April 30, 2019

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

Regarding:	Notice of Exempt Modification – Addition of 3 Antennas and 6 radio heads
Property Address:	99 Cedarwood Lane, Newington, CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 170 foot guyed lattice tower ("tower") at the above-referenced address, latitude 41.69477, longitude -72.7089711. AT&T's facility consists of nine (9) wireless telecommunications antennas at 120 feet. The tower is controlled and owned by Callahan Acres, LLC. Assessor's Information is attached hereto.

AT&T desires to modify its existing telecommunications facility by adding three (3) antennas, and six (6) remote radio heads ("RRHs"). The centerline height of said antennas is and will remain at 120 feet.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72 (b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor of Newington, the Town Manager of Newington, The Building Official of Newington and the Town Planner of Newington. A copy of this letter is also being sent to Callahan Acres, LLC, the owner of the structure that AT&T is located.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's antennas and RRHs will be installed at 120 foot level of the 170 foot tall guyed lattice tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.

16 Esquire Road, Billerica, MA 01862 Phone 978-284-3906 Email: ncaplan@empiretelecomm.com

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. An RF emissions calculation is attached.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by AECOM Engineering dated January 11, 2019).

For the foregoing reasons AT&T respectfully requests that the proposed addition of 3 antennas and 6 RRHs be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

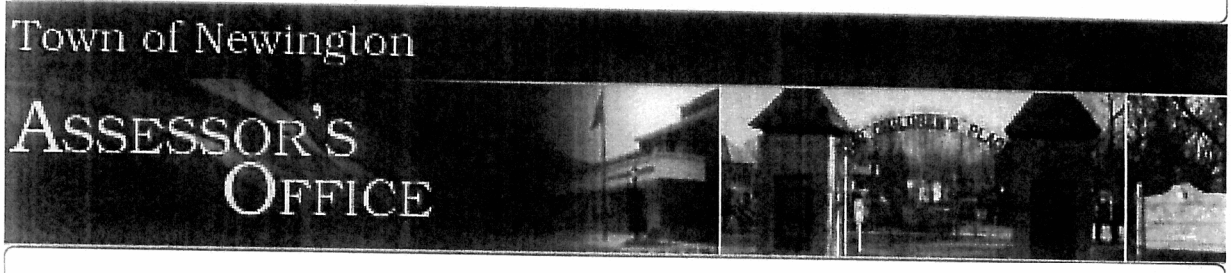
Sincerely,

Scott Pike
Site Acquisition Specialist
Empire Telecom

CC: The Honorable Roy Zartarian, Mayor, Town of Newington
Tanya Lane, Town Manager, Town of Newington
Craig Minor, Town Planner, Town of Newington
Douglas Jourdan, Building Official, Town of Newington
Callahan Acres, LLC c/o Fred Callahan

16 Esquire Road, Billerica, MA 01862 Phone 339-223-9828 Email: spike@empiretelecomm.com

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2015.



Information on the Property Records for the Municipality of Newington was last updated on 5/12/2016.

Parcel Information

Location:	99 CEDARWOOD LN	Property Use:	Residential	Primary Use:	Residential
Unique ID:	C1000010	Map Block Lot:	17/480/000	Acres:	2.81
490 Acres:	0.00	Zone:	R-20	Volume / Page:	2117/0550
Developers Map / Lot:	N/E 2139 AKA 5	Census:			

Value Information

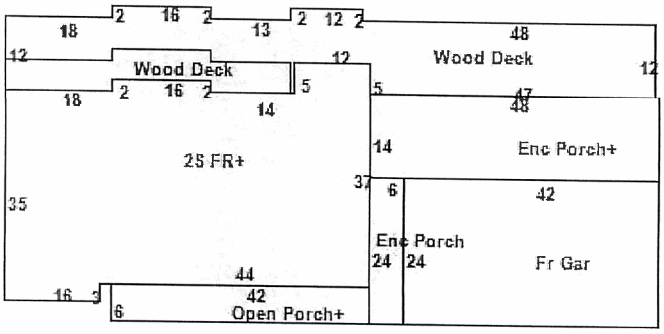
	Appraised Value	70% Assessed Value
Land	145,955	102,170

	Appraised Value	70% Assessed Value
Buildings	463,632	324,540
Detached Outbuildings	0	0
Total	609,587	426,710

Owner's Information

Owner's Data
CALLAHAN QUALIFIED PERSONAL RESIDENC THE CIOFFARI PAUL TRUSTEE 433 SOUTH MAIN ST STE 200 WEST HARTFORD CT 06110

Building 1



Building Use:	Single Family	Style:	Colonial	Living Area:	4,120
Stories:	2.00	Construction:	Wood Frame	Year Built:	1990
Total Rooms:	9	Bedrooms:	4	Full Baths:	3
Half Baths:	0	Fireplaces:	1	Heating:	Hot Water
Fuel:	Oil	Cooling Percent:	100	Basement Area:	2,060

Basement Finished Area:	500	Basement Garages:	0	Roof Material:	Asphalt
Siding:	Clapboards	Units:			

Special Features

Attached Components

Type:	Year Built:	Area:
Wood Deck	1990	235
Wood Deck	1990	1,248
Frame Garage	1990	1,008
Enclosed Porch	1990	672
Enclosed Porch	1990	144
Open Porch	1990	252

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Cell Tower	2000	0.00	0.00	0

Owner History - Sales

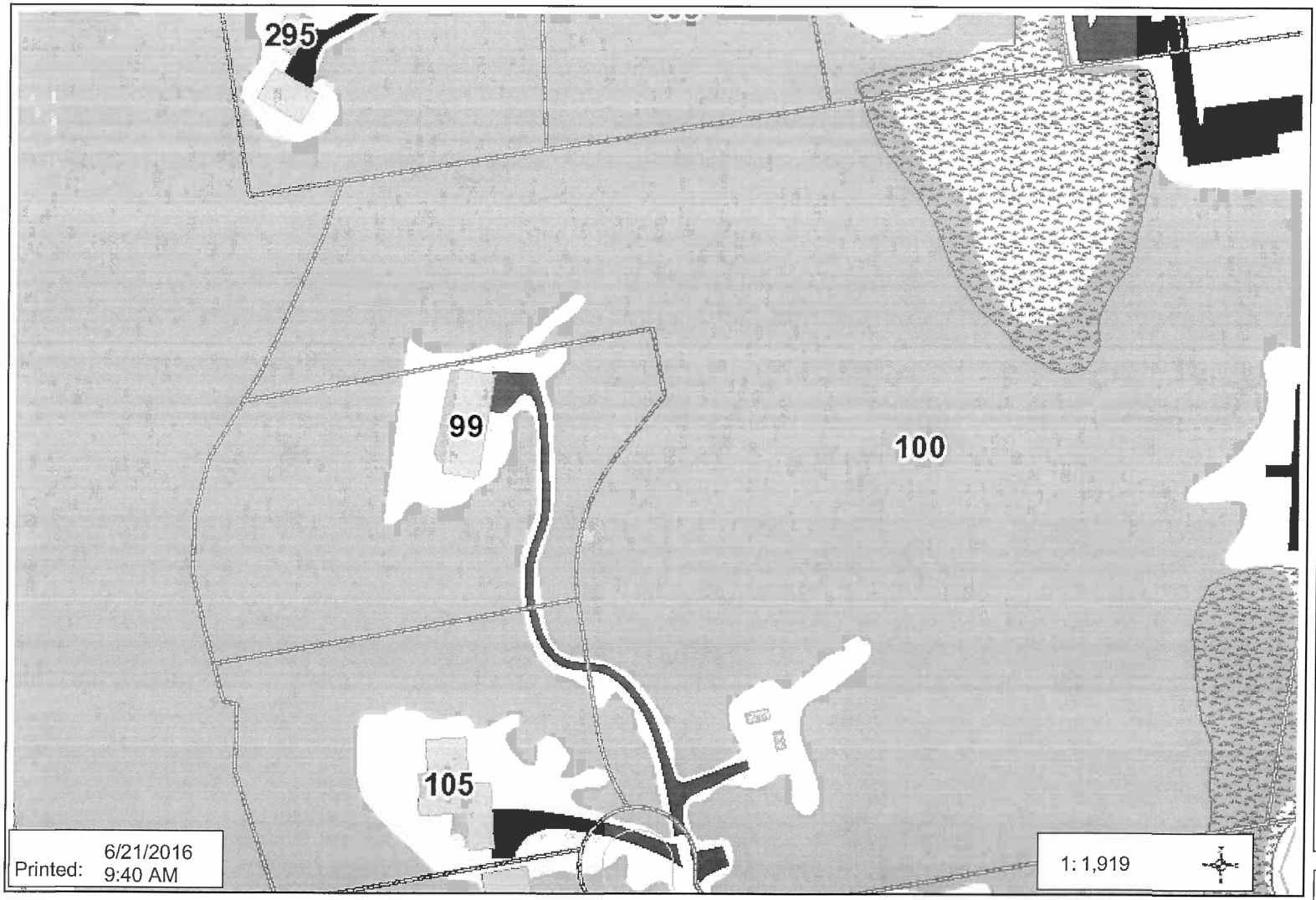
Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
CALLAHAN QUALIFIED PERSONAL RESIDENC THE	2117	550	04/01/2013		No	$0
CALLAHAN FREDERICK H III	737	309	01/02/1990		No	$0
CALLAHAN FREDERICK H JR	245	222	01/10/1974		No	$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
B-14-704	Remodel	11/06/2014		Closed	REMOVAL RADIO EQUIPMENT ADD HAMS CABLES ANTENNAS
TB-14-597		09/15/2014		Closed	Structural Modification Tower to include Plumb & Tension
B-14-541		09/05/2014		Needs Visit	INSTALL 3 RADIO HEADS
B-13-78	Remodel	03/07/2013		Closed	REPLACE ONE RADIO CABINET
76601		11/25/2008		Closed	3 ANTENNAS & 6 CABLES ON TOWER

Newington GIS Web Map



Legend

- Parcel
- Structures
  - BUILDING
  - CEMENT
  - DECK
  - FOOTBRIDGE
  - FOUNDATION
  - GREENHOUSE
  - POOL
  - STEPS
  - TANK
- Paved Areas
  - Driveway and Parking Lot
  - Sidewalk
- Rail Road Line
- Hydrography
  - Water
  - Swamp area
- Stream
- Vegetation Area

Notes

Notes

319.9 0 159.94 319.9 Feet

This map is user generated static output. This map is for reference only and should be used for REPRESENTATION ONLY. The Town of Newington refutes any liability for any actions taken or not taken based on this map.

THIS MAP IS NOT TO BE USED FOR NAVIGATION AND IS NOT CONSIDERED SURVEY QUALITY.

WIRELESS COMMUNICATIONS FACILITY
CT1145 - LTE 5C/6C/7C FIRSTNET
NEWINGTON
99 CEDARWOOD LANE
NEWINGTON, CT 06111

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA–222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2016 CONNECTICUT FIRE SAFETY CODE AND, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD–OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON–SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB–CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1–800–922–4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT

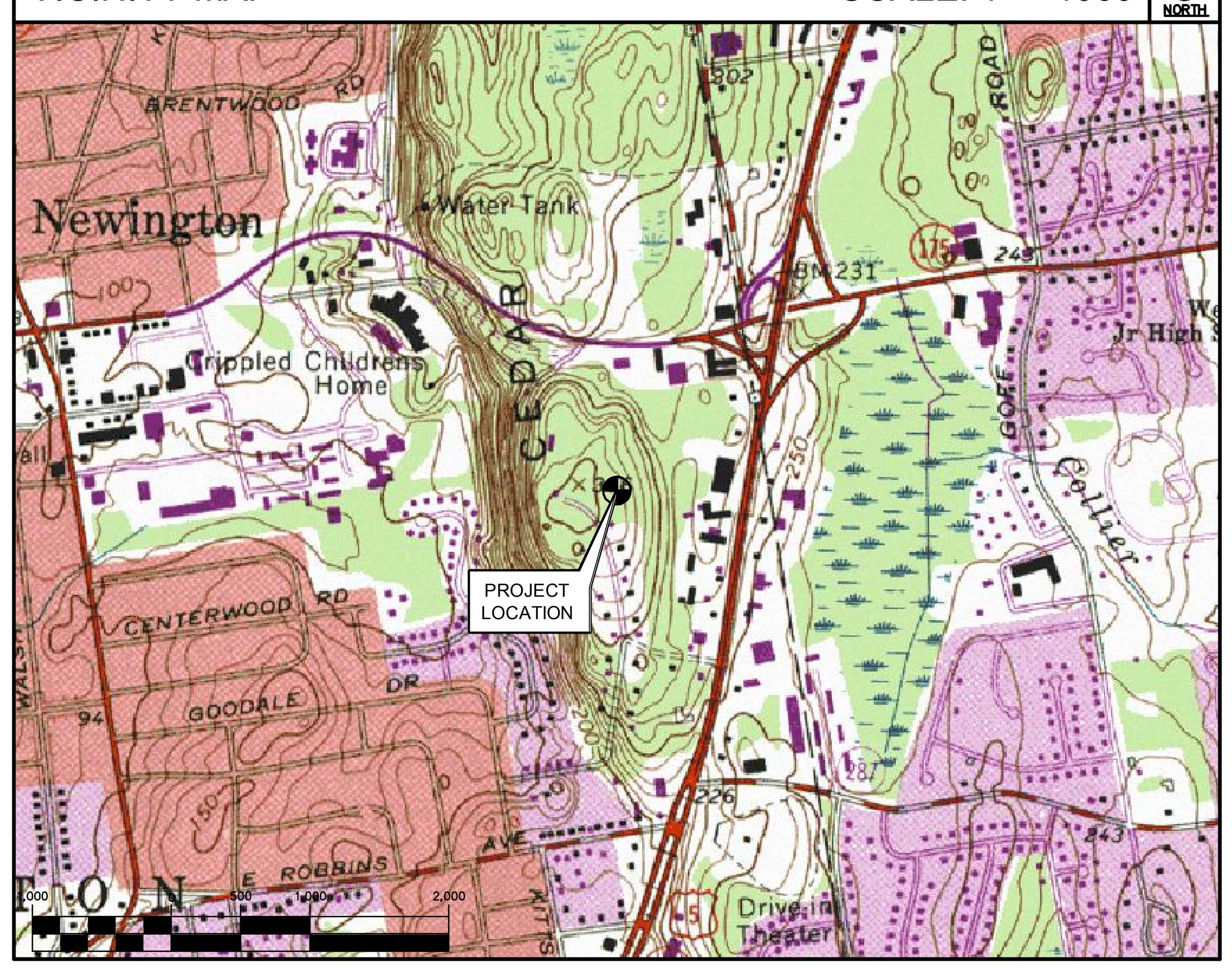
TO: 99 CEDARWOOD LANE
NEWINGTON, CONNECTICUT

1.	TURN LEFT ONTO CAPITAL BLVD.	0.36 MI
2.	TURN LEFT ONTO WEST ST.	0.27 MI
3.	TURN RIGHT ONTO CROMWELL AVE/CT–3.	0.59 MI
4.	TURN LEFT ONTO NEW BRITAIN AVE/CT–160.	0.81 MI
5.	TAKE THE 3RD RIGHT ONTO HAYES RD.	0.39 MI
6.	HAYES RD BECOMES HIGHLAND ST.	0.82 MI
7.	HIGHLAND ST BECOMES THORNBUSH RD.	0.66 MI
8.	TURN LEFT ONTO PROSPECT ST/CT–287.	0.57 MI
9.	TURN LEFT ONTO US–5 S/CT–15 S/CT–287/BERLIN TURNPIKE.	0.77 MI
10.	TAKE THE 1ST RIGHT ONTO E ROBBINS AVE/CT–287.	0.06 MI
11.	TAKE THE 1ST RIGHT ONTO GOODALE DR	0.22 MI
12.	TAKE THE 1ST RIGHT ONTO CEDARWOOD LN.	0.10 MI
13.	99 CEDARWOOD LN, NEWINGTON, CT 06111–3127, 99 CEDARWOOD LN IS ON THE LEFT.	0.50 MI

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

   A. AT ANTENNA SECTORS:
   - REPLACE THE EXISTING ANTENNA BOOM MOUNTS WITH NEW BOOM MOUNTS AS SPECIFIED HEREING (TYPICAL OF (3).
   - INSTALL KATHREIN ANTENNA AT POS 3. (TOTAL OF 3)
   - INSTALL (1) DC SQUID
   - INSTALL RRUS–32 B66 AT POS. 3. (TOTAL OF 3)
   - INSTALL B14–4478 AT POS. 3. (TOTAL OF 3)

   B. AT THE EQUIPMENT SHELTER
   - REMOVE EXISTING RRU RACK AND REPLACE WITH NEW RRU RACK TO ACCOMMODATE EXISTING/PROPOSED EQUIPMENT.
   - RRUS (TOTAL OF 6) FROM EXISTING RACK, TO BE MOUNTED ON NEWLY PROPOSED RACK.
   - INSTALL (3) RRUS–E2 ON NEWLY PROPOSED RRU RACK WITH (6) SURGE ARRESTORS (APTDC–BDFDM–DB)
   - IN LTE RACK, ADD 2ND 5216 WITH XMU AND IDLe.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT1145
AT&T SITE NAME:	NEWINGTON
SITE ADDRESS:	99 CEDARWOOD LANE NEWINGTON, CT 06111
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
AT&T PACE ID NUMBER:	PACE JOB 1 – MRCTB024103 PACE JOB 2 – MRCTB022772
AT&T FA LOCATION CODE:	10035097
ENGINEER:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°–41'–41.25" N LONGITUDE: 72°–42'–32.37" W GROUND ELEVATION: ±345' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T–1	TITLE SHEET	0
N–1	NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE	0
C–1	PLANS AND ELEVATION	0
C–2	ANTENNA CONFIGURATION DETAILS	0
C–3	DETAILS	0
C–4	DETAILS	0
E–1	SCHEMATIC DIAGRAM AND NOTES	0
E–2	WIRING DIAGRAM	0
E–3	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/31/18	DMD	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
NEWINGTON
CT1145 – LTE 5C/6C/7C FIRSTNET
99 CEDARWOOD LANE
NEWINGTON, CT 06111

DATE: 03/15/18
SCALE: AS NOTED
JOB NO. 18000.21

TITLE SHEET

T–1

Sheet No. 1 of 9

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90–110 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. ANTENNA PANELS:
   A. SHERWIN WILLIAMS POLANE-B
   B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
2. COAXIAL CABLES:
   A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI-SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH-PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON-PETROLEUM-BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

PROPOSED ANTENNA AND APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) TMA/DIPLEXER/TRIPLEXER (QTY)	(E/P) RRU (QTY)	FEEDER	(E/P) RAYCAP (QTY)
A1	EXISTING	UMTS 850	POWERWAVE (7770)	55 x 11 x 5	120'	143°	(E) PWAV TMA: LGP21401 SINGLE 1900 W/ 850BP (2), (E) KATHREIN DIPLEX.: 782-10250		7/8ø COAX (2)	(E) RAYCAP DC6-48-60-18-8F (2)
A2	EXISTING	LTE WCS/850/700DE	CCI (OPA-65R-LCUU-H6)	72.0 x 14.8 x 7.4	120'	90°	(E) CCI TRIPLEX.: TPX-070821	(E) RRUS-11 (1), (E) RRUS-32 (1), (P)RRUS-E2 (1)	7/8ø COAX (2), FIBER AND DC POWER	
A3	PROPOSED	LTE 700 B14/AWS	KATHREIN (800-10965)	78.7 x 20.0 x 6.9	120'	90°		(P) B14-4478 (1), (P) RRUS-32 B66 (1)	FIBER AND DC POWER	(P) RAYCAP DC6-48-60-0-8F (1)
A4	EXISTING	LTE 700/PCS	QUINTEL (QS66512-2)	72.0 x 12.0 x 9.6	120'	90°		(E) RRUS-11 (1), (E) RRUS-32 B2 (1)	FIBER AND DC POWER	
B1	EXISTING	UMTS 850	POWERWAVE (7770)	55 x 11 x 5	120'	263°	(E) PWAV TMA: LGP21401 SINGLE 1900 W/ 850BP (2), (E) KATHREIN DIPLEX.: 782-10250		7/8ø COAX (2)	
B2	EXISTING	LTE WCS/850/700DE	CCI (OPA-65R-LCUU-H6)	72.0 x 14.8 x 7.4	120'	220°	(E) CCI TRIPLEX.: TPX-070821	(E) RRUS-11 (1), (E) RRUS-32 (1), (P)RRUS-E2 (1)	7/8ø COAX (2), FIBER AND DC POWER	
B3	PROPOSED	LTE 700 B14/AWS	KATHREIN (800-10965)	78.7 x 20.0 x 6.9	120'	220°		(P) B14-4478 (1), (P) RRUS-32 B66 (1)	FIBER AND DC POWER	
B4	EXISTING	LTE 700/PCS	QUINTEL (QS66512-2)	72.0 x 12.0 x 9.6	120'	220°		(E) RRUS-11 (1), (E) RRUS-32 B2 (1)	FIBER AND DC POWER	
C1	EXISTING	UMTS 850	POWERWAVE (7770)	55 x 11 x 5	120'	23°	(E) PWAV TMA: LGP21401 SINGLE 1900 W/ 850BP (2), (E) KATHREIN DIPLEX.: 782-10250		7/8ø COAX (2)	
C2	EXISTING	LTE WCS/850/700DE	CCI (OPA-65R-LCUU-H6)	72.0 x 14.8 x 7.4	120'	340°	(E) CCI TRIPLEX.: TPX-070821	(E) RRUS-11 (1), (E) RRUS-32 (1), (P)RRUS-E2 (1)	7/8ø COAX (2), FIBER AND DC POWER	
C3	PROPOSED	LTE 700 B14/AWS	KATHREIN (800-10965)	78.7 x 20.0 x 6.9	120'	340°		(P) B14-4478 (1), (P) RRUS-32 B66 (1)	FIBER AND DC POWER	
C4	EXISTING	LTE 700/PCS	QUINTEL (QS66512-2)	72.0 x 12.0 x 9.6	120'	340°		(E) RRUS-11 (1), (E) RRUS-32 B2 (1)	FIBER AND DC POWER	

RRU	SIZE (INCHES) (L x W x D)
RRUS-11	19.7 x 17 x 7.2
RRUS-32	27.2 x 12.1 x 7
RRUS-32 B2	27.2 x 12.1 x 7
RRUS-32 B66	27.2 x 12.1 x 7
B14-4478	14.9 x 13.1 x 7.3
RRUS-E2	20.4 x 18.5 x 7.5

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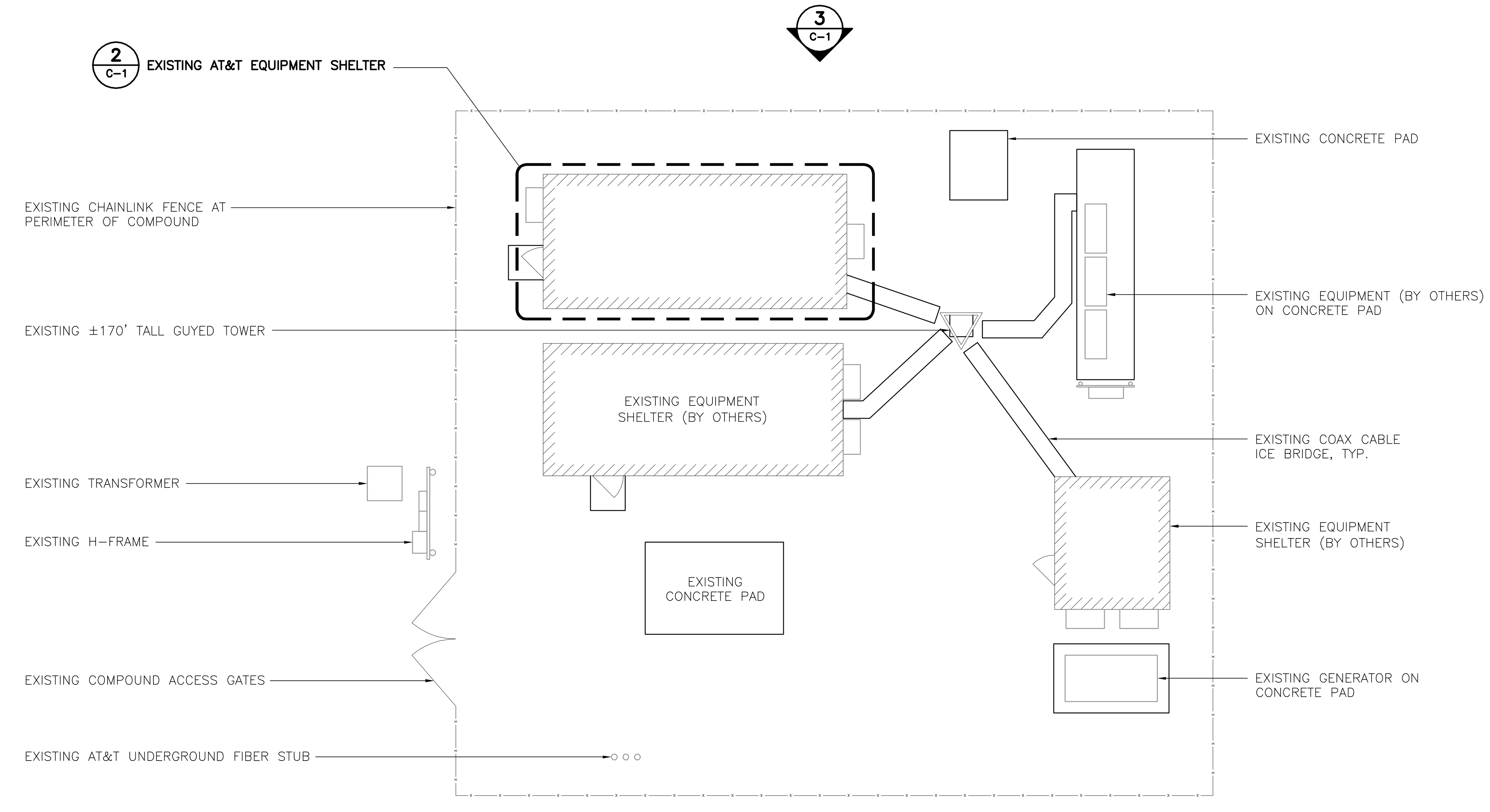
NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE

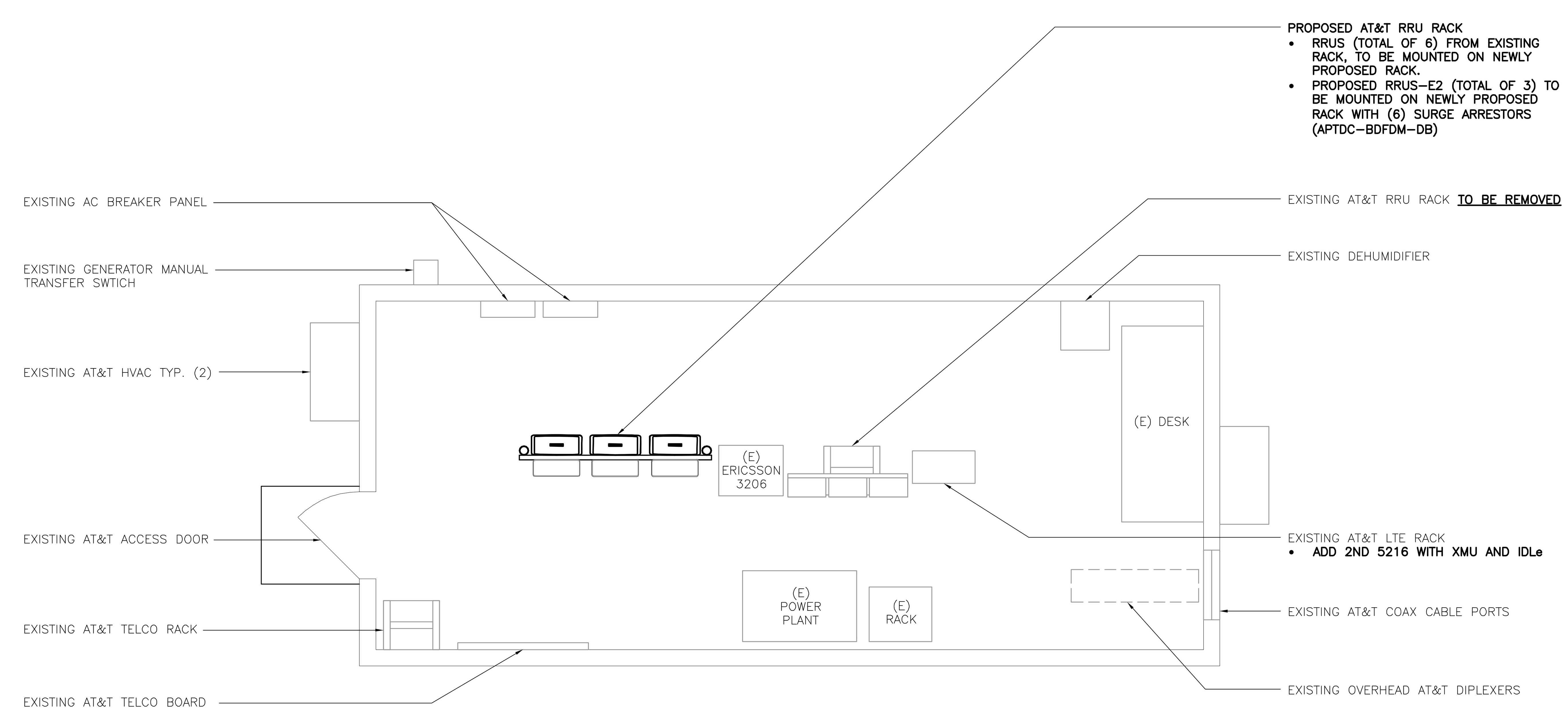
N-1



1 C-1 **PARTIAL SITE PLAN**
SCALE: 1/8" = 1'-0"

TRUE NORTH

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1/8 inch = 1 ft.

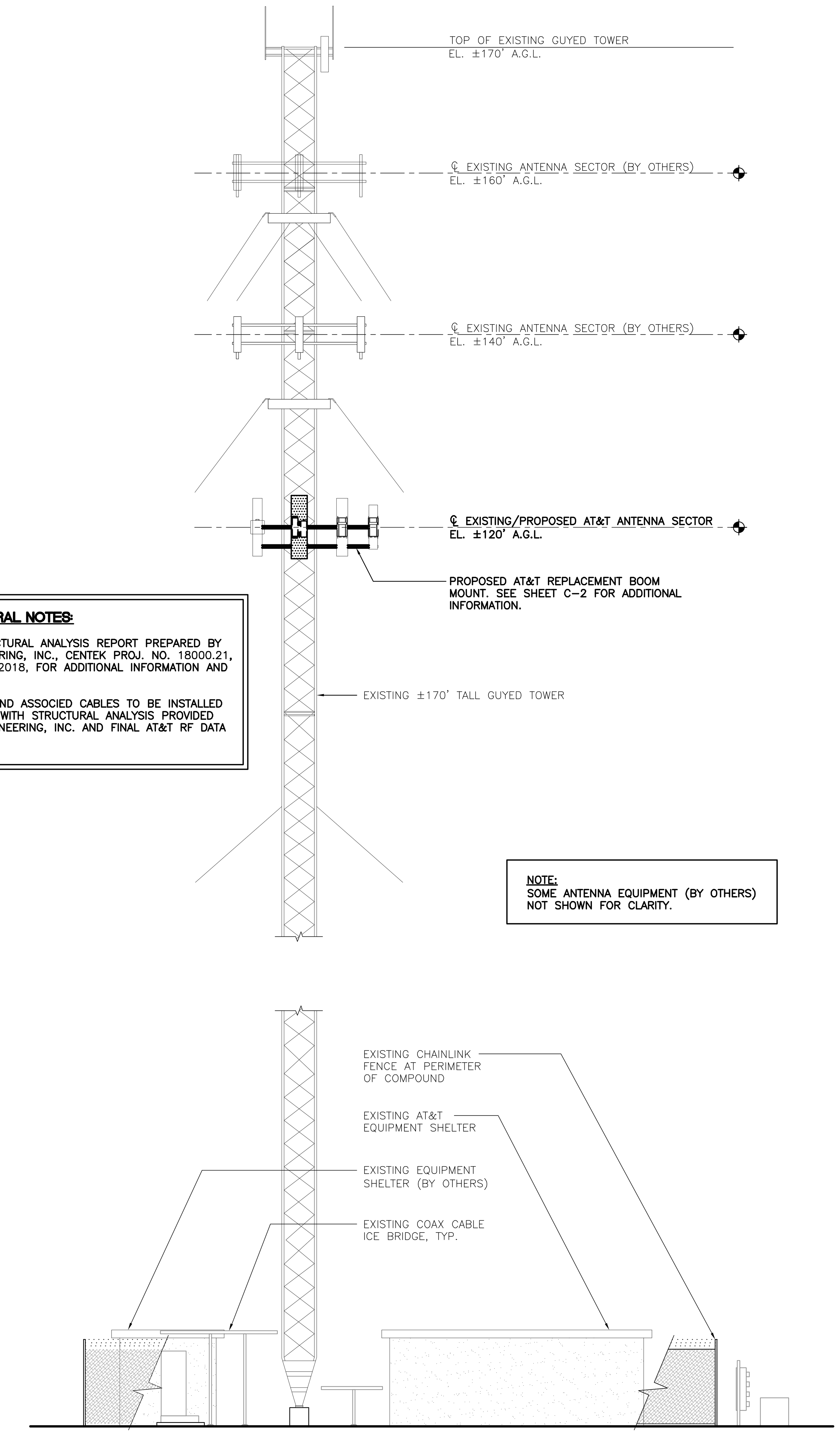


2 C-1 **PROPOSED EQUIPMENT LAYOUT PLAN**
SCALE: 3/8" = 1'-0"

TRUE NORTH

TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., CENTEK PROJ. NO. 18000.21, DATED MAY 25, 2018, FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND ASSOCIED CABLES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC. AND FINAL AT&T RF DATA SHEET.



NOTE:
SOME ANTENNA EQUIPMENT (BY OTHERS) NOT SHOWN FOR CLARITY.

3 C-1 **PARTIAL NORTH ELEVATION - PROPOSED**
SCALE: 1/8" = 1'-0"

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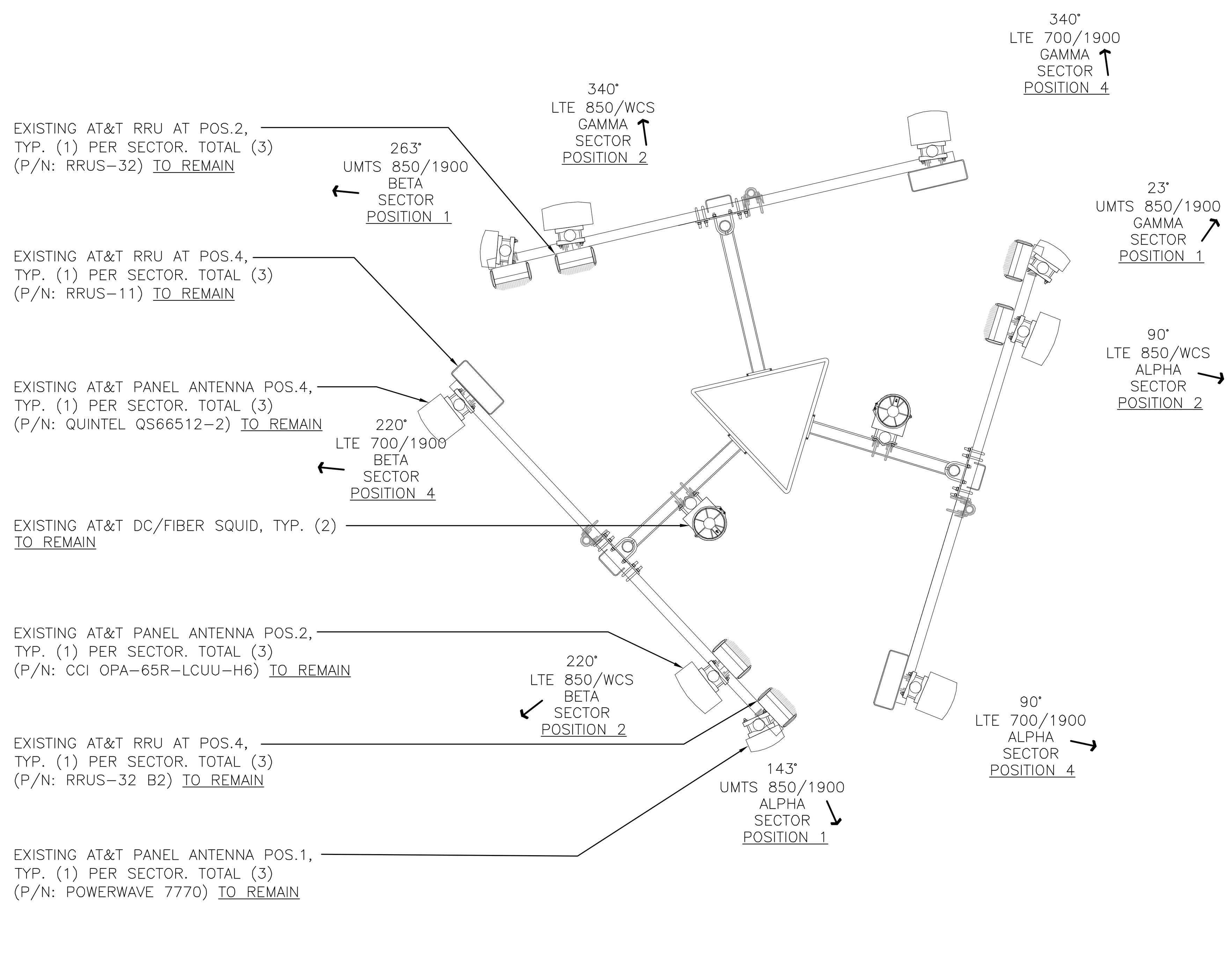
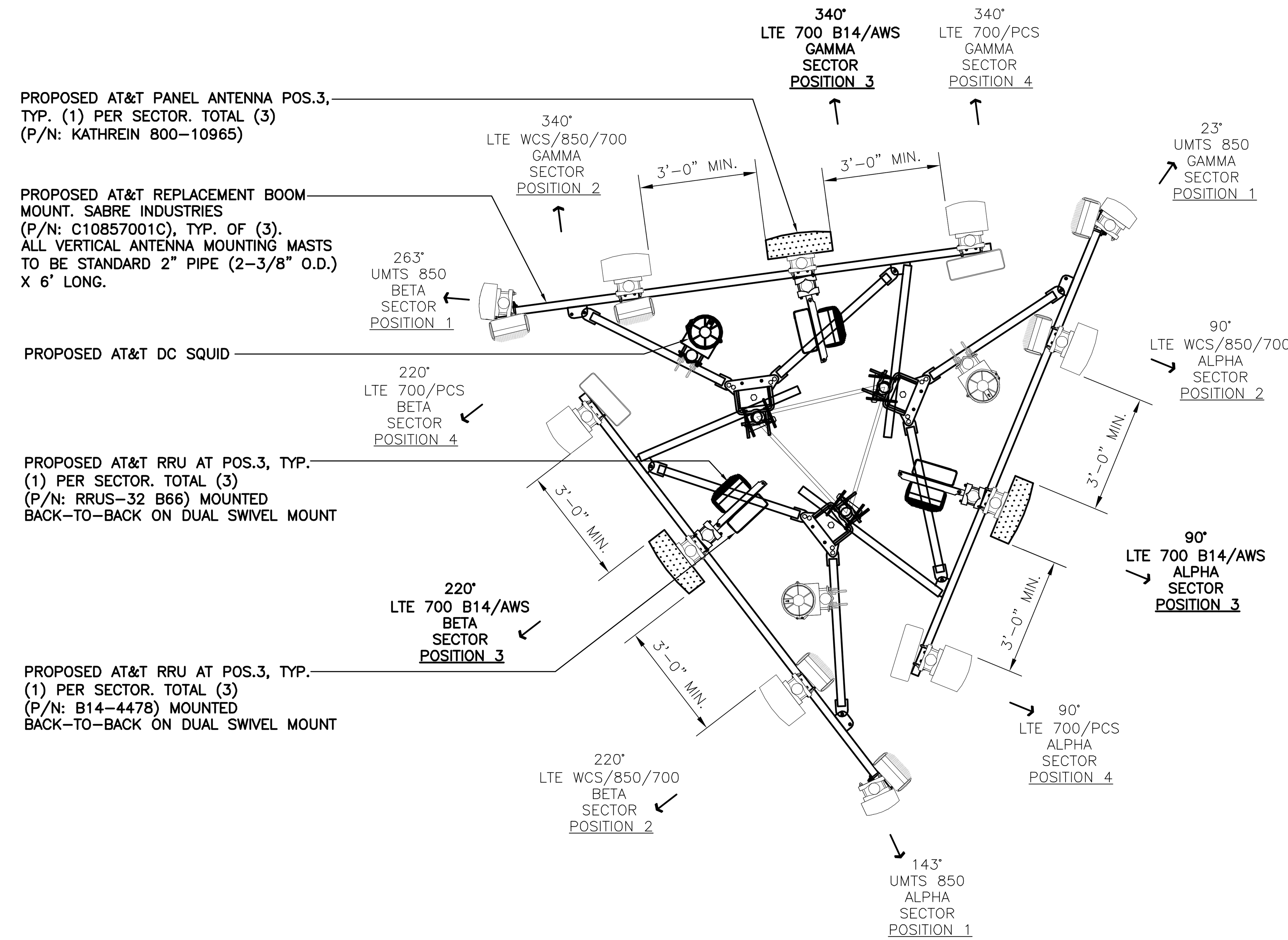
PLANS AND ELEVATION

C-1

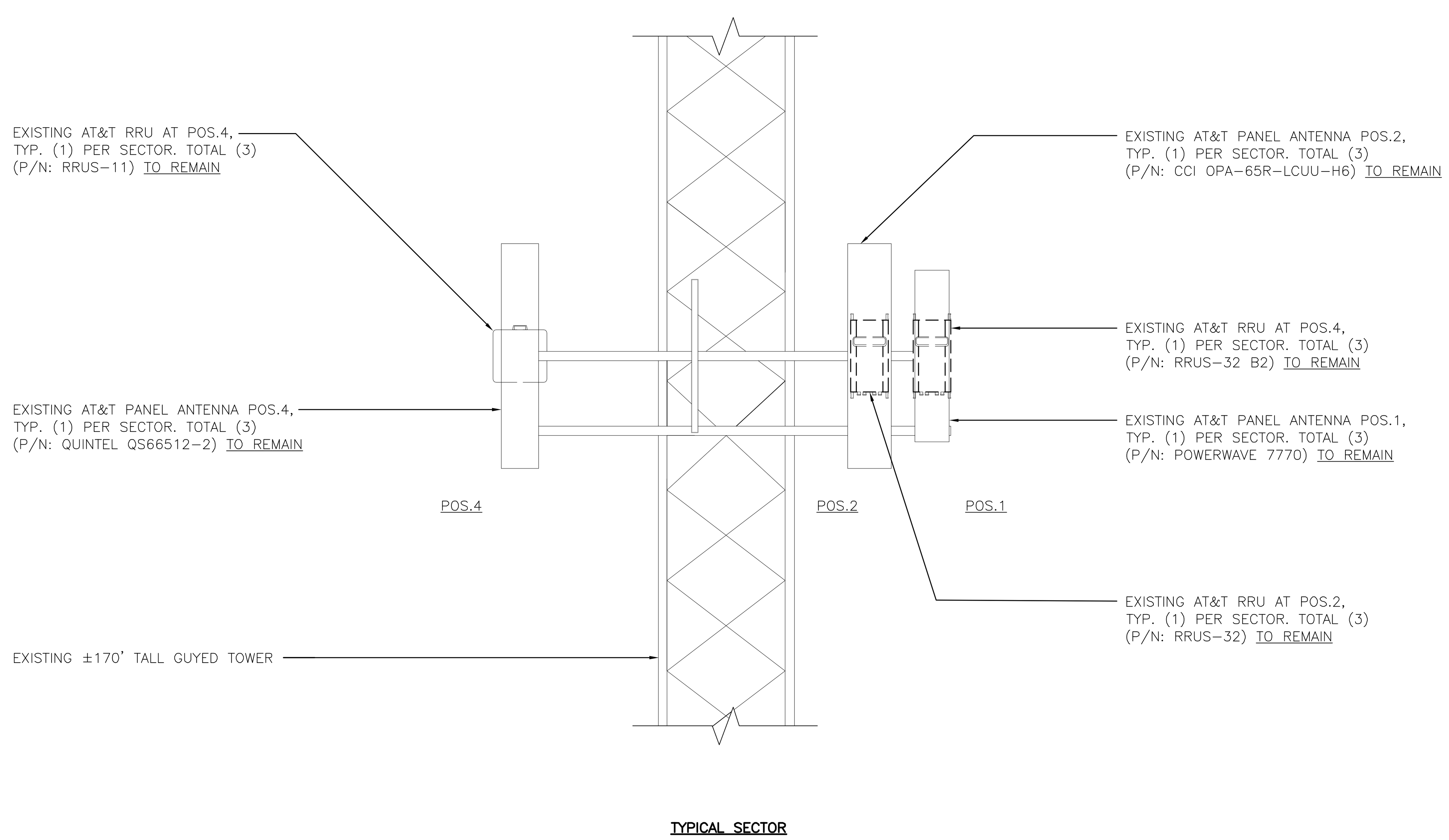
Sheet No. 3 of 9



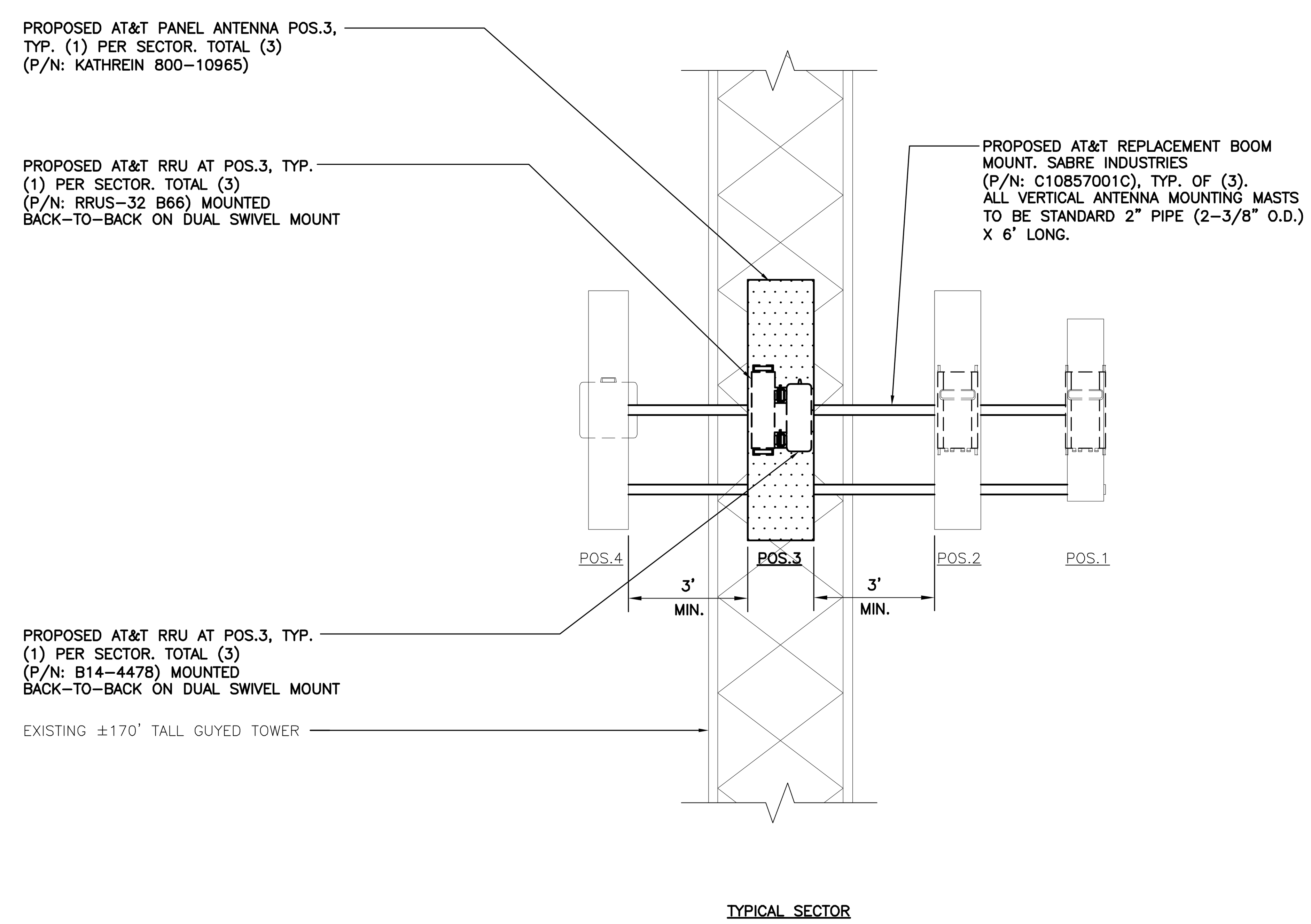
1 / C-2 **EXISTING ANTENNA PLAN**
SCALE: 3/8" = 1'-0"
TRUE NORTH



2 / C-2 **PROPOSED ANTENNA PLAN**
SCALE: 3/8" = 1'-0"
TRUE NORTH



1A / C-2 **EXISTING ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"



2A / C-2 **PROPOSED ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"

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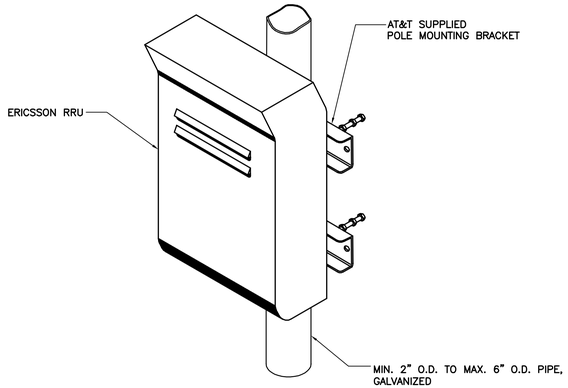
ANTENNA CONFIGURATION DETAILS

C-2



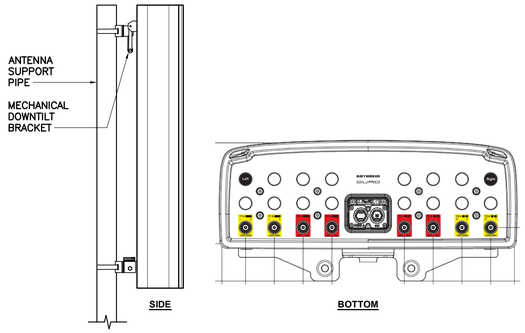
ISOMETRIC VIEW

NOTES:

1. AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 C-3 TYPICAL RRUS MOUNTING DETAILS

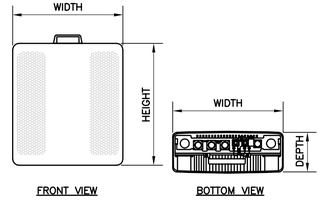
NOT TO SCALE



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KATHREIN MODEL: 800-10965	78.7"L x 20"W x 6.9"D	108.6 LBS.

2 C-3 PROPOSED ANTENNA DETAIL

NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-E2	20.4"L x 18.5"W x 7.5"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

3 C-3 ERICSSON RRUS-E2 DETAIL

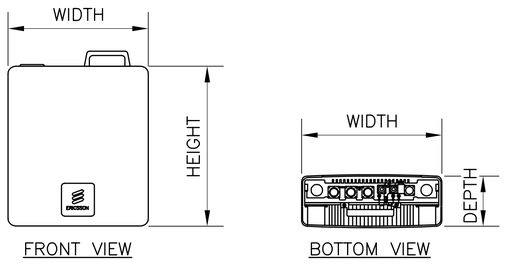
NOT TO SCALE

SURGE ARESSTOR		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ANDREW MODEL: APTDC-BDFDM-DB	3.46"H x 3.46"W x 1.65"D	1.32 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

4 C-3 ANDREW APTDC-BDFDM-DB DETAIL

NOT TO SCALE

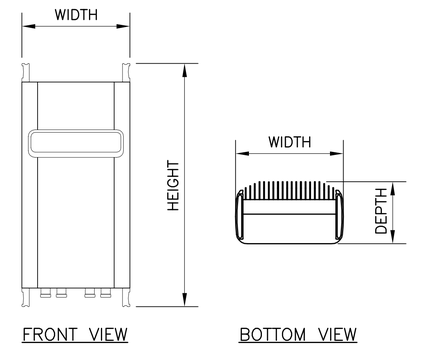


RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: B14 4478	14.9"L x 13.1"W x 7.3"D	60 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 C-3 ERICSSON B14 4478 DETAIL

NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-32 B66	27.17"L x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 C-3 ERICSSON RRUS-32 B66 DETAIL

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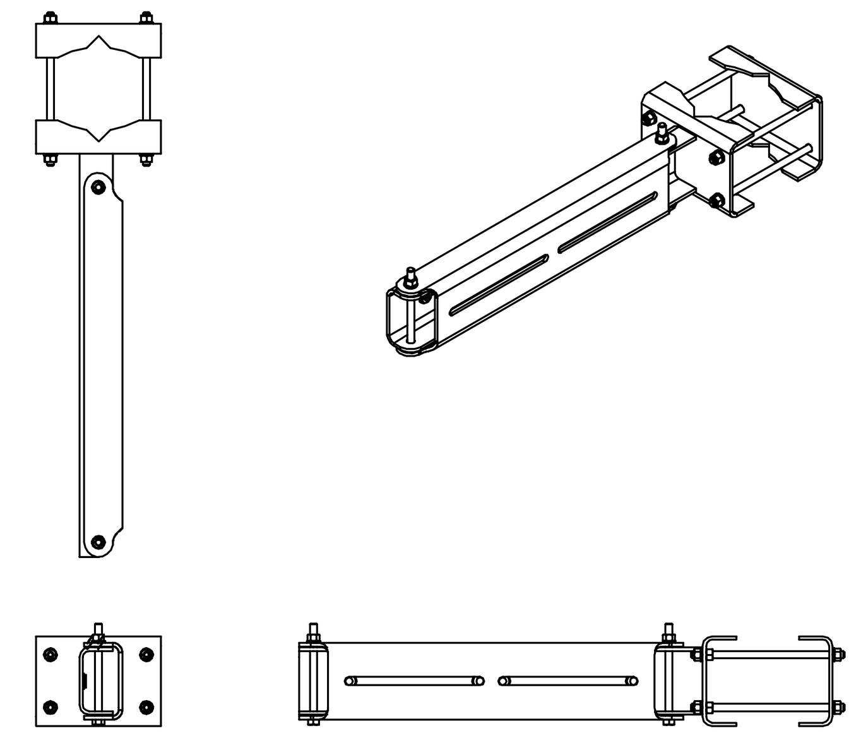
DETAILS

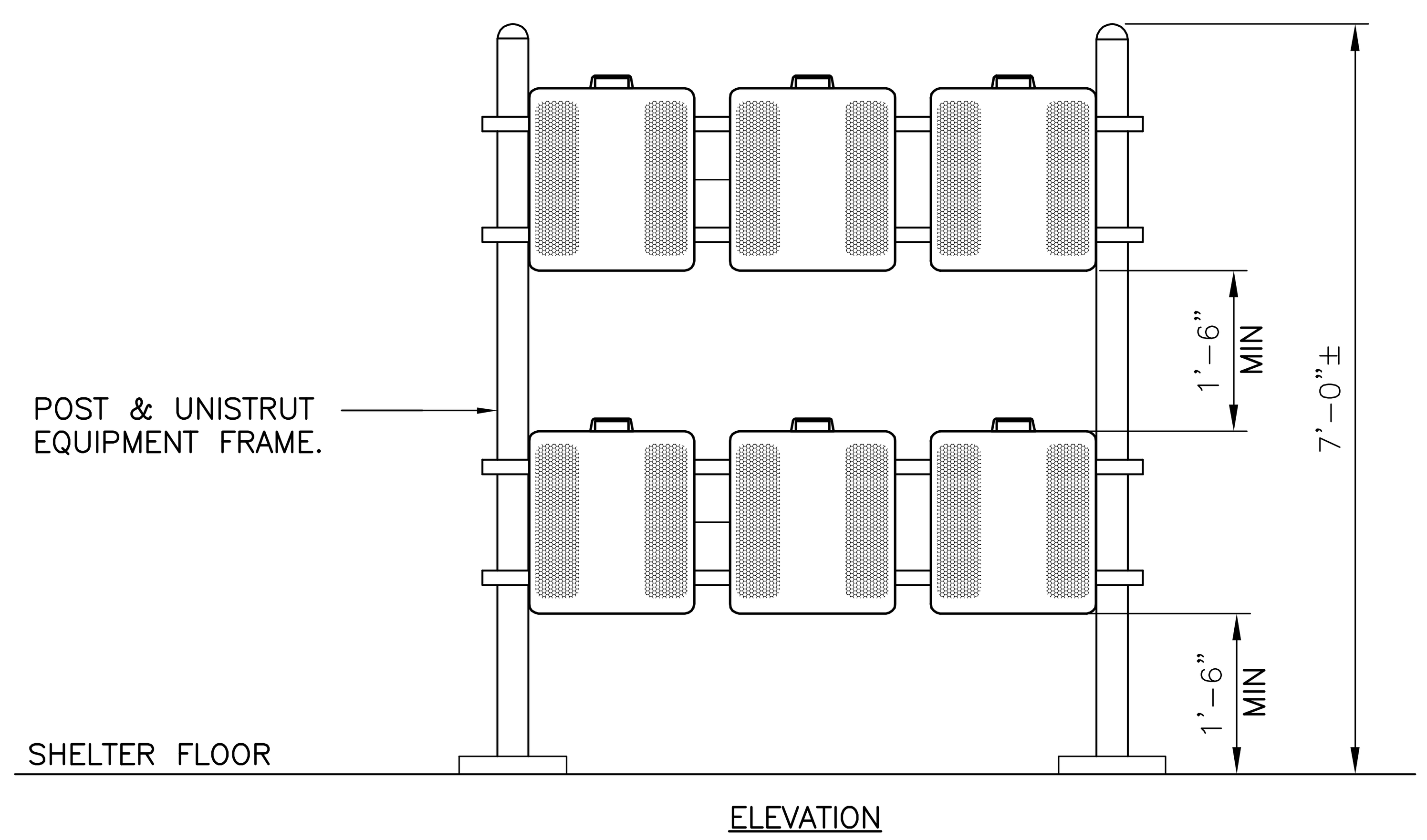
C-3

Sheet No. 5 of 9

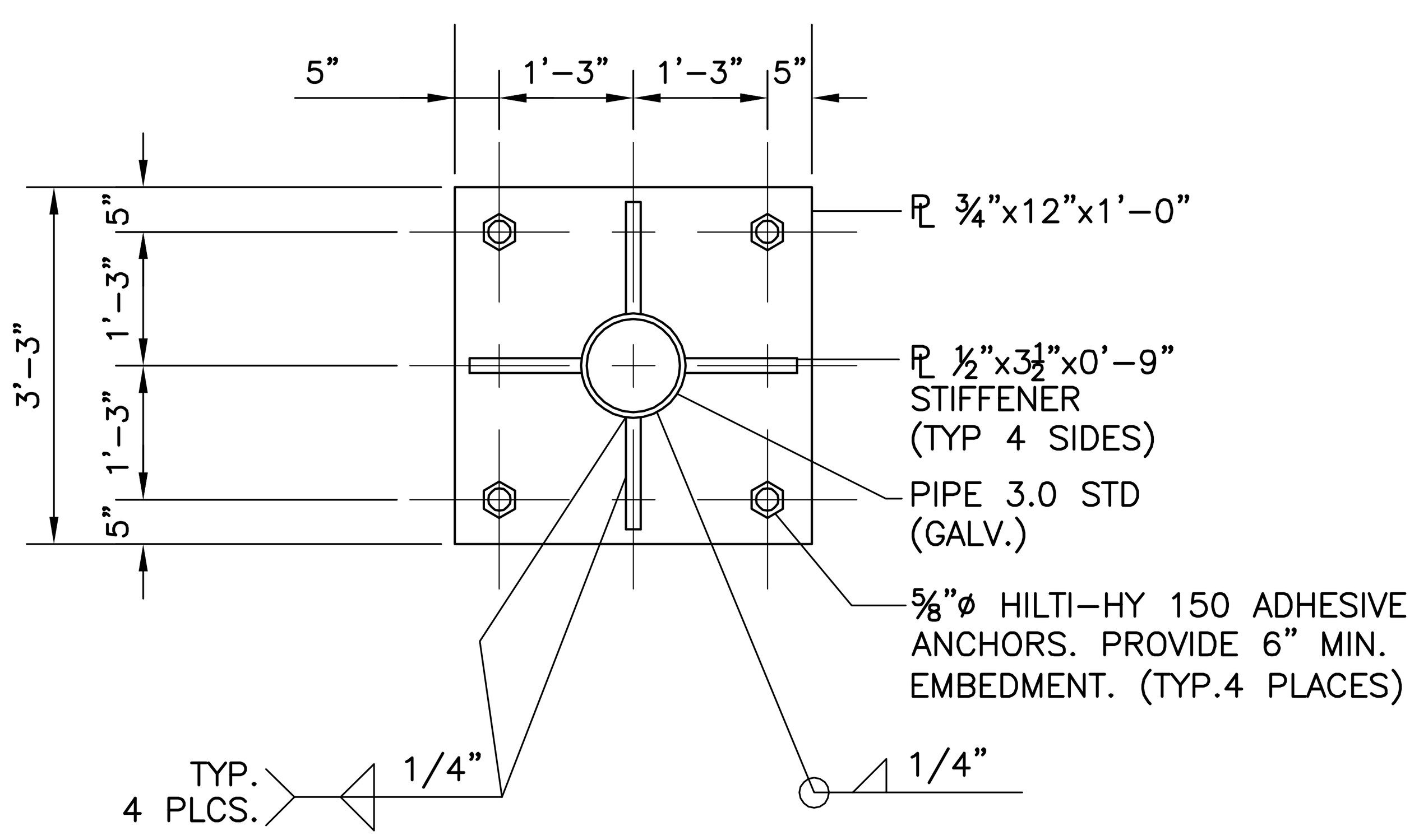


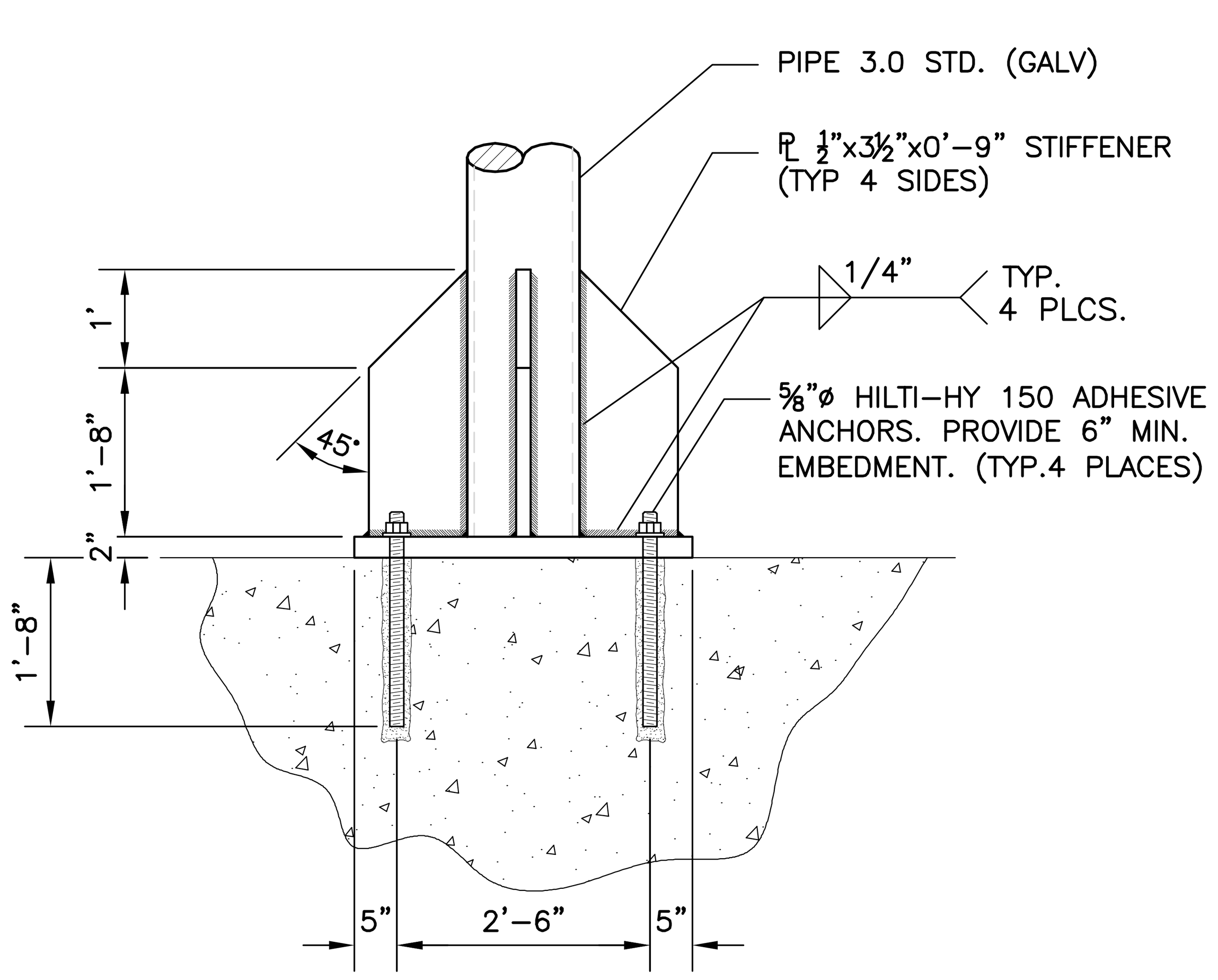
RRU DUAL SWIVEL MOUNT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SITE PRO 1 PART NO.: RRUDSM	27.75"L x 6.5"W x 4.7"D	39.4 LBS.

1 / C-4 **RRH DUAL SWIVEL MOUNT DETAIL**
NOT TO SCALE

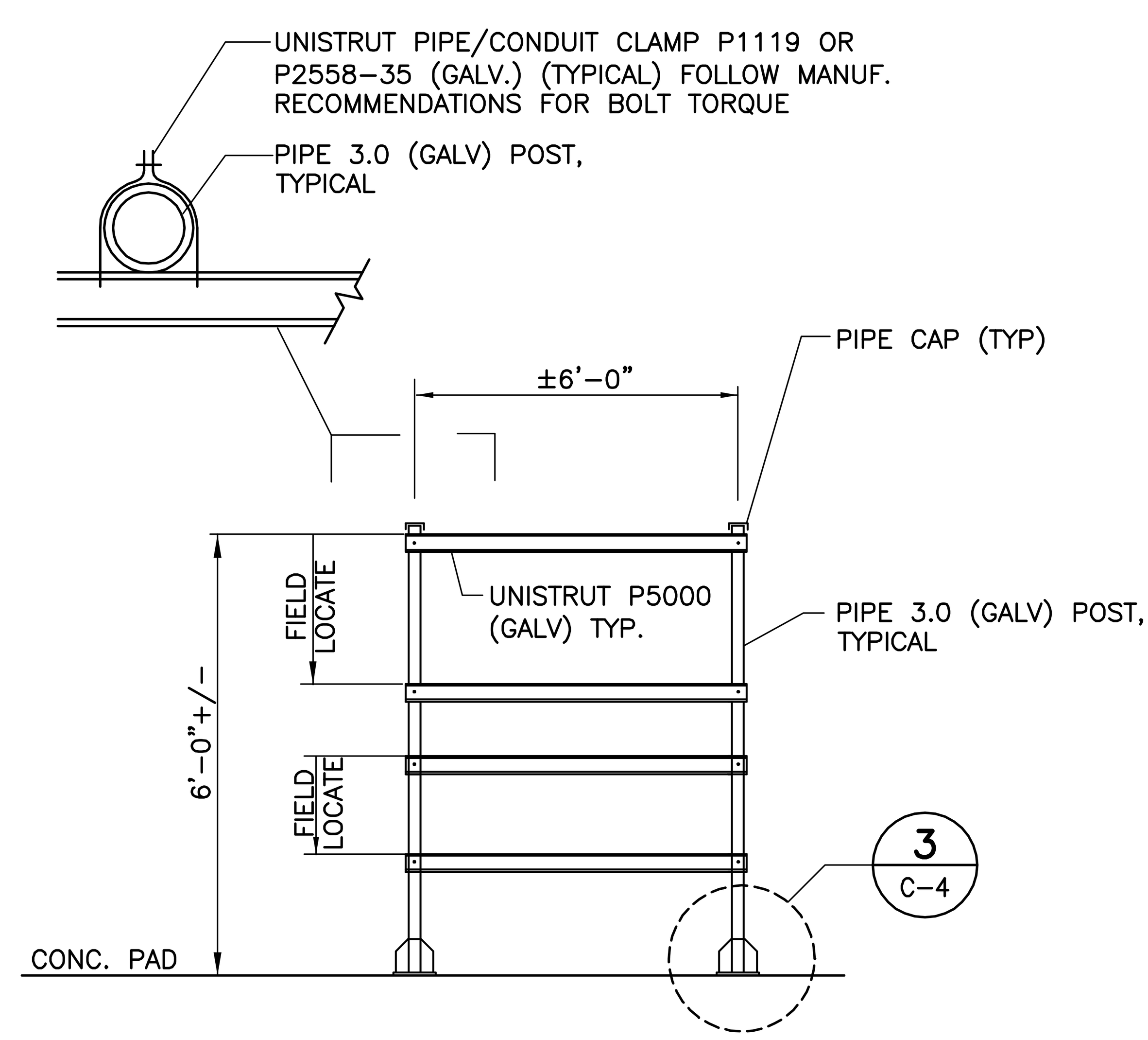


2 / C-4 **EQUIPMENT FRAME ELEVATION DETAIL**
NOT TO SCALE

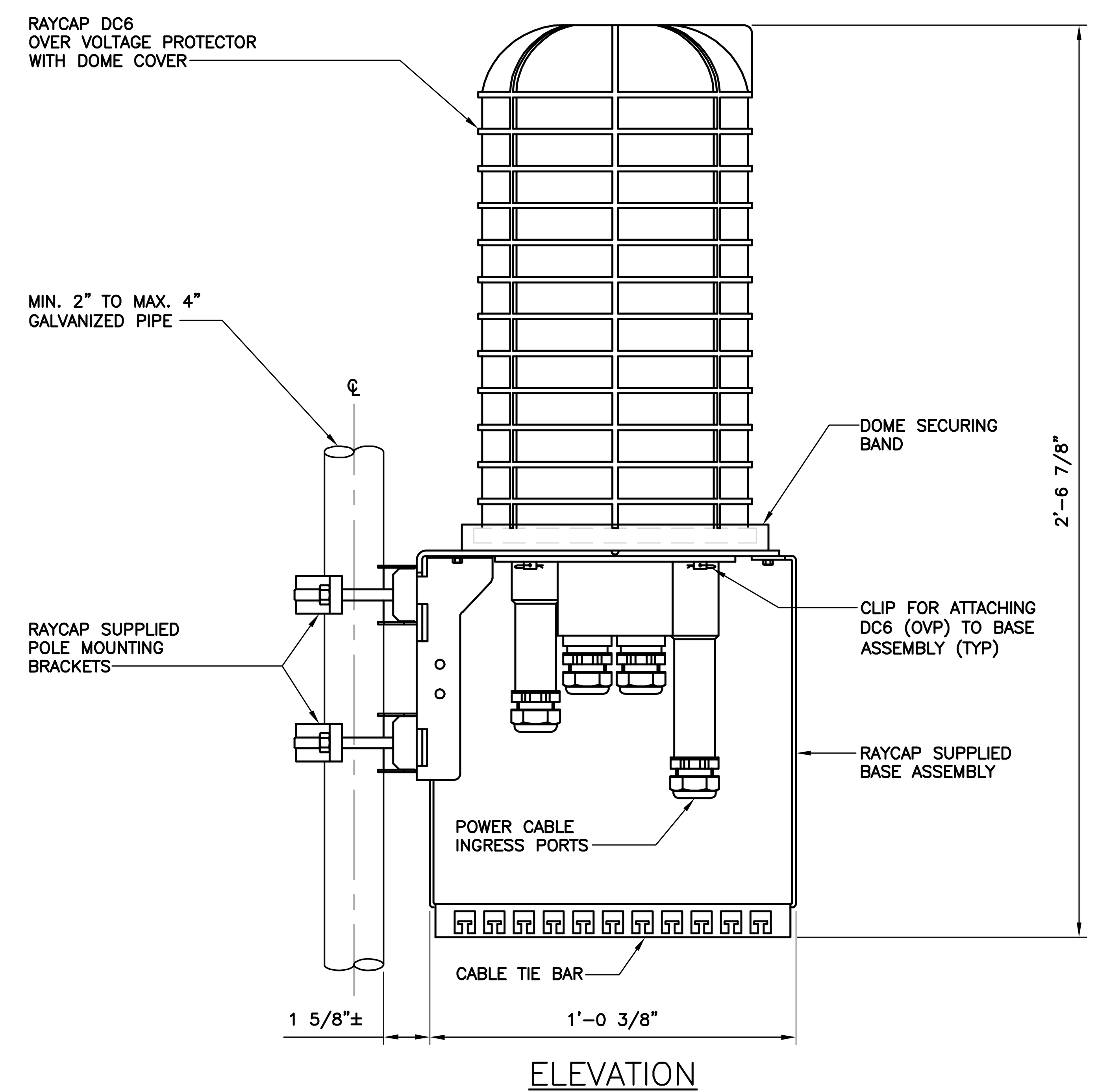




3 / C-4 **FRAME TO CONCRETE CONNECTION DETAIL**
NOT TO SCALE



4 / C-4 **EQUIPMENT MOUNTING FRAME DETAIL (TYP)**
NOT TO SCALE



SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6-48-60-0-8F	(1) PER SITE	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.
3. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

5 / C-4 **TYPICAL DC FIBER SQUID DETAIL**
NOT TO SCALE

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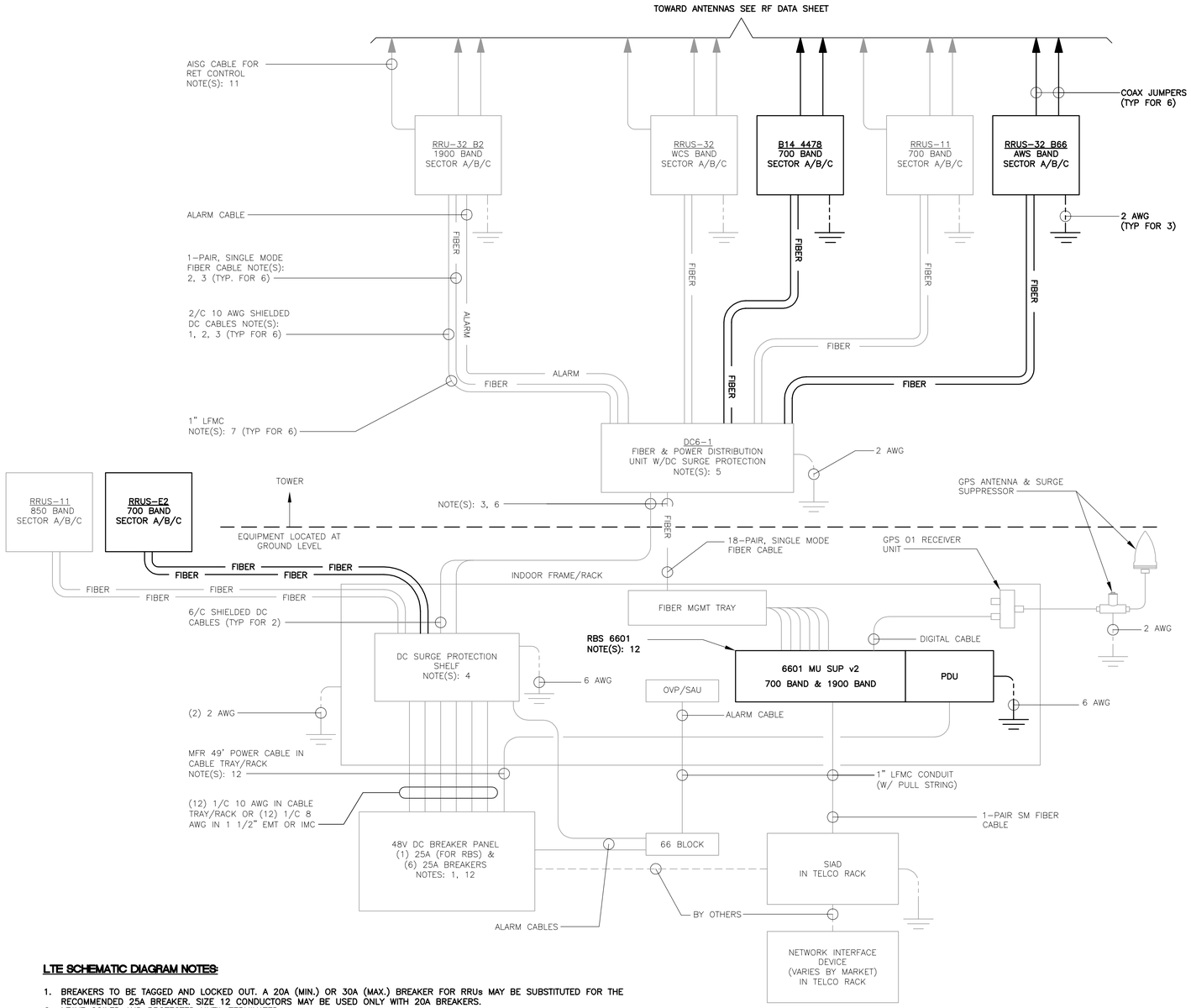
DETAILS

C-4



LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

1 / E-1 **SCHEMATIC DIAGRAM**

NOT TO SCALE

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

   TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

   THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

   1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
   2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
   3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	05/31/18	DMD	CAG	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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WIRELESS COMMUNICATIONS FACILITY

NEWINGTON

CT1145 - LTE 5C/6C/7C FIRSTNET

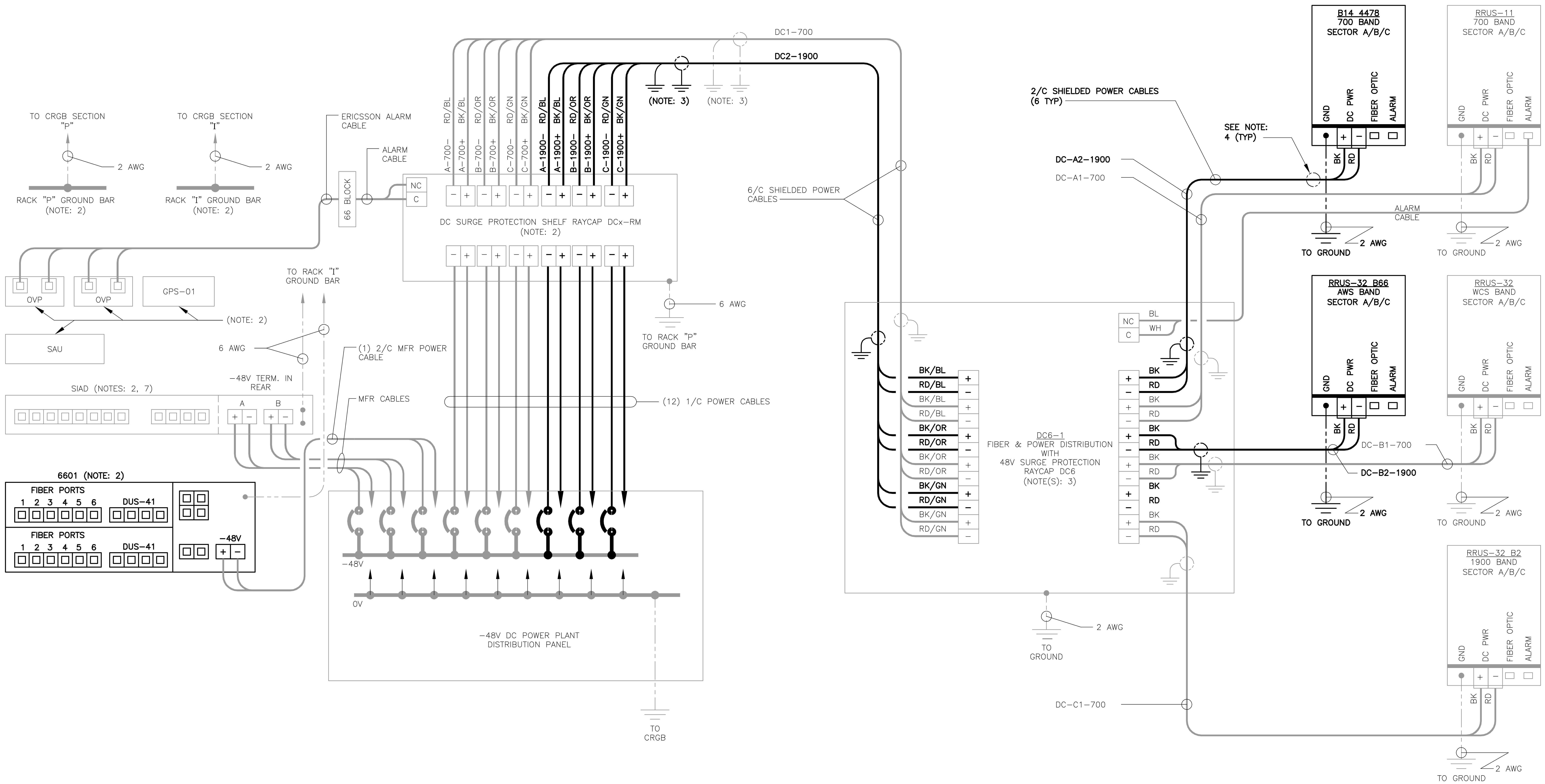
99 CEDARWOOD LANE
NEWINGTON, CT 06111

DATE: 03/15/18
SCALE: AS NOTED
JOB NO. 18000.21

SCHEMATIC DIAGRAM AND NOTES

E-1

Sheet No. 7 of 9



LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

1 / E-2 **WIRING DIAGRAM**
NOT TO SCALE

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NEWINGTON, CT 06111

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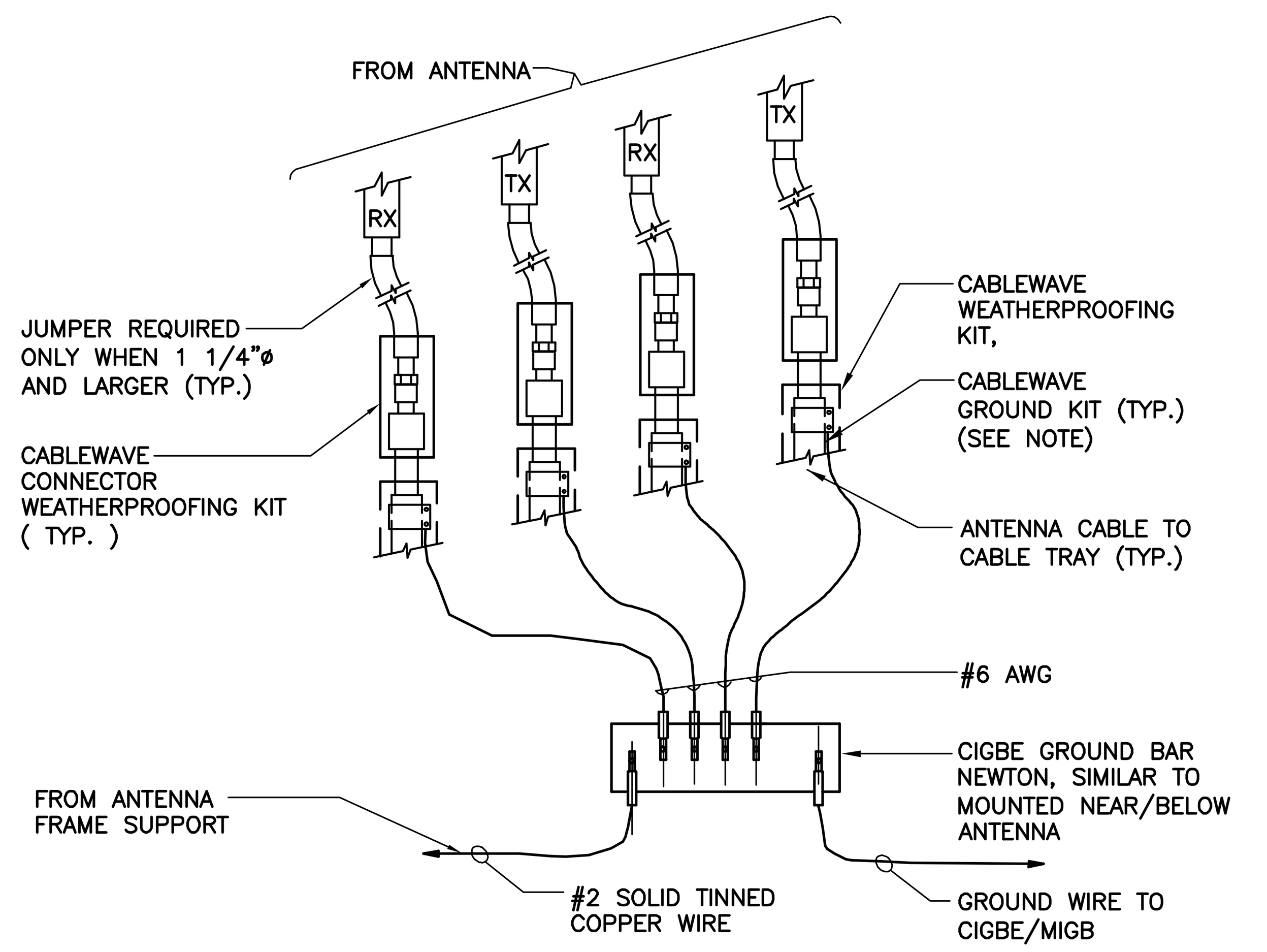
SCALE: AS NOTED
JOB NO. 18000.21

WIRING DIAGRAM

E-2

Sheet No. 8 of 9

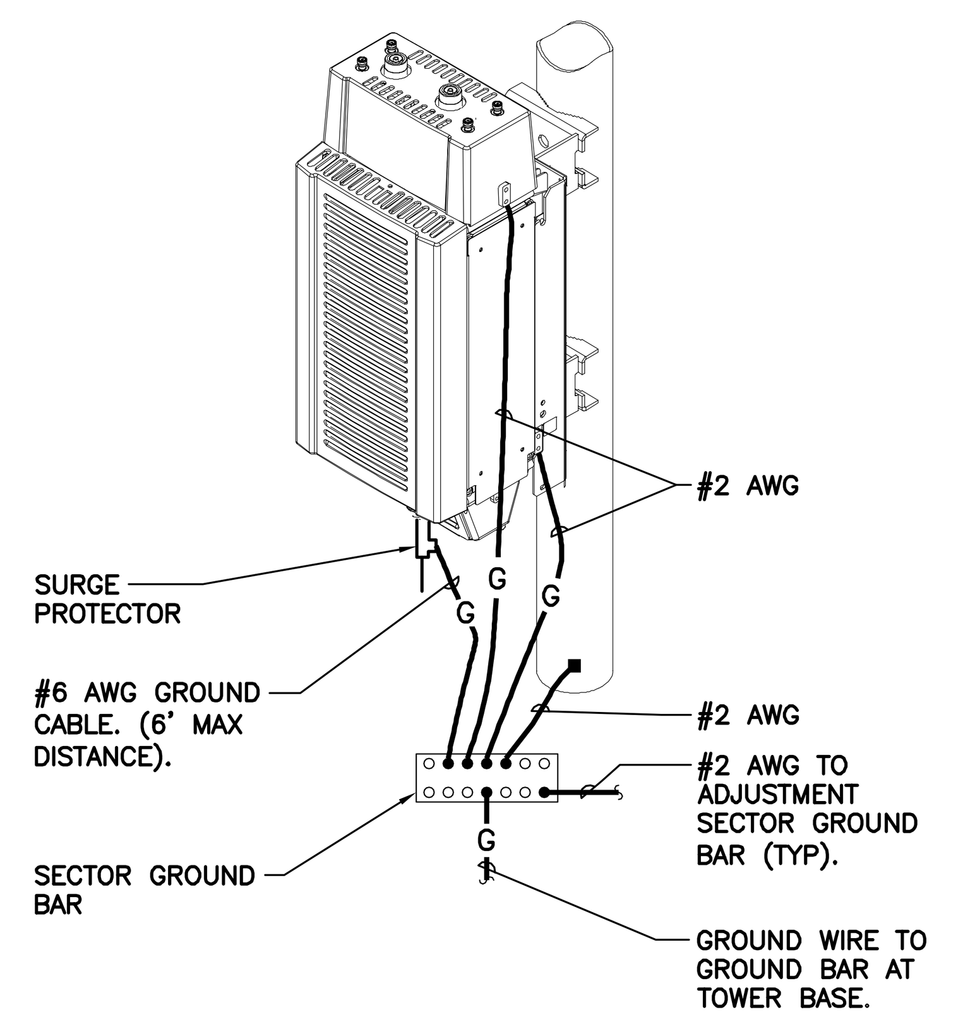


NOTE:

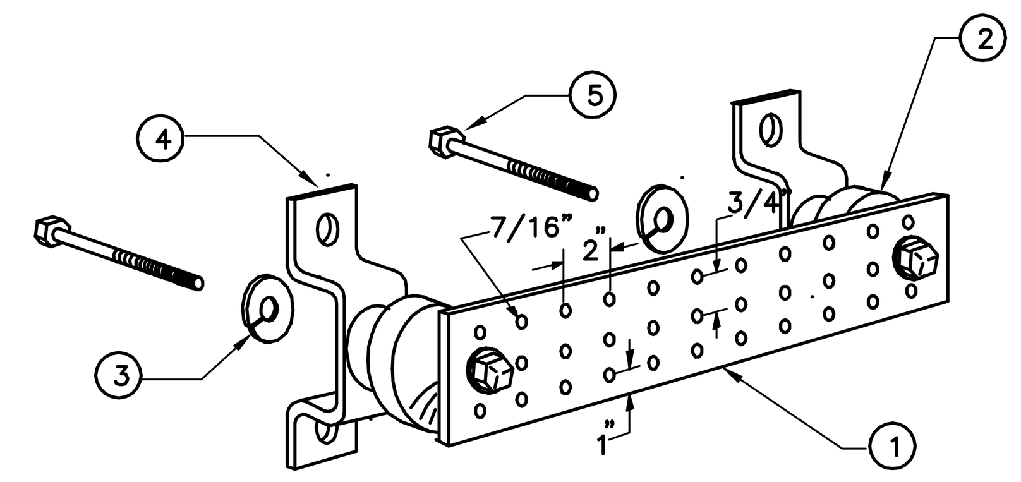
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

1 CONNECTION OF GROUND WIRES TO GROUND BAR
E-3 NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



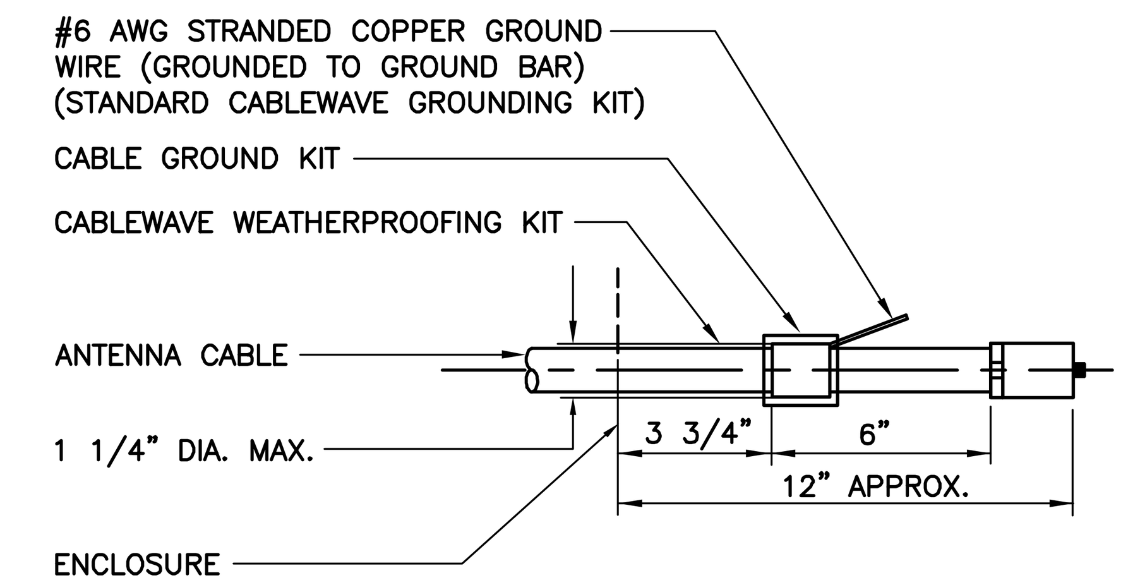
2 RRU POLE MOUNT GROUNDING
E-3 NOT TO SCALE



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

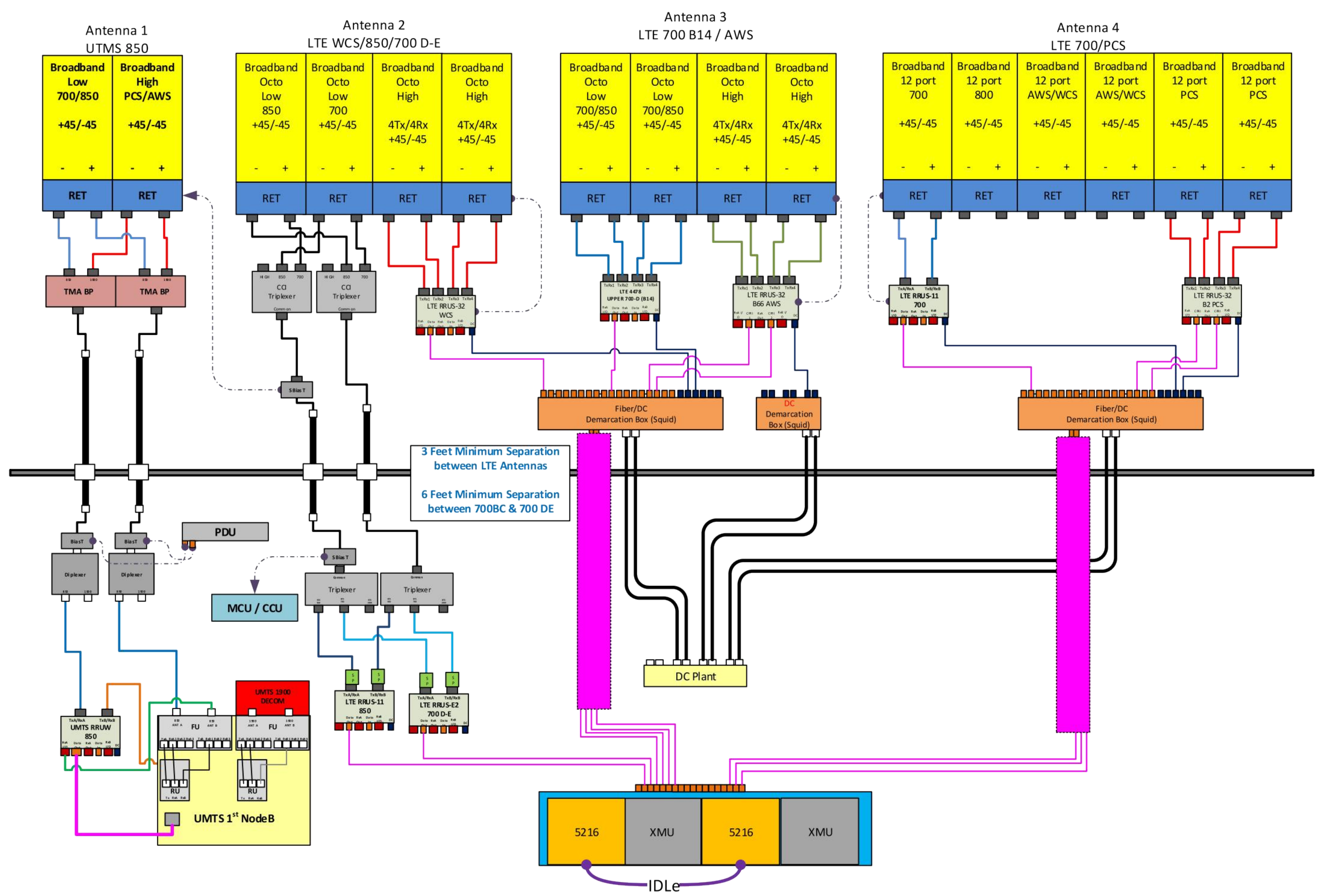
3 GROUND BAR DETAIL
E-3 NOT TO SCALE



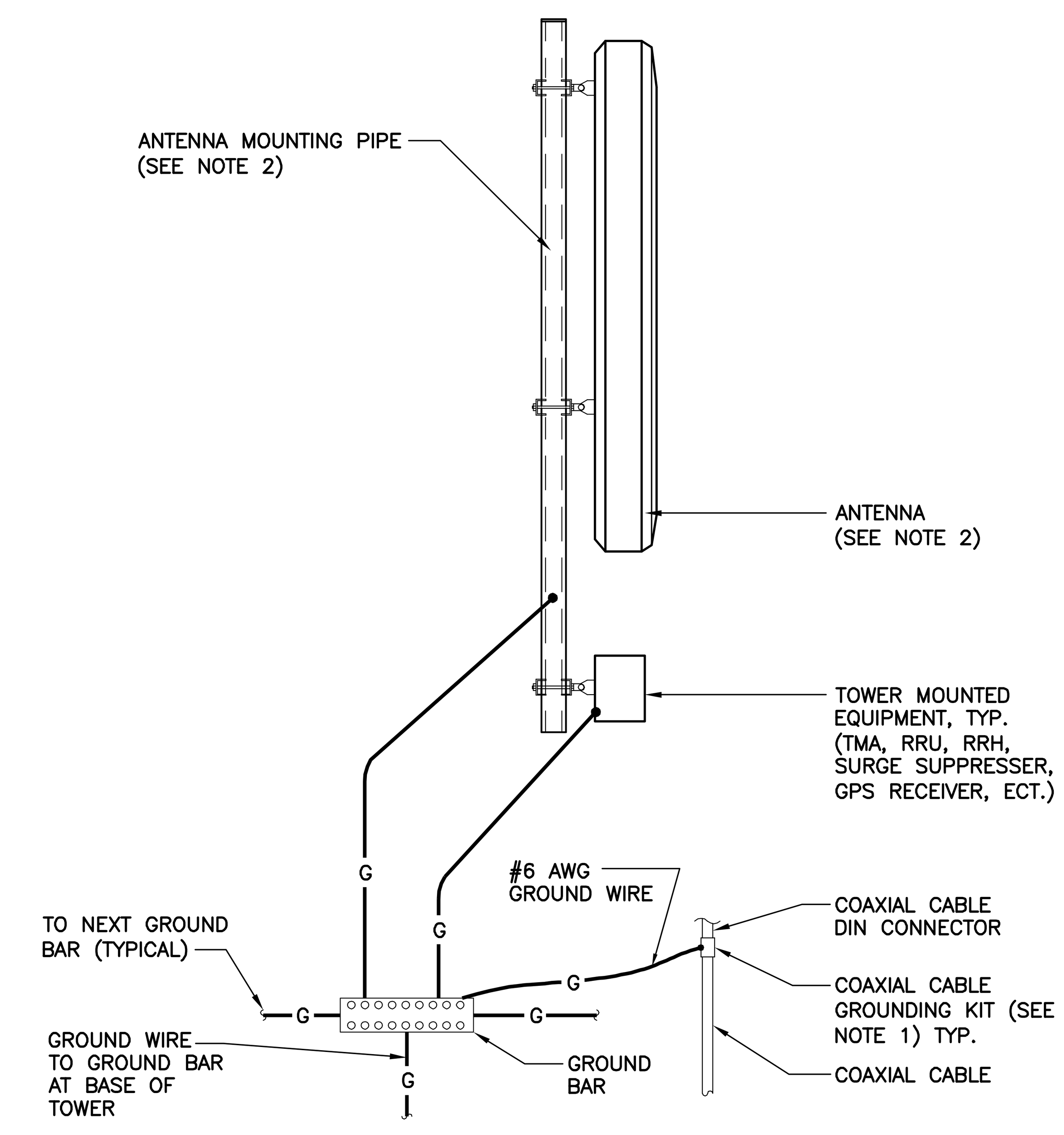
NOTE:

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

4 ANTENNA CABLE GROUNDING DETAIL
E-3 NOT TO SCALE



5 RF PLUMBING DIAGRAM
E-3 NOT TO SCALE



NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

6 TYPICAL ANTENNA GROUNDING DETAIL
E-3 NOT TO SCALE

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NEWINGTON, CT 06111

DATE: 03/15/18
SCALE: AS NOTED
JOB NO. 18000.21

TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 9 of 9

AECOM

Submitted to
Callahan Acres
99 Cedarwood Lane
Newington, CT 06111

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
January 11, 2019

DETAILED STRUCTURAL ANALYSIS AND MODIFICATION OF AN EXISTING 170’ GUYED TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

Site Name: Callahan Tower
Site Address: 99 Cedarwood Lane
Newington, Connecticut

60581585 Revision 2
CAL-005

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and modification of the existing 170' guyed tower structure located at 99 Cedarwood Lane in Newington, Connecticut.

The structural analysis was conducted in accordance with the 2018 Connecticut State Building Code which includes the TIA-222-G[1] Standard, the 2015 International Building Code with 2018 Connecticut State Building Code Amendments, the AISC[2] Load Resistance Factor Design (LRFD) and the ASCE 7[3] design Code.

The antenna loading considered in the analysis consists of all the existing and previously proposed antennas, transmission lines and ancillary items as outlined in the Introduction Section of this report. The statement "previously proposed antennas" refers to earlier analyses performed on behalf Sprint, AT&T and T-Mobile separately without combining other carrier data.

The previously proposed Sprint, AT&T and T-Mobile antenna installation are listed below:

Antenna and Mount	Carrier	Antenna Center Elevation
Remove:		
(3) RFS APX16DWV-16DWV-S-E-A20 Panel Antennas (3) Andrew LNX-6515DS-A1M Panel Antennas (3) Generic Style 1A TMA Units (PCS) (3) Generic Style 1B TMA Units (AWS)	**T-Mobile (existing)**	**@ 163'**
(4) Decibel 844G65VTASX Panel Antennas (Alpha & Gamma Sectors) (2) Decibel DB844H90E-XY Panel Antennas (Beta Sector)	**Sprint (existing)**	**@ 140'**
(3) 12' T-Frame Antenna Mount Assemblies	**AT&T (existing)**	**@ 120'**
Install:		
(3) Ericsson AIR 3246 B66 Panels (3) RFS APXVAARR24_43-U-NA20 Panels (3) Ericsson KRY 112 489/2 TMA Units (3) Ericsson KRY 112 144/2 TMA Units (3) Ericsson Radio 4449 B71 + B12 Units (2) 6x12 Hybrid Cable Systems	**T-Mobile (Proposed)**	**@ 163'**
(3) Nokia MAA-AAHC Panel Antennas (1 Per Sector) (3) Commscope NNVV-65B-R4 Panel Antennas (1 Per Sector) (3) ALU 4x45-1900 RRH Units (6) ALU 2x50-800 RRH Units (4) Fiber Optic Cables (Analysis (3) applied 1-1/4" O.D. Cables & 1 7/8" O.D. Cable)	**Sprint (Proposed)**	**@ 140'**

Antenna and Mount	Carrier	Antenna Center Elevation
Install (continued): **(3) Kathrein 800-10965 Panel Antennas** **(3) Ericsson RRUS-32 B66 RRH Units** **(3) Ericsson 4478 Remote Radio Units** **(1) Raycap DC6-48-60-18-8F Surge Arrestor Units** **(3) Sabre 12' HD V-Boom Antenna Mount Assemblies (Part # C10857001C)** **(1) Fiber Optic Cable (Analysis applied 0.4" O.D. Cable)** **(2) DC Control Cables (Analysis applied 0.4" O.D. Cables)**	**AT&T (Proposed)**	**@ 120'**

The results of an initial analysis indicated the existing tower structure and foundation components did not have enough capacity for the proposed loading conditions. The tower structure, foundation anchors and anchor components require modifications shown on SK-1 through SK-5. **Once the modifications indicated on sheets SK-1 through SK-6 are performed, the modified tower structure, foundation anchors and anchor components are considered structurally adequate with the wind load specification specified above with the existing and proposed antenna loading herein. The maximum structural capacity calculated herein is 97.7%**

The analysis results presented herewith are based upon the inclusion tower modifications proposed by Maser Consulting Connecticut tower modification report, project 17924017A, signed and sealed April 19, 2018. **No installation of reinforcing members nor proposed inventory shall be permitted to be installed prior to the installation of the Maser Consulting tower modifications.** If the tower has not been modified to the specifications proposed by AECOM, please notify the engineer in writing immediately.

1. TIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version G)

2. AISC = American Institute of Steel Construction (14th Edition)

3. ASCE 7 = American Society of Civil Engineers Standard 7 (2010 Edition)

1. EXECUTIVE SUMMARY – continued

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Original manufacturers drawings prepared by Charles Burns, P.E. on behalf of Mohawk Towers, dated December 1997.
3) Structural Analysis Report prepared by Bay State Design, Inc., on behalf of Clearwire, signed and sealed on April 7, 2010.
4) Revised Structural Analysis Report prepared by Hudson Design Group, on behalf of AT&T, signed and sealed on June 13, 2012. *NOTE: This analysis document includes a Tower Mapping Report performed by Hudson Design Group (included in Section 6 of Report), dated May 24, 2012.*
5) Geotechnical Engineering Report prepared by Terracon Consultants, Inc., dated August 24, 2012.
6) Tower Reinforcement and Structural Analysis, prepared by URS on behalf of Callahan Acres, project 36931230 / CAL-001, signed and sealed August 14, 2014.
7) Structural Analysis and tower reinforcement performed by Maser Consulting Connecticut, on behalf of Sprint, project number 17924017A, signed and sealed on April 19, 2018. Concurrent construction drawings included with analysis document, signed and sealed on April 16, 2018. *NOTE: The antenna inventory proposed by Sprint is applied to this analysis and includes proposed tower/foundation modifications.*
8) Structural Analysis Report performed by Destek Engineering on behalf of T-Mobile, project number 1875013, signed and sealed May 22, 2018. *NOTE: The antenna inventory proposed by T-Mobile is applied to this analysis without consideration of proposed tower/foundation modifications.*
9) Structural Analysis Report performed by Centek Engineering on behalf of AT&T, project 18000.21, signed and sealed on May 25, 2018. Antenna and mount configuration as specified on the following pages of this report.
10) Field site visit conducted on September 19, 2018.
11) Tower Climb and site measurements conducted by Northeast Site Solutions dated, October 1, 2018.
12) Update to site Geotechnical Engineering report provided by Terracon Consultants, Inc. dated October 10, 2018.

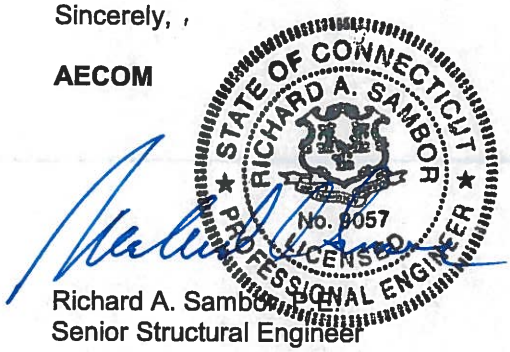
1. EXECUTIVE SUMMARY – continued

This report is only valid as per the information and data provided by others for antenna inventory, mounts, tower structure, existing foundation and associated cables. The user of this report shall field verify the antenna, cabling and mount configuration used, as well as the physical condition of the tower members, connections and foundations. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please contact this office at (860) 990-6767.

Sincerely, ,

AECOM



Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mcd

cc: CF/Book – URS

2. INTRODUCTION

The subject tower is located at 99 Cedarwood Lane in Newington, CT. The structure is a 170' guyed tower structure designed by Charles Burns, P.E. (Mohawk Towers) and Rohn Industries.

The structural analysis was conducted in accordance with the following:

- TIA-222-G Standard for a wind velocity range of 90 mph to 105 mph (3-second gust) and 50 mph (3-second gust) concurrent with 1.00 ice thickness, considered to increase in thickness with height.
- 2015 International Building Code with 2018 Connecticut State Building Code Amendments for a wind speed of 97 mph (3-second gust)
- 2010 AISC Load Resistance Factor Design (LRFD)
- 2010 ASCE 7 Minimum Design loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-G Standard.

The inventory together with the previously proposed AT&T, T-Mobile and Sprint's antenna arrangement is summarized in the table below:

Antenna Type	***Carrier***	***Mount***	***Antenna Centerline Elevation***	***Cable***
(1) DS4C03F36U-D (2) SC473-HF1LDF (1) TXRX 430-83H-01-M-X7 TTA Unit	Wethersfield (existing)	(2) 5' Side Mount Standoffs & (1) 1' Side Mount Standoff @ 170'	175'	(2) 7/8" (1) 1 5/8" (1) 1/2"
(1) RFD SC2-W100BC Dish	Wethersfield (existing)	Leg Mounted	167'	(1) 1/2"
(3) Ericsson AIR 3246 B66 Panels (3) RFS APXVAARR24_43-U-NA20 Panels (3) Ericsson KRY 112 489/2 TMA Units (3) Ericsson KRY 112 144/2 TMA Units (3) Ericsson Radio 4449 B71 + B12 Units	**T-Mobile (Proposed)**	*See Below Mount*	**163'**	**(2) 6x12 Hybrid Cable Systems**
(3) Ericsson AIR32 KRD901146-1-B2A Panel Antennas	T-Mobile (existing)	(3) 12' T-Frame Sector Mounts	163'	(12) 1 5/8" (1) 6x12 Hybrid Cable System
(1) VHLP2-180 Dish	Clearwire (existing)	Leg Mounted	146'	(1) 1/2"
(1) VHLP800-11 Dish (1) VHLP2-180 Dish	Clearwire (existing)	Leg Mounted	145'-6"	(2) 1/2"
(3)LLRx310R-V1 Panel Antennas	Clearwire (existing)	See below Mount	143'	(2) 2" Rigid Cables

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(3) Nokia MAA-AAHC Panel Antennas (1 Per Sector) (3) Commscope NNVV-65B-R4 Panel Antennas (1 Per Sector) (3) ALU 4x45-1900 RRH Units (6) ALU 2x50-800 RRH Units	**Sprint (Proposed)**	*See Below Mounts*	**140'**	**(4) Fiber Optic Cables (Analysis (3) applied 1-1/4" O.D. Cables & 1 7/8" O.D. Cable)**
(4) Decibel 844G65VTZASX Panels (2 A & 2 C) (2)Decibel DB844H90E-XY Panels (2 B) (1) Junction Box Unit	Sprint (existing)	(3) 12' T-Frame Sector Mounts	140'	*See Above Cables*
(3) Kathrein 800-10965 Panel Antennas (3) Ericsson RRUS-32 B66 RRH Units (3) Ericsson 4478 Radio Units (1) Raycap DC6-48-60-18-8F Surge Arrestor Unit	**AT&T (Proposed)**	**(3) Sabre 12' HD V-Boom Mount Assemblies (Part # C10857001C**	**120'**	**(1) F.O. Cable (Analysis considering 0.4" O.D. Cable) (2) DC Cables (Analysis considering 0.4" O.D. Cables)**
(3) Quintel QS66512-2 Panel Antennas (3) Powerwave 7770.00 Panel Antennas (3) CCI OPA-65R-LCUU-H6 Panel Antennas (6) Powerwave LGP21401 TMA Units (6) CCI TPX-070821 Triplexer Units (3) Ericsson RRUS-32 RRH Units (3) Ericsson RRUS-11 RRH Units (3) Ericsson RRUS-32 B2 RRH Units (2) Raycap DC6-48-60-18-8F Surge Arrestor Units	AT&T (existing)	*Shared with Above Mount*	120'	(12) 7/8" (1) 3/8" F.O. Cable (2) 3/4" DC Cables

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(3) 6'x6"x3" Panel Antennas	Pocket Wireless (existing)	Leg Mounted	109'	(6) 1 5/8"
(2) GPS Units	Town (existing)	Leg Mounted	50'	(2) LMR-400

This structural analysis of the communications tower was performed by AECOM for Callahan Acres for the recent antenna upgrades of the AT&T, T-Mobile and Sprint service equipment. The purpose of this analysis was to investigate the modified tower structure and foundation components with existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower ant he effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the 2018 Connecticut State Building Code, TIA-222-G—Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction—Load Resistance Factor Design (LRFD).

The analysis was conducted using TNX tower version 8.0.5.0 and used the following conditions for this tower review (following the TIA-222-G Standard):

- Structure Class 2 – (Substantial Communications)
- Topographic Category 3 – (Tower location on top of hill – rolling wind conditions considered)
  - NOTE: The use of Google Earth Pro software (version 7.3.1.4505) along with Survey Topographic maps were used for the following determinations
    - Crest Height used for analysis (approximate elevations listed below):
      - Tower Base elevation = 340'
      - Average elevation measured from 0.5 miles, 1.0 miles, 1.5 miles and 2 miles from tower (213 ft., 170 ft., 147 ft., 129 ft.)
        - Average elevation determined from above information = 165 feet
      - "H" = Average Elevation – Base Elevation = (340-165) = **175 feet**
- Exposure Class B – (Urban / Suburban areas; closely spaced obstructions)
- Load Conditions:
  - Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
  - Hartford County (Wind Speed Range): V = 90 mph – 105 mph (3-second gust) [Annex of TIA-222-G 2006]
- IBC 2015 w/ 2018 CT State Building Code Amendment
  - (2015) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination of Design Wind Load obtained as "V.ult" are to be converted to "V.asd" when applying the TIA-222-G design Standard (Under Section 1609.3) for Basic Wind Speed.
  - (2018) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
    - V.asd = 97 mph (3-second Gust) Wind Design Parameter for the Town of Newington, Connecticut for Risk Category two (II) for Substantial (non-essential) communications.

Loading cases:

Load Condition 1 = 97 mph (3-second gust) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 50 mph (3-second gust) Wind load (with ice) + Ice Load + Tower Dead Load

The ice thickness used for this analysis is **1 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-G and follows the same design criteria as the ASCE 7 Standard.

Seismic event consideration factors/values for design:

- S.s = 0.182 (2018 CT State Building Code – Location Specific Value)
- S.1 = 0.064 (2018 CT State Building Code – Location Specific Value)
- Site Classification = "C" (Reference: Terracon Geotechnical Report Page 4)
- Seismic Design Category = "B" (2015 International Building Code)
- F.a = 1.2 (Obtained from TIA-222-G Table 2-12 Considering above conditions)
- F.v = 1.7 (Obtained from TIA-222-G Table 2-13 Considering above conditions)

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (continued)

Strength Limit State Load Combinations (TIA-222-G Section 2.3.2):

The structural analysis herein has considered the following load combinations within the analysis:

1. ***1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.6 Wind Load without Ice***
2. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Dead Weight of ice due to factored ice thickness + 1.0 concurrent wind load with factored ice thickness + 1.0 Load effects due to temperature
3. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Earthquake Load

Note 1: The above **bolded** load combination is considered to create the governing design loads per the results of the analysis.

Note 2: The "Load effects due to temperature" do not apply for structures that are self-sustaining (from the TIA-222-G Standard)

4. FINDINGS AND EVALUATION

Combined axial and bending stresses on the modified tower structure were evaluated to compare with strength above in accordance with AISC (LRFD). The results of an initial analysis indicated that the existing tower structure, foundation anchors and anchorage components did not have enough capacity to support the proposed loading conditions. The tower structure, foundation anchorage and anchorage cables require modifications shown on SK-1 through SK-6. **Once the modifications indicated on sheets SK-1 through SK-6 are performed, the modified structure, foundation anchors and anchorage components are considered structurally adequate with the wind load specification and with the existing and proposed antenna loading herein.**

Table 1: Tower Component Stress vs. Capacity Summary Table:

Component / Section No.	*Controlling Component / Elevation*	*Stress (% Capacity)*	*Pass/Fail*	*Comments*
Tower Leg (T12)	ROHN 2.5 STD / 80' – 100'	97.7	Pass	
Diagonal (T15)	P1.5 x 0.062" Crushed Pipe / 20' – 40'	81.7	Pass	
Horizontal (T16)	SR 1" / 5' – 20'	17.7	Pass	
Secondary Horizontal (T3)	L1-3/4x1-3/4x1/4 / 120' – 140'	39.9	Pass	
Top Girt (T3)	L1-3/4x1-3/4x1/4 / 120' – 140'	36.8	Pass	
Bottom Girt (T16)	L2x2x3/16 / 5' – 20'	46.4	Pass	
Guy @ 155'	EHS 7/16"	91.5	Pass	
Guy @ 132'	EHS 9/16"	89.4	Pass	
Guy @ 87.5'	EHS 9/16"	85.8	Pass	Re-Located guy connection for assembly
Guy @ 47.5'	EHS 9/16"	76.4	Pass	Re-Located guy connection for assembly
Top Guy Pull-Off (T2)	L2x2x3/16" / 140' – 155'	88.6	Pass	Interior Connection behind Torque Arm
Torque Arm Top (T2)	C12x20.7 / 120' – 140'	53.6	Pass	
Connection Bolt	(1) 1/2" A325N Diagonal Member Bolt / 155'	88.6	Pass	
Tower Foundation	Bearing Capacity/Foundation Pad	70.7	Pass	
Anchor Uplift Resistance	Interior Anchors – Concrete Guy Anchor	62.6	Pass	See Below Note 2
Anchor Shear Resistance	Interior Anchors – Concrete Guy Anchor	64.5	Pass	See Below Note 2
Anchor Uplift Resistance	Exterior Anchors – Concrete Guy Anchor	50.9	Pass	See Below Note 2

Component / Section No.	*Controlling Component / Elevation*	*Stress (% Capacity)*	*Pass/Fail*	*Comments*
Anchor Slide Resistance	Exterior Anchors – Concrete Guy Anchor	45.9	Pass	See Below Note 2
Guy Anchor – Shackle	Shackle connected to Tower	75.8	Pass	
Guy Anchor – Turnbuckle	Turnbuckle Attachment connected to Tower / Anchor Fan-plate	72.1	Pass	Replaced original Turnbuckle (see analysis)
Guy Anchor – Block Shear Check	Welded “Corner” plated to Tower Leg	53.7	Pass	Proposed newly installed Corner connection Plate
Guy Anchor – Plate connection on Tower	Bolted Bent Plate attached to Shackle	91.4	Pass	
Guy Anchor – Block Shear Check	Anchor Plate welded to Solid round anchor Bars	76.8	Pass	Proposed Anchor Fan Plate (see reference materials)
Guy Anchor – Anchor Rod Tension Check	Tension Yield of (1) 1-1/4” Solid Round Bar	78.1	Pass	Proposed Anchor (see reference materials)
Guy Anchor – Anchor Rod Tension Check	Tension Yield of (1) 1-3/4” Solid Round Bar	46.4	Pass	

Structure Rating (Maximum from all components) =	**97.7 %**	**Pass**

Note 1: Connection bolts are assumed to be similar to that of ROHN Model 80 connection bolts as indicated in the Mohawk Towers Construction Plans, dated 1997.

Note 2: Existing guys anchor are assumed NOT to have been anchored to rock material and buried within a Glacial Till layer as indicated in the Terracon geotechnical report, dated August 24, 2012.

The analysis results presented herewith are based upon the inclusion tower modifications proposed by Maser Consulting Connecticut tower modification report, project 17924017A, signed and sealed April 19, 2018. **No installation of reinforcing members nor proposed inventory shall be permitted to be installed prior to the installation of the Maser Consulting tower modifications.** If the tower has not been modified to the specifications proposed by AECOM, please notify the engineer in writing immediately.

5. CONCLUSIONS

The results of an initial analysis indicated the existing tower structure and foundation components did not have enough capacity for the proposed loading conditions. The tower structure, foundation anchors and anchor components require modifications shown on SK-1 through SK-6. **Once the modifications indicated on sheets SK-1 through SK-6 are performed, the modified tower structure, foundation anchors and anchor components are considered structurally adequate with the wind load specification specified with the existing and proposed antenna loading herein. The maximum structural capacity calculated herein is 97.7%**

The analysis results presented herewith are based upon the inclusion tower modifications proposed by Maser Consulting Connecticut tower modification report, project 17924017A, signed and sealed April 19, 2018. **No installation of reinforcing members nor proposed inventory shall be permitted to be installed prior to the installation of the Maser Consulting tower modifications.** If the tower has not been modified to the specifications proposed by AECOM, please notify the engineer in writing immediately.

Limitations/Assumptions:

This report is based on the following:

1. All tower connection bolts for diagonal and horizontal members follow ROHN design standards for ROHN Model 80 tower structures, unless noted otherwise.
2. Tower inventory as listed in this report.
3. Tower is properly installed and maintained.
4. All members are as specified in the original design documents and are in good condition.
5. All required members are in place.
6. All bolts are in place and are properly tightened.
7. Tower is in plumb condition.
8. All member protective coatings are in good condition.
9. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
10. Foundations are in good condition without defect and were properly constructed to support original design loads as specified in the original design documents
11. All coaxial cables are installed as specified in Section 6 of this report.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

5. CONCLUSIONS (continued)

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The tower owner shall refer to TIA-222-G section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. It is also recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

REINFORCEMENT DRAWINGS SK-1 THROUGH SK-6

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE CONNECTICUT STATE BUILDING AND LIFE SAFETY CODES, SUPPLEMENTS AND AMENDMENTS.
2. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON DRAWINGS OR WRITTEN IN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION AND ELECTRICAL SUB-CONTRACTORS SHALL PAY FOR THEIR PERMITS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR SHALL FURNISH "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. INSTALLATION OF THIS WIRELESS COMMUNICATIONS EQUIPMENT SITE REQUIRES WORK IN THE IMMEDIATE VICINITY OF EXISTING TELECOMMUNICATION SYSTEMS. THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION WITH THE VARIOUS TELECOMMUNICATION CARRIERS AND THE TOWER OWNER.
8. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER MFR'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR ARCHITECT.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
10. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ARCHITECT FOR REVIEW. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ARCHITECT FOR REVIEW.
11. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. SUBMIT TO THE ARCHITECT ANY DISCREPANCIES FROM THE DRAWINGS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. COORDINATE ALL CIVIL AND ELECTRICAL DRAWINGS FOR THE LOCATION OF ALL OPENINGS, RECESSES, BUILT-IN WORK, ETC.
14. CONTRACTOR TO CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE CONTRACT AREA.
15. CONTRACTOR SHALL COMPLY WITH OWNER ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
16. EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE DOCUMENTS ARE BASED ON ORIGINAL DESIGN DOCUMENTS PREPARED BY CHARLES L BURNS, DATED DECEMBER 1997 & TOWER EXTENSION BY ROHN DATED APRIL 2003, AND ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.
17. CONTRACTOR TO VERIFY REQUIRED CLEARANCES INCLUDING BUT NOT LIMITED TO EXISTING BUILDINGS, EQUIPMENT PADS AND SHELTERS PRIOR TO COMMENCING WORK.
18. PREVIOUSLY DESIGNED TOWER MODIFICATIONS FROM MASER CONSULTING OF CONNECTICUT (SIGNED AND SEALED ON APRIL 18, 2018) ARE SHOWN AS REFERENCE ONLY. AECOM ASSUMES NO LIABILITY FOR THE PREVIOUSLY DESIGNED AND APPROVED CONSTRUCTION PLANS CREATED BY MASER CONSULTING OF CONNECTICUT. UNFORESEEN DESIGN CONFLICTS SHALL BE COORDINATED WITH MASER FOR THE INSTALLED MODIFICATIONS INDICATED WITHIN THESE CONTRACT DOCUMENTS.

STRUCTURAL NOTES

1. ULTIMATE STRENGTH SOIL BEARING CAPACITY OF 8,000 PSF USED FOR FOUNDATION DESIGN. GENERAL CONTRACTOR RESPONSIBLE FOR VERIFYING BEARING CAPACITIES.
2. ALL SURFACES MUST BE FREE OF STANDING WATER PRIOR TO PLACING CONCRETE.
3. COMPACTED GRAVEL FILL PER CONNECTICUT DOT STANDARD SPEC. SECTION M.02.01 AND ASTM D1557.
4. CONTACT THE ENGINEER IF GROUND WATER IS IN ENCOUNTERED AND DEWATERING IS REQUIRED.
5. EXCAVATED SOIL SHALL BE PLACED IN 8" LOOSE DEPTH LAYERS AND COMPACTED TO AT LEAST 95% OF THE MAXIMUM DENSITY OBTAINED IN THE STANDARD COMPACTION TEST. BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL.

STRUCTURAL STEEL:

STRUCTURAL STEEL LEG..... A501 GRADE B (50 KSI)
PROPOSED CUT PIPE/TUBE..... A501 GRADE B (50 KSI)
EXISTING BEAMS, CHANNELS, PLATES, ANGLES, REPLACEMENT ANGLES..... A36
PROPOSED WELDED PLATES..... A529 GRADE B (50 KSI)
WELDED "T" BEAM..... A992 (50 KSI)

STRUCTURAL STEEL SHALL CONFORM TO ALL THE REQUIREMENTS OF THE ASTM SPECIFICATION, AS REFERENCED IN THE CODE.

UNLESS OTHERWISE NOTED, ALL STEEL WILL BE GALVANIZED IN ACCORDANCE WITH ASTM 123 AFTER FABRICATION. TOUCH UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT 2 SETS OF PRINTS FOR THE ENGINEER REVIEW.

EXISTING DIMENSIONS OF STRUCTURE SHOWN ON THESE DOCUMENTS ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.

CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 5/16" AND MINIMUM OF (2) 3/4" BOLTS.

ALL BOLT HOLES WILL BE DRILLED OR PUNCHED, WITH BURRS REMOVED PRIOR TO COATING.

MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

THE OMISSION OF ANY MATERIAL THAT WAS SHOWN ON THE CONTRACT DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF PROVIDING THE SAME.

ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS STANDARDS, USING E70XX ELECTRODES UNLESS OTHERWISE NOTED. WHERE WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZES PER "PREQUALIFIED WELDED JOINTS" TABLES IN AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION.

CONNECTIONS / FIELD ASSEMBLY:

BOLTED CONNECTIONS: UNLESS OTHERWISE NOTED, ALL JOINTS ARE SLIP CRITICAL TYPE, REQUIRING 3/4" DIA. A325-N BOLTS, A563 NUTS AND F436 WASHERS, ALL GALVANIZED. BEVELED WASHERS SHALL BE USED ON BEAM FLANGES HAVING A SLOPE GREATER THAN 1:20.

NON-STRUCTURAL CONNECTIONS, SUCH AS FOR STEEL GRATING, MAY USE 5/8" DIA. GALVANIZED ASTM A307 BOLTS, UNLESS OTHERWISE NOTED.

STRUCTURE IS DESIGNED TO BE LEVEL AND PLUMB, SELF-SUPPORTING AND STABLE AFTER WORK IS COMPLETED.

COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

IF WELDING GALVANIZED MATERIALS, USE PRECAUTIONS & PROCEDURES PER AWS D1.1.

THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. NO MEMBER OF THE TOWER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY. THE CONTRACTOR SHALL BE AWARE OF WEATHER AND WIND CONDITIONS AND NOT PERFORM MEMBER REPLACEMENT IN A WIND.

INSPECTIONS:

SPECIAL INSPECTIONS ARE REQUIRED PER THE CODE FOR STRUCTURAL STEEL WORK.

PLEASE CONTACT AECOM @ 860-990-6767 FOR CONSTRUCTION PHASE SERVICES AND/OR SPECIAL INSPECTIONS.

AT&T, SPRINT AND T-MOBILE WILL SUPPLY THE SERVICES OF THE REQUIRED SPECIAL INSPECTOR AND TESTING AGENTS AS REQUIRED. CONTRACTOR SHALL COORDINATE INSPECTIONS OF FABRICATOR'S AND ERECTOR'S WORK AND MATERIALS TO MEET THE REQUIREMENTS OF THE STATEMENT OF SPECIAL INSPECTIONS FOR THIS PROJECT.

COPIES OF TESTING AND INSPECTION REPORTS WILL BE PROVIDED TO AT&T, SPRINT AND T-MOBILE, STATE BUILDING OFFICIAL, ENGINEER OF RECORD AND CONTRACTOR.

PROJECT NO. 60581585
Designed by: MCD
Drawn by: GAT
Checked by: KAB
Approved by: RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CALLAHAN ACRES

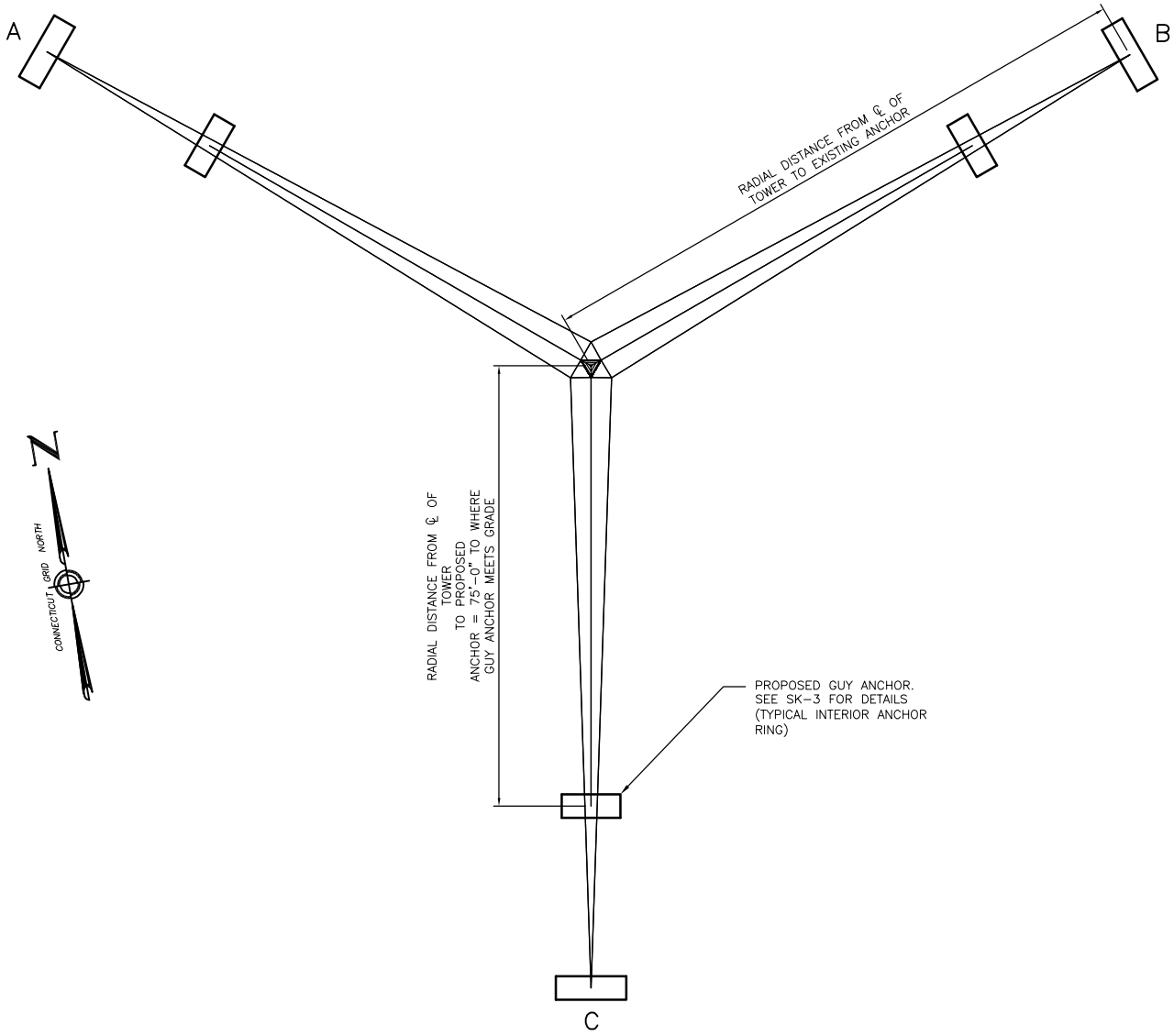
CALLAHAN TOWER
SITE ADDRESS: 2111 BERLIN TURNPIKE
NEWINGTON, CONNECTICUT 06111

REV.	DATE:	DESCRIPTION
2	01/11/19	RE-ISSUE/NO CHANGE
1	11/28/18	REVISION 1

Scale: AS NOTED | Date: 10/10/18
Job No. CAL-005 | File No.

Dwg. No. SK-1
Dwg. 1 of 6

NOTE:
THIS SHEET IS TO BE COORDINATED WITH SK–1 & SK–3 FOR CONSTRUCTION.



1 / SK–2 SITE PLAN
SCALE: 1"= 30'–0"

PROJECT NO.	60581585
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CALLAHAN ACRES

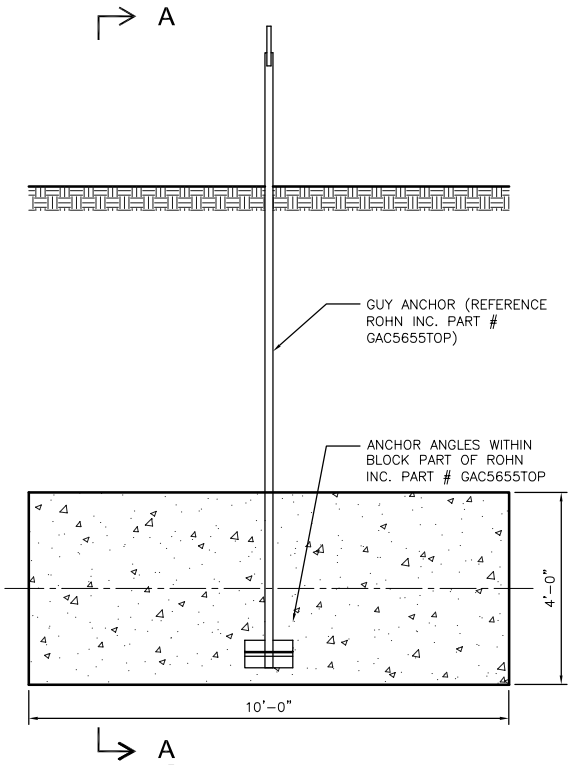
CALLAHAN TOWER
SITE ADDRESS: 2111 BERLIN TURNPIKE
NEWINGTON, CONNECTICUT 06111

REV.	DATE:	DESCRIPTION
2	01/11/19	RE–ISSUE/NO CHANGE
1	11/28/18	REVISION 1

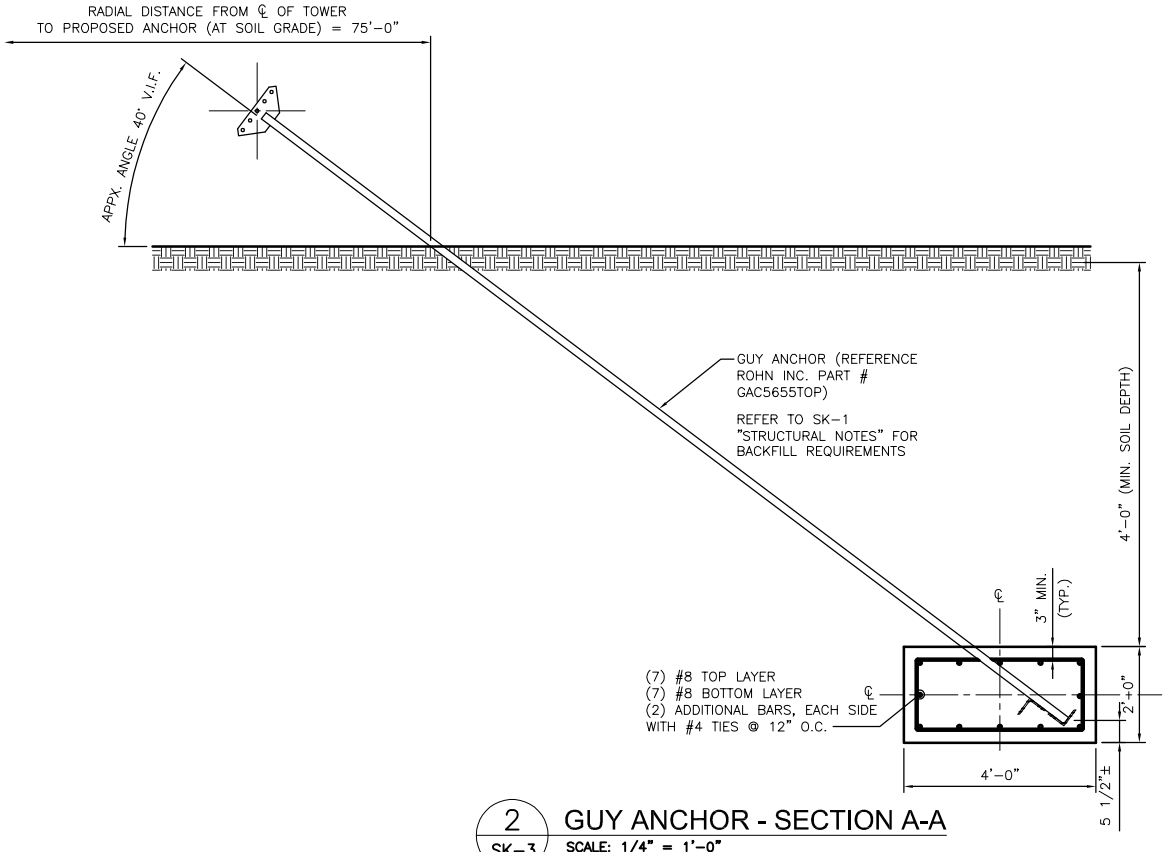
Scale: AS NOTED | Date: 10/10/18
Job No. CAL–005 | File No.

Dwg. No. SK–2

NOTE:
REFER TO SHEET SK-1 FOR CONSTRUCTION NOTES.



1 / SK-3 GUY ANCHOR - ELEVATION
SCALE: 1/4" = 1'-0"



2 / SK-3 GUY ANCHOR - SECTION A-A
SCALE: 1/4" = 1'-0"

PROJECT NO.	60581585
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

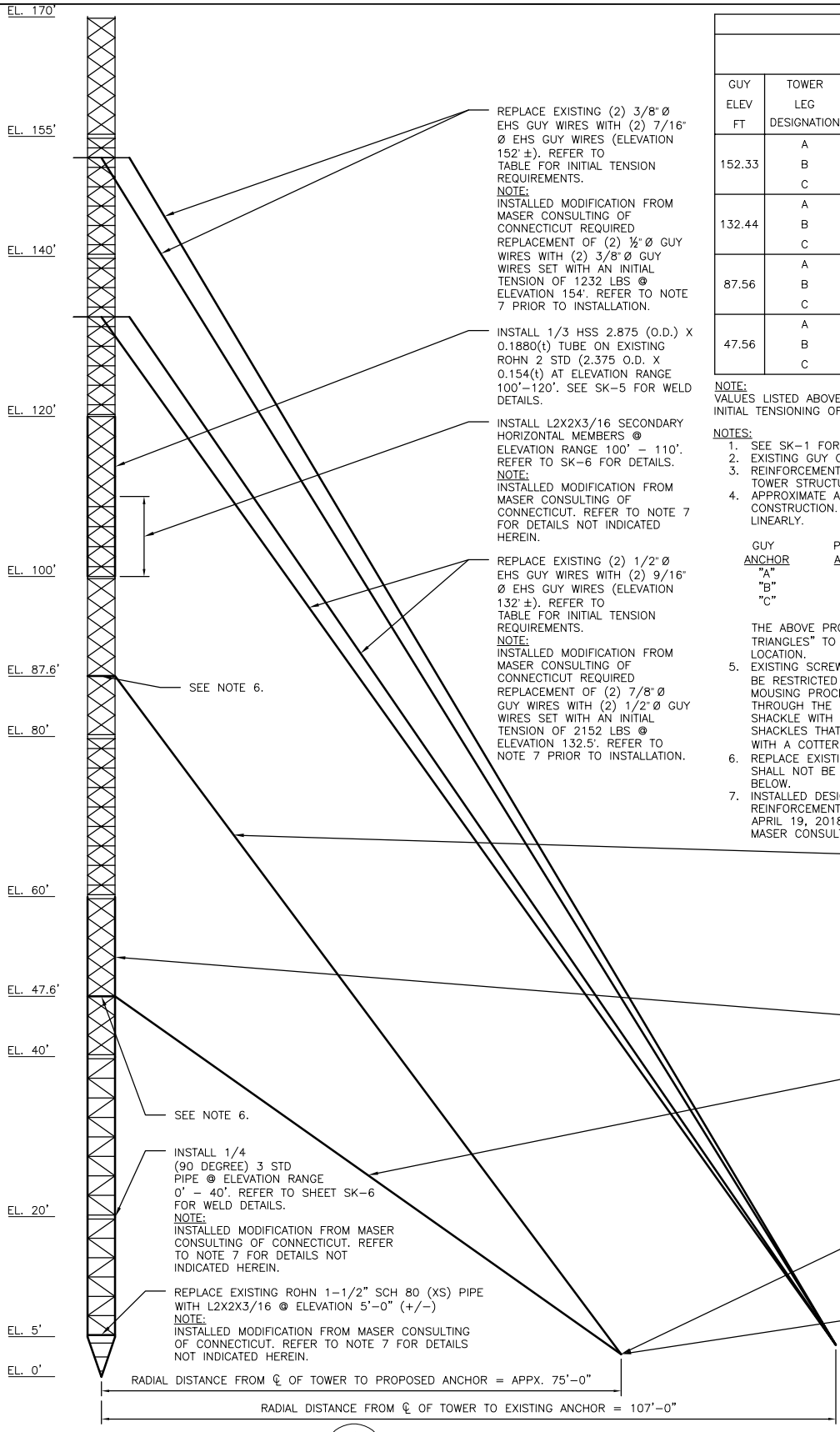
CALLAHAN ACRES

CALLAHAN TOWER
SITE ADDRESS: 2111 BERLIN TURNPIKE
NEWINGTON, CONNECTICUT 06111

REV.	DATE:	DESCRIPTION
2	01/11/19	RE-ISSUE/NO CHANGE
1	11/28/18	REVISION 1

Scale: AS NOTED | Date: 10/10/18
Job No. CAL-005 | File No.

Dwg. No. SK-3



1 / SK–4 TOWER ELEVATION REINFORCEMENT
SCALE: 1" = 20'–0"

GUY–TENSIONING INFORMATION								
		TEMPERATURE AT TIME OF TENSIONING						
		0 F	20 F	40 F	60 F	80 F	100 F	120 F
GUY ELEV FT	TOWER LEG DESIGNATION	Initial Tension LB	Initial Tension LB	Initial Tension LB	Initial Tension LB	Initial Tension LB	Initial Tension LB	Initial Tension LB
152.33	A	2357	2265	2172	2080	1988	1897	1807
	B	2383	2282	2181	2080	1980	1880	1781
	C	2404	2296	2188	2080	1973	1867	1762
132.44	A	4058	3871	3685	3500	3316	3133	2952
	B	4113	3908	3703	3500	3298	3097	2899
	C	4156	3936	3718	3500	3284	3070	2858
87.56	A	4109	3905	3702	3500	3298	3098	2898
	B	4170	3946	3723	3500	3278	3058	2838
	C	4209	3972	3736	3500	3265	3032	2800
47.56	A	4546	4196	3848	3500	3154	2812	2473
	B	4644	4262	3880	3500	3122	2748	2379
	C	4703	4301	3899	3500	3103	2710	2325

NOTE:
VALUES LISTED ABOVE ARE REFERENCED FROM ASTM A475–03 CONSIDERING 10% INITIAL TENSIONING OF CABLE AT AN AMBIENT TEMPERATURE.

NOTES:
1. SEE SK–1 FOR STRUCTURAL NOTES.
2. EXISTING GUY CABLES SHALL BE REMOVED ONE AT A TIME.
3. REINFORCEMENT INDICATED SHALL BE INSTALLED ON ALL 3 SIDES OF TOWER STRUCTURE.
4. APPROXIMATE ANCHOR GRADE ELEVATIONS, TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION. ANCHOR GRADE ELEVATIONS AREA ASSUMED TO DESCEND LINEARLY.

GUY ANCHOR	PREVIOUS ELEVATION ABOVE/BELOW TOWER BASE	PROPOSED ELEVATION ABOVE/BELOW TOWER BASE
"A"	10 FT	7 FT
"B"	–6.0 FT	–4.25 FT
"C"	4.0 FT	2.833 FT

THE ABOVE PROPOSED ELEVATIONS ARE DERIVED FROM "SIMILAR TRIANGLES" TO DETERMINE THE PROPOSED ELEVATION OF THE NEW ANCHOR LOCATION.

5. EXISTING SCREW PIN SHACKLES NOT INDICATED FOR REPLACEMENT SHALL BE RESTRICTED FROM ROTATION/LOOSENING VIA MOUSING OF SHACKLE. MOUSING PROCESS CONSISTS OF USING AN ANNEALED IRON WIRE LOOPING THROUGH THE HOLE OF THE PIN COLLAR AND AROUND ADJACENT LEG OF SHACKLE WITH ENDS OF WIRE SECURELY TWISTED TOGETHER. EXISTING SHACKLES THAT ARE OF ROUND PIN AND BOLT–TYPE SHACKLES ATTACHED WITH A COTTER PIN AND/OR NUT ARE NOT REQUIRED TO BE MOUSED.
6. REPLACE EXISTING 3/4" & 1"ø SHACKLES IN KIND. EXISTING SHACKLES SHALL NOT BE RE–USED DURING RELOCATION OF GUY WIRES INDICATED BELOW.
7. INSTALLED DESIGN MODIFICATIONS IMPLEMENTED THE PREVIOUS REINFORCEMENT DESIGNED BY MASER CONSULTING OF CONNECTICUT, DATED APRIL 19, 2018. REFER TO SK–1 FOR GENERAL NOTES RELATED TO THE MASER CONSULTING TOWER MODIFICATIONS.

PROJECT NO. 60581585
Designed by: MCD
Drawn by: GAT
Checked by: KAB
Approved by: RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CALLAHAN ACRES

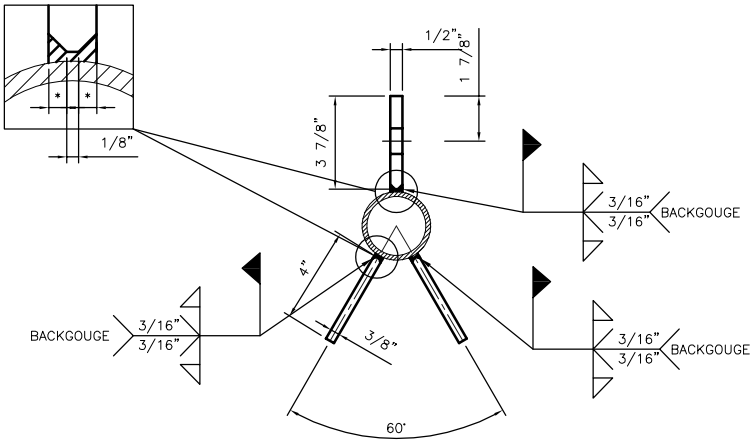
CALLAHAN TOWER
SITE ADDRESS: 2111 BERLIN TURNPIKE
NEWINGTON, CONNECTICUT 06111

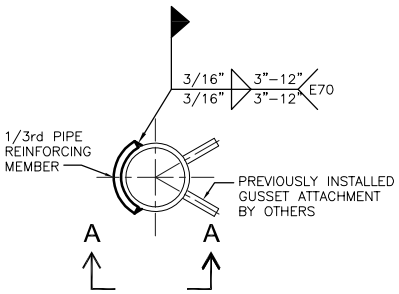
REV.	DATE:	DESCRIPTION
2	01/11/19	RE–ISSUE/NO CHANGE
1	11/28/18	REVISION 1

Scale: AS NOTED | Date: 10/10/18
Job No. CAL–005 | File No.

Dwg. No. SK–4
Dwg. 4 of 6

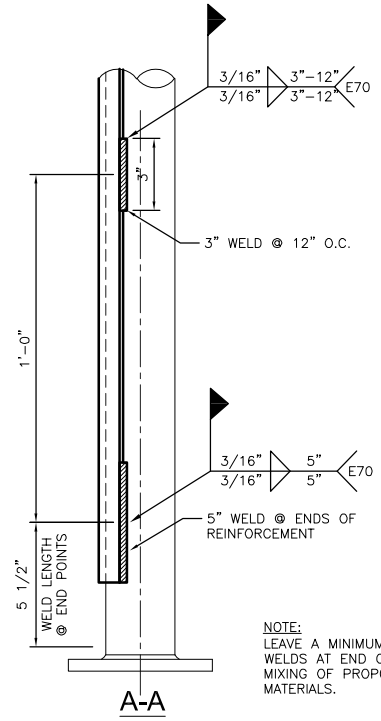
NOTE:
REFER TO STRUCTURAL NOTES ON SK–1 FOR ADDITIONAL DETAILS.





WELDING NOTES (@ EL. 47.6' & 87.6'):
1. WELDING FOR CORNER GUY CONNECTION PLATE INSTALLATION SHALL FOLLOW THE PRE–QUALIFIED WELD JOINT DESIGNATION TC–U5B, AS INDICATED IN THE AISC STEEL CONSTRUCTION MANUAL FOR COMPLETE–JOINT–PENETRATION (CJP) WELDS; 14TH EDITION TABLE 8–2 FOR DOUBLE–BEVEL–GROOVE–WELD.
2. WELDING OF CORNER PLATES TO EXISTING TOWER LEG SHALL BACKGOUGE ROOT TO SOUND METAL PRIOR TO WELDING THE SECOND SIDE OF PLATE ATTACHMENT.
3. THE USE OF FILLER METAL FOR CJP WELDING SHALL COMPLY WITH THE REQUIREMENTS FOR MATCHING FILLER MATERIALS AS INDICATED IN AWS D1.1, TABLE 3.1.
4. INTERMIXING OF WELDING MATERIALS SHALL NOT BE PERMITTED FOR WELDED CONNECTIONS AS SHOWN IN CONSTRUCTION DOCUMENTS..3
5. THE ASTERISK "*" DIMENSION FOR THE 1/2" CORNER PLATE IS 3/16" AND THE DIMENSION FOR THE INTERIOR SUPPORT PLATES ARE 1/8".
6. PROPOSED CORNER CONNECTION PLATE (@ EL. 47.6') IS INTENDED TO BE WELDED TO PROPOSED 1/3 HSS AFTER THE HSS HAS BEEN INSTALLED. WELD ON CORNER PLATE SHALL BE FOR FULL DEPTH OF CORNER PLATE.

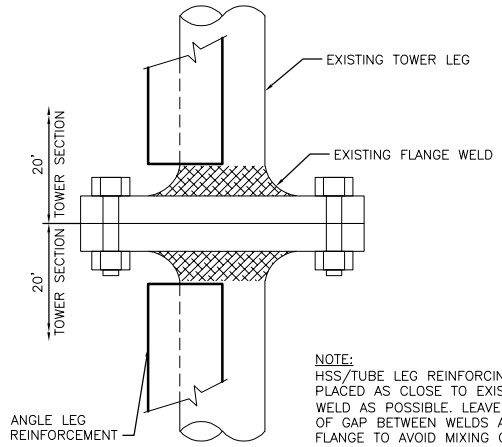
2 / SK–5 REINFORCEMENT DETAIL @ ELEVATION 47.5' & 87.6'
SCALE: 3/4" = 1'–0"



NOTE:
LEAVE A MINIMUM 3" OF GAP BETWEEN WELDS AT END OF FLANGE TO AVOID MIXING OF PROPOSED AND EXISTING WELD MATERIALS.

WELDING NOTES (SECTION A–A):
1. END OF 1/3RD PIPE WELDS SHALL BE A MINIMUM OF 5" OF 3/16 WELD WITH E70 ELECTRODE. SKIP WELDS SHALL BE A MINIMUM OF 3" LENGTH SPACED NO LARGER THAN 12", CENTER–TO–CENTER.
2. WELDS ARE INTENDED TO BE ON EACH SIDE OF REINFORCING 1/3RD PIPE TO EXISTING TOWER LEG STRUCTURE.
3. REINFORCEMENT MATERIALS ATTACHING TO LEG SHALL BE PLACED AS CLOSE TO EXISTING TOWER SECTION FLANGE AS POSSIBLE.

1 / SK–5 1/3rd PIPE LEG REINFORCEMENT AT TOWER ELEVATION 40'-60' & 100'-120'
SCALE: 1" = 1'–0"



NOTE:
HSS/TUBE LEG REINFORCING SHALL BE PLACED AS CLOSE TO EXISTING FLANGE WELD AS POSSIBLE. LEAVE A MINIMUM 3" OF GAP BETWEEN WELDS AT END OF FLANGE TO AVOID MIXING OF PROPOSED AND EXISTING WELD MATERIALS.

PROJECT NO. 60581585
Designed by: MCD
Drawn by: GAT
Checked by: KAB
Approved by: RAS

AECOM
500 ENTERPRISE DRIVE
ROCKY HILL, CONNECTICUT
(860)-529-8882

CALLAHAN ACRES

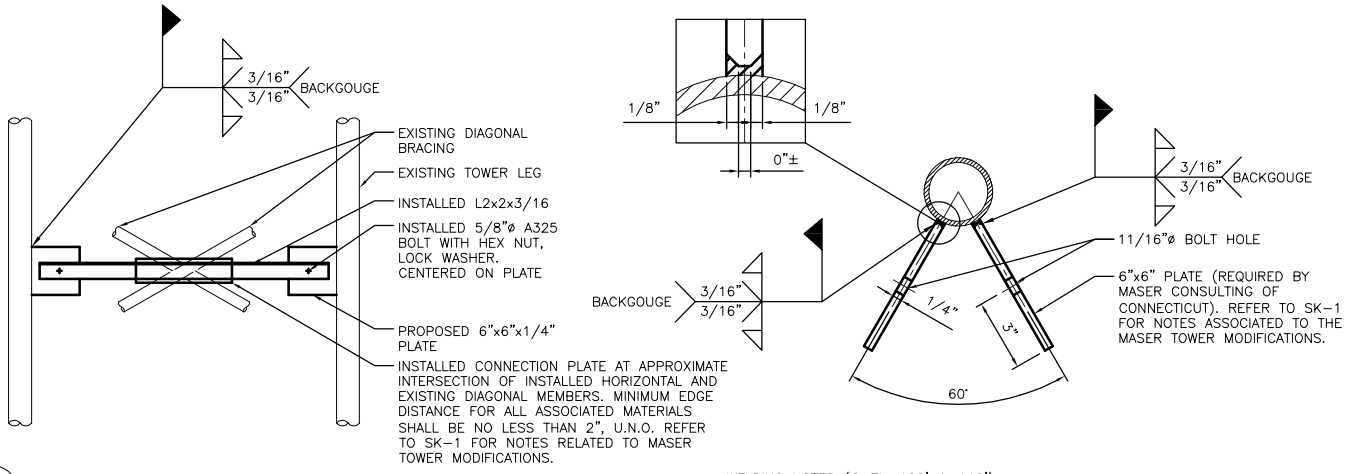
CALLAHAN TOWER
SITE ADDRESS: 2111 BERLIN TURNPIKE
NEWINGTON, CONNECTICUT 06111

REV.	DATE:	DESCRIPTION
2	01/11/19	RE–ISSUE/NO CHANGE
1	11/28/18	REVISION 1

Scale: AS NOTED | Date: 10/10/18
Job No. CAL–005 | File No.

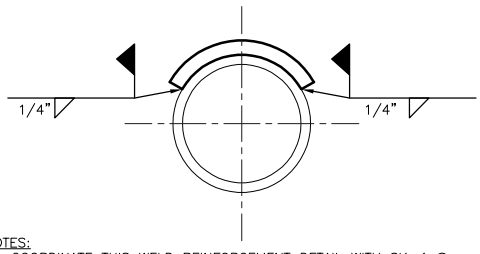
Dwg. No. SK–5
Dwg. 5 of 6

NOTE:
REFER TO STRUCTURAL NOTES ON SK–1 FOR ADDITIONAL DETAILS.



3 SK–6 SECONDARY HORIZONTAL MEMBER DETAIL

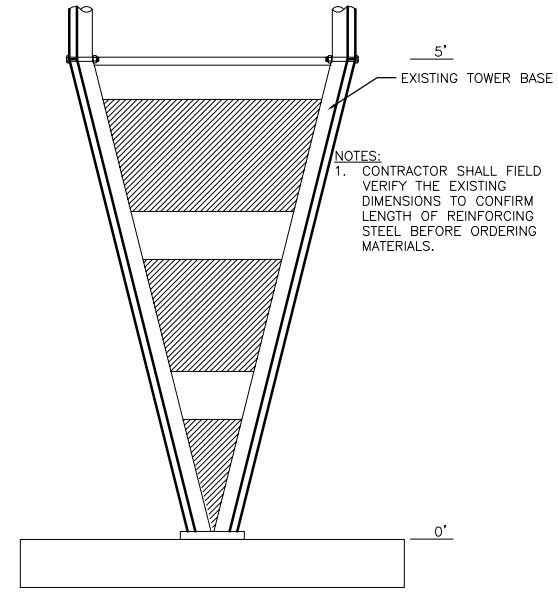
SCALE: 1/2" = 1'–0"



NOTES:
1. COORDINATE THIS WELD REINFORCEMENT DETAIL WITH SK–4 @ ELEVATION 0'–40'. WELD IS CONSIDERED FULL LENGTH (AS REQUIRED BY MASER CONSULTING OF CONNECTICUT). SEE SK–1 FOR NOTES RELATED TO MASER TOWER MODIFICATIONS.
2. ELECTRODE TO APPLY PROPOSED WELD IS E70XX (MINIMUM).
3. COORDINATE WELDING AT FLANGE ENDS WITH SK–5, WITH A MINIMUM DISTANCE OF 2" (CLEAR) FROM EXISTING WELD TO REQUIRED WELD.

2 SK–6 TOWER LEG REINFORCEMENT DETAIL

SCALE: N.T.S.



NOTES:
1. CONTRACTOR SHALL FIELD VERIFY THE EXISTING DIMENSIONS TO CONFIRM LENGTH OF REINFORCING STEEL BEFORE ORDERING MATERIALS.

1 SK–6 1/4th PIPE LEG REINFORCEMENT AT TOWER ELEVATION 0'-40'

SCALE: 1/2" = 1'–0"

WELDING NOTES (@ EL. 100' & 110'):
1. WELDING FOR CORNER GUY CONNECTION PLATE INSTALLATION SHALL FOLLOW THE PRE–QUALIFIED WELD JOINT DESIGNATION TC–U5B, AS INDICATED IN THE AISC STEEL CONSTRUCTION MANUAL FOR COMPLETE–JOINT–PENETRATION (CJP) WELDS; 14TH EDITION TABLE 8–2 FOR DOUBLE–BEVEL–GROOVE–WELD.
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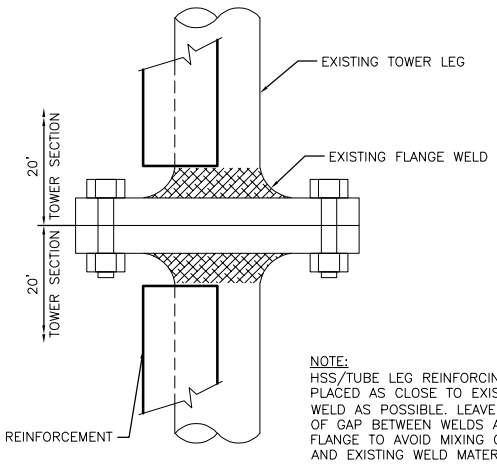
3. THE USE OF FILLER METAL FOR CJP WELDING SHALL COMPLY WITH THE REQUIREMENTS FOR MATCHING FILLER MATERIALS AS INDICATED IN AWS D1.1, TABLE 3.1.
4. INTERMIXING OF WELDING MATERIALS SHALL NOT BE PERMITTED FOR WELDED CONNECTIONS AS SHOWN IN CONSTRUCTION DOCUMENTS.

4 SK–6 REINFORCEMENT DETAIL @ ELEVATION 100' - 110'

SCALE: 3/4" = 1'–0"



NOTE:
HSS/TUBE LEG REINFORCING SHALL BE PLACED AS CLOSE TO EXISTING FLANGE WELD AS POSSIBLE. LEAVE A MINIMUM 2" OF GAP BETWEEN WELDS AT END OF FLANGE TO AVOID MIXING OF PROPOSED AND EXISTING WELD MATERIALS.

PROJECT NO.	60581585
Designed by:	MCD
Drawn by:	GAT
Checked by:	KAB
Approved by:	RAS

AECOM
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Scale: AS NOTED | Date: 10/10/18
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Dwg. No. SK–6

Dwg. 6 of 6

SEISMIC BASE SHEAR

AECOM

Seismic (Vs) Base Shear Implementing ANSI/TIA–222-G, IBC 2015 & Connecticut State Building Code of 2018

Calculation of Seismic Base Shear Implementing ANSI/TIA-222-G, IBC 2015 & & CT State Building Code 2018.

Location: Newington, CT -Site Class "C"

$S_{DS} = \frac{2}{3} F_A S_S$, where $S_S = 0.182$ and $F_A = 1.2$ $S_{DS} = \frac{2}{3} F_A S_S = \frac{2}{3} * 1.2 * 0.182 = 0.146$

$S_{D1} = \frac{2}{3} F_V S_1$, where $S_1 = 0.064$ and $F_V = 1.7$ $S_{D1} = \frac{2}{3} F_V S_1 = \frac{2}{3} * 1.7 * 0.064 = 0.073$

TIA-222-G SECTION 2.7 EARTHQUATE LOADS (PROCEDURES):

1. Importance Factor "I" (tables 2-3 TIA-222-G) = 1.0 (Structure Class 2)

ANSI/TIA-222-G 2.7.7.1 (TOTAL BASE SEISMIC SHEAR (Vs)

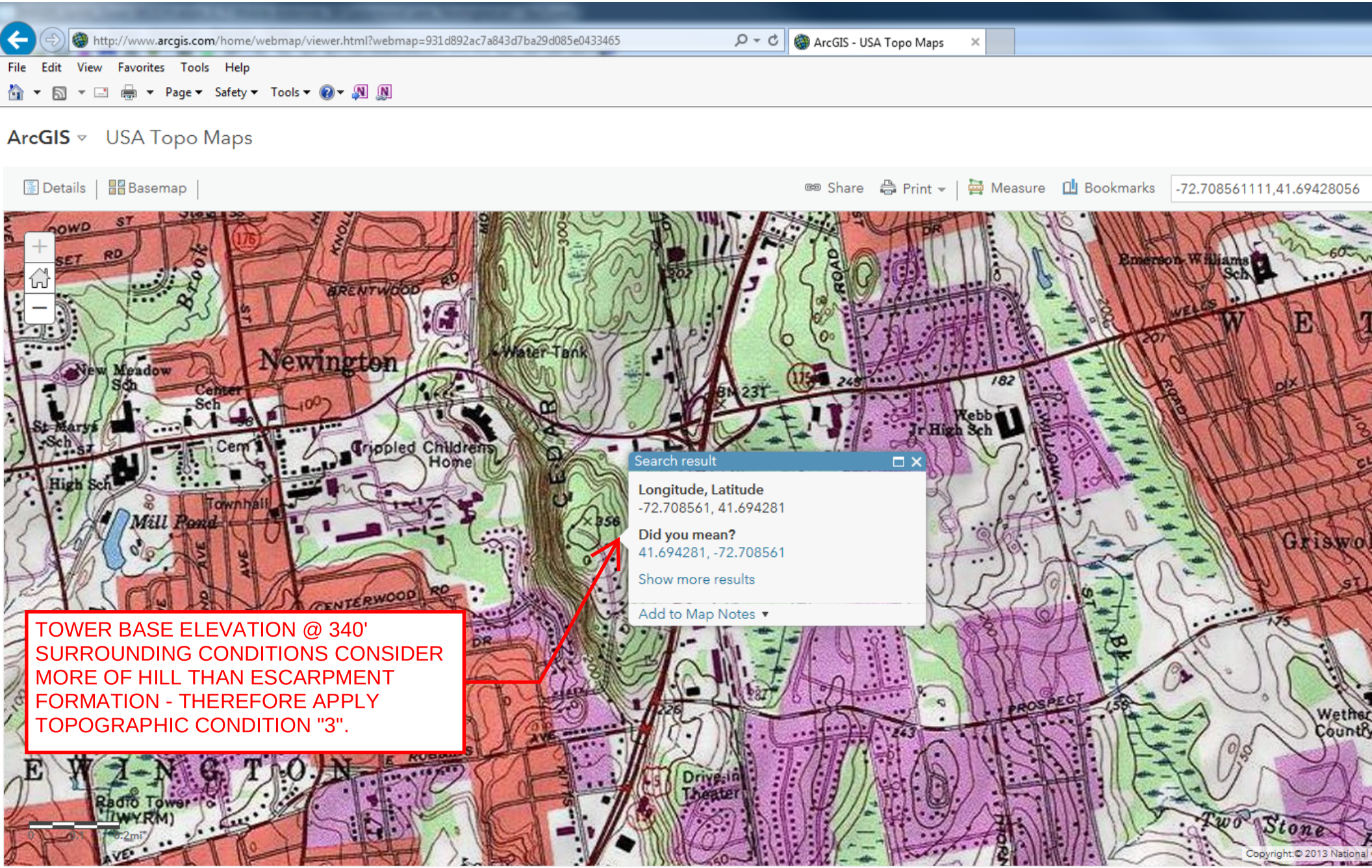
W=DL TOWER	= 10.420	Kips
W=Antennas/Mounts	= 11.186	Kips
W=Cables	= 7.015	Kips
	28.621	Kips = WT Total = "W"

$$V_s = \frac{S_{DS} * W * I}{R} = \frac{0.146 * 28.621 kips * 1.0}{2.5} = 1.6715 \ kips,$$ where R = 2.5 for Guyed Lattice Tower

$$V_{S.min} = \frac{0.5 * S_{D1} * W * I}{R} = \frac{0.5 * 0.073 * 28.621 kips * 1.0}{2.5} = 0.4179 \ kips$$

*By visual inspection, the above "Base Shear" value when considering the following Load Combination is less that the base shear of wind on structure.

$1.2 * DL + 1.0\ E < 1.2\ DL + 1.6\ W$, (3.125 Kips), therefore seismic effect on structure Does NOT control Design.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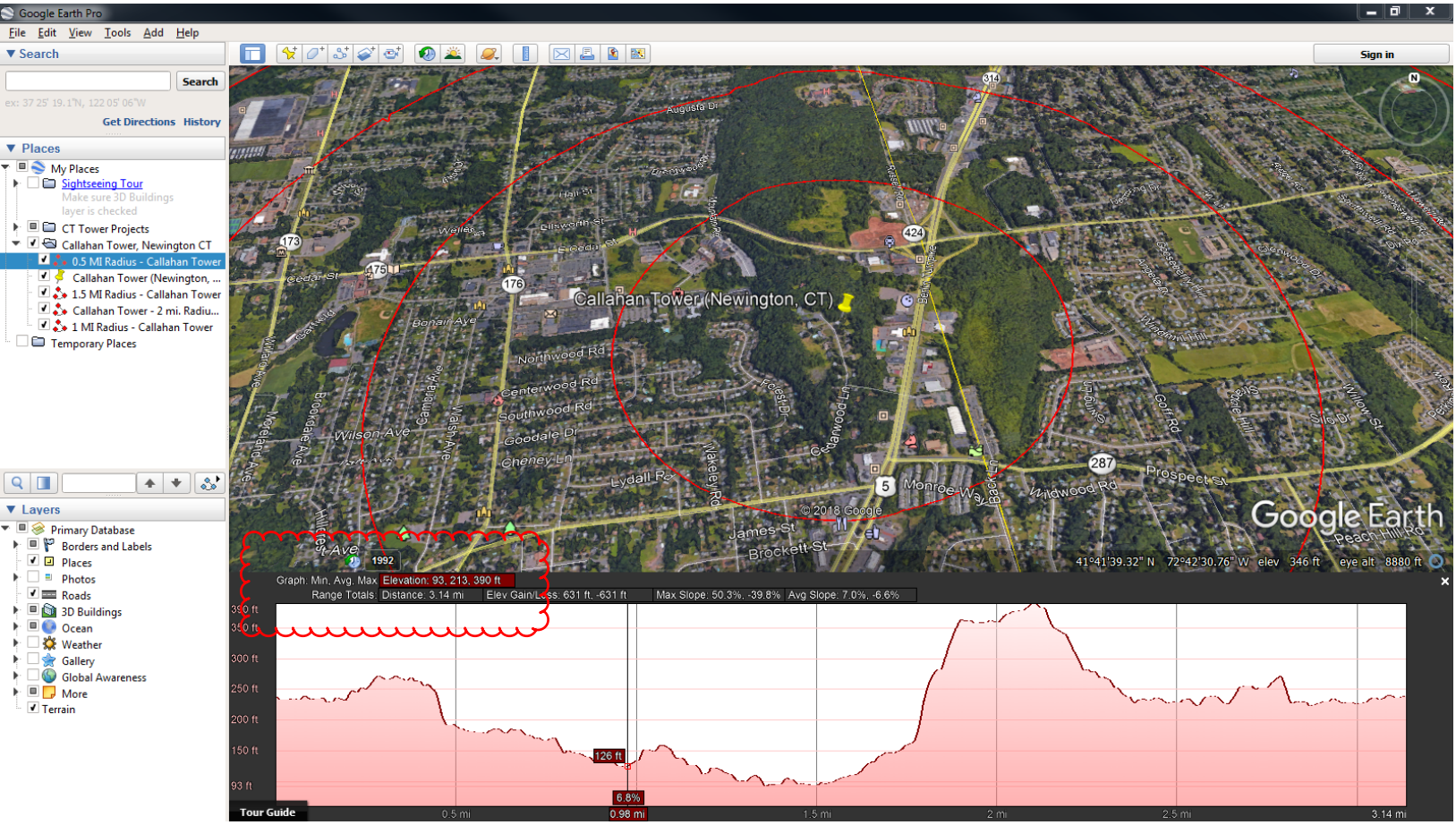
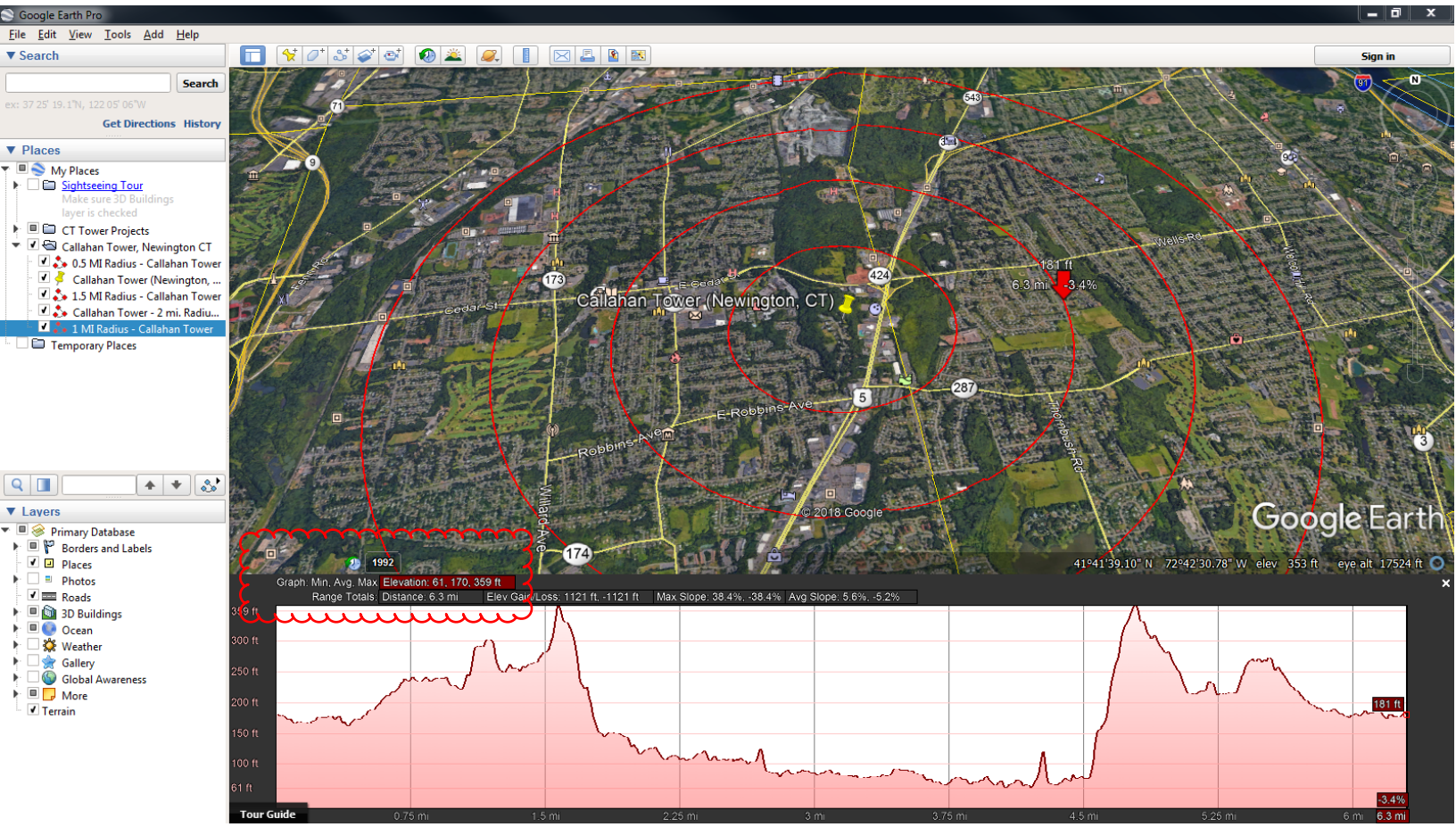
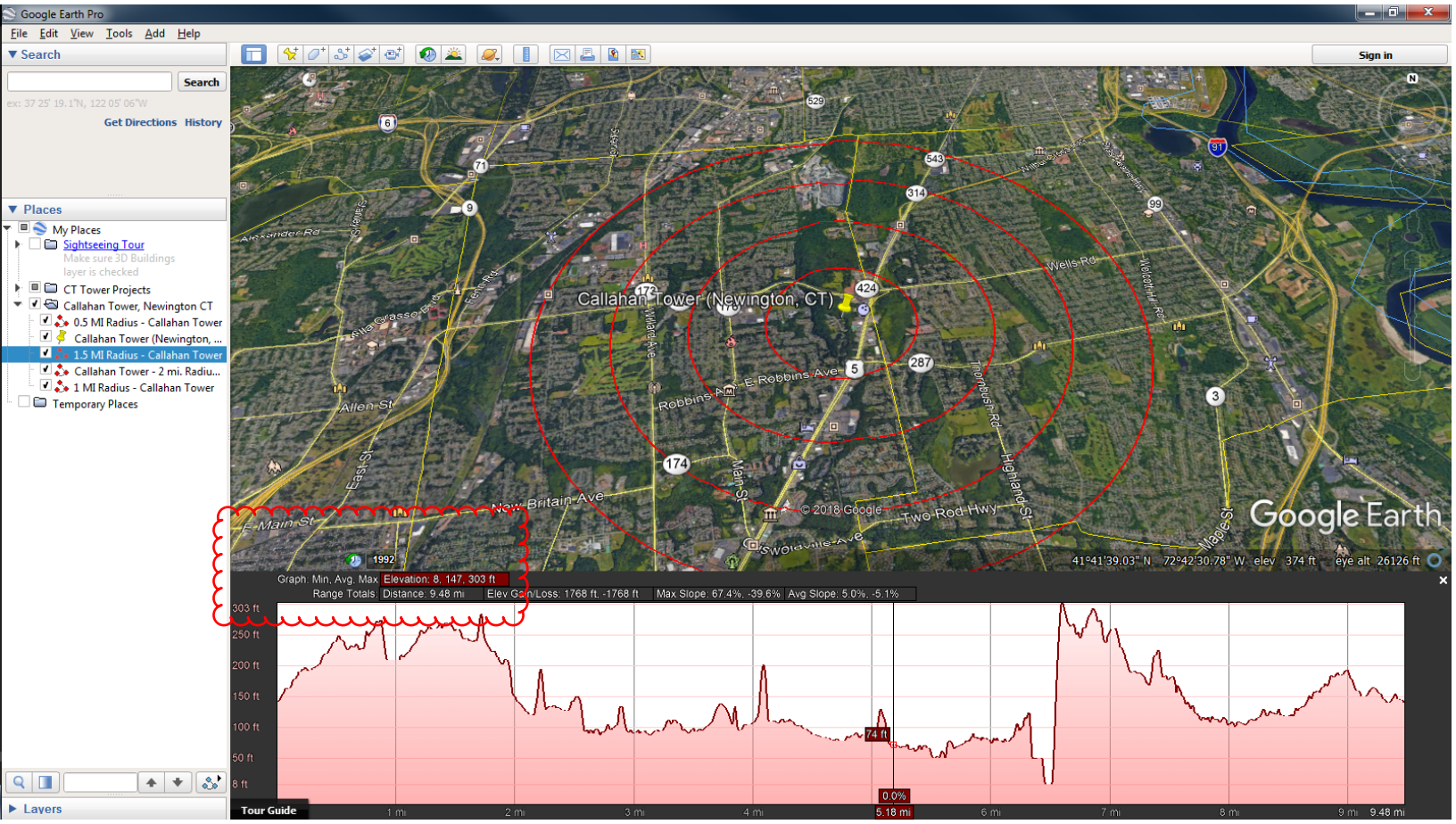
ArcGIS - USA Topo Maps
File Edit View Favorites Tools Help
Page Safety Tools
ArcGIS USA Topo Maps
Details Basemap
Share Print Measure Bookmarks
-72.708561111,41.69428056
Search result
Longitude, Latitude
-72.708561, 41.694281
Did you mean?
41.694281, -72.708561
Show more results
Add to Map Notes
Newington
Water Tank
New Meadow Sch
Center Sch
St Marys Sch
High Sch
Cem
Crippled Childrens Home
Townhall
Mill Pond
BRENTWOOD RD
CENTERWOOD RD
Webb Jr High Sch
Emerson Williams Sch
PROSPECT
Drive-in Theater
Radio Tower (WYRM)
Two Stone
TOWER BASE ELEVATION @ 340'
SURROUNDING CONDITIONS CONSIDER
MORE OF HILL THAN ESCARPMENT
FORMATION - THEREFORE APPLY
TOPOGRAPHIC CONDITION "3".

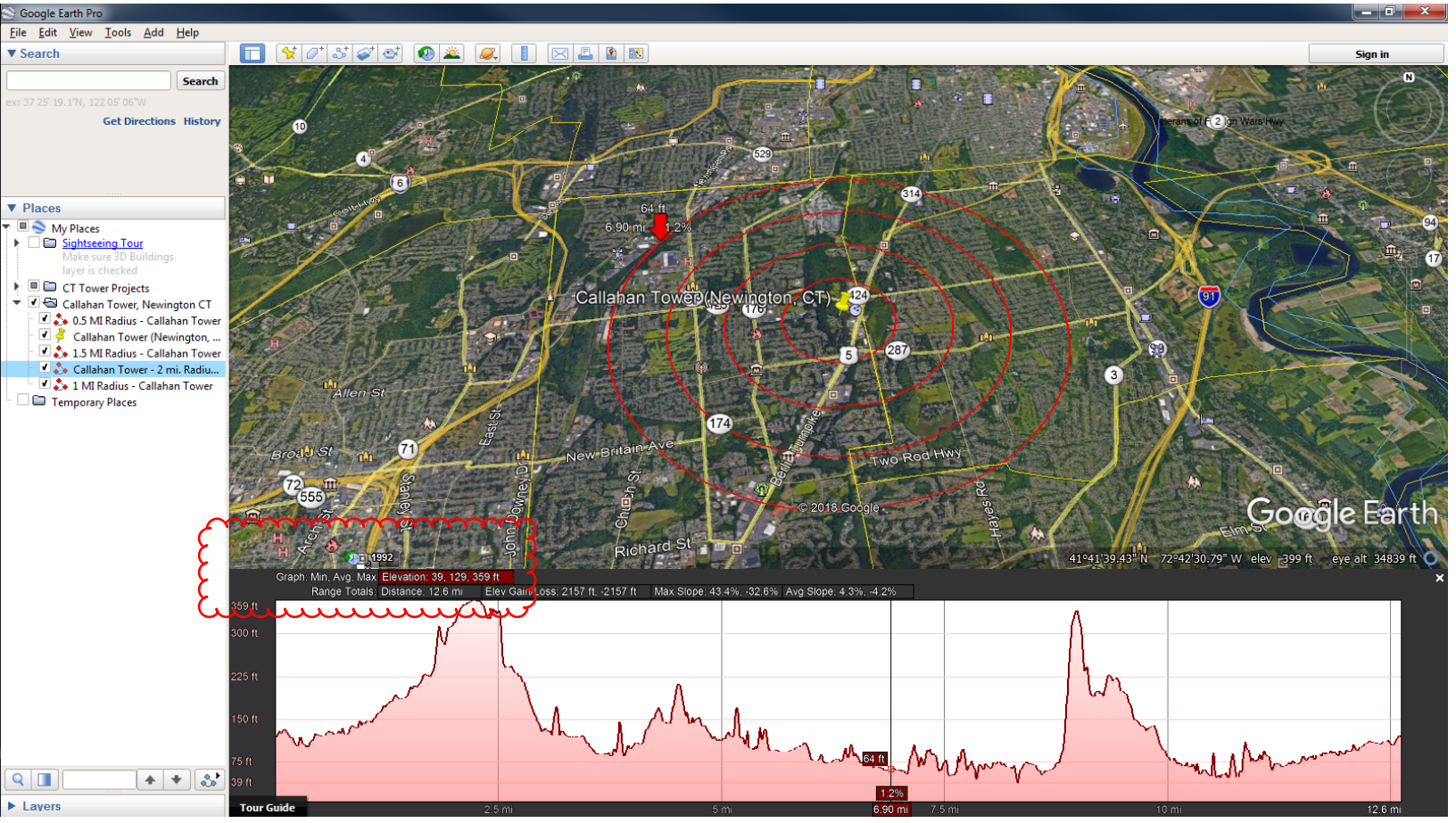


ABOVE 0.5 MI RADIUS | BELOW 1.0 MI RADIUS



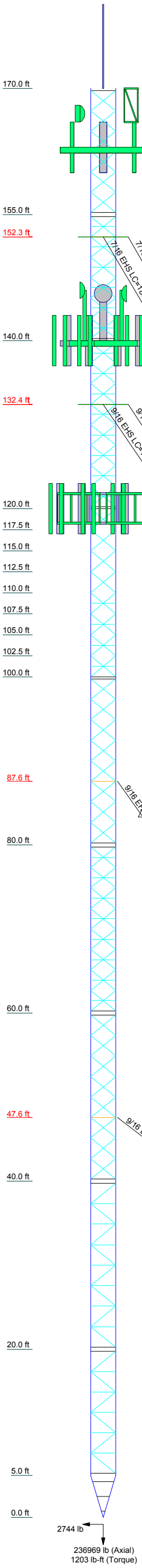


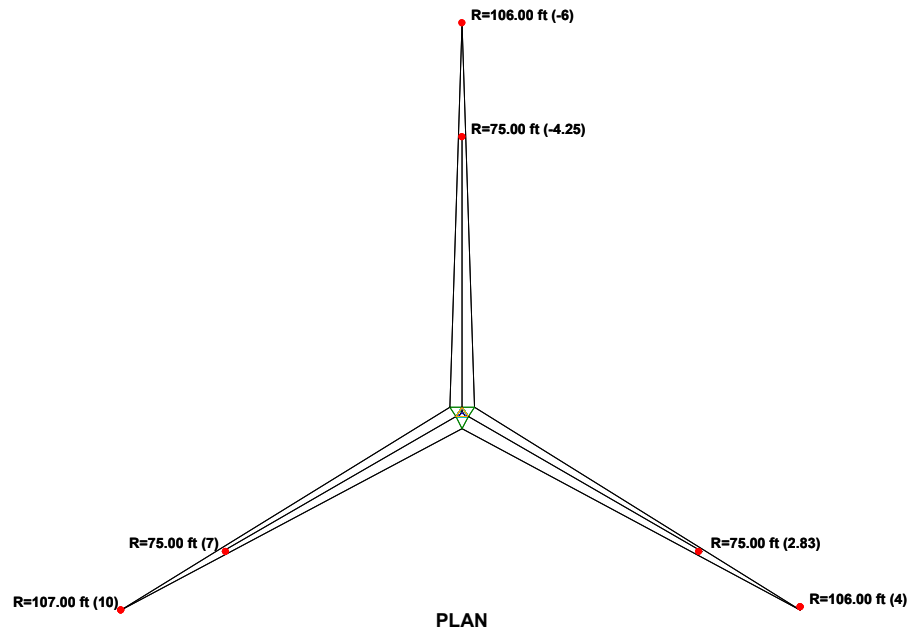
ABOVE 1.5 MI RADIUS | BELOW 2.0 MI RADIUS



TNX TOWER INPUT/OUTPUT SUMMARY

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17
Legs		ROHN 2 STD	ROHN 2 STD w/ 1" Solid Rod				CAL-005 MOD#2							CAL-005 MOD#1		MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	
Leg Grade												A572-50					
Diagonals	P1.5x16GA	ROHN 1.5 STD	L1 3/4x1 3/4x1/4									P1.5x16GA					N.A.
Diagonal Grade				A			N.A.					A36		P1.5x16GA			N.A.
Top Girts	P1.5x16GA		L1 3/4x1 3/4x3/16									N.A.					14x3/16
Mid Girts												P1.5x16GA					14x3/16
Bottom Girts	P1.5x16GA		L1 3/4x1 3/4x3/16									P1.5x16GA				L2x2x3/16	14x3/16
Horizontals							N.A.				N.A.		L2x2x3/16	4x3/8			N.A.
Sec. Horizontals	N.A.	SR 1	L1 3/4x1 3/4x1/4	N.A.	N.A.	N.A.				L2x2x3/16					N.A.		
Top Guy Pull-Offs	N.A.	L2x2x3/16	N.A.													N.A.	
Face Width (ft)																	
# Panels @ (ft)	12 @ 2.41667	12 @ 2.41667	8 @ 2.4375	8 @ 2.5	8 @ 2.5	8 @ 2.5						32 @ 2.4375				6 @ 2.41667	3 @ 1.75
Weight (lb)	3.42	1280.0	1949.4	79.7	69.4	69.4			95.6	95.6	105.9	644.3	822.7	808.4		624.0	2441.2
	345.5														813.9		10409.9





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DS4C03F36U-D 8' Omni (Town)	175	DB844H90E-XY Panel Antenna (Sprint)	140
SC473-HF1LDF (Town)	175	DB844H90E-XY Panel Antenna (Sprint)	140
SC473-HF1LDF (Town)	175	7770.00 (ATI Equipment)	120
TTA 432-83H-01T (Town)	170	7770.00 (ATI Equipment)	120
Pirod 4' Side Mount Standoff (1) (Town)	168	7770.00 (ATI Equipment)	120
Pirod 4' Side Mount Standoff (1) (Town)	168	OPA-65R-LCUU-H6 Panel (ATI Equipment)	120
4' Standoff (Town)	168	OPA-65R-LCUU-H6 Panel (ATI Equipment)	120
RFS SC2-W100BC	167	OPA-65R-LCUU-H6 Panel (ATI Equipment)	120
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	163	(2) LGP214## TMA (ATI Equipment)	120
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	163	(2) LGP214## TMA (ATI Equipment)	120
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	163	(2) LGP214## TMA (ATI Equipment)	120
AIR 3246 B66 Panel Antenna (T-Mobile)	163	(2) TPX-070821 CCI Triplexer Unit (ATI Equipment)	120
AIR 3246 B66 Panel Antenna (T-Mobile)	163	(2) TPX-070821 CCI Triplexer Unit (ATI Equipment)	120
AIR 3246 B66 Panel Antenna (T-Mobile)	163	(2) TPX-070821 CCI Triplexer Unit (ATI Equipment)	120
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	163	RRUS-32 (ATI Equipment)	120
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	163	RRUS-32 (ATI Equipment)	120
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	163	RRUS-32 (ATI Equipment)	120
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	163	DC6-48-60-18-8F (Squid) Suppressor (ATI Equipment)	120
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	163	DC6-48-60-18-8F (Squid) Suppressor (ATI Equipment)	120
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	163	800-10965 Kathrien Panel w/ Pipe Mount (ATI Equipment)	120
KRY 112 489/2 (T-Mobile)	163	800-10965 Kathrien Panel w/ Pipe Mount (ATI Equipment)	120
KRY 112 489/2 (T-Mobile)	163	800-10965 Kathrien Panel w/ Pipe Mount (ATI Equipment)	120
KRY 112 489/2 (T-Mobile)	163	RRUS-32 B66 (ATI Equipment)	120
KRY 112 144/2 (T-Mobile)	163	RRUS-32 B66 (ATI Equipment)	120
KRY 112 144/2 (T-Mobile)	163	RRUS-32 B66 (ATI Equipment)	120
KRY 112 144/2 (T-Mobile)	163	4478 Radio Unit (4x40W) (ATI Equipment)	120
4449 B71 + B12 Radio Unit (T-Mobile)	163	4478 Radio Unit (4x40W) (ATI Equipment)	120
4449 B71 + B12 Radio Unit (T-Mobile)	163	4478 Radio Unit (4x40W) (ATI Equipment)	120
4449 B71 + B12 Radio Unit (T-Mobile)	163	DC6-48-60-18-8F (Squid) Suppressor (ATI Equipment)	120
VHLP2-180	146	Sabre 12" HD V-Boom Antenna Mount (ATI Equipment)	120
VHLP800-11	145.6	Sabre 12" HD V-Boom Antenna Mount (ATI Equipment)	120
VHLP2-180	145.6	Sabre 12" HD V-Boom Antenna Mount (ATI Equipment)	120
844H90T11EXY (Clearwire)	143	RRUS-32 (ATI Equipment)	120
844H90T11EXY (Clearwire)	143	RRUS-32 (ATI Equipment)	120
844H90T11EXY (Clearwire)	143	QS66512-2 Panel Antenna (ATI Equipment)	120
Pirod 12' T-Frame Sector Mount (1) (Sprint)	140	QS66512-2 Panel Antenna (ATI Equipment)	120
Pirod 12' T-Frame Sector Mount (1) (Sprint)	140	QS66512-2 Panel Antenna (ATI Equipment)	120
Pirod 12' T-Frame Sector Mount (1) (Sprint)	140	RRUS-11 (ATI Equipment)	120
AAHC Panel Antenna (Sprint)	140	RRUS-11 (ATI Equipment)	120
AAHC Panel Antenna (Sprint)	140	RRUS-11 (ATI Equipment)	120
AAHC Panel Antenna (Sprint)	140	RRUS-11 (ATI Equipment)	120
NNVV-65B-R4 Panel Antenna (Sprint)	140	RRUS-32 (ATI Equipment)	120
NNVV-65B-R4 Panel Antenna (Sprint)	140	(2) GPS (Town)	50
NNVV-65B-R4 Panel Antenna (Sprint)	140		
ALU 4x45-1900 MHz RRH Unit (Sprint)	140		
ALU 4x45-1900 MHz RRH Unit (Sprint)	140		
ALU 4x45-1900 MHz RRH Unit (Sprint)	140		
(2) ALU 800MHz 2x50W (Sprint)	140		
(2) ALU 800MHz 2x50W (Sprint)	140		
(2) ALU 800MHz 2x50W (Sprint)	140		
844G65VTZASX w/Mount Pipe (Sprint)	140		
844G65VTZASX w/Mount Pipe (Sprint)	140		
844G65VTZASX w/Mount Pipe (Sprint)	140		
844G65VTZASX w/Mount Pipe (Sprint)	140		

SYMBOL LIST

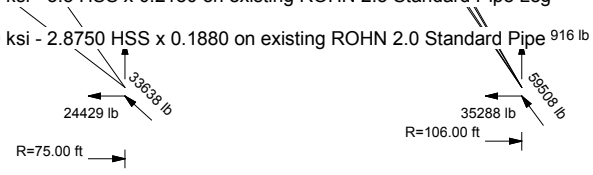
MARK	SIZE	MARK	SIZE
A	P1.5x16GA		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 3 with Crest Height of 178.00 ft
8. ANALYSIS ASSUMPTIONS:
9. Tower diagonal and horizontal bolts are assumed to match ROHN specifications of 1/2" ASTM 325N (unless indicated otherwise).
10. TOWER MODifications indicated are from "Sprint - Maser Consulting Connecticut" Analysis; project number 17924017A, dated April 19, 2018.
11. Previous Tower MODifications @ Elevations 120'-155' for Secondary Horizontal installs and Diagonal Pipe replacement are from AECOM (formerly URS Corporation Project # 36931279 / EBI-001, dated August 22, 2014) assumed to be constructed.
12. Previous Tower MODifications other Elevations from others predating the above AECOM MODification report.
13. MODification Notes:
14. "CAL-005 MOD #1" - Consists of a welded 1/3rd 50 ksi - 3.5 HSS x 0.2180 on existing ROHN 2.5 Standard Pipe Leg (EL Region 40' - 60')
15. "CAL-005 MOD #2" - Consists of a welded 1/3rd 50 ksi - 2.8750 HSS x 0.1880 on existing ROHN 2.0 Standard Pipe Leg (EL Region 100' - 120')
16. TOWER RATING: 97.7%

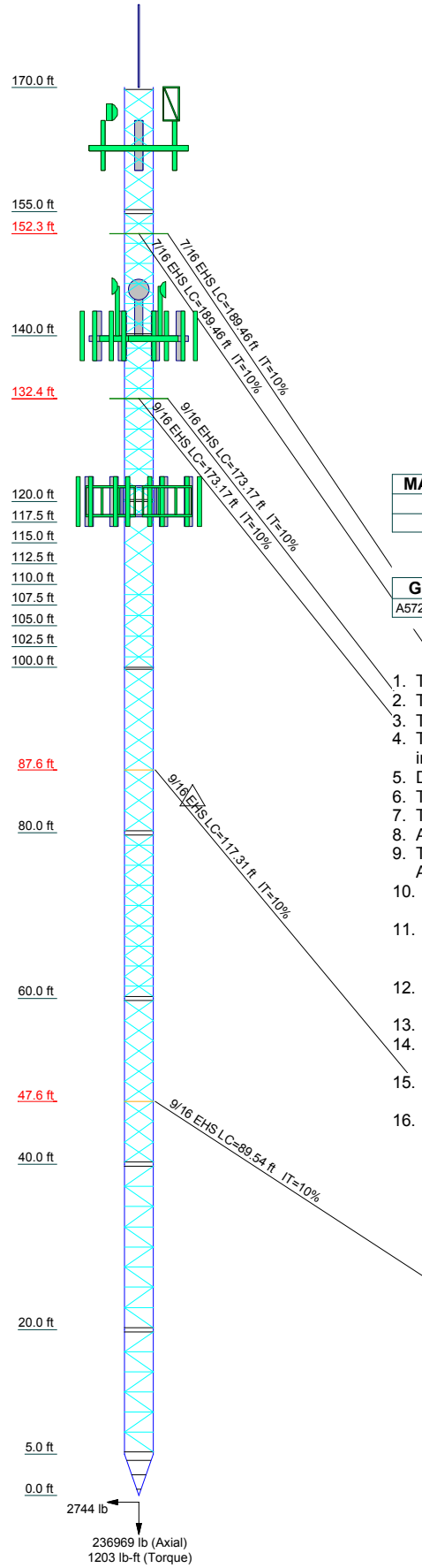


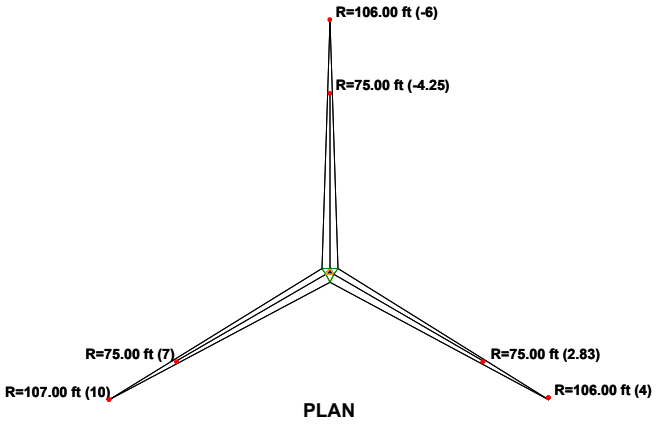
ALL REACTIONS ARE FACTORED

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***170' Callahan Tower (Newington, CT)***			
Project: ***S.A. - Callahan Tower***			
Client: CAL-005 / MODifications for Previous 3 Carrier Antenna Upgrades	Drawn by: MCD	App'd:	
Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
Path:		Dwg No. E-1	

Section		T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe			CAL-005 MOD#1	ROHN 2 STD w/ 1/3rd pipe	ROHN 2.5 STD			CAL-005 MOD#2						A	ROHN 2 STD	
Leg Grade							A572-50											3.42
Diagonals		N.A.				P1.5x16GA										L1 3/4x1 3/4x1/4	ROHN 1.5 STD	P1.5x16GA
Diagonal Grade		N.A.					A36											
Top Girts		C				P1.5x16GA						N.A.		B		L1 3/4x1 3/4x3/16		P1.5x16GA
Mid Girts		C					N.A.											
Bottom Girts		C		L2x2x3/16		P1.5x16GA						N.A.				L1 3/4x1 3/4x3/16		P1.5x16GA
Horizontals		N.A.		SR 1			N.A.											
Sec. Horizontals				N.A.		L2x2x3/16	N.A.			L2x2x3/16		N.A.		N.A.		L1 3/4x1 3/4x1/4	SR 1	N.A.
Top Guy Pull-Offs				N.A.	4x3/8	N.A.	4x3/8					8 @ 2.5			N.A.		L2x2x3/16	N.A.
Face Width (ft)																		
# Panels @ (ft)		D	6 @ 2.41667		32 @ 2.4375											8 @ 2.4375	12 @ 2.41667	
Weight (lb)	10409.9	2441.2	624.0	813.9	808.4	822.7	644.3	105.8	95.6	95.6	95.6	69.4	69.4	69.4	79.7	1949.4	1280.0	345.5





PLAN

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2 STD w/ 1" Solid Rod	C	14x3/16
B	P1.5x16GA	D	3 @ 1.75

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 3 with Crest Height of 178.00 ft
8. ANALYSIS ASSUMPTIONS:
9. Tower diagonal and horizontal bolts are assumed to match ROHN specifications of 1/2" ASTM 325N (unless indicated otherwise).
10. TOWER MODifications indicated are from "Sprint - Maser Consulting Connecticut" Analysis; project number 17924017A, dated April 19, 2018.
11. Previous Tower MODifications @ Elevations 120'-155' for Secondary Horizontal installs and Diagonal Pipe replacement are from AECOM (formerly URS Corporation Project # 36931279 / EBI-001, dated August 22, 2014) assumed to be constructed.
12. Previous Tower MODifications other Elevations from others predating the above AECOM MODification report.
13. MODification Notes:
14. "CAL-005 MOD #1" - Consists of a welded 1/3rd 50 ksi - 3.5 HSS x 0.2180 on existing ROHN 2.5 Standard Pipe Leg (EL Region 40' - 60')
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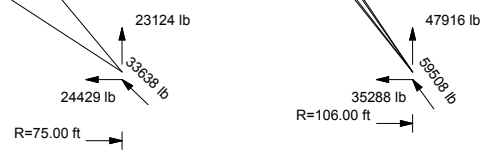
16. TOWER RATING: 97.7%



ALL REACTIONS ARE FACTORED

AECOM
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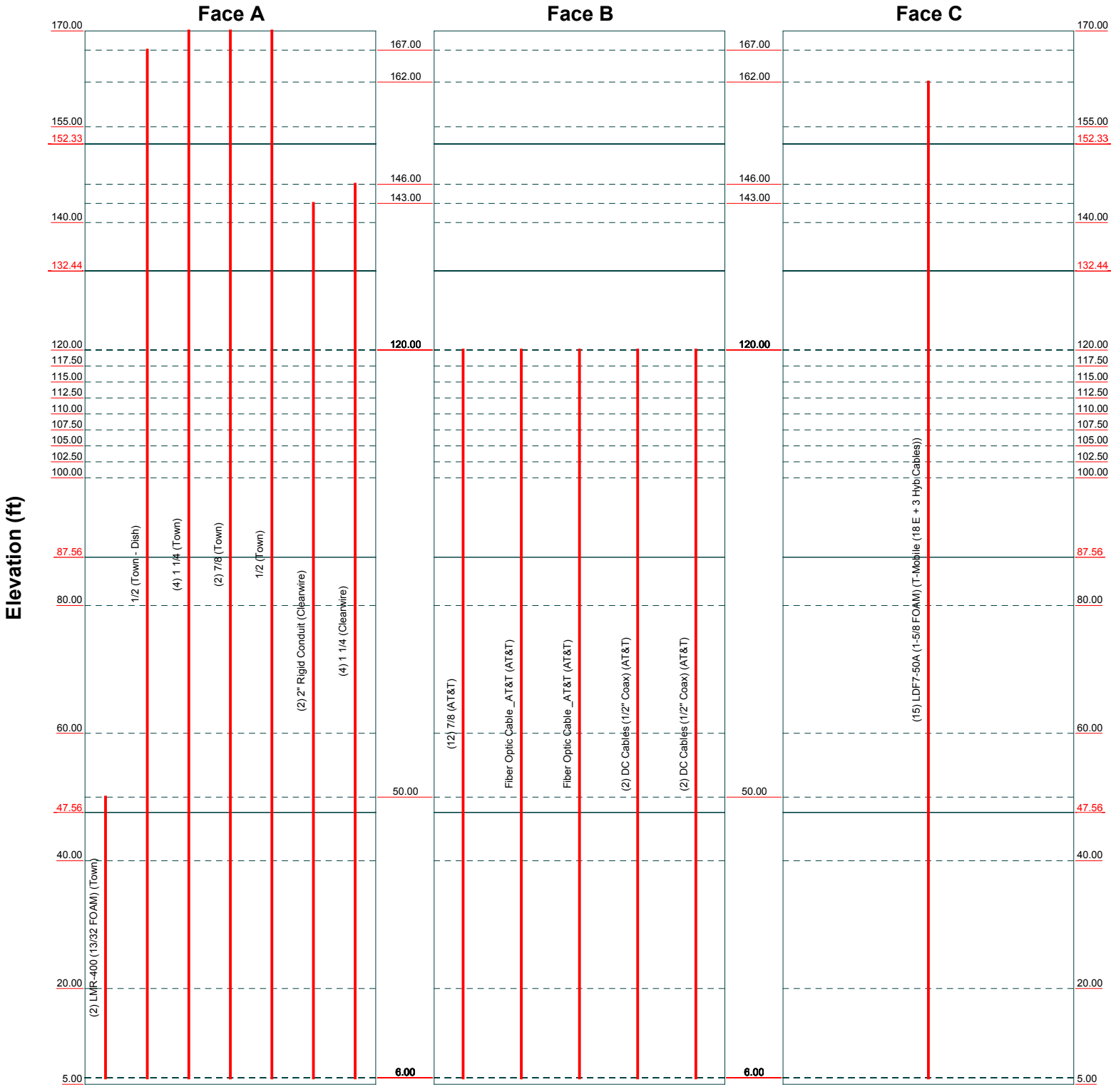
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***170' Callahan Tower (Newington, CT)***		
Project:	***S.A. - Callahan Tower***		
Client:	CAL-005 / MODifications for Previous 3 Carrier Antenna Upgrades	Drawn by: MCD	App'd:
Code:	TIA-222-G	Date: 01/11/19	Scale: NTS
Path:			Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION CHART

Feed Line Distribution Chart
5' - 170'

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



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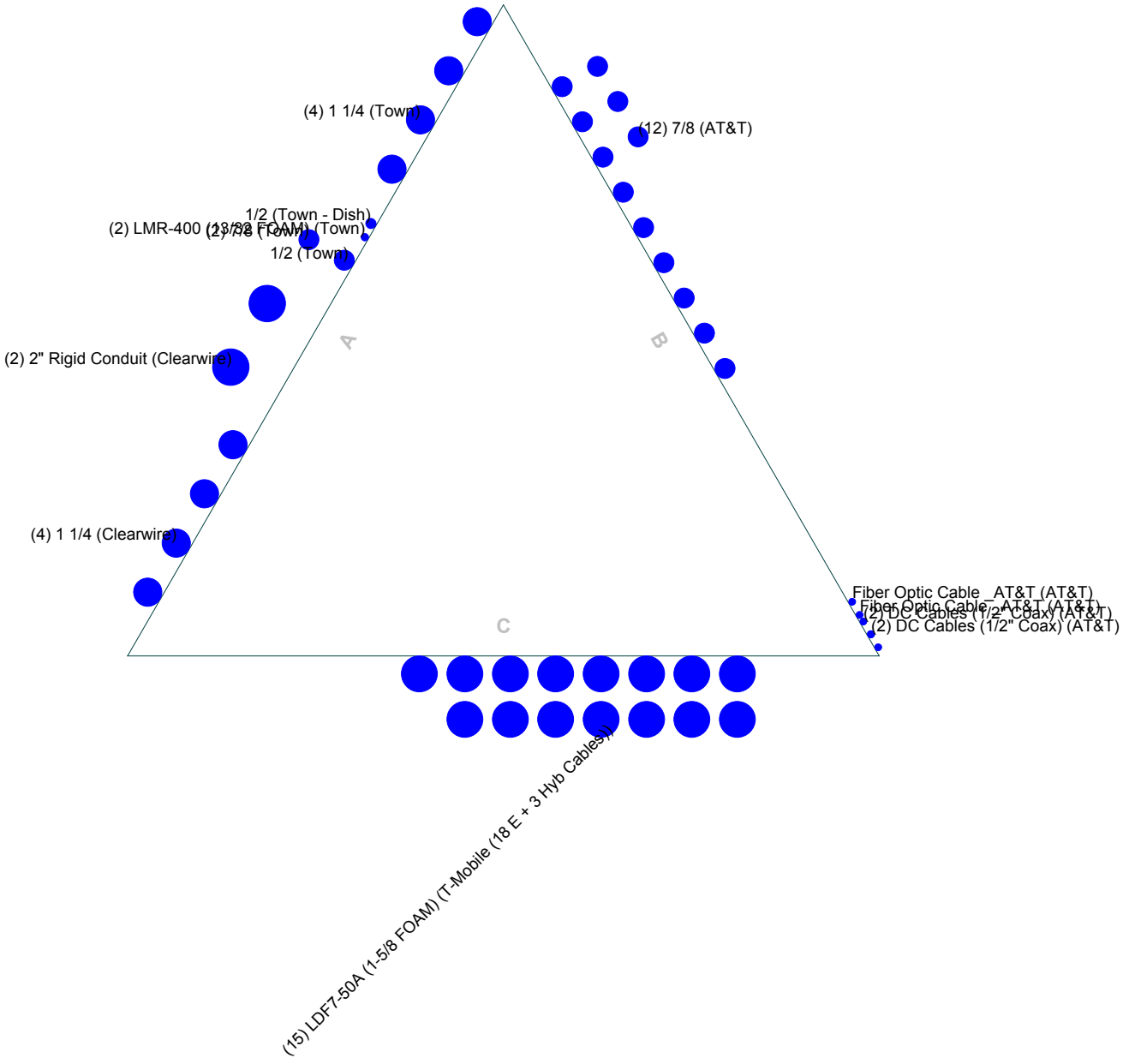
Path:			Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round Flat App In Face App Out Face



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Project: ***S.A. - Callahan Tower***			
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Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
Path:		Dwg No. E-7	

TNX TOWER ANCHOR REACTIONS

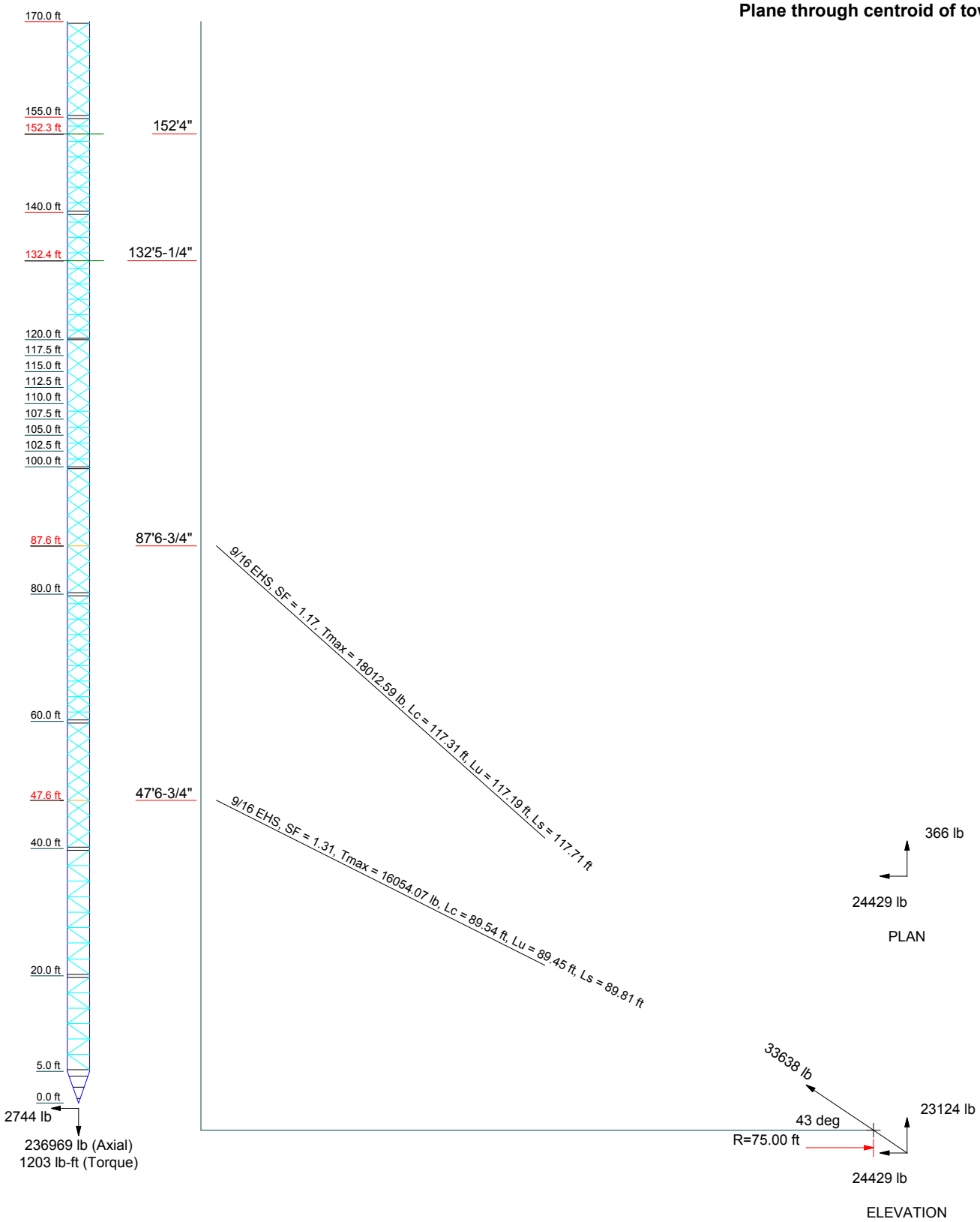
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'A'@75 ft Azimuth 0 deg Elev -4.25 ft

Plane through centroid of tower



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: ***170' Callahan Tower (Newington, CT)***			
	Project: ***S.A. - Callahan Tower***			
	Client: CAL-005 / MODifications for Previous 3 Carrier Antenna Upgrades	Drawn by: MCD	App'd:	
	Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
	Path:		Dwg No. E-6	

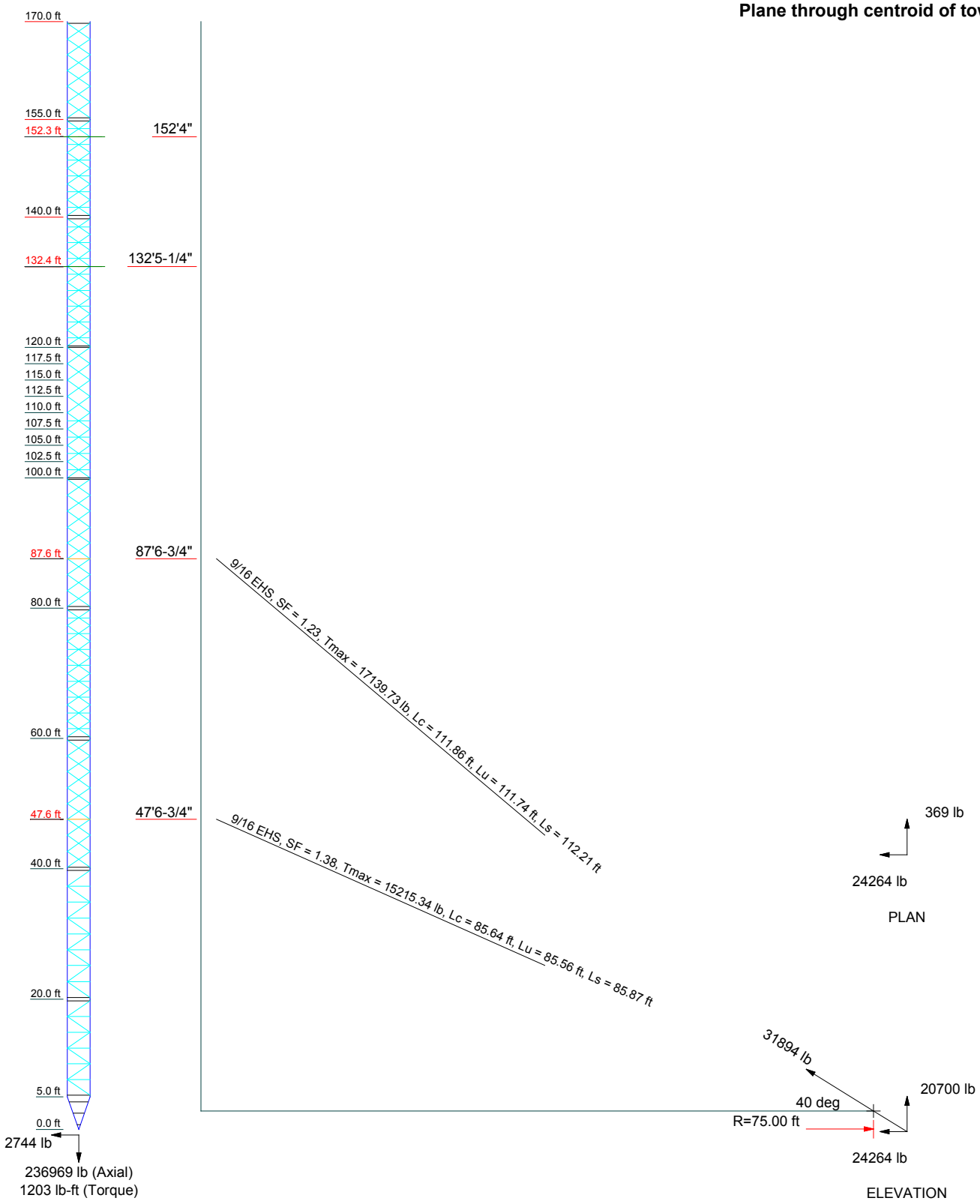
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'B'@75 ft Azimuth 120 deg Elev 2.83 ft

Plane through centroid of tower



AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***170' Callahan Tower (Newington, CT)***			
Project: ***S.A. - Callahan Tower***			
Client: CAL-005 / MODifications for Previous 3 Carrier Antenna Upgrades	Drawn by: MCD	App'd:	
Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
Path:		Dwg No. E-6	

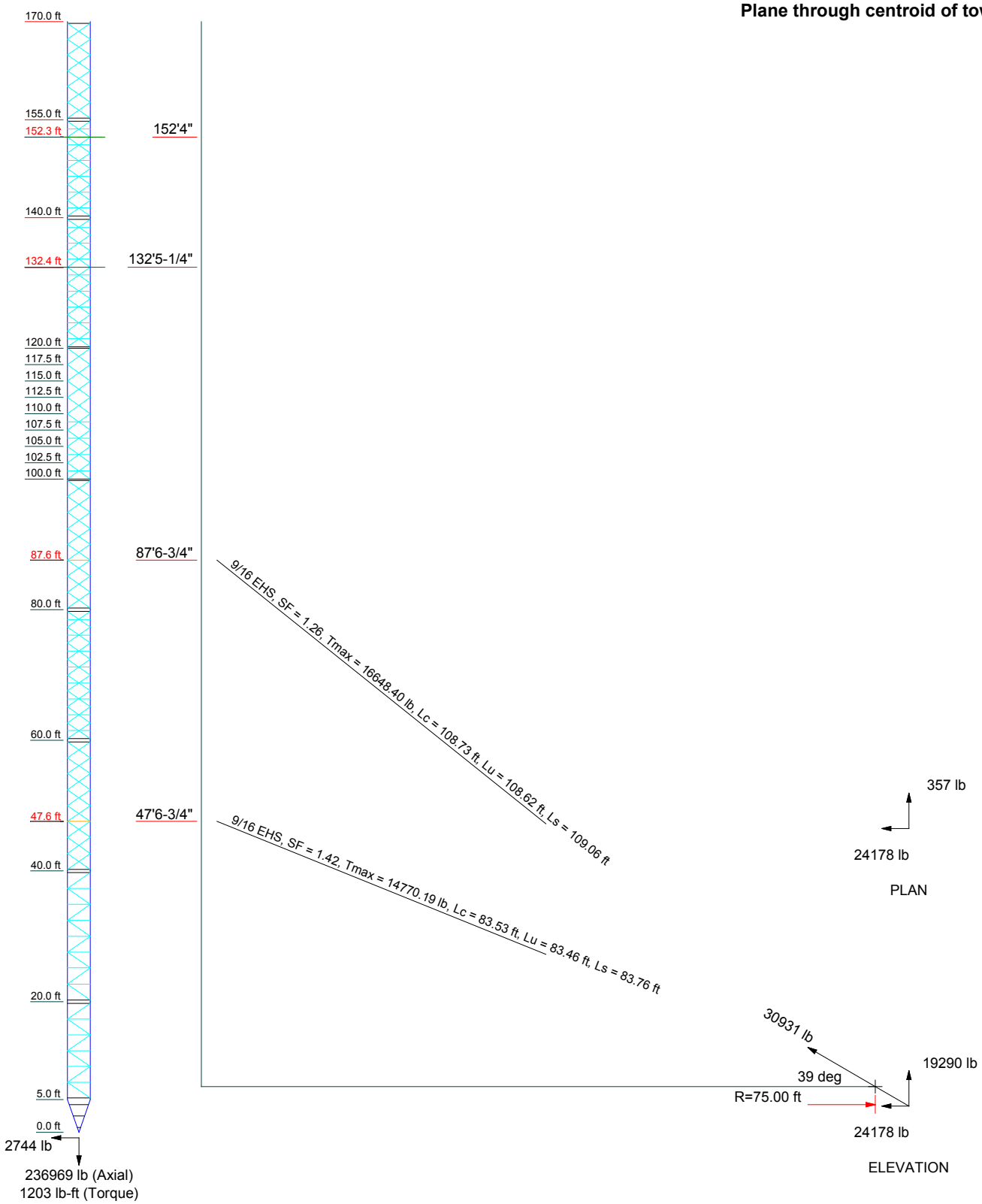
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'C'@75 ft Azimuth 240 deg Elev 7 ft

Plane through centroid of tower



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: ***170' Callahan Tower (Newington, CT)***			
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	Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
	Path:		Dwg No. E-6	

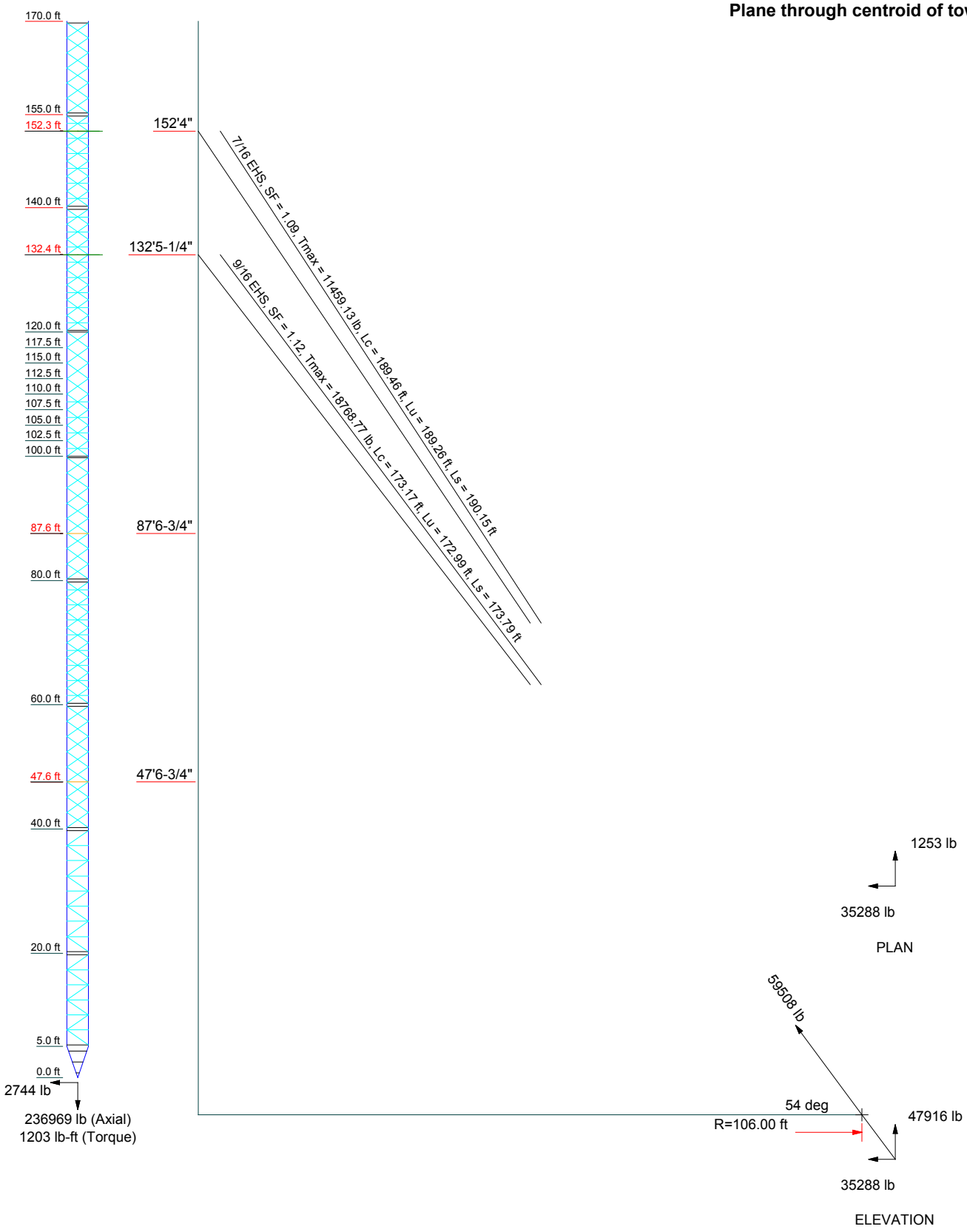
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'A'@106 ft Azimuth 0 deg Elev -6 ft

Plane through centroid of tower



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	Project: ***S.A. - Callahan Tower***			
	Client: CAL-005 / MODifications for Previous 3 Carrier Antenna Upgrades	Drawn by: MCD	App'd:	
	Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
	Path:		Dwg No. E-6	

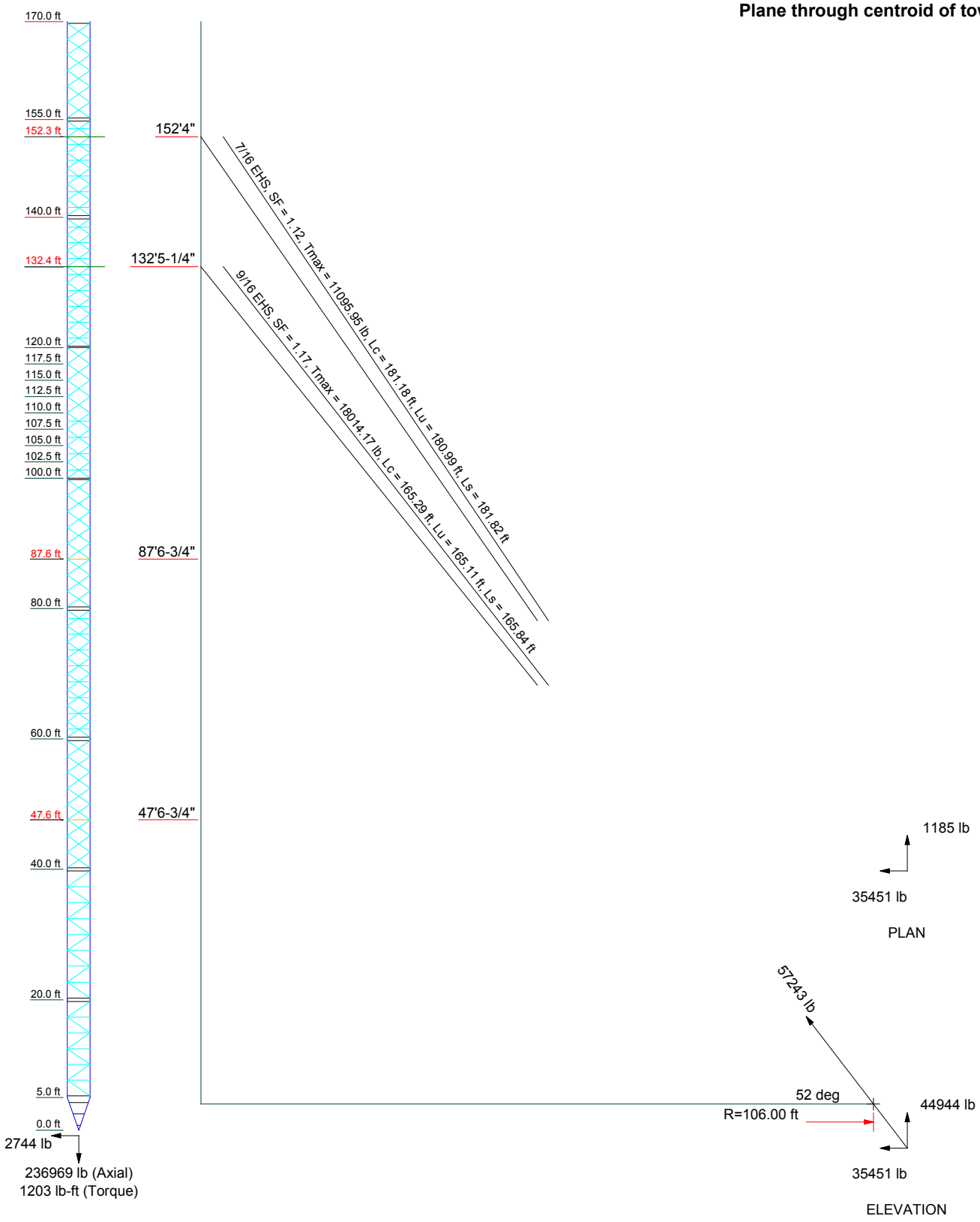
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'B'@106 ft Azimuth 120 deg Elev 4 ft

Plane through centroid of tower



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	Client: CAL-005 / MODifications for Previous 3 Carrier Antenna Upgrades	Drawn by: MCD	App'd:	
	Code: TIA-222-G	Date: 01/11/19	Scale: NTS	
	Path:		Dwg No. E-6	

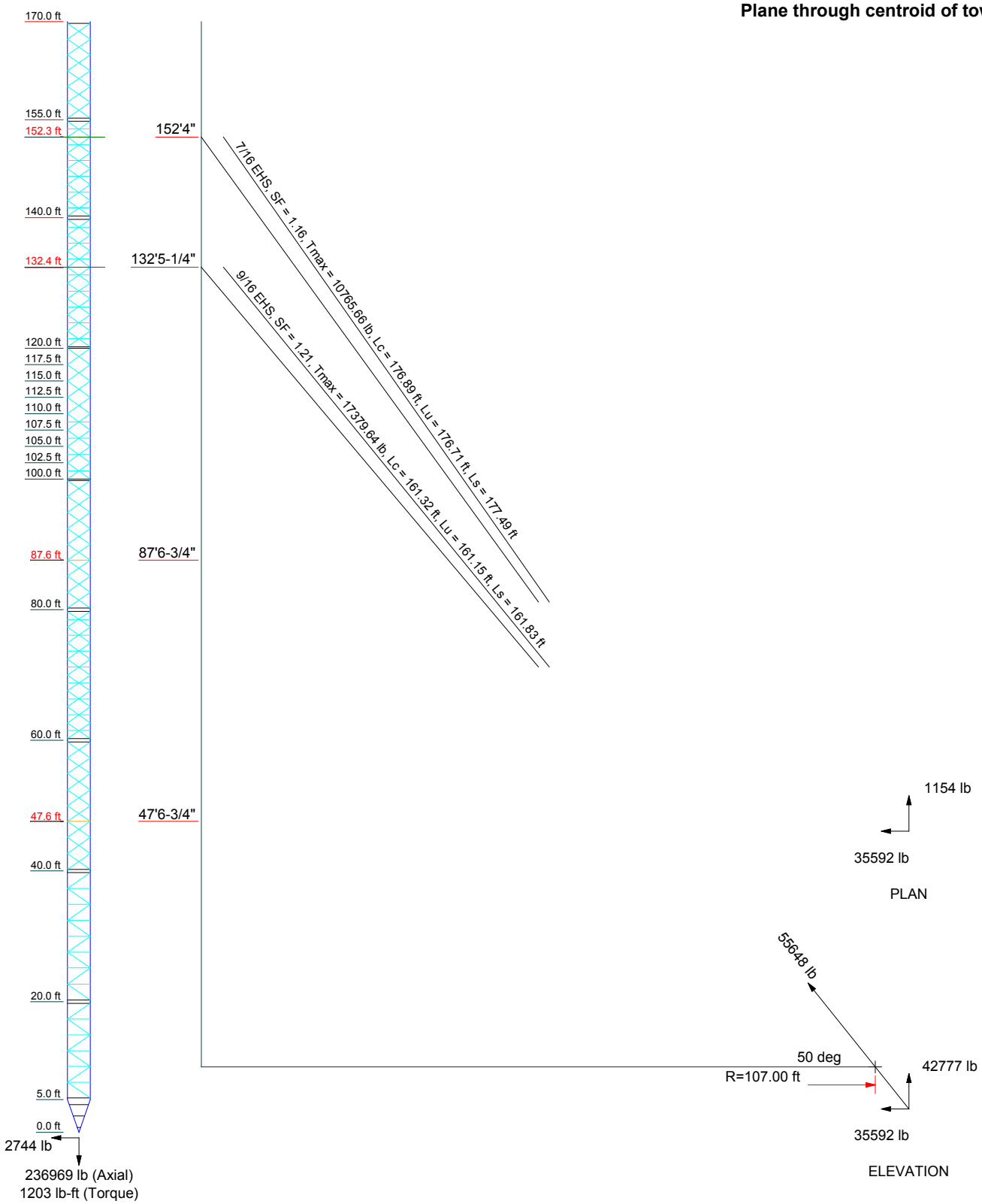
Guy Tensions and Tower Reactions

TIA-222-G - 97 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'C'@107 ft Azimuth 240 deg Elev 10 ft

Plane through centroid of tower



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Project: ***S.A. - Callahan Tower***			
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Code: TIA-222-G		Date: 01/11/19	Scale: NTS
Path:			Dwg No. E-6

TNX TOWER DETAILED OUTPUT

Tower Input Data

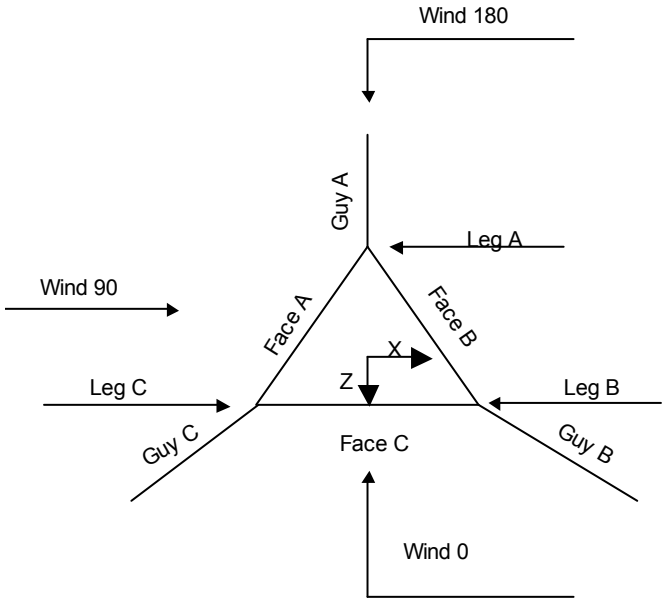
The main tower is a 3x guyed tower with an overall height of 170.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category B.
Topographic Category 3.
Crest Height 178.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
ANALYSIS ASSUMPTIONS:.
Tower diagonal and horizontal bolts are assumed to match ROHN specifications of 1/2" ASTM 325N (unless indicated otherwise)..
TOWER MODifications indicated are from "Sprint - Maser Consulting Connecticut" Analysis; project number 17924017A, dated April 19, 2018..
Previous Tower MODifications @ Elevations 120'-155' for Secondary Horizontal installs and Diagonal Pipe replacement are from AECOM (formerly URS Corporation Project # 36931279 / EBI-001, dated August 22, 2014) assumed to be constructed..
Previous Tower MODifications other Elevations from others predating the above AECOM MODification report..
MODification Notes:.
"CAL-005 MOD #1" - Consists of a welded 1/3rd 50 ksi - 3.5 HSS x 0.2180 on existing ROHN 2.5 Standard Pipe Leg (EL Region 40' - 60').
"CAL-005 MOD #2" - Consists of a welded 1/3rd 50 ksi - 2.8750 HSS x 0.1880 on existing ROHN 2.0 Standard Pipe Leg (EL Region 100' - 120').
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

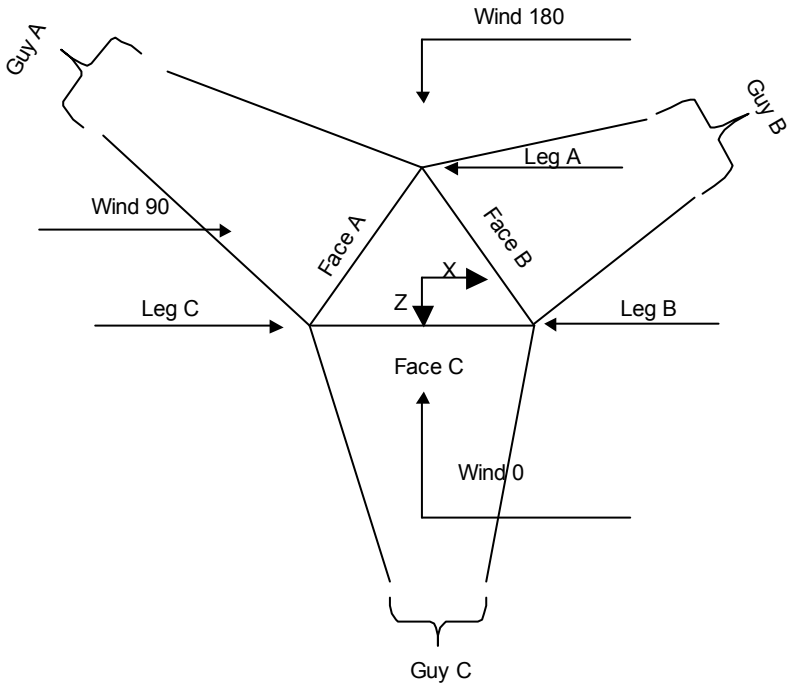
Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption

√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
√ Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	170.00-155.00			3.42	1	15.00
T2	155.00-140.00			3.42	1	15.00
T3	140.00-120.00			3.42	1	20.00
T4	120.00-117.50			3.42	1	2.50
T5	117.50-115.00			3.42	1	2.50
T6	115.00-112.50			3.42	1	2.50
T7	112.50-110.00			3.42	1	2.50
T8	110.00-107.50			3.42	1	2.50
T9	107.50-105.00			3.42	1	2.50
T10	105.00-102.50			3.42	1	2.50
T11	102.50-100.00			3.42	1	2.50
T12	100.00-80.00			3.42	1	20.00
T13	80.00-60.00			3.42	1	20.00
T14	60.00-40.00			3.42	1	20.00
T15	40.00-20.00			3.42	1	20.00
T16	20.00-5.00			3.42	1	15.00

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T17	5.00-0.00			3.42	1	5.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	170.00-155.00	2.42	X Brace	No	No	3.0000	3.0000
T2	155.00-140.00	2.42	X Brace	No	Yes	3.0000	3.0000
T3	140.00-120.00	2.44	X Brace	No	Yes	3.0000	3.0000
T4	120.00-117.50	2.50	X Brace	No	Yes	0.0000	0.0000
T5	117.50-115.00	2.50	X Brace	No	Yes	0.0000	0.0000
T6	115.00-112.50	2.50	X Brace	No	Yes	0.0000	0.0000
T7	112.50-110.00	2.50	X Brace	No	Yes	0.0000	0.0000
T8	110.00-107.50	2.50	X Brace	No	Yes	0.0000	0.0000
T9	107.50-105.00	2.50	X Brace	No	Yes	0.0000	0.0000
T10	105.00-102.50	2.50	X Brace	No	Yes	0.0000	0.0000
T11	102.50-100.00	2.50	X Brace	No	Yes	0.0000	0.0000
T12	100.00-80.00	2.44	X Brace	No	No	3.0000	3.0000
T13	80.00-60.00	2.44	X Brace	No	Yes	3.0000	3.0000
T14	60.00-40.00	2.44	X Brace	No	Yes	3.0000	3.0000
T15	40.00-20.00	2.44	K Brace Right	No	Yes	3.0000	3.0000
T16	20.00-5.00	2.42	K Brace Right	No	Yes	3.0000	3.0000
T17	5.00-0.00	1.75	K Brace Right	No	Yes	9.0000	9.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 170.00-155.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T2 155.00-140.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A36 (36 ksi)
T3 140.00-120.00	Arbitrary Shape	ROHN 2 STD w/ 1" Solid Rod	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T4 120.00-117.50	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T5 117.50-115.00	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T6 115.00-112.50	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T7 112.50-110.00	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T8 110.00-107.50	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T9 107.50-105.00	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T10 105.00-102.50	Arbitrary Shape	CAL-005 MOD#2	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T11	Arbitrary Shape	CAL-005 MOD#2	A572-50	Pipe	P1.5x16GA	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
102.50-100.00			(50 ksi)			(36 ksi)
T12 100.00-80.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T13 80.00-60.00	Arbitrary Shape	ROHN 2 STD w/ 1/3rd pipe	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T14 60.00-40.00	Arbitrary Shape	CAL-005 MOD#1	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T15 40.00-20.00	Arbitrary Shape	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T16 20.00-5.00	Arbitrary Shape	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	A572-50 (50 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T17 5.00-0.00	Arbitrary Shape	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	A572-50 (50 ksi)	Pipe		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 170.00-155.00	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T2 155.00-140.00	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T3 140.00-120.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 120.00-117.50	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe		A36 (36 ksi)
T11 102.50-100.00	Solid Round		A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T12 100.00-80.00	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T13 80.00-60.00	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T14 60.00-40.00	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T15 40.00-20.00	Pipe	P1.5x16GA	A36 (36 ksi)	Pipe	P1.5x16GA	A36 (36 ksi)
T16 20.00-5.00	Pipe	P1.5x16GA	A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T17 5.00-0.00	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar	14x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T15 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T16 20.00-5.00	None	Flat Bar		A36	Solid Round	1	A36

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T17 5.00-0.00	1	Flat Bar	14x3/16	(36 ksi) A36 (36 ksi)	Flat Bar		(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 155.00-140.00	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T3 140.00-120.00	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T8 110.00-107.50	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T9 107.50-105.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T10 105.00-102.50	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 102.50-100.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T13 80.00-60.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 170.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 155.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 120.00-117.50	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 117.50-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 115.00-112.50	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 112.50-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 110.00-107.50	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 107.50-105.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
105.00-102.50			(36 ksi)						
T11	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
102.50-100.00			(36 ksi)						
T12	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
100.00-80.00			(36 ksi)						
T13	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
80.00-60.00			(36 ksi)						
T14	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
60.00-40.00			(36 ksi)						
T15	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
40.00-20.00			(36 ksi)						
T16 20.00-5.00	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						
T17 5.00-0.00	0.00	0.0000	A36	1	1	1.05	36.0000	36.0000	36.0000
			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	No	1	1	1	1	1	1	1	1
170.00-155.00				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
155.00-140.00				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
120.00-117.50				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
117.50-115.00				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
115.00-112.50				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
112.50-110.00				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
110.00-107.50				1	1	1	1	1	1	1
T9	No	No	1	1	1	1	1	1	1	1
107.50-105.00				1	1	1	1	1	1	1
T10	No	No	1	1	1	1	1	1	1	1
105.00-102.50				1	1	1	1	1	1	1
T11	No	No	1	1	1	1	1	1	1	1
102.50-100.00				1	1	1	1	1	1	1
T12	No	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T13	No	No	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T14	No	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T15	No	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T16	No	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
20.00-5.00				1	1	1	1	1	1	1
T17 5.00-0.00	No	No	0.5	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 170.00-155.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 155.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-117.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 117.50-115.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 115.00-112.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 112.50-110.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 110.00-107.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 107.50-105.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 105.00-102.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 102.50-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 20.00-5.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 5.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.5000	1	0.5000	1	0.5000	1
170.00-155.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.5000	1	0.5000	1	0.5000	1
155.00-140.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	0.7500	4	0.6250	1	0.6250	1	0.6250	1	0.6250	1	0.6250	1	0.6250	1
140.00-120.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	Flange	0.7500	4	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
120.00-117.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
117.50-115.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
115.00-112.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
112.50-110.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
110.00-107.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
107.50-105.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
105.00-102.50		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T11	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
102.50-100.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T12	Flange	0.7500	4	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
100.00-80.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T13	Flange	0.7500	4	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
80.00-60.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T14	Flange	0.7500	4	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
60.00-40.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T15	Flange	0.7500	4	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
40.00-20.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T16 20.00-5.00	Flange	0.7500	0	0.5000	1	0.5000	1	0.0000	0	0.5000	1	0.5000	1	0.5000	1
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T17 5.00-0.00	Flange	0.7500	4	0.5000	0	0.5000	0	0.0000	0	0.5000	0	0.5000	0	0.5000	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
152.333	EHS	A	7/16	2080.00	10%	21000	0.399	189.29	106.00	0.0000	-6.00	100%
		B	7/16	2080.00	10%	21000	0.399	181.03	106.00	0.0000	4.00	100%
		C	7/16	2080.00	10%	21000	0.399	176.74	107.00	0.0000	10.00	100%
132.438	EHS	A	9/16	3500.00	10%	21000	0.671	173.03	106.00	0.0000	-6.00	100%
		B	9/16	3500.00	10%	21000	0.671	165.15	106.00	0.0000	4.00	100%
		C	9/16	3500.00	10%	21000	0.671	161.18	107.00	0.0000	10.00	100%
87.5625	EHS	A	9/16	3500.00	10%	21000	0.671	117.21	75.00	0.0000	-4.25	100%
		B	9/16	3500.00	10%	21000	0.671	111.76	75.00	0.0000	2.83	100%
		C	9/16	3500.00	10%	21000	0.671	108.64	75.00	0.0000	7.00	100%
47.5625	EHS	A	9/16	3500.00	10%	21000	0.671	89.46	75.00	0.0000	-4.25	100%
		B	9/16	3500.00	10%	21000	0.671	85.56	75.00	0.0000	2.83	100%
		C	9/16	3500.00	10%	21000	0.671	83.46	75.00	0.0000	7.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
152.333	Torque Arm	7.00	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
132.438	Torque Arm	7.00	0.0000	Channel	A36 (36 ksi)	Arbitrary Shape	C12x20.7 w/ 8"x3/8" plate
87.5625	Corner						
47.5625	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
152.33	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L2x2x3/16
132.44	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Equal Angle	
87.56	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	4x3/8
47.56	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	4x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
152.333	75.53	72.23	70.52		3.39 3.2 sec/pulse	3.10 3.0 sec/pulse	2.96 3.0 sec/pulse	
132.438	116.10	110.81	108.15		2.83 2.9 sec/pulse	2.58 2.8 sec/pulse	2.46 2.7 sec/pulse	
87.5625	78.65	74.99	72.90		1.31 2.0 sec/pulse	1.19 1.9 sec/pulse	1.12 1.8 sec/pulse	
47.5625	60.03	57.41	56.00		0.76 1.5 sec/pulse	0.70 1.4 sec/pulse	0.67 1.4 sec/pulse	

Guy Data *(cont'd)*

	Torque Arm	Pull Off	Diagonal

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K_x	K_y	K_x	K_y	K_x	K_y
152.333	No	No	1	1	1	1	1	1
132.438	No	No	1	1	1	1	1	1
87.5625	No	No			1	1	1	1
47.5625	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
152.333	0.7500 A325N	8	0.0000	1	0.7500 A325N	1	0.0000	1	0.0000 A325N	0	0.0000	1
132.438	0.7500 A325N	8	0.0000	1	0.7500 A325N	1	0.0000	1	0.0000 A325N	0	0.0000	1
87.5625	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
47.5625	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
152.333	A	73.17	27	7	2.4744
	B	78.17	27	7	2.4743
	C	81.17	27	7	2.4741
132.438	A	63.22	27	7	2.4734
	B	68.22	27	7	2.4742
	C	71.22	27	7	2.4744
87.5625	A	41.66	27	7	2.4581
	B	45.20	27	7	2.4627
	C	47.28	27	7	2.4649
47.5625	A	21.66	27	7	2.3951
	B	25.20	26	7	2.4135
	C	27.28	26	7	2.4224

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
152.333	A	104.04	158.33	2357	2.99	2265	3.12	2172	3.25	2080	3.39	1988	3.54	1897	3.71	1807	3.89
	B	104.04	148.33	2383	2.71	2282	2.83	2181	2.96	2080	3.10	1980	3.26	1880	3.43	1781	3.61
	C	105.04	142.33	2404	2.56	2296	2.68	2188	2.81	2080	2.96	1973	3.12	1867	3.29	1762	3.49
132.438	A	104.04	138.44	4058	2.45	3871	2.57	3685	2.69	3500	2.83	3316	2.99	3133	3.16	2952	3.35
	B	104.04	128.44	4113	2.20	3908	2.32	3703	2.44	3500	2.58	3298	2.74	3097	2.92	2899	3.11
	C	105.04	122.44	4156	2.08	3936	2.19	3718	2.32	3500	2.46	3284	2.62	3070	2.81	2858	3.01

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
87.5625	A	73.03	91.81	4109	1.11	3905	1.17	3702	1.24	3500	1.31	3298	1.39	3098	1.48	2898	1.58
	B	73.03	84.73	4170	1.00	3946	1.06	3723	1.12	3500	1.19	3278	1.27	3058	1.36	2838	1.46
	C	73.03	80.56	4209	0.94	3972	0.99	3736	1.05	3500	1.12	3265	1.20	3032	1.30	2800	1.40
47.5625	A	73.03	51.81	4546	0.59	4196	0.64	3848	0.70	3500	0.76	3154	0.85	2812	0.95	2473	1.08
	B	73.03	44.73	4644	0.53	4262	0.57	3880	0.63	3500	0.70	3122	0.78	2748	0.89	2379	1.03
	C	73.03	40.56	4703	0.50	4301	0.54	3899	0.60	3500	0.67	3103	0.75	2710	0.86	2325	1.00

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LMR-400 (13/32 FOAM) (Town)	A	No	No	Ar (CaAa)	50.00 - 6.00	0.0000	0.15	2	2	0.4100	0.4100		0.07
1/2 (Town - Dish)	A	No	No	Ar (CaAa)	167.00 - 6.00	0.0000	0.16	1	1	0.5800	0.5800		0.25
1 1/4 (Town)	A	No	No	Ar (CaAa)	170.00 - 6.00	0.0000	0.35	4	4	1.5500	1.5500		0.66
7/8 (Town)	A	No	No	Ar (CaAa)	170.00 - 6.00	0.0000	0.1	2	1	1.1100	1.1100		0.54
1/2 (Town)	A	No	No	Ar (CaAa)	170.00 - 6.00	0.0000	0.1	1	1	0.5800	0.5800		0.25
2" Rigid Conduit (Clearwire)	A	No	No	Ar (CaAa)	143.00 - 6.00	2.0000	-0.05	2	2	2.0000	2.0000		2.80
1 1/4 (Clearwire)	A	No	No	Ar (CaAa)	146.00 - 6.00	0.0000	-0.3	4	4	1.5500	1.5500		0.66
7/8 (AT&T)	B	No	No	Ar (CaAa)	120.00 - 6.00	0.0000	-0.15	12	9	1.1100	1.1100		0.54
Fiber Optic Cable _AT&T (AT&T)	B	No	No	Ar (CaAa)	120.00 - 6.00	0.0000	0.44	1	1	0.4000	0.4000		1.00
Fiber Optic Cable _AT&T (AT&T)	B	No	No	Ar (CaAa)	120.00 - 6.00	0.0000	0.42	1	1	0.4000	0.4000		1.00
DC Cables (1/2" Coax) (AT&T)	B	No	No	Ar (CaAa)	120.00 - 6.00	0.0000	0.46	2	2	0.4000	0.4000		0.11
DC Cables (1/2" Coax) (AT&T)	B	No	No	Ar (CaAa)	120.00 - 6.00	0.0000	0.48	2	2	0.4000	0.4000		0.11
LDF7-50A (1-5/8 FOAM) (T-Mobile (18 E + 3 Hyb Cables))	C	No	No	Ar (CaAa)	162.00 - 6.00	0.0000	-0.1	15	8	0.5000	1.9800		0.82

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 lb
T1	170.00-155.00	A	0.000	0.000	14.196	0.000	62.55
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	20.790	0.000	86.10
T2	155.00-140.00	A	0.000	0.000	19.290	0.000	95.94
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	44.550	0.000	184.50
T3	140.00-120.00	A	0.000	0.000	39.560	0.000	249.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	59.400	0.000	246.00
T4	120.00-117.50	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T5	117.50-115.00	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T6	115.00-112.50	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T7	112.50-110.00	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T8	110.00-107.50	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T9	107.50-105.00	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T10	105.00-102.50	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T11	102.50-100.00	A	0.000	0.000	4.945	0.000	31.15
		B	0.000	0.000	3.930	0.000	22.30
		C	0.000	0.000	7.425	0.000	30.75
T12	100.00-80.00	A	0.000	0.000	39.560	0.000	249.20
		B	0.000	0.000	31.440	0.000	178.40
		C	0.000	0.000	59.400	0.000	246.00
T13	80.00-60.00	A	0.000	0.000	39.560	0.000	249.20
		B	0.000	0.000	31.440	0.000	178.40
		C	0.000	0.000	59.400	0.000	246.00
T14	60.00-40.00	A	0.000	0.000	40.380	0.000	250.60
		B	0.000	0.000	31.440	0.000	178.40
		C	0.000	0.000	59.400	0.000	246.00
T15	40.00-20.00	A	0.000	0.000	41.200	0.000	252.00
		B	0.000	0.000	31.440	0.000	178.40
		C	0.000	0.000	59.400	0.000	246.00
T16	20.00-5.00	A	0.000	0.000	28.840	0.000	176.40
		B	0.000	0.000	22.008	0.000	124.88
		C	0.000	0.000	41.580	0.000	172.20
T17	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

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 lb
T1	170.00-155.00	A	2.470	0.000	0.000	66.132	0.000	1136.44

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 lb
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	22.783	0.000	530.15
T2	155.00-140.00	A	2.469	0.000	0.000	85.425	0.000	1465.99
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	48.813	0.000	1135.54
T3	140.00-120.00	A	2.469	0.000	0.000	165.404	0.000	2845.17
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	65.083	0.000	1513.98
T4	120.00-117.50	A	2.470	0.000	0.000	20.679	0.000	355.77
		B		0.000	0.000	15.631	0.000	258.79
		C		0.000	0.000	8.136	0.000	189.29
T5	117.50-115.00	A	2.470	0.000	0.000	20.680	0.000	355.81
		B		0.000	0.000	15.632	0.000	258.82
		C		0.000	0.000	8.136	0.000	189.30
T6	115.00-112.50	A	2.470	0.000	0.000	20.681	0.000	355.86
		B		0.000	0.000	15.633	0.000	258.86
		C		0.000	0.000	8.136	0.000	189.32
T7	112.50-110.00	A	2.470	0.000	0.000	20.682	0.000	355.91
		B		0.000	0.000	15.634	0.000	258.89
		C		0.000	0.000	8.137	0.000	189.33
T8	110.00-107.50	A	2.471	0.000	0.000	20.683	0.000	355.96
		B		0.000	0.000	15.635	0.000	258.93
		C		0.000	0.000	8.137	0.000	189.35
T9	107.50-105.00	A	2.471	0.000	0.000	20.685	0.000	356.01
		B		0.000	0.000	15.636	0.000	258.97
		C		0.000	0.000	8.137	0.000	189.37
T10	105.00-102.50	A	2.471	0.000	0.000	20.686	0.000	356.07
		B		0.000	0.000	15.637	0.000	259.01
		C		0.000	0.000	8.137	0.000	189.39
T11	102.50-100.00	A	2.472	0.000	0.000	20.687	0.000	356.13
		B		0.000	0.000	15.638	0.000	259.05
		C		0.000	0.000	8.138	0.000	189.41
T12	100.00-80.00	A	2.473	0.000	0.000	165.554	0.000	2851.20
		B		0.000	0.000	125.149	0.000	2073.93
		C		0.000	0.000	65.110	0.000	1515.98
T13	80.00-60.00	A	2.474	0.000	0.000	165.595	0.000	2852.85
		B		0.000	0.000	125.182	0.000	2075.10
		C		0.000	0.000	65.118	0.000	1516.53
T14	60.00-40.00	A	2.467	0.000	0.000	175.546	0.000	2947.60
		B		0.000	0.000	124.981	0.000	2068.07
		C		0.000	0.000	65.072	0.000	1513.23
T15	40.00-20.00	A	2.432	0.000	0.000	184.269	0.000	2998.15
		B		0.000	0.000	123.980	0.000	2033.23
		C		0.000	0.000	64.845	0.000	1496.85
T16	20.00-5.00	A	2.314	0.000	0.000	125.510	0.000	1973.55
		B		0.000	0.000	84.427	0.000	1342.60
		C		0.000	0.000	44.856	0.000	1009.43
T17	5.00-0.00	A	2.017	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	170.00-155.00	0.0905	1.0290	-0.7752	-1.4927

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T2	155.00-140.00	0.2149	4.0175	-0.0201	-0.0100
T3	140.00-120.00	-0.9796	3.0640	-0.6810	-0.1860
T4	120.00-117.50	0.7261	1.4524	0.2506	-0.4729
T5	117.50-115.00	0.7455	1.4947	0.4604	-0.8640
T6	115.00-112.50	0.7455	1.4947	0.4604	-0.8639
T7	112.50-110.00	0.7455	1.4947	0.4604	-0.8638
T8	110.00-107.50	0.6958	1.4077	0.2312	-0.4393
T9	107.50-105.00	0.6958	1.4077	0.2311	-0.4391
T10	105.00-102.50	0.6958	1.4077	0.2311	-0.4389
T11	102.50-100.00	0.6812	1.3743	0.0000	0.0000
T12	100.00-80.00	0.7783	1.5209	0.3129	-0.5719
T13	80.00-60.00	0.6891	1.3941	0.1793	-0.3406
T14	60.00-40.00	0.6738	1.3714	0.2745	-0.8704
T15	40.00-20.00	0.6609	1.3582	0.2097	-1.2689
T16	20.00-5.00	0.6406	1.3212	0.1899	-1.2514
T17	5.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	1/2	155.00 - 167.00	0.6000	0.2198
T1	3	1 1/4	155.00 - 170.00	0.6000	0.2198
T1	4	7/8	155.00 - 170.00	0.6000	0.2198
T1	5	1/2	155.00 - 170.00	0.6000	0.2198
T1	13	LDF7-50A (1-5/8 FOAM)	155.00 - 162.00	0.6000	0.2198
T2	2	1/2	140.00 - 155.00	0.6000	0.0049
T2	3	1 1/4	140.00 - 155.00	0.6000	0.0049
T2	4	7/8	140.00 - 155.00	0.6000	0.0049
T2	5	1/2	140.00 - 155.00	0.6000	0.0049
T2	6	2" Rigid Conduit	140.00 - 143.00	0.6000	0.0049
T2	7	1 1/4	140.00 - 146.00	0.6000	0.0049
T2	13	LDF7-50A (1-5/8 FOAM)	140.00 - 155.00	0.6000	0.0049
T3	2	1/2	120.00 - 140.00	0.6000	0.0749
T3	3	1 1/4	120.00 - 140.00	0.6000	0.0749
T3	4	7/8	120.00 - 140.00	0.6000	0.0749
T3	5	1/2	120.00 - 140.00	0.6000	0.0749
T3	6	2" Rigid Conduit	120.00 - 140.00	0.6000	0.0749

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	7	1 1/4	120.00 - 140.00	0.6000	0.0749
T3	13	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.0749
T4	2	1/2	117.50 - 120.00	0.6000	0.1558
T4	3	1 1/4	117.50 - 120.00	0.6000	0.1558
T4	4	7/8	117.50 - 120.00	0.6000	0.1558
T4	5	1/2	117.50 - 120.00	0.6000	0.1558
T4	6	2" Rigid Conduit	117.50 - 120.00	0.6000	0.1558
T4	7	1 1/4	117.50 - 120.00	0.6000	0.1558
T4	8	7/8	117.50 - 120.00	0.6000	0.1558
T4	9	Fiber Optic Cable _AT&T	117.50 - 120.00	0.6000	0.1558
T4	10	Fiber Optic Cable _AT&T	117.50 - 120.00	0.6000	0.1558
T4	11	DC Cables (1/2" Coax)	117.50 - 120.00	0.6000	0.1558
T4	12	DC Cables (1/2" Coax)	117.50 - 120.00	0.6000	0.1558
T4	13	LDF7-50A (1-5/8 FOAM)	117.50 - 120.00	0.6000	0.1558
T5	2	1/2	115.00 - 117.50	0.6000	0.3292
T5	3	1 1/4	115.00 - 117.50	0.6000	0.3292
T5	4	7/8	115.00 - 117.50	0.6000	0.3292
T5	5	1/2	115.00 - 117.50	0.6000	0.3292
T5	6	2" Rigid Conduit	115.00 - 117.50	0.6000	0.3292
T5	7	1 1/4	115.00 - 117.50	0.6000	0.3292
T5	8	7/8	115.00 - 117.50	0.6000	0.3292
T5	9	Fiber Optic Cable _AT&T	115.00 - 117.50	0.6000	0.3292
T5	10	Fiber Optic Cable _AT&T	115.00 - 117.50	0.6000	0.3292
T5	11	DC Cables (1/2" Coax)	115.00 - 117.50	0.6000	0.3292
T5	12	DC Cables (1/2" Coax)	115.00 - 117.50	0.6000	0.3292
T5	13	LDF7-50A (1-5/8 FOAM)	115.00 - 117.50	0.6000	0.3292
T6	2	1/2	112.50 - 115.00	0.6000	0.3292
T6	3	1 1/4	112.50 - 115.00	0.6000	0.3292
T6	4	7/8	112.50 - 115.00	0.6000	0.3292
T6	5	1/2	112.50 - 115.00	0.6000	0.3292
T6	6	2" Rigid Conduit	112.50 - 115.00	0.6000	0.3292

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	7	1 1/4	112.50 - 115.00	0.6000	0.3292
T6	8	7/8	112.50 - 115.00	0.6000	0.3292
T6	9	Fiber Optic Cable _AT&T	112.50 - 115.00	0.6000	0.3292
T6	10	Fiber Optic Cable _AT&T	112.50 - 115.00	0.6000	0.3292
T6	11	DC Cables (1/2" Coax)	112.50 - 115.00	0.6000	0.3292
T6	12	DC Cables (1/2" Coax)	112.50 - 115.00	0.6000	0.3292
T6	13	LDF7-50A (1-5/8 FOAM)	112.50 - 115.00	0.6000	0.3292
T7	2	1/2	110.00 - 112.50	0.6000	0.3291
T7	3	1 1/4	110.00 - 112.50	0.6000	0.3291
T7	4	7/8	110.00 - 112.50	0.6000	0.3291
T7	5	1/2	110.00 - 112.50	0.6000	0.3291
T7	6	2" Rigid Conduit	110.00 - 112.50	0.6000	0.3291
T7	7	1 1/4	110.00 - 112.50	0.6000	0.3291
T7	8	7/8	110.00 - 112.50	0.6000	0.3291
T7	9	Fiber Optic Cable _AT&T	110.00 - 112.50	0.6000	0.3291
T7	10	Fiber Optic Cable _AT&T	110.00 - 112.50	0.6000	0.3291
T7	11	DC Cables (1/2" Coax)	110.00 - 112.50	0.6000	0.3291
T7	12	DC Cables (1/2" Coax)	110.00 - 112.50	0.6000	0.3291
T7	13	LDF7-50A (1-5/8 FOAM)	110.00 - 112.50	0.6000	0.3291
T8	2	1/2	107.50 - 110.00	0.6000	0.1433
T8	3	1 1/4	107.50 - 110.00	0.6000	0.1433
T8	4	7/8	107.50 - 110.00	0.6000	0.1433
T8	5	1/2	107.50 - 110.00	0.6000	0.1433
T8	6	2" Rigid Conduit	107.50 - 110.00	0.6000	0.1433
T8	7	1 1/4	107.50 - 110.00	0.6000	0.1433
T8	8	7/8	107.50 - 110.00	0.6000	0.1433
T8	9	Fiber Optic Cable _AT&T	107.50 - 110.00	0.6000	0.1433
T8	10	Fiber Optic Cable _AT&T	107.50 - 110.00	0.6000	0.1433
T8	11	DC Cables (1/2" Coax)	107.50 - 110.00	0.6000	0.1433
T8	12	DC Cables (1/2" Coax)	107.50 - 110.00	0.6000	0.1433
T8	13	LDF7-50A (1-5/8 FOAM)	107.50 - 110.00	0.6000	0.1433

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	2	1/2	105.00 - 107.50	0.6000	0.1433
T9	3	1 1/4	105.00 - 107.50	0.6000	0.1433
T9	4	7/8	105.00 - 107.50	0.6000	0.1433
T9	5	1/2	105.00 - 107.50	0.6000	0.1433
T9	6	2" Rigid Conduit	105.00 - 107.50	0.6000	0.1433
T9	7	1 1/4	105.00 - 107.50	0.6000	0.1433
T9	8	7/8	105.00 - 107.50	0.6000	0.1433
T9	9	Fiber Optic Cable _AT&T	105.00 - 107.50	0.6000	0.1433
T9	10	Fiber Optic Cable _AT&T	105.00 - 107.50	0.6000	0.1433
T9	11	DC Cables (1/2" Coax)	105.00 - 107.50	0.6000	0.1433
T9	12	DC Cables (1/2" Coax)	105.00 - 107.50	0.6000	0.1433
T9	13	LDF7-50A (1-5/8 FOAM)	105.00 - 107.50	0.6000	0.1433
T10	2	1/2	102.50 - 105.00	0.6000	0.1432
T10	3	1 1/4	102.50 - 105.00	0.6000	0.1432
T10	4	7/8	102.50 - 105.00	0.6000	0.1432
T10	5	1/2	102.50 - 105.00	0.6000	0.1432
T10	6	2" Rigid Conduit	102.50 - 105.00	0.6000	0.1432
T10	7	1 1/4	102.50 - 105.00	0.6000	0.1432
T10	8	7/8	102.50 - 105.00	0.6000	0.1432
T10	9	Fiber Optic Cable _AT&T	102.50 - 105.00	0.6000	0.1432
T10	10	Fiber Optic Cable _AT&T	102.50 - 105.00	0.6000	0.1432
T10	11	DC Cables (1/2" Coax)	102.50 - 105.00	0.6000	0.1432
T10	12	DC Cables (1/2" Coax)	102.50 - 105.00	0.6000	0.1432
T10	13	LDF7-50A (1-5/8 FOAM)	102.50 - 105.00	0.6000	0.1432
T11	2	1/2	100.00 - 102.50	0.6000	0.0000
T11	3	1 1/4	100.00 - 102.50	0.6000	0.0000
T11	4	7/8	100.00 - 102.50	0.6000	0.0000
T11	5	1/2	100.00 - 102.50	0.6000	0.0000
T11	6	2" Rigid Conduit	100.00 - 102.50	0.6000	0.0000
T11	7	1 1/4	100.00 - 102.50	0.6000	0.0000
T11	8	7/8	100.00 - 102.50	0.6000	0.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	9	Fiber Optic Cable _AT&T	100.00 - 102.50	0.6000	0.0000
T11	10	Fiber Optic Cable _AT&T	100.00 - 102.50	0.6000	0.0000
T11	11	DC Cables (1/2" Coax)	100.00 - 102.50	0.6000	0.0000
T11	12	DC Cables (1/2" Coax)	100.00 - 102.50	0.6000	0.0000
T11	13	LDF7-50A (1-5/8 FOAM)	100.00 - 102.50	0.6000	0.0000
T12	2	1/2	80.00 - 100.00	0.6000	0.1966
T12	3	1 1/4	80.00 - 100.00	0.6000	0.1966
T12	4	7/8	80.00 - 100.00	0.6000	0.1966
T12	5	1/2	80.00 - 100.00	0.6000	0.1966
T12	6	2" Rigid Conduit	80.00 - 100.00	0.6000	0.1966
T12	7	1 1/4	80.00 - 100.00	0.6000	0.1966
T12	8	7/8	80.00 - 100.00	0.6000	0.1966
T12	9	Fiber Optic Cable _AT&T	80.00 - 100.00	0.6000	0.1966
T12	10	Fiber Optic Cable _AT&T	80.00 - 100.00	0.6000	0.1966
T12	11	DC Cables (1/2" Coax)	80.00 - 100.00	0.6000	0.1966
T12	12	DC Cables (1/2" Coax)	80.00 - 100.00	0.6000	0.1966
T12	13	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.1966
T13	2	1/2	60.00 - 80.00	0.6000	0.1105
T13	3	1 1/4	60.00 - 80.00	0.6000	0.1105
T13	4	7/8	60.00 - 80.00	0.6000	0.1105
T13	5	1/2	60.00 - 80.00	0.6000	0.1105
T13	6	2" Rigid Conduit	60.00 - 80.00	0.6000	0.1105
T13	7	1 1/4	60.00 - 80.00	0.6000	0.1105
T13	8	7/8	60.00 - 80.00	0.6000	0.1105
T13	9	Fiber Optic Cable _AT&T	60.00 - 80.00	0.6000	0.1105
T13	10	Fiber Optic Cable _AT&T	60.00 - 80.00	0.6000	0.1105
T13	11	DC Cables (1/2" Coax)	60.00 - 80.00	0.6000	0.1105
T13	12	DC Cables (1/2" Coax)	60.00 - 80.00	0.6000	0.1105
T13	13	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.1105
T14	1	LMR-400 (13/32 FOAM)	40.00 - 50.00	0.6000	0.2572
T14	2	1/2	40.00 - 60.00	0.6000	0.2572
T14	3	1 1/4	40.00 - 60.00	0.6000	0.2572
T14	4	7/8	40.00 - 60.00	0.6000	0.2572
T14	5	1/2	40.00 - 60.00	0.6000	0.2572
T14	6	2" Rigid Conduit	40.00 - 60.00	0.6000	0.2572
T14	7	1 1/4	40.00 - 60.00	0.6000	0.2572
T14	8	7/8	40.00 - 60.00	0.6000	0.2572
T14	9	Fiber Optic Cable _AT&T	40.00 - 60.00	0.6000	0.2572
T14	10	Fiber Optic Cable _AT&T	40.00 - 60.00	0.6000	0.2572
T14	11	DC Cables (1/2" Coax)	40.00 - 60.00	0.6000	0.2572
T14	12	DC Cables (1/2" Coax)	40.00 - 60.00	0.6000	0.2572
T14	13	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.2572
T15	1	LMR-400 (13/32 FOAM)	20.00 - 40.00	0.6000	0.3577
T15	2	1/2	20.00 - 40.00	0.6000	0.3577
T15	3	1 1/4	20.00 - 40.00	0.6000	0.3577
T15	4	7/8	20.00 - 40.00	0.6000	0.3577
T15	5	1/2	20.00 - 40.00	0.6000	0.3577
T15	6	2" Rigid Conduit	20.00 - 40.00	0.6000	0.3577
T15	7	1 1/4	20.00 - 40.00	0.6000	0.3577
T15	8	7/8	20.00 - 40.00	0.6000	0.3577
T15	9	Fiber Optic Cable _AT&T	20.00 - 40.00	0.6000	0.3577
T15	10	Fiber Optic Cable _AT&T	20.00 - 40.00	0.6000	0.3577
T15	11	DC Cables (1/2" Coax)	20.00 - 40.00	0.6000	0.3577
T15	12	DC Cables (1/2" Coax)	20.00 - 40.00	0.6000	0.3577
T15	13	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.3577
T16	1	LMR-400 (13/32 FOAM)	6.00 - 20.00	0.6000	0.3668
T16	2	1/2	6.00 - 20.00	0.6000	0.3668

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T16	3	1 1/4	6.00 - 20.00	0.6000	0.3668
T16	4	7/8	6.00 - 20.00	0.6000	0.3668
T16	5	1/2	6.00 - 20.00	0.6000	0.3668
T16	6	2" Rigid Conduit	6.00 - 20.00	0.6000	0.3668
T16	7	1 1/4	6.00 - 20.00	0.6000	0.3668
T16	8	7/8	6.00 - 20.00	0.6000	0.3668
T16	9	Fiber Optic Cable _AT&T	6.00 - 20.00	0.6000	0.3668
T16	10	Fiber Optic Cable _AT&T	6.00 - 20.00	0.6000	0.3668
T16	11	DC Cables (1/2" Coax)	6.00 - 20.00	0.6000	0.3668
T16	12	DC Cables (1/2" Coax)	6.00 - 20.00	0.6000	0.3668
T16	13	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	0.6000	0.3668

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
DS4C03F36U-D 8' Omni	A	From Leg	1.00	0.0000	175.00	No Ice	2.56	2.56	30.00
(Town)			0.00			1/2" Ice	3.28	3.28	48.53
			0.00			1" Ice	3.76	3.76	72.43
SC473-HF1LDF	B	From Leg	1.00	0.0000	175.00	No Ice	1.44	1.44	17.00
(Town)			0.00			1/2" Ice	1.74	1.74	29.43
			0.00			1" Ice	2.05	2.05	45.34
SC473-HF1LDF	C	From Leg	1.00	0.0000	175.00	No Ice	1.44	1.44	17.00
(Town)			0.00			1/2" Ice	1.74	1.74	29.43
			0.00			1" Ice	2.05	2.05	45.34
TTA 432-83H-01T	A	None		0.0000	170.00	No Ice	1.63	0.95	25.00
(Town)						1/2" Ice	1.81	1.09	37.44
						1" Ice	1.99	1.24	52.22
Pirod 4' Side Mount Standoff	A	From Leg	2.50	0.0000	168.00	No Ice	2.72	2.72	50.00
(1)			0.00			1/2" Ice	4.91	4.91	89.00
(Town)			0.00			1" Ice	7.10	7.10	128.00
Pirod 4' Side Mount Standoff	B	From Leg	2.50	0.0000	168.00	No Ice	2.72	2.72	50.00
(1)			0.00			1/2" Ice	4.91	4.91	89.00
(Town)			0.00			1" Ice	7.10	7.10	128.00
4' Standoff	C	From Leg	0.50	0.0000	168.00	No Ice	3.42	3.42	111.16
(Town)			0.00			1/2" Ice	3.67	3.67	147.20
			0.00			1" Ice	3.92	3.92	187.07
844H90T11EXY	A	From Leg	1.00	0.0000	143.00	No Ice	3.06	3.61	14.00
(Clearwire)			0.00			1/2" Ice	3.37	3.92	40.30
			0.00			1" Ice	3.67	4.23	70.84
844H90T11EXY	B	From Leg	1.00	0.0000	143.00	No Ice	3.06	3.61	14.00
(Clearwire)			0.00			1/2" Ice	3.37	3.92	40.30
			0.00			1" Ice	3.67	4.23	70.84
844H90T11EXY	C	From Leg	1.00	0.0000	143.00	No Ice	3.06	3.61	14.00
(Clearwire)			0.00			1/2" Ice	3.37	3.92	40.30
			0.00			1" Ice	3.67	4.23	70.84
(2) GPS	C	None		0.0000	50.00	No Ice	1.00	1.00	10.00
(Town)						1/2" Ice	1.50	1.50	15.00
						1" Ice	2.00	2.00	20.00

***AT&T Inventory - from

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		C_AA_A *Front* ft²	C_AA_A *Side* ft²	*Weight* lb
Centek 05/25/2018									
QS66512-2 Panel Antenna	A	From Leg	3.00	0.0000	120.00	No Ice	8.40	8.22	132.90
(AT&T Equipment)			6.00			1/2" Ice	8.95	9.19	205.99
			0.00			1" Ice	9.51	10.09	287.01
QS66512-2 Panel Antenna	B	From Leg	3.00	0.0000	120.00	No Ice	8.40	8.22	132.90
(AT&T Equipment)			6.00			1/2" Ice	8.95	9.19	205.99
			0.00			1" Ice	9.51	10.09	287.01
QS66512-2 Panel Antenna	C	From Leg	3.00	0.0000	120.00	No Ice	8.40	8.22	132.90
(AT&T Equipment)			6.00			1/2" Ice	8.95	9.19	205.99
			0.00			1" Ice	9.51	10.09	287.01
7770.00	A	From Leg	3.00	0.0000	120.00	No Ice	5.90	4.01	52.03
(AT&T Equipment)			-6.00			1/2" Ice	6.34	4.64	97.08
			0.00			1" Ice	6.78	5.28	148.33
7770.00	B	From Leg	3.00	0.0000	120.00	No Ice	5.90	4.01	52.03
(AT&T Equipment)			-6.00			1/2" Ice	6.34	4.64	97.08
			0.00			1" Ice	6.78	5.28	148.33
7770.00	C	From Leg	3.00	0.0000	120.00	No Ice	5.90	4.01	52.03
(AT&T Equipment)			-6.00			1/2" Ice	6.34	4.64	97.08
			0.00			1" Ice	6.78	5.28	148.33
OPA-65R-LCUU-H6 Panel	A	From Leg	3.00	0.0000	120.00	No Ice	10.12	5.49	64.00
(AT&T Equipment)			-3.00			1/2" Ice	10.69	5.94	121.33
			0.00			1" Ice	11.26	6.41	184.95
OPA-65R-LCUU-H6 Panel	B	From Leg	3.00	0.0000	120.00	No Ice	10.12	5.49	64.00
(AT&T Equipment)			-3.00			1/2" Ice	10.69	5.94	121.33
			0.00			1" Ice	11.26	6.41	184.95
OPA-65R-LCUU-H6 Panel	C	From Leg	3.00	0.0000	120.00	No Ice	10.12	5.49	64.00
(AT&T Equipment)			-3.00			1/2" Ice	10.69	5.94	121.33
			0.00			1" Ice	11.26	6.41	184.95
(2) LGP214## TMA	A	From Leg	3.00	0.0000	120.00	No Ice	1.29	0.23	14.10
(AT&T Equipment)			-6.00			1/2" Ice	1.45	0.31	21.26
			0.00			1" Ice	1.61	0.40	30.32
(2) LGP214## TMA	A	From Leg	3.00	0.0000	120.00	No Ice	1.29	0.23	14.10
(AT&T Equipment)			-6.00			1/2" Ice	1.45	0.31	21.26
			0.00			1" Ice	1.61	0.40	30.32
(2) LGP214## TMA	A	From Leg	3.00	0.0000	120.00	No Ice	1.29	0.23	14.10
(AT&T Equipment)			-6.00			1/2" Ice	1.45	0.31	21.26
			0.00			1" Ice	1.61	0.40	30.32
(2) TPX-070821 CCI	A	From Leg	3.00	0.0000	120.00	No Ice	0.55	0.12	7.50
Triplexer Unit			-3.00			1/2" Ice	0.65	0.17	10.95
(AT&T Equipment)			0.00			1" Ice	0.76	0.24	15.73
(2) TPX-070821 CCI	B	From Leg	3.00	0.0000	120.00	No Ice	0.55	0.12	7.50
Triplexer Unit			-3.00			1/2" Ice	0.65	0.17	10.95
(AT&T Equipment)			0.00			1" Ice	0.76	0.24	15.73
(2) TPX-070821 CCI	C	From Leg	3.00	0.0000	120.00	No Ice	0.55	0.12	7.50
Triplexer Unit			-3.00			1/2" Ice	0.65	0.17	10.95
(AT&T Equipment)			0.00			1" Ice	0.76	0.24	15.73
RRUS-32	A	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			6.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-32	B	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			6.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-32	C	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			6.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-11	A	From Leg	3.00	0.0000	120.00	No Ice	2.99	1.25	50.00
(AT&T Equipment)			6.00			1/2" Ice	3.23	1.41	69.57

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 lb
			0.00			1" Ice	3.47	1.59	92.08
RRUS-11	B	From Leg	3.00	0.0000	120.00	No Ice	2.99	1.25	50.00
(AT&T Equipment)			6.00			1/2" Ice	3.23	1.41	69.57
			0.00			1" Ice	3.47	1.59	92.08
RRUS-11	C	From Leg	3.00	0.0000	120.00	No Ice	2.99	1.25	50.00
(AT&T Equipment)			6.00			1/2" Ice	3.23	1.41	69.57
			0.00			1" Ice	3.47	1.59	92.08
RRUS-32	A	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			6.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-32	B	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			6.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-32	C	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			6.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
DC6-48-60-18-8F (Squid)	A	From Leg	3.00	0.0000	120.00	No Ice	1.27	1.27	20.00
Suppressor			0.00			1/2" Ice	1.46	1.46	35.12
(AT&T Equipment)			0.00			1" Ice	1.66	1.66	52.57
DC6-48-60-18-8F (Squid)	B	From Leg	3.00	0.0000	120.00	No Ice	1.27	1.27	20.00
Suppressor			0.00			1/2" Ice	1.46	1.46	35.12
(AT&T Equipment)			0.00			1" Ice	1.66	1.66	52.57
*** AT&T Proposed from Centek Analysis									
800-10965 Kathrien Panel w/	A	From Leg	3.00	0.0000	120.00	No Ice	15.33	7.42	133.33
Pipe Mount			3.00			1/2" Ice	15.98	8.56	227.49
(AT&T Equipment)			0.00			1" Ice	16.64	9.46	330.50
800-10965 Kathrien Panel w/	B	From Leg	3.00	0.0000	120.00	No Ice	15.33	7.42	133.33
Pipe Mount			3.00			1/2" Ice	15.98	8.56	227.49
(AT&T Equipment)			0.00			1" Ice	16.64	9.46	330.50
800-10965 Kathrien Panel w/	C	From Leg	3.00	0.0000	120.00	No Ice	15.33	7.42	133.33
Pipe Mount			3.00			1/2" Ice	15.98	8.56	227.49
(AT&T Equipment)			0.00			1" Ice	16.64	9.46	330.50
RRUS-32 B66	A	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			3.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-32 B66	B	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			3.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
RRUS-32 B66	C	From Leg	3.00	0.0000	120.00	No Ice	3.20	1.85	60.00
(AT&T Equipment)			3.00			1/2" Ice	3.46	2.08	81.11
			0.00			1" Ice	3.73	2.31	105.42
4478 Radio Unit (4x40W)	A	From Leg	3.00	0.0000	120.00	No Ice	1.26	1.26	60.00
(AT&T Equipment)			3.00			1/2" Ice	1.42	1.42	73.78
			0.00			1" Ice	1.58	1.58	89.96
4478 Radio Unit (4x40W)	B	From Leg	3.00	0.0000	120.00	No Ice	1.26	1.26	60.00
(AT&T Equipment)			3.00			1/2" Ice	1.42	1.42	73.78
			0.00			1" Ice	1.58	1.58	89.96
4478 Radio Unit (4x40W)	C	From Leg	3.00	0.0000	120.00	No Ice	1.26	1.26	60.00
(AT&T Equipment)			3.00			1/2" Ice	1.42	1.42	73.78
			0.00			1" Ice	1.58	1.58	89.96
DC6-48-60-18-8F (Squid)	C	From Leg	3.00	0.0000	120.00	No Ice	1.27	1.27	20.00
Suppressor			0.00			1/2" Ice	1.46	1.46	35.12
(AT&T Equipment)			0.00			1" Ice	1.66	1.66	52.57
Sabre 12" HD V-Boom	A	From Leg	2.00	0.0000	120.00	No Ice	9.12	8.00	600.00
Antenna Mount			0.00			1/2" Ice	11.00	9.60	750.00
(AT&T Equipment)			0.00			1" Ice	12.88	11.20	900.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Sabre 12" HD V-Boom Antenna Mount (AT&T Equipment)	B	From Leg	2.00 0.00 0.00		0.0000	120.00	No Ice 1/2" Ice 1" Ice	9.12 11.00 12.88	8.00 9.60 11.20	600.00 750.00 900.00
Sabre 12" HD V-Boom Antenna Mount (AT&T Equipment) *** AT&T Proposed from Centek Analysis ***AT&T Inventory - from Centek 05/25/2018 ***T-Mobile Inventory from Destek 05/22/2018	C	From Leg	2.00 0.00 0.00		0.0000	120.00	No Ice 1/2" Ice 1" Ice	9.12 11.00 12.88	8.00 9.60 11.20	600.00 750.00 900.00
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	A	None			0.0000	163.00	No Ice 1/2" Ice 1" Ice	14.52 20.61 26.69	14.52 20.61 26.69	626.50 901.50 1176.50
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	B	None			0.0000	163.00	No Ice 1/2" Ice 1" Ice	14.52 20.61 26.69	14.52 20.61 26.69	626.50 901.50 1176.50
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	C	None			0.0000	163.00	No Ice 1/2" Ice 1" Ice	14.52 20.61 26.69	14.52 20.61 26.69	626.50 901.50 1176.50
AIR 3246 B66 Panel Antenna (T-Mobile)	A	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	8.92 9.41 9.91	6.47 7.22 7.98	213.25 281.27 356.35
AIR 3246 B66 Panel Antenna (T-Mobile)	B	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	8.92 9.41 9.91	6.47 7.22 7.98	213.25 281.27 356.35
AIR 3246 B66 Panel Antenna (T-Mobile)	C	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	8.92 9.41 9.91	6.47 7.22 7.98	213.25 281.27 356.35
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	A	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	22.38 23.16 23.95	10.79 12.21 13.49	206.20 339.89 484.20
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	B	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	22.38 23.16 23.95	10.79 12.21 13.49	206.20 339.89 484.20
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	C	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	22.38 23.16 23.95	10.79 12.21 13.49	206.20 339.89 484.20
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	A	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	6.35 6.91 7.44	5.37 6.23 6.97	154.10 208.49 269.17
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	B	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	6.35 6.91 7.44	5.37 6.23 6.97	154.10 208.49 269.17
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	C	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	6.35 6.91 7.44	5.37 6.23 6.97	154.10 208.49 269.17
KRY 112 489/2 (T-Mobile)	A	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	0.56 0.66 0.76	0.37 0.45 0.53	15.40 20.47 25.54
KRY 112 489/2 (T-Mobile)	B	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	0.56 0.66 0.76	0.37 0.45 0.53	15.40 20.47 25.54
KRY 112 489/2 (T-Mobile)	C	From Leg	3.00 0.00 0.00		0.0000	163.00	No Ice 1/2" Ice 1" Ice	0.56 0.66 0.76	0.37 0.45 0.53	15.40 20.47 25.54

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 lb
KRY 112 144/2	A	From Leg	3.00	0.0000	163.00	No Ice	0.48	0.23	9.70
(T-Mobile)			0.00			1/2" Ice	0.57	0.30	13.78
			0.00			1" Ice	0.66	0.37	17.86
KRY 112 144/2	B	From Leg	3.00	0.0000	163.00	No Ice	0.48	0.23	9.70
(T-Mobile)			0.00			1/2" Ice	0.57	0.30	13.78
			0.00			1" Ice	0.66	0.37	17.86
KRY 112 144/2	C	From Leg	3.00	0.0000	163.00	No Ice	0.48	0.23	9.70
(T-Mobile)			0.00			1/2" Ice	0.57	0.30	13.78
			0.00			1" Ice	0.66	0.37	17.86
4449 B71 + B12 Radio Unit	A	From Leg	3.00	0.0000	163.00	No Ice	1.93	1.35	80.00
(T-Mobile)			0.00			1/2" Ice	2.12	1.51	96.16
			0.00			1" Ice	2.32	1.68	114.94
4449 B71 + B12 Radio Unit	B	From Leg	3.00	0.0000	163.00	No Ice	1.93	1.35	80.00
(T-Mobile)			0.00			1/2" Ice	2.12	1.51	96.16
			0.00			1" Ice	2.32	1.68	114.94
4449 B71 + B12 Radio Unit	C	From Leg	3.00	0.0000	163.00	No Ice	1.93	1.35	80.00
(T-Mobile)			0.00			1/2" Ice	2.12	1.51	96.16
			0.00			1" Ice	2.32	1.68	114.94
***T-Mobile Inventory from Destek 05/22/2018 ***Sprint Inventory from Cherundolo Consulting									
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	0.00	0.0000	140.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(Sprint)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	0.00	0.0000	140.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(Sprint)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector Mount (1)	C	From Leg	0.00	0.0000	140.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
(Sprint)			0.00			1" Ice	23.20	23.20	735.00
AAHC Panel Antenna	A	From Leg	3.00	0.0000	140.00	No Ice	4.90	2.40	104.00
(Sprint)			-2.00			1/2" Ice	5.20	2.63	136.31
			0.00			1" Ice	5.51	2.87	172.37
AAHC Panel Antenna	B	From Leg	3.00	0.0000	140.00	No Ice	4.90	2.40	104.00
(Sprint)			-2.00			1/2" Ice	5.20	2.63	136.31
			0.00			1" Ice	5.51	2.87	172.37
AAHC Panel Antenna	C	From Leg	3.00	0.0000	140.00	No Ice	4.90	2.40	104.00
(Sprint)			-2.00			1/2" Ice	5.20	2.63	136.31
			0.00			1" Ice	5.51	2.87	172.37
NNVV-65B-R4 Panel Antenna	A	From Leg	3.00	0.0000	140.00	No Ice	13.72	5.75	85.00
			-5.00			1/2" Ice	14.32	6.21	157.14
(Sprint)			0.00			1" Ice	14.92	6.67	235.92
NNVV-65B-R4 Panel Antenna	B	From Leg	3.00	0.0000	140.00	No Ice	13.72	5.75	85.00
			-5.00			1/2" Ice	14.32	6.21	157.14
(Sprint)			0.00			1" Ice	14.92	6.67	235.92
NNVV-65B-R4 Panel Antenna	C	From Leg	3.00	0.0000	140.00	No Ice	13.72	5.75	85.00
			-5.00			1/2" Ice	14.32	6.21	157.14
(Sprint)			0.00			1" Ice	14.92	6.67	235.92
ALU 4x45-1900 MHz RRH Unit	A	From Leg	3.00	0.0000	140.00	No Ice	2.92	2.92	69.50
			0.00			1/2" Ice	3.16	3.16	95.23
(Sprint)			0.00			1" Ice	3.41	3.41	124.33
ALU 4x45-1900 MHz RRH Unit	B	From Leg	3.00	0.0000	140.00	No Ice	2.92	2.92	69.50
			0.00			1/2" Ice	3.16	3.16	95.23
(Sprint)			0.00			1" Ice	3.41	3.41	124.33
ALU 4x45-1900 MHz RRH Unit	C	From Leg	3.00	0.0000	140.00	No Ice	2.92	2.92	69.50
			0.00			1/2" Ice	3.16	3.16	95.23

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 lb
(Sprint)			0.00			1" Ice	3.41	3.41	124.33
(2) ALU 800MHz 2x50W	A	From Leg	3.00	0.0000	140.00	No Ice	2.40	2.25	64.00
(Sprint)			0.00			1/2" Ice	2.61	2.46	86.12
			0.00			1" Ice	2.83	2.68	111.30
(2) ALU 800MHz 2x50W	B	From Leg	3.00	0.0000	140.00	No Ice	2.40	2.25	64.00
(Sprint)			0.00			1/2" Ice	2.61	2.46	86.12
			0.00			1" Ice	2.83	2.68	111.30
(2) ALU 800MHz 2x50W	C	From Leg	3.00	0.0000	140.00	No Ice	2.40	2.25	64.00
(Sprint)			0.00			1/2" Ice	2.61	2.46	86.12
			0.00			1" Ice	2.83	2.68	111.30
844G65VTZASX w/Mount Pipe	A	From Leg	3.00	0.0000	140.00	No Ice	5.96	5.46	41.55
			2.00			1/2" Ice	6.60	6.49	98.42
(Sprint)			0.00			1" Ice	7.12	7.24	161.84
844G65VTZASX w/Mount Pipe	A	From Leg	3.00	0.0000	140.00	No Ice	5.96	5.46	41.55
			5.00			1/2" Ice	6.60	6.49	98.42
(Sprint)			0.00			1" Ice	7.12	7.24	161.84
844G65VTZASX w/Mount Pipe	C	From Leg	3.00	0.0000	140.00	No Ice	5.96	5.46	41.55
			2.00			1/2" Ice	6.60	6.49	98.42
(Sprint)			0.00			1" Ice	7.12	7.24	161.84
844G65VTZASX w/Mount Pipe	C	From Leg	3.00	0.0000	140.00	No Ice	5.96	5.46	41.55
			5.00			1/2" Ice	6.60	6.49	98.42
(Sprint)			0.00			1" Ice	7.12	7.24	161.84
DB844H90E-XY Panel Antenna	B	From Leg	3.00	0.0000	140.00	No Ice	3.22	4.81	31.03
			2.00			1/2" Ice	3.59	5.46	69.74
(Sprint)			0.00			1" Ice	3.99	6.13	114.11
DB844H90E-XY Panel Antenna	B	From Leg	3.00	0.0000	140.00	No Ice	3.22	4.81	31.03
			5.00			1/2" Ice	3.59	5.46	69.74
(Sprint)			0.00			1" Ice	3.99	6.13	114.11
***Sprint Inventory from Cherundolo Consulting									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
VHLP800-11	A	Paraboloid w/Radome	From Leg	1.00	Worst		145.60	2.50	No Ice	4.90	49.00
				0.00					1/2" Ice	84.00	282.00
				0.00					1" Ice	163.10	515.00
VHLP2-180	B	Paraboloid w/o Radome	From Leg	1.00	Worst		145.60	2.00	No Ice	3.14	25.00
				0.00					1/2" Ice	3.41	42.49
				0.00					1" Ice	3.67	59.98
VHLP2-180	C	Paraboloid w/o Radome	From Leg	1.00	Worst		146.00	2.00	No Ice	3.14	25.00
				0.00					1/2" Ice	3.41	42.49
				0.00					1" Ice	3.67	59.98
RFS SC2-W100BC	C	Paraboloid w/Shroud (HP)	From Leg	1.00	Worst		167.00	2.00	No Ice	3.14	20.00
				0.00					1/2" Ice	3.41	37.50
				0.00					1" Ice	3.68	55.01

222-G Verification Constants

Constant	*Value*
Wind Importance Factor Without Ice	1
Wind Importance Factor With Ice Factor	1
Ice Importance Factor	1
K_d	0.85
Z_g	1200
α	7
K_{zmin}	0.7
K_e	0.9
K_t	0.53
f	2

222-G Section Verification ArRr By Element

Section Elevation *ft*	*Elem. Num.*	*Size*	*C*	*C w/Ice*	*Face*	*e*	*e w/Ice*	A_r ft^2	A_r *w/Ice* ft^2	A_rR_r ft^2	A_rR_r *w/Ice* ft^2
T1	1	ROHN 2 STD	22.027	34.975	C	0.233	0.78	2.969	9.145	1.725	7.959
170.00-155.00											
	1	ROHN 2 STD	22.027	34.975	A	0.233	0.78	2.969	9.145	1.725	7.959
	2	ROHN 2 STD	22.027	34.975	C	0.233	0.78	2.969	9.145	1.725	7.959
	2	ROHN 2 STD	22.027	34.975	B	0.233	0.78	2.969	9.145	1.725	7.959
	3	ROHN 2 STD	22.027	34.975	B	0.233	0.78	2.969	9.145	1.725	7.959
	3	ROHN 2 STD	22.027	34.975	A	0.233	0.78	2.969	9.145	1.725	7.959
	4	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.403	1.729	0.234	1.505
	5	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.403	1.729	0.234	1.505
	6	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.403	1.729	0.234	1.505
	7	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.403	1.729	0.234	1.505
	8	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.403	1.729	0.234	1.505
	9	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.403	1.729	0.234	1.505
	10	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	11	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	12	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	13	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	14	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	15	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	16	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	17	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	18	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	19	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	20	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	21	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	22	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	23	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	24	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	25	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	26	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	27	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	28	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	29	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	30	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	31	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	32	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	33	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	34	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	35	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	36	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	37	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	38	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	39	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	40	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	41	P1.5x16GA	13.912	30.791	C	0.233	0.78	0.493	2.118	0.287	1.843
	42	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	43	P1.5x16GA	13.912	30.791	B	0.233	0.78	0.493	2.118	0.287	1.843
	44	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
	45	P1.5x16GA	13.912	30.791	A	0.233	0.78	0.493	2.118	0.287	1.843
					A			Sum: 12.661	47.160	7.357	41.043
					B			12.661	47.160	7.357	41.043
					C			12.661	47.160	7.357	41.043
T2	46	ROHN 2 STD	22.009	34.932	C	0.302	0.995	2.969	9.141	1.780	9.141
155.00-140.00											
	46	ROHN 2 STD	22.009	34.932	A	0.302	0.995	2.969	9.141	1.780	9.141
	47	ROHN 2 STD	22.009	34.932	C	0.302	0.995	2.969	9.141	1.780	9.141
	47	ROHN 2 STD	22.009	34.932	B	0.302	0.995	2.969	9.141	1.780	9.141
	48	ROHN 2 STD	22.009	34.932	B	0.302	0.995	2.969	9.141	1.780	9.141
	48	ROHN 2 STD	22.009	34.932	A	0.302	0.995	2.969	9.141	1.780	9.141
	49	P1.5x16GA	13.9	30.753	C	0.302	0.995	0.403	1.729	0.241	1.729
	50	P1.5x16GA	13.9	30.753	B	0.302	0.995	0.403	1.729	0.241	1.729
	51	P1.5x16GA	13.9	30.753	A	0.302	0.995	0.403	1.729	0.241	1.729
	52	P1.5x16GA	13.9	30.753	C	0.302	0.995	0.403	1.729	0.241	1.729
	53	P1.5x16GA	13.9	30.753	B	0.302	0.995	0.403	1.729	0.241	1.729
	54	P1.5x16GA	13.9	30.753	A	0.302	0.995	0.403	1.729	0.241	1.729
	55	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	56	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	57	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	58	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	59	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	60	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	61	1	9.267	28.364	C	0.302	0.995	0.269	1.594	0.161	1.594
	62	1	9.267	28.364	B	0.302	0.995	0.269	1.594	0.161	1.594
	63	1	9.267	28.364	A	0.302	0.995	0.269	1.594	0.161	1.594
	64	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	65	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	66	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	67	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	68	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	69	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	70	1	9.267	28.364	C	0.302	0.995	0.269	1.594	0.161	1.594
	71	1	9.267	28.364	B	0.302	0.995	0.269	1.594	0.161	1.594
	72	1	9.267	28.364	A	0.302	0.995	0.269	1.594	0.161	1.594
	73	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	74	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	75	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	76	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	77	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	78	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	79	1	9.267	28.364	C	0.302	0.995	0.269	1.594	0.161	1.594
	80	1	9.267	28.364	B	0.302	0.995	0.269	1.594	0.161	1.594
	81	1	9.267	28.364	A	0.302	0.995	0.269	1.594	0.161	1.594
	82	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	83	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	84	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	85	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	86	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	87	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	88	1	9.267	28.364	C	0.302	0.995	0.269	1.594	0.161	1.594
	89	1	9.267	28.364	B	0.302	0.995	0.269	1.594	0.161	1.594
	90	1	9.267	28.364	A	0.302	0.995	0.269	1.594	0.161	1.594
	91	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	92	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	93	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	94	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	95	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	96	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	97	1	9.267	28.364	C	0.302	0.995	0.269	1.594	0.161	1.594
	98	1	9.267	28.364	B	0.302	0.995	0.269	1.594	0.161	1.594
	99	1	9.267	28.364	A	0.302	0.995	0.269	1.594	0.161	1.594
	100	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	101	ROHN 1.5 STD	17.607	32.663	C	0.302	0.995	0.625	2.248	0.375	2.248
	102	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	103	ROHN 1.5 STD	17.607	32.663	B	0.302	0.995	0.625	2.248	0.375	2.248
	104	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	105	ROHN 1.5 STD	17.607	32.663	A	0.302	0.995	0.625	2.248	0.375	2.248
	106	1	9.267	28.364	C	0.302	0.995	0.269	1.594	0.161	1.594
	107	1	9.267	28.364	B	0.302	0.995	0.269	1.594	0.161	1.594
	108	1	9.267	28.364	A	0.302	0.995	0.269	1.594	0.161	1.594
					A		Sum:	15.850	58.284	9.503	58.284
					B			15.850	58.284	9.503	58.284
					C			15.850	58.284	9.503	58.284
T3					A		Sum:	0.000	0.000	0.000	0.000
140.00-120.00					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T4	193	P1.5x16GA	13.905	30.768	C	0.275	0.844	0.403	1.729	0.238	1.591
120.00-117.50											
	194	P1.5x16GA	13.905	30.768	B	0.275	0.844	0.403	1.729	0.238	1.591
	195	P1.5x16GA	13.905	30.768	A	0.275	0.844	0.403	1.729	0.238	1.591
	196	P1.5x16GA	13.905	30.768	C	0.275	0.844	0.498	2.138	0.295	1.968
	197	P1.5x16GA	13.905	30.768	C	0.275	0.844	0.498	2.138	0.295	1.968
	198	P1.5x16GA	13.905	30.768	B	0.275	0.844	0.498	2.138	0.295	1.968
	199	P1.5x16GA	13.905	30.768	B	0.275	0.844	0.498	2.138	0.295	1.968
	200	P1.5x16GA	13.905	30.768	A	0.275	0.844	0.498	2.138	0.295	1.968
	201	P1.5x16GA	13.905	30.768	A	0.275	0.844	0.498	2.138	0.295	1.968
					A		Sum:	1.399	6.006	0.828	5.527
					B			1.399	6.006	0.828	5.527
					C			1.399	6.006	0.828	5.527
T5	205	P1.5x16GA	13.907	30.774	C	0.23	0.671	0.497	2.135	0.289	1.688
117.50-115.00											
	206	P1.5x16GA	13.907	30.774	C	0.23	0.671	0.497	2.135	0.289	1.688
	207	P1.5x16GA	13.907	30.774	B	0.23	0.671	0.497	2.135	0.289	1.688
	208	P1.5x16GA	13.907	30.774	B	0.23	0.671	0.497	2.135	0.289	1.688
	209	P1.5x16GA	13.907	30.774	A	0.23	0.671	0.497	2.135	0.289	1.688
	210	P1.5x16GA	13.907	30.774	A	0.23	0.671	0.497	2.135	0.289	1.688
					A		Sum:	0.995	4.271	0.577	3.377
					B			0.995	4.271	0.577	3.377
					C			0.995	4.271	0.577	3.377
T6	214	P1.5x16GA	13.909	30.781	C	0.23	0.671	0.497	2.136	0.289	1.688
115.00-112.50											
	215	P1.5x16GA	13.909	30.781	C	0.23	0.671	0.497	2.136	0.289	1.688
	216	P1.5x16GA	13.909	30.781	B	0.23	0.671	0.497	2.136	0.289	1.688
	217	P1.5x16GA	13.909	30.781	B	0.23	0.671	0.497	2.136	0.289	1.688
	218	P1.5x16GA	13.909	30.781	A	0.23	0.671	0.497	2.136	0.289	1.688
	219	P1.5x16GA	13.909	30.781	A	0.23	0.671	0.497	2.136	0.289	1.688
					A		Sum:	0.995	4.271	0.577	3.377
					B			0.995	4.271	0.577	3.377

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
					C			0.995	4.271	0.577	3.377
T7	223	P1.5x16GA	13.911	30.789	C	0.23	0.671	0.497	2.136	0.289	1.689
112.50-110.00											
	224	P1.5x16GA	13.911	30.789	C	0.23	0.671	0.497	2.136	0.289	1.689
	225	P1.5x16GA	13.911	30.789	B	0.23	0.671	0.497	2.136	0.289	1.689
	226	P1.5x16GA	13.911	30.789	B	0.23	0.671	0.497	2.136	0.289	1.689
	227	P1.5x16GA	13.911	30.789	A	0.23	0.671	0.497	2.136	0.289	1.689
	228	P1.5x16GA	13.911	30.789	A	0.23	0.671	0.497	2.136	0.289	1.689
					A		Sum:	0.995	4.272	0.577	3.377
					B			0.995	4.272	0.577	3.377
					C			0.995	4.272	0.577	3.377
T8	232	P1.5x16GA	13.913	30.797	C	0.289	0.857	0.497	2.136	0.296	1.987
110.00-107.50											
	233	P1.5x16GA	13.913	30.797	C	0.289	0.857	0.497	2.136	0.296	1.987
	234	P1.5x16GA	13.913	30.797	B	0.289	0.857	0.497	2.136	0.296	1.987
	235	P1.5x16GA	13.913	30.797	B	0.289	0.857	0.497	2.136	0.296	1.987
	236	P1.5x16GA	13.913	30.797	A	0.289	0.857	0.497	2.136	0.296	1.987
	237	P1.5x16GA	13.913	30.797	A	0.289	0.857	0.497	2.136	0.296	1.987
					A		Sum:	0.995	4.272	0.593	3.974
					B			0.995	4.272	0.593	3.974
					C			0.995	4.272	0.593	3.974
T9	244	P1.5x16GA	13.916	30.805	C	0.289	0.857	0.497	2.136	0.296	1.987
107.50-105.00											
	245	P1.5x16GA	13.916	30.805	C	0.289	0.857	0.497	2.136	0.296	1.987
	246	P1.5x16GA	13.916	30.805	B	0.289	0.857	0.497	2.136	0.296	1.987
	247	P1.5x16GA	13.916	30.805	B	0.289	0.857	0.497	2.136	0.296	1.987
	248	P1.5x16GA	13.916	30.805	A	0.289	0.857	0.497	2.136	0.296	1.987
	249	P1.5x16GA	13.916	30.805	A	0.289	0.857	0.497	2.136	0.296	1.987
					A		Sum:	0.995	4.272	0.593	3.975
					B			0.995	4.272	0.593	3.975
					C			0.995	4.272	0.593	3.975
T10	256	P1.5x16GA	13.919	30.814	C	0.289	0.857	0.497	2.136	0.296	1.988
105.00-102.50											
	257	P1.5x16GA	13.919	30.814	C	0.289	0.857	0.497	2.136	0.296	1.988
	258	P1.5x16GA	13.919	30.814	B	0.289	0.857	0.497	2.136	0.296	1.988
	259	P1.5x16GA	13.919	30.814	B	0.289	0.857	0.497	2.136	0.296	1.988
	260	P1.5x16GA	13.919	30.814	A	0.289	0.857	0.497	2.136	0.296	1.988
	261	P1.5x16GA	13.919	30.814	A	0.289	0.857	0.497	2.136	0.296	1.988
					A		Sum:	0.995	4.273	0.593	3.975
					B			0.995	4.273	0.593	3.975
					C			0.995	4.273	0.593	3.975
T11	268	P1.5x16GA	13.921	30.824	C	0.334	1	0.402	1.725	0.245	1.725
102.50-100.00											
	269	P1.5x16GA	13.921	30.824	B	0.334	1	0.402	1.725	0.245	1.725
	270	P1.5x16GA	13.921	30.824	A	0.334	1	0.402	1.725	0.245	1.725
	271	P1.5x16GA	13.921	30.824	C	0.334	1	0.497	2.137	0.304	2.137
	272	P1.5x16GA	13.921	30.824	C	0.334	1	0.497	2.137	0.304	2.137
	273	P1.5x16GA	13.921	30.824	B	0.334	1	0.497	2.137	0.304	2.137
	274	P1.5x16GA	13.921	30.824	B	0.334	1	0.497	2.137	0.304	2.137
	275	P1.5x16GA	13.921	30.824	A	0.334	1	0.497	2.137	0.304	2.137
	276	P1.5x16GA	13.921	30.824	A	0.334	1	0.497	2.137	0.304	2.137
					A		Sum:	1.396	5.998	0.852	5.998
					B			1.396	5.998	0.852	5.998
					C			1.396	5.998	0.852	5.998
T12	280	ROHN 2.5 STD	26.706	37.45	C	0.263	0.803	4.792	13.035	2.819	11.578
100.00-80.00											
	280	ROHN 2.5 STD	26.706	37.45	A	0.263	0.803	4.792	13.035	2.819	11.578
	281	ROHN 2.5 STD	26.706	37.45	C	0.263	0.803	4.792	13.035	2.819	11.578
	281	ROHN 2.5 STD	26.706	37.45	B	0.263	0.803	4.792	13.035	2.819	11.578
	282	ROHN 2.5 STD	26.706	37.45	B	0.263	0.803	4.792	13.035	2.819	11.578

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	282	ROHN 2.5 STD	26.706	37.45	A	0.263	0.803	4.792	13.035	2.819	11.578
	283	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.398	1.708	0.234	1.517
	284	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.398	1.708	0.234	1.517
	285	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.398	1.708	0.234	1.517
	286	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.398	1.708	0.234	1.517
	287	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.398	1.708	0.234	1.517
	288	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.398	1.708	0.234	1.517
	289	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	290	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	291	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	292	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	293	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	294	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	295	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	296	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	297	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	298	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	299	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	300	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	301	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	302	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	303	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	304	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	305	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	306	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	307	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	308	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	309	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	310	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	311	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	312	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	313	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	314	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	315	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	316	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	317	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	318	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	319	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	320	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	321	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	322	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	323	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	324	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	325	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	326	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	327	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	328	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	329	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	330	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	331	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	332	P1.5x16GA	13.934	30.866	C	0.263	0.803	0.488	2.098	0.287	1.863
	333	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	334	P1.5x16GA	13.934	30.866	B	0.263	0.803	0.488	2.098	0.287	1.863
	335	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
	336	P1.5x16GA	13.934	30.866	A	0.263	0.803	0.488	2.098	0.287	1.863
					A		Sum:	18.190	63.056	10.701	56.005
					B			18.190	63.056	10.701	56.005
					C			18.190	63.056	10.701	56.005
T13 80.00-60.00	340	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.400	1.719	0.239	1.645
	341	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.400	1.719	0.239	1.645

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	342	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.400	1.719	0.239	1.645
	343	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.400	1.719	0.239	1.645
	344	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.400	1.719	0.239	1.645
	345	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.400	1.719	0.239	1.645
	346	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	347	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	348	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	349	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	350	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	351	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	355	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	356	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	357	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	358	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	359	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	360	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	364	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	365	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	366	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	367	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	368	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	369	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	373	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	374	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	375	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	376	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	377	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	378	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	382	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	383	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	384	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	385	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	386	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	387	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	391	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	392	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	393	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	394	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	395	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	396	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	400	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	401	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	402	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	403	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	404	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	405	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	409	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	410	P1.5x16GA	13.943	30.898	C	0.3	0.889	0.491	2.111	0.294	2.020
	411	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	412	P1.5x16GA	13.943	30.898	B	0.3	0.889	0.491	2.111	0.294	2.020
	413	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
	414	P1.5x16GA	13.943	30.898	A	0.3	0.889	0.491	2.111	0.294	2.020
					A		Sum:	8.657	37.216	5.184	35.615
					B			8.657	37.216	5.184	35.615
					C			8.657	37.216	5.184	35.615
T14 60.00-40.00	421	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.396	1.698	0.234	1.430
	422	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.396	1.698	0.234	1.430
	423	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.396	1.698	0.234	1.430
	424	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.396	1.698	0.234	1.430
	425	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.396	1.698	0.234	1.430

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	426	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.396	1.698	0.234	1.430
	427	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	428	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	429	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	430	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	431	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	432	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	433	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	434	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	435	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	436	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	437	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	438	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	439	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	440	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	441	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	442	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	443	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	444	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	445	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	446	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	447	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	448	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	449	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	450	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	451	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	452	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	453	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	454	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	455	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	456	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	457	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	458	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	459	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	460	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	461	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	462	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	463	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	464	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	465	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	466	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	467	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	468	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	469	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	470	P1.5x16GA	13.886	30.705	C	0.272	0.743	0.486	2.086	0.287	1.756
	471	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	472	P1.5x16GA	13.886	30.705	B	0.272	0.743	0.486	2.086	0.287	1.756
	473	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
	474	P1.5x16GA	13.886	30.705	A	0.272	0.743	0.486	2.086	0.287	1.756
					A		Sum:	8.571	36.766	5.064	30.964
					B			8.571	36.766	5.064	30.964
					C			8.571	36.766	5.064	30.964
T15 40.00-20.00	478	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.398	1.687	0.231	1.301
	479	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.398	1.687	0.231	1.301
	480	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.398	1.687	0.231	1.301
	481	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.398	1.687	0.231	1.301
	482	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.398	1.687	0.231	1.301
	483	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.398	1.687	0.231	1.301
	484	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	485	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	486	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	487	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	488	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	489	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	490	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	491	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	492	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	493	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	494	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	495	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	496	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	497	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	498	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	499	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	500	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	501	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	502	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	503	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	504	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	505	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	506	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	507	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	508	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	509	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	510	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	511	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	512	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	513	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	514	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	515	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	516	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	517	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	518	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	519	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	520	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	521	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	522	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
	523	1	9.07	27.416	C	0.232	0.642	0.265	1.554	0.154	1.199
	524	1	9.07	27.416	B	0.232	0.642	0.265	1.554	0.154	1.199
	525	1	9.07	27.416	A	0.232	0.642	0.265	1.554	0.154	1.199
	526	P1.5x16GA	13.605	29.753	C	0.232	0.642	0.488	2.071	0.284	1.598
	527	P1.5x16GA	13.605	29.753	B	0.232	0.642	0.488	2.071	0.284	1.598
	528	P1.5x16GA	13.605	29.753	A	0.232	0.642	0.488	2.071	0.284	1.598
					A		Sum:	6.556	30.823	3.807	23.774
					B			6.556	30.823	3.807	23.774
					C			6.556	30.823	3.807	23.774
T16 20.00-5.00	532	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.398	1.624	0.231	1.243
	533	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.398	1.624	0.231	1.243
	534	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.398	1.624	0.231	1.243
	538	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.487	1.988	0.283	1.522
	539	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.487	1.988	0.283	1.522
	540	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.487	1.988	0.283	1.522
	541	1	9.566	27.748	C	0.236	0.633	0.265	1.491	0.154	1.141
	542	1	9.566	27.748	B	0.236	0.633	0.265	1.491	0.154	1.141
	543	1	9.566	27.748	A	0.236	0.633	0.265	1.491	0.154	1.141
	544	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.487	1.988	0.283	1.522
	545	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.487	1.988	0.283	1.522
	546	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.487	1.988	0.283	1.522
	547	1	9.566	27.748	C	0.236	0.633	0.265	1.491	0.154	1.141
	548	1	9.566	27.748	B	0.236	0.633	0.265	1.491	0.154	1.141

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
	549	1	9.566	27.748	A	0.236	0.633	0.265	1.491	0.154	1.141
	550	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.487	1.988	0.283	1.522
	551	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.487	1.988	0.283	1.522
	552	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.487	1.988	0.283	1.522
	553	1	9.566	27.748	C	0.236	0.633	0.265	1.491	0.154	1.141
	554	1	9.566	27.748	B	0.236	0.633	0.265	1.491	0.154	1.141
	555	1	9.566	27.748	A	0.236	0.633	0.265	1.491	0.154	1.141
	556	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.487	1.988	0.283	1.522
	557	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.487	1.988	0.283	1.522
	558	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.487	1.988	0.283	1.522
	559	1	9.566	27.748	C	0.236	0.633	0.265	1.491	0.154	1.141
	560	1	9.566	27.748	B	0.236	0.633	0.265	1.491	0.154	1.141
	561	1	9.566	27.748	A	0.236	0.633	0.265	1.491	0.154	1.141
	562	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.487	1.988	0.283	1.522
	563	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.487	1.988	0.283	1.522
	564	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.487	1.988	0.283	1.522
	565	1	9.566	27.748	C	0.236	0.633	0.265	1.491	0.154	1.141
	566	1	9.566	27.748	B	0.236	0.633	0.265	1.491	0.154	1.141
	567	1	9.566	27.748	A	0.236	0.633	0.265	1.491	0.154	1.141
	568	P1.5x16GA	14.349	30.214	C	0.236	0.633	0.487	1.988	0.283	1.522
	569	P1.5x16GA	14.349	30.214	B	0.236	0.633	0.487	1.988	0.283	1.522
	570	P1.5x16GA	14.349	30.214	A	0.236	0.633	0.487	1.988	0.283	1.522
					A		Sum:	4.643	21.012	2.702	16.078
					B			4.643	21.012	2.702	16.078
					C			4.643	21.012	2.702	16.078
T17 5.00-0.00					A		Sum:	0.000	0.000	0.000	0.000
					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000

222-G Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft^2
T1 170.00-155.00	162.50		1.135	6.208	1.16		27	A	0.233	7.357
								B	0.233	7.357
								C	0.233	7.357
T2 155.00-140.00	147.50		1.104	5.245	1.19		27	A	0.302	9.503
								B	0.302	9.503
								C	0.302	9.503
T3 140.00-120.00	130.00		1.065	4.309	1.234		27	A	0.343	0.000
								B	0.343	0.000
								C	0.343	0.000
T4 120.00-117.50	118.75		1.038	3.797	1.267		27	A	0.275	0.828
								B	0.275	0.828
								C	0.275	0.828
T5 117.50-115.00	116.25		1.032	3.692	1.275		27	A	0.23	0.577
								B	0.23	0.577
								C	0.23	0.577
T6 115.00-112.50	113.75		1.025	3.59	1.283		27	A	0.23	0.577
								B	0.23	0.577
								C	0.23	0.577

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T7 112.50-110.00	111.25		1.019	3.49	1.292		27	A	0.23	0.577
								B	0.23	0.577
								C	0.23	0.577
T8 110.00-107.50	108.75		1.012	3.394	1.301		27	A	0.289	0.593
								B	0.289	0.593
								C	0.289	0.593
T9 107.50-105.00	106.25		1.005	3.3	1.31		27	A	0.289	0.593
								B	0.289	0.593
								C	0.289	0.593
T10 105.00-102.50	103.75		0.999	3.208	1.319		27	A	0.289	0.593
								B	0.289	0.593
								C	0.289	0.593
T11 102.50-100.00	101.25		0.992	3.119	1.329		27	A	0.334	0.852
								B	0.334	0.852
								C	0.334	0.852
T12 100.00-80.00	90.00		0.959	2.749	1.377		27	A	0.263	10.701
								B	0.263	10.701
								C	0.263	10.701
T13 80.00-60.00	70.00		0.892	2.196	1.482		27	A	0.3	5.184
								B	0.3	5.184
								C	0.3	5.184
T14 60.00-40.00	50.00		0.811	1.754	1.618		27	A	0.272	5.064
								B	0.272	5.064
								C	0.272	5.064
T15 40.00-20.00	30.00		0.701	1.401	1.797		26	A	0.232	3.807
								B	0.232	3.807
								C	0.232	3.807
T16 20.00-5.00	12.50		0.7	1.151	2.001		29	A	0.236	2.702
								B	0.236	2.702
								C	0.236	2.702
T17 5.00-0.00	2.50		0.7	1.028	2.143		31	A	0.816	0.000
								B	0.816	0.000
								C	0.816	0.000

222-G Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 170.00-155.00	162.50	162.50	1.135	6.208	1.16	2.4704	7	A	0.78	41.043
								B	0.78	41.043
								C	0.78	41.043
T2 155.00-140.00	147.50	147.50	1.104	5.245	1.19	2.4690	7	A	0.995	59.610
								B	0.995	59.610
								C	0.995	59.610
T3 140.00-120.00	130.00	130.00	1.065	4.309	1.234	2.4688	7	A	0.925	38.774
								B	0.925	38.774
								C	0.925	38.774
T4 120.00-117.50	118.75	118.75	1.038	3.797	1.267	2.4695	7	A	0.844	5.527
								B	0.844	5.527
								C	0.844	5.527
T5 117.50-115.00	116.25	116.25	1.032	3.692	1.275	2.4698	7	A	0.671	3.377
								B	0.671	3.377
								C	0.671	3.377
T6 115.00-112.50	113.75	113.75	1.025	3.59	1.283	2.4700	7	A	0.671	3.377
								B	0.671	3.377

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
								C	0.671	3.377
T7 112.50-110.00	111.25	111.25	1.019	3.49	1.292	2.4703	7	A	0.671	3.377
								B	0.671	3.377
								C	0.671	3.377
T8 110.00-107.50	108.75	108.75	1.012	3.394	1.301	2.4706	7	A	0.857	5.205
								B	0.857	5.205
								C	0.857	5.205
T9 107.50-105.00	106.25	106.25	1.005	3.3	1.31	2.4709	7	A	0.857	5.206
								B	0.857	5.206
								C	0.857	5.206
T10 105.00-102.50	103.75	103.75	0.999	3.208	1.319	2.4712	7	A	0.857	5.207
								B	0.857	5.207
								C	0.857	5.207
T11 102.50-100.00	101.25	101.25	0.992	3.119	1.329	2.4716	7	A	1	7.321
								B	1	7.321
								C	1	7.321
T12 100.00-80.00	90.00	90.00	0.959	2.749	1.377	2.4731	7	A	0.803	57.169
								B	0.803	57.169
								C	0.803	57.169
T13 80.00-60.00	70.00	70.00	0.892	2.196	1.482	2.4743	7	A	0.889	45.715
								B	0.889	45.715
								C	0.889	45.715
T14 60.00-40.00	50.00	50.00	0.811	1.754	1.618	2.4672	7	A	0.743	32.061
								B	0.743	32.061
								C	0.743	32.061
T15 40.00-20.00	30.00	30.00	0.701	1.401	1.797	2.4321	7	A	0.642	23.774
								B	0.642	23.774
								C	0.642	23.774
T16 20.00-5.00	12.50	12.50	0.7	1.151	2.001	2.3136	8	A	0.633	17.017
								B	0.633	17.017
								C	0.633	17.017
T17 5.00-0.00	2.50	2.50	0.7	1.028	2.143	2.0175	8	A	1	1.483
								B	1	1.483
								C	1	1.483

222-G Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
T1 170.00-155.00	162.50		1.135	6.208	1.16		10	A	0.233	7.357
								B	0.233	7.357
								C	0.233	7.357
T2 155.00-140.00	147.50		1.104	5.245	1.19		10	A	0.302	9.503
								B	0.302	9.503
								C	0.302	9.503
T3 140.00-120.00	130.00		1.065	4.309	1.234		10	A	0.343	0.000
								B	0.343	0.000
								C	0.343	0.000
T4 120.00-117.50	118.75		1.038	3.797	1.267		10	A	0.275	0.828
								B	0.275	0.828
								C	0.275	0.828
T5 117.50-115.00	116.25		1.032	3.692	1.275		10	A	0.23	0.577
								B	0.23	0.577
								C	0.23	0.577
T6 115.00-112.50	113.75		1.025	3.59	1.283		10	A	0.23	0.577

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z psf	Face	e	A_rR_r ft²
								B	0.23	0.577
								C	0.23	0.577
T7 112.50-110.00	111.25		1.019	3.49	1.292		10	A	0.23	0.577
								B	0.23	0.577
								C	0.23	0.577
T8 110.00-107.50	108.75		1.012	3.394	1.301		10	A	0.289	0.593
								B	0.289	0.593
								C	0.289	0.593
T9 107.50-105.00	106.25		1.005	3.3	1.31		10	A	0.289	0.593
								B	0.289	0.593
								C	0.289	0.593
T10 105.00-102.50	103.75		0.999	3.208	1.319		10	A	0.289	0.593
								B	0.289	0.593
								C	0.289	0.593
T11 102.50-100.00	101.25		0.992	3.119	1.329		10	A	0.334	0.852
								B	0.334	0.852
								C	0.334	0.852
T12 100.00-80.00	90.00		0.959	2.749	1.377		10	A	0.263	10.701
								B	0.263	10.701
								C	0.263	10.701
T13 80.00-60.00	70.00		0.892	2.196	1.482		10	A	0.3	5.184
								B	0.3	5.184
								C	0.3	5.184
T14 60.00-40.00	50.00		0.811	1.754	1.618		10	A	0.272	5.064
								B	0.272	5.064
								C	0.272	5.064
T15 40.00-20.00	30.00		0.701	1.401	1.797		10	A	0.232	3.807
								B	0.232	3.807
								C	0.232	3.807
T16 20.00-5.00	12.50		0.7	1.151	2.001		11	A	0.236	2.702
								B	0.236	2.702
								C	0.236	2.702
T17 5.00-0.00	2.50		0.7	1.028	2.143		12	A	0.816	0.000
								B	0.816	0.000
								C	0.816	0.000

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	162.50	1.135	27	54.269	A	0.000	12.661	5.938	46.90	14.196	0.000
170.00-155.00					B	0.000	12.661		46.90	0.000	0.000
					C	0.000	12.661		46.90	20.790	0.000
T2	147.50	1.104	27	54.269	A	0.537	15.850	5.938	36.23	19.290	0.000
155.00-140.00					B	0.537	15.850		36.23	0.000	0.000
					C	0.537	15.850		36.23	44.550	0.000
T3	130.00	1.065	27	73.288	A	25.129	0.000	11.198	44.56	39.560	0.000
140.00-120.00					B	25.129	0.000		44.56	0.000	0.000
					C	25.129	0.000		44.56	59.400	0.000
T4	118.75	1.038	27	8.975	A	1.068	1.399	1.068	43.29	4.945	0.000
120.00-117.50					B	1.068	1.399		43.29	3.930	0.000
					C	1.068	1.399		43.29	7.425	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T5	116.25	1.032	27	8.975	A	1.068	0.995	1.068	51.77	4.945	0.000
117.50-115.00					B	1.068	0.995		51.77	3.930	0.000
					C	1.068	0.995		51.77	7.425	0.000
T6	113.75	1.025	27	8.975	A	1.068	0.995	1.068	51.77	4.945	0.000
115.00-112.50					B	1.068	0.995		51.77	3.930	0.000
					C	1.068	0.995		51.77	7.425	0.000
T7	111.25	1.019	27	8.975	A	1.068	0.995	1.068	51.77	4.945	0.000
112.50-110.00					B	1.068	0.995		51.77	3.930	0.000
					C	1.068	0.995		51.77	7.425	0.000
T8	108.75	1.012	27	8.975	A	1.603	0.995	1.068	41.10	4.945	0.000
110.00-107.50					B	1.603	0.995		41.10	3.930	0.000
					C	1.603	0.995		41.10	7.425	0.000
T9	106.25	1.005	27	8.975	A	1.603	0.995	1.068	41.10	4.945	0.000
107.50-105.00					B	1.603	0.995		41.10	3.930	0.000
					C	1.603	0.995		41.10	7.425	0.000
T10	103.75	0.999	27	8.975	A	1.603	0.995	1.068	41.10	4.945	0.000
105.00-102.50					B	1.603	0.995		41.10	3.930	0.000
					C	1.603	0.995		41.10	7.425	0.000
T11	101.25	0.992	27	8.975	A	1.603	1.396	1.068	35.60	4.945	0.000
102.50-100.00					B	1.603	1.396		35.60	3.930	0.000
					C	1.603	1.396		35.60	7.425	0.000
T12	90.00	0.959	27	73.192	A	1.060	18.190	9.583	49.78	39.560	0.000
100.00-80.00					B	1.060	18.190		49.78	31.440	0.000
					C	1.060	18.190		49.78	59.400	0.000
T13	70.00	0.892	27	72.550	A	13.102	8.657	8.837	40.61	39.560	0.000
80.00-60.00					B	13.102	8.657		40.61	31.440	0.000
					C	13.102	8.657		40.61	59.400	0.000
T14	50.00	0.811	27	73.018	A	11.316	8.571	10.260	51.59	40.380	0.000
60.00-40.00					B	11.316	8.571		51.59	31.440	0.000
					C	11.316	8.571		51.59	59.400	0.000
T15	30.00	0.701	26	72.746	A	10.303	6.556	10.303	61.11	41.200	0.000
40.00-20.00					B	10.303	6.556		61.11	31.440	0.000
					C	10.303	6.556		61.11	59.400	0.000
T16 20.00-5.00	12.50	0.7	29	54.559	A	8.258	4.643	7.728	59.90	28.840	0.000
					B	8.258	4.643		59.90	22.008	0.000
					C	8.258	4.643		59.90	41.580	0.000
T17 5.00-0.00	2.50	0.7	31	9.698	A	7.916	0.000	2.769	34.99	0.000	0.000
					B	7.916	0.000		34.99	0.000	0.000
					C	7.916	0.000		34.99	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	162.50	1.135	7	2.4704	60.445	A	0.000	47.160	18.290	38.78	66.132	0.000
170.00-155.00						B	0.000	47.160		38.78	0.000	0.000
						C	0.000	47.160		38.78	22.783	0.000
T2	147.50	1.104	7	2.4690	60.441	A	0.537	59.610	18.282	30.40	85.425	0.000
155.00-140.00						B	0.537	59.610		30.40	0.000	0.000
						C	0.537	59.610		30.40	48.813	0.000
T3	130.00	1.065	7	2.4688	81.517	A	36.102	39.307	22.171	29.40	165.404	0.000
140.00-120.00						B	36.102	39.307		29.40	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	36.102	39.307		29.40	65.083	0.000
T4 120.00-117.50	118.75	1.038	7	2.4695	10.004	A	2.440	6.006	2.440	28.89	20.679	0.000
						B	2.440	6.006		28.89	15.631	0.000
						C	2.440	6.006		28.89	8.136	0.000
T5 117.50-115.00	116.25	1.032	7	2.4698	10.004	A	2.440	4.271	2.440	36.36	20.680	0.000
						B	2.440	4.271		36.36	15.632	0.000
						C	2.440	4.271		36.36	8.136	0.000
T6 115.00-112.50	113.75	1.025	7	2.4700	10.004	A	2.440	4.271	2.440	36.36	20.681	0.000
						B	2.440	4.271		36.36	15.633	0.000
						C	2.440	4.271		36.36	8.136	0.000
T7 112.50-110.00	111.25	1.019	7	2.4703	10.005	A	2.440	4.272	2.440	36.36	20.682	0.000
						B	2.440	4.272		36.36	15.634	0.000
						C	2.440	4.272		36.36	8.137	0.000
T8 110.00-107.50	108.75	1.012	7	2.4706	10.005	A	2.976	5.595	2.440	28.47	20.683	0.000
						B	2.976	5.595		28.47	15.635	0.000
						C	2.976	5.595		28.47	8.137	0.000
T9 107.50-105.00	106.25	1.005	7	2.4709	10.005	A	2.976	5.595	2.441	28.47	20.685	0.000
						B	2.976	5.595		28.47	15.636	0.000
						C	2.976	5.595		28.47	8.137	0.000
T10 105.00-102.50	103.75	0.999	7	2.4712	10.005	A	2.976	5.596	2.441	28.47	20.686	0.000
						B	2.976	5.596		28.47	15.637	0.000
						C	2.976	5.596		28.47	8.137	0.000
T11 102.50-100.00	101.25	0.992	7	2.4716	10.005	A	2.976	7.321	2.441	23.70	20.687	0.000
						B	2.976	7.321		23.70	15.638	0.000
						C	2.976	7.321		23.70	8.138	0.000
T12 100.00-80.00	90.00	0.959	7	2.4731	81.435	A	1.060	64.367	26.071	39.85	165.554	0.000
						B	1.060	64.367		39.85	125.149	0.000
						C	1.060	64.367		39.85	65.110	0.000
T13 80.00-60.00	70.00	0.892	7	2.4743	80.797	A	24.099	47.770	19.834	27.60	165.595	0.000
						B	24.099	47.770		27.60	125.182	0.000
						C	24.099	47.770		27.60	65.118	0.000
T14 60.00-40.00	50.00	0.811	7	2.4672	81.242	A	22.281	38.069	21.226	35.17	175.546	0.000
						B	22.281	38.069		35.17	124.981	0.000
						C	22.281	38.069		35.17	65.072	0.000
T15 40.00-20.00	30.00	0.701	7	2.4321	80.853	A	21.113	30.823	21.113	40.65	184.269	0.000
						B	21.113	30.823		40.65	123.980	0.000
						C	21.113	30.823		40.65	64.845	0.000
T16 20.00-5.00	12.50	0.7	8	2.3136	60.344	A	15.970	22.238	15.440	40.41	125.510	0.000
						B	15.970	22.238		40.41	84.427	0.000
						C	15.970	22.238		40.41	44.856	0.000
T17 5.00-0.00	2.50	0.7	8	2.0175	11.475	A	10.326	1.483	5.180	43.86	0.000	0.000
						B	10.326	1.483		43.86	0.000	0.000
						C	10.326	1.483		43.86	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 170.00-155.00	162.50	1.135	10	54.269	A	0.000	12.661	5.938	46.90	14.196	0.000
					B	0.000	12.661		46.90	0.000	0.000
					C	0.000	12.661		46.90	20.790	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T2	147.50	1.104	10	54.269	A	0.537	15.850	5.938	36.23	19.290	0.000
155.00-140.00					B	0.537	15.850		36.23	0.000	0.000
					C	0.537	15.850		36.23	44.550	0.000
T3	130.00	1.065	10	73.288	A	25.129	0.000	11.198	44.56	39.560	0.000
140.00-120.00					B	25.129	0.000		44.56	0.000	0.000
					C	25.129	0.000		44.56	59.400	0.000
T4	118.75	1.038	10	8.975	A	1.068	1.399	1.068	43.29	4.945	0.000
120.00-117.50					B	1.068	1.399		43.29	3.930	0.000
					C	1.068	1.399		43.29	7.425	0.000
T5	116.25	1.032	10	8.975	A	1.068	0.995	1.068	51.77	4.945	0.000
117.50-115.00					B	1.068	0.995		51.77	3.930	0.000
					C	1.068	0.995		51.77	7.425	0.000
T6	113.75	1.025	10	8.975	A	1.068	0.995	1.068	51.77	4.945	0.000
115.00-112.50					B	1.068	0.995		51.77	3.930	0.000
					C	1.068	0.995		51.77	7.425	0.000
T7	111.25	1.019	10	8.975	A	1.068	0.995	1.068	51.77	4.945	0.000
112.50-110.00					B	1.068	0.995		51.77	3.930	0.000
					C	1.068	0.995		51.77	7.425	0.000
T8	108.75	1.012	10	8.975	A	1.603	0.995	1.068	41.10	4.945	0.000
110.00-107.50					B	1.603	0.995		41.10	3.930	0.000
					C	1.603	0.995		41.10	7.425	0.000
T9	106.25	1.005	10	8.975	A	1.603	0.995	1.068	41.10	4.945	0.000
107.50-105.00					B	1.603	0.995		41.10	3.930	0.000
					C	1.603	0.995		41.10	7.425	0.000
T10	103.75	0.999	10	8.975	A	1.603	0.995	1.068	41.10	4.945	0.000
105.00-102.50					B	1.603	0.995		41.10	3.930	0.000
					C	1.603	0.995		41.10	7.425	0.000
T11	101.25	0.992	10	8.975	A	1.603	1.396	1.068	35.60	4.945	0.000
102.50-100.00					B	1.603	1.396		35.60	3.930	0.000
					C	1.603	1.396		35.60	7.425	0.000
T12	90.00	0.959	10	73.192	A	1.060	18.190	9.583	49.78	39.560	0.000
100.00-80.00					B	1.060	18.190		49.78	31.440	0.000
					C	1.060	18.190		49.78	59.400	0.000
T13	70.00	0.892	10	72.550	A	13.102	8.657	8.837	40.61	39.560	0.000
80.00-60.00					B	13.102	8.657		40.61	31.440	0.000
					C	13.102	8.657		40.61	59.400	0.000
T14	50.00	0.811	10	73.018	A	11.316	8.571	10.260	51.59	40.380	0.000
60.00-40.00					B	11.316	8.571		51.59	31.440	0.000
					C	11.316	8.571		51.59	59.400	0.000
T15	30.00	0.701	10	72.746	A	10.303	6.556	10.303	61.11	41.200	0.000
40.00-20.00					B	10.303	6.556		61.11	31.440	0.000
					C	10.303	6.556		61.11	59.400	0.000
T16 20.00-5.00	12.50	0.7	11	54.559	A	8.258	4.643	7.728	59.90	28.840	0.000
					B	8.258	4.643		59.90	22.008	0.000
					C	8.258	4.643		59.90	41.580	0.000
T17 5.00-0.00	2.50	0.7	12	9.698	A	7.916	0.000	2.769	34.99	0.000	0.000
					B	7.916	0.000		34.99	0.000	0.000
					C	7.916	0.000		34.99	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	148.65	345.49	A	0.233	2.489	27	1	1	7.357	900.37	60.02	C
170.00-155.00			B	0.233	2.489		1	1	7.357			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.233	2.489		1	1	7.357			
T2	280.44	823.04	A	0.302	2.291	27	1	1	10.040	1402.14	93.48	C
155.00-140.00		TA 456.98	B	0.302	2.291		1	1	10.040			
			C	0.302	2.291		1	1	10.040			
T3	495.20	1267.29	A	0.343	2.188	27	1	1	25.129	2615.27	130.76	C
140.00-120.00		TA 682.09	B	0.343	2.188		1	1	25.129			
			C	0.343	2.188		1	1	25.129			
T4	84.20	79.73	A	0.275	2.365	27	1	1	1.895	326.43	130.57	C
120.00-117.50			B	0.275	2.365		1	1	1.895			
			C	0.275	2.365		1	1	1.895			
T5	84.20	69.38	A	0.23	2.499	27	1	1	1.645	318.03	127.21	C
117.50-115.00			B	0.23	2.499		1	1	1.645			
			C	0.23	2.499		1	1	1.645			
T6	84.20	69.38	A	0.23	2.499	27	1	1	1.645	318.13	127.25	C
115.00-112.50			B	0.23	2.499		1	1	1.645			
			C	0.23	2.499		1	1	1.645			
T7	84.20	69.38	A	0.23	2.499	27	1	1	1.645	318.23	127.29	C
112.50-110.00			B	0.23	2.499		1	1	1.645			
			C	0.23	2.499		1	1	1.645			
T8	84.20	95.59	A	0.289	2.324	27	1	1	2.196	341.07	136.43	C
110.00-107.50			B	0.289	2.324		1	1	2.196			
			C	0.289	2.324		1	1	2.196			
T9	84.20	95.59	A	0.289	2.324	27	1	1	2.196	341.20	136.48	C
107.50-105.00			B	0.289	2.324		1	1	2.196			
			C	0.289	2.324		1	1	2.196			
T10	84.20	95.59	A	0.289	2.324	27	1	1	2.196	341.33	136.53	C
105.00-102.50			B	0.289	2.324		1	1	2.196			
			C	0.289	2.324		1	1	2.196			
T11	84.20	105.94	A	0.334	2.209	27	1	1	2.456	348.80	139.52	C
102.50-100.00			B	0.334	2.209		1	1	2.456			
			C	0.334	2.209		1	1	2.456			
T12	673.60	644.28	A	0.263	2.399	27	1	1	11.761	2446.55	122.33	C
100.00-80.00			B	0.263	2.399		1	1	11.761			
			C	0.263	2.399		1	1	11.761			
T13	673.60	822.74	A	0.3	2.296	27	1	1	18.287	2766.86	138.34	C
80.00-60.00			B	0.3	2.296		1	1	18.287			
			C	0.3	2.296		1	1	18.287			
T14	675.00	808.38	A	0.272	2.372	27	1	1	16.380	2684.04	134.20	C
60.00-40.00			B	0.272	2.372		1	1	16.380			
			C	0.272	2.372		1	1	16.380			
T15	676.40	813.85	A	0.232	2.493	26	1	1	14.111	2506.56	125.33	C
40.00-20.00			B	0.232	2.493		1	1	14.111			
			C	0.232	2.493		1	1	14.111			
T16	473.48	624.01	A	0.236	2.479	29	1	1	10.959	2013.81	134.25	C
20.00-5.00			B	0.236	2.479		1	1	10.959			
			C	0.236	2.479		1	1	10.959			
T17 5.00-0.00	0.00	2441.16	A	0.816	1.829	31	1	1	7.916	377.89	75.58	C
			B	0.816	1.829		1	1	7.916			
			C	0.816	1.829		1	1	7.916			
Sum Weight:	4769.97	10409.91								20366.70		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	148.65	345.49	A	0.233	2.489	27	0.8	1	7.357	900.37	60.02	C
170.00-155.00			B	0.233	2.489		0.8	1	7.357			
			C	0.233	2.489		0.8	1	7.357			
T2	280.44	823.04	A	0.302	2.291	27	0.8	1	9.932	1396.51	93.10	C
155.00-140.00		TA 456.98	B	0.302	2.291		0.8	1	9.932			
			C	0.302	2.291		0.8	1	9.932			
T3	495.20	1267.29	A	0.343	2.188	27	0.8	1	20.103	2363.78	118.19	C
140.00-120.00		TA 682.09	B	0.343	2.188		0.8	1	20.103			
			C	0.343	2.188		0.8	1	20.103			
T4	84.20	79.73	A	0.275	2.365	27	0.8	1	1.682	314.87	125.95	C
120.00-117.50			B	0.275	2.365		0.8	1	1.682			
			C	0.275	2.365		0.8	1	1.682			
T5	84.20	69.38	A	0.23	2.499	27	0.8	1	1.432	305.81	122.32	C
117.50-115.00			B	0.23	2.499		0.8	1	1.432			
			C	0.23	2.499		0.8	1	1.432			
T6	84.20	69.38	A	0.23	2.499	27	0.8	1	1.432	305.90	122.36	C
115.00-112.50			B	0.23	2.499		0.8	1	1.432			
			C	0.23	2.499		0.8	1	1.432			
T7	84.20	69.38	A	0.23	2.499	27	0.8	1	1.432	306.00	122.40	C
112.50-110.00			B	0.23	2.499		0.8	1	1.432			
			C	0.23	2.499		0.8	1	1.432			
T8	84.20	95.59	A	0.289	2.324	27	0.8	1	1.875	323.99	129.60	C
110.00-107.50			B	0.289	2.324		0.8	1	1.875			
			C	0.289	2.324		0.8	1	1.875			
T9	84.20	95.59	A	0.289	2.324	27	0.8	1	1.875	324.11	129.64	C
107.50-105.00			B	0.289	2.324		0.8	1	1.875			
			C	0.289	2.324		0.8	1	1.875			
T10	84.20	95.59	A	0.289	2.324	27	0.8	1	1.875	324.24	129.69	C
105.00-102.50			B	0.289	2.324		0.8	1	1.875			
			C	0.289	2.324		0.8	1	1.875			
T11	84.20	105.94	A	0.334	2.209	27	0.8	1	2.135	332.55	133.02	C
102.50-100.00			B	0.334	2.209		0.8	1	2.135			
			C	0.334	2.209		0.8	1	2.135			
T12	673.60	644.28	A	0.263	2.399	27	0.8	1	11.549	2434.86	121.74	C
100.00-80.00			B	0.263	2.399		0.8	1	11.549			
			C	0.263	2.399		0.8	1	11.549			
T13	673.60	822.74	A	0.3	2.296	27	0.8	1	15.666	2628.39	131.42	C
80.00-60.00			B	0.3	2.296		0.8	1	15.666			
			C	0.3	2.296		0.8	1	15.666			
T14	675.00	808.38	A	0.272	2.372	27	0.8	1	14.116	2561.50	128.07	C
60.00-40.00			B	0.272	2.372		0.8	1	14.116			
			C	0.272	2.372		0.8	1	14.116			
T15	676.40	813.85	A	0.232	2.493	26	0.8	1	12.050	2393.99	119.70	C
40.00-20.00			B	0.232	2.493		0.8	1	12.050			
			C	0.232	2.493		0.8	1	12.050			
T16	473.48	624.01	A	0.236	2.479	29	0.8	1	9.308	1914.03	127.60	C
20.00-5.00			B	0.236	2.479		0.8	1	9.308			
			C	0.236	2.479		0.8	1	9.308			
T17 5.00-0.00	0.00	2441.16	A	0.816	1.829	31	0.8	1	6.333	302.31	60.46	C
			B	0.816	1.829		0.8	1	6.333			
			C	0.816	1.829		0.8	1	6.333			
Sum Weight:	4769.97	10409.91								19433.21		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	148.65	345.49	A	0.233	2.489	27	0.85	1	7.357	900.37	60.02	C
170.00-155.00			B	0.233	2.489		0.85	1	7.357			
			C	0.233	2.489		0.85	1	7.357			
T2	280.44	823.04	A	0.302	2.291	27	0.85	1	9.959	1397.92	93.19	C
155.00-140.00		TA 456.98	B	0.302	2.291		0.85	1	9.959			
			C	0.302	2.291		0.85	1	9.959			
T3	495.20	1267.29	A	0.343	2.188	27	0.85	1	21.360	2426.65	121.33	C
140.00-120.00		TA 682.09	B	0.343	2.188		0.85	1	21.360			
			C	0.343	2.188		0.85	1	21.360			
T4	84.20	79.73	A	0.275	2.365	27	0.85	1	1.735	317.76	127.10	C
120.00-117.50			B	0.275	2.365		0.85	1	1.735			
			C	0.275	2.365		0.85	1	1.735			
T5	84.20	69.38	A	0.23	2.499	27	0.85	1	1.485	308.87	123.55	C
117.50-115.00			B	0.23	2.499		0.85	1	1.485			
			C	0.23	2.499		0.85	1	1.485			
T6	84.20	69.38	A	0.23	2.499	27	0.85	1	1.485	308.96	123.58	C
115.00-112.50			B	0.23	2.499		0.85	1	1.485			
			C	0.23	2.499		0.85	1	1.485			
T7	84.20	69.38	A	0.23	2.499	27	0.85	1	1.485	309.06	123.62	C
112.50-110.00			B	0.23	2.499		0.85	1	1.485			
			C	0.23	2.499		0.85	1	1.485			
T8	84.20	95.59	A	0.289	2.324	27	0.85	1	1.955	328.26	131.31	C
110.00-107.50			B	0.289	2.324		0.85	1	1.955			
			C	0.289	2.324		0.85	1	1.955			
T9	84.20	95.59	A	0.289	2.324	27	0.85	1	1.955	328.38	131.35	C
107.50-105.00			B	0.289	2.324		0.85	1	1.955			
			C	0.289	2.324		0.85	1	1.955			
T10	84.20	95.59	A	0.289	2.324	27	0.85	1	1.955	328.51	131.40	C
105.00-102.50			B	0.289	2.324		0.85	1	1.955			
			C	0.289	2.324		0.85	1	1.955			
T11	84.20	105.94	A	0.334	2.209	27	0.85	1	2.215	336.62	134.65	C
102.50-100.00			B	0.334	2.209		0.85	1	2.215			
			C	0.334	2.209		0.85	1	2.215			
T12	673.60	644.28	A	0.263	2.399	27	0.85	1	11.602	2437.78	121.89	C
100.00-80.00			B	0.263	2.399		0.85	1	11.602			
			C	0.263	2.399		0.85	1	11.602			
T13	673.60	822.74	A	0.3	2.296	27	0.85	1	16.321	2663.00	133.15	C
80.00-60.00			B	0.3	2.296		0.85	1	16.321			
			C	0.3	2.296		0.85	1	16.321			
T14	675.00	808.38	A	0.272	2.372	27	0.85	1	14.682	2592.13	129.61	C
60.00-40.00			B	0.272	2.372		0.85	1	14.682			
			C	0.272	2.372		0.85	1	14.682			
T15	676.40	813.85	A	0.232	2.493	26	0.85	1	12.565	2422.13	121.11	C
40.00-20.00			B	0.232	2.493		0.85	1	12.565			
			C	0.232	2.493		0.85	1	12.565			
T16	473.48	624.01	A	0.236	2.479	29	0.85	1	9.721	1938.98	129.27	C
20.00-5.00			B	0.236	2.479		0.85	1	9.721			
			C	0.236	2.479		0.85	1	9.721			
T17 5.00-0.00	0.00	2441.16	A	0.816	1.829	31	0.85	1	6.728	321.20	64.24	C
			B	0.816	1.829		0.85	1	6.728			
			C	0.816	1.829		0.85	1	6.728			
Sum Weight:	4769.97	10409.91								19666.59		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1666.59	3056.05	A	0.78	1.803	7	1	1	41.043	569.34	37.96	C
170.00-155.00			B	0.78	1.803		1	1	41.043			
			C	0.78	1.803		1	1	41.043			
T2	2601.53	4521.12	A	0.995	2.09	7	1	1	60.147	767.87	51.19	C
155.00-140.00		TA	B	0.995	2.09		1	1	60.147			
		1396.11	C	0.995	2.09		1	1	60.147			
T3	4359.15	6763.85	A	0.925	1.962	7	1	1	74.876	997.44	49.87	C
140.00-120.00		TA	B	0.925	1.962		1	1	74.876			
		1384.22	C	0.925	1.962		1	1	74.876			
T4	803.85	613.71	A	0.844	1.855	7	1	1	7.967	127.76*	51.10	C
120.00-117.50			B	0.844	1.855		1	1	7.967			
			C	0.844	1.855		1	1	7.967			
T5	803.94	480.54	A	0.671	1.777	7	1	1	5.817	127.79*	51.12	C
117.50-115.00			B	0.671	1.777		1	1	5.817			
			C	0.671	1.777		1	1	5.817			
T6	804.03	480.60	A	0.671	1.777	7	1	1	5.817	127.83*	51.13	C
115.00-112.50			B	0.671	1.777		1	1	5.817			
			C	0.671	1.777		1	1	5.817			
T7	804.13	480.67	A	0.671	1.777	7	1	1	5.818	127.88*	51.15	C
112.50-110.00			B	0.671	1.777		1	1	5.818			
			C	0.671	1.777		1	1	5.818			
T8	804.24	671.06	A	0.857	1.869	7	1	1	8.181	127.92*	51.17	C
110.00-107.50			B	0.857	1.869		1	1	8.181			
			C	0.857	1.869		1	1	8.181			
T9	804.35	671.17	A	0.857	1.869	7	1	1	8.182	127.97*	51.19	C
107.50-105.00			B	0.857	1.869		1	1	8.182			
			C	0.857	1.869		1	1	8.182			
T10	804.47	671.28	A	0.857	1.869	7	1	1	8.183	128.02*	51.21	C
105.00-102.50			B	0.857	1.869		1	1	8.183			
			C	0.857	1.869		1	1	8.183			
T11	804.59	804.79	A	1	2.1	7	1	1	10.298	128.07*	51.23	C
102.50-100.00			B	1	2.1		1	1	10.298			
			C	1	2.1		1	1	10.298			
T12	6441.11	4481.40	A	0.803	1.819	7	1	1	58.229	1044.27*	52.21	C
100.00-80.00			B	0.803	1.819		1	1	58.229			
			C	0.803	1.819		1	1	58.229			
T13	6444.48	5675.75	A	0.889	1.909	7	1	1	69.814	1037.50*	51.87	C
80.00-60.00			B	0.889	1.909		1	1	69.814			
			C	0.889	1.909		1	1	69.814			
T14	6528.90	4688.29	A	0.743	1.785	7	1	1	54.342	1034.73*	51.74	C
60.00-40.00			B	0.743	1.785		1	1	54.342			
			C	0.743	1.785		1	1	54.342			
T15	6528.22	3964.41	A	0.642	1.784	7	1	1	44.887	988.41*	49.42	C
40.00-20.00			B	0.642	1.784		1	1	44.887			
			C	0.642	1.784		1	1	44.887			
T16	4325.58	2890.78	A	0.633	1.787	8	1	1	32.986	820.67*	54.71	C
20.00-5.00			B	0.633	1.787		1	1	32.986			
			C	0.633	1.787		1	1	32.986			
T17 5.00-0.00	0.00	3283.95	A	1	2.1	8	1	1	11.809	167.13*	33.43	C
			B	1	2.1		1	1	11.809			
			C	1	2.1		1	1	11.809			
Sum Weight:	45329.15	46979.75			*2.1A_g limit					8450.60		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1666.59	3056.05	A	0.78	1.803	7	0.8	1	41.043	569.34	37.96	C
170.00-155.00			B	0.78	1.803		0.8	1	41.043			
			C	0.78	1.803		0.8	1	41.043			
T2	2601.53	4521.12	A	0.995	2.09	7	0.8	1	60.040	766.51	51.10	C
155.00-140.00		TA	B	0.995	2.09		0.8	1	60.040			
		1396.11	C	0.995	2.09		0.8	1	60.040			
T3	4359.15	6763.85	A	0.925	1.962	7	0.8	1	67.656	911.38	45.57	C
140.00-120.00		TA	B	0.925	1.962		0.8	1	67.656			
		1384.22	C	0.925	1.962		0.8	1	67.656			
T4	803.85	613.71	A	0.844	1.855	7	0.8	1	7.479	126.49	50.60	C
120.00-117.50			B	0.844	1.855		0.8	1	7.479			
			C	0.844	1.855		0.8	1	7.479			
T5	803.94	480.54	A	0.671	1.777	7	0.8	1	5.329	127.79*	51.12	C
117.50-115.00			B	0.671	1.777		0.8	1	5.329			
			C	0.671	1.777		0.8	1	5.329			
T6	804.03	480.60	A	0.671	1.777	7	0.8	1	5.329	127.83*	51.13	C
115.00-112.50			B	0.671	1.777		0.8	1	5.329			
			C	0.671	1.777		0.8	1	5.329			
T7	804.13	480.67	A	0.671	1.777	7	0.8	1	5.330	127.88*	51.15	C
112.50-110.00			B	0.671	1.777		0.8	1	5.330			
			C	0.671	1.777		0.8	1	5.330			
T8	804.24	671.06	A	0.857	1.869	7	0.8	1	7.586	125.11	50.04	C
110.00-107.50			B	0.857	1.869		0.8	1	7.586			
			C	0.857	1.869		0.8	1	7.586			
T9	804.35	671.17	A	0.857	1.869	7	0.8	1	7.587	125.16	50.06	C
107.50-105.00			B	0.857	1.869		0.8	1	7.587			
			C	0.857	1.869		0.8	1	7.587			
T10	804.47	671.28	A	0.857	1.869	7	0.8	1	7.588	125.20	50.08	C
105.00-102.50			B	0.857	1.869		0.8	1	7.588			
			C	0.857	1.869		0.8	1	7.588			
T11	804.59	804.79	A	1	2.1	7	0.8	1	9.703	124.20	49.68	C
102.50-100.00			B	1	2.1		0.8	1	9.703			
			C	1	2.1		0.8	1	9.703			
T12	6441.11	4481.40	A	0.803	1.819	7	0.8	1	58.017	1044.27*	52.21	C
100.00-80.00			B	0.803	1.819		0.8	1	58.017			
			C	0.803	1.819		0.8	1	58.017			
T13	6444.48	5675.75	A	0.889	1.909	7	0.8	1	64.994	999.33	49.97	C
80.00-60.00			B	0.889	1.909		0.8	1	64.994			
			C	0.889	1.909		0.8	1	64.994			
T14	6528.90	4688.29	A	0.743	1.785	7	0.8	1	49.886	1034.73*	51.74	C
60.00-40.00			B	0.743	1.785		0.8	1	49.886			
			C	0.743	1.785		0.8	1	49.886			
T15	6528.22	3964.41	A	0.642	1.784	7	0.8	1	40.664	988.41*	49.42	C
40.00-20.00			B	0.642	1.784		0.8	1	40.664			
			C	0.642	1.784		0.8	1	40.664			
T16	4325.58	2890.78	A	0.633	1.787	8	0.8	1	29.793	820.67*	54.71	C
20.00-5.00			B	0.633	1.787		0.8	1	29.793			
			C	0.633	1.787		0.8	1	29.793			
T17 5.00-0.00	0.00	3283.95	A	1	2.1	8	0.8	1	9.744	141.92	28.38	C
			B	1	2.1		0.8	1	9.744			
			C	1	2.1		0.8	1	9.744			
Sum Weight:	45329.15	46979.75			*2.1A_g limit					8286.22		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	1666.59	3056.05	A	0.78	1.803	7	0.85	1	41.043	569.34	37.96	C
170.00-155.00			B	0.78	1.803		0.85	1	41.043			
			C	0.78	1.803		0.85	1	41.043			
T2	2601.53	4521.12	A	0.995	2.09	7	0.85	1	60.067	766.85	51.12	C
155.00-140.00		TA	B	0.995	2.09		0.85	1	60.067			
		1396.11	C	0.995	2.09		0.85	1	60.067			
T3	4359.15	6763.85	A	0.925	1.962	7	0.85	1	69.461	932.90	46.64	C
140.00-120.00		TA	B	0.925	1.962		0.85	1	69.461			
		1384.22	C	0.925	1.962		0.85	1	69.461			
T4	803.85	613.71	A	0.844	1.855	7	0.85	1	7.601	127.76*	51.10	C
120.00-117.50			B	0.844	1.855		0.85	1	7.601			
			C	0.844	1.855		0.85	1	7.601			
T5	803.94	480.54	A	0.671	1.777	7	0.85	1	5.451	127.79*	51.12	C
117.50-115.00			B	0.671	1.777		0.85	1	5.451			
			C	0.671	1.777		0.85	1	5.451			
T6	804.03	480.60	A	0.671	1.777	7	0.85	1	5.451	127.83*	51.13	C
115.00-112.50			B	0.671	1.777		0.85	1	5.451			
			C	0.671	1.777		0.85	1	5.451			
T7	804.13	480.67	A	0.671	1.777	7	0.85	1	5.452	127.88*	51.15	C
112.50-110.00			B	0.671	1.777		0.85	1	5.452			
			C	0.671	1.777		0.85	1	5.452			
T8	804.24	671.06	A	0.857	1.869	7	0.85	1	7.734	126.80	50.72	C
110.00-107.50			B	0.857	1.869		0.85	1	7.734			
			C	0.857	1.869		0.85	1	7.734			
T9	804.35	671.17	A	0.857	1.869	7	0.85	1	7.735	126.85	50.74	C
107.50-105.00			B	0.857	1.869		0.85	1	7.735			
			C	0.857	1.869		0.85	1	7.735			
T10	804.47	671.28	A	0.857	1.869	7	0.85	1	7.736	126.90	50.76	C
105.00-102.50			B	0.857	1.869		0.85	1	7.736			
			C	0.857	1.869		0.85	1	7.736			
T11	804.59	804.79	A	1	2.1	7	0.85	1	9.851	126.10	50.44	C
102.50-100.00			B	1	2.1		0.85	1	9.851			
			C	1	2.1		0.85	1	9.851			
T12	6441.11	4481.40	A	0.803	1.819	7	0.85	1	58.070	1044.27*	52.21	C
100.00-80.00			B	0.803	1.819		0.85	1	58.070			
			C	0.803	1.819		0.85	1	58.070			
T13	6444.48	5675.75	A	0.889	1.909	7	0.85	1	66.199	1013.40	50.67	C
80.00-60.00			B	0.889	1.909		0.85	1	66.199			
			C	0.889	1.909		0.85	1	66.199			
T14	6528.90	4688.29	A	0.743	1.785	7	0.85	1	51.000	1034.73*	51.74	C
60.00-40.00			B	0.743	1.785		0.85	1	51.000			
			C	0.743	1.785		0.85	1	51.000			
T15	6528.22	3964.41	A	0.642	1.784	7	0.85	1	41.720	988.41*	49.42	C
40.00-20.00			B	0.642	1.784		0.85	1	41.720			
			C	0.642	1.784		0.85	1	41.720			
T16	4325.58	2890.78	A	0.633	1.787	8	0.85	1	30.591	820.67*	54.71	C
20.00-5.00			B	0.633	1.787		0.85	1	30.591			
			C	0.633	1.787		0.85	1	30.591			
T17 5.00-0.00	0.00	3283.95	A	1	2.1	8	0.85	1	10.260	149.44	29.89	C
			B	1	2.1		0.85	1	10.260			
			C	1	2.1		0.85	1	10.260			
Sum Weight:	45329.15	46979.75			*2.1A_g limit					8337.92		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	148.65	345.49	A	0.233	2.489	10	1	1	7.357	344.49	22.97	C
170.00-155.00			B	0.233	2.489		1	1	7.357			
			C	0.233	2.489		1	1	7.357			
T2	280.44	823.04	A	0.302	2.291	10	1	1	10.040	536.47	35.76	C
155.00-140.00		TA 456.98	B	0.302	2.291		1	1	10.040			
			C	0.302	2.291		1	1	10.040			
T3	495.20	1267.29	A	0.343	2.188	10	1	1	25.129	1000.64	50.03	C
140.00-120.00		TA 682.09	B	0.343	2.188		1	1	25.129			
			C	0.343	2.188		1	1	25.129			
T4	84.20	79.73	A	0.275	2.365	10	1	1	1.895	124.90	49.96	C
120.00-117.50			B	0.275	2.365		1	1	1.895			
			C	0.275	2.365		1	1	1.895			
T5	84.20	69.38	A	0.23	2.499	10	1	1	1.645	121.68	48.67	C
117.50-115.00			B	0.23	2.499		1	1	1.645			
			C	0.23	2.499		1	1	1.645			
T6	84.20	69.38	A	0.23	2.499	10	1	1	1.645	121.72	48.69	C
115.00-112.50			B	0.23	2.499		1	1	1.645			
			C	0.23	2.499		1	1	1.645			
T7	84.20	69.38	A	0.23	2.499	10	1	1	1.645	121.76	48.70	C
112.50-110.00			B	0.23	2.499		1	1	1.645			
			C	0.23	2.499		1	1	1.645			
T8	84.20	95.59	A	0.289	2.324	10	1	1	2.196	130.50	52.20	C
110.00-107.50			B	0.289	2.324		1	1	2.196			
			C	0.289	2.324		1	1	2.196			
T9	84.20	95.59	A	0.289	2.324	10	1	1	2.196	130.55	52.22	C
107.50-105.00			B	0.289	2.324		1	1	2.196			
			C	0.289	2.324		1	1	2.196			
T10	84.20	95.59	A	0.289	2.324	10	1	1	2.196	130.60	52.24	C
105.00-102.50			B	0.289	2.324		1	1	2.196			
			C	0.289	2.324		1	1	2.196			
T11	84.20	105.94	A	0.334	2.209	10	1	1	2.456	133.46	53.38	C
102.50-100.00			B	0.334	2.209		1	1	2.456			
			C	0.334	2.209		1	1	2.456			
T12	673.60	644.28	A	0.263	2.399	10	1	1	11.761	936.08	46.80	C
100.00-80.00			B	0.263	2.399		1	1	11.761			
			C	0.263	2.399		1	1	11.761			
T13	673.60	822.74	A	0.3	2.296	10	1	1	18.287	1058.63	52.93	C
80.00-60.00			B	0.3	2.296		1	1	18.287			
			C	0.3	2.296		1	1	18.287			
T14	675.00	808.38	A	0.272	2.372	10	1	1	16.380	1026.95	51.35	C
60.00-40.00			B	0.272	2.372		1	1	16.380			
			C	0.272	2.372		1	1	16.380			
T15	676.40	813.85	A	0.232	2.493	10	1	1	14.111	959.04	47.95	C
40.00-20.00			B	0.232	2.493		1	1	14.111			
			C	0.232	2.493		1	1	14.111			
T16	473.48	624.01	A	0.236	2.479	11	1	1	10.959	770.51	51.37	C
20.00-5.00			B	0.236	2.479		1	1	10.959			
			C	0.236	2.479		1	1	10.959			
T17 5.00-0.00	0.00	2441.16	A	0.816	1.829	12	1	1	7.916	144.58	28.92	C
			B	0.816	1.829		1	1	7.916			
			C	0.816	1.829		1	1	7.916			
Sum Weight:	4769.97	10409.91								7792.55		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	148.65	345.49	A	0.233	2.489	10	0.8	1	7.357	344.49	22.97	C
170.00-155.00			B	0.233	2.489		0.8	1	7.357			
			C	0.233	2.489		0.8	1	7.357			
T2	280.44	823.04	A	0.302	2.291	10	0.8	1	9.932	534.32	35.62	C
155.00-140.00		TA 456.98	B	0.302	2.291		0.8	1	9.932			
			C	0.302	2.291		0.8	1	9.932			
T3	495.20	1267.29	A	0.343	2.188	10	0.8	1	20.103	904.41	45.22	C
140.00-120.00		TA 682.09	B	0.343	2.188		0.8	1	20.103			
			C	0.343	2.188		0.8	1	20.103			
T4	84.20	79.73	A	0.275	2.365	10	0.8	1	1.682	120.47	48.19	C
120.00-117.50			B	0.275	2.365		0.8	1	1.682			
			C	0.275	2.365		0.8	1	1.682			
T5	84.20	69.38	A	0.23	2.499	10	0.8	1	1.432	117.01	46.80	C
117.50-115.00			B	0.23	2.499		0.8	1	1.432			
			C	0.23	2.499		0.8	1	1.432			
T6	84.20	69.38	A	0.23	2.499	10	0.8	1	1.432	117.04	46.82	C
115.00-112.50			B	0.23	2.499		0.8	1	1.432			
			C	0.23	2.499		0.8	1	1.432			
T7	84.20	69.38	A	0.23	2.499	10	0.8	1	1.432	117.08	46.83	C
112.50-110.00			B	0.23	2.499		0.8	1	1.432			
			C	0.23	2.499		0.8	1	1.432			
T8	84.20	95.59	A	0.289	2.324	10	0.8	1	1.875	123.96	49.59	C
110.00-107.50			B	0.289	2.324		0.8	1	1.875			
			C	0.289	2.324		0.8	1	1.875			
T9	84.20	95.59	A	0.289	2.324	10	0.8	1	1.875	124.01	49.60	C
107.50-105.00			B	0.289	2.324		0.8	1	1.875			
			C	0.289	2.324		0.8	1	1.875			
T10	84.20	95.59	A	0.289	2.324	10	0.8	1	1.875	124.06	49.62	C
105.00-102.50			B	0.289	2.324		0.8	1	1.875			
			C	0.289	2.324		0.8	1	1.875			
T11	84.20	105.94	A	0.334	2.209	10	0.8	1	2.135	127.24	50.90	C
102.50-100.00			B	0.334	2.209		0.8	1	2.135			
			C	0.334	2.209		0.8	1	2.135			
T12	673.60	644.28	A	0.263	2.399	10	0.8	1	11.549	931.61	46.58	C
100.00-80.00			B	0.263	2.399		0.8	1	11.549			
			C	0.263	2.399		0.8	1	11.549			
T13	673.60	822.74	A	0.3	2.296	10	0.8	1	15.666	1005.65	50.28	C
80.00-60.00			B	0.3	2.296		0.8	1	15.666			
			C	0.3	2.296		0.8	1	15.666			
T14	675.00	808.38	A	0.272	2.372	10	0.8	1	14.116	980.06	49.00	C
60.00-40.00			B	0.272	2.372		0.8	1	14.116			
			C	0.272	2.372		0.8	1	14.116			
T15	676.40	813.85	A	0.232	2.493	10	0.8	1	12.050	915.97	45.80	C
40.00-20.00			B	0.232	2.493		0.8	1	12.050			
			C	0.232	2.493		0.8	1	12.050			
T16	473.48	624.01	A	0.236	2.479	11	0.8	1	9.308	732.33	48.82	C
20.00-5.00			B	0.236	2.479		0.8	1	9.308			
			C	0.236	2.479		0.8	1	9.308			
T17 5.00-0.00	0.00	2441.16	A	0.816	1.829	12	0.8	1	6.333	115.67	23.13	C
			B	0.816	1.829		0.8	1	6.333			
			C	0.816	1.829		0.8	1	6.333			
Sum Weight:	4769.97	10409.91								7435.39		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	148.65	345.49	A	0.233	2.489	10	0.85	1	7.357	344.49	22.97	C
170.00-155.00			B	0.233	2.489		0.85	1	7.357			
			C	0.233	2.489		0.85	1	7.357			
T2	280.44	823.04	A	0.302	2.291	10	0.85	1	9.959	534.86	35.66	C
155.00-140.00		TA 456.98	B	0.302	2.291		0.85	1	9.959			
			C	0.302	2.291		0.85	1	9.959			
T3	495.20	1267.29	A	0.343	2.188	10	0.85	1	21.360	928.47	46.42	C
140.00-120.00		TA 682.09	B	0.343	2.188		0.85	1	21.360			
			C	0.343	2.188		0.85	1	21.360			
T4	84.20	79.73	A	0.275	2.365	10	0.85	1	1.735	121.58	48.63	C
120.00-117.50			B	0.275	2.365		0.85	1	1.735			
			C	0.275	2.365		0.85	1	1.735			
T5	84.20	69.38	A	0.23	2.499	10	0.85	1	1.485	118.18	47.27	C
117.50-115.00			B	0.23	2.499		0.85	1	1.485			
			C	0.23	2.499		0.85	1	1.485			
T6	84.20	69.38	A	0.23	2.499	10	0.85	1	1.485	118.21	47.28	C
115.00-112.50			B	0.23	2.499		0.85	1	1.485			
			C	0.23	2.499		0.85	1	1.485			
T7	84.20	69.38	A	0.23	2.499	10	0.85	1	1.485	118.25	47.30	C
112.50-110.00			B	0.23	2.499		0.85	1	1.485			
			C	0.23	2.499		0.85	1	1.485			
T8	84.20	95.59	A	0.289	2.324	10	0.85	1	1.955	125.60	50.24	C
110.00-107.50			B	0.289	2.324		0.85	1	1.955			
			C	0.289	2.324		0.85	1	1.955			
T9	84.20	95.59	A	0.289	2.324	10	0.85	1	1.955	125.64	50.26	C
107.50-105.00			B	0.289	2.324		0.85	1	1.955			
			C	0.289	2.324		0.85	1	1.955			
T10	84.20	95.59	A	0.289	2.324	10	0.85	1	1.955	125.69	50.28	C
105.00-102.50			B	0.289	2.324		0.85	1	1.955			
			C	0.289	2.324		0.85	1	1.955			
T11	84.20	105.94	A	0.334	2.209	10	0.85	1	2.215	128.79	51.52	C
102.50-100.00			B	0.334	2.209		0.85	1	2.215			
			C	0.334	2.209		0.85	1	2.215			
T12	673.60	644.28	A	0.263	2.399	10	0.85	1	11.602	932.72	46.64	C
100.00-80.00			B	0.263	2.399		0.85	1	11.602			
			C	0.263	2.399		0.85	1	11.602			
T13	673.60	822.74	A	0.3	2.296	10	0.85	1	16.321	1018.90	50.94	C
80.00-60.00			B	0.3	2.296		0.85	1	16.321			
			C	0.3	2.296		0.85	1	16.321			
T14	675.00	808.38	A	0.272	2.372	10	0.85	1	14.682	991.78	49.59	C
60.00-40.00			B	0.272	2.372		0.85	1	14.682			
			C	0.272	2.372		0.85	1	14.682			
T15	676.40	813.85	A	0.232	2.493	10	0.85	1	12.565	926.74	46.34	C
40.00-20.00			B	0.232	2.493		0.85	1	12.565			
			C	0.232	2.493		0.85	1	12.565			
T16	473.48	624.01	A	0.236	2.479	11	0.85	1	9.721	741.88	49.46	C
20.00-5.00			B	0.236	2.479		0.85	1	9.721			
			C	0.236	2.479		0.85	1	9.721			
T17 5.00-0.00	0.00	2441.16	A	0.816	1.829	12	0.85	1	6.728	122.90	24.58	C
			B	0.816	1.829		0.85	1	6.728			
			C	0.816	1.829		0.85	1	6.728			
Sum Weight:	4769.97	10409.91								7524.68		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3366.72			
Bracing Weight	7043.19			
Total Member Self-Weight	10409.91			
Guy Weight	1506.68			
Total Weight	27872.31			
Wind 0 deg - No Ice		41.57	-32373.96	-438.49
Wind 30 deg - No Ice		15776.46	-27451.14	793.33
Wind 60 deg - No Ice		27081.96	-15756.23	1812.58
Wind 90 deg - No Ice		31480.93	-41.57	2346.15
Wind 120 deg - No Ice		27848.82	16150.98	2251.07
Wind 150 deg - No Ice		15704.47	27409.57	1552.82
Wind 180 deg - No Ice		-41.57	31440.47	438.49
Wind 210 deg - No Ice		-15776.46	27451.14	-793.33
Wind 240 deg - No Ice		-27890.39	16222.98	-1812.58
Wind 270 deg - No Ice		-31480.93	41.57	-2346.15
Wind 300 deg - No Ice		-27040.40	-15684.24	-2251.07
Wind 330 deg - No Ice		-15704.47	-27409.57	-1552.82
Member Ice	36569.84			
Guy Ice	24129.63			
Total Weight Ice	159080.65			
Wind 0 deg - Ice		11.38	-16077.79	-282.73
Wind 30 deg - Ice		7959.69	-13831.87	-3694.27
Wind 60 deg - Ice		13730.43	-7966.56	-6126.53
Wind 90 deg - Ice		15899.66	-11.38	-6909.99
Wind 120 deg - Ice		13861.41	8029.04	-5824.78
Wind 150 deg - Ice		7939.98	13820.50	-3215.73
Wind 180 deg - Ice		-11.38	15913.41	274.87
Wind 210 deg - Ice		-7959.69	13831.87	3694.27
Wind 240 deg - Ice		-13872.79	8048.75	6107.51
Wind 270 deg - Ice		-15899.66	11.38	6909.99
Wind 300 deg - Ice		-13719.05	-7946.85	5851.65
Wind 330 deg - Ice		-7939.98	-13820.50	3215.73
Total Weight	27872.31			
Wind 0 deg - Service		15.90	-12386.68	-167.77
Wind 30 deg - Service		6036.27	-10503.14	303.54
Wind 60 deg - Service		10361.89	-6028.53	693.52
Wind 90 deg - Service		12044.99	-15.90	897.67
Wind 120 deg - Service		10655.30	6179.57	861.29
Wind 150 deg - Service		6008.72	10487.24	594.13
Wind 180 deg - Service		-15.90	12029.51	167.77
Wind 210 deg - Service		-6036.27	10503.14	-303.54
Wind 240 deg - Service		-10671.21	6207.11	-693.52
Wind 270 deg - Service		-12044.99	15.90	-897.67
Wind 300 deg - Service		-10345.99	-6000.98	-861.29
Wind 330 deg - Service		-6008.72	-10487.24	-594.13

Load Combinations

Comb. No.	Description

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	170 - 155	Leg	Max Tension	12	19548.88	-484.48	-272.36
			Max. Compression	10	-23338.38	178.28	-102.86
			Max. Mx	11	-192.89	-547.90	4.00
			Max. My	8	19546.21	-5.90	555.59
			Max. Vy	5	2831.78	-214.32	11.53
			Max. Vx	8	3097.55	3.30	-218.57
		Diagonal	Max Tension	9	3297.18	0.00	0.00
			Max. Compression	9	-3351.42	0.00	0.00
			Max. Mx	24	1084.48	-13.93	0.17
			Max. My	9	-2985.65	2.78	5.50
			Max. Vy	24	18.02	-13.93	0.17
			Max. Vx	9	2.63	2.78	5.50
		Top Girt	Max Tension	10	26.30	0.00	0.00
			Max. Compression	21	-42.02	0.00	0.00
			Max. Mx	14	-33.01	19.29	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	24	-32.64	0.00	-0.00
			Max. Vy	14	-22.56	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1075.65	0.00	0.00
			Max. Compression	10	-958.31	0.00	0.00
			Max. Mx	14	252.83	19.29	0.00
			Max. My	24	235.86	0.00	-0.00
			Max. Vy	14	-22.56	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
T2	155 - 140	Leg	Max Tension	8	23086.24	12.52	-995.16
			Max. Compression	6	-32747.00	36.87	39.35
			Max. Mx	11	19773.95	924.75	134.04
			Max. My	8	19543.72	12.52	-995.16
			Max. Vy	5	2841.19	-924.32	134.43
			Max. Vx	8	3107.21	12.52	-995.16
		Diagonal	Max Tension	12	3976.16	0.00	0.00
			Max. Compression	6	-4389.98	37.72	12.77
			Max. Mx	16	-1102.51	-86.64	-6.98
			Max. My	25	-1315.24	-30.14	14.82
			Max. Vy	16	55.63	-86.64	-6.98
			Max. Vx	25	-7.14	-30.14	14.82
		Secondary Horizontal	Max Tension	10	1890.53	0.00	0.00
			Max. Compression	8	-1493.25	-1.40	-1.82
			Max. Mx	18	-396.83	-11.07	1.68
			Max. My	10	78.27	-4.50	-5.70
			Max. Vy	18	18.30	-11.07	1.68
			Max. Vx	6	3.33	0.00	0.00
		Top Girt	Max Tension	19	473.58	0.00	0.00
			Max. Compression	4	-146.74	0.00	0.00
			Max. Mx	14	366.84	19.27	0.00
			Max. My	24	351.17	0.00	-0.00
			Max. Vy	14	22.54	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Bottom Girt	Max Tension	23	624.25	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	623.50	19.27	0.00
			Max. My	24	520.91	0.00	-0.00
			Max. Vy	19	22.54	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	11398.37		
			Top Tension	7	11459.13		
			Top Cable Vert	7	9603.95		
			Top Cable Norm	7	6251.05		
			Top Cable Tan	7	7.45		
			Bot Cable Vert	7	-9423.36		
			Bot Cable Norm	7	6410.97		
			Bot Cable Tan	7	150.12		
		Guy B	Bottom Tension	13	11038.89		
			Top Tension	13	11095.95		
			Top Cable Vert	13	9113.39		
			Top Cable Norm	13	6329.79		
			Top Cable Tan	13	7.22		
			Bot Cable Vert	13	-8939.59		
			Bot Cable Norm	13	6474.62		
			Bot Cable Tan	13	141.86		
		Guy C	Bottom Tension	3	10710.84		
			Top Tension	3	10765.66		
			Top Cable Vert	3	8693.62		
			Top Cable Norm	3	6349.82		
			Top Cable Tan	3	8.94		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Vert	3	-8523.43		
			Bot Cable Norm	3	6484.90		
			Bot Cable Tan	3	138.86		
		Top Guy Pull-Off	Max Tension	4	6140.23	0.00	0.00
			Max. Compression	2	-5160.12	0.00	0.00
			Max. Mx	14	1187.68	-27.84	0.00
			Max. My	24	1020.96	0.00	0.00
			Max. Vy	14	-32.57	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Torque Arm Top	Max Tension	5	6944.36	0.00	0.00
			Max. Compression	11	-3388.06	0.00	0.00
			Max. Mx	9	-152.89	-33421.63	-0.00
			Max. My	24	300.12	-20238.99	0.02
			Max. Vy	9	9593.91	-33421.63	-0.00
			Max. Vx	24	0.01	-20238.99	0.01
T3	140 - 120	Leg	Max Tension	4	26913.80	-541.56	-1.60
			Max. Compression	10	-51721.29	-1758.72	-52.58
			Max. Mx	2	-51484.17	-1760.33	-23.46
			Max. My	9	-12409.58	-767.43	2292.84
			Max. Vy	10	-3377.53	789.25	0.04
			Max. Vx	9	-2339.10	-767.43	2292.84
		Diagonal	Max Tension	6	5406.37	0.00	0.00
			Max. Compression	7	-6985.22	-81.94	47.27
			Max. Mx	12	4030.64	143.40	-6.06
			Max. My	11	-5309.10	33.34	-79.91
			Max. Vy	12	-71.27	143.40	-6.06
			Max. Vx	11	38.06	33.34	-79.91
		Secondary Horizontal	Max Tension	8	3093.51	-132.42	1.35
			Max. Compression	6	-1664.76	115.40	-3.34
			Max. Mx	2	-583.44	-133.75	-13.91
			Max. My	9	470.88	-111.21	-18.63
			Max. Vy	2	81.20	0.00	0.00
			Max. Vx	9	-10.90	-111.21	-18.63
		Top Girt	Max Tension	10	2136.02	0.00	0.00
			Max. Compression	8	-1589.23	0.00	0.00
			Max. Mx	19	1313.20	-25.69	0.00
			Max. My	24	604.69	0.00	0.00
			Max. Vy	19	30.05	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Bottom Girt	Max Tension	10	1890.07	0.00	0.00
			Max. Compression	8	-832.31	0.00	0.00
			Max. Mx	25	480.64	-25.69	0.00
			Max. My	24	799.13	0.00	0.00
			Max. Vy	25	30.05	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	18678.43		
			Top Tension	7	18768.77		
			Top Cable Vert	7	15029.76		
			Top Cable Norm	7	11241.52		
			Top Cable Tan	7	35.61		
			Bot Cable Vert	7	-14788.18		
			Bot Cable Norm	7	11408.52		
			Bot Cable Tan	7	198.44		
		Guy B	Bottom Tension	13	17930.21		
			Top Tension	13	18014.17		
			Top Cable Vert	13	14027.96		
			Top Cable Norm	13	11301.58		
			Top Cable Tan	13	33.02		
			Bot Cable Vert	13	-13797.18		
			Bot Cable Norm	13	11449.70		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Tan	13	185.88		
		Guy C	Bottom Tension	3	17299.53		
			Top Tension	3	17379.64		
			Top Cable Vert	3	13224.82		
			Top Cable Norm	3	11276.29		
			Top Cable Tan	3	34.45		
			Bot Cable Vert	3	-13000.00		
			Bot Cable Norm	3	11412.32		
			Bot Cable Tan	3	181.48		
		Torque Arm Top	Max Tension	5	12805.98	0.00	0.00
			Max. Compression	11	-6534.23	0.00	0.00
			Max. Mx	9	-405.74	-51798.27	-0.00
			Max. My	24	70.43	-24492.83	0.01
			Max. Vy	9	14866.43	-51798.27	-0.00
			Max. Vx	24	0.01	-24492.83	0.01
T4	120 - 117.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-50732.06	-176.92	-33.89
			Max. Mx	8	-36301.60	322.71	26.65
			Max. My	13	-28884.38	90.22	-243.82
			Max. Vy	9	192.56	-146.61	-12.80
			Max. Vx	13	-116.84	-120.86	20.19
		Diagonal	Max Tension	4	496.09	10.08	-1.81
			Max. Compression	10	-949.52	0.43	2.03
			Max. Mx	24	-211.61	20.95	1.10
			Max. My	10	-946.10	17.83	2.15
			Max. Vy	24	21.16	0.00	0.00
			Max. Vx	10	1.02	17.83	2.15
		Top Girt	Max Tension	10	1177.65	0.00	0.00
			Max. Compression	8	-261.65	0.00	0.00
			Max. Mx	25	597.25	19.28	0.00
			Max. My	24	694.99	0.00	-0.00
			Max. Vy	25	22.55	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
T5	117.5 - 115	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-51860.55	152.83	-1.74
			Max. Mx	25	-41537.90	-217.66	-4.02
			Max. My	25	-49353.85	-182.58	47.21
			Max. Vy	21	-146.83	-209.64	-9.45
			Max. Vx	3	-29.31	-119.17	-12.84
		Diagonal	Max Tension	23	681.92	0.00	0.00
			Max. Compression	9	-316.13	0.00	0.00
			Max. Mx	24	-77.65	-29.90	0.99
			Max. My	9	-314.60	2.43	2.17
			Max. Vy	23	25.38	-29.75	1.32
			Max. Vx	9	1.03	2.43	2.17
T6	115 - 112.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-51849.91	-44.83	-15.99
			Max. Mx	25	-51768.41	152.83	-1.73
			Max. My	9	-29127.03	-39.76	-34.02
			Max. Vy	21	90.37	-68.43	-4.46
			Max. Vx	10	20.27	118.52	-16.32
		Diagonal	Max Tension	9	578.57	0.00	0.00
			Max. Compression	9	-718.05	-11.00	1.47
			Max. Mx	25	95.51	-18.21	0.91
			Max. My	10	-164.69	14.34	1.93
			Max. Vy	25	19.92	-18.21	0.91
			Max. Vx	10	0.92	14.34	1.93
T7	112.5 - 110	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52586.93	-146.85	-9.85
			Max. Mx	23	-52539.83	-149.17	7.47
			Max. My	9	-29363.25	-95.43	-40.26

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	15	49.44	-43.14	-3.89
			Max. Vx	3	-19.18	-35.54	23.67
		Diagonal	Max Tension	9	899.80	0.00	0.00
			Max. Compression	9	-811.79	0.00	0.00
			Max. Mx	23	569.75	-26.87	1.33
			Max. My	9	-810.25	4.56	2.00
			Max. Vy	23	24.02	-26.87	1.33
			Max. Vx	9	0.95	4.56	2.00
T8	110 - 107.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-52914.43	-662.51	14.74
			Max. Mx	23	-52914.43	-662.51	14.74
			Max. My	7	-28984.27	-382.99	57.01
			Max. Vy	23	998.99	582.38	-5.16
			Max. Vx	7	-63.16	323.73	-14.55
		Diagonal	Max Tension	9	758.92	0.00	0.00
			Max. Compression	9	-1395.64	-11.11	4.40
			Max. Mx	23	35.54	-22.29	-2.37
			Max. My	24	-1007.56	10.48	4.67
			Max. Vy	23	21.86	-22.29	-2.37
			Max. Vx	24	2.30	10.48	4.67
		Secondary Horizontal	Max Tension	23	916.50	3.04	-5.36
			Max. Compression	23	-916.50	0.00	0.00
			Max. Mx	20	857.87	-5.80	-4.81
			Max. My	24	-898.00	3.35	-5.72
			Max. Vy	22	19.22	5.01	-4.62
			Max. Vx	24	3.43	0.00	0.00
T9	107.5 - 105	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-53647.30	-553.97	12.23
			Max. Mx	23	-53602.53	-662.51	14.74
			Max. My	7	-28867.77	-383.00	57.01
			Max. Vy	23	-1031.36	622.82	-4.75
			Max. Vx	7	61.51	340.69	-12.48
		Diagonal	Max Tension	9	758.16	0.00	0.00
			Max. Compression	9	-1840.77	-11.32	3.67
			Max. Mx	23	-291.59	-24.72	-1.85
			Max. My	24	-1426.21	7.09	4.20
			Max. Vy	23	23.01	-24.72	-1.85
			Max. Vx	24	2.08	7.09	4.20
		Secondary Horizontal	Max Tension	23	1119.72	0.00	0.00
			Max. Compression	23	-929.20	0.00	0.00
			Max. Mx	23	1057.02	18.05	-4.13
			Max. My	26	1113.83	16.41	-4.82
			Max. Vy	23	26.86	18.05	-4.13
			Max. Vx	24	2.88	0.00	0.00
T10	105 - 102.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-55442.98	-828.67	16.00
			Max. Mx	23	-55442.98	-828.67	16.00
			Max. My	25	-52065.81	-798.00	48.14
			Max. Vy	23	1257.98	739.95	-7.22
			Max. Vx	7	57.97	402.87	-18.29
		Diagonal	Max Tension	9	1225.18	15.46	-1.13
			Max. Compression	9	-1787.40	-6.73	3.84
			Max. Mx	23	159.74	-18.75	-2.42
			Max. My	23	-1126.85	15.81	4.88
			Max. Vy	23	20.19	-18.75	-2.42
			Max. Vx	24	2.39	15.81	4.86
		Secondary Horizontal	Max Tension	24	1299.92	0.00	0.00
			Max. Compression	23	-960.30	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	23	-960.30	-19.23	-5.75
			Max. My	24	-936.93	-18.04	-5.87
			Max. Vy	23	27.08	0.00	0.00
			Max. Vx	24	3.51	0.00	0.00
T11	102.5 - 100	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-55948.08	531.41	-3.86
			Max. Mx	23	-55932.82	-828.67	16.00
			Max. My	5	-28255.37	-2.65	-106.78
			Max. Vy	23	-1090.65	531.41	-3.86
			Max. Vx	5	98.16	260.81	12.46
		Diagonal	Max Tension	9	1204.09	6.09	-0.04
			Max. Compression	9	-2668.88	0.00	0.00
			Max. Mx	23	-477.30	-31.48	-1.83
			Max. My	24	-1850.12	0.43	4.18
			Max. Vy	23	26.21	-31.48	-1.83
			Max. Vx	24	2.07	0.43	4.18
		Secondary Horizontal	Max Tension	23	969.05	44.80	-4.08
			Max. Compression	23	-969.05	0.00	0.00
			Max. Mx	23	827.19	48.09	-3.67
			Max. My	24	-943.07	46.02	-4.61
			Max. Vy	23	44.43	48.09	-3.67
			Max. Vx	24	2.78	0.00	0.00
		Bottom Girt	Max Tension	25	432.56	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	420.17	19.30	0.00
			Max. My	24	378.43	0.00	-0.00
			Max. Vy	17	-22.58	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
T12	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-69344.06	-67.81	32.93
			Max. Mx	10	-51832.55	394.48	-224.53
			Max. My	2	-50445.48	0.21	445.07
			Max. Vy	6	1880.23	-244.60	-154.85
			Max. Vx	2	-2222.60	-16.17	288.68
		Diagonal	Max Tension	9	2655.03	0.00	0.00
			Max. Compression	9	-2894.39	0.00	0.00
			Max. Mx	23	151.03	-35.00	0.60
			Max. My	10	-2346.47	-13.63	2.60
			Max. Vy	23	28.01	-35.00	0.60
			Max. Vx	10	-1.25	0.00	0.00
		Top Girt	Max Tension	25	873.55	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	847.42	19.32	0.00
			Max. My	24	793.75	0.00	-0.00
			Max. Vy	17	-22.60	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Bottom Girt	Max Tension	22	1019.24	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	951.30	19.32	0.00
			Max. My	24	992.72	0.00	-0.00
			Max. Vy	14	-22.60	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Guy A	Bottom Tension	9	17952.50		
			Top Tension	9	18012.59		
			Top Cable Vert	9	14100.97		
			Top Cable Norm	9	11207.73		
			Top Cable Tan	9	51.01		
			Bot Cable Vert	9	-13937.69		
			Bot Cable Norm	9	11314.16		
			Bot Cable Tan	9	151.33		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Guy B	Bottom Tension	13	17084.16		
			Top Tension	13	17139.73		
			Top Cable Vert	13	12992.44		
			Top Cable Norm	13	11178.78		
			Top Cable Tan	13	42.06		
			Bot Cable Vert	13	-12836.80		
			Bot Cable Norm	13	11272.38		
			Bot Cable Tan	13	136.23		
		Guy C	Bottom Tension	3	16595.53		
			Top Tension	3	16648.40		
			Top Cable Vert	3	12346.73		
			Top Cable Norm	3	11168.06		
			Top Cable Tan	3	43.09		
			Bot Cable Vert	3	-12195.84		
			Bot Cable Norm	3	11254.11		
			Bot Cable Tan	3	133.60		
		Top Guy Pull-Off	Max Tension	10	6311.55	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	3126.01	38.08	0.00
			Max. My	24	3547.28	0.00	-0.00
			Max. Vy	17	-44.53	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
T13	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-70903.13	48.83	-4.23
			Max. Mx	23	-69030.01	-900.20	1.48
			Max. My	3	-34255.68	-72.79	132.90
			Max. Vy	10	-1678.20	76.66	-1.25
			Max. Vx	7	559.24	20.38	-14.73
		Diagonal	Max Tension	9	523.34	13.41	-1.70
			Max. Compression	9	-2062.67	0.00	0.00
			Max. Mx	23	-924.31	-33.61	-2.16
			Max. My	18	-864.83	17.89	-5.00
			Max. Vy	23	27.35	-33.61	-2.16
			Max. Vx	18	-2.44	17.89	-5.00
		Secondary Horizontal	Max Tension	22	1394.55	-21.30	-5.97
			Max. Compression	23	-1200.74	0.00	0.00
			Max. Mx	23	1024.43	51.99	-3.60
			Max. My	22	1350.10	31.47	-6.03
			Max. Vy	23	46.73	51.99	-3.60
			Max. Vx	24	3.54	0.00	0.00
		Top Girt	Max Tension	25	455.93	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	352.88	19.33	0.00
			Max. My	24	362.39	0.00	-0.00
			Max. Vy	14	-22.61	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Bottom Girt	Max Tension	21	389.65	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	389.65	19.33	0.00
			Max. My	24	366.91	0.00	-0.00
			Max. Vy	21	-22.61	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
T14	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-77197.47	-171.73	-75.12
			Max. Mx	10	-57537.68	870.00	140.43
			Max. My	6	-42865.43	-334.62	606.49
			Max. Vy	10	2395.09	870.00	140.44
			Max. Vx	6	1166.28	-334.62	606.49
		Diagonal	Max Tension	7	2574.58	0.00	0.00
			Max. Compression	7	-2947.97	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	23	-1680.98	-29.18	2.43
			Max. My	24	-1774.52	-28.77	2.93
			Max. Vy	23	25.17	-29.18	2.43
			Max. Vx	24	-1.45	-28.77	2.93
		Top Girt	Max Tension	22	880.51	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	880.04	19.25	0.00
			Max. My	24	845.69	0.00	-0.00
			Max. Vy	21	22.52	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Bottom Girt	Max Tension	9	961.53	0.00	0.00
			Max. Compression	6	-69.34	0.00	0.00
			Max. Mx	21	680.51	19.25	0.00
			Max. My	24	550.88	0.00	-0.00
			Max. Vy	21	22.52	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	16019.83		
			Top Tension	7	16054.07		
			Top Cable Vert	7	9305.49		
			Top Cable Norm	7	13082.07		
			Top Cable Tan	7	22.89		
			Bot Cable Vert	7	-9191.89		
			Bot Cable Norm	7	13120.07		
			Bot Cable Tan	7	88.43		
		Guy B	Bottom Tension	13	15185.75		
			Top Tension	13	15215.34		
			Top Cable Vert	13	7965.51		
			Top Cable Norm	13	12963.67		
			Top Cable Tan	13	20.96		
			Bot Cable Vert	13	-7863.02		
			Bot Cable Norm	13	12991.29		
			Bot Cable Tan	13	79.39		
		Guy C	Bottom Tension	3	14743.34		
			Top Tension	3	14770.19		
			Top Cable Vert	3	7190.69		
			Top Cable Norm	3	12901.63		
			Top Cable Tan	3	21.38		
			Bot Cable Vert	3	-7094.57		
			Bot Cable Norm	3	12923.91		
			Bot Cable Tan	3	75.94		
		Top Guy Pull-Off	Max Tension	10	7144.30	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	3767.44	37.98	0.00
			Max. My	24	4271.10	0.00	-0.00
			Max. Vy	21	44.42	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
T15	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	24	-77130.92	6.86	574.58
			Max. Mx	7	-39703.02	459.56	-6.74
			Max. My	23	-73571.55	-3.74	717.98
			Max. Vy	10	2399.88	271.61	264.80
			Max. Vx	6	1172.82	31.34	315.17
		Diagonal	Max Tension	7	3374.30	0.00	0.00
			Max. Compression	9	-4449.32	0.00	0.00
			Max. Mx	20	-1153.44	23.19	0.00
			Max. My	18	-1156.60	0.00	0.10
			Max. Vy	20	22.09	0.00	0.00
			Max. Vx	18	0.10	0.00	0.00
		Horizontal	Max Tension	18	1315.67	0.00	0.00
			Max. Compression	18	-1315.67	0.00	0.00
			Max. Mx	14	1238.82	19.83	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	10	956.03	0.00	-0.00
			Max. Vy	14	23.20	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Top Girt	Max Tension	10	1164.38	0.00	0.00
			Max. Compression	7	-781.04	0.00	0.00
			Max. Mx	15	241.91	18.85	0.00
			Max. My	24	-110.58	0.00	-0.00
			Max. Vy	15	-22.05	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
		Bottom Girt	Max Tension	24	575.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	419.00	18.85	0.00
			Max. My	24	575.46	0.00	-0.00
			Max. Vy	21	-22.05	0.00	0.00
			Max. Vx	24	0.00	0.00	0.00
T16	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-78519.40	-4557.31	202.33
			Max. Mx	22	-78519.40	-4557.31	202.33
			Max. My	23	-77016.11	9.34	-737.38
			Max. Vy	21	17978.77	-4547.50	230.37
			Max. Vx	23	610.87	18.63	-723.19
		Diagonal	Max Tension	11	2095.69	0.00	0.00
			Max. Compression	5	-2889.56	0.00	0.00
			Max. Mx	20	26.62	21.51	0.00
			Max. My	18	-738.51	0.00	0.06
			Max. Vy	20	-20.55	0.00	0.00
			Max. Vx	18	-0.06	0.00	0.00
		Horizontal	Max Tension	24	1351.14	0.00	0.00
			Max. Compression	24	-1351.14	0.00	0.00
			Max. Mx	15	1330.58	18.62	0.00
			Max. My	10	957.78	0.00	-0.00
			Max. Vy	15	21.77	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Top Girt	Max Tension	18	555.08	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	448.15	17.53	0.00
			Max. My	24	378.18	0.00	-0.00
			Max. Vy	21	20.50	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Bottom Girt	Max Tension	24	10756.62	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	10287.11	-25.73	0.00
			Max. My	18	10329.79	0.00	0.00
			Max. Vy	21	-30.10	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T17	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-85515.93	398.43	-86.78
			Max. Mx	23	-77453.50	5388.69	53.85
			Max. My	10	-53941.84	3294.44	673.44
			Max. Vy	23	-12313.12	5387.70	19.80
			Max. Vx	4	794.83	738.02	-293.58
		Top Girt	Max Tension	23	7669.35	-3487.18	-129.92
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	7492.10	-3979.31	-260.46
			Max. My	10	4698.27	-1867.17	428.67
			Max. Vy	18	767.88	-3979.31	-260.46
			Max. Vx	10	310.24	-2412.86	-321.31
		Bottom Girt	Max Tension	10	4347.37	-186.68	-723.96
			Max. Compression	9	-5746.89	-1085.12	997.04
			Max. Mx	10	-4088.56	-1706.20	1715.19
			Max. My	10	-4933.91	-1078.86	1736.78

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	10	3252.37	-1706.20	1715.19
			Max. Vx	10	-5286.59	-60.94	-992.07
		Mid Girt	Max Tension	19	83.61	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	78.64	79.01	0.00
			Max. My	19	80.21	0.00	15.60
			Max. Vy	21	184.82	0.00	0.00
			Max. Vx	19	-36.49	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	23	236969.47	278.65	-72.75
	Max. H_x	12	105728.44	2339.18	1289.62
	Max. H_z	2	146884.48	-42.65	1818.48
	Max. M_x	1	0.00	1.48	2.98
	Max. M_z	1	0.00	1.48	2.98
	Max. Torsion	18	1203.07	-403.18	108.08
	Min. Vert	1	67616.04	1.48	2.98
	Min. H_x	4	103867.60	-2398.33	1333.51
	Min. H_z	8	108911.71	0.22	-2510.48
	Min. M_x	1	0.00	1.48	2.98
	Min. M_z	1	0.00	1.48	2.98
	Min. Torsion	4	-1154.55	-2398.33	1333.51
Guy C @ 107 ft Elev 10 ft Azimuth 240 deg	Max. Vert	10	-1077.99	-443.63	255.44
	Max. H_x	10	-1077.99	-443.63	255.44
	Max. H_z	3	-42777.47	-30521.02	18319.25
	Min. Vert	3	-42777.47	-30521.02	18319.25
	Min. H_x	5	-42270.79	-30775.36	17040.09
	Min. H_z	9	-1523.39	-905.73	222.93
Guy B @ 106 ft Elev 4 ft Azimuth 120 deg	Max. Vert	6	-1270.77	507.32	291.71
	Max. H_x	11	-44460.67	30704.21	16964.78
	Max. H_z	13	-44943.89	30397.28	18252.97
	Min. Vert	13	-44943.89	30397.28	18252.97
	Min. H_x	6	-1270.77	507.32	291.71
	Min. H_z	7	-1726.69	969.66	247.52
Guy A @ 106 ft Elev -6 ft Azimuth 0 deg	Max. Vert	2	-1592.85	0.44	-706.28
	Max. H_x	24	-17757.90	1253.22	-14971.28
	Max. H_z	2	-1592.85	0.44	-706.28
	Min. Vert	9	-47916.41	673.87	-35288.27
	Min. H_x	18	-17693.77	-1242.12	-14924.88
	Min. H_z	9	-47916.41	673.87	-35288.27
Guy C @ 75 ft Elev 7 ft Azimuth 240 deg	Max. Vert	10	-147.01	-83.50	48.11
	Max. H_x	10	-147.01	-83.50	48.11
	Max. H_z	3	-19290.42	-20834.01	12270.48
	Min. Vert	3	-19290.42	-20834.01	12270.48
	Min. H_x	5	-19168.43	-20938.59	11830.47

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	10	-147.01	-83.50	48.11
Guy B @ 75 ft Elev 2.83 ft Azimuth 120 deg	Max. Vert	6	-172.38	82.59	47.52
	Max. H_x	11	-20566.91	21013.29	11860.68
	Max. H_z	13	-20699.82	20905.14	12318.57
	Min. Vert	13	-20699.82	20905.14	12318.57
	Min. H_x	6	-172.38	82.59	47.52
	Min. H_z	6	-172.38	82.59	47.52
Guy A @ 75 ft Elev -4.25 ft Azimuth 0 deg	Max. Vert	2	-251.23	0.07	-140.88
	Max. H_x	10	-20379.37	366.07	-21541.09
	Max. H_z	2	-251.23	0.07	-140.88
	Min. Vert	9	-23124.01	241.44	-24426.45
	Min. H_x	6	-20357.96	-354.77	-21516.79
	Min. H_z	7	-23123.72	-235.61	-24429.23

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	67616.04	-1.48	-2.98	0.00	0.00	-22.85
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	146884.48	42.65	-1818.48	0.00	0.00	294.42
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	132172.88	1471.02	-1614.00	0.00	0.00	822.71
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	103867.60	2398.33	-1333.51	0.00	0.00	1154.55
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	133314.91	2113.38	-520.78	0.00	0.00	958.56
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	150315.51	1507.21	710.86	0.00	0.00	623.92
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	137955.66	544.38	1793.85	0.00	0.00	174.13
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	108911.71	-0.22	2510.48	0.00	0.00	-282.74
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	139751.06	-479.45	1773.79	0.00	0.00	-838.02
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	153516.53	-1372.34	685.05	0.00	0.00	-1084.11
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	136658.49	-1976.37	-533.38	0.00	0.00	-1090.32
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	105728.44	-2339.18	-1289.62	0.00	0.00	-968.73
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	133734.08	-1402.04	-1550.71	0.00	0.00	-318.90
1.2 Dead+1.0 Ice+1.0 Temp+Guy	227884.57	-7.68	-47.79	0.00	0.00	-72.12
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	233544.08	0.49	-411.91	0.00	0.00	-84.59
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	232920.17	233.24	-389.90	0.00	0.00	-484.87
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	232871.65	385.02	-277.72	0.00	0.00	-961.79
1.2 Dead+1.0 Wind 90 deg+1.0	233873.18	403.18	-108.08	0.00	0.00	-1203.07

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	235289.44	292.01	81.07	0.00	0.00	-963.80
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	234810.23	148.10	260.10	0.00	0.00	-501.68
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	234594.96	-11.16	331.20	0.00	0.00	-57.38
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	235811.83	-156.20	254.85	0.00	0.00	383.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	236969.47	-278.65	72.75	0.00	0.00	836.07
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	235292.82	-389.80	-106.86	0.00	0.00	1071.18
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	233726.35	-380.82	-262.51	0.00	0.00	824.96
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	233360.16	-232.56	-374.13	0.00	0.00	329.52
Dead+Wind 0 deg - Service+Guy	68359.34	0.71	-800.16	0.00	0.00	63.50
Dead+Wind 30 deg - Service+Guy	68629.39	377.14	-648.25	0.00	0.00	199.42
Dead+Wind 60 deg - Service+Guy	68700.71	638.53	-366.67	0.00	0.00	249.32
Dead+Wind 90 deg - Service+Guy	68319.92	756.05	-3.25	0.00	0.00	225.64
Dead+Wind 120 deg - Service+Guy	67808.99	701.78	394.42	0.00	0.00	163.26
Dead+Wind 150 deg - Service+Guy	67882.97	377.48	637.37	0.00	0.00	54.85
Dead+Wind 180 deg - Service+Guy	67970.03	-3.68	718.68	0.00	0.00	-106.38
Dead+Wind 210 deg - Service+Guy	67786.16	-384.12	639.95	0.00	0.00	-246.33
Dead+Wind 240 deg - Service+Guy	67618.81	-706.84	399.01	0.00	0.00	-293.84
Dead+Wind 270 deg - Service+Guy	68091.72	-758.71	2.31	0.00	0.00	-270.81
Dead+Wind 300 deg - Service+Guy	68495.47	-638.74	-361.67	0.00	0.00	-210.42
Dead+Wind 330 deg - Service+Guy	68502.11	-375.99	-645.45	0.00	0.00	-97.66

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-27872.05	-0.00	-0.71	27872.10	2.85	0.011%
2	57.32	-33242.79	-55455.93	-57.45	33242.59	55452.28	0.006%
3	27053.05	-33095.59	-47078.45	-27053.14	33095.45	47075.73	0.004%
4	46465.50	-32959.50	-27031.52	-46466.73	32959.49	27029.28	0.004%
5	53985.06	-33126.71	-61.45	-53982.86	33126.58	62.99	0.004%
6	47701.52	-33297.92	27678.95	-47698.49	33297.72	-27676.83	0.006%
7	26952.84	-33176.34	47027.79	-26950.36	33176.18	-47026.06	0.005%
8	-57.32	-33047.62	53962.34	55.10	33047.61	-53962.34	0.004%
9	-27053.05	-33194.83	47078.45	27051.11	33194.71	-47077.19	0.004%
10	-47758.99	-33330.91	27778.31	47756.58	33330.76	-27776.75	0.004%
11	-53985.06	-33163.70	61.44	53981.78	33163.50	-59.31	0.006%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
12	-46408.04	-32992.49	-26932.15	46408.28	32992.48	26931.45	0.001%
13	-26952.85	-33114.08	-47027.79	26952.75	33113.93	47024.95	0.004%
14	0.00	-164348.98	-0.00	-1.64	164348.98	2.82	0.002%
15	-5.20	-164519.48	-22584.39	5.18	164519.46	22583.73	0.000%
16	11179.37	-164265.31	-19447.10	-11179.56	164265.29	19446.35	0.000%
17	19303.75	-164029.86	-11205.98	-19303.15	164029.84	11206.07	0.000%
18	22329.42	-164317.74	-1.93	-22328.76	164317.72	2.67	0.001%
19	19451.61	-164612.35	11297.34	-19450.84	164612.32	-11296.79	0.001%
20	11187.09	-164401.41	19464.33	-11186.06	164401.39	-19463.96	0.001%
21	5.20	-164178.48	22420.01	-5.90	164178.47	-22419.70	0.000%
22	-11179.37	-164432.66	19447.10	11178.48	164432.63	-19446.76	0.001%
23	-19446.11	-164668.11	11288.17	19445.42	164668.08	-11287.70	0.001%
24	-22329.42	-164380.23	1.93	22328.81	164380.21	-1.29	0.001%
25	-19309.25	-164085.62	-11215.15	19308.40	164085.61	11216.07	0.001%
26	-11187.09	-164296.56	-19464.33	11187.26	164296.54	19463.57	0.000%
27	13.71	-27895.39	-13261.33	-13.81	27895.38	13259.42	0.006%
28	6469.27	-27860.18	-11258.00	-6469.37	27860.17	11256.57	0.005%
29	11111.42	-27827.64	-6464.12	-11109.66	27827.63	6463.22	0.006%
30	12909.60	-27867.63	-14.69	-12908.44	27867.62	15.70	0.005%
31	11407.00	-27908.57	6618.94	-11405.16	27908.56	-6617.45	0.008%
32	6445.31	-27879.49	11245.88	-6443.94	27879.48	-11244.50	0.006%
33	-13.71	-27848.72	12904.16	13.64	27848.71	-12902.40	0.006%
34	-6469.27	-27883.92	11258.00	6467.62	27883.90	-11256.59	0.007%
35	-11420.74	-27916.46	6642.70	11418.31	27916.45	-6640.93	0.010%
36	-12909.60	-27876.47	14.69	12908.16	27876.46	-13.62	0.006%
37	-11097.68	-27835.53	-6440.36	11096.79	27835.53	6439.94	0.003%
38	-6445.31	-27864.61	-11245.88	6445.16	27864.59	11244.39	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	10	0.00000001	0.00008026
2	Yes	21	0.00006589	0.00009423
3	Yes	21	0.00005826	0.00007550
4	Yes	18	0.00009567	0.00002007
5	Yes	22	0.00005800	0.00007122
6	Yes	22	0.00006441	0.00009035
7	Yes	22	0.00005771	0.00007801
8	Yes	22	0.00007961	0.00002312
9	Yes	23	0.00004422	0.00005935
10	Yes	23	0.00004936	0.00006996
11	Yes	22	0.00008009	0.00009973
12	Yes	17	0.00000001	0.00006452
13	Yes	21	0.00005815	0.00007796
14	Yes	14	0.00010000	0.00004850
15	Yes	23	0.00000001	0.00002013
16	Yes	22	0.00000001	0.00002242
17	Yes	17	0.00000001	0.00002539
18	Yes	22	0.00000001	0.00002645
19	Yes	23	0.00000001	0.00002714
20	Yes	22	0.00009566	0.00002950
21	Yes	19	0.00000001	0.00002174
22	Yes	23	0.00000001	0.00002628
23	Yes	24	0.00000001	0.00002419
24	Yes	23	0.00000001	0.00002418

25	Yes	18	0.00000001	0.00002405
26	Yes	22	0.00000001	0.00002250
27	Yes	10	0.00000001	0.00005150
28	Yes	11	0.00000001	0.00006690
29	Yes	10	0.00000001	0.00009576
30	Yes	11	0.00000001	0.00006723
31	Yes	10	0.00000001	0.00005421
32	Yes	11	0.00000001	0.00008468
33	Yes	11	0.00000001	0.00008107
34	Yes	11	0.00000001	0.00009722
35	Yes	10	0.00000001	0.00007256
36	Yes	11	0.00000001	0.00008156
37	Yes	11	0.00000001	0.00005365
38	Yes	11	0.00000001	0.00007067

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 155	3.219	33	0.1785	0.0360
T2	155 - 140	2.655	33	0.1556	0.0337
T3	140 - 120	2.260	33	0.0963	0.0335
T4	120 - 117.5	1.966	33	0.0658	0.0389
T5	117.5 - 115	1.930	33	0.0710	0.0393
T6	115 - 112.5	1.891	33	0.0762	0.0407
T7	112.5 - 110	1.850	33	0.0811	0.0421
T8	110 - 107.5	1.805	33	0.0858	0.0434
T9	107.5 - 105	1.757	33	0.0899	0.0446
T10	105 - 102.5	1.708	33	0.0933	0.0458
T11	102.5 - 100	1.656	33	0.0960	0.0469
T12	100 - 80	1.602	33	0.0976	0.0483
T13	80 - 60	1.211	33	0.0806	0.0633
T14	60 - 40	0.877	33	0.0769	0.0716
T15	40 - 20	0.595	33	0.0569	0.0687
T16	20 - 5	0.364	33	0.0722	0.0506
T17	5 - 0	0.096	33	0.0884	0.0288

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	DS4C03F36U-D 8' Omni	33	3.219	0.1785	0.0360	38738
170.00	TTA 432-83H-01T	33	3.219	0.1785	0.0360	38738
168.00	Pirod 4' Side Mount Standoff (1)	33	3.139	0.1769	0.0356	38738
167.00	RFS SC2-W100BC	33	3.099	0.1760	0.0355	38738
163.00	Pirod 12' T-Frame Sector Mount (1)	33	2.943	0.1718	0.0348	27670
152.33	Guy	33	2.570	0.1467	0.0333	13066
146.00	VHLP2-180	33	2.394	0.1213	0.0329	13086
145.60	VHLP800-11	33	2.384	0.1196	0.0330	13092
143.00	844H90T11EXY	33	2.323	0.1085	0.0331	13172
140.00	Pirod 12' T-Frame Sector Mount (1)	33	2.260	0.0963	0.0335	13842
132.44	Guy	33	2.132	0.0720	0.0357	23724
120.00	QS66512-2 Panel Antenna	33	1.966	0.0658	0.0389	33094
87.56	Guy	33	1.351	0.0889	0.0581	69036

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
50.00	(2) GPS	33	0.726	0.0661	0.0716	59162
47.56	Guy	33	0.692	0.0631	0.0712	51454

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 155	30.408	10	1.3124	0.7494
T2	155 - 140	26.267	10	1.2167	0.7413
T3	140 - 120	22.849	10	0.9597	0.7180
T4	120 - 117.5	19.323	10	0.8142	0.6625
T5	117.5 - 115	18.895	10	0.8326	0.6548
T6	115 - 112.5	18.453	10	0.8511	0.6473
T7	112.5 - 110	18.001	10	0.8690	0.6396
T8	110 - 107.5	17.537	10	0.8856	0.6319
T9	107.5 - 105	17.064	10	0.9000	0.6241
T10	105 - 102.5	16.582	10	0.9115	0.6162
T11	102.5 - 100	16.094	10	0.9196	0.6084
T12	100 - 80	15.599	10	0.9234	0.6000
T13	80 - 60	11.865	10	0.8190	0.5356
T14	60 - 40	8.537	10	0.7597	0.4728
T15	40 - 20	5.615	10	0.6345	0.3963
T16	20 - 5	3.073	10	0.6764	0.2409
T17	5 - 0	0.792	10	0.7418	0.1211

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	DS4C03F36U-D 8' Omni	10	30.408	1.3124	0.7494	9260
170.00	TTA 432-83H-01T	10	30.408	1.3124	0.7494	9260
168.00	Pirod 4' Side Mount Standoff (1)	10	29.837	1.3057	0.7488	9260
167.00	RFS SC2-W100BC	10	29.552	1.3021	0.7484	9260
163.00	Pirod 12' T-Frame Sector Mount (1)	10	28.423	1.2846	0.7467	6614
152.33	Guy	10	25.596	1.1792	0.7385	3088
146.00	VHLP2-180	10	24.112	1.0690	0.7296	3034
145.60	VHLP800-11	10	24.023	1.0615	0.7289	3032
143.00	844H90T11EXY	10	23.463	1.0132	0.7242	3027
140.00	Pirod 12' T-Frame Sector Mount (1)	10	22.849	0.9597	0.7180	3158
132.44	Guy	10	21.437	0.8522	0.6992	5338
120.00	QS66512-2 Panel Antenna	10	19.323	0.8142	0.6625	9916
87.56	Guy	10	13.226	0.8677	0.5595	10498
50.00	(2) GPS	10	7.008	0.6923	0.4410	8918
47.56	Guy	10	6.654	0.6747	0.4319	8090

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	170	Leg	A325N	0.7500	4	77.59	29820.60	0.003 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3297.18	4132.50	0.798 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	26.31	4132.50	0.006 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	1075.65	4132.50	0.260 ✓	1	Member Bearing
T2	155	Leg	A325N	0.7500	4	4886.61	29820.60	0.164 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	4389.98	7952.16	0.552 ✓	1	Bolt Shear
		Secondary Horizontal	A325N	0.5000	1	1890.53	7952.16	0.238 ✓	1	Bolt Shear
		Top Girt	A325N	0.5000	1	473.58	4132.50	0.115 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	624.25	4132.50	0.151 ✓	1	Member Bearing
		Top Guy Pull-Off@152.333	A325N	0.7500	1	6140.23	6932.81	0.886 ✓	1	Member Block Shear
		Torque Arm Top@152.333	A325N	0.7500	8	868.04	17892.40	0.049 ✓	1	Bolt Shear
T3	140	Leg	A325N	0.7500	4	2815.89	29820.60	0.094 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	5406.37	7748.44	0.698 ✓	1	Member Block Shear
		Secondary Horizontal	A325N	0.6250	1	3093.51	7748.44	0.399 ✓	1	Member Block Shear
		Top Girt	A325N	0.6250	1	2136.02	5811.33	0.368 ✓	1	Member Block Shear
		Bottom Girt	A325N	0.6250	1	1890.07	5811.33	0.325 ✓	1	Member Block Shear
		Torque Arm Top@132.438	A325N	0.7500	8	1600.75	17892.40	0.089 ✓	1	Bolt Shear
T4	120	Leg	A325N	0.7500	4	4227.67	29820.60	0.142 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	949.52	6960.00	0.136 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	1177.65	4132.50	0.285 ✓	1	Member Bearing
T5	117.5	Diagonal	A325N	0.5000	1	681.92	4132.50	0.165 ✓	1	Member Bearing
T6	115	Diagonal	A325N	0.5000	1	578.57	4132.50	0.140 ✓	1	Member Bearing
T7	112.5	Diagonal	A325N	0.5000	1	899.80	4132.50	0.218 ✓	1	Member Bearing
T8	110	Diagonal	A325N	0.5000	1	1395.64	6960.00	0.201 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	916.51	6198.75	0.148 ✓	1	Member Bearing
T9	107.5	Diagonal	A325N	0.5000	1	1840.77	6960.00	0.264 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	1119.72	6198.75	0.181 ✓	1	Member Bearing
T10	105	Diagonal	A325N	0.5000	1	1225.18	4132.50	0.296 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	1299.92	6198.75	0.210 ✓	1	Member Bearing
T11	102.5	Diagonal	A325N	0.5000	1	2668.88	6960.00	0.383 ✓	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	969.05	6198.75	0.156 ✓	1	Member Bearing
T12	100	Leg	A325N	0.7500	4	4847.16	29820.60	0.163 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2655.03	4132.50	0.642 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	873.55	4132.50	0.211 ✓	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T13	80	Leg	A325N	0.7500	4	5682.29	29820.60	0.191 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2062.67	6960.00	0.296 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	1394.55	6198.75	0.225 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	455.93	4132.50	0.110 ✔	1	Member Bearing
T14	60	Leg	A325N	0.7500	4	5908.99	29820.60	0.198 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2574.58	4132.50	0.623 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	880.51	4132.50	0.213 ✔	1	Member Bearing
T15	40	Leg	A325N	0.7500	4	6270.26	29820.60	0.210 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3374.30	4132.50	0.817 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	1315.67	7952.16	0.165 ✔	1	Bolt Shear
		Top Girt	A325N	0.5000	1	1164.38	4132.50	0.282 ✔	1	Member Bearing
T16	20	Diagonal	A325N	0.5000	1	2095.69	4132.50	0.507 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	1351.14	7952.16	0.170 ✔	1	Bolt Shear
		Top Girt	A325N	0.5000	1	555.08	4132.50	0.134 ✔	1	Member Bearing
T17	5	Leg	A325N	0.7500	4	6636.04	29820.60	0.223 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T2	152.33 (A) (594)	7/16 EHS	2080.00	20800.02	11423.80	12480.00	1.000	1.092 ✔
	152.33 (A) (595)	7/16 EHS	2080.00	20800.02	11459.10	12480.00	1.000	1.089 ✔
	152.33 (B) (590)	7/16 EHS	2080.00	20800.02	11096.00	12480.00	1.000	1.125 ✔
	152.33 (B) (591)	7/16 EHS	2080.00	20800.02	10863.30	12480.00	1.000	1.149 ✔
	152.33 (C) (583)	7/16 EHS	2080.00	20800.02	10566.80	12480.00	1.000	1.181 ✔
	152.33 (C) (584)	7/16 EHS	2080.00	20800.02	10765.70	12480.00	1.000	1.159 ✔
T3	132.44 (A) (606)	9/16 EHS	3500.00	35000.04	18692.40	21000.00	1.000	1.123 ✔
	132.44 (A) (607)	9/16 EHS	3500.00	35000.04	18768.80	21000.00	1.000	1.119 ✔
	132.44 (B) (602)	9/16 EHS	3500.00	35000.04	18014.20	21000.00	1.000	1.166 ✔
	132.44 (B) (603)	9/16 EHS	3500.00	35000.04	17719.40	21000.00	1.000	1.185 ✔
	132.44 (C) (598)	9/16 EHS	3500.00	35000.04	17306.20	21000.00	1.000	1.213 ✔
	132.44 (C) (599)	9/16 EHS	3500.00	35000.04	17379.60	21000.00	1.000	1.208 ✔
T12	87.56 (A)	9/16 EHS	3500.00	35000.04	18012.60	21000.00	1.000	1.166 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
	(615) 87.56 (B) (614)	9/16 EHS	3500.00	35000.04	17139.70	21000.00	1.000	1.225 ✔
	87.56 (C) (610)	9/16 EHS	3500.00	35000.04	16648.40	21000.00	1.000	1.261 ✔
T14	47.56 (A) (621)	9/16 EHS	3500.00	35000.04	16054.10	21000.00	1.000	1.308 ✔
	47.56 (B) (620)	9/16 EHS	3500.00	35000.04	15215.30	21000.00	1.000	1.380 ✔
	47.56 (C) (616)	9/16 EHS	3500.00	35000.04	14770.20	21000.00	1.000	1.422 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 155	ROHN 2 STD	15.00	2.42	36.8 K=1.00	1.0745	1.00	-23338.40	43785.30	0.533 [1] ✔
T2	155 - 140	ROHN 2 STD	15.00	1.21	18.4 K=1.00	1.0745	1.00	-32747.00	47168.90	0.694 [1] ✔
T3	140 - 120	ROHN 2 STD w/ 1" Solid Rod	20.00	1.22	23.6 K=1.00	1.8578	0.99	-51721.30	79785.00	0.648 [1] ✔
T4	120 - 117.5	CAL-005 MOD#2	2.50	2.50	38.9 K=1.00	1.6326	1.00	-50732.10	65760.00	0.771 [1] ✔
T5	117.5 - 115	CAL-005 MOD#2	2.50	2.50	38.9 K=1.00	1.6326	1.00	-51860.50	65760.00	0.789 [1] ✔
T6	115 - 112.5	CAL-005 MOD#2	2.50	2.50	38.9 K=1.00	1.6326	1.00	-51849.90	65760.00	0.788 [1] ✔
T7	112.5 - 110	CAL-005 MOD#2	2.50	2.50	38.9 K=1.00	1.6326	1.00	-52586.90	65760.00	0.800 [1] ✔
T8	110 - 107.5	CAL-005 MOD#2	2.50	1.25	19.5 K=1.00	1.6326	0.96	-52914.40	68251.60	0.775 [1] ✔
T9	107.5 - 105	CAL-005 MOD#2	2.50	1.25	19.5 K=1.00	1.6326	0.96	-53647.30	68284.50	0.786 [1] ✔
T10	105 - 102.5	CAL-005 MOD#2	2.50	1.25	19.5 K=1.00	1.6326	0.96	-55443.00	68318.30	0.812 [1] ✔
T11	102.5 - 100	CAL-005 MOD#2	2.50	1.25	19.5 K=1.00	1.6326	0.96	-55948.10	68361.20	0.818 [1] ✔
T12	100 - 80	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	1.7040	0.99	-69344.10	70951.90	0.977 [1] ✔
T13	80 - 60	ROHN 2 STD w/ 1/3rd pipe	20.00	1.22	19.4 K=1.00	1.8149	0.97	-70903.10	77035.00	0.920 [1] ✔
T14	60 - 40	CAL-005 MOD#1	20.00	2.44	31.2 K=1.00	2.4695	1.00	-77197.50	103476.00	0.746 [1] ✔
T15	40 - 20	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	20.00	2.44	32.8 K=1.00	2.2856	0.99	-77130.90	94149.40	0.819 [1] ✔
T16	20 - 5	MASER MOD -	15.00	2.42	32.5	2.2856	0.99	-78519.40	94141.30	0.834 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	5 - 0	1/4 3 STD Pipe on 2.5 STD Pipe MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	5.38	1.88	K=1.00 25.3 K=1.00	2.2856	0.96	-85515.90	94270.60	0.907 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 155	P1.5x16GA	4.19	1.97	46.5 K=1.00	0.2823	-3351.42	8159.74	0.411 [1] ✔
T2	155 - 140	ROHN 1.5 STD	4.19	1.97	38.0 K=1.00	0.7995	-4389.98	24004.30	0.183 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	4.20	1.98	69.5 K=1.00	0.8125	-6985.22	20407.30	0.342 [1] ✔
T4	120 - 117.5	P1.5x16GA	4.24	2.00	47.1 K=1.00	0.2823	-949.52	8138.04	0.117 [1] ✔
T5	117.5 - 115	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-316.13	8143.67	0.039 [1] ✔
T6	115 - 112.5	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-718.05	8143.67	0.088 [1] ✔
T7	112.5 - 110	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-811.79	8143.67	0.100 [1] ✔
T8	110 - 107.5	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-1395.64	8143.67	0.171 [1] ✔
T9	107.5 - 105	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-1840.77	8143.67	0.226 [1] ✔
T10	105 - 102.5	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-1787.40	8143.67	0.219 [1] ✔
T11	102.5 - 100	P1.5x16GA	4.24	1.99	46.9 K=1.00	0.2823	-2668.88	8143.67	0.328 [1] ✔
T12	100 - 80	P1.5x16GA	4.20	1.95	46.1 K=1.00	0.2823	-2894.39	8178.44	0.354 [1] ✔
T13	80 - 60	P1.5x16GA	4.20	1.96	46.3 K=1.00	0.2823	-2062.67	8167.69	0.253 [1] ✔
T14	60 - 40	P1.5x16GA	4.20	1.94	45.9 K=1.00	0.2823	-2947.97	8185.90	0.360 [1] ✔
T15	40 - 20	P1.5x16GA	4.20	3.91	92.1 K=1.00	0.2823	-4449.32	5849.69	0.761 [1] ✔
T16	20 - 5	P1.5x16GA	4.19	3.89	91.9 K=1.00	0.2823	-2889.56	5864.69	0.493 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T15	40 - 20	1	3.42	3.18	152.7 K=1.00	0.7854	-1315.67	7613.41	0.173 [1] ✔
T16	20 - 5	1	3.42	3.18	152.7 K=1.00	0.7854	-1351.14	7613.41	0.177 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	155 - 140	1	3.42	3.22	154.7 K=1.00	0.7854	-1493.25	7417.78	0.201 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	3.42	3.22	73.1 K=1.00	0.8125	-1664.76	19866.90	0.084 [1] ✔
T8	110 - 107.5	L2x2x3/16	3.42	3.21	62.5 K=1.00	0.7150	-916.51	18862.50	0.049 [1] ✔
T9	107.5 - 105	L2x2x3/16	3.42	3.21	62.5 K=1.00	0.7150	-929.20	18862.50	0.049 [1] ✔
T10	105 - 102.5	L2x2x3/16	3.42	3.21	62.5 K=1.00	0.7150	-960.30	18862.50	0.051 [1] ✔
T11	102.5 - 100	L2x2x3/16	3.42	3.21	62.5 K=1.00	0.7150	-969.05	18862.50	0.051 [1] ✔
T13	80 - 60	L2x2x3/16	3.42	3.20	62.2 K=1.00	0.7150	-1200.74	18894.90	0.064 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	170 - 155	P1.5x16GA	3.42	3.22	76.0 K=1.00	0.2823	-42.02	6746.92	0.006 [1] ✔
T2	155 - 140	P1.5x16GA	3.42	3.22	76.0 K=1.00	0.2823	-146.74	6746.92	0.022 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x3/16	3.42	3.22	112.6 K=1.00	0.6211	-1589.23	10326.10	0.154 [1] ✔
T4	120 - 117.5	P1.5x16GA	3.42	3.22	76.0 K=1.00	0.2823	-261.65	6746.92	0.039 [1] ✔
T15	40 - 20	P1.5x16GA	3.42	3.18	75.0 K=1.00	0.2823	-781.04	6799.86	0.115 [1] ✔

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	170 - 155	P1.5x16GA	3.42	3.22	76.0 K=1.00	0.2823	-958.31	6746.92	0.142 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x3/16	3.42	3.22	112.6 K=1.00	0.6211	-832.31	10326.10	0.081 [1] ✔
T14	60 - 40	P1.5x16GA	3.42	3.17	74.7 K=1.00	0.2823	-69.34	6816.32	0.010 [1] ✔
T17	5 - 0	14x3/16	0.51	0.27	3.8 K=1.00	42.0000	-5746.89	1359770.00	0.004 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	155 - 140	L2x2x3/16	3.42	3.22	98.1 K=1.00	0.7150	-5160.12	13953.10	0.370 [1]

[1] $P_u / \phi P_n$ controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
T2	155 - 140	L2x2x3/16	0.00	1301.02	0.000	0.00	664.35	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140	L2x2x3/16	0.370	0.000	0.000	0.370 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	155 - 140 (585)	C12x20.7	3.50	3.40	51.1 K=1.00	6.0900	-3333.96	171988.00	0.019
T2	155 - 140 (586)	C12x20.7	3.50	3.40	51.1 K=1.00	6.0900	-3343.52	171988.00	0.019
T2	155 - 140 (592)	C12x20.7	3.50	3.40	51.1 K=1.00	6.0900	-3387.47	171988.00	0.020
T2	155 - 140 (593)	C12x20.7	3.50	3.40	51.1 K=1.00	6.0900	-3384.49	171988.00	0.020
T2	155 - 140 (596)	C12x20.7	3.50	3.40	51.1 K=1.00	6.0900	-84.81	171988.00	0.000
T2	155 - 140 (597)	C12x20.7	3.50	3.40	51.1 K=1.00	6.0900	-152.89	171988.00	0.001
T3	140 - 120 (600)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6 K=1.00	9.0900	-6443.84	241128.00	0.027
T3	140 - 120 (601)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6 K=1.00	9.0900	-6487.85	241128.00	0.027
T3	140 - 120 (604)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6 K=1.00	9.0900	-6533.52	241128.00	0.027
T3	140 - 120 (605)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6 K=1.00	9.0900	-6523.72	241128.00	0.027
T3	140 - 120 (608)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6 K=1.00	9.0900	-6355.95	241128.00	0.026
T3	140 - 120 (609)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6 K=1.00	9.0900	-6381.50	241128.00	0.026

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T2	155 - 140 (585)	C12x20.7	-29934.83	68355.42	0.438	0.00	7006.50	0.000
T2	155 - 140 (586)	C12x20.7	-32908.58	68355.42	0.481	-0.00	7006.50	0.000
T2	155 - 140 (592)	C12x20.7	-31145.50	68355.42	0.456	-0.00	7006.50	0.000
T2	155 - 140 (593)	C12x20.7	-29832.75	68355.42	0.436	0.00	7006.50	0.000
T2	155 - 140 (596)	C12x20.7	-31698.42	68355.42	0.464	0.00	7006.50	0.000
T2	155 - 140 (597)	C12x20.7	-33421.67	68355.42	0.489	-0.00	7006.50	0.000
T3	140 - 120 (600)	C12x20.7 w/ 8"x3/8" plate	-45188.67	97875.00	0.462	0.00	6916.18	0.000
T3	140 - 120 (601)	C12x20.7 w/ 8"x3/8" plate	-51142.92	97875.00	0.523	-0.00	6916.18	0.000
T3	140 - 120 (604)	C12x20.7 w/ 8"x3/8" plate	-47630.00	97875.00	0.487	-0.00	6916.18	0.000
T3	140 - 120 (605)	C12x20.7 w/ 8"x3/8" plate	-45115.00	97875.00	0.461	0.00	6916.18	0.000
T3	140 - 120 (608)	C12x20.7 w/ 8"x3/8" plate	-47325.83	97875.00	0.484	-0.00	6916.18	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T3	140 - 120 (609)	C12x20.7 w/ 8"x3/8" plate	-50687.25	97875.00	0.518	0.00	6916.18	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140 (585)	C12x20.7	0.019	0.438	0.000	0.448 ✔	1.000	4.8.1 ✔
T2	155 - 140 (586)	C12x20.7	0.019	0.481	0.000	0.491 ✔	1.000	4.8.1 ✔
T2	155 - 140 (592)	C12x20.7	0.020	0.456	0.000	0.465 ✔	1.000	4.8.1 ✔
T2	155 - 140 (593)	C12x20.7	0.020	0.436	0.000	0.446 ✔	1.000	4.8.1 ✔
T2	155 - 140 (596)	C12x20.7	0.000	0.464	0.000	0.464 ✔	1.000	4.8.1 ✔
T2	155 - 140 (597)	C12x20.7	0.001	0.489	0.000	0.489 ✔	1.000	4.8.1 ✔
T3	140 - 120 (600)	C12x20.7 w/ 8"x3/8" plate	0.027	0.462	0.000	0.475 ✔	1.000	4.8.1 ✔
T3	140 - 120 (601)	C12x20.7 w/ 8"x3/8" plate	0.027	0.523	0.000	0.536 ✔	1.000	4.8.1 ✔
T3	140 - 120 (604)	C12x20.7 w/ 8"x3/8" plate	0.027	0.487	0.000	0.500 ✔	1.000	4.8.1 ✔
T3	140 - 120 (605)	C12x20.7 w/ 8"x3/8" plate	0.027	0.461	0.000	0.474 ✔	1.000	4.8.1 ✔
T3	140 - 120 (608)	C12x20.7 w/ 8"x3/8" plate	0.026	0.484	0.000	0.497 ✔	1.000	4.8.1 ✔
T3	140 - 120 (609)	C12x20.7 w/ 8"x3/8" plate	0.026	0.518	0.000	0.531 ✔	1.000	4.8.1 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 155	ROHN 2 STD	15.00	2.42	36.8	1.0745	19548.90	48353.90	0.404 [1] ✔
T2	155 - 140	ROHN 2 STD	15.00	1.21	18.4	1.0745	23086.20	48353.90	0.477 [1] ✔
T3	140 - 120	ROHN 2 STD w/ 1" Solid Rod	20.00	1.22	23.6	1.8578	26913.80	83601.00	0.322 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 155	P1.5x16GA	4.19	1.97	46.5	0.2823	3297.18	9144.98	0.361 [1] ✔
T2	155 - 140	ROHN 1.5 STD	4.19	1.97	38.0	0.7995	3976.16	25902.40	0.154 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	4.20	1.98	44.9	0.4688	5406.37	20390.60	0.265 [1] ✔
T4	120 - 117.5	P1.5x16GA	4.24	2.00	47.1	0.2823	496.09	9144.98	0.054 [1] ✔
T5	117.5 - 115	P1.5x16GA	4.24	1.99	46.9	0.2823	681.92	9144.98	0.075 [1] ✔
T6	115 - 112.5	P1.5x16GA	4.24	1.99	46.9	0.2823	578.57	9144.98	0.063 [1] ✔
T7	112.5 - 110	P1.5x16GA	4.24	1.99	46.9	0.2823	899.80	9144.98	0.098 [1] ✔
T8	110 - 107.5	P1.5x16GA	4.24	1.99	46.9	0.2823	758.91	9144.98	0.083 [1] ✔
T9	107.5 - 105	P1.5x16GA	4.24	1.99	46.9	0.2823	758.16	9144.98	0.083 [1] ✔
T10	105 - 102.5	P1.5x16GA	4.24	1.99	46.9	0.2823	1225.18	9144.98	0.134 [1] ✔
T11	102.5 - 100	P1.5x16GA	4.24	1.99	46.9	0.2823	1204.09	9144.98	0.132 [1] ✔
T12	100 - 80	P1.5x16GA	4.20	1.95	46.1	0.2823	2655.03	9144.98	0.290 [1] ✔
T13	80 - 60	P1.5x16GA	4.20	1.96	46.3	0.2823	523.34	9144.98	0.057 [1] ✔
T14	60 - 40	P1.5x16GA	4.20	1.94	45.9	0.2823	2574.58	9144.98	0.282 [1] ✔
T15	40 - 20	P1.5x16GA	4.20	3.91	92.1	0.2823	3374.30	9144.98	0.369 [1] ✔
T16	20 - 5	P1.5x16GA	4.19	3.89	91.9	0.2823	2095.69	9144.98	0.229 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T15	40 - 20	1	3.42	3.18	152.7	0.7854	1315.67	25446.90	0.052 [1] ✔
T16	20 - 5	1	3.42	3.18	152.7	0.7854	1351.14	25446.90	0.053 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T2	155 - 140	1	3.42	3.22	154.7	0.7854	1890.53	25446.90	0.074 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	3.42	3.22	73.1	0.4688	3093.51	20390.60	0.152 [1] ✔
T8	110 - 107.5	L2x2x3/16	3.42	3.21	62.5	0.4484	916.51	19503.60	0.047 [1] ✔
T9	107.5 - 105	L2x2x3/16	3.42	3.21	62.5	0.4484	1119.72	19503.60	0.057 [1] ✔
T10	105 - 102.5	L2x2x3/16	3.42	3.21	62.5	0.4484	1299.92	19503.60	0.067 [1] ✔
T11	102.5 - 100	L2x2x3/16	3.42	3.21	62.5	0.4484	969.05	19503.60	0.050 [1] ✔
T13	80 - 60	L2x2x3/16	3.42	3.20	62.2	0.4484	1394.55	19503.60	0.072 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (lb)	ϕP_n (lb)	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 155	P1.5x16GA	3.42	3.22	76.0	0.2823	26.31	9144.98	0.003 [1] ✔
T2	155 - 140	P1.5x16GA	3.42	3.22	76.0	0.2823	473.58	9144.98	0.052 [1] ✔
T3	140 - 120	L1 3/4x1 3/4x3/16	3.42	3.22	72.0	0.3604	2136.02	15675.30	0.136 [1] ✔
T4	120 - 117.5	P1.5x16GA	3.42	3.22	76.0	0.2823	1177.65	9144.98	0.129 [1] ✔
T12	100 - 80	P1.5x16GA	3.42	3.18	75.0	0.2823	873.55	9144.98	0.096 [1] ✔
T13	80 - 60	P1.5x16GA	3.42	3.20	75.5	0.2823	455.93	9144.98	0.050 [1] ✔
T14	60 - 40	P1.5x16GA	3.42	3.17	74.7	0.2823	880.51	9144.98	0.096 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T15	40 - 20	P1.5x16GA	3.42	3.18	75.0	0.2823	1164.38	9144.98	0.127 [1]
T16	20 - 5	P1.5x16GA	3.42	3.18	75.0	0.2823	555.08	9144.98	0.061 [1]
T17	5 - 0	14x3/16	2.91	2.67	37.0	42.0000	7669.35	1360800.00	0.006 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 155	P1.5x16GA	3.42	3.22	76.0	0.2823	1075.65	9144.98	0.118 [1]
T2	155 - 140	P1.5x16GA	3.42	3.22	76.0	0.2823	624.25	9144.98	0.068 [1]
T3	140 - 120	L1 3/4x1 3/4x3/16	3.42	3.22	72.0	0.3604	1890.07	15675.30	0.121 [1]
T11	102.5 - 100	P1.5x16GA	3.42	3.21	75.8	0.2823	432.56	9144.98	0.047 [1]
T12	100 - 80	P1.5x16GA	3.42	3.18	75.0	0.2823	1019.24	9144.98	0.111 [1]
T13	80 - 60	P1.5x16GA	3.42	3.20	75.5	0.2823	389.65	9144.98	0.043 [1]
T14	60 - 40	P1.5x16GA	3.42	3.17	74.7	0.2823	961.53	9144.98	0.105 [1]
T15	40 - 20	P1.5x16GA	3.42	3.18	75.0	0.2823	575.46	9144.98	0.063 [1]
T16	20 - 5	L2x2x3/16	3.42	3.18	61.9	0.7150	10756.60	23166.00	0.464 [1]
T17	5 - 0	14x3/16	0.51	0.27	3.8	42.0000	4347.37	1360800.00	0.003 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T17	5 - 0	14x3/16	1.71	1.47	20.4	42.0000	83.61	1360800.00	0.000 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	155 - 140	L2x2x3/16	3.42	3.22	62.7	0.7150	6140.23	23166.00	0.265 [1]
T12	100 - 80	4x3/8	3.42	3.18	352.6	1.5000	6311.55	48600.00	0.130 [1]
T14	60 - 40	4x3/8	3.42	3.17	351.1	1.5000	7144.30	48600.00	0.147 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
T2	155 - 140	L2x2x3/16	0.00	1301.02	0.000	0.00	664.35	0.000
T12	100 - 80	4x3/8	0.00	4050.00	0.000	0.00	379.69	0.000
T14	60 - 40	4x3/8	0.00	4050.00	0.000	0.00	379.69	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							
T2	155 - 140	L2x2x3/16	0.265	0.000	0.000	0.265 [1] ✔	1.000	4.8.1 ✔
T12	100 - 80	4x3/8	0.130	0.000	0.000	0.130 [1] ✔	1.000	4.8.1 ✔
T14	60 - 40	4x3/8	0.147	0.000	0.000	0.147 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T2	155 - 140 (585)	C12x20.7	3.50	3.40	51.1	6.0900	2833.20	197316.00	0.014
T2	155 - 140 (586)	C12x20.7	3.50	3.40	51.1	6.0900	2711.94	197316.00	0.014
T2	155 - 140 (592)	C12x20.7	3.50	3.40	51.1	6.0900	2805.71	197316.00	0.014
T2	155 - 140 (593)	C12x20.7	3.50	3.40	51.1	6.0900	2832.14	197316.00	0.014

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	155 - 140 (596)	C12x20.7	3.50	3.40	51.1	6.0900	2813.49	197316.00	0.014
T2	155 - 140 (597)	C12x20.7	3.50	3.40	51.1	6.0900	2728.29	197316.00	0.014
T3	140 - 120 (600)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6	9.0900	5342.83	294516.00	0.018
T3	140 - 120 (601)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6	9.0900	4861.16	294516.00	0.017
T3	140 - 120 (604)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6	9.0900	5106.57	294516.00	0.017
T3	140 - 120 (605)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6	9.0900	5246.39	294516.00	0.018
T3	140 - 120 (608)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6	9.0900	5272.02	294516.00	0.018
T3	140 - 120 (609)	C12x20.7 w/ 8"x3/8" plate	3.50	3.40	61.6	9.0900	4951.39	294516.00	0.017

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T2	155 - 140 (585)	C12x20.7	-26639.50	68355.42	0.390	-0.00	7006.50	0.000
T2	155 - 140 (586)	C12x20.7	-28918.58	68355.42	0.423	-0.00	7006.50	0.000
T2	155 - 140 (592)	C12x20.7	-27715.17	68355.42	0.405	0.00	7006.50	0.000
T2	155 - 140 (593)	C12x20.7	-26754.67	68355.42	0.391	0.00	7006.50	0.000
T2	155 - 140 (596)	C12x20.7	-27803.33	68355.42	0.407	0.00	7006.50	0.000
T2	155 - 140 (597)	C12x20.7	-29144.83	68355.42	0.426	0.00	7006.50	0.000
T3	140 - 120 (600)	C12x20.7 w/ 8"x3/8" plate	-40643.75	97875.00	0.415	-0.00	6916.18	0.000
T3	140 - 120 (601)	C12x20.7 w/ 8"x3/8" plate	-45167.00	97875.00	0.461	-0.00	6916.18	0.000
T3	140 - 120 (604)	C12x20.7 w/ 8"x3/8" plate	-42700.00	97875.00	0.436	0.00	6916.18	0.000
T3	140 - 120 (605)	C12x20.7 w/ 8"x3/8" plate	-40879.83	97875.00	0.418	0.00	6916.18	0.000
T3	140 - 120 (608)	C12x20.7 w/ 8"x3/8" plate	-42794.67	97875.00	0.437	0.00	6916.18	0.000
T3	140 - 120 (609)	C12x20.7 w/ 8"x3/8" plate	-45566.00	97875.00	0.466	0.00	6916.18	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140 (585)	C12x20.7	0.014	0.390	0.000	0.397 ✔	1.000	4.8.1 ✔
T2	155 - 140 (586)	C12x20.7	0.014	0.423	0.000	0.430 ✔	1.000	4.8.1 ✔
T2	155 - 140 (592)	C12x20.7	0.014	0.405	0.000	0.413 ✔	1.000	4.8.1 ✔
T2	155 - 140 (593)	C12x20.7	0.014	0.391	0.000	0.399 ✔	1.000	4.8.1 ✔
T2	155 - 140 (596)	C12x20.7	0.014	0.407	0.000	0.414 ✔	1.000	4.8.1 ✔
T2	155 - 140 (597)	C12x20.7	0.014	0.426	0.000	0.433 ✔	1.000	4.8.1 ✔
T3	140 - 120 (600)	C12x20.7 w/ 8"x3/8" plate	0.018	0.415	0.000	0.424 ✔	1.000	4.8.1 ✔
T3	140 - 120 (601)	C12x20.7 w/ 8"x3/8" plate	0.017	0.461	0.000	0.470 ✔	1.000	4.8.1 ✔
T3	140 - 120 (604)	C12x20.7 w/ 8"x3/8" plate	0.017	0.436	0.000	0.445 ✔	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T3	140 - 120 (605)	C12x20.7 w/ 8"x3/8" plate	0.018	0.418	0.000	0.427	1.000	4.8.1
T3	140 - 120 (608)	C12x20.7 w/ 8"x3/8" plate	0.018	0.437	0.000	0.446	1.000	4.8.1
T3	140 - 120 (609)	C12x20.7 w/ 8"x3/8" plate	0.017	0.466	0.000	0.474	1.000	4.8.1

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	170 - 155	Leg	ROHN 2 STD	1	-23338.40	43785.30	53.3	Pass
		Leg	ROHN 2 STD	2	-23261.50	43785.30	53.1	Pass
		Leg	ROHN 2 STD	3	-23265.90	43785.30	53.1	Pass
T2	155 - 140	Leg	ROHN 2 STD	46	-32607.40	47168.90	69.1	Pass
		Leg	ROHN 2 STD	47	-32747.00	47168.90	69.4	Pass
		Leg	ROHN 2 STD	48	-32510.90	47168.90	68.9	Pass
T3	140 - 120	Leg	ROHN 2 STD w/ 1" Solid Rod	109	-51721.30	79785.00	64.8	Pass
		Leg	ROHN 2 STD w/ 1" Solid Rod	110	-51572.70	79783.20	64.6	Pass
		Leg	ROHN 2 STD w/ 1" Solid Rod	111	-51484.20	79780.30	64.5	Pass
T4	120 - 117.5	Leg	CAL-005 MOD#2	190	-49570.60	65760.00	75.4	Pass
		Leg	CAL-005 MOD#2	191	-46321.00	65760.00	70.4	Pass
		Leg	CAL-005 MOD#2	192	-50732.10	65760.00	77.1	Pass
T5	117.5 - 115	Leg	CAL-005 MOD#2	202	-51046.30	65760.00	77.6	Pass
		Leg	CAL-005 MOD#2	203	-47750.40	65760.00	72.6	Pass
		Leg	CAL-005 MOD#2	204	-51860.50	65760.00	78.9	Pass
T6	115 - 112.5	Leg	CAL-005 MOD#2	211	-51442.70	65760.00	78.2	Pass
		Leg	CAL-005 MOD#2	212	-48124.80	65760.00	73.2	Pass
		Leg	CAL-005 MOD#2	213	-51849.90	65760.00	78.8	Pass
T7	112.5 - 110	Leg	CAL-005 MOD#2	220	-52539.80	65760.00	79.9	Pass
		Leg	CAL-005 MOD#2	221	-49177.40	65760.00	74.8	Pass
		Leg	CAL-005 MOD#2	222	-52586.90	65760.00	80.0	Pass
T8	110 - 107.5	Leg	CAL-005 MOD#2	229	-52914.40	68251.60	77.5	Pass
		Leg	CAL-005 MOD#2	230	-49529.00	68207.40	72.6	Pass
		Leg	CAL-005 MOD#2	231	-52679.30	68177.80	77.3	Pass
T9	107.5 - 105	Leg	CAL-005 MOD#2	241	-53647.30	68284.50	78.6	Pass
		Leg	CAL-005 MOD#2	242	-50296.60	68240.10	73.7	Pass
		Leg	CAL-005 MOD#2	243	-53110.40	68207.10	77.9	Pass
T10	105 - 102.5	Leg	CAL-005 MOD#2	253	-55443.00	68318.30	81.2	Pass
		Leg	CAL-005 MOD#2	254	-52127.70	68275.20	76.3	Pass
		Leg	CAL-005 MOD#2	255	-54689.80	68244.20	80.1	Pass
T11	102.5 - 100	Leg	CAL-005 MOD#2	265	-55948.10	68361.20	81.8	Pass
		Leg	CAL-005 MOD#2	266	-52704.90	68319.60	77.1	Pass
		Leg	CAL-005 MOD#2	267	-55012.50	68291.20	80.6	Pass
T12	100 - 80	Leg	ROHN 2.5 STD	280	-69344.10	70951.90	97.7	Pass
		Leg	ROHN 2.5 STD	281	-66722.70	70943.30	94.1	Pass
		Leg	ROHN 2.5 STD	282	-67594.50	70939.20	95.3	Pass
T13	80 - 60	Leg	ROHN 2 STD w/ 1/3rd pipe	337	-70903.10	77035.00	92.0	Pass
		Leg	ROHN 2 STD w/ 1/3rd pipe	338	-69368.20	76998.90	90.1	Pass
		Leg	ROHN 2 STD w/ 1/3rd pipe	339	-68613.50	76984.40	89.1	Pass
T14	60 - 40	Leg	CAL-005 MOD#1	418	-77197.50	103476.00	74.6	Pass
		Leg	CAL-005 MOD#1	419	-76512.80	103476.00	73.9	Pass
		Leg	CAL-005 MOD#1	420	-75399.40	103476.00	72.9	Pass
T15	40 - 20	Leg	MASER MOD - 1/4 3 STD Pipe	475	-76625.20	94146.00	81.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
			on 2.5 STD Pipe					
		Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	476	-77130.90	94149.40	81.9	Pass
		Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	477	-76916.70	94148.30	81.7	Pass
T16	20 - 5	Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	529	-77889.90	94134.20	82.7	Pass
		Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	530	-78399.20	94140.30	83.3	Pass
		Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	531	-78519.40	94141.30	83.4	Pass
T17	5 - 0	Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	571	-84837.20	94245.80	90.0	Pass
		Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	572	-85406.70	94267.80	90.6	Pass
		Leg	MASER MOD - 1/4 3 STD Pipe on 2.5 STD Pipe	573	-85515.90	94270.60	90.7	Pass
T1	170 - 155	Diagonal	P1.5x16GA	10	-3349.01	8159.74	41.0 79.7 (b)	Pass
		Diagonal	P1.5x16GA	11	-3347.12	8159.74	41.0 79.7 (b)	Pass
		Diagonal	P1.5x16GA	12	-3253.92	8159.74	39.9 77.4 (b)	Pass
		Diagonal	P1.5x16GA	13	-3252.04	8159.74	39.9 77.5 (b)	Pass
		Diagonal	P1.5x16GA	14	-3347.61	8159.74	41.0 79.8 (b)	Pass
		Diagonal	P1.5x16GA	15	-3351.42	8159.74	41.1 79.7 (b)	Pass
		Diagonal	P1.5x16GA	16	-2817.76	8159.74	34.5 68.8 (b)	Pass
		Diagonal	P1.5x16GA	17	-2816.30	8159.74	34.5 68.9 (b)	Pass
		Diagonal	P1.5x16GA	18	-2740.94	8159.74	33.6 66.9 (b)	Pass
		Diagonal	P1.5x16GA	19	-2739.12	8159.74	33.6 66.9 (b)	Pass
		Diagonal	P1.5x16GA	20	-2824.74	8159.74	34.6 69.1 (b)	Pass
		Diagonal	P1.5x16GA	21	-2828.09	8159.74	34.7 69.0 (b)	Pass
		Diagonal	P1.5x16GA	22	-2971.74	8159.74	36.4 71.0 (b)	Pass
		Diagonal	P1.5x16GA	23	-2970.15	8159.74	36.4 71.0 (b)	Pass
		Diagonal	P1.5x16GA	24	-2896.56	8159.74	35.5 69.2 (b)	Pass
		Diagonal	P1.5x16GA	25	-2894.86	8159.74	35.5 69.3 (b)	Pass
		Diagonal	P1.5x16GA	26	-2983.59	8159.74	36.6 71.4 (b)	Pass
		Diagonal	P1.5x16GA	27	-2987.16	8159.74	36.6 71.4 (b)	Pass
		Diagonal	P1.5x16GA	28	-1110.97	8159.74	13.6 27.3 (b)	Pass
		Diagonal	P1.5x16GA	29	-1165.24	8159.74	14.3 28.6 (b)	Pass
		Diagonal	P1.5x16GA	30	-1080.36	8159.74	13.2 26.5 (b)	Pass
		Diagonal	P1.5x16GA	31	-1067.48	8159.74	13.1 26.2 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	P1.5x16GA	32	-1177.14	8159.74	14.4 28.9 (b)	Pass
		Diagonal	P1.5x16GA	33	-1135.82	8159.74	13.9 27.8 (b)	Pass
		Diagonal	P1.5x16GA	34	-377.33	8159.74	4.6 8.7 (b)	Pass
		Diagonal	P1.5x16GA	35	-363.37	8159.74	4.5 8.4 (b)	Pass
		Diagonal	P1.5x16GA	36	-319.87	8159.74	3.9 7.3 (b)	Pass
		Diagonal	P1.5x16GA	37	-326.48	8159.74	4.0 7.6 (b)	Pass
		Diagonal	P1.5x16GA	38	-389.95	8159.74	4.8 9.0 (b)	Pass
		Diagonal	P1.5x16GA	39	-392.28	8159.74	4.8 9.1 (b)	Pass
		Diagonal	P1.5x16GA	40	-210.85	8159.74	2.6 5.3 (b)	Pass
		Diagonal	P1.5x16GA	41	-203.93	8159.74	2.5 5.2 (b)	Pass
		Diagonal	P1.5x16GA	42	-264.58	8159.74	3.2 6.6 (b)	Pass
		Diagonal	P1.5x16GA	43	-241.75	8159.74	3.0 6.1 (b)	Pass
		Diagonal	P1.5x16GA	44	-226.84	8159.74	2.8 5.7 (b)	Pass
		Diagonal	P1.5x16GA	45	-256.57	8159.74	3.1 6.4 (b)	Pass
T2	155 - 140	Diagonal	ROHN 1.5 STD	55	-1990.34	24004.30	8.3 25.0 (b)	Pass
		Diagonal	ROHN 1.5 STD	56	-1935.86	24004.30	8.1 24.3 (b)	Pass
		Diagonal	ROHN 1.5 STD	57	-3123.24	24004.30	13.0 39.3 (b)	Pass
		Diagonal	ROHN 1.5 STD	58	-3032.33	24004.30	12.6 38.1 (b)	Pass
		Diagonal	ROHN 1.5 STD	59	-2968.04	24004.30	12.4 37.3 (b)	Pass
		Diagonal	ROHN 1.5 STD	60	-3092.84	24004.30	12.9 38.9 (b)	Pass
		Diagonal	ROHN 1.5 STD	64	578.39	25902.40	2.2 7.3 (b)	Pass
		Diagonal	ROHN 1.5 STD	65	592.31	25902.40	2.3 7.4 (b)	Pass
		Diagonal	ROHN 1.5 STD	66	1926.72	25902.40	7.4 24.2 (b)	Pass
		Diagonal	ROHN 1.5 STD	67	1745.69	25902.40	6.7 22.0 (b)	Pass
		Diagonal	ROHN 1.5 STD	68	1701.95	25902.40	6.6 21.4 (b)	Pass
		Diagonal	ROHN 1.5 STD	69	1871.64	25902.40	7.2 23.5 (b)	Pass
		Diagonal	ROHN 1.5 STD	73	-1084.81	24004.30	4.5 13.6 (b)	Pass
		Diagonal	ROHN 1.5 STD	74	-1006.15	24004.30	4.2 12.7 (b)	Pass
		Diagonal	ROHN 1.5 STD	75	-1343.50	24004.30	5.6 16.9 (b)	Pass
		Diagonal	ROHN 1.5 STD	76	-1397.02	24004.30	5.8 17.6 (b)	Pass
		Diagonal	ROHN 1.5 STD	77	-1411.76	24004.30	5.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	ROHN 1.5 STD	78	-1330.69	24004.30	17.8 (b) 5.5	Pass
		Diagonal	ROHN 1.5 STD	82	634.48	25902.40	16.7 (b) 2.4	Pass
		Diagonal	ROHN 1.5 STD	83	647.57	25902.40	8.0 (b) 2.5	Pass
		Diagonal	ROHN 1.5 STD	84	684.30	25902.40	8.1 (b) 2.6	Pass
		Diagonal	ROHN 1.5 STD	85	769.04	25902.40	8.6 (b) 3.0	Pass
		Diagonal	ROHN 1.5 STD	86	810.79	25902.40	9.7 (b) 3.1	Pass
		Diagonal	ROHN 1.5 STD	87	730.66	25902.40	10.2 (b) 2.8	Pass
		Diagonal	ROHN 1.5 STD	91	-1322.12	24004.30	9.2 (b) 5.5	Pass
		Diagonal	ROHN 1.5 STD	92	-1329.55	24004.30	16.6 (b) 5.5	Pass
		Diagonal	ROHN 1.5 STD	93	-1518.57	24004.30	16.7 (b) 6.3	Pass
		Diagonal	ROHN 1.5 STD	94	-1484.48	24004.30	19.1 (b) 6.2	Pass
		Diagonal	ROHN 1.5 STD	95	-1541.30	24004.30	18.7 (b) 6.4	Pass
		Diagonal	ROHN 1.5 STD	96	-1535.12	24004.30	19.4 (b) 6.4	Pass
		Diagonal	ROHN 1.5 STD	100	-4344.64	24004.30	19.3 (b) 18.1	Pass
		Diagonal	ROHN 1.5 STD	101	-4389.98	24004.30	54.6 (b) 18.3	Pass
		Diagonal	ROHN 1.5 STD	102	-4225.12	24004.30	55.2 (b) 17.6	Pass
		Diagonal	ROHN 1.5 STD	103	-4226.57	24004.30	53.1 (b) 17.6	Pass
		Diagonal	ROHN 1.5 STD	104	-4372.09	24004.30	53.2 (b) 18.2	Pass
		Diagonal	ROHN 1.5 STD	105	-4322.93	24004.30	55.0 (b) 18.0	Pass
T3	140 - 120	Diagonal	L1 3/4x1 3/4x1/4	118	-4801.20	20407.30	54.4 (b) 23.5	Pass
		Diagonal	L1 3/4x1 3/4x1/4	119	-4773.30	20407.30	38.6 (b) 23.4	Pass
		Diagonal	L1 3/4x1 3/4x1/4	120	-4320.23	20407.30	38.4 (b) 21.2	Pass
		Diagonal	L1 3/4x1 3/4x1/4	121	-4302.78	20407.30	34.8 (b) 21.1	Pass
		Diagonal	L1 3/4x1 3/4x1/4	122	-4563.79	20407.30	34.6 (b) 22.4	Pass
		Diagonal	L1 3/4x1 3/4x1/4	123	-4555.66	20407.30	36.7 (b) 22.3	Pass
		Diagonal	L1 3/4x1 3/4x1/4	127	-3953.59	20407.30	36.7 (b) 19.4	Pass
		Diagonal	L1 3/4x1 3/4x1/4	128	-3757.52	20407.30	42.5 (b) 18.4	Pass
		Diagonal	L1 3/4x1 3/4x1/4	129	-3521.61	20407.30	41.4 (b) 17.3	Pass
		Diagonal	L1 3/4x1 3/4x1/4	130	-3298.76	20407.30	37.1 (b) 16.2	Pass
		Diagonal	L1 3/4x1 3/4x1/4	131	-3466.93	20407.30	35.8 (b) 17.0 37.8 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	L1 3/4x1 3/4x1/4	132	-3837.18	20407.30	18.8 40.5 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	136	-4549.71	20407.30	22.3 38.0 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	137	-4664.74	20407.30	22.9 41.0 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	138	-4073.89	20407.30	20.0 32.8 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	139	-4237.39	20407.30	20.8 34.8 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	140	-4526.45	20407.30	22.2 39.3 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	141	-4276.30	20407.30	21.0 34.4 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	145	-5534.98	20407.30	27.1 58.8 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	146	-5325.33	20407.30	26.1 57.7 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	147	-5040.15	20407.30	24.7 52.7 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	148	-4757.52	20407.30	23.3 50.9 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	149	-4944.02	20407.30	24.2 53.1 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	150	-5386.84	20407.30	26.4 56.4 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	154	-6620.36	20407.30	32.4 67.2 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	155	-6915.18	20407.30	33.9 69.8 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	156	-6322.63	20407.30	31.0 60.5 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	157	-6714.04	20407.30	32.9 65.9 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	158	-6985.22	20407.30	34.2 69.4 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	159	-6253.98	20407.30	30.6 61.7 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	163	-4999.60	20407.30	24.5 60.0 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	164	-5090.23	20407.30	24.9 61.2 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	165	-5047.28	20407.30	24.7 61.2 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	166	-5023.13	20407.30	24.6 60.6 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	167	-5054.72	20407.30	24.8 60.5 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	168	-4975.91	20407.30	24.4 60.3 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	172	-5055.21	20407.30	24.8 54.7 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	173	-4940.09	20407.30	24.2 54.1 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	174	-5043.69	20407.30	24.7 55.4 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	175	-5031.68	20407.30	24.7 55.9 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	176	-4953.24	20407.30	24.3 55.0 (b)	Pass
		Diagonal	L1 3/4x1 3/4x1/4	177	-5067.74	20407.30	24.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	L1 3/4x1 3/4x1/4	181	-3814.69	20407.30	55.1 (b) 18.7	Pass
		Diagonal	L1 3/4x1 3/4x1/4	182	-3865.65	20407.30	39.6 (b) 18.9	Pass
		Diagonal	L1 3/4x1 3/4x1/4	183	-4042.30	20407.30	41.1 (b) 19.8	Pass
		Diagonal	L1 3/4x1 3/4x1/4	184	-3992.29	20407.30	42.2 (b) 19.6	Pass
		Diagonal	L1 3/4x1 3/4x1/4	185	-3944.42	20407.30	42.6 (b) 19.3	Pass
		Diagonal	L1 3/4x1 3/4x1/4	186	-3933.68	20407.30	42.2 (b) 19.3	Pass
T4	120 - 117.5	Diagonal	P1.5x16GA	196	-887.42	8138.04	40.5 (b) 10.9	Pass
		Diagonal	P1.5x16GA	197	-949.52	8138.04	12.8 (b) 11.7	Pass
		Diagonal	P1.5x16GA	198	-832.00	8138.04	13.6 (b) 10.2	Pass
		Diagonal	P1.5x16GA	199	-585.97	8138.04	12.0 (b) 7.2	Pass
		Diagonal	P1.5x16GA	200	-532.88	8138.04	8.4 (b) 6.5	Pass
		Diagonal	P1.5x16GA	201	-833.80	8138.04	7.7 (b) 10.2	Pass
T5	117.5 - 115	Diagonal	P1.5x16GA	205	384.11	9144.98	12.0 (b) 4.2	Pass
		Diagonal	P1.5x16GA	206	546.59	9144.98	9.3 (b) 6.0	Pass
		Diagonal	P1.5x16GA	207	514.20	9144.98	13.2 (b) 5.6	Pass
		Diagonal	P1.5x16GA	208	649.44	9144.98	12.4 (b) 7.1	Pass
		Diagonal	P1.5x16GA	209	681.92	9144.98	15.7 (b) 7.5	Pass
		Diagonal	P1.5x16GA	210	536.72	9144.98	16.5 (b) 5.9	Pass
T6	115 - 112.5	Diagonal	P1.5x16GA	214	-248.40	8143.67	13.0 (b) 3.1	Pass
		Diagonal	P1.5x16GA	215	-323.35	8143.67	3.6 (b) 4.0	Pass
		Diagonal	P1.5x16GA	216	-564.02	8143.67	5.2 (b) 6.9	Pass
		Diagonal	P1.5x16GA	217	-334.32	8143.67	8.1 (b) 4.1	Pass
		Diagonal	P1.5x16GA	218	-620.74	8143.67	8.4 (b) 7.6	Pass
		Diagonal	P1.5x16GA	219	-718.05	8143.67	14.0 (b) 8.8	Pass
T7	112.5 - 110	Diagonal	P1.5x16GA	223	303.51	9144.98	11.9 (b) 3.3	Pass
		Diagonal	P1.5x16GA	224	394.41	9144.98	7.3 (b) 4.3	Pass
		Diagonal	P1.5x16GA	225	-592.97	8143.67	9.5 (b) 7.3	Pass
		Diagonal	P1.5x16GA	226	613.50	9144.98	12.7 (b) 6.7	Pass
		Diagonal	P1.5x16GA	227	899.80	9144.98	14.8 (b) 9.8	Pass
		Diagonal	P1.5x16GA	228	-811.79	8143.67	21.8 (b) 10.0 19.5 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T8	110 - 107.5	Diagonal	P1.5x16GA	232	-814.93	8143.67	10.0 11.7 (b)	Pass
		Diagonal	P1.5x16GA	233	-825.34	8143.67	10.1 11.9 (b)	Pass
		Diagonal	P1.5x16GA	234	-1131.85	8143.67	13.9 16.3 (b)	Pass
		Diagonal	P1.5x16GA	235	-970.17	8143.67	11.9 13.9 (b)	Pass
		Diagonal	P1.5x16GA	236	-1280.16	8143.67	15.7 18.4 (b)	Pass
		Diagonal	P1.5x16GA	237	-1395.64	8143.67	17.1 20.1 (b)	Pass
T9	107.5 - 105	Diagonal	P1.5x16GA	244	-1280.40	8143.67	15.7 18.4 (b)	Pass
		Diagonal	P1.5x16GA	245	-1264.12	8143.67	15.5 18.2 (b)	Pass
		Diagonal	P1.5x16GA	246	-1556.96	8143.67	19.1 22.4 (b)	Pass
		Diagonal	P1.5x16GA	247	-1414.00	8143.67	17.4 20.3 (b)	Pass
		Diagonal	P1.5x16GA	248	-1711.94	8143.67	21.0 24.6 (b)	Pass
		Diagonal	P1.5x16GA	249	-1840.77	8143.67	22.6 26.4 (b)	Pass
T10	105 - 102.5	Diagonal	P1.5x16GA	256	-1263.76	8143.67	15.5 18.2 (b)	Pass
		Diagonal	P1.5x16GA	257	-1225.44	8143.67	15.0 17.6 (b)	Pass
		Diagonal	P1.5x16GA	258	-1498.89	8143.67	18.4 21.5 (b)	Pass
		Diagonal	P1.5x16GA	259	-1387.18	8143.67	17.0 22.5 (b)	Pass
		Diagonal	P1.5x16GA	260	-1672.60	8143.67	20.5 29.6 (b)	Pass
		Diagonal	P1.5x16GA	261	-1787.40	8143.67	21.9 27.7 (b)	Pass
T11	102.5 - 100	Diagonal	P1.5x16GA	271	-2112.50	8143.67	25.9 30.4 (b)	Pass
		Diagonal	P1.5x16GA	272	-2058.09	8143.67	25.3 29.6 (b)	Pass
		Diagonal	P1.5x16GA	273	-2338.40	8143.67	28.7 33.6 (b)	Pass
		Diagonal	P1.5x16GA	274	-2226.00	8143.67	27.3 32.0 (b)	Pass
		Diagonal	P1.5x16GA	275	-2524.90	8143.67	31.0 36.3 (b)	Pass
		Diagonal	P1.5x16GA	276	-2668.88	8143.67	32.8 38.3 (b)	Pass
T12	100 - 80	Diagonal	P1.5x16GA	289	-1593.21	8178.44	19.5 22.9 (b)	Pass
		Diagonal	P1.5x16GA	290	-1605.31	8178.44	19.6 23.1 (b)	Pass
		Diagonal	P1.5x16GA	291	-1555.34	8178.44	19.0 22.3 (b)	Pass
		Diagonal	P1.5x16GA	292	-1425.15	8178.44	17.4 20.5 (b)	Pass
		Diagonal	P1.5x16GA	293	-1244.40	8178.44	15.2 17.9 (b)	Pass
		Diagonal	P1.5x16GA	294	-1308.16	8178.44	16.0 18.8 (b)	Pass
		Diagonal	P1.5x16GA	295	1608.93	9144.98	17.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	P1.5x16GA	296	1641.99	9144.98	38.9 (b) 18.0	Pass
		Diagonal	P1.5x16GA	297	1485.01	9144.98	39.7 (b) 16.2	Pass
		Diagonal	P1.5x16GA	298	1549.76	9144.98	35.9 (b) 16.9	Pass
		Diagonal	P1.5x16GA	299	1341.68	9144.98	37.5 (b) 14.7	Pass
		Diagonal	P1.5x16GA	300	1300.97	9144.98	32.5 (b) 14.2	Pass
		Diagonal	P1.5x16GA	301	-1825.99	8178.44	31.5 (b) 22.3	Pass
		Diagonal	P1.5x16GA	302	-1846.15	8178.44	26.2 (b) 22.6	Pass
		Diagonal	P1.5x16GA	303	-1782.34	8178.44	26.5 (b) 21.8	Pass
		Diagonal	P1.5x16GA	304	-1656.42	8178.44	25.6 (b) 20.3	Pass
		Diagonal	P1.5x16GA	305	-1469.92	8178.44	23.8 (b) 18.0	Pass
		Diagonal	P1.5x16GA	306	-1533.63	8178.44	21.1 (b) 18.8	Pass
		Diagonal	P1.5x16GA	307	-2527.31	8178.44	22.0 (b) 30.9	Pass
		Diagonal	P1.5x16GA	308	-2462.12	8178.44	43.5 (b) 30.1	Pass
		Diagonal	P1.5x16GA	309	-2656.07	8178.44	44.6 (b) 32.5	Pass
		Diagonal	P1.5x16GA	310	-2565.88	8178.44	46.0 (b) 31.4	Pass
		Diagonal	P1.5x16GA	311	-2782.66	8178.44	48.0 (b) 34.0	Pass
		Diagonal	P1.5x16GA	312	-2894.39	8178.44	53.3 (b) 35.4	Pass
		Diagonal	P1.5x16GA	313	2207.23	9144.98	51.3 (b) 24.1	Pass
		Diagonal	P1.5x16GA	314	2267.23	9144.98	53.4 (b) 24.8	Pass
		Diagonal	P1.5x16GA	315	2321.19	9144.98	54.9 (b) 25.4	Pass
		Diagonal	P1.5x16GA	316	2409.27	9144.98	56.2 (b) 26.3	Pass
		Diagonal	P1.5x16GA	317	2655.03	9144.98	58.3 (b) 29.0	Pass
		Diagonal	P1.5x16GA	318	2550.39	9144.98	64.2 (b) 27.9	Pass
		Diagonal	P1.5x16GA	319	-2037.40	8178.44	61.7 (b) 24.9	Pass
		Diagonal	P1.5x16GA	320	-1976.77	8178.44	39.8 (b) 24.2	Pass
		Diagonal	P1.5x16GA	321	-2196.18	8178.44	41.0 (b) 26.9	Pass
		Diagonal	P1.5x16GA	322	-2107.23	8178.44	42.9 (b) 25.8	Pass
		Diagonal	P1.5x16GA	323	-2345.38	8178.44	44.9 (b) 28.7	Pass
		Diagonal	P1.5x16GA	324	-2451.66	8178.44	51.0 (b) 30.0	Pass
		Diagonal	P1.5x16GA	325	1792.90	9144.98	48.8 (b) 19.6	Pass
							43.4 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	P1.5x16GA	326	1854.19	9144.98	20.3 44.9 (b)	Pass
		Diagonal	P1.5x16GA	327	1935.76	9144.98	21.2 46.8 (b)	Pass
		Diagonal	P1.5x16GA	328	2024.04	9144.98	22.1 49.0 (b)	Pass
		Diagonal	P1.5x16GA	329	2288.93	9144.98	25.0 55.4 (b)	Pass
		Diagonal	P1.5x16GA	330	2182.14	9144.98	23.9 52.8 (b)	Pass
		Diagonal	P1.5x16GA	331	-1850.03	8178.44	22.6 27.5 (b)	Pass
		Diagonal	P1.5x16GA	332	-1782.83	8178.44	21.8 28.7 (b)	Pass
		Diagonal	P1.5x16GA	333	-2049.09	8178.44	25.1 31.5 (b)	Pass
		Diagonal	P1.5x16GA	334	-1951.40	8178.44	23.9 33.5 (b)	Pass
		Diagonal	P1.5x16GA	335	-2229.00	8178.44	27.3 40.4 (b)	Pass
		Diagonal	P1.5x16GA	336	-2348.31	8178.44	28.7 38.3 (b)	Pass
T13	80 - 60	Diagonal	P1.5x16GA	346	-1947.08	8167.69	23.8 28.0 (b)	Pass
		Diagonal	P1.5x16GA	347	-1943.77	8167.69	23.8 27.9 (b)	Pass
		Diagonal	P1.5x16GA	348	-1960.33	8167.69	24.0 28.2 (b)	Pass
		Diagonal	P1.5x16GA	349	-1844.37	8167.69	22.6 26.5 (b)	Pass
		Diagonal	P1.5x16GA	350	-1985.87	8167.69	24.3 28.5 (b)	Pass
		Diagonal	P1.5x16GA	351	-2062.67	8167.69	25.3 29.6 (b)	Pass
		Diagonal	P1.5x16GA	355	-1045.91	8167.69	12.8 15.0 (b)	Pass
		Diagonal	P1.5x16GA	356	-1042.98	8167.69	12.8 15.0 (b)	Pass
		Diagonal	P1.5x16GA	357	-1080.91	8167.69	13.2 15.5 (b)	Pass
		Diagonal	P1.5x16GA	358	-983.44	8167.69	12.0 14.1 (b)	Pass
		Diagonal	P1.5x16GA	359	-1101.78	8167.69	13.5 15.8 (b)	Pass
		Diagonal	P1.5x16GA	360	-1166.15	8167.69	14.3 16.8 (b)	Pass
		Diagonal	P1.5x16GA	364	-1133.07	8167.69	13.9 16.3 (b)	Pass
		Diagonal	P1.5x16GA	365	-1166.66	8167.69	14.3 16.8 (b)	Pass
		Diagonal	P1.5x16GA	366	-1276.10	8167.69	15.6 18.3 (b)	Pass
		Diagonal	P1.5x16GA	367	-1033.62	8167.69	12.7 14.9 (b)	Pass
		Diagonal	P1.5x16GA	368	-1177.86	8167.69	14.4 16.9 (b)	Pass
		Diagonal	P1.5x16GA	369	-1238.25	8167.69	15.2 17.8 (b)	Pass
		Diagonal	P1.5x16GA	373	-987.71	8167.69	12.1 14.2 (b)	Pass
		Diagonal	P1.5x16GA	374	-1017.49	8167.69	12.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	P1.5x16GA	375	-1055.85	8167.69	14.6 (b) 12.9	Pass
		Diagonal	P1.5x16GA	376	-803.05	8167.69	15.2 (b) 9.8	Pass
		Diagonal	P1.5x16GA	377	-862.46	8167.69	11.5 (b) 10.6	Pass
		Diagonal	P1.5x16GA	378	-1017.70	8167.69	12.4 (b) 12.5	Pass
		Diagonal	P1.5x16GA	382	-1049.44	8167.69	14.6 (b) 12.8	Pass
		Diagonal	P1.5x16GA	383	-1076.11	8167.69	15.1 (b) 13.2	Pass
		Diagonal	P1.5x16GA	384	-1058.65	8167.69	15.5 (b) 13.0	Pass
		Diagonal	P1.5x16GA	385	-821.08	8167.69	15.2 (b) 10.1	Pass
		Diagonal	P1.5x16GA	386	-851.21	8167.69	11.8 (b) 10.4	Pass
		Diagonal	P1.5x16GA	387	-1019.65	8167.69	12.2 (b) 12.5	Pass
		Diagonal	P1.5x16GA	391	-1213.86	8167.69	14.7 (b) 14.9	Pass
		Diagonal	P1.5x16GA	392	-1239.46	8167.69	17.4 (b) 15.2	Pass
		Diagonal	P1.5x16GA	393	-1181.77	8167.69	17.8 (b) 14.5	Pass
		Diagonal	P1.5x16GA	394	-952.21	8167.69	17.0 (b) 11.7	Pass
		Diagonal	P1.5x16GA	395	-973.14	8167.69	13.7 (b) 11.9	Pass
		Diagonal	P1.5x16GA	396	-1131.89	8167.69	14.0 (b) 13.9	Pass
		Diagonal	P1.5x16GA	400	-926.13	8167.69	16.3 (b) 11.3	Pass
		Diagonal	P1.5x16GA	401	-945.17	8167.69	13.3 (b) 11.6	Pass
		Diagonal	P1.5x16GA	402	-847.58	8167.69	13.6 (b) 10.4	Pass
		Diagonal	P1.5x16GA	403	-725.99	8167.69	12.2 (b) 8.9	Pass
		Diagonal	P1.5x16GA	404	-669.66	8167.69	10.4 (b) 8.2	Pass
		Diagonal	P1.5x16GA	405	-795.35	8167.69	9.6 (b) 9.7	Pass
		Diagonal	P1.5x16GA	409	-1719.25	8167.69	11.4 (b) 21.0	Pass
		Diagonal	P1.5x16GA	410	-1737.49	8167.69	24.7 (b) 21.3	Pass
		Diagonal	P1.5x16GA	411	-1682.83	8167.69	25.0 (b) 20.6	Pass
		Diagonal	P1.5x16GA	412	-1549.55	8167.69	24.2 (b) 19.0	Pass
		Diagonal	P1.5x16GA	413	-1367.42	8167.69	22.3 (b) 16.7	Pass
		Diagonal	P1.5x16GA	414	-1443.28	8167.69	19.6 (b) 17.7	Pass
T14	60 - 40	Diagonal	P1.5x16GA	427	-2466.83	8185.90	20.7 (b) 30.1	Pass
		Diagonal	P1.5x16GA	428	-2824.29	8185.90	43.9 (b) 34.5 42.1 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	P1.5x16GA	429	-2588.11	8185.90	31.6 46.7 (b)	Pass
		Diagonal	P1.5x16GA	430	-2947.97	8185.90	36.0 45.1 (b)	Pass
		Diagonal	P1.5x16GA	431	-2576.11	8185.90	31.5 46.2 (b)	Pass
		Diagonal	P1.5x16GA	432	-2887.49	8185.90	35.3 43.9 (b)	Pass
		Diagonal	P1.5x16GA	433	2490.30	9144.98	27.2 60.3 (b)	Pass
		Diagonal	P1.5x16GA	434	2401.08	9144.98	26.3 58.1 (b)	Pass
		Diagonal	P1.5x16GA	435	2574.58	9144.98	28.2 62.3 (b)	Pass
		Diagonal	P1.5x16GA	436	2480.28	9144.98	27.1 60.0 (b)	Pass
		Diagonal	P1.5x16GA	437	2516.26	9144.98	27.5 60.9 (b)	Pass
		Diagonal	P1.5x16GA	438	2465.92	9144.98	27.0 59.7 (b)	Pass
		Diagonal	P1.5x16GA	439	-2563.70	8185.90	31.3 41.2 (b)	Pass
		Diagonal	P1.5x16GA	440	-2614.29	8185.90	31.9 43.0 (b)	Pass
		Diagonal	P1.5x16GA	441	-2640.64	8185.90	32.3 42.9 (b)	Pass
		Diagonal	P1.5x16GA	442	-2691.49	8185.90	32.9 44.9 (b)	Pass
		Diagonal	P1.5x16GA	443	-2617.86	8185.90	32.0 42.2 (b)	Pass
		Diagonal	P1.5x16GA	444	-2623.16	8185.90	32.0 43.1 (b)	Pass
		Diagonal	P1.5x16GA	445	-2155.16	8185.90	26.3 36.9 (b)	Pass
		Diagonal	P1.5x16GA	446	-2114.18	8185.90	25.8 37.8 (b)	Pass
		Diagonal	P1.5x16GA	447	-2086.46	8185.90	25.5 34.7 (b)	Pass
		Diagonal	P1.5x16GA	448	-2019.12	8185.90	24.7 36.4 (b)	Pass
		Diagonal	P1.5x16GA	449	-2059.46	8185.90	25.2 36.8 (b)	Pass
		Diagonal	P1.5x16GA	450	-2132.29	8185.90	26.0 36.0 (b)	Pass
		Diagonal	P1.5x16GA	451	1901.60	9144.98	20.8 46.0 (b)	Pass
		Diagonal	P1.5x16GA	452	1946.46	9144.98	21.3 47.1 (b)	Pass
		Diagonal	P1.5x16GA	453	1814.86	9144.98	19.8 43.9 (b)	Pass
		Diagonal	P1.5x16GA	454	1888.84	9144.98	20.7 45.7 (b)	Pass
		Diagonal	P1.5x16GA	455	1930.88	9144.98	21.1 46.7 (b)	Pass
		Diagonal	P1.5x16GA	456	1872.97	9144.98	20.5 45.3 (b)	Pass
		Diagonal	P1.5x16GA	457	-1683.71	8185.90	20.6 34.5 (b)	Pass
		Diagonal	P1.5x16GA	458	-1638.33	8185.90	20.0 35.3 (b)	Pass
		Diagonal	P1.5x16GA	459	-1644.53	8185.90	20.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							32.8 (b)	
		Diagonal	P1.5x16GA	460	-1568.63	8185.90	19.2	Pass
							34.4 (b)	
		Diagonal	P1.5x16GA	461	-1634.91	8185.90	20.0	Pass
							35.7 (b)	
		Diagonal	P1.5x16GA	462	-1696.72	8185.90	20.7	Pass
							34.3 (b)	
		Diagonal	P1.5x16GA	463	1460.30	9144.98	16.0	Pass
							35.3 (b)	
		Diagonal	P1.5x16GA	464	1504.52	9144.98	16.5	Pass
							36.4 (b)	
		Diagonal	P1.5x16GA	465	1404.56	9144.98	15.4	Pass
							34.0 (b)	
		Diagonal	P1.5x16GA	466	1477.45	9144.98	16.2	Pass
							35.8 (b)	
		Diagonal	P1.5x16GA	467	1541.93	9144.98	16.9	Pass
							37.3 (b)	
		Diagonal	P1.5x16GA	468	1477.52	9144.98	16.2	Pass
							35.8 (b)	
		Diagonal	P1.5x16GA	469	-1583.82	8185.90	19.3	Pass
							22.8 (b)	
		Diagonal	P1.5x16GA	470	-1532.76	8185.90	18.7	Pass
							22.9 (b)	
		Diagonal	P1.5x16GA	471	-1568.05	8185.90	19.2	Pass
							22.5 (b)	
		Diagonal	P1.5x16GA	472	-1483.02	8185.90	18.1	Pass
							22.6 (b)	
		Diagonal	P1.5x16GA	473	-1580.46	8185.90	19.3	Pass
							24.6 (b)	
		Diagonal	P1.5x16GA	474	-1659.86	8185.90	20.3	Pass
							23.8 (b)	
T15	40 - 20	Diagonal	P1.5x16GA	484	-1899.28	5849.69	32.5	Pass
		Diagonal	P1.5x16GA	485	-1555.67	5849.69	26.6	Pass
		Diagonal	P1.5x16GA	486	-1552.79	5849.69	26.5	Pass
		Diagonal	P1.5x16GA	490	-2142.95	5849.69	36.6	Pass
		Diagonal	P1.5x16GA	491	-1933.60	5849.69	33.1	Pass
		Diagonal	P1.5x16GA	492	-2092.13	5849.69	35.8	Pass
		Diagonal	P1.5x16GA	496	-2200.23	5849.69	37.6	Pass
		Diagonal	P1.5x16GA	497	-2355.01	5849.69	40.3	Pass
		Diagonal	P1.5x16GA	498	-2385.19	5849.69	40.8	Pass
		Diagonal	P1.5x16GA	502	-2446.88	5849.69	41.8	Pass
		Diagonal	P1.5x16GA	503	-2792.19	5849.69	47.7	Pass
		Diagonal	P1.5x16GA	504	-2888.73	5849.69	49.4	Pass
		Diagonal	P1.5x16GA	508	-2878.97	5849.69	49.2	Pass
		Diagonal	P1.5x16GA	509	-3191.94	5849.69	54.6	Pass
		Diagonal	P1.5x16GA	510	-3179.95	5849.69	54.4	Pass
		Diagonal	P1.5x16GA	514	-3327.72	5849.69	56.9	Pass
		Diagonal	P1.5x16GA	515	-3621.26	5849.69	61.9	Pass
		Diagonal	P1.5x16GA	516	-3677.66	5849.69	62.9	Pass
		Diagonal	P1.5x16GA	520	-3712.11	5849.69	63.5	Pass
		Diagonal	P1.5x16GA	521	-3975.39	5849.69	68.0	Pass
		Diagonal	P1.5x16GA	522	-3922.97	5849.69	67.1	Pass
		Diagonal	P1.5x16GA	526	-4196.51	5849.69	71.7	Pass
							75.9 (b)	
		Diagonal	P1.5x16GA	527	-4446.02	5849.69	76.0	Pass
							81.7 (b)	
		Diagonal	P1.5x16GA	528	-4449.32	5849.69	76.1	Pass
							81.0 (b)	
T16	20 - 5	Diagonal	P1.5x16GA	538	-2889.56	5864.69	49.3	Pass
							50.7 (b)	
		Diagonal	P1.5x16GA	539	-2382.08	5864.69	40.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	P1.5x16GA	540	-2086.05	5864.69	35.6	Pass
		Diagonal	P1.5x16GA	544	-2801.12	5864.69	47.8	Pass
		Diagonal	P1.5x16GA	545	-2265.90	5864.69	38.6	Pass
		Diagonal	P1.5x16GA	546	-2089.86	5864.69	35.6	Pass
		Diagonal	P1.5x16GA	550	-2355.89	5864.69	40.2	Pass
		Diagonal	P1.5x16GA	551	-1968.03	5864.69	33.6	Pass
		Diagonal	P1.5x16GA	552	-1899.86	5864.69	32.4	Pass
		Diagonal	P1.5x16GA	556	-1937.87	5864.69	33.0	Pass
		Diagonal	P1.5x16GA	557	-1887.42	5864.69	32.2	Pass
		Diagonal	P1.5x16GA	558	-1934.37	5864.69	33.0	Pass
		Diagonal	P1.5x16GA	562	-1739.28	5864.69	29.7	Pass
		Diagonal	P1.5x16GA	563	-1803.93	5864.69	30.8	Pass
		Diagonal	P1.5x16GA	564	-1742.79	5864.69	29.7	Pass
		Diagonal	P1.5x16GA	568	-1859.41	5864.69	31.7	Pass
		Diagonal	P1.5x16GA	569	-1622.70	5864.69	27.7	Pass
		Diagonal	P1.5x16GA	570	-1665.38	5864.69	28.4	Pass
T15	40 - 20	Horizontal	1	487	-1315.67	7613.41	17.3	Pass
		Horizontal	1	488	-1315.16	7613.41	17.3	Pass
		Horizontal	1	489	-1315.67	7613.41	17.3	Pass
		Horizontal	1	493	-1315.67	7613.41	17.3	Pass
		Horizontal	1	494	-1315.16	7613.41	17.3	Pass
		Horizontal	1	495	-1315.67	7613.41	17.3	Pass
		Horizontal	1	499	-1315.67	7613.41	17.3	Pass
		Horizontal	1	500	-1315.16	7613.41	17.3	Pass
		Horizontal	1	501	-1315.67	7613.41	17.3	Pass
		Horizontal	1	505	-1315.67	7613.41	17.3	Pass
		Horizontal	1	506	-1315.16	7613.41	17.3	Pass
		Horizontal	1	507	-1315.67	7613.41	17.3	Pass
		Horizontal	1	511	-1315.67	7613.41	17.3	Pass
		Horizontal	1	512	-1315.16	7613.41	17.3	Pass
		Horizontal	1	513	-1315.67	7613.41	17.3	Pass
		Horizontal	1	517	-1315.67	7613.41	17.3	Pass
		Horizontal	1	518	-1315.16	7613.41	17.3	Pass
		Horizontal	1	519	-1315.67	7613.41	17.3	Pass
		Horizontal	1	523	-1315.67	7613.41	17.3	Pass
		Horizontal	1	524	-1315.16	7613.41	17.3	Pass
		Horizontal	1	525	-1315.67	7613.41	17.3	Pass
T16	20 - 5	Horizontal	1	541	-1351.14	7613.41	17.7	Pass
		Horizontal	1	542	-1351.14	7613.41	17.7	Pass
		Horizontal	1	543	-1350.86	7613.41	17.7	Pass
		Horizontal	1	547	-1351.14	7613.41	17.7	Pass
		Horizontal	1	548	-1351.14	7613.41	17.7	Pass
		Horizontal	1	549	-1350.86	7613.41	17.7	Pass
		Horizontal	1	553	-1351.14	7613.41	17.7	Pass
		Horizontal	1	554	-1351.14	7613.41	17.7	Pass
		Horizontal	1	555	-1350.86	7613.41	17.7	Pass
		Horizontal	1	559	-1351.14	7613.41	17.7	Pass
		Horizontal	1	560	-1351.14	7613.41	17.7	Pass
		Horizontal	1	561	-1350.86	7613.41	17.7	Pass
		Horizontal	1	565	-1351.14	7613.41	17.7	Pass
		Horizontal	1	566	-1351.14	7613.41	17.7	Pass
		Horizontal	1	567	-1350.86	7613.41	17.7	Pass
T2	155 - 140	Secondary Horizontal	1	61	-528.74	7417.78	7.1 10.1 (b)	Pass
		Secondary Horizontal	1	62	-528.74	7417.78	7.1 11.6 (b)	Pass
		Secondary Horizontal	1	63	-526.84	7417.78	7.1 11.7 (b)	Pass
		Secondary Horizontal	1	70	-528.74	7417.78	7.1 9.5 (b)	Pass
		Secondary Horizontal	1	71	-528.74	7417.78	7.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Secondary Horizontal	1	72	-526.84	7417.78	10.6 (b) 7.1	Pass
		Secondary Horizontal	1	79	-528.74	7417.78	10.7 (b) 7.1	Pass
		Secondary Horizontal	1	80	-528.74	7417.78	8.8 (b) 7.1	Pass
		Secondary Horizontal	1	81	-526.84	7417.78	16.1 (b) 7.1	Pass
		Secondary Horizontal	1	88	-528.74	7417.78	16.2 (b) 7.1	Pass
		Secondary Horizontal	1	89	-528.74	7417.78	8.7 (b) 7.1	Pass
		Secondary Horizontal	1	90	-526.84	7417.78	8.9 (b) 7.1	Pass
		Secondary Horizontal	1	97	-528.74	7417.78	8.8 (b) 7.1	Pass
		Secondary Horizontal	1	98	-528.74	7417.78	7.1	Pass
		Secondary Horizontal	1	99	-526.84	7417.78	7.1	Pass
		Secondary Horizontal	1	106	-1449.13	7417.78	7.1	Pass
		Secondary Horizontal	1	107	-1455.08	7417.78	19.5 23.8 (b)	Pass
		Secondary Horizontal	1	108	-1493.25	7417.78	19.6 23.1 (b)	Pass
T3	140 - 120	Secondary Horizontal	L1 3/4x1 3/4x1/4	124	1302.10	20390.60	20.1 23.7 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	125	1277.66	20390.60	6.4 16.8 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	126	1273.02	20390.60	6.3 16.5 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	133	1680.29	20390.60	6.2 16.4 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	134	1727.07	20390.60	8.2 21.7 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	135	1728.29	20390.60	8.5 22.3 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	142	1689.94	20390.60	8.5 22.3 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	143	1745.42	20390.60	8.3 21.8 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	144	1758.10	20390.60	8.6 22.5 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	151	1652.99	20390.60	8.6 22.7 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	152	1727.06	20390.60	8.1 21.3 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	153	1719.37	20390.60	8.5 22.3 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	160	1984.54	20390.60	8.4 22.2 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	161	2114.55	20390.60	9.7 25.6 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	162	2079.15	20390.60	10.4 27.3 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	169	3093.51	20390.60	10.2 26.8 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	170	2994.35	20390.60	15.2 39.9 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	171	3029.20	20390.60	14.7 38.6 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	178	1144.69	20390.60	14.9 39.1 (b)	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	178	1144.69	20390.60	5.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Secondary Horizontal	L1 3/4x1 3/4x1/4	179	1175.88	20390.60	14.8 (b) 5.8	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	180	1181.60	20390.60	15.2 (b) 5.8	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	187	1236.95	20390.60	15.2 (b) 6.1	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	188	1382.63	20390.60	16.0 (b) 6.8	Pass
		Secondary Horizontal	L1 3/4x1 3/4x1/4	189	1396.37	20390.60	17.8 (b) 6.8	Pass
T8	110 - 107.5	Secondary Horizontal	L2x2x3/16	238	-916.51	18862.50	18.0 (b) 4.9	Pass
		Secondary Horizontal	L2x2x3/16	239	-912.43	18862.50	14.8 (b) 4.8	Pass
		Secondary Horizontal	L2x2x3/16	240	-916.51	18862.50	14.7 (b) 4.9	Pass
T9	107.5 - 105	Secondary Horizontal	L2x2x3/16	250	1097.30	19503.60	14.8 (b) 5.6	Pass
		Secondary Horizontal	L2x2x3/16	251	1091.76	19503.60	17.7 (b) 5.6	Pass
		Secondary Horizontal	L2x2x3/16	252	1119.72	19503.60	17.6 (b) 5.7	Pass
T10	105 - 102.5	Secondary Horizontal	L2x2x3/16	262	1278.18	19503.60	18.1 (b) 6.6	Pass
		Secondary Horizontal	L2x2x3/16	263	1266.77	19503.60	20.6 (b) 6.5	Pass
		Secondary Horizontal	L2x2x3/16	264	1299.92	19503.60	20.4 (b) 6.7	Pass
T11	102.5 - 100	Secondary Horizontal	L2x2x3/16	277	-969.05	18862.50	21.0 (b) 5.1	Pass
		Secondary Horizontal	L2x2x3/16	278	-952.84	18862.50	15.6 (b) 5.1	Pass
		Secondary Horizontal	L2x2x3/16	279	-969.05	18862.50	15.4 (b) 5.1	Pass
T13	80 - 60	Secondary Horizontal	L2x2x3/16	352	-1200.74	18894.90	15.6 (b) 6.4	Pass
		Secondary Horizontal	L2x2x3/16	353	-1170.86	18894.90	19.4 (b) 6.2	Pass
		Secondary Horizontal	L2x2x3/16	354	-1200.74	18894.90	18.9 (b) 6.4	Pass
		Secondary Horizontal	L2x2x3/16	361	1394.55	19503.60	19.4 (b) 7.2	Pass
		Secondary Horizontal	L2x2x3/16	362	1354.88	19503.60	22.5 (b) 6.9	Pass
		Secondary Horizontal	L2x2x3/16	363	1383.42	19503.60	21.9 (b) 7.1	Pass
		Secondary Horizontal	L2x2x3/16	370	1252.88	19503.60	22.3 (b) 6.4	Pass
		Secondary Horizontal	L2x2x3/16	371	1220.06	19503.60	20.2 (b) 6.3	Pass
		Secondary Horizontal	L2x2x3/16	372	1248.19	19503.60	19.7 (b) 6.4	Pass
		Secondary Horizontal	L2x2x3/16	379	1303.11	19503.60	20.1 (b) 6.7	Pass
		Secondary Horizontal	L2x2x3/16	380	1268.12	19503.60	21.0 (b) 6.5	Pass
		Secondary Horizontal	L2x2x3/16	381	1299.12	19503.60	20.5 (b) 6.7	Pass
		Secondary Horizontal	L2x2x3/16	388	1292.31	19503.60	21.0 (b) 6.6	Pass
							20.8 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Secondary Horizontal	L2x2x3/16	389	1257.48	19503.60	6.4 20.3 (b)	Pass
		Secondary Horizontal	L2x2x3/16	390	1289.09	19503.60	6.6 20.8 (b)	Pass
		Secondary Horizontal	L2x2x3/16	397	-1200.74	18894.90	6.4 19.9 (b)	Pass
		Secondary Horizontal	L2x2x3/16	398	-1170.86	18894.90	6.2 19.4 (b)	Pass
		Secondary Horizontal	L2x2x3/16	399	-1200.74	18894.90	6.4 19.9 (b)	Pass
		Secondary Horizontal	L2x2x3/16	406	1350.10	19503.60	6.9 21.8 (b)	Pass
		Secondary Horizontal	L2x2x3/16	407	1315.45	19503.60	6.7 21.2 (b)	Pass
		Secondary Horizontal	L2x2x3/16	408	1345.85	19503.60	6.9 21.7 (b)	Pass
		Secondary Horizontal	L2x2x3/16	415	-1200.74	18894.90	6.4 19.4 (b)	Pass
		Secondary Horizontal	L2x2x3/16	416	-1170.86	18894.90	6.2 18.9 (b)	Pass
		Secondary Horizontal	L2x2x3/16	417	-1200.74	18894.90	6.4 19.4 (b)	Pass
T1	170 - 155	Top Girt	P1.5x16GA	4	-42.02	6746.92	0.6	Pass
		Top Girt	P1.5x16GA	5	-40.80	6746.92	0.6 0.6 (b)	Pass
		Top Girt	P1.5x16GA	6	-41.44	6746.92	0.6 0.6 (b)	Pass
T2	155 - 140	Top Girt	P1.5x16GA	49	466.90	9144.98	5.1 11.3 (b)	Pass
		Top Girt	P1.5x16GA	50	463.18	9144.98	5.1 11.2 (b)	Pass
		Top Girt	P1.5x16GA	51	473.58	9144.98	5.2 11.5 (b)	Pass
T3	140 - 120	Top Girt	L1 3/4x1 3/4x3/16	112	-1589.23	10326.10	15.4 36.6 (b)	Pass
		Top Girt	L1 3/4x1 3/4x3/16	113	-1571.65	10326.10	15.2 36.8 (b)	Pass
		Top Girt	L1 3/4x1 3/4x3/16	114	-1554.58	10326.10	15.1 36.2 (b)	Pass
T4	120 - 117.5	Top Girt	P1.5x16GA	193	1164.78	9144.98	12.7 28.2 (b)	Pass
		Top Girt	P1.5x16GA	194	1177.65	9144.98	12.9 28.5 (b)	Pass
		Top Girt	P1.5x16GA	195	1164.18	9144.98	12.7 28.2 (b)	Pass
T12	100 - 80	Top Girt	P1.5x16GA	283	847.37	9144.98	9.3 20.5 (b)	Pass
		Top Girt	P1.5x16GA	284	847.42	9144.98	9.3 20.5 (b)	Pass
		Top Girt	P1.5x16GA	285	873.55	9144.98	9.6 21.1 (b)	Pass
T13	80 - 60	Top Girt	P1.5x16GA	340	441.91	9144.98	4.8 10.7 (b)	Pass
		Top Girt	P1.5x16GA	341	444.61	9144.98	4.9 10.8 (b)	Pass
		Top Girt	P1.5x16GA	342	455.93	9144.98	5.0 11.0 (b)	Pass
T14	60 - 40	Top Girt	P1.5x16GA	421	880.51	9144.98	9.6 21.3 (b)	Pass
		Top Girt	P1.5x16GA	422	865.82	9144.98	9.5 21.0 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Top Girt	P1.5x16GA	423	880.41	9144.98	9.6	Pass
							21.3 (b)	
T15	40 - 20	Top Girt	P1.5x16GA	478	1098.54	9144.98	12.0	Pass
							26.6 (b)	
		Top Girt	P1.5x16GA	479	1151.37	9144.98	12.6	Pass
							27.9 (b)	
		Top Girt	P1.5x16GA	480	1164.38	9144.98	12.7	Pass
							28.2 (b)	
T16	20 - 5	Top Girt	P1.5x16GA	532	544.44	9144.98	6.0	Pass
							13.2 (b)	
		Top Girt	P1.5x16GA	533	533.84	9144.98	5.8	Pass
							12.9 (b)	
		Top Girt	P1.5x16GA	534	555.08	9144.98	6.1	Pass
							13.4 (b)	
T17	5 - 0	Top Girt	14x3/16	574	7532.94	1360800.00	0.6	Pass
		Top Girt	14x3/16	575	7669.35	1360800.00	0.6	Pass
		Top Girt	14x3/16	576	7573.64	1360800.00	0.6	Pass
T1	170 - 155	Bottom Girt	P1.5x16GA	7	-954.84	6746.92	14.2	Pass
							26.0 (b)	
		Bottom Girt	P1.5x16GA	8	-958.31	6746.92	14.2	Pass
							26.0 (b)	
		Bottom Girt	P1.5x16GA	9	-956.80	6746.92	14.2	Pass
							26.0 (b)	
T2	155 - 140	Bottom Girt	P1.5x16GA	52	606.28	9144.98	6.6	Pass
							14.7 (b)	
		Bottom Girt	P1.5x16GA	53	624.25	9144.98	6.8	Pass
							15.1 (b)	
		Bottom Girt	P1.5x16GA	54	623.50	9144.98	6.8	Pass
							15.1 (b)	
T3	140 - 120	Bottom Girt	L1 3/4x1 3/4x3/16	115	1880.42	15675.30	12.0	Pass
							32.4 (b)	
		Bottom Girt	L1 3/4x1 3/4x3/16	116	1890.07	15675.30	12.1	Pass
							32.5 (b)	
		Bottom Girt	L1 3/4x1 3/4x3/16	117	1871.62	15675.30	11.9	Pass
							32.2 (b)	
T11	102.5 - 100	Bottom Girt	P1.5x16GA	268	430.64	9144.98	4.7	Pass
		Bottom Girt	P1.5x16GA	269	420.18	9144.98	4.6	Pass
		Bottom Girt	P1.5x16GA	270	432.56	9144.98	4.7	Pass
T12	100 - 80	Bottom Girt	P1.5x16GA	286	1019.24	9144.98	11.1	Pass
		Bottom Girt	P1.5x16GA	287	988.28	9144.98	10.8	Pass
		Bottom Girt	P1.5x16GA	288	1007.35	9144.98	11.0	Pass
T13	80 - 60	Bottom Girt	P1.5x16GA	343	389.65	9144.98	4.3	Pass
		Bottom Girt	P1.5x16GA	344	374.31	9144.98	4.1	Pass
		Bottom Girt	P1.5x16GA	345	373.06	9144.98	4.1	Pass
T14	60 - 40	Bottom Girt	P1.5x16GA	424	925.37	9144.98	10.1	Pass
		Bottom Girt	P1.5x16GA	425	942.59	9144.98	10.3	Pass
		Bottom Girt	P1.5x16GA	426	961.53	9144.98	10.5	Pass
T15	40 - 20	Bottom Girt	P1.5x16GA	481	575.46	9144.98	6.3	Pass
		Bottom Girt	P1.5x16GA	482	547.19	9144.98	6.0	Pass
		Bottom Girt	P1.5x16GA	483	484.16	9144.98	5.3	Pass
T16	20 - 5	Bottom Girt	L2x2x3/16	535	10458.50	23166.00	45.1	Pass
		Bottom Girt	L2x2x3/16	536	10756.60	23166.00	46.4	Pass
		Bottom Girt	L2x2x3/16	537	10710.90	23166.00	46.2	Pass
T17	5 - 0	Bottom Girt	14x3/16	577	-4925.11	1359770.00	0.9	Pass
		Bottom Girt	14x3/16	578	-5662.56	1359770.00	0.7	Pass
		Bottom Girt	14x3/16	579	-5746.89	1359770.00	0.8	Pass
T17	5 - 0	Mid Girt	14x3/16	580	83.21	1360800.00	0.0	Pass
		Mid Girt	14x3/16	581	83.30	1360800.00	0.0	Pass
		Mid Girt	14x3/16	582	83.61	1360800.00	0.0	Pass
T2	155 - 140	Guy A@152.333	7/16	594	11423.80	12480.00	91.5	Pass
		Guy A@152.333	7/16	595	11459.10	12480.00	91.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T3	140 - 120	Guy A@132.438	9/16	606	18692.40	21000.00	89.0	Pass
		Guy A@132.438	9/16	607	18768.80	21000.00	89.4	Pass
T12	100 - 80	Guy A@87.5625	9/16	615	18012.60	21000.00	85.8	Pass
T14	60 - 40	Guy A@47.5625	9/16	621	16054.10	21000.00	76.4	Pass
T2	155 - 140	Guy B@152.333	7/16	590	11096.00	12480.00	88.9	Pass
		Guy B@152.333	7/16	591	10863.30	12480.00	87.0	Pass
T3	140 - 120	Guy B@132.438	9/16	602	18014.20	21000.00	85.8	Pass
		Guy B@132.438	9/16	603	17719.40	21000.00	84.4	Pass
T12	100 - 80	Guy B@87.5625	9/16	614	17139.70	21000.00	81.6	Pass
T14	60 - 40	Guy B@47.5625	9/16	620	15215.30	21000.00	72.5	Pass
T2	155 - 140	Guy C@152.333	7/16	583	10566.80	12480.00	84.7	Pass
		Guy C@152.333	7/16	584	10765.70	12480.00	86.3	Pass
T3	140 - 120	Guy C@132.438	9/16	598	17306.20	21000.00	82.4	Pass
		Guy C@132.438	9/16	599	17379.60	21000.00	82.8	Pass
T12	100 - 80	Guy C@87.5625	9/16	610	16648.40	21000.00	79.3	Pass
T14	60 - 40	Guy C@47.5625	9/16	616	14770.20	21000.00	70.3	Pass
T2	155 - 140	Top Guy Pull-Off@152.333	L2x2x3/16	587	-5160.12	13953.10	37.0 87.9 (b)	Pass
		Top Guy Pull-Off@152.333	L2x2x3/16	588	-5132.45	13953.10	36.8 88.6 (b)	Pass
		Top Guy Pull-Off@152.333	L2x2x3/16	589	-5121.31	13953.10	36.7 88.1 (b)	Pass
T12	100 - 80	Top Guy Pull-Off@87.5625	4x3/8	611	6295.19	48600.00	13.0	Pass
		Top Guy Pull-Off@87.5625	4x3/8	612	6311.55	48600.00	13.0	Pass
		Top Guy Pull-Off@87.5625	4x3/8	613	6288.25	48600.00	12.9	Pass
T14	60 - 40	Top Guy Pull-Off@47.5625	4x3/8	617	7060.02	48600.00	14.5	Pass
		Top Guy Pull-Off@47.5625	4x3/8	618	7144.30	48600.00	14.7	Pass
		Top Guy Pull-Off@47.5625	4x3/8	619	7107.44	48600.00	14.6	Pass
T2	155 - 140	Torque Arm Top@152.333	C12x20.7	585	-3333.96	171988.00	44.8	Pass
		Torque Arm Top@152.333	C12x20.7	586	-3343.52	171988.00	49.1	Pass
		Torque Arm Top@152.333	C12x20.7	592	-3387.47	171988.00	46.5	Pass
		Torque Arm Top@152.333	C12x20.7	593	-3384.49	171988.00	44.6	Pass
		Torque Arm Top@152.333	C12x20.7	596	2813.49	197316.00	46.4	Pass
		Torque Arm Top@152.333	C12x20.7	597	2728.29	197316.00	48.9	Pass
T3	140 - 120	Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" plate	600	-6443.84	241128.00	47.5	Pass
		Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" plate	601	-6487.85	241128.00	53.6	Pass
		Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" plate	604	-6533.52	241128.00	50.0	Pass
		Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" plate	605	-6523.72	241128.00	47.4	Pass
		Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" plate	608	-6355.95	241128.00	49.7	Pass
		Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" plate	609	-6381.50	241128.00	53.1	Pass
							Summary	
						Leg (T12)	97.7	Pass
						Diagonal	81.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						(T15)		
						Horizontal (T16)	17.7	Pass
						Secondary Horizontal (T3)	39.9	Pass
						Top Girt (T3)	36.8	Pass
						Bottom Girt (T16)	46.4	Pass
						Mid Girt (T17)	0.0	Pass
						Guy A (T2)	91.8	Pass
						Guy B (T2)	88.9	Pass
						Guy C (T2)	86.3	Pass
						Top Guy Pull-Off (T2)	88.6	Pass
						Torque Arm Top (T3)	53.6	Pass
						Bolt Checks	88.6	Pass
						RATING =	**97.7**	**Pass**

Program Version 8.0.5.0 - 11/28/2018 File:P:/Projects/Telcom/StructuralsByLocation/Connecticut/Newington_99 CedarwoodLane/IQ1_Update to CAL-005/Option 1/ERI_G_/20180918_AECOM MODS_99 Cedarwood Lane_Newington.eri

FOUNDATION ANALYSIS

AECOM

				Page	of
Job	170' Guyed Lattice Tower - Newington, CT	Project No.	CAL-005 (Rev. 2)	Sheet 1	of 2
Description	Spread Footing w/ Pier Analysis - TIA Req	Computed by	MCD	Date	10/11/18
	TIA-222-G Standard - Foundation Pad Check	Checked by		Date	

FOUNDATION ANALYSIS

TOWER FORCES:

Moment Caused by Tower: $M_t := 0 \cdot ft \cdot kips$

Factored Shear at Base of Tower: $S_t := 2744 lbf$

Factored Max Compressive Force: $C_t := 236969 lbf$

Height of Tower: $H_t := 170 \cdot ft$

FOOTING DIMENSIONS:

Overall Depth of Footing: $D_f := 4.5 ft$

Length of Pier: $L_p := 1.75 \cdot ft$

Extension of Pier Above Grade: $L_{pag} := 0.5 \cdot ft$

Diameter of Pier: $d_p := 2 \cdot ft$

Thickness of Footing: $T_f := 2.75 \cdot ft$

Width of Footing: $W_f := 9.5 ft$

PROPERTIES:

Internal Friction Angle of Soil: $\phi_s := 30 \cdot deg$

Allowable Bearing Capacity: $q_s := 4000 \cdot psf$

Ultimate Bearing Capacity: $U_{q.s} := 2 \cdot q_s$

Design Bearing Capacity: "0.6" TIA-222-G Red. Factor: $D_{q.s} := 0.6 \cdot U_{q.s} = 4.8 \cdot ksf$

Unit Weight of Soil: $\gamma_s := 120 \cdot pcf$

Unit Weight of Concrete: $\gamma_c := 150 \cdot pcf$

Depth to Neglect: $n := 0 ft$

Cohesion of Clay Type Soil Note: Use 0 for Sandy Soil: $c := 0 \cdot ksf$

Seismic Zone Factor: UBC Fig 23-2: $Z := 2$

Coefficient of Friction between Concrete: $\mu := 0.45$

STABILITY OF FOOTING

Coefficient of Lateral Soil Pressure:

$$K_p := \frac{1 + \sin(\phi_s)}{1 - \sin(\phi_s)} \qquad K_p = 3$$

Passive Pressure:

$$P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} \qquad P_{pn} = 0 \cdot ksf$$

$$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} \qquad P_{pt} = 0.63 \cdot ksf$$

$$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] \qquad P_{top} = 0.63 \cdot ksf$$

$$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} \qquad P_{bot} = 1.62 \cdot ksf$$

$$P_{ave} := \frac{P_{top} + P_{bot}}{2} \qquad P_{ave} = 1.125 \cdot ksf$$

$$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] \qquad T_p = 2.75 \cdot ft$$

$$A_p := W_f \cdot T_p \qquad A_p = 26.125 \cdot ft^2$$

Ultimate Shear:

$$S_u := P_{ave} \cdot A_p \qquad S_u = 29.3906 \cdot kip$$

AECOM

Job	170' Guyed Lattice Tower - Newington, CT	Project No.	CAL-005 (Rev. 2)	Page / Sheet	2 of 2
Description	Spread Footing w/ Pier Analysis - TIA Req	Computed by	MCD	Date	10/11/18
	TIA-222-G Standard - Foundation Pad Check	Checked by		Date	

Weight of Concrete Pad:

$$WT_c := \left[\left[\left(W_f^{\,2}\cdot T_f\right) + d_p^{\,2} L_p\right]\cdot \gamma_c\right]\cdot 0.9 \qquad WT_c = 34.4503\cdot kip$$

Weight of Soil: above Footing:

$$WT_{s1} := \left[\left[W_f^{\,2}\cdot\left(\left|L_p - L_{pag}\right|\right) - \frac{d_p^{\,2}\cdot\pi}{4}\cdot\left(\left|L_p - L_{pag}\right|\right)\right]\cdot\gamma_s\right]\cdot 0.9 \qquad WT_{s1} = 11.7596\cdot kip$$

Weight of Soil Wedge at back face:

$$WT_{s2} := \left[\left(\frac{D_f^{\,2}\cdot\tan\left(\phi_s\right)}{2}\cdot W_f\right)\cdot\gamma_s\right]\cdot 0.9 \qquad WT_{s2} = 5.9977\cdot kip$$

Total Weight:

$$WT_{tot.0.9} := WT_c + WT_{s1} + C_t \qquad WT_{tot.0.9} = 283.1789\cdot kip$$

Resisting Moment:

$$M_r := \left(WT_{tot.0.9}\right)\cdot\frac{W_f}{2} + S_u\cdot\frac{T_f}{3} + WT_{s2}\cdot\left(W_f + \frac{D_f\cdot\tan\left(\phi_s\right)}{3}\right) \qquad M_r = 1434.2133\cdot kip\cdot ft$$

Overturning Moment:

$$M_{ot} := M_t + S_t\cdot\left(L_p + T_f\right) \qquad M_{ot} = 12.348\cdot kip\cdot ft$$

Factor of Safety:

$$FS := \frac{M_r}{M_{ot}} \qquad FS = 116.15$$

$$SafetyCheck := \text{if}\left(M_r > M_{ot}, \text{"Okay"}, \text{"No Good"}\right) \qquad SafetyCheck = \text{"Okay"}$$

BEARING PRESSURE CAUSED BY FOOTING

$$WT_{tot.1.2} := WT_c\cdot\frac{4}{3} + WT_{s1}\cdot\frac{4}{3} + C_t$$

NOTE: The "4/3" value multiplier is the multiplied value of increasing the above DL*0.9 to equal DL*1.2, per TIA-222-G design Standards (Section 9.4 - Foundation Design) for additional factored Dead Load of Foundation/Soil.

$$A_{mat} := W_f^{\,2} \qquad A_{mat} = 90.25\cdot ft^2$$

$$S := \frac{W_f^{\,3}}{6} \qquad S = 142.8958\cdot ft^3$$

$$P_{max} := \frac{WT_{tot.1.2}}{A_{mat}} + \frac{M_{ot}}{S} \qquad P_{max} = 3.3948\cdot ksf$$

$$P_{min} := \frac{WT_{tot.1.2}}{A_{mat}} - \frac{M_{ot}}{S} \qquad P_{min} = 3.222\cdot ksf$$

$$MaxPressure := \text{if}\left(P_{max} < D_{q.s}, \text{"Okay"}, \text{"No Good"}\right) \qquad MaxPressure = \text{"Okay"}$$

$$MinPressure := \text{if}\left[\left(P_{min} \geq 0\right)\cdot\left(P_{min} < D_{q.s}\right), \text{"Okay"}, \text{"No Good"}\right] \qquad MinPressure = \text{"Okay"}$$

$$\frac{P_{max}}{D_{q.s}} = 70.73\cdot\% \qquad \frac{P_{min}}{D_{q.s}} = 67.12\cdot\%$$

ANCHOR DETAILS

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	1 of 2
	Anchor Block A	**Checked by:**		**Date**	1/11/19
				Date	

CHECK UPLIFT RESISTANCE

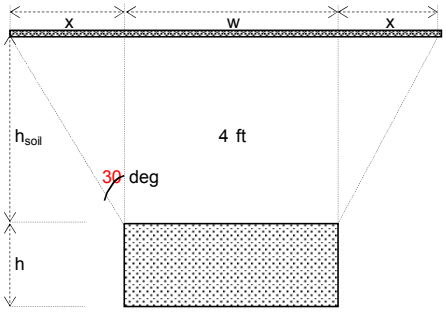
RESULTS FROM COMPUTER ANALYSIS:

(Factored)	Uplift =	23.124	kips
(Factored)	Sliding =	24.429	kips

CONCRETE PARAMETERS:

	γ_{conc} =	150	pcf
	w =	4	ft
	h =	2	ft
	d =	10	ft
	Vol. =	*80*	ft^3
0.9 *	Wc =	*10.80*	kips

*See Note 1 Below for 0.9*DL Explanation*



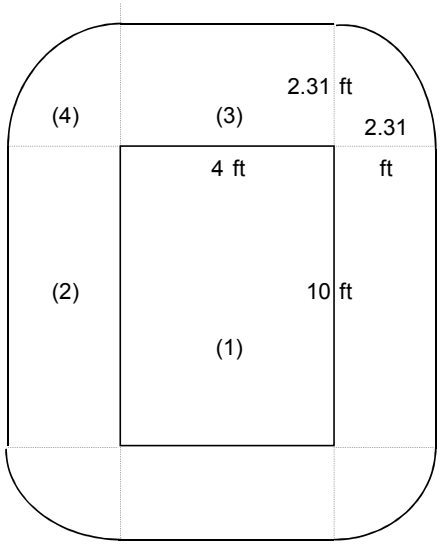
Foundation Section

SOIL PARAMETERS:

	γ_{soil} =	130	pcf
	h_{soil} =	4	ft
	x =	*2.31*	ft

Soil Weight (Wr):

0.9 *	(1) =	18.72	kips
	(2) =	12.01	kips
	(3) =	4.80	kips
	(4) =	2.90	kips
*(5) Anchor Reinf. =		0	kips
R_n =	Total =	38.44	kips
	φs =	0.75	*TIA-222-G Red. Factor*
	$\phi s*R_n$ =	36.93	kips



Foundation Plan View

CHECK UPLIFT (PER TIA-222-G STANDARD):

36.93 (Reduced Resistance) **>** *23.124* (Factored Uplift) ***OK*** **62.6%**

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

NOTES: ***Note 1 -*** **0.9xDL of concrete and soil directly above foundation (Section 2.3.2 - Note 2)**
Note 2 - Soil not directly above guy anchor treated as "nominal resistance" multiplied by TIAA-222-G Section 9 Reduction Factor for Uplift resistance

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	2 of 2
	Anchor Block A	**Checked by:**		**Date**	1/11/19
				Date	

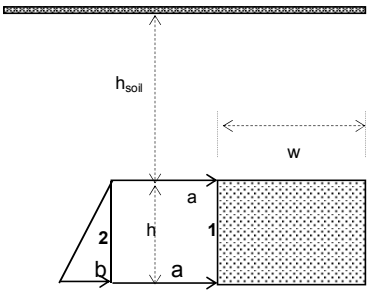
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	130	pcf
h_{soil} =	4	ft
h =	2	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.0	ft
h =	2.0	ft
d =	10.0	ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		1.56	ksf
2 =		2.34	ksf
Average of Soil Pressure on Anchor Block =		1.95	ksf
RESIST TO SLIDING =		39.00	k
SOIL & CONCRETE WEIGHT * 0.9(DL) =	Wr + Wc =	46.18	k
UPLIFT REACTIONS =		-23.124	k
SUM =		23.06	k
COEF. OF FRICTION, (0.5) =		11.53	k
RESIST TO SLIDING =		39.00	k
SUM =		50.53	k
Applied Reduction Factor (0.75) per TIA-222-G =		37.90	kips

SF AGAINST SLIDING

SF = ***37.90*** ***>*** ***24.4*** ***OK*** **64.5%**

(Reduced Resistance) (Factored Shear/Slide Force)

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

NOTES: Note 1 - "Soil and Concrete Weight shown applies 0.9xDL for Soil above Concrete & Concrete DL
Note 2 - TIA-222-G States "when determinimg a soil nominal resistance that is a function of soil wt. a factor of 1.0 applies to th weight of soil and the resulting nominal strength shall be multiplied by the appropiate resistance factor" (0.75 - TIA-222-G Section 9) "to determine soil design str."

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	1 of 2
	Anchor Block B	**Checked by:**		**Date**	1/11/19
				Date	

CHECK UPLIFT RESISTANCE

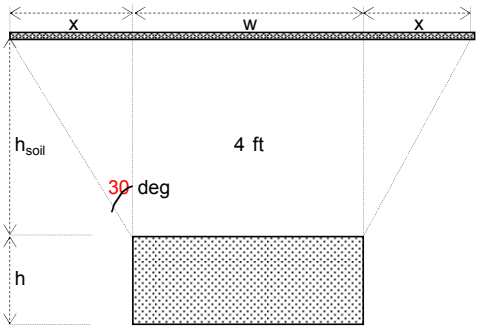
RESULTS FROM COMPUTER ANALYSIS:

(Factored)	Uplift =	20.700	kips
(Factored)	Sliding =	24.264	kips

CONCRETE PARAMETERS:

	γ_{conc} =	150	pcf
	w =	4	ft
	h =	2	ft
	d =	10	ft
	Vol. =	*80*	ft^3
0.9 *	Wc =	*10.80*	kips

*See Note 1 Below for 0.9*DL Explanation*



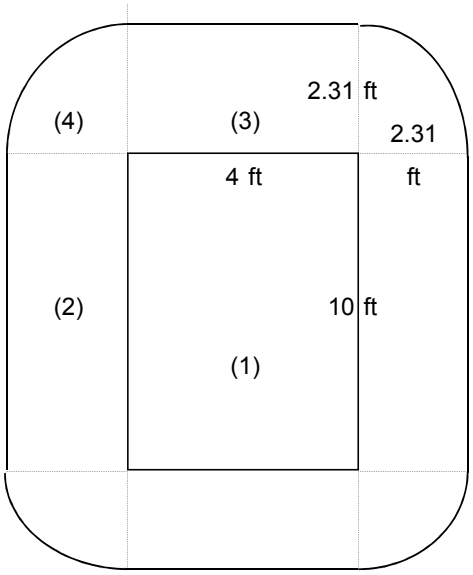
Foundation Section

SOIL PARAMETERS:

	γ_{soil} =	130	pcf
	h_{soil} =	4	ft
	x =	*2.31*	ft

Soil Weight (Wr):

0.9 *	(1) =	18.72	kips
	(2) =	12.01	kips
	(3) =	4.80	kips
	(4) =	2.90	kips
	*(5) Anchor Reinf. =	0	kips
R_n =	Total =	38.44	kips
	φs =	0.75	*TIA-222-G Red. Factor*
	$\phi s*R_n$ =	36.93	kips



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Foundation Plan View

CHECK UPLIFT (PER TIA-222-G STANDARD):

36.93 **>** *20.7* ***OK*** **56.1%**

(Reduced Resistance) (Factored Uplift)

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

NOTES: ***Note 1 -*** **0.9xDL of concrete and soil directly above foundation (Section 2.3.2 - Note 2**

Note 2 - Soil not directly above guy anchor treated as "nominal resistance" multiplied by TIAA-222-G Section 9 Reduction Factor for Uplift resistance

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	2 of 2
	Anchor Block B	**Checked by:**		**Date**	1/11/19
				Date	

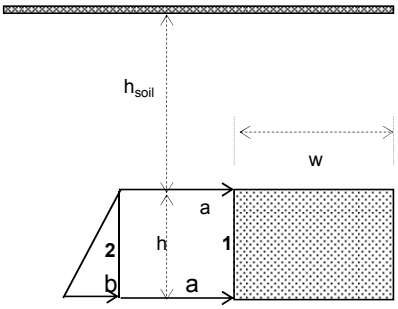
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	130	pcf
h_{soil} =	4	ft
h =	2	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.0	ft
h =	2.0	ft
d =	10.0	ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		1.56	ksf
2 =		2.34	ksf
Average of Soil Pressure on Anchor Block =		1.95	ksf
RESIST TO SLIDING =		39.00	k
SOIL & CONCRETE WEIGHT * 0.9(DL) =	Wr + Wc =	46.18	k
UPLIFT REACTIONS =		-20.7	k
SUM =		25.48	k
COEF. OF FRICTION, (0.5) =		12.74	k
RESIST TO SLIDING =		39.00	k
SUM =		51.74	k
Applied Reduction Factor (0.75) per TIA-222-G =		38.81	kips

SF AGAINST SLIDING

SF = ***38.81*** ***>*** ***24.3*** ***OK*** **62.5%**

(Reduced Resistance) (Factored Shear/Slide Force)

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

NOTES: Note 1 - "Soil and Concrete Weight shown applies 0.9xDL for Soil above Concrete & Concrete DL
Note 2 - TIA-222-G States "when determinimg a soil nominal resistance that is a function of soil wt. a factor of 1.0 applies to th weight of soil and the resulting nominal strength shall be multiplied by the appropiate resistance factor" (0.75 - TIA-222-G Section 9) "to determine soil design str.'

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	1 of 2
	Anchor Block C	**Checked by:**		**Date**	1/11/19
				Date	

CHECK UPLIFT RESISTANCE

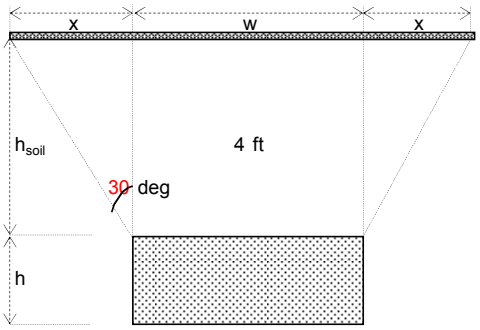
RESULTS FROM COMPUTER ANALYSIS:

(Factored)	Uplift =	19.290	kips
(Factored)	Sliding =	24.178	kips

CONCRETE PARAMETERS:

	γ_{conc} =	150	pcf
	w =	4	ft
	h =	2	ft
	d =	10	ft
	Vol. =	*80*	ft^3
0.9 *	Wc =	*10.80*	kips

*See Note 1 Below for 0.9*DL Explanation*



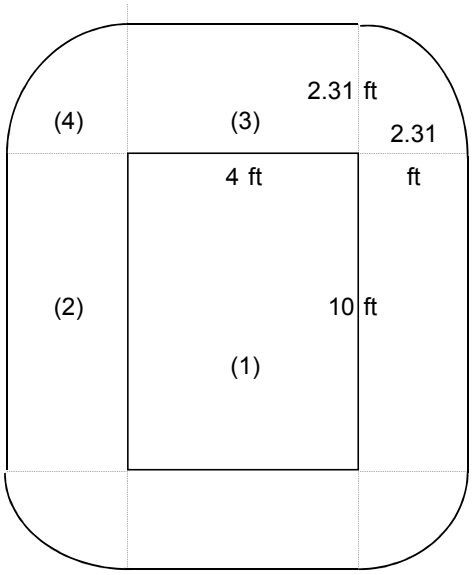
Foundation Section

SOIL PARAMETERS:

	γ_{soil} =	130	pcf
	h_{soil} =	4	ft
	x =	*2.31*	ft

Soil Weight (Wr):

0.9 *	(1) =	18.72	kips
	(2) =	12.01	kips
	(3) =	4.80	kips
	(4) =	2.90	kips
	*(5) Anchor Reinf. =	0	kips
R_n =	Total =	38.44	kips
	φs =	0.75	*TIA-222-G Red. Factor*
	$\phi s*R_n$ =	36.93	kips



FORCE ←

Foundation Plan View

CHECK UPLIFT (PER TIA-222-G STANDARD):

36.93 **>** *19.29* ***OK*** **52.2%**

(Reduced Resistance) (Factored Uplift)

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

NOTES: ***Note 1 -*** **0.9xDL of concrete and soil directly above foundation (Section 2.3.2 - Note 2**

Note 2 - Soil not directly above guy anchor treated as "nominal resistance" multiplied by TIAA-222-G Section 9 Reduction Factor for Uplift resistance

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	2 of 2
	Anchor Block C	**Checked by:**		**Date**	1/11/19
				Date	

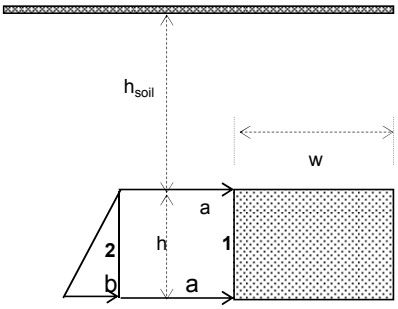
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	130	pcf
h_{soil} =	4	ft
h =	2	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.0	ft
h =	2.0	ft
d =	10.0	ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		1.56	ksf
2 =		2.34	ksf
Average of Soil Pressure on Anchor Block =		1.95	ksf
RESIST TO SLIDING =		39.00	k
SOIL & CONCRETE WEIGHT * 0.9(DL) =	Wr + Wc =	46.18	k
UPLIFT REACTIONS =		-19.29	k
SUM =		26.89	k
COEF. OF FRICTION, (0.5) =		13.45	k
RESIST TO SLIDING =		39.00	k
SUM =		52.45	k
Applied Reduction Factor (0.75) per TIA-222-G =		39.34	kips

SF AGAINST SLIDING

SF = ***39.34*** ***>*** ***24.2*** ***OK*** **61.5%**

(Reduced Resistance) (Factored Shear/Slide Force)

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

NOTES: Note 1 - "Soil and Concrete Weight shown applies 0.9xDL for Soil above Concrete & Concrete DL
Note 2 - TIA-222-G States "when determinimg a soil nominal resistance that is a function of soil wt. a factor of 1.0 applies to th weight of soil and the resulting nominal strength shall be multiplied by the appropiate resistance factor" (0.75 - TIA-222-G Section 9) "to determine soil design str.'

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	1 of 2
	Anchor Block A	**Checked by:**		**Date**	1/11/19
				Date	

CHECK UPLIFT RESISTANCE

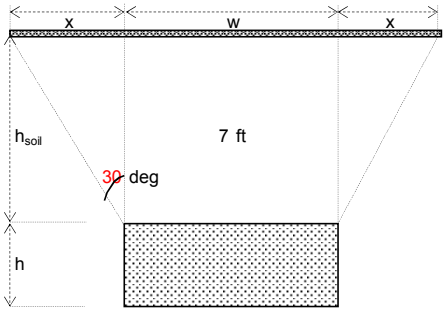
RESULTS FROM COMPUTER ANALYSIS:

(Factored)	Uplift =	47.916	kips
(Factored)	Sliding =	35.288	kips

CONCRETE PARAMETERS:

	γ_{conc} =	150	pcf
	w =	4	ft
	h =	1.833333	ft
	d =	12	ft
	Vol. =	*87.999984*	ft^3
0.9 *	Wc =	*11.88*	kips

*See Note 1 Below for 0.9*DL Explanation*



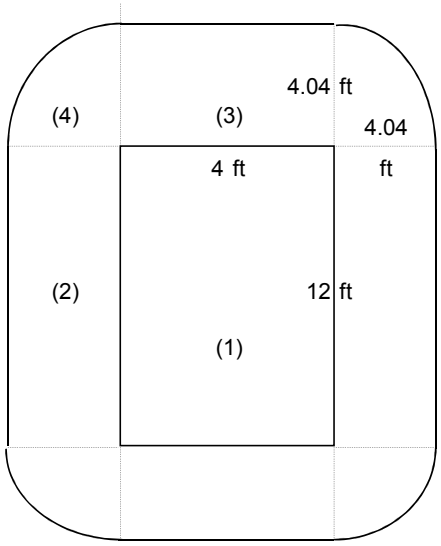
Foundation Section

SOIL PARAMETERS:

	γ_{soil} =	130	pcf
	h_{soil} =	7	ft
	x =	*4.04*	ft

Soil Weight (Wr):

0.9 *	(1) =	39.31	kips
	(2) =	44.13	kips
	(3) =	14.71	kips
	(4) =	15.56	kips
*(5) Anchor Reinf. =		0	kips
R_n =	Total =	113.72	kips
	φs =	0.75	*TIA-222-G Red. Factor*
	$\phi s*R_n$ =	94.20	kips



Foundation Plan View

CHECK UPLIFT (PER TIA-222-G STANDARD):

94.20 **>** *47.916* ***OK*** **50.9%**

(Reduced Resistance) (Factored Uplift)

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

NOTES: ***Note 1 -*** **0.9xDL of concrete and soil directly above foundation (Section 2.3.2 - Note 2)**

Note 2 - Soil not directly above guy anchor treated as "nominal resistance" multiplied by TIAA-222-G Section 9 Reduction Factor for Uplift resistance

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	2 of 2
	Anchor Block A	**Checked by:**		**Date**	1/11/19
				Date	

CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ = 130 pcf

h_{soil} = 7 ft

h = 1.833333 ft

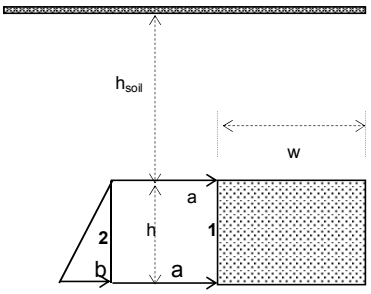
ϕ = 30 degrees

ANCHOR PARAMETERS

w = 4.0 ft

h = 1.8 ft

d = 12.0 ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		2.73	ksf
2 =		3.44	ksf
Average of Soil Pressure on Anchor Block =		3.09	ksf
RESIST TO SLIDING =		67.92	k
SOIL & CONCRETE WEIGHT * 0.9(DL) =	Wr + Wc =	116.97	k
UPLIFT REACTIONS =		-47.916	k
SUM =		69.06	k
COEF. OF FRICTION, (0.5) =		34.53	k
RESIST TO SLIDING =		67.92	k
SUM =		102.45	k
Applied Reduction Factor (0.75) per TIA-222-G =		76.84	kips

SF AGAINST SLIDING

SF = ***76.84*** ***>*** ***35.3*** ***OK*** **45.9%**

(Reduced Resistance) (Factored Shear/Slide Force)

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

NOTES: Note 1 - "Soil and Concrete Weight shown applies 0.9xDL for Soil above Concrete & Concrete DL
Note 2 - TIA-222-G States "when determinimg a soil nominal resistance that is a function of soil wt. a factor of 1.0 applies to th weight of soil and the resulting nominal strength shall be multiplied by the appropiate resistance factor" (0.75 - TIA-222-G Section 9) "to determine soil design str."

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	1 of 2
	Anchor Block B	**Checked by:**		**Date**	1/11/19
				Date	

CHECK UPLIFT RESISTANCE

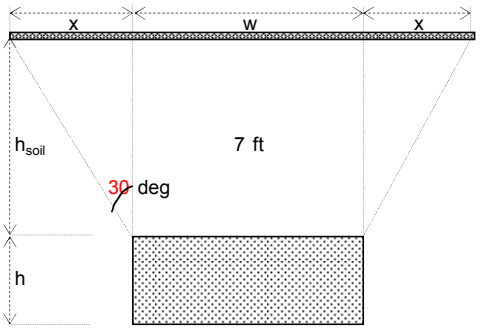
RESULTS FROM COMPUTER ANALYSIS:

(Factored)	Uplift =	44.944	kips
(Factored)	Sliding =	35.451	kips

CONCRETE PARAMETERS:

	γ_{conc} =	150	pcf
	w =	4	ft
	h =	1.833333	ft
	d =	12	ft
	Vol. =	*87.999984*	ft^3
0.9 *	Wc =	*11.88*	kips

*See Note 1 Below for 0.9*DL Explanation*



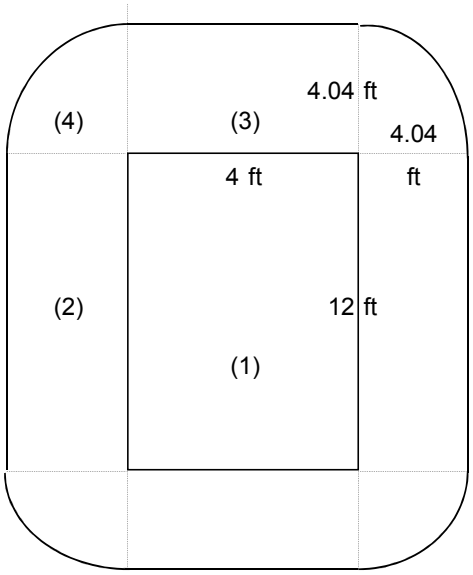
Foundation Section

SOIL PARAMETERS:

	γ_{soil} =	130	pcf
	h_{soil} =	7	ft
	x =	*4.04*	ft

Soil Weight (Wr):

0.9 *	(1) =	39.31	kips
	(2) =	44.13	kips
	(3) =	14.71	kips
	(4) =	15.56	kips
	*(5) Anchor Reinf. =	0	kips
R_n =	Total =	113.72	kips
	φs =	0.75	*TIA-222-G Red. Factor*
	$\phi s*R_n$ =	94.20	kips



Foundation Plan View

CHECK UPLIFT (PER TIA-222-G STANDARD):

94.20 **>** *44.944* ***OK*** **47.7%**

(Reduced Resistance) (Factored Uplift)

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

NOTES: ***Note 1 -*** **0.9xDL of concrete and soil directly above foundation (Section 2.3.2 - Note 2**

Note 2 - Soil not directly above guy anchor treated as "nominal resistance" multiplied by TIAA-222-G Section 9 Reduction Factor for Uplift resistance

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	2 of 2
	Anchor Block B	**Checked by:**		**Date**	1/11/19
				Date	

CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ = 130 pcf

h_{soil} = 7 ft

h = 1.833333 ft

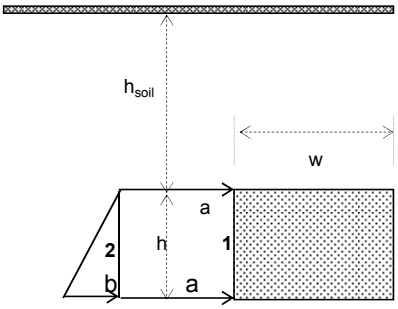
ϕ = 30 degrees

ANCHOR PARAMETERS

w = 4.0 ft

h = 1.8 ft

d = 12.0 ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		2.73	ksf
2 =		3.44	ksf
Average of Soil Pressure on Anchor Block =		3.09	ksf
RESIST TO SLIDING =		67.92	k
SOIL & CONCRETE WEIGHT * 0.9(DL) =	Wr + Wc =	116.97	k
UPLIFT REACTIONS =		-44.944	k
SUM =		72.03	k
COEF. OF FRICTION, (0.5) =		36.01	k
RESIST TO SLIDING =		67.92	k
SUM =		103.94	k
Applied Reduction Factor (0.75) per TIA-222-G =		77.95	kips

SF AGAINST SLIDING

SF = ***77.95*** ***>*** ***35.5*** ***OK*** **45.5%**

(Reduced Resistance) (Factored Shear/Slide Force)

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

NOTES: Note 1 - "Soil and Concrete Weight shown applies 0.9xDL for Soil above Concrete & Concrete DL
Note 2 - TIA-222-G States "when determinimg a soil nominal resistance that is a function of soil wt. a factor of 1.0 applies to th weight of soil and the resulting nominal strength shall be multiplied by the appropiate resistance factor" (0.75 - TIA-222-G Section 9) "to determine soil design str.'

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	1 of 2
	Anchor Block C	**Checked by:**		**Date**	1/11/19
				Date	

CHECK UPLIFT RESISTANCE

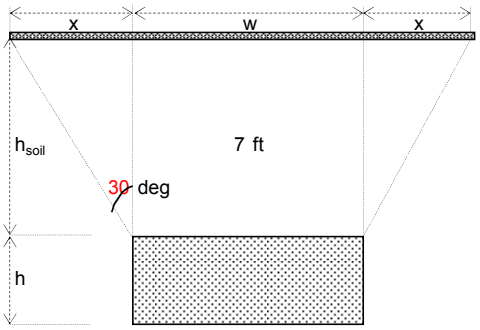
RESULTS FROM COMPUTER ANALYSIS:

(Factored)	Uplift =	42.777	kips
(Factored)	Sliding =	35.592	kips

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
w =	4	ft
h =	1.833333	ft
d =	12	ft
Vol. =	*87.999984*	ft^3
0.9 * Wc =	*11.88*	kips

*See Note 1 Below for 0.9*DL Explanation*



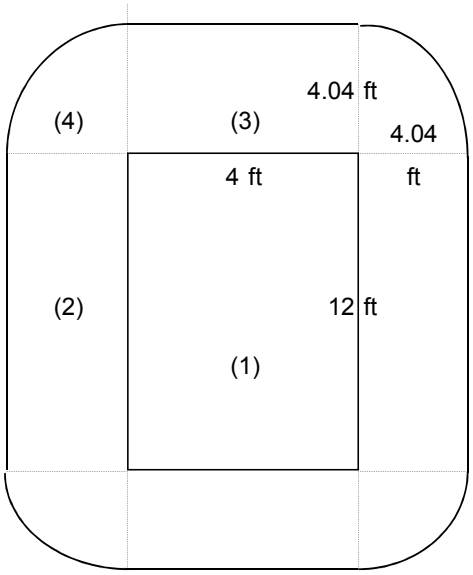
Foundation Section

SOIL PARAMETERS:

γ_{soil} =	130	pcf
h_{soil} =	7	ft
x =	*4.04*	ft

Soil Weight (Wr):

0.9 *	(1) =	39.31	kips
	(2) =	44.13	kips
	(3) =	14.71	kips
	(4) =	15.56	kips
	*(5) Anchor Reinf. =	0	kips
R_n =	Total =	113.72	kips
	φs =	0.75	*TIA-222-G Red. Factor*
	$\phi s*R_n$ =	94.20	kips



FORCE ←

Foundation Plan View

CHECK UPLIFT (PER TIA-222-G STANDARD):

94.20 (Reduced Resistance) **>** *42.777* (Factored Uplift) ***OK*** **45.4%**

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

NOTES: ***Note 1 -*** **0.9xDL of concrete and soil directly above foundation (Section 2.3.2 - Note 2**
Note 2 - Soil not directly above guy anchor treated as "nominal resistance" multiplied by TIAA-222-G Section 9 Reduction Factor for Uplift resistance

AECOM

Job :	Calahan Tower - Newington, CT	**Project No.:**	CAL-005	**Page**	___ of ___
Description:	Anchor Block Evaluation - TIA-222-G	**Computed by:**	MCD	**Sheet**	2 of 2
	Anchor Block C	**Checked by:**		**Date**	1/11/19
				Date	

CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ = 130 pcf

h_{soil} = 7 ft

h = 1.833333 ft

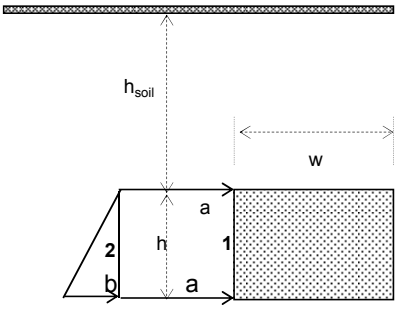
ϕ = 30 degrees

ANCHOR PARAMETERS

w = 4.0 ft

h = 1.8 ft

d = 12.0 ft



Foundation Elevation View

K_a = 0.33

K_p = 3.00

Δ = 2.67

HORIZONTAL FORCES

1 =		2.73	ksf
2 =		3.44	ksf
Average of Soil Pressure on Anchor Block =		3.09	ksf
RESIST TO SLIDING =		67.92	k
SOIL & CONCRETE WEIGHT * 0.9(DL) =	Wr + Wc =	116.97	k
UPLIFT REACTIONS =		-42.777	k
SUM =		74.19	k
COEF. OF FRICTION, (0.5) =		37.10	k
RESIST TO SLIDING =		67.92	k
SUM =		105.02	k
Applied Reduction Factor (0.75) per TIA-222-G =		78.77	kips

SF AGAINST SLIDING

SF = ***78.77*** ***>*** ***35.6*** ***OK*** **45.2%**

(Reduced Resistance) (Factored Shear/Slide Force)

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***

NOTES: Note 1 - "Soil and Concrete Weight shown applies 0.9xDL for Soil above Concrete & Concrete DL
Note 2 - TIA-222-G States "when determinimg a soil nominal resistance that is a function of soil wt. a factor of 1.0 applies to th weight of soil and the resulting nominal strength shall be multiplied by the appropiate resistance factor" (0.75 - TIA-222-G Section 9) "to determine soil design str.'

MISCELLANEOUS GUY ANCHOR COMPONENTS

AECOM

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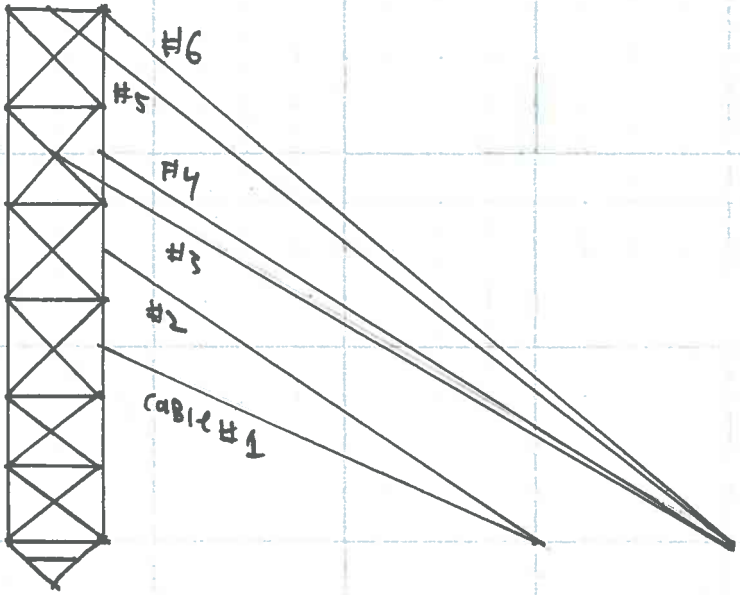
Job _____ Project No. _____ Sheet _____ of _____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference



Cable #	Maximum Tension Force EHS Guy Cables (lbf) TNX Analysis Program
# 6	11459.13 lbf
# 5	11459.13 lbf
# 4	18769 lbf
# 3	18769 lbf
# 2	18013 lbf
# 1	16054 lbf

- Check Shackle / Turnbuckle Assemblies:

Existing Turnbuckle @ Guy Anchor Base:

Cable #	Turnbuckle Diameter		Braking Force (lbf)	TIA-222-G Sect 7.6.2 ϕ = 0.5					Capacity Ratio (%)	Connecting Plate Hole Diameter	Pin Diameter	CHECK
# 1	7/8	--------->	36000	0.5	=	18000	>	16054.07 OK	89.2%	1.125	0.75	OK
# 2	7/8	--------->	36000	0.5	=	18000	<	18012.59 No Good	100.1%	1.125	0.75	OK
# 3	1 1/4	--------->	50000	0.5	=	25000	>	18768.77 OK	75.1%	1.125	0.88	OK
# 4	1 1/4	--------->	50000	0.5	=	25000	>	18768.77 OK	75.1%	1.125	0.88	OK
# 5	1	--------->	50000	0.5	=	25000	>	11459.13 OK	45.8%	1.125	0.88	OK
# 6	1	--------->	50000	0.5	=	25000	>	11459.13 OK	45.8%	1.125	0.88	OK

* NOTE: "Braking Force is in reference to the Breaking Capacity of the Turnbuckle referenced from SitePro1 product catalog"

*** Because of overstresses in existing Turnbuckles, the sizes of turnbuckles are required to be larger (see below equipment updates)

PROPOSED TURNBUCKLE										Connecting Plate Hole Diameter	Pin Diameter	CHECK
# 1	1	--------->	50000	0.5	=	25000	>	16054.07 OK	64.2%	1.125	0.88	OK
# 2	1	--------->	50000	0.5	=	25000	>	18012.59 OK	72.1%	1.125	0.88	OK

Existing Shackle @ Guy Tower Connection:

Cable #	Shackle Diameter		Braking Force (lbf)	TIA-222-G Sect 7.6.2 ϕ = 0.5					Capacity Ratio (%)
# 1	3/4	--------->	47500	0.5	=	23750	>	16054.07 OK	67.6%
# 2	3/4	--------->	47500	0.5	=	23750	>	18012.59 OK	75.8%
# 3	7/8	--------->	65000	0.5	=	32500	>	18768.77 OK	57.8%
# 4	7/8	--------->	65000	0.5	=	32500	>	18768.77 OK	57.8%
# 5	3/4	--------->	47500	0.5	=	23750	>	11459.13 OK	48.2%
# 6	3/4	--------->	47500	0.5	=	23750	>	11459.13 OK	48.2%

* NOTE: "Braking Force is in reference to the Breaking Capacity of the Turnbuckle referenced from SitePro1 product catalog"

AECOM

Job _____ Project No. _____ Page _____ of _____

Description _____ Computed by _____ Sheet _____ of _____

_____ Checked by _____ Date _____

Reference

- CHECK Guy Connection on Topwer for Cables 1 & 2 (Interior Anchor Ring):
*** Calculations are considering modified connection corner plate for capacity design criteria
TIA-222-G Section 4.9.6.2 - Bolt Bearing on Plate

$$R_n = 1.2 * \left(L_c + \frac{d_{bolt}}{4}\right) * t_{plate} * F_{u.steel} \leq 2.4 * d_{bolt} * t_{plate} * F_{u.steel} \qquad \theta = 0.80$$

Edge Distance =	1.25	in	d.bolt =	0.88	in
Hole =	1.0625	in	t.plate =	0.5	in
Lc =	1.25	in	F.u.Plate =	65	ksi
ϕ =	0.8				

Rn =	57330 (lbf)	<	68640 (lbf)	NOTE: Lower value Governs Design
Rn =	57330			
ϕ * Rn =	45864	>	16054.07 OK	35.0% Cable #1
	45864	>	18012.59 OK	39.3% Cable #2

TIA-222-G Section 4.9.6.3 - Connecting Elements

- Tension Yielding - Plate

$$R_n = F_{y.steel} * A_{gross.t} \qquad \theta = 0.90$$

Fy. Steel =	50	ksi
A.gross.t =	1.8125	in2 <--- 3-5/8*1/2
ϕ =	0.9	
Rn =	90625	lbf
ϕ * Rn =	81562.5	lbf

- Tension Rupture - Plate

$$R_n = F_{u.steel} * A_{n.tension} \qquad \theta = 0.75$$

Fy. Steel =	65	ksi
A.net.t	1.28125	in2 <--- (3-5/8-17/16)*1/2
ϕ =	0.75	
Rn =	83281	lbf
ϕ * Rn =	62461	lbf

- Shear Yield - Plate

$$R_n = 0.6 * F_{y.steel} * A_{gross.v} \qquad \theta = 1.00$$

Fy. Steel =	50	ksi
A.gross.v =	1.8125	in2 <--- 3-5/8*7/16
ϕ =	1	
Rn =	54375	lbf
ϕ * Rn =	54375	lbf

- Shear Rupture - Plate

$$R_n = 0.6 * F_{u.steel} * A_{net.v} \qquad \theta = 0.75$$

Fy. Steel =	65	ksi
A.net.v	1.28125	in2 <--- (3-5/8-17/16)*7/16
ϕ =	0.75	
Rn =	49968.75	lbf
ϕ * Rn =	37476.56	lbf

- Block Shear - Plate

$$R_n = 0.6 * F_{u.steel} * A_{nv} + U_{bs} * F_{u.steel} * A_{nt} \leq 0.6 * F_{y.steel} * A_{gross.v} + U_{bs} * F_{u.steel} * A_{nt} \qquad \theta = 0.75$$

F.y.steel =	50	ksi
F.u.steel =	65	ksi
A.gross =	0.90625	in2 =1.8125 x 1/2
A.nv =	0.625	in2 =1.25 x 1/2
A.nt =	0.625	in2 =1.25 x 1/2
U.bs =	0.5	
ϕ =	0.75	

Rn =	44.6875 kip	<	47.5 kip	NOTE: Lower value Governs Design
Rn =	44687.5	lbf		
ϕ * Rn =	33515.63	lbf		

* NOTE: Plate area is minimal break-out of plate w/ smallest dimensions

GOVERNING Design Resistance Check (4.9.6.3)

- Tension Yielding - Plate	81562.5 lbf
- Tension Rupture - Plate	62461 lbf
- Shear Yielding - Plate	54375 lbf
- Shear Rupture - Plate	37477 lbf
- Block Shear - Plate	33516 lbf
Governing Resistance	33516 lbf

ϕ * Rn =	33516 lbf	>	16054.07 lbf	47.9%
	33516 lbf	>	18012.59 lbf	53.7%

AECOM

Page _____ of _____

Job _____ Project No. _____ Sheet _____ of _____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference

- CHECK Guy Connection on Tower for Cables 3 & 4 (Exterior Anchor Ring):

TIA-222-G Section 4.9.6.2 - Bolt Bearing on Plate

$$R_n = 1.2 * \left(L_c + \frac{d_{bolt}}{4}\right) * t_{plate} * F_{u.steel} \leq 2.4 * d_{bolt} * t_{plate} * F_{u.steel} \qquad \theta = 0.80$$

Edge Distance =	1.5 in	d.bolt =	1.125 in
Hole =	1.25 in	t.plate =	0.4375 in
Lc =	0.875 in	F.u.Plate =	50 ksi
ϕ =	0.8		

Rn = 30351.56 (lbf) < 59062.5 (lbf) NOTE: Lower value Governs Design

Rn = 30351.56
ϕ * Rn = 24281.25 > 18768.77 OK 77.3% Cable #3
24281.25 > 18768.77 OK 77.3% Cable #4

TIA-222-G Section 4.9.6.3 - Connecting Elements

- Tension Yielding - Plate

$R_n = F_{y.steel} * A_{gross.t}$ $\theta = 0.90$

Fy. Steel = 36 ksi
A.gross.t = 1.3125 in2
ϕ = 0.9

Rn = 47250 lbf
ϕ * Rn = 42525 lbf

- Tension Rupture - Plate

$R_n = F_{u.steel} * A_{n.tension}$ $\theta = 0.75$

Fy. Steel = 50 ksi
A.net.t 0.65625 in2
ϕ = 0.75

Rn = 32813 lbf
ϕ * Rn = 24609 lbf

- Shear Yield - Plate

$R_n = 0.6 * F_{y.steel} * A_{gross.v}$ $\theta = 1.00$

Fy. Steel = 50 ksi
A.gross.v = 1.3125 in2
ϕ = 1

Rn = 39375 lbf
ϕ * Rn = 39375 lbf

- Shear Rupture - Plate

$R_n = 0.6 * F_{u.steel} * A_{net.v}$ $\theta = 0.75$

Fy. Steel = 65 ksi
A.net.v 0.875 in2
ϕ = 0.75

Rn = 34125 lbf
ϕ * Rn = 25593.75 lbf

- Block Shear - Plate

$$R_n = 0.6 * F_{u.steel} * A_{nv} + U_{bs} * F_{u.steel} * A_{nt} \leq 0.6 * F_{y.steel} * A_{gross.v} + U_{bs} * F_{u.steel} * A_{nt} \qquad \theta = 0.75$$

F.y.steel =	50 ksi	* NOTE: Plate area is minimal break-out of plate w/ smallest dimensions
F.u.steel =	65 ksi	
A.gross =	0.75 in2	=1.50 x 1/2
A.nv =	0.382813 in2	=7/8 x 1/2
A.nt =	0.382813 in2	=7/8 x 1/2
U.bs =	0.5	
ϕ =	0.75	

Rn = 27.37109 (lbf) < 34.94141 (lbf) NOTE: Lower value Governs Design

Rn = 27371.09 lbf
ϕ * Rn = 20528.32 lbf

GOVERNING Design Resistance Check (4.9.6.3)

- Tension Yielding - Plate	42525 lbf
- Tension Rupture - Plate	24609 lbf
- Shear Yielding - Plate	39375 lbf
- Shear Rupture - Plate	25594 lbf
- Block Shear - Plate	20528 lbf
Governing Resistance	20528 lbf

ϕ * Rn = 20528 lbf > 18769 lbf 91.4%
20528 lbf > 18769 lbf 91.4%

AECOM

Job _____ Project No. _____ Page _____ of _____

Description _____ Computed by _____ Sheet _____ of _____

_____ Checked by _____ Date _____

Reference

- CHECK Guy Connection on Topwer for Cables 5 & 6 (Exterior Anchor Ring):

TIA-222-G Section 4.9.6.2 - Bolt Bearing on Plate

$$R_n = 1.2 * \left(L_c + \frac{d_{bolt}}{4}\right) * t_{plate} * F_{u.steel} \leq 2.4 * d_{bolt} * t_{plate} * F_{u.steel} \qquad \theta = 0.80$$

Edge Distance =	1.5	in	d.bolt =	0.875	in (for 7/8" shackle pin diameter)
Hole =	1.5	in	t.plate =	0.75	in
Lc =	0.75	in	F.u.Plate =	50	ksi
ϕ =	0.8				

Rn =	43593.75 (lbf)	<	78750 (lbf)	NOTE: Lower value Governs Design

Rn =	43593.75				
ϕ * Rn =	34875	>	16054.07	OK	46.0% Cable #5
	34875	>	18012.59	OK	51.6% Cable #6

TIA-222-G Section 4.9.6.3 - Connecting Elements

- Tension Yielding - Plate

$$R_n = F_{y.steel} * A_{gross.t} \qquad \theta = 0.90$$

Fy. Steel =	36	ksi
A.gross.t =	2.25	in2
ϕ =	0.9	
Rn =	81000	lbf
ϕ * Rn =	72900	lbf

- Tension Rupture - Plate

$$R_n = F_{u.steel} * A_{n.tension} \qquad \theta = 0.75$$

Fy. Steel =	50	ksi
A.net.t	1.125	in2
ϕ =	0.75	
Rn =	56250	lbf
ϕ * Rn =	42188	lbf

- Shear Yield - Plate

$$R_n = 0.6 * F_{y.steel} * A_{gross.v} \qquad \theta = 1.00$$

Fy. Steel =	36	ksi
A.gross.v =	2.25	in2
ϕ =	1	
Rn =	48600	lbf
ϕ * Rn =	48600	lbf

- Shear Rupture - Plate

$$R_n = 0.6 * F_{u.steel} * A_{net.v} \qquad \theta = 0.75$$

Fy. Steel =	50	ksi
A.net.v	1.125	in2
ϕ =	0.75	
Rn =	33750	lbf
ϕ * Rn =	25312.5	lbf

- Block Shear - Plate

$$R_n = 0.6 * F_{u.steel} * A_{nv} + U_{bs} * F_{u.steel} * A_{nt} \leq 0.6 * F_{y.steel} * A_{gross.v} + U_{bs} * F_{u.steel} * A_{nt} \qquad \theta = 0.75$$

F.y.steel =	36	ksi	* NOTE: Plate area is minimal break-out of plate w/ smallest dimensions
F.u.steel =	50	ksi	
A.gross =	1.125	in2	=1.50 x 3/4
A.nv =	0.5625	in2	=3/4 x 3/4
A.nt =	0.5625	in2	=3/4 x 3/4
U.bs =	0.5		
ϕ =	0.75		

Rn =	30.9375 (lbf)	<	38.3625 (lbf)	NOTE: Lower value Governs Design

Rn =	30937.5 lbf
ϕ * Rn =	23203.13 lbf

GOVERNING Design Resistance Check (4.9.6.3)

- Tension Yielding - Plate	72900 lbf
- Tension Rupture - Plate	42188 lbf
- Shear Yielding - Plate	48600 lbf
- Shear Rupture - Plate	25313 lbf
- Block Shear - Plate	23203 lbf
Governing Resistance	23203 lbf

ϕ * Rn =	23203 lbf	>	11459.13 lbf	49.4%
	23203 lbf	>	11459.13 lbf	49.4%

AECOM

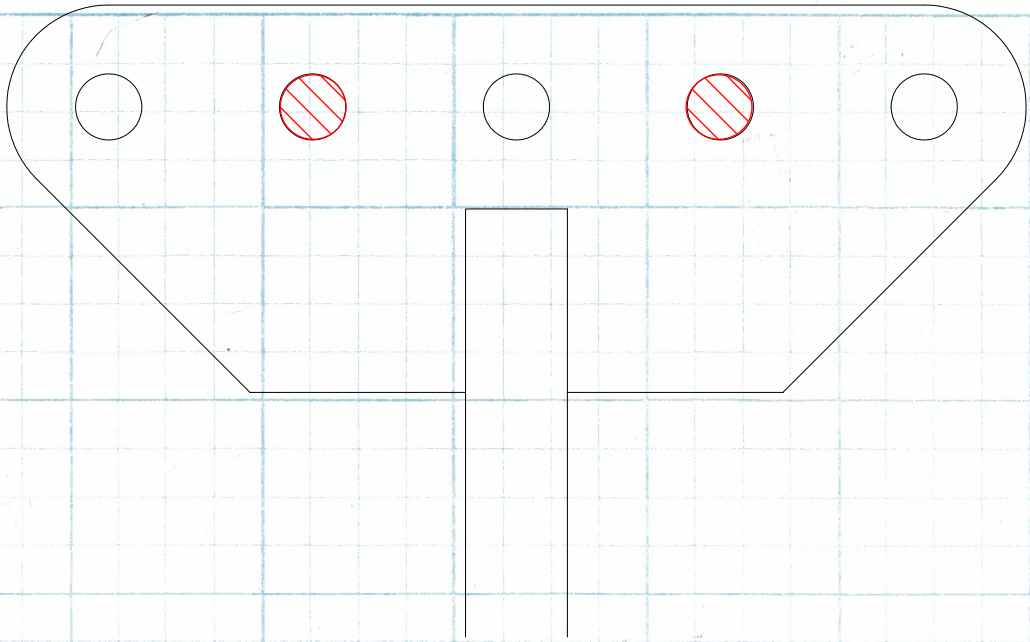
Page _____ of _____

Job _____ Project No. _____ Sheet _____ of _____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference



Check Guy Connection Fan Plate - Interior Anchorage Ring

F. Design 18013 lbf (max) Maximum cable force for cables #1 & 2

Block Shear Plate - (Plate reference ROHN Product/Part # GAC5655TOP)

- Block Shear - Plate

$$R_n = 0.6 * F_{u.steel} * A_{nv} + U_{bs} * F_{u.steel} * A_{nt} \leq 0.6 * F_{y.steel} * A_{gross.v} + U_{bs} * F_{u.steel} * A_{nt} \qquad \theta = 0.75$$

F.y.steel =	50	ksi	* NOTE: Plate area is minimal break-out of plate w/ smallest dimensions
F.u.steel =	65	ksi	
A.gross =	0.625	in2	=1.25 x 1/2
A.nv =	0.4375	in2	=7/8 x 1/2
A.nt =	0.4375	in2	=7/8 x 1/2
U.bs =	0.5		
ϕ =	0.75		

Rn = 31.28125 (lbf) < 32.96875 (lbf) NOTE: Lower value Governs Design

Rn = 31281.25 lbf

ϕ * Rn = 23460.94 lbf > 18013 lbf 76.8%

- CHECK Guy Connection - Solid Rod welded to Fan Plate: (TIA-222-G Section 4.6.3)

F.Design 36956 lbf (max) Maximum Tension Force - Interior Anchor Ring

Qty =	1	ea
A.gross =	1.227	in2
F.y.steel =	50	ksi
F.u.steel =	65	ksi
ϕ =	0.8	

Rn = 59121.99 lbf

ϕ * Rn = 47297.59 lbf > 36956 lbf 78.1%

ϕ = 0.65

Rn = 76858.58 lbf

ϕ * Rn = 49958.08 lbf > 36956 lbf 74.0%

AECOM

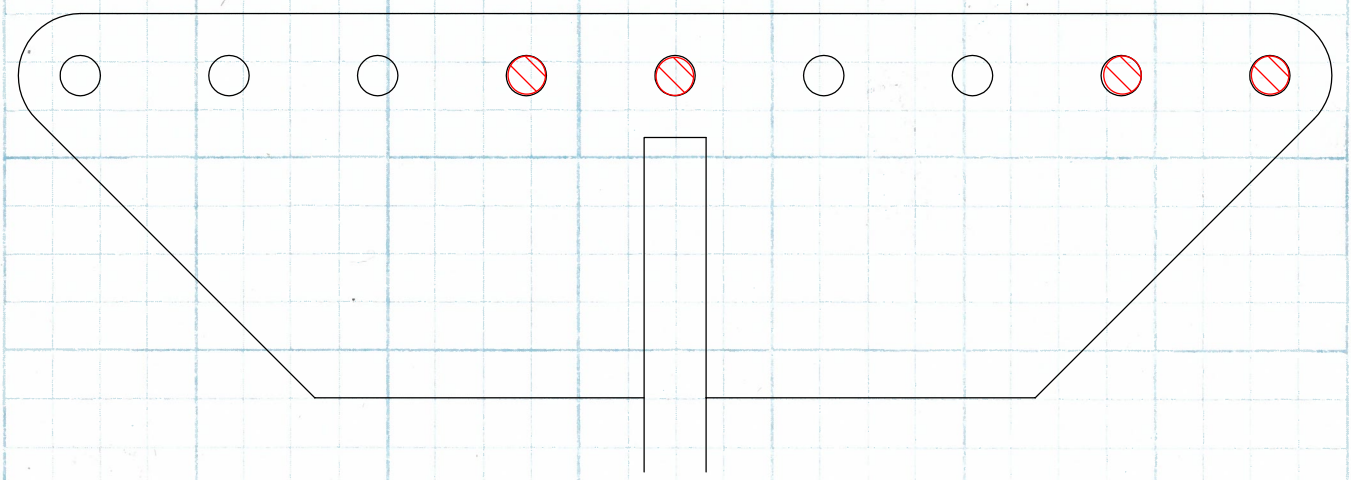
Page _____ of _____

Job _____ Project No. _____ Sheet _____ of _____

Description _____ Computed by _____ Date _____

_____ Checked by _____ Date _____

Reference



Check Guy Connection Fan Plate - Exterior Anchorage Ring

F. Design 18769 lbf (max) Maximum cable force for cables #3,4,5 & 6

Block Shear Plate - (Plate reference ROHN Product/Part # GAC5755TOP)

- Block Shear - Plate

$$R_n = 0.6 * F_{u.steel} * A_{nv} + U_{bs} * F_{u.steel} * A_{nt} \leq 0.6 * F_{y.steel} * A_{gross.v} + U_{bs} * F_{u.steel} * A_{nt} \qquad \theta = 0.75$$

F.y.steel =	50 ksi		* NOTE: Plate area is minimal break-out of plate w/ smallest dimensions
F.u.steel =	65 ksi		
A.gross =	0.9375 in2		=1.25 x 3/4
A.nv =	0.65625 in2		=7/8 x 3/4
A.nt =	0.65625 in2		=7/8 x 3/4
U.bs =	0.5		
ϕ =	0.75		
Rn =	46.92188 (lbf)	< 49.45313 (lbf)	NOTE: Lower value Governs Design
Rn =	46921.88 lbf		
ϕ * Rn =	35191.41 lbf	> 18769 lbf	53.3%

- CHECK Guy Connection - Solid Rod welded to Fan Plate: (TIA-222-G Section 4.6.3)

F.Design 60676 lbf (max) Maximum Tension Force - Interior Anchor Ring

Qty =	1 ea		
A.gross =	2.405282 in2		
F.y.steel =	36 ksi		
F.u.steel =	50 ksi		
ϕ =	0.8		
Rn =	163577.8 lbf		
ϕ * Rn =	130862.2 lbf	> 60676 lbf	46.4%
ϕ =	0.65		
Rn =	227191.4 lbf		
ϕ * Rn =	147674.4 lbf	> 60676 lbf	41.1%

DESIGN REFERENCES / INFORMATION

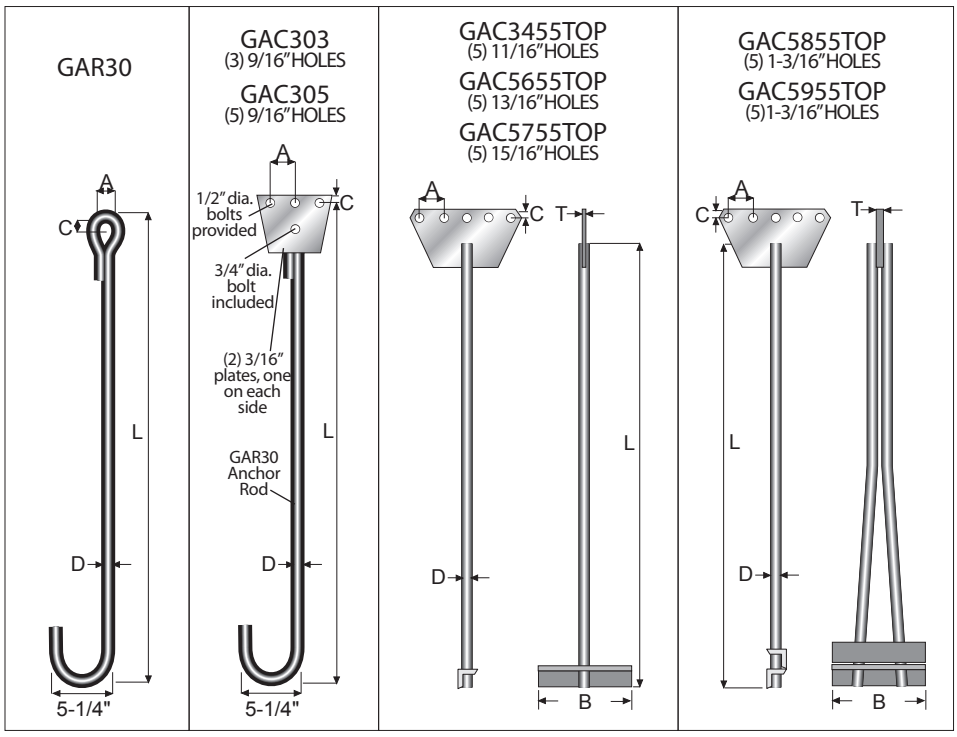
GUY ANCHOR SELECTION CHART

GUYS		TURNBUCKLES		ANCHOR RODS COMPATIBLE WITH TURNBUCKLE SIZE						
SIZE & TYPE	ULTIMATE STRENGTH (LBS)	SIZE	ULTIMATE STRENGTH (LBS)							
3/16EHS	3990	3/8	6000		GAC					
1/4EHS	6650	1/2	11000	GAR	GAC	GAC34				
5/16EHS	11200	5/8	17500	GAR	GAC	GAC34	GAC56			
3/8EHS	15400	5/8	17500	GAR		GAC34	GAC56			
7/16EHS	20800	3/4	26000	GAR		GAC34	GAC56	GAC57		
1/2EHS	26900	7/8	36000				GAC56	GAC57		
9/16EHS	35000	7/8	36000				GAC56	GAC57		
5/8EHS	42400	1	50000					GAC57	GAC58	GAC59
3/4EHS	58300	1-1/4	76000						GAC58	GAC59

ANCHOR RODS

materials are minimum of 50 KSI - E-mail from ROHN Towers confirmed from 2014 e-mail conversation.

Type	L	A	B	C	D	T	Part No.	Weight (lbs.)
GAR	84″	1″	-	2″	5/8″	-	GAR30	9
GAC	84″	2″	-	1″	5/8″	3/16″	GAC303	13
GAC	84″	2″	-	1″	5/8″	3/16″	GAC305	14
GAC34	84″	2″	12″	1″	3/4″	3/8″	GAC3455TOP	25
GAC56	120″	2-1/2″	12″	1-1/4″	1-1/4″	1/2″	GAC5655TOP	65
GAC57	168″	3″	12″	1-3/8″	1-7/16″	3/4″	GAC5755TOP	125
GAC58	192″	4″	12″	1-3/4″	1-1/4″	1″	GAC5855TOP	220
GAC59	240″	4″	18″	1-3/4″	1-7/16″	1″	GAC5955TOP	310



NOTE: *GAC Anchors require use of eye and eye turnbuckles. All other anchors are for use with eye and jaw turnbuckles. Refer to page 297.*

Bolt-Type Anchor Shackles

PRICE CUT

- Forged shackles
- Bolt-type anchor
- Thin-head bolt with nut and cotter pin
- Hot-dip galvanized
- Meets Federal Specifications RR-C-271D, Type IVA, Grade A, Class 3
- Ships from Plymouth, IN

Part #	Size	Inside Width at Pin	Pin Dia.	Working Load Limit (tons)	Breaking Load (lbs.)	Price
320751-I	1/2”	13/16”	5/8”	2	20,000	$3.45
320752-I	5/8”	1-1/16”	3/4”	3-1/4	32,500	$5.25
320753-I	3/4”	1-1/4”	7/8”	4-3/4	47,500	$8.25
320754-I	7/8”	1-7/16”	1”	6-1/2	65,000	$11.95
320755-I	1”	1-11/16”	1-1/8”	8-1/2	85,000	$15.95
320756-I	1-1/8”	1-13/16”	1-1/4”	9-1/2	95,000	$19.95
320757-I	1-1/4”	2-1/32”	1-3/8”	12	120,000	$28.95
320758-I	1-3/8”	2-1/4”	1-1/2”	13-1/2	135,000	$44.95

Jaw-Jaw Turnbuckles

- Heavy duty
- Hot-dip galvanized
- Ships from Plymouth, IN
- All meet Federal Specification FF-T-791B, Type1, Form 1, Class 7

Part #	Size	Take-up	Break Strength Lbs.	Price
320600-I	1/2”	12”	11,000	$9.59
320601-I	5/8”	12”	17,500	$11.50
320602-I	3/4”	12”	26,000	$21.00
320598-I	3/4”	18”	26,000	$26.50
320603-I	7/8”	12”	36,000	$36.00
320599-I	7/8”	18”	36,000	$38.00
320604-I	1”	12”	50,000	$42.00
320607-I	1”	18”	50,000	$49.00
320605-I	1-1/4”	18”	76,000	$89.00
320606-I	1-1/2”	18”	107,000	$145.00

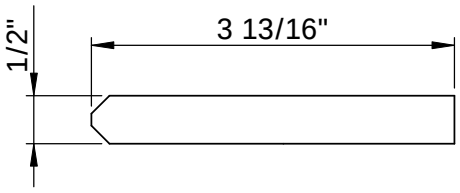
Jaw-Eye Turnbuckles

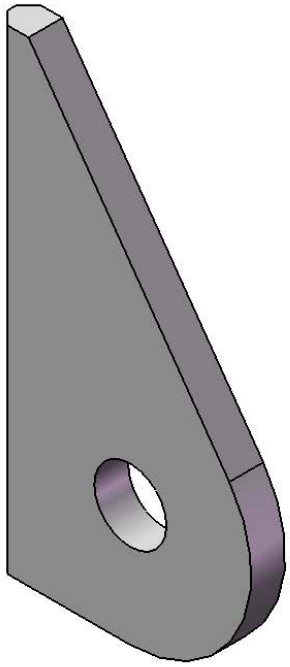
- Heavy duty
- Hot-dip galvanized
- Ships from Plymouth, IN
- All meet Federal Specification FF-T-791B, Type1, Form 1, Class 8

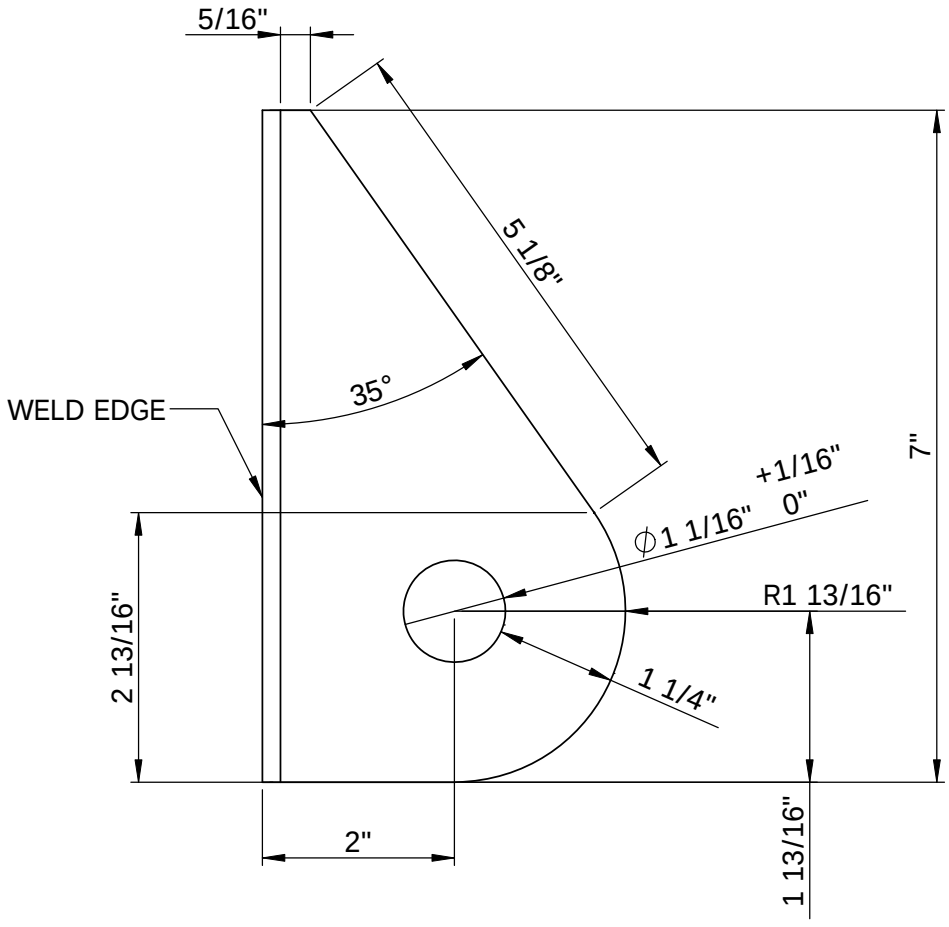
Part #	Size	Take-up	Break Strength Lbs.	Price
320596-I	1/2”	12”	11,000	$9.99
320597-I	5/8”	12”	17,500	$12.75
320595-I	3/4”	12”	26,000	$18.95
162930-I	7/8”	12”	36,000	$34.95
162931-I	1”	12”	50,000	$42.00
320625-I	1-1/4”	18”	76,000	$89.00
320626-I	1-1/2”	18”	107,000	$139.00

New York 1-888-438-7761
Georgia 1-866-901-0603
Indiana 1-888-753-7446
Florida 1-844-278-6371

MATERIAL : MIN. 50 KSI YIELD
FINISH : NONE
WEIGHT (LBS): 2.38

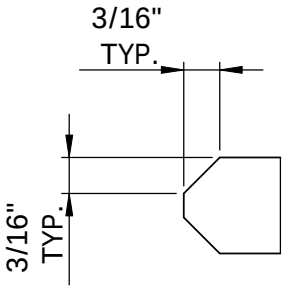


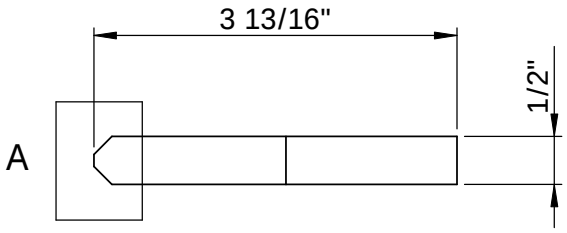


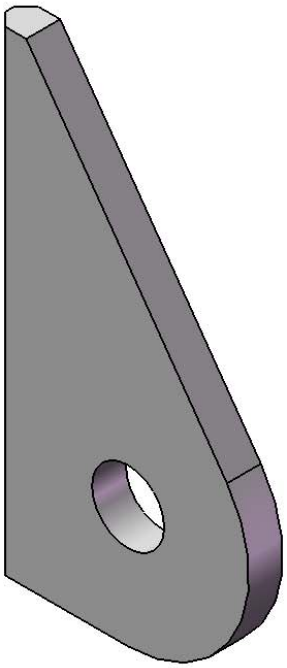


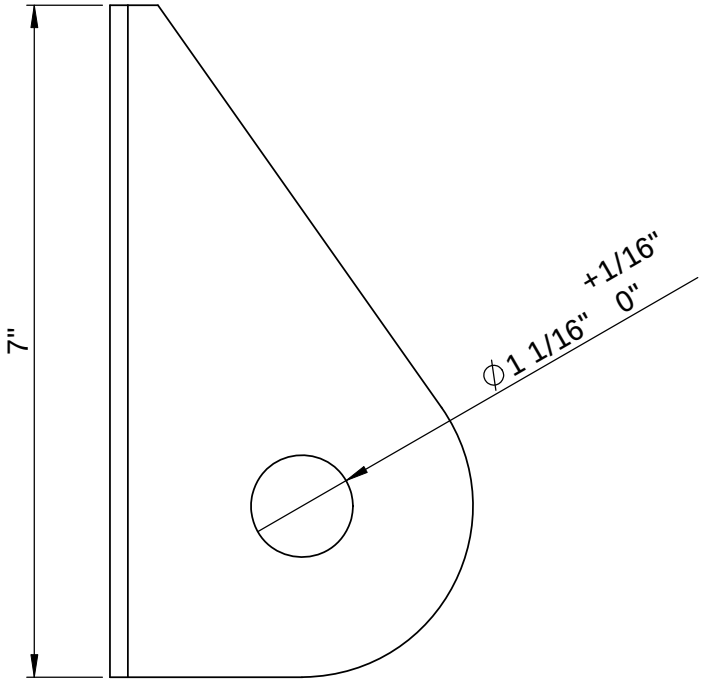
PART #: P519-002-01	1/2" THK GUY LUG 1-1/16" Ø HOLE	
Structural Components Bringing It All Together. 1617 PEARL ST., UNIT A | BOULDER, CO | (866) 386-7622	FILE: P519-002-01 - Rev 1.SLDDRW	SCALE : 1:2
	PAGE NUMBER / REVISION NUMBER	DATE: 5/5/2009
	1 OF 2 / 1	TOLERANCE: UNLESS OTHERWISE NOTED ±1/32"

MATERIAL : MIN. 50 KSI YIELD
FINISH : NONE
WEIGHT (LBS): 2.38









PART #: P519-002-01	1/2" THK GUY LUG 1-1/16" Ø HOLE	
Structural Components Bringing It All Together. 1617 PEARL ST., UNIT A | BOULDER, CO | (866) 386-7622	FILE: P519-002-01 - Rev 1.SLDDRW	SCALE : 1:2
	PAGE NUMBER: 2 OF 2 / REVISION NUMBER: 1	DATE: 5/5/2009
		TOLERANCE: UNLESS OTHERWISE NOTED ±1/32"

5/11/12

TOWER MAPPING REPORT

For

CT1145

NEWINGTON

99 Cedarwood Lane
Newington, CT 06111

Antennas Mounted to the Tower

Prepared for:

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

Dated: May 24, 2012

Prepared by:

Hudson Design Group LLC
1600 Osgood Street Building 20 North, Suite 2-101
North Andover, MA 01845
Phone: (978) 557-5553
www.hudsondesigngroupllc.com

Hudson Design Group LLC

Guyed Tower Mapping Form

Guy anchor position:

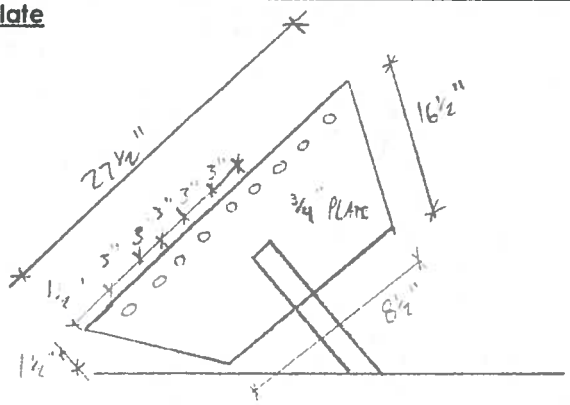
Inner Middle Outer

Guy Anchor Information

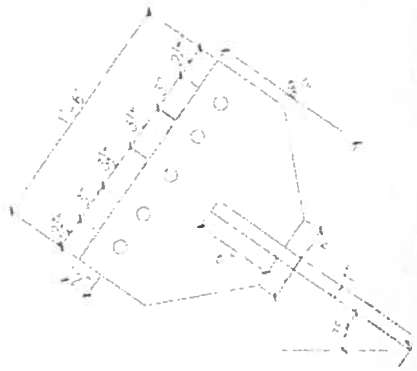
NOTE: All measurements must be to the nearest 1/16"
Repeat this sheet for each set of anchors.

Anchor	Azimuth	Anchor Radius Tower center to anchor	Elevation difference from Tower Base	Angle from Horizon
A	300°	107'	+10'	43°
B	60°	106'	-6'	47°
C	180°	106'	-4'	47°
D				

Sketch Guy Anchor Fan Plate



Example



Hole	Guy Level Number	Guy Elevation (on tower)	Guy Wire Diameter (nearest 16")	Guy Wire Type
1	1	50'	7/16"	(EHS) BS UHS
2	2	90'	7/16"	(EHS) BS UHS
3	3	133'	7/8"	(EHS) BS UHS
4	3	133'	7/8"	(EHS) BS UHS
5	4	155'	1/2	(EHS) BS UHS
6	4	155'	1/2"	(EHS) BS UHS
7				(EHS) BS UHS

Hole	Preform Color or Socket Size	Turnbuckle Size or Hairpin Diameter	Pin Diameter (nearest 1/16")	Hole Diameter (nearest 1/16")	Plate Hole to Edge Distance
1	—	1/8"	3/4"	1 1/8"	1 1/2"
2	—	7/8"	3/4"	1 1/8"	1 1/2"
3	GREEN	1 1/4"	1 1/8"	1 1/8"	1 1/2"
4	GREEN	1 1/4"	1 1/8"	1 1/8"	1 1/2"
5	BLUE	1 1/4"	27/32"	1 1/8"	1 1/2"
6	BLUE	1 1/4"	27/32"	1 1/8"	1 1/2"
7					

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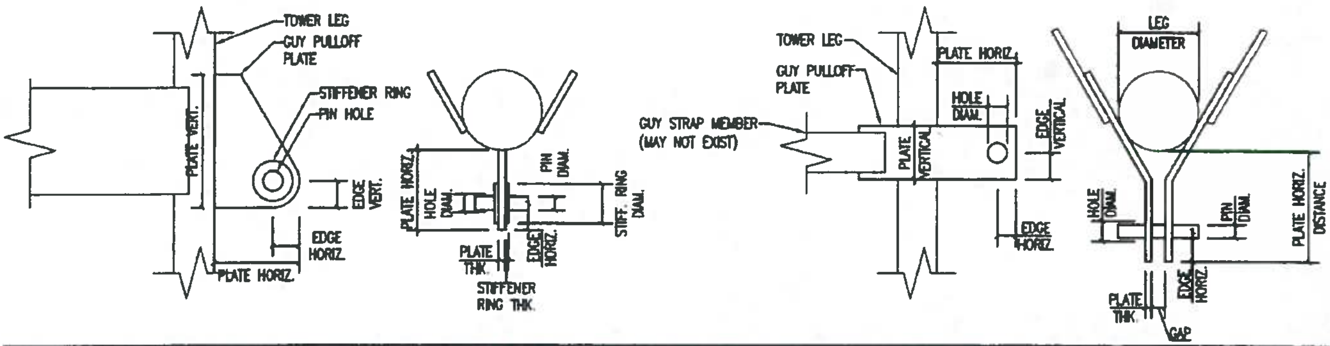
Guyed Tower Mapping Form

Guy Pulloff Information



Guy Number	Elevation	Plate Thickness	Plate Vertical	Plate Horizontal	Gap (if exists)	Edge Vertical
1	50'	3/8"	4 1/2"	4"	0"	1 1/2"
	Edge Horizontal	Shackle or Socket Size	Other Info	Section #	Bay #	Hole Diam.
Guy Elevation	1 1/2"	3/4"	—	—	—	1"
50'-6"	Pin Diam.	Stiff. Ring. Thickness	Stiff. Ring Thickness	Stiff. Ring Diam.	Guy Strap Member Size	Connection to leg (Bolt Size and Grade/Weld Size)
	3/4"	-	—	—	2 3/4"x20"x3/8"	—
Guy Number	Elevation	Plate Thickness	Plate Vertical	Plate Horizontal	Gap (if exists)	Edge Vertical
2	90'	3/8"	4 1/2"	4"	0"	1 1/2"
	Edge Horizontal	Shackle or Socket Size	Other Info	Section #	Bay #	Hole Diam.
Guy Elevation	1 1/2"	3/4"	-	-	-	1"
90'-7"	Pin Diam.	Stiff. Ring. Thickness	Stiff. Ring Thickness	Stiff. Ring Diam.	Guy Strap Member Size	Connection to leg (Bolt Size and Grade/Weld Size)
	3/4"				2 3/4 x20 x 3/8"	
Guy Number	Elevation	Plate Thickness	Plate Vertical	Plate Horizontal	Gap (if exists)	Edge Vertical
	Edge Horizontal	Shackle or Socket Size	Other Info	Section #	Bay #	Hole Diam.
Guy Elevation						
	Pin Diam.	Stiff. Ring. Thickness	Stiff. Ring Thickness	Stiff. Ring Diam.	Guy Strap Member Size	Connection to leg (Bolt Size and Grade/Weld Size)
Guy Number	Elevation	Plate Thickness	Plate Vertical	Plate Horizontal	Gap (if exists)	Edge Vertical
	Edge Horizontal	Shackle or Socket Size	Other Info	Section #	Bay #	Hole Diam.
Guy Elevation						
	Pin Diam.	Stiff. Ring. Thickness	Stiff. Ring Thickness	Stiff. Ring Diam.	Guy Strap Member Size	Connection to leg (Bolt Size and Grade/Weld Size)
Guy Number	Elevation	Plate Thickness	Plate Vertical	Plate Horizontal	Gap (if exists)	Edge Vertical
	Edge Horizontal	Shackle or Socket Size	Other Info	Section #	Bay #	Hole Diam.
Guy Elevation						
	Pin Diam.	Stiff. Ring. Thickness	Stiff. Ring Thickness	Stiff. Ring Diam.	Guy Strap Member Size	Connection to leg (Bolt Size and Grade/Weld Size)

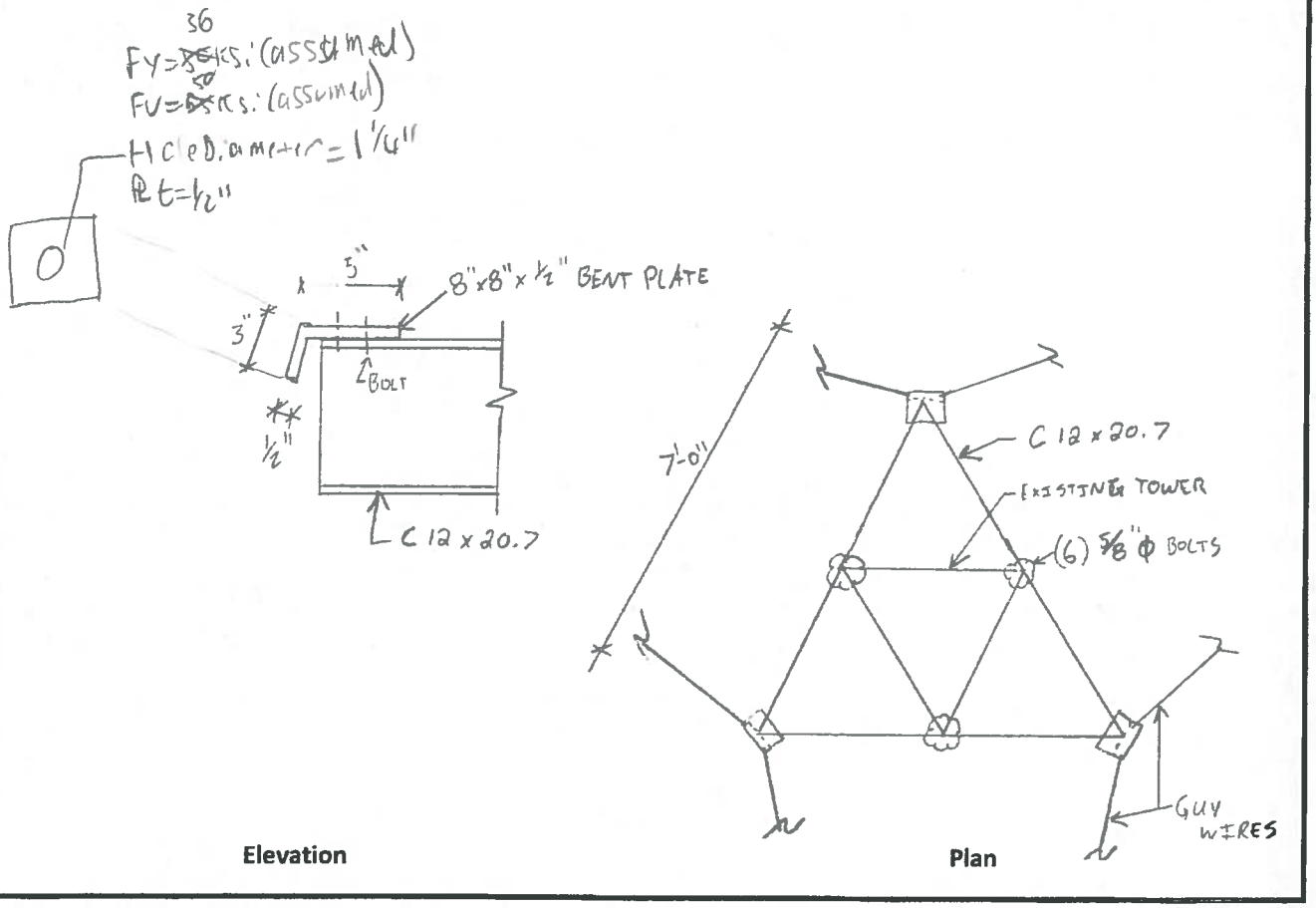
Hudson Design Group LLC

Guyed Tower Mapping Form

Torque Arm Information

- Sketch torque arm below.
- Show overall **height**, **spread** (hole to hole), **face width**, **member sizes**.
- Detail **pulloff plates** that guys are attached to.
- Measure to the nearest **1/16"** and to **hole/bolt center**.
- Repeat this sheet for each torque arm.

Elevation 132.5'	Pin Diameter 1"
Guy Level 3	Hole Diam. On Plate 1¼"
Section # Bay #	Plate Hole End Distance 1½"
Shackle or Socket Size 1"	Pulloff Plate Thickness ½"
Other Info	



Elevation **Plan**

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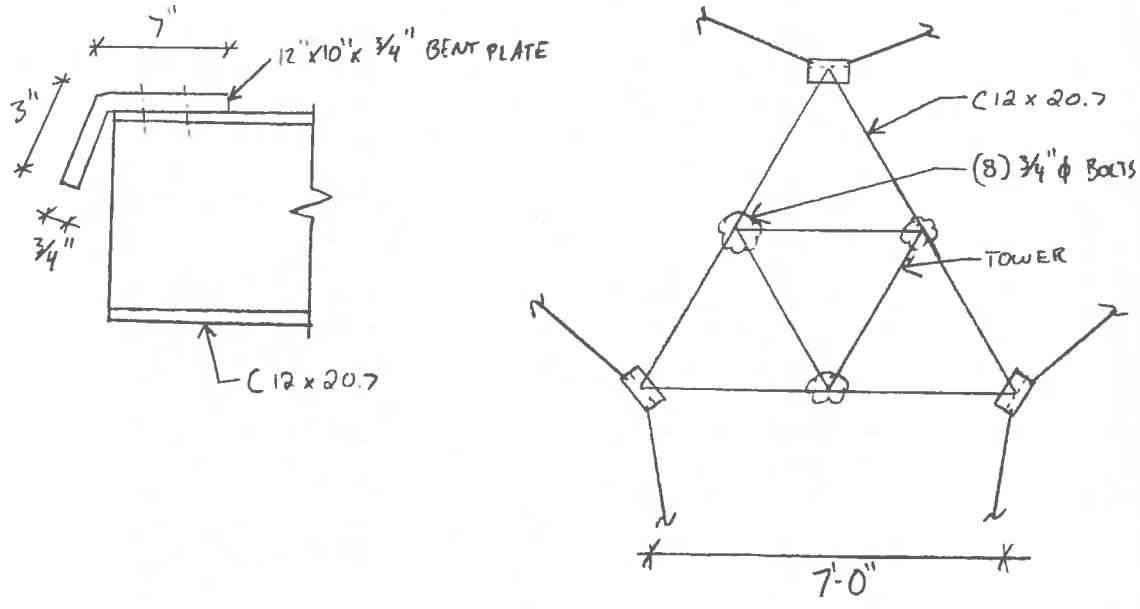
Guyed Tower Mapping Form

Torque Arm Information

- Sketch torque arm below.
- Show overall **height, spread** (hole to hole), **face width, member sizes.**
- Detail **pulloff plates** that guys are attached to.
- Measure to the nearest **1/16"** and to **hole/bolt center.**
- Repeat this sheet for each torque arm.

Elevation 152.5'	Pin Diameter 1"
Guy Level 4	Hole Diam. On Plate 1½"
Section # Bay #	Plate Hole End Distance 1½"
Shackle or Socket Size 1"	Pulloff Plate Thickness ¾"
Other Info	



Elevation **Plan**

p: 978.557.5553 f: 978.336.5586 a: 1600 Osgood Street, Building 20 North, Suite 2-101, N. Andover, MA 01845

October 10, 2018

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067

Attn: Mr. Michael Egan
P: (860) 529-8882
E: michael.egan@aecom.com

Re: Geotechnical Engineering Services
Callahan Tower
Newington, Connecticut
Terracon Proposal No. PJ2185155

Dear Mr. Egan:

Terracon Consultants, Inc. (Terracon) has completed our review of the above-referenced project, in accordance with our proposal dated September 26, 2018. Our scope of work included visiting the site to review existing site conditions and reviewing the results and recommendations provided in our August 24, 2012 Geotechnical Engineering Report. Based on our conversations, we understand the project consists of performing a structural assessment of the existing tower to evaluate the capacity to carry additional communications equipment.

Based on our review, we recommend proceeding with the analysis using the parameters provided and conditions summarized in our previous report. Seismic ground motion values should be updated to meet the Connecticut State Building Code version applicable to the design of this project.

We trust this letter meets your needs at this time. Please contact us if you have questions or require additional information.

Sincerely,
Terracon Consultants, Inc.

Brian D. Opp, P.E.
Senior Geotechnical Engineer

Stephen C. Lanne, P.E.
Geotechnical Department Manager

/scl/J2175053

October 10, 2018

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067

Attn: Mr. Michael Egan
P: (860) 529-8882
E: michael.egan@aecom.com

Re: Geotechnical Engineering Services
Callahan Tower
Newington, Connecticut
Terracon Proposal No. PJ2185155

Dear Mr. Egan:

Terracon Consultants, Inc. (Terracon) has completed our review of the above-referenced project, in accordance with our proposal dated September 26, 2018. Our scope of work included visiting the site to review existing site conditions and reviewing the results and recommendations provided in our August 24, 2012 Geotechnical Engineering Report. Based on our conversations, we understand the project consists of performing a structural assessment of the existing tower to evaluate the capacity to carry additional communications equipment.

Based on our review, we recommend proceeding with the analysis using the parameters provided and conditions summarized in our previous report. Seismic ground motion values should be updated to meet the Connecticut State Building Code version applicable to the design of this project.

We trust this letter meets your needs at this time. Please contact us if you have questions or require additional information.

Sincerely,
Terracon Consultants, Inc.

Brian D. Opp, P.E.
Senior Geotechnical Engineer

Stephen C. Lanne, P.E.
Geotechnical Department Manager

/scl/J2175053

Geotechnical Engineering Report

T-Mobile Site CT11174A Callahan Tower 1
Newington, Connecticut
August 24, 2012
Project No. J2125144

Prepared for:
Northeast Site Solutions, LLC
Farmington, Connecticut

Prepared by:
Terracon Consultants, Inc.
Rocky Hill, Connecticut

August 24, 2012

Northeast Site Solutions, LLC
199 Brickyard Road
Farmington, CT 06032

Attn: Mr. Scott Chase
P: (860) 677 1999
E: sscott@northeasttowers.com

Re: Geotechnical Engineering Report
T-Mobile Site CT11174A Callahan Tower 1
Newington, Connecticut
Terracon Project No. J2125144

Dear Mr. Chase:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the above referenced project. This study was performed in general accordance with our proposal dated July 23, 2012. This report presents the findings of the subsurface exploration and provides geotechnical recommendations relative to soil design strength parameters to evaluate the existing tower foundation. An investigation of the configuration of existing tower foundation is not provided in this report.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Patrick D. Cameron
Project Manager

Ryan R. Roy, P.E.
Senior Principal/Division Manager

/pdc/J2125144

TABLE OF CONTENTS

GEOTECHNICAL ENGINEERING REPORT
T-MOBILE SITE CT11174A CALLAHAN TOWER 1
NEWINGTON, CONNECTICUT

Project No. J2125144
August 24, 2012

1.0 INTRODUCTION

A geotechnical engineering report has been completed for the existing approximately 170-foot high guyed tower located within wooded land at the end of Cedarwood Lane in Newington, Connecticut. Two test borings was advanced to a maximum depth of 15 feet below the existing ground surface to the north and the south of the existing fenced compound area. Three test probes were advanced proximal to the guy anchors to depths ranging from approximately 5.5 to 10 feet below the existing ground surface. Logs of the test boring and probes, along with a Site Location Map (Exhibit A-1) and an Exploration Location Diagram (Exhibit A-2) are included in Appendix A of this report.

The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- subsurface soil conditions
- groundwater conditions
- soil/rock design parameters
- seismic considerations

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Site layout	Appendix A, Exhibit A-2 - Exploration Location Diagram
Tower	Approximately 170-foot high guyed communications tower
Guyed tower: **Maximum allowable settlement**	Total Settlement: 1 inch
Grading	No change to grade anticipated.

2.2 Site Location and Description

Item	Description
Location	Existing compound surrounded by wooded land at the end of Cedarwood Lane in Newington, Connecticut.
Existing improvements	Approximately 170-foot high guyed communications tower with associated electrical appurtenances within a fenced compound area.
Current ground cover	Forest mat and gravel
Existing topography	Slopes down gradually to the east.

3.0 SUBSURFACE EXPLORATIONS AND CONDITIONS

3.1 Typical Profile

Based on the results of the explorations and observations at the time of drilling, subsurface conditions on the project site can be generalized as follows:

Description	Approximate Depth to Bottom of Stratum (feet)	Material Encountered [1]	Consistency / Relative Density
Glacial Till	5.5 to 10	Silty Sand, with gravel, occasional cobbles, red-brown	Medium Dense to Very Dense
Bedrock	> 15	Gray, fresh, hard, Basalt	N/A

1. Forest Mat or gravel (about 6 inches thick) was encountered at the ground surface

Because of site limitations, including existing underground electrical lines and site topography, B-1 was advanced just south and B-2 was advanced just north of the existing compound area. Competent bedrock was encountered at a depth of approximately 9.5 feet to 6.5 feet below the existing ground surface. Bedrock was cored to a depth of 15 feet with an NX-sized core barrel in B-1. The Rock Quality Designation (RQD) value was 78 percent from a depth of 10 to 15 feet, indicating good in-situ bedrock quality. Presumed bedrock was encountered at a depth of approximately 6.5 feet in B-2. Three additional probes (P-1, P-2, and P-3) were advanced proximal to the three guy anchor locations, to further identify subsurface conditions. The probes were terminated on auger refusal on competent bedrock at depths of approximately 5.5 to 10 feet below existing ground surface.

Conditions encountered at each exploration location are indicated on the test boring and test probe logs. Stratification boundaries on the exploration logs represent the approximate location of changes in soil types; *in situ*, the transition between materials may be gradual. Further details of the explorations can be found on the logs in Appendix A of this report.

3.2 Groundwater

Groundwater was not encountered in the explorations. However, fluctuations in groundwater level may occur because of seasonal variations in the amount of rainfall, runoff, and other factors. Additionally, groundwater may become perched in portions of the Glacial Till with elevated fines content or on bedrock. The possibility of groundwater level fluctuations should be considered.

4.0 RECOMMENDED SOIL/ROCK DESIGN PARAMETERS

Although our scope of work did not include an investigation of existing tower foundation configuration, we anticipate that the approximately 170-foot lattice telecommunications tower is supported on a mat foundation bearing on glacial till and the guy anchors are likely bearing in the glacial till or on bedrock. Based on our observations, we have tabulated our estimates of the soil/bedrock parameters below:

4.1 Soil/Rock Design Parameters

Description	Value
Net allowable bearing pressure (on glacial till) [1]	4 kips per square foot (ksf)
Net allowable bearing pressure (on bedrock) [1]	10 kips per square foot (ksf)
Total Unit Weight (Glacial Till) (γ)	130 pounds per cubic foot (pcf)
Total Unit Weight (Bedrock) (γ)	165 pcf
Angle of Internal Friction [2]**, φ (degrees)**	30 to 32
Coefficient of sliding friction [3]	0.5 (ultimate)

1. The recommended net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation.
2. Angle of internal friction of the glacial till may be higher where there are more frequent gravel-sized particles.
3. A factor of safety of at least 1.5 should be applied to the sliding resistance.

4.2 Seismic Considerations

Description	Value
Code Used	Connecticut State Building Code (CBC) [1]
Site Class	C[2]
Maximum considered earthquake ground motions (5 percent damping)	0.064g (1.0 second spectral response acceleration, S_1)
	0.240g (0.2 second spectral response acceleration, S_s)
Liquefaction potential in event of an earthquake	Not susceptible

1. The CBC incorporates the Seismic Design Category approach from the 2003 International Building Code.
2. The CBC requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100-foot soil profile determination; the borings performed for this report extended to a maximum depth of 15 feet. However, we expect soil at least as dense as encountered above a depth of 10 feet or bedrock will extend to a depth of 100 feet.

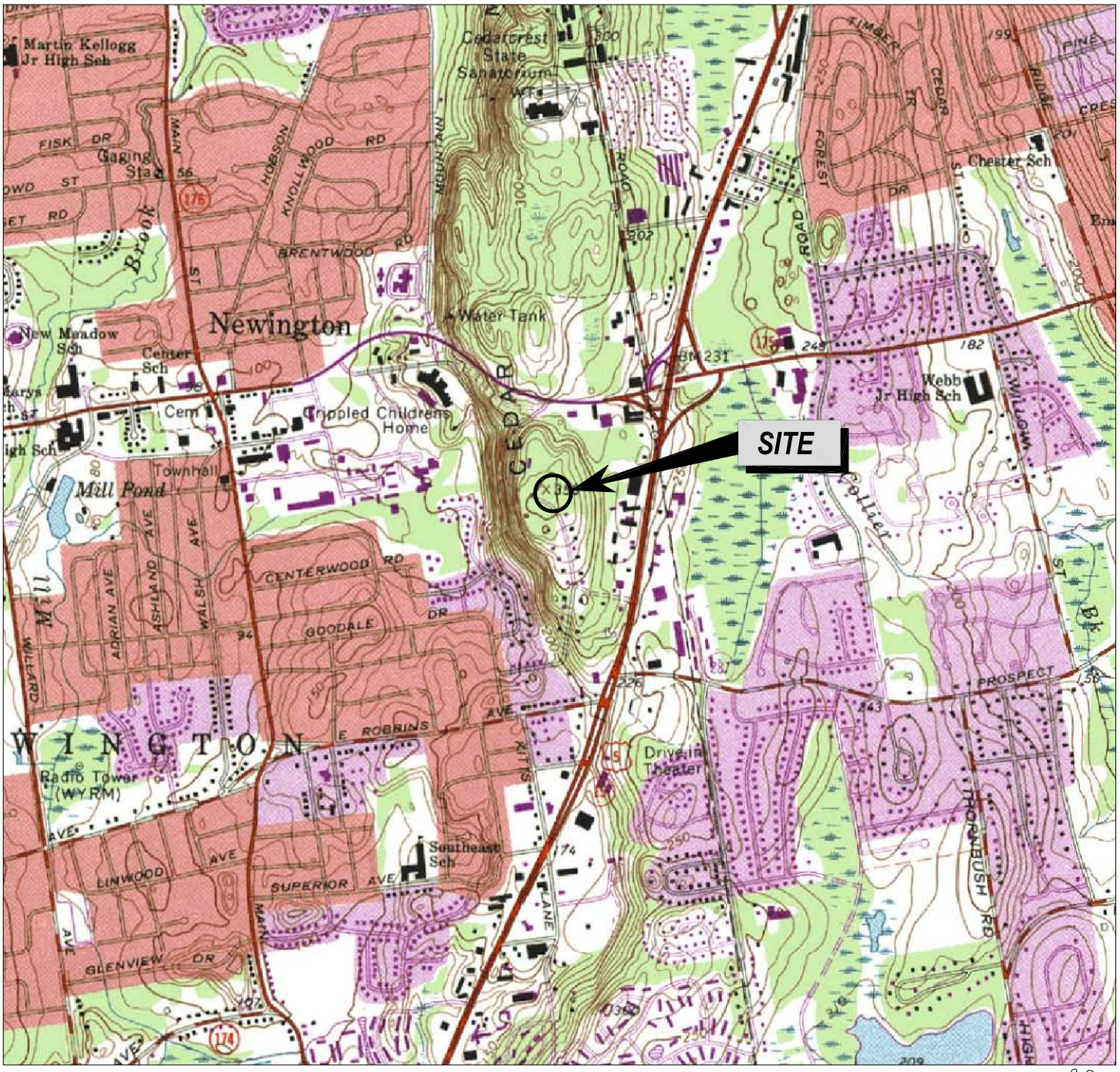
5.0 GENERAL COMMENTS

The analysis and recommendations presented in this report are based upon the data obtained from the explorations performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between explorations, across the site, or due to the modifying effects of weather. The nature and extent of such variations would not become evident without excavation to the bedrock surface.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
FIELD EXPLORATION



SCALE: 1:24 000

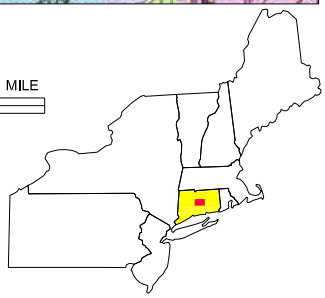
1 1/2 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER

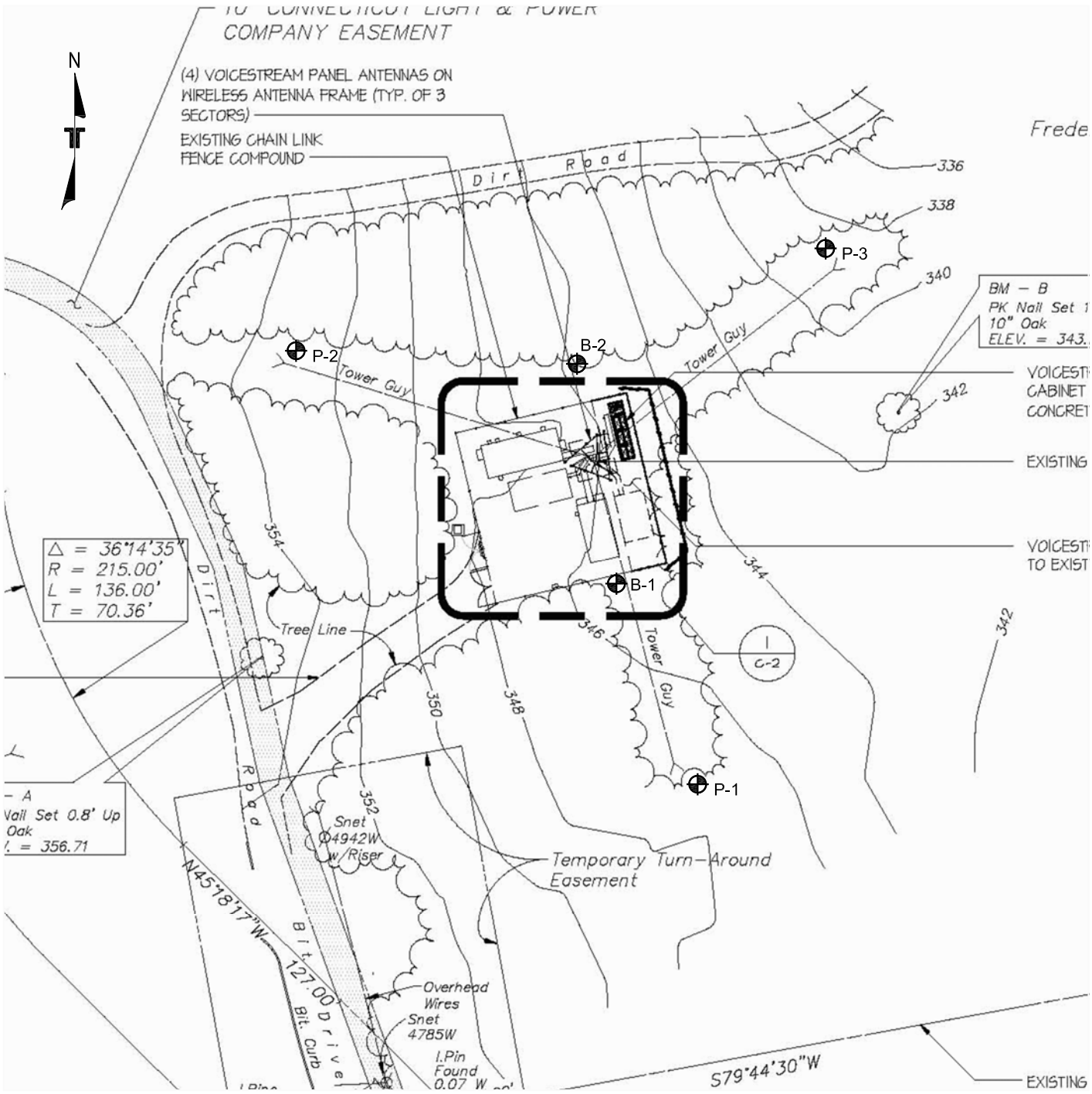
CONTOUR INTERVAL 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

N



QUADRANGLE LOCATION
SOURCE:
USGS HARTFORD SOUTH, CT
1992

Project Mngr: PDC	Project No. J2125144	Terracon	SITE LOCATION MAP
Drawn By: MCR	Scale: AS SHOWN	201 Hammer Mill Road Rocky Hill, Connecticut 06067	T MOBILE SITE CT11174A CALLAHAN TOWER 1 NEWINGTON, CT
Checked By: PDC	File No. J2125144.dwg	PH. (860)721-1900 FAX.(860)721-1939	EXHIBIT A-1
Approved By: RRR	Date: August 2012		



NOTES:

1. THIS EXHIBIT WAS PREPARED FROM A PLAN ENTITLED: SITE PLAN AND NOTES, No. C-1, CALLAHAN TOWER 1, 2111 BERLIN TURNPIKE, NEWINGTON, CT, PREPARED BY URS CORPORATION AES OF ROCKY HILL, CT.

2. TEST BORINGS B-1 AND B-2 AND TEST PROBES P-1, P-2, AND P-3 WERE ADVANCED ON AUGUST 13, 2012 UNDER THE DIRECTION OF TERRACON WITH EQUIPMENT OWNED AND OPERATED BY NEW ENGLAND BORING CONTRACTORS, OF GLASTONBURY, CT.

3. THE APPROXIMATE LOCATIONS OF THE TEST BORINGS WERE LOCATED BY TAPE MEASUREMENT REFERENCING EXISTING SITE FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.

4. USE OF THIS PLAN IS LIMITED TO THE ILLUSTRATION OF THE APPROXIMATE LOCATION OF THE TEST BORINGS, TEST PROBES AND OTHER PERTINENT SITE FEATURES. OTHER USE OF THIS PLAN WITHOUT PERMISSION FROM TERRACON IS PROHIBITED.

LEGEND

B-1 APPROXIMATE TEST BORING LOCATION (TYP)

P-1 APPROXIMATE TEST PROBE LOCATION (TYP)

GRAPHIC SCALE
0 25 50
(IN FEET)

Project Mngr: PDC	Project No. J2125144	Terracon	EXPLORATION LOCATION DIAGRAM
Drawn By: MCR	Scale: 1" = 50'		T MOBILE SITE CT11174A CALLAHAN TOWER 1 NEWINGTON, CT
Checked By: PDC	File No. J2125144.dwg		EXHIBIT A-2
Approved By: RRR	Date: August 2012	201 Hammer Mill Road Rocky Hill, Connecticut 06067 PH. (860)721-1900 FAX.(860)721-1939	

BORING NO. B-1

CLIENT	**Northeast Site Solutions**
SITE LOCATION	**Callahan Tower 1** **Newington, Connecticut**
PROJECT NAME	**T Mobile Site CT11174A**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	SAMPLES: USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - Blows per 6" RQD (%)	TESTS: WATER CONTENT,%	ORGANIC CONTENT, %	PID (ppm)	OTHER TESTS
	Approx. Surface Elev.:										
	0.5 Trap rock gravel			1	SS	10	10-12 14-17				
	SILTY SAND, with gravel, occasional cobbles, red-brown, medium dense to very dense.			2	SS	10	12-18 15-16				
		5		3	SS	0	50/0"				
				4	SS	6	59-53 59				
	9.5 **(GLACIAL TILL)**						Coring rate				RQD (%)
	10 **(WEATHERED BEDROCK)**	10		1	CORE	60	4.5 4.0 4.0 4.5 4.5				78.3
	BASALT, hard, fresh, gray. **(BEDROCK)**										
	15 BORING TERMINATED AT 15.0 ft	15									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

Auger Type: HSA, Auger Dia: 3.25" O.D.
Core Barrel: NX
Hammer Type: Auto, Hammer weight 140 lbs.
Drop Method: Winch

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▽
WL	Not encountered	

Terracon

BORING STARTED	8-13-12		
BORING COMPLETED	8-13-12		
RIG	B-53	FOREMAN	Tim C.
LOGGED BY:	MK	JOB #	J2125144

BORING NO. B-2

CLIENT	**Northeast Site Solutions**
SITE LOCATION	**Callahan Tower 1** **Newington, Connecticut**
PROJECT NAME	**T Mobile Site CT11174A**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	SAMPLES: USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - Blows per 6" RQD (%)	TESTS: WATER CONTENT,%	TESTS: ORGANIC CONTENT, %	TESTS: PID (ppm)	TESTS: OTHER TESTS
	Approx. Surface Elev.:										
	0.2 Forest mat			1	SS	16	11-11 12-14				
	SILTY SAND, with gravel, occasional cobbles, red-brown, medium dense to very dense.			2	SS	12	13-17 17-21				
		5		3	SS	10	38-42 50/2"				
	6.5 Refusal at 6', offset boring 5' east, refusal at 7'. **(GLACIAL TILL)**										
	BORING TERMINATED AT 7.0 ft on presumed bedrock										

Auger Type: HSA, Auger Dia: 3.25" O.D.
Hammer Type: Auto, Hammer weight 140 lbs.
Drop Method: Winch

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▽
WL	Not encountered	

Terracon

BORING STARTED			8-13-12
BORING COMPLETED			8-13-12
RIG	B-53	FOREMAN	Tim C.
LOGGED BY:	MK	JOB #	J2125144

PROBE NO. P-1

CLIENT **Northeast Site Solutions**	
SITE LOCATION **Callahan Tower 1 Newington, Connecticut**	PROJECT NAME **T Mobile Site CT11174A**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - Blows per 6"	TESTS WATER CONTENT, %	TESTS pH	TESTS UNCONFINED STRENGTH, psf	TESTS OTHER TESTS
	Approx. Surface Elev.:										
	0.5 Forest mat										
	SILTY SAND, with gravel, occasional cobbles, red-brown.										
	5.5 Refusal at 5.5', offest 5' south, refusal at 4.5'. **(GLACIAL TILL)**	5									
	BORING TERMINATED AT 5.5 ft										

Auger Type: SSA, Auger Dia: 4" O.D.

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▽
WL	Not encountered	

Terracon

BORING STARTED			8-13-12
BORING COMPLETED			8-13-12
RIG	B-53	FOREMAN	Tim C.
LOGGED BY:	MK	JOB #	J2125144

PROBE LOG J2125144.GPJ TERRACON 20080217.GDT 8/24/12

PROBE NO. P-2

CLIENT **Northeast Site Solutions**	
SITE LOCATION **Callahan Tower 1 Newington, Connecticut**	PROJECT NAME **T Mobile Site CT11174A**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - Blows per 6"	TESTS WATER CONTENT, %	TESTS pH	TESTS UNCONFINED STRENGTH, psf	TESTS OTHER TESTS
	Approx. Surface Elev.:										
	0.5 Forest mat										
	SILTY SAND, with gravel, occasional cobbles, red-brown.	5									
	6 Refusal at 6', offest 5' east, refusal at 6.5'. **(GLACIAL TILL)**										
	BORING TERMINATED AT 6 ft										

Auger Type: SSA, Auger Dia: 4" O.D.

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▽
WL	Not encountered	

Terracon

BORING STARTED			8-13-12
BORING COMPLETED			8-13-12
RIG	B-53	FOREMAN	Tim C.
LOGGED BY:	MK	JOB #	J2125144

PROBE LOG J2125144.GPJ TERRACON 20080217.GDT 8/24/12

PROBE NO. P-3

CLIENT **Northeast Site Solutions**	
SITE LOCATION **Callahan Tower 1 Newington, Connecticut**	PROJECT NAME **T Mobile Site CT11174A**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - Blows per 6"	TESTS WATER CONTENT, %	TESTS pH	TESTS UNCONFINED STRENGTH, psf	TESTS OTHER TESTS
	Approx. Surface Elev.:										
	0.5 Forest mat										
	SILTY SAND, with gravel, occasional cobbles, red-brown.	5									
	10 **(GLACIAL TILL)**	10									
	BORING TERMINATED AT 10 ft										

Auger Type: SSA, Auger Dia: 4" O.D.

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▽
WL	Not encountered	

Terracon

BORING STARTED			8-13-12
BORING COMPLETED			8-13-12
RIG	B-53	FOREMAN	Tim C.
LOGGED BY:	MK	JOB #	J2125144

PROBE LOG J2125144.GPJ TERRACON 20080217.GDT 8/24/12

Field Exploration Description

The site has an existing tower within a fenced compound area. Terracon monitored the advancement of two test borings (B-1 and B-2) in the vicinity of the existing tower compound area and three test probes (P-1, P-2, and P-3) proximal to the guy anchors on August 13, 2012. The explorations were advanced using a Mobile B-53 all-terrain vehicle-mounted rotary drill rig, owned and operated by New England Boring Contractors Inc. of Glastonbury, Connecticut. B-1 and B-2 was advanced using 3 1/4-inch inside diameter hollow-stem augers (HSA) to a maximum depth of about 10 feet below existing grade and terminated at refusal on competent bedrock. Bedrock was then cored to a depth of 15 feet with an NX-sized core barrel.

The soil samples were placed in labeled glass jars and taken, along with the rock core in a wooden core box, to our Rocky Hill (Hartford), Connecticut office for further review by a Terracon geotechnical engineer. Information provided on the boring log attached to this report includes soil and rock descriptions, relative density and/or consistency evaluations, boring depths, sampling intervals, and groundwater conditions. The boring was backfilled with auger cuttings prior to the drill crew leaving the site.

P-1, P-2, and P-3 were advanced with 4-inch diameter solid stem augers (SSA) to further evaluate the subsurface conditions in the vicinity of the existing tower compound area. P-1 and P-2 were terminated on auger refusal at depths ranging from approximately 5.5 to 6.5 feet. P-3 was terminated at a depth of approximately 10 feet. The probes were backfilled with auger cuttings prior to the drill crew leaving the site.

Field logs of the boring and probes were prepared by a Terracon field engineer. These logs included visual classifications of the materials encountered during drilling as well as interpretation by our field engineer of the subsurface conditions between samples. Final exploration logs included with this report represent further interpretation by the geotechnical engineer of the field logs and incorporate, where appropriate, modifications based on laboratory classification of the samples.

The approximate exploration locations, which are shown on Exhibit A-2, were measured by taping from existing features in the field and by estimating right angles. The locations of the explorations should be considered accurate only to the degree implied by the method used to define them. Ground elevations at the exploration locations were not available.

APPENDIX B

SUPPORTING DOCUMENTS

GENERAL NOTES

DRILLING & SAMPLING SYMBOLS:

SS:	Split Spoon – 1-$^3/_8$" I.D., 2" O.D., unless otherwise noted	HS:	Hollow Stem Auger
ST:	Thin-Walled Tube - 2" O.D., unless otherwise noted	PA:	Power Auger
RS:	Ring Sampler - 2.42" I.D., 3" O.D., unless otherwise noted	HA:	Hand Auger
DB:	Diamond Bit Coring - 4", N, B	RB:	Rock Bit
BS:	Bulk Sample or Auger Sample	WB:	Wash Boring or Mud Rotary

The number of blows required to advance a standard 2-inch O.D. split-spoon sampler (SS) typically the middle 12 inches of the total 24-inch penetration with a 140-pound hammer falling 30 inches is considered the “Standard Penetration” or “N-value”.

WATER LEVEL MEASUREMENT SYMBOLS:

WL:	Water Level	WS:	While Sampling	N/E:	Not Encountered
WCI:	Wet Cave in	WD:	While Drilling		
DCI:	Dry Cave in	BCR:	Before Casing Removal		
AB:	After Boring	ACR:	After Casing Removal		

Water levels indicated on the boring logs are the levels measured in the borings at the times indicated. Groundwater levels at other times and other locations across the site could vary. In pervious soils, the indicated levels may reflect the location of groundwater. In low permeability soils, the accurate determination of groundwater levels may not be possible with only short-term observations.

DESCRIPTIVE SOIL CLASSIFICATION: Soil classification is based on the Unified Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Standard Penetration or N-value (SS) Blows/Ft.	Consistency
< 500	<2	Very Soft
500 – 1,000	2-3	Soft
1,001 – 2,000	4-6	Medium Stiff
2,001 – 4,000	7-12	Stiff
4,001 – 8,000	13-26	Very Stiff
8,000+	26+	Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Standard Penetration or N-value (SS) Blows/Ft.	Ring Sampler (RS) Blows/Ft.	Relative Density
0 – 3	0-6	Very Loose
4 – 9	7-18	Loose
10 – 29	19-58	Medium Dense
30 – 49	59-98	Dense
50+	99+	Very Dense

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other Constituents	Percent of Dry Weight
Trace	< 15
With	15 – 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75 mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm)
Silt or Clay	Passing #200 Sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other Constituents	Percent of Dry Weight
Trace	< 5
With	5 – 12
Modifiers	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1-10
Medium	11-30
High	30+

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines Classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-in. (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

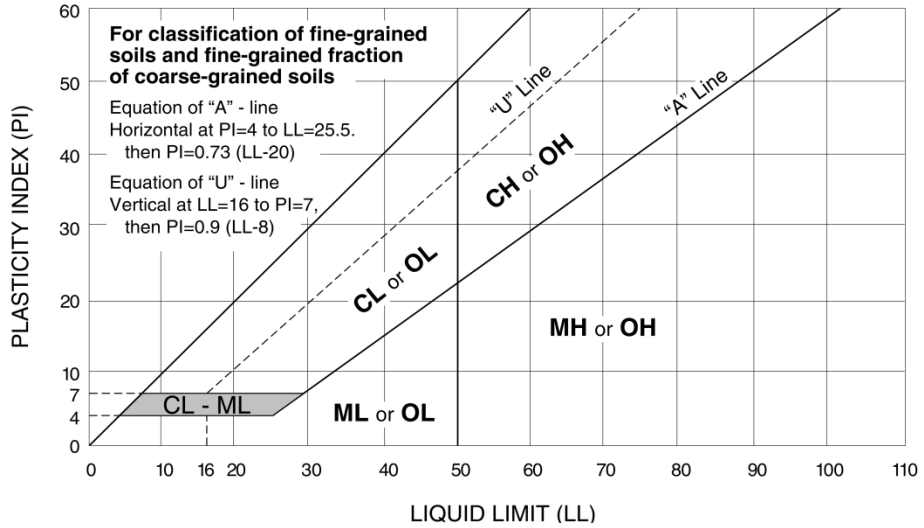
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



DESCRIPTION OF ROCK PROPERTIES

WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

HARDNESS (for engineering description of rock – not to be confused with Moh's scale for minerals)

Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding and Foliation Spacing in Rock[a]

Spacing	Joints	Bedding/Foliation
Less than 2 in.	Very close	Very thin
2 in. – 1 ft.	Close	Thin
1 ft. – 3 ft.	Moderately close	Medium
3 ft. – 10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

Rock Quality Designator (RQD)[b]		Joint Openness Descriptors	
RQD, as a percentage	Diagnostic description	Openness	Descriptor
Exceeding 90	Excellent	No Visible Separation	Tight
90 – 75	Good	Less than 1/32 in.	Slightly Open
75 – 50	Fair	1/32 to 1/8 in.	Moderately Open
50 – 25	Poor	1/8 to 3/8 in.	Open
Less than 25	Very poor	3/8 in. to 0.1 ft.	Moderately Wide
		Greater than 0.1 ft.	Wide

a. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.
b. RQD (given as a percentage) = length of core in pieces 4 in. and longer/length of run.

References: American Society of Civil Engineers. Manuals and Reports on Engineering Practice - No. 56. Subsurface Investigation for Design and Construction of Foundations of Buildings. New York: American Society of Civil Engineers, 1976.
U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.

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Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT1145

FA#: 10035097

Newington
99 Cedarwood Lane
Newington, CT 06111

June 13, 2018

Centerline Communications Project Number: 950006-129

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.36 %**

June 13, 2018

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1145 – Newington**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **99 Cedarwood Lane, Newington, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) 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 performed for the proposed AT&T Wireless antenna facility located at **99 Cedarwood Lane, Newington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	4	60
LTE	700 MHz (Band 14)	4	60
LTE	850 MHz	2	60
LTE	1900 MHz (PCS)	4	60
LTE	2100 MHz (AWS)	4	60
LTE	2300 MHz (WCS)	4	60

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	140
A	2	CCI OPA-65R-LCUU-H6	140
A	3	Kathrein 800-10965	140
A	4	Quintel QS66512-2	140
B	1	Powerwave 7770	140
B	2	CCI OPA-65R-LCUU-H6	140
B	3	Kathrein 800-10965	140
B	4	Quintel QS66512-2	140
C	1	Powerwave 7770	140
C	2	CCI OPA-65R-LCUU-H6	140
C	3	Kathrein 800-10965	140
C	4	Quintel QS66512-2	140

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.56
Antenna A2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	8	280	6,785.10	1.84
Antenna A3	Kathrein 800-10965	700 MHz (Band 14) / 2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	2.21
Antenna A4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	1.19
						Sector A Composite MPE%	**5.80**
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.56
Antenna B2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	8	280	6,785.10	1.84
Antenna B3	Kathrein 800-10965	700 MHz (Band 14)/ 2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	2.21
Antenna B4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	1.19
						Sector B Composite MPE%	**5.80**
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	0.56
Antenna C2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	8	280	6,785.10	1.84
Antenna C3	Kathrein 800-10965	700 MHz (Band 14) / 2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	2.21
Antenna C4	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	6	240	4,855.52	1.19
						Sector C Composite MPE%	**5.80**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**5.80 %**
Clearwire	0.10 %
Sprint	2.56 %
Carbone's Auto Body	6.45 %
Town of Wethersfield	0.08 %
T-Mobile	1.37 %
Site Total MPE %:	**16.36 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	5.80 %
AT&T Sector B Total:	5.80 %
AT&T Sector C Total:	5.80 %
Site Total:	16.36 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS – Antenna 1	2	414.12	140	1.66	850 MHz	567	0.29%
AT&T 1900 MHz (PCS) UMTS – Antenna 1	2	656.33	140	2.63	1900 MHz (PCS)	1000	0.26%
AT&T 700 MHz LTE – Antenna 2	2	584.87	140	2.34	700 MHz	467	0.50%
AT&T 850 MHz LTE – Antenna 2	2	703.17	140	2.82	850 MHz	567	0.50%
AT&T 2300 MHz (WCS) LTE – Antenna 2	4	1,052.26	140	8.43	2300 MHz (WCS)	1000	0.84%
AT&T 700 MHz LTE (Band 14) – Antenna 3	4	736.31	140	5.90	700 MHz	467	1.26%
AT&T 2100 MHz (AWS) LTE – Antenna 3	4	1,180.65	140	9.46	2100 MHz (AWS)	1000	0.95%
AT&T 700 MHz LTE – Antenna 4	2	486.47	140	1.95	700 MHz	467	0.42%
AT&T 1900 MHz (PCS) LTE – Antenna 4	4	970.64	140	7.77	1900 MHz (PCS)	1000	0.78%
						Total:	**5.80**

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector A:	5.80 %
Sector B:	5.80 %
Sector C:	5.80 %
AT&T Maximum Total (per sector):	5.80 %
Site Total:	16.36 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.36 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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3 MAY 2019 ⓘ
by **8:00pm** ⓘ

Status

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