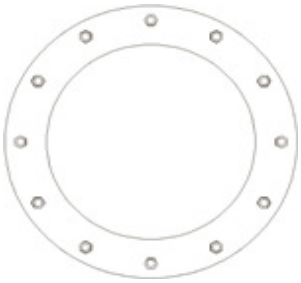
n/a

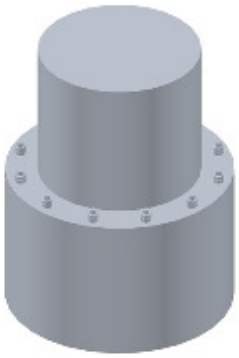
Stiffener Results

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

Pole Results

Pole Punching Shear Check: n/a





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

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

Monopole on Mat Foundation with Rock Anchors - TIA-222-F

Site Data	
Site Name:	Horse Hill
CCI Number:	BU 876314
TEP Job Number:	25675.2059

ASIF	1.333

Unfactored Reactions from TNX		
Axial	30	k
Shear	25	k
Moment	2136	k-ft

Soil Properties		
Allowable Bearing q_a	20	ksf
Mat Subgrade, ks	720	kcf
Wt Soil Above Mat	0	pcf

Mat and Pier Properties		
Mat Width	16.5	ft
Mat Length	16.5	ft
Mat Depth	4.0	ft
Pier Type	Round	
Pier Width/Diam.	6.0	ft
Pier Height	0.0	ft

Rock Anchor Properties		
Diameter	2	in
Net Area	2.43	in^2
Yield Stress	90.1	ksi

Rock Geotechnical Properties		
Wt of Rock	165	pcf
Angle of Rock Cone	35	deg
Steel/Grout Bond[1]	145	psi
Grout/Rock Bond[1]	75	psi
Total RA Length	20	ft
Bonded Length	15	ft
Drilled Shaft Diam.	3.50	in

[1]Allowable Bond Values

Spring Stiffness	366.5	k/in

Mat Foundation Results

Bearing Stress	16.5	ksf
Allowable Bearing	20.0	ksf
% Capacity	82.6%	**Pass**

Mat and Pier Structural Results

Bending Moment	1321.4	kft
Allowable Bending	5038.1	kft
% Capacity	26.2%	**Pass**

Grout-Steel Bond

Load Reaction	39.42	k
Allowable Design Load	218.7	k
% Capacity	18.0%	**Pass**

Grout-Rock Bond

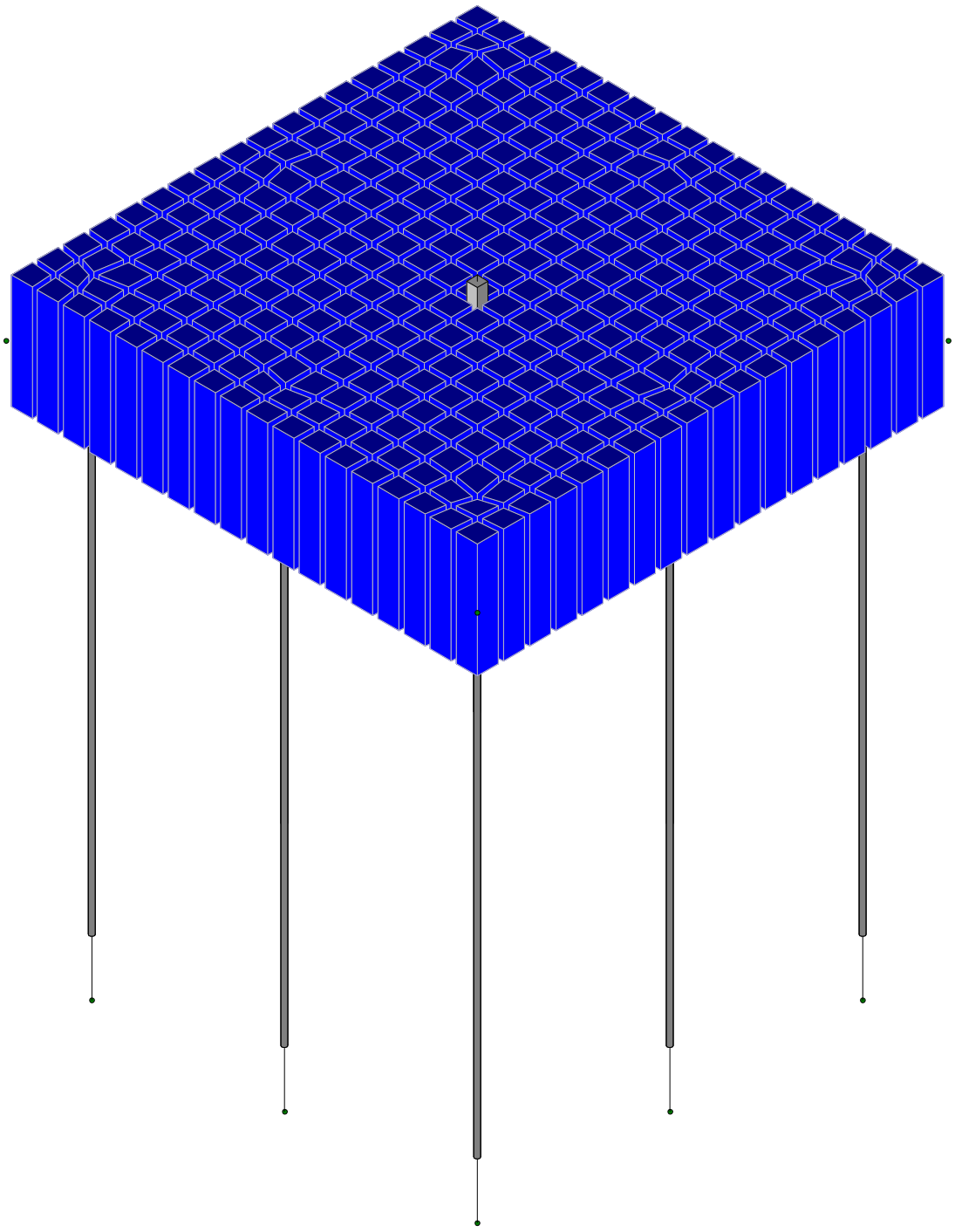
Load Reaction	39.42	k
Allowable Design Load	148.4	k
% Capacity	26.6%	**Pass**

Weight of Rock

Load Reaction	108.99	k
Allowable Design Load	494.7	k
% Capacity	22.0%	**Pass**

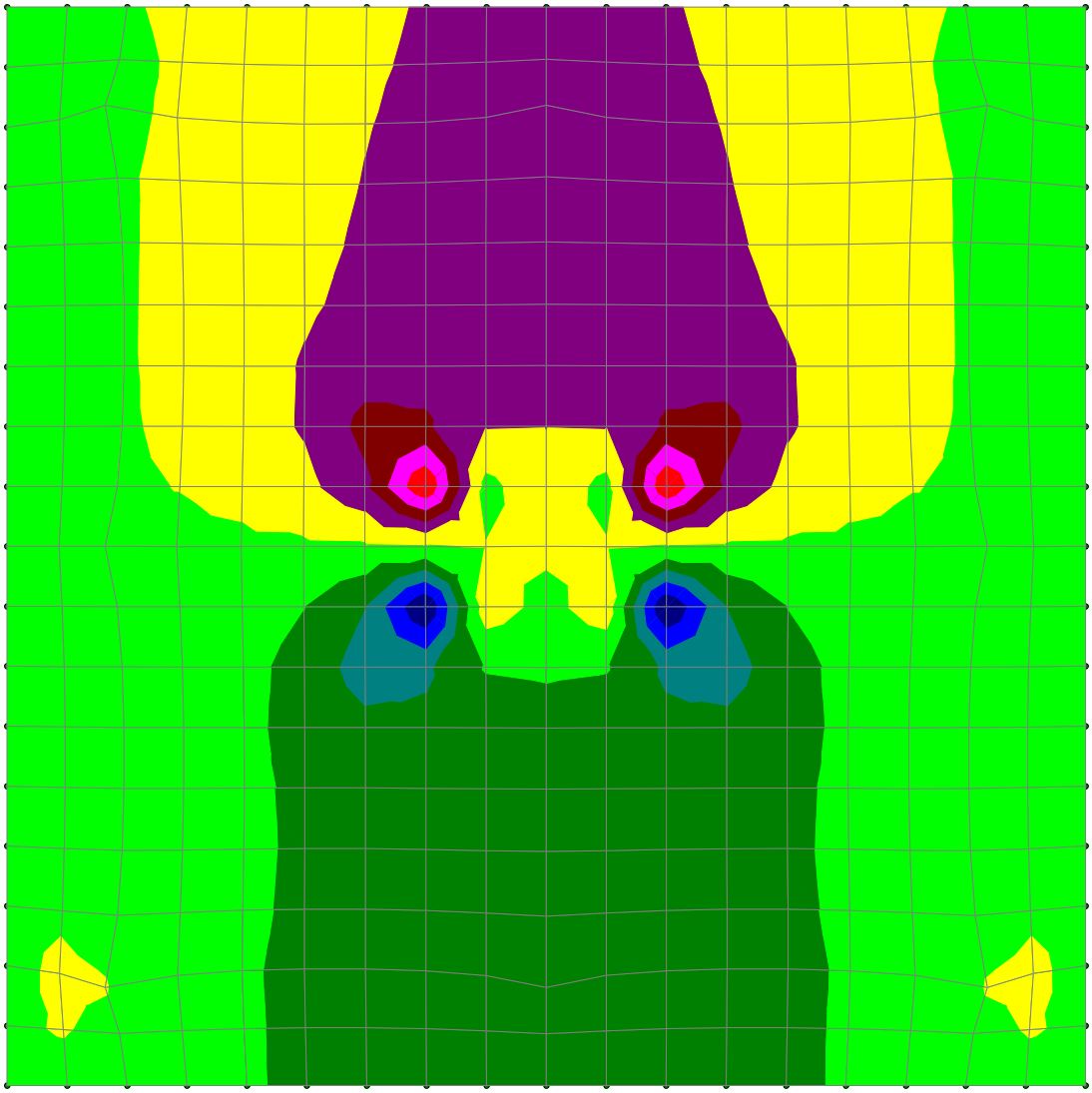
Rock Anchor Steel Results

Load Reaction	39.42	k
Allowable Design Load	175.2	k
% Capacity	22.5%	**Pass**



Envelope Only Solution

TEP	Horse Hill (BU 876314)	SK - 1
RT		June 24, 2014 at 9:18 AM
25675.20592		Foundation.r3d



TEP	Horse Hill (BU 876314)	SK - 2
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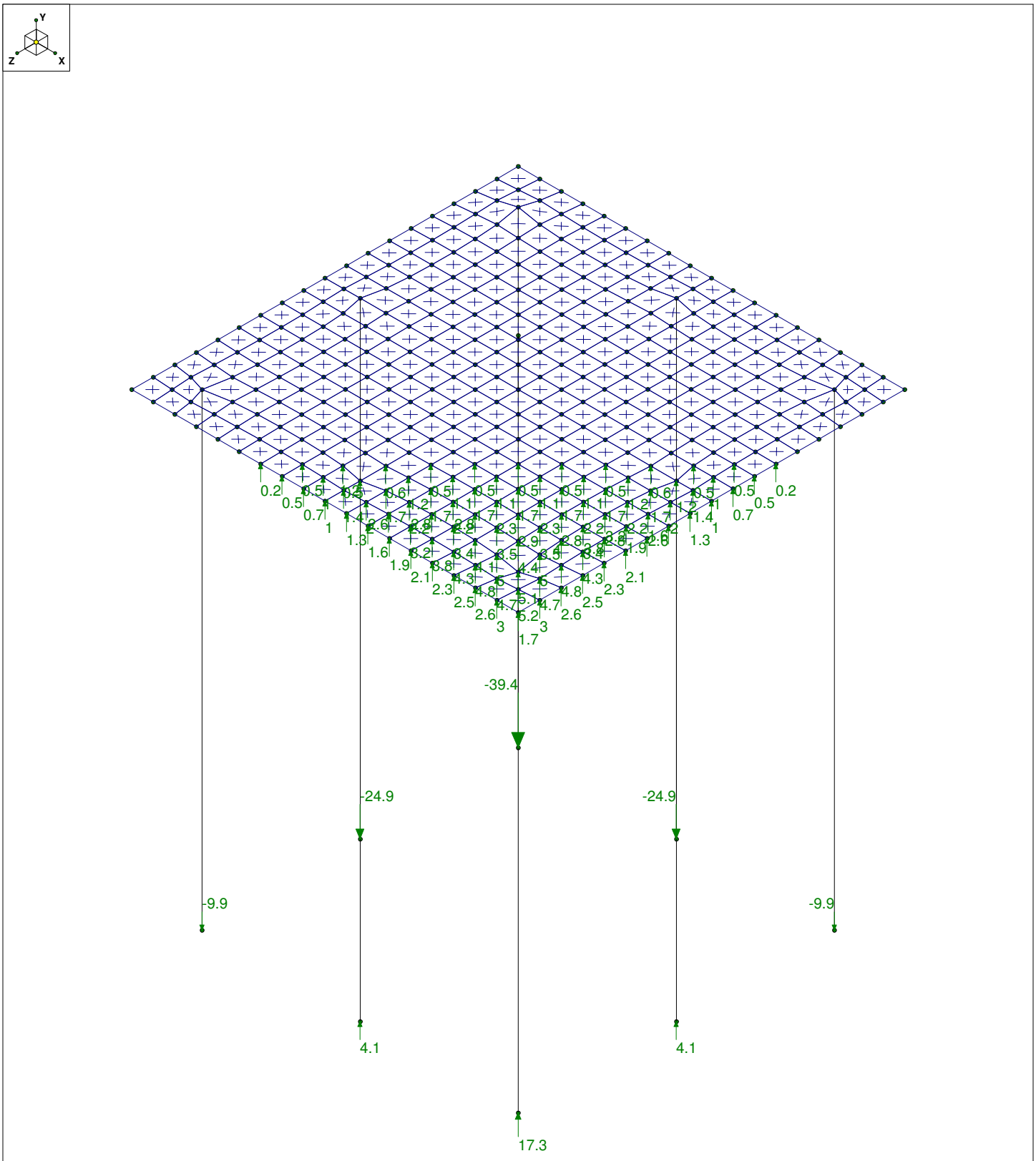

TEP	Horse Hill (BU 876314)	SK - 3
RT		June 24, 2014 at 9:21 AM
25675.20592		Foundation.r3d

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC017

Horse Hill

214 Russian Village Road
Southbury, CT 06488

July 4, 2014

EBI Project Number: 62143777

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

EBI Consulting
environmental | engineering | due diligence

July 4, 2014

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

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT03XC017 - Horse Hill

Site Total: 51.11% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 214 Russian Village Road, Southbury, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 214 Russian Village Road, Southbury, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 3 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
7) The antenna mounting height centerline for the proposed antennas is **120 feet** above ground level (AGL).
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT03XC017 - Horse Hill
Site Addresss	214 Russian Village Road, Southbury, CT, 06488
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	120	114	1/2 "	0.5	0	208.04	0.58%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	120	114	1/2 "	0.5	0	39.00	0.19%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	120	114	1/2 "	0.5	0	138.69	0.68%
														Sector total Power Density Value:		1.44%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	120	114	1/2 "	0.5	0	208.04	0.58%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	120	114	1/2 "	0.5	0	39.00	0.19%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	120	114	1/2 "	0.5	0	138.69	0.68%
														Sector total Power Density Value:		1.44%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	3	60	5.9	120	114	1/2 "	0.5	0	208.04	0.58%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	120	114	1/2 "	0.5	0	39.00	0.19%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	120	114	1/2 "	0.5	0	138.69	0.68%
														Sector total Power Density Value:		1.44%

Site Composite MPE %	
Carrier	MPE %
Sprint	4.33%
Nextel	4.71%
MetroPCS	8.40%
T-Mobile	11.22%
AT&T	22.45%
Total Site MPE %	**51.11%**

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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **4.33% (1.44% from sector 1, 1.44% from sector 2 and 1.44% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **51.11%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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RF Engineering Director

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