NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
4 Angelas Way, Burlington CT 06013
203-435-3640
denise@northeastsitesolutions.com

February 6, 2024

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
101 Mountain Road, Redding CT 06896
Latitude: 41.278333
Longitude: -73.442222
T-Mobile Site#: CT11116C_L600

Dear Ms. Bachman:
T-Mobile currently maintains two (2) antenna at the 74-foot level of the existing 80-foot monopole located at 101 Mountain Road, Redding CT. The tower and property are owned by CL&P d/b/a Eversource. T-Mobile intends to remove the two (2) existing antenna and replace them with two (2) new 600/700/1900/2100 MHz antenna. T-Mobile also intends to replace the existing pipe mast with a new pipe 25-ft mast attached to the 68-foot transmission tower. The new pipe mast overall height will remain the same (80-ft). The new antennas would be installed flush mounted at the 77-foot level of the new 80-foot monopole. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable.

T-Mobile Planned Modifications:
Remove: None

Remove and Replace:
(2) APX16DWV Antenna (Remove) – (2) APXVAALL18 600/700/1900/2100 MHz Antenna (Replace)
(1) 4" Sch.40 Pipe Mast (Remove) – (1) 10" Sch.80 Pipe Mast (Replace)

Install New:
(2) Andrew ATSBTTOP- MF-4G Smart Bias Tees flush mounted

Existing to Remain:
(8) 7/8" Coax cables

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This facility was originally approved by the Connecticut Siting Council on December 8, 1999 Petition No. 441.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to First Selectman Julia Pemberton and Aimee Pardee, Land Use Director, as well as the property owner and the tower owner (Eversource).

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

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

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

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

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

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

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under
R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Denise Sabo

Denise Sabo
Mobile: 203-435-3640
Fax: 413-521-0558
Office: 4 Angelas Way, Burlington CT 06013
Email: denise@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments:

cc:
Julia Pemberton, First Selectman
100 Hill Road, P.O. Box 1028 Redding, CT 06875

Aimee Pardee, Land Use Director
100 Hill Road, P.O. Box 1028 Redding, CT 06875

CL&P d/b/a Eversource Energy, as tower owner and property owner
PO BOX 270, Hartford, CT 06141

Exhibit A

Original Facility Approval

Petition No. 441
Omnipoint Communications
Staff Report
December 8, 1999

On December 6, 1999, Connecticut Siting Council (Council) member Edward S. Wilensky, and Council staff Steve Levine met Omnipoint representatives Brendan Sharkey, Chetan Dhaduk, and Brian Raggozine in Redding for inspection of an electric transmission structure. The structure is owned by Connecticut Light and Power Co. (CL&P). Omnipoint, with the agreement of CL&P, proposes to modify the structure for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification. Omnipoint submits that the proposed modification will not have a substantial adverse environmental effect and will reduce the need for new telecommunications towers by utilizing an existing structure.

Omnipoint proposes to place a pipe-mount with two panel antennas atop existing CL&P structure #3275, which is located within the CL&P right-of-way between Route 7 and Mountain Road in Redding. The monopole-style tower is 68 feet tall. Associated equipment would be mounted on a new 7 ft. by 10 ft. fenced concrete slab poured near the base of the tower. Access to the site would be by private easement along an existing driveway that leads to near the base of the tower. Utility service would be routed underground along the driveway from an existing CL&P distribution pole.

As proposed, Omnipoint's equipment would extend approximately 11.5 feet above the tower, bringing the total height to approximately 80 feet. The antenna structure itself would consist of 5.5 foot-high antennas with approximately 6 feet of pipe showing between the antenna bottoms and the top of the lattice structure. The pipe would be 4 inches in diameter, and the asymmetrical antenna cluster would measure between approximately 10 inches and 2 feet in width, depending on the direction of view.

The proposed antennas and associated equipment will not increase the noise levels at the existing site, under normal operating conditions, by six decibels or more. The worst case power density for the telecommunications operations at the site has been calculated to be 2.52% of the applicable standard for uncontrolled environments. Omnipoint contends that the proposed installation will not cause a substantial adverse environmental effect, and for this reason would not require a Certificate.

Exhibit B

Property Card

99 MOUNTAIN RD

Location	99 MOUNTAIN RD	**Mblu**	35/ / 82/ C/
Acct#	3582C	**Owner**	EVERSOURCE
Assessment	$252,000	**Appraisal**	$360,000
PID	100623	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2023	$0	$360,000	$360,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2023	$0	$252,000	$252,000

Owner of Record

Owner EVERSOURCE
Co-Owner
Address PO BOX 270
HARTFORD , CT 06141

Sale Price $0
Certificate 1
Book & Page 0000/0000
Sale Date 10/01/2015
Instrument 25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
EVERSOURCE	$0	1	0000/0000	25	10/01/2015
CONN LIGHT & POWER	$0		0296/356X	XX	09/16/2003

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:

Replacement Cost
Less Depreciation: $0

Building Attributes	
Field	**Description**
Style	Vacant Land
Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms	
Full Bathrooms	
Half Bathrooms	
Total Xtra Fixtrs	
Total Rooms	
Bath Style:	
Kitchen Style:	
Fireplaces 2	
Cndtn	
Whirlpool Tubs	
Fin Bsmt Area	
Fin Bsmt Qual	
Bsmt Garages	
Num Park	
Fireplaces	
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos/ReddingCTPhotos//default.jpg)

Building Layout

(ParcelSketch.ashx?pid=100623&bid=20626)

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

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	435
Description	Cell Site Vac Lnd
Zone	R-2
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.00
Frontage	
Depth	
Assessed Value	$252,000
Appraised Value	$360,000

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$0	$360,000	$360,000
2021	$0	$360,000	$360,000
2020	$0	$360,000	$360,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2022	$0	$252,000	$252,000
2021	$0	$252,000	$252,000
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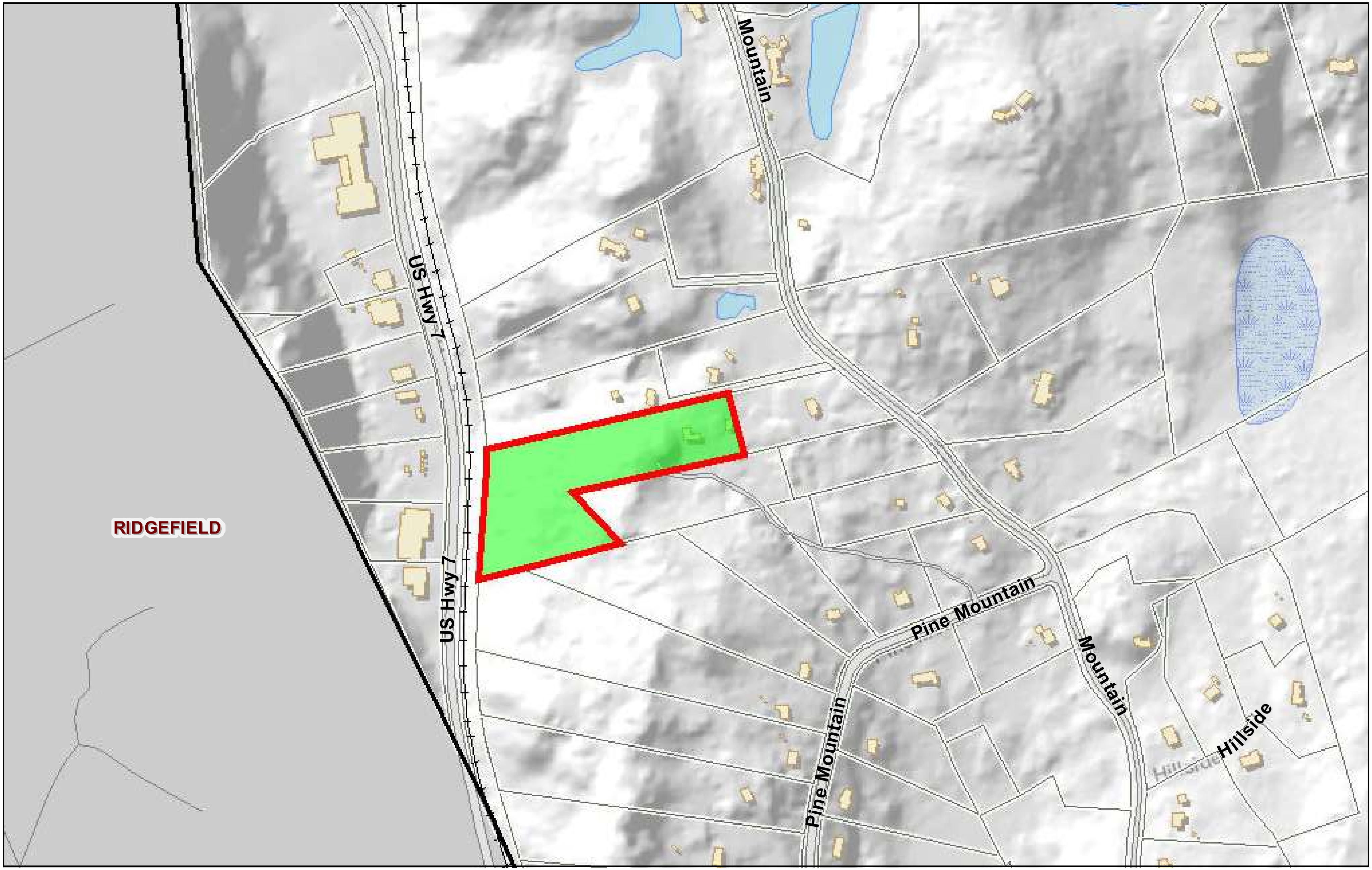

Information presented is provided "as is." The Town of Redding, CT disclaims all representations or warranties regarding GIS information. GIS data is representative data only. In no event will the Town of Redding be responsible for damages of any nature whatsoever resulting from use of or reliance upon GIS information.

Exhibit C

Construction Drawings

SITE NAME: RIDGEFIELD/ ETHAN ALLEN H

SITE ID: CT11116C

101 MOUNTAIN RD. CL&P POLE #3275

REDDING, CT 06896

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67E04B OUTDOOR

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. 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. 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.
5. 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 AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. 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.
7. 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.
8. 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.
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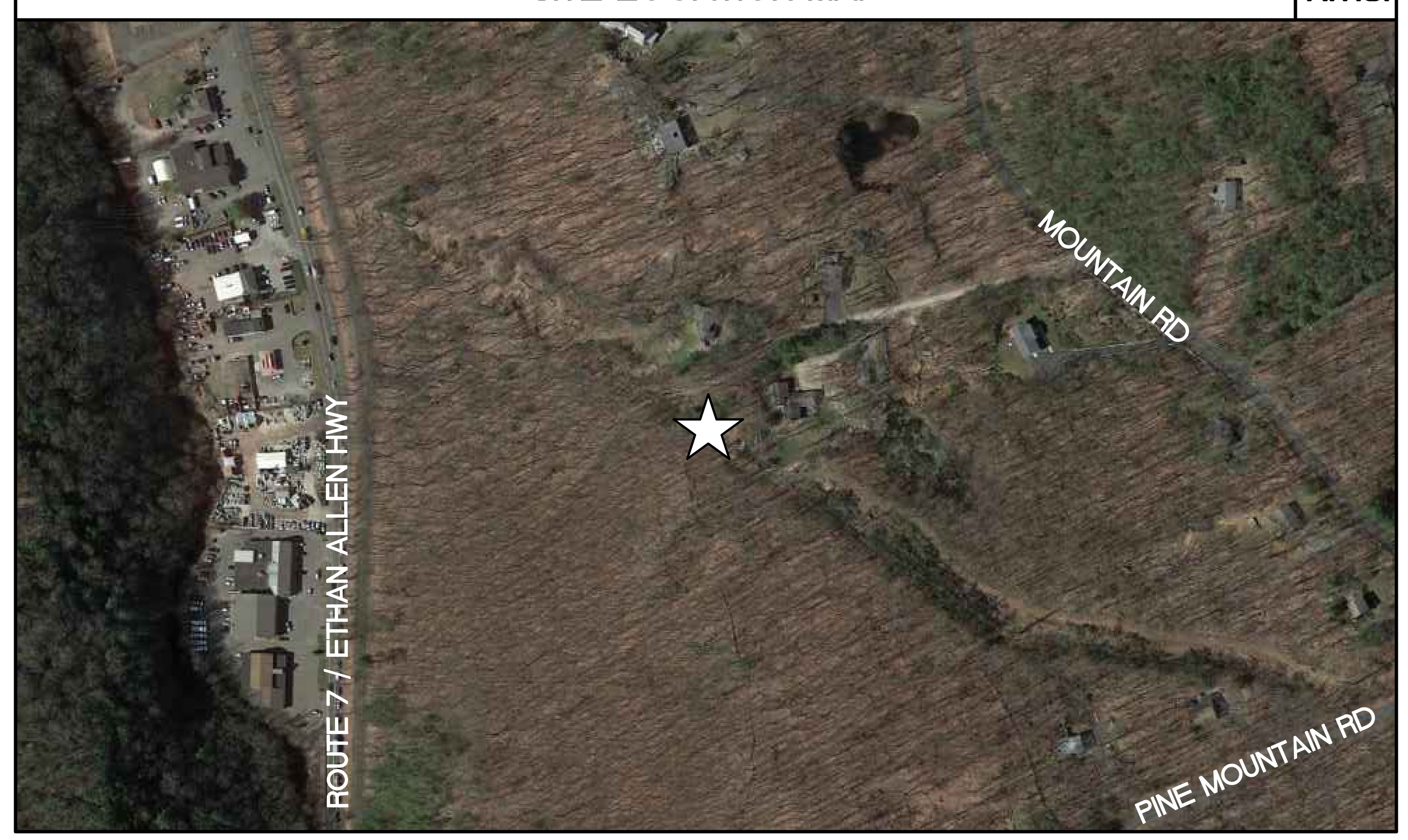
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. 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.
12. 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.
13. 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.
14. 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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T–MOBILE 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.
18. 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.
19. 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.
20. 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.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. 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.
23. 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. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

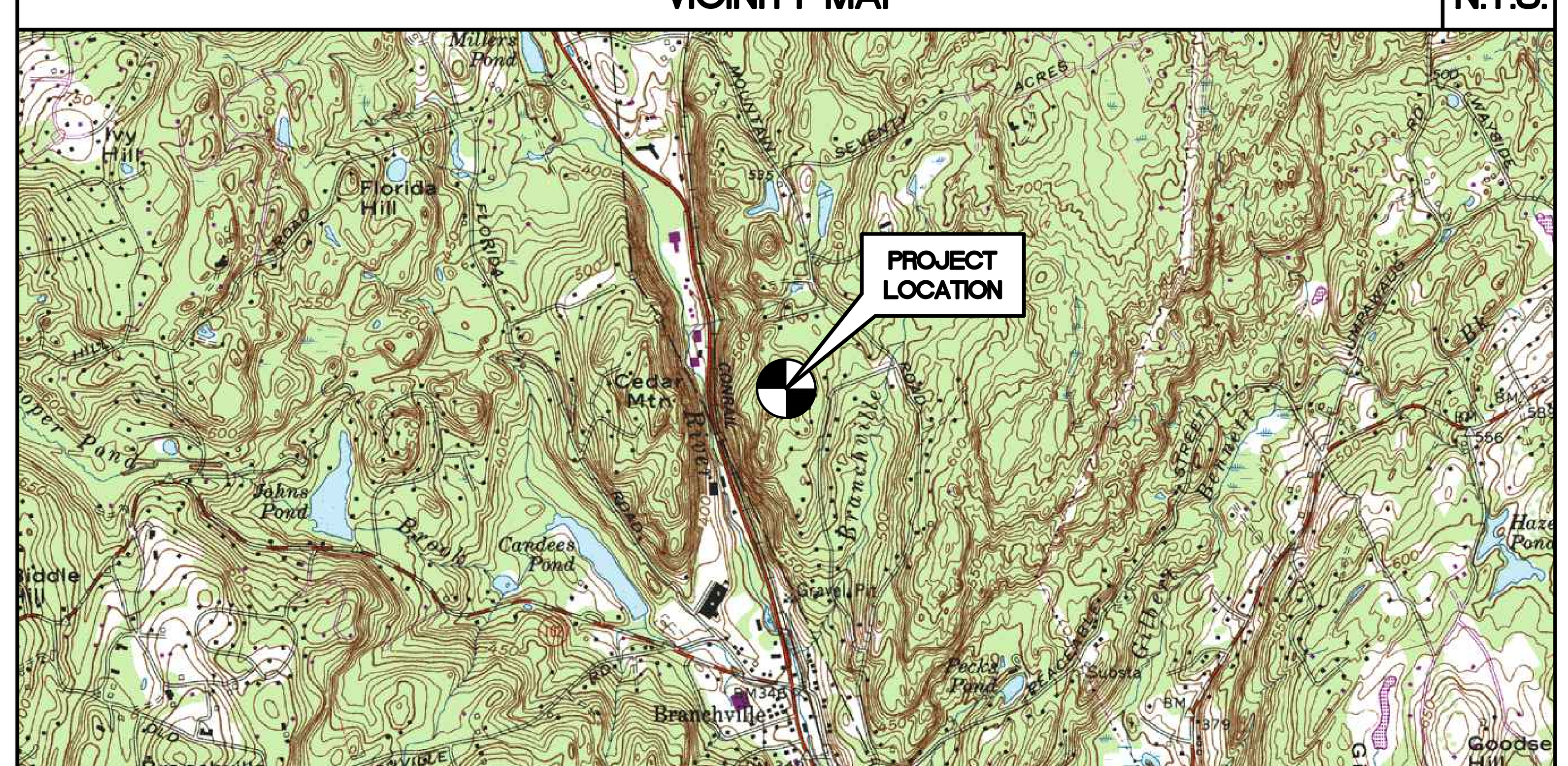
SITE LOCATION MAP

N.T.S.



VICINITY MAP

N.T.S.



COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH.

SITE COORDINATES: LATITUDE: 41°–16'–42" N; LONGITUDE: 73°–26'–32" W; GROUND ELEVATION: ±570' AMSL

NORTH

PROJECT SUMMARY

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

1. REMOVE EXISTING RFS: APX16DWV–16DWVS ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (2)
2. REMOVE EXISTING TMAs
3. INSTALL 10" SCH. 80 x 25' LONG PIPE MAST TO REPLACE EXISTING MAST.
4. INSTALL (8) 7/8" COAX CABLES
5. INSTALL RFS: APXVAALL18_43–U–NA20 ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (2)
6. INSTALL COMMSCOPE: SMART BIAST – ATSBT–TOP–MF–4G TYP. (1) PER SECTOR; TOTAL OF (2)
7. INSTALL ERICSSON: RADIO 4480 B71+B85, TYP. (1) PER SECTOR; TOTAL OF (2) AT GRADE
8. INSTALL NEW 6' LONG PIPE MASTS, TYP. (1) PER SECTOR; TOTAL OF (2)
9. INSTALL NEW 200A CIRCUIT BREAKER AT UTILITY METER.
10. INSTALL NEW 200A MINI PPC CABINET

STRUCTURAL + SPECIAL INSPECTIONS

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S–1 FOR ADDITIONAL DETAILS. FOR REQUIRED SPECIAL INSPECTIONS, NOTES, AND REQUIREMENTS, SEE SHEET(S) N–2 FOR ADDITIONAL DETAILS.

1. INSTALL NEW ANTENNA MAST AND ANTENNA MOUNTS TO EXISTING STRUCTURE.

PROJECT INFORMATION

SITE NAME:	RIDGEFIELD/ ETHAN ALLEN H
SITE ID:	CT11116C
SITE ADDRESS:	101 MOUNTAIN RD. CL&P POLE #3275 REDDING, CT 06896
APPLICANT:	T–MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT. 06002
CONTACT PERSON:	MATT BANDLE (PROJECT MANAGER) NORTHEAST SITE SOLUTIONS (508) 642–8801
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488–0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°–16'–42" N LONGITUDE: 73°–26'–32" W GROUND ELEVATION: ±570' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
3	01/17/24	BSP	TJR	CONSTRUCTION DRAWINGS – REVISED PER NEWLY ISSUED RFDS
2	11/06/23	BSP	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
1	09/12/23	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
0	08/10/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · CARLO F. CENTORE · No. 16694 · LICENSED PROFESSIONAL ENGINEER

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

NSS NORTHEAST SITE SOLUTIONS Turnkey Wireless Development

T-MOBILE NORTHEAST LLC

SITE NAME: RIDGEFIELD/ ETHAN ALLEN H

SITE ID: CT11116C

101 MOUNTAIN RD. CL+P POLE #3275

REDDING, CT 06896

DATE:	08/10/23
SCALE:	AS NOTED
JOB NO.	22006.03

TITLE SHEET

T–1

NOTES AND SPECIFICATIONS:

DESIGN BASIS:

1. GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.
2. TIA-222-H, ASCE MANUAL NO. 48-19 – "DESIGN OF STEEL TRANSMISSION POLE STRUCTURES SECOND EDITION", NESC C2-2023 AND EVERSOURCE.
3. DESIGN CRITERIA
   - WIND LOAD: (ANTENNA MAST)
     ULTIMATE DESIGN AND WIND SPEED (V) = 125 MPH (2022 CSBC: APPENDIX "P")
   - WIND LOAD: (UTILITY POLE & FOUNDATION)
     BASIC WIND SPEED (V) = 110 MPH (3 SECOND GUST) BASED ON NESC C2-2023, SECTION 25 RULE 250C.

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

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12. 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.
13. 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.
14. 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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE 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.
18. 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.
19. 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.
20. 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.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. 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.
23. 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. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

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.

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY) – AT GRADE	(E/P) TMA (QTY) – AT TOWER	(QTY) PROPOSED HYBRID/COAX
B1	PROPOSED	RFS (APXVAALL18_43-U_NA20)	72 x 24 x 8.5	77'	190°	(P) RADIO 4480 B71+B85 (1)	(P) COMMSCOPE: SMART BIAST-ATSBT-TOP-MF-4G (1)	(4) 7/8" COAX CABLE
C1	PROPOSED	RFS (APXVAALL18_43-U_NA20)	72 x 24 x 8.5	77'	330°	(P) RADIO 4480 B71+B85 (1)	(P) COMMSCOPE: SMART BIAST-ATSBT-TOP-MF-4G (1)	(4) 7/8" COAX CABLE

NOTE:
ALL HYBRID/COAX LENGTHS TO BE MEASURED AND VERIFIED IN FIELD BEFORE ORDERING

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
3	01/17/24	BSP	TJR	CONSTRUCTION DRAWINGS – REVISED PER NEWLY ISSUED RFDS
2	11/06/23	BSP	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
1	09/12/23	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
0	08/10/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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SITE ID: CT11116C
101 MOUNTAIN RD, CL+P POLE #3275
REDDING, CT 06896

DATE: 08/10/23
SCALE: AS NOTED
JOB NO. 22006.03

NOTES AND SPECIFICATIONS, ANT. SCHEDULE

N-1

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTRUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED STEEL SHOP DRAWINGS	–	EARTHWORK BACKFILL MATERIAL AND COMPACTION	–	POST–INSTALLED ANCHOR ROD PULL–OUT TEST
–	EOR APPROVED POST–INSTALLED ANCHOR MPII	–	REBAR AND FORMWORK GEOMETRY VERIFICATION	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	–	CONCRETE TESTING	X	STEEL INSPECTION
–	FABRICATOR CERTIFIED WELDER INSPECTION	X	STEEL INSPECTION		
X	MATERIAL CERTIFICATIONS	–	POST INSTALLED ANCHOR ROD VERIFICATION		
		–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON–SITE COLD GALVANIZED VERIFICATION		
		X	CONTRACTOR AS–BUILT REDLINE DRAWINGS		
		–	HOST BUILDING (BEARING WALL/PARAPET ETC..) INTEGRITY VERIFICATION PRIOR TO ANY INSTALLATIONS		
		–	HOST BUILDING (ROOF OPENING) FRAMING VERIFICATION PRIOR TO ANY INSTALLATIONS		

NOTES
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. (X) DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT
3. (–) DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT
4. EOR – ENGINEER OF RECORD
5. MPII – MANUFACTURER'S PRINTED INSTALLATION GUIDELINES

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.
3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.
4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.
5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:
   - REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   - WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   - DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.
2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON–SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:
   - REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   - WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   - DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.
2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:
   - CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   - WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS–BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:
   - PRE–CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   - DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   - POST–CONSTRUCTION: FINAL CONDITION OF THE SITE

NOTE:
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REDDING, CT 06896

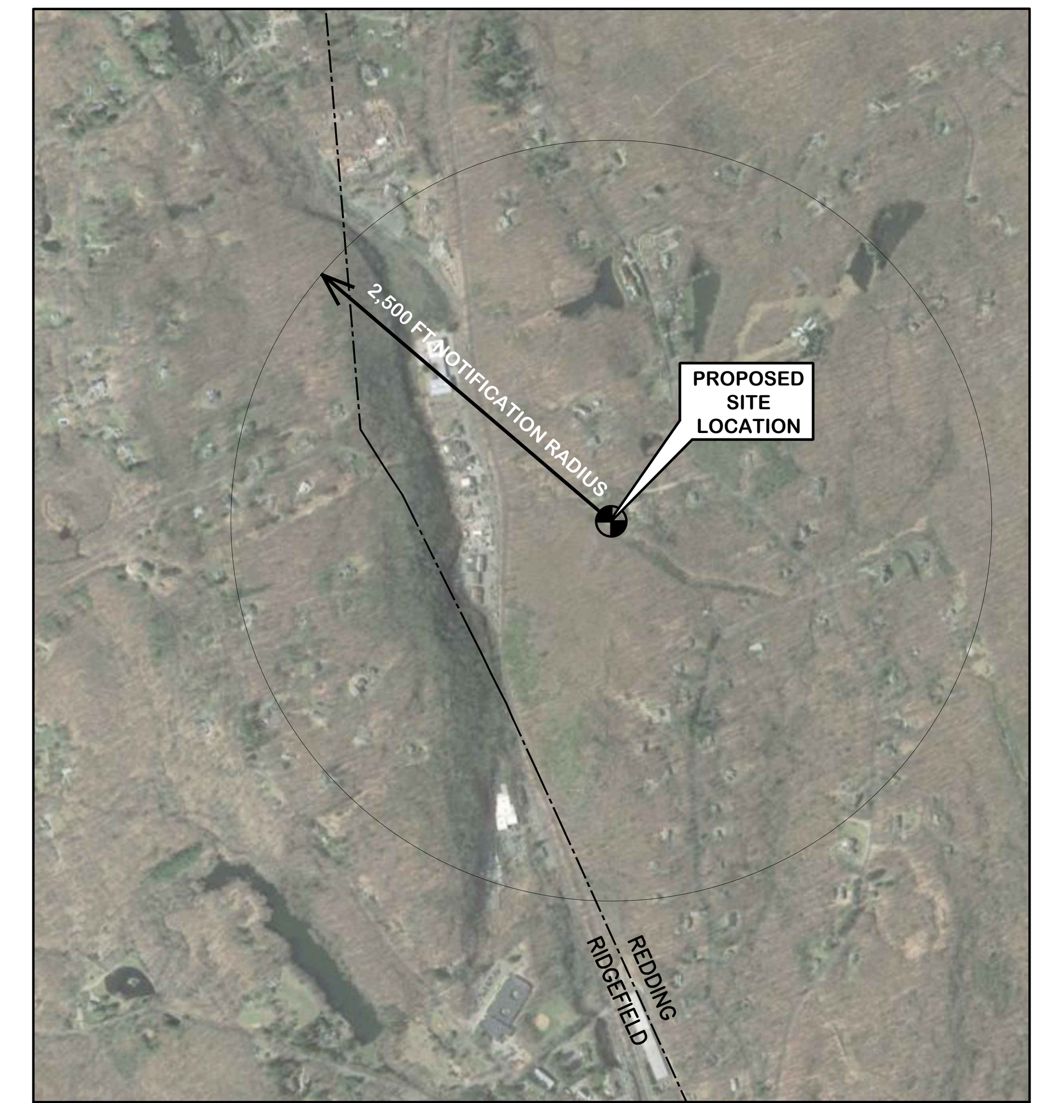
DATE: 08/10/23
SCALE: AS NOTED
JOB NO. 22006.03

SPECIAL INSPECTIONS AND SPECIFICATIONS

N–2

ABUTTERS LIST

REF.	ID	ADDRESS	OWNER	MAILING ADDRESS
1	3490	105 MOUNTAIN ROAD	ROBERT M & SHELLEY MCCONNELL	105 MOUNTAIN ROAD, REDDING, CT 06896
2	3496	103 MOUNTAIN ROAD	CLAIRE LOUISE FISCHER	103 MOUNTAIN ROAD, REDDING, CT 06896
3	3565	100 MOUNTAIN ROAD	NICHOLAS STEINBRICK & KRISTEN FRISCH	100 MOUNTAIN ROAD, REDDING, CT 06896
4	3495	97 MOUNTAIN ROAD	ILONA REVOC HORVATH TRUST & JUDITH 50/50 TTEE ILONA C/O HORVATH LIFE USE	97 MOUNTAIN ROAD, REDDING, CT 06896
5	3497	99 MOUNTAIN ROAD	KAREN DEFRIESSE	99 MOUNTAIN ROAD, REDDING, CT 06896
6	3480	219 ETHAN ALLEN HWY	219 EAH LLC	219 ETHAN ALLEN HWY, RIDGEFIELD, CT 06877
7	3477	227 ETHAN ALLEN HWY	KUCZO HOLDING COMPANY LLC	52 ERDMANN LANE, WILTON, CT 06897



MUNICIPALITY NOTIFICATION LIMIT MAP

1 / C-0 **ABUTTERS MAP**
SCALE: 1"=150'

APPROXIMATE NORTH

GRAPHIC SCALE
150 0 75 150 300 600
(IN FEET)
1 inch = 150 ft.

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ABUTTERS MAP

C-0

SHEET NO. 4 OF 11

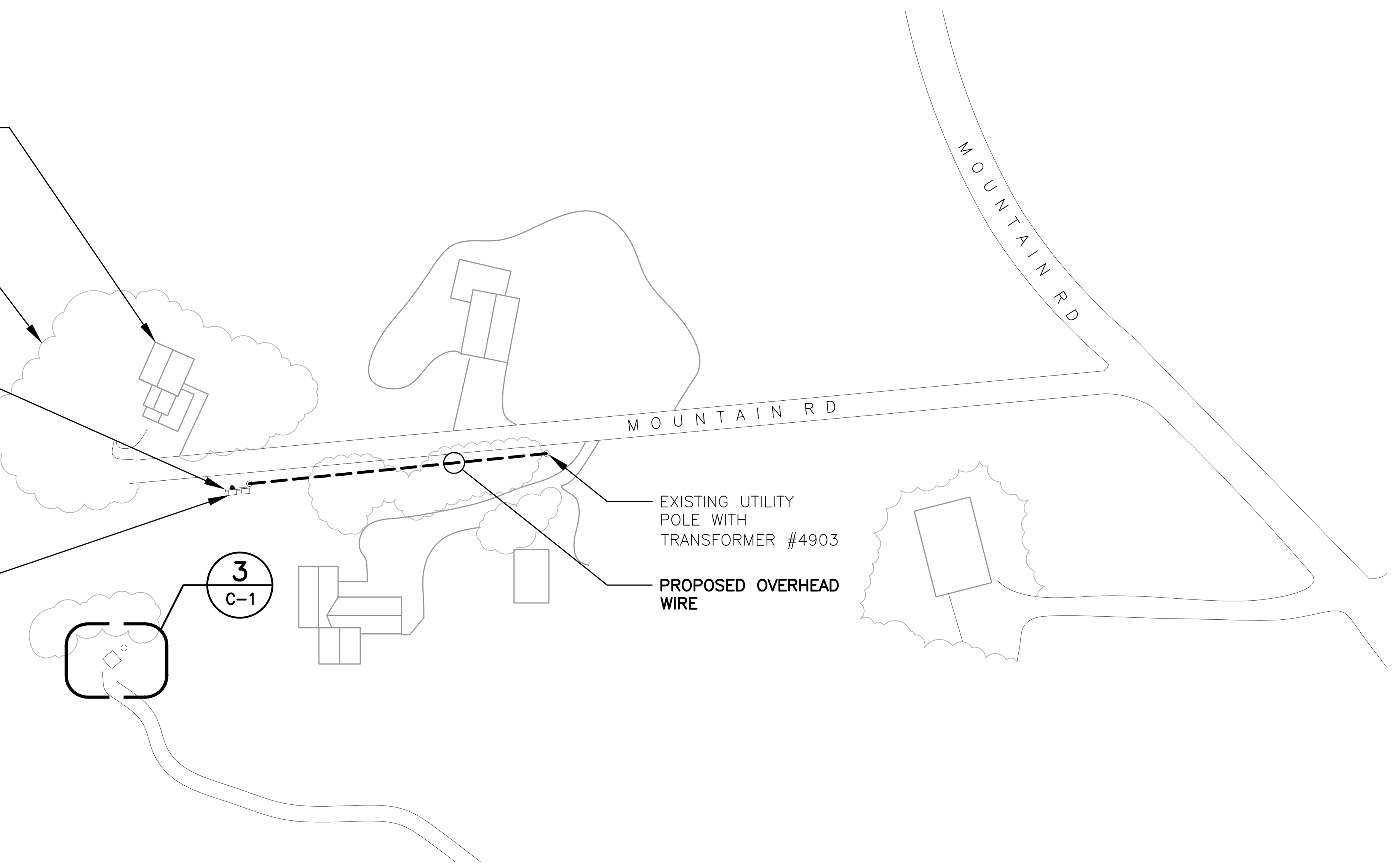
STRUCTURAL COMPLIANCE

TOWER AND TOWER FOUNDATION

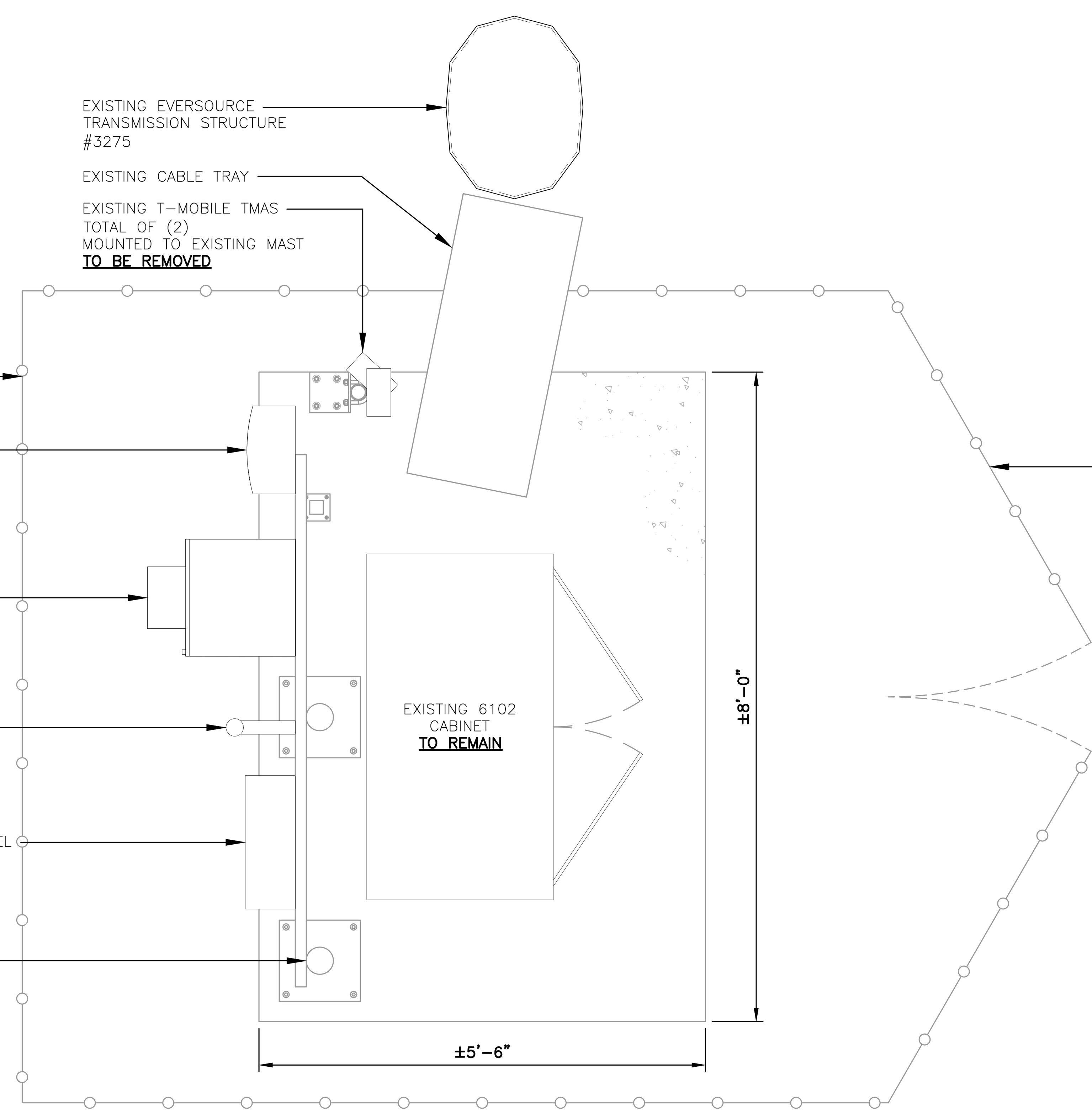
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22006.03) DATED 01/17/24 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

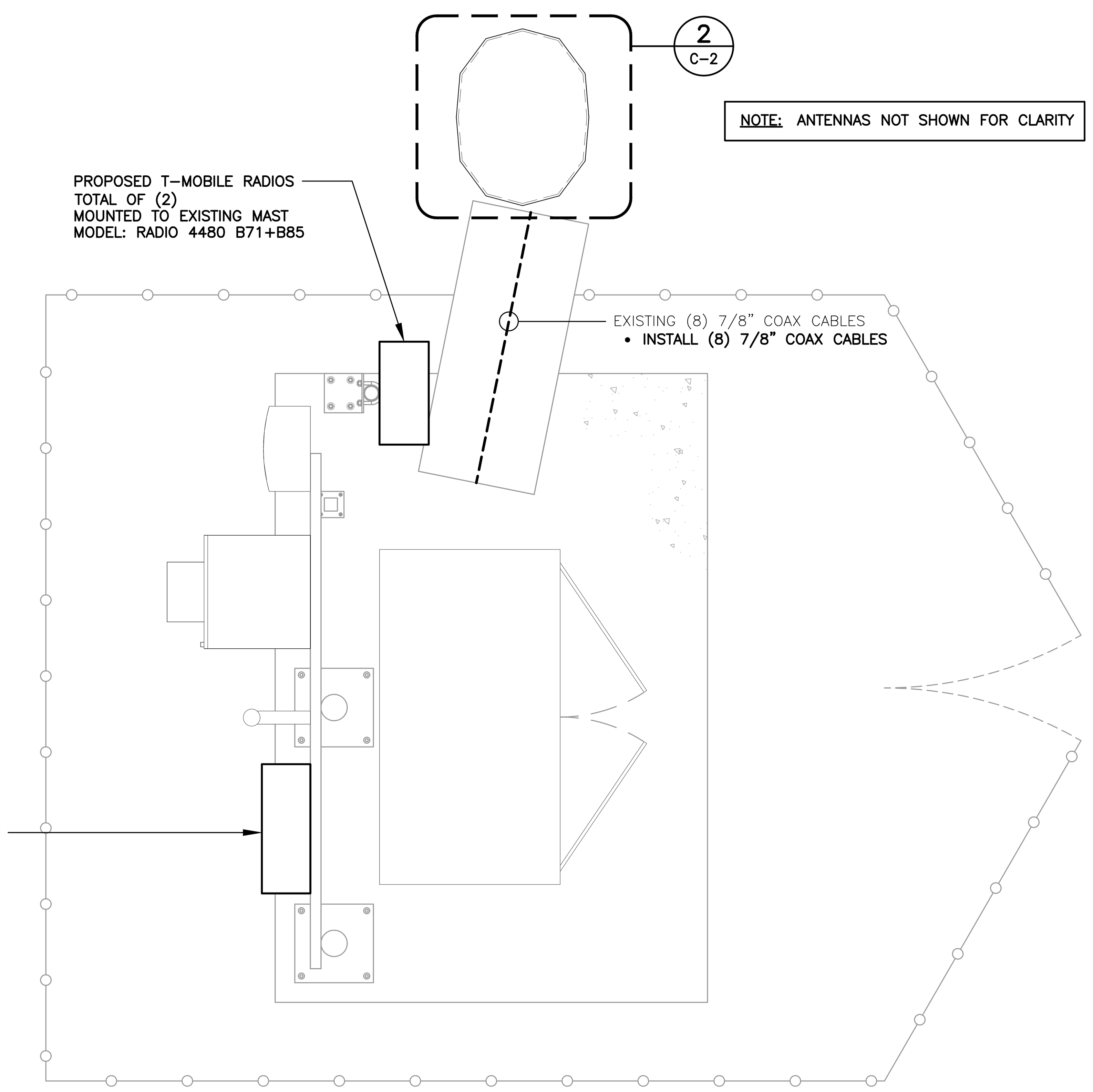
NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



1 C-1 **SITE PLAN – PROPOSED**
SCALE: 1" = 5'
TRUE NORTH



2 C-1 **EQUIPMENT PLAN – EXISTING**
SCALE: 3/4" = 1'
TRUE NORTH



3 C-1 **EQUIPMENT PLAN – PROPOSED**
SCALE: 3/4" = 1'
TRUE NORTH

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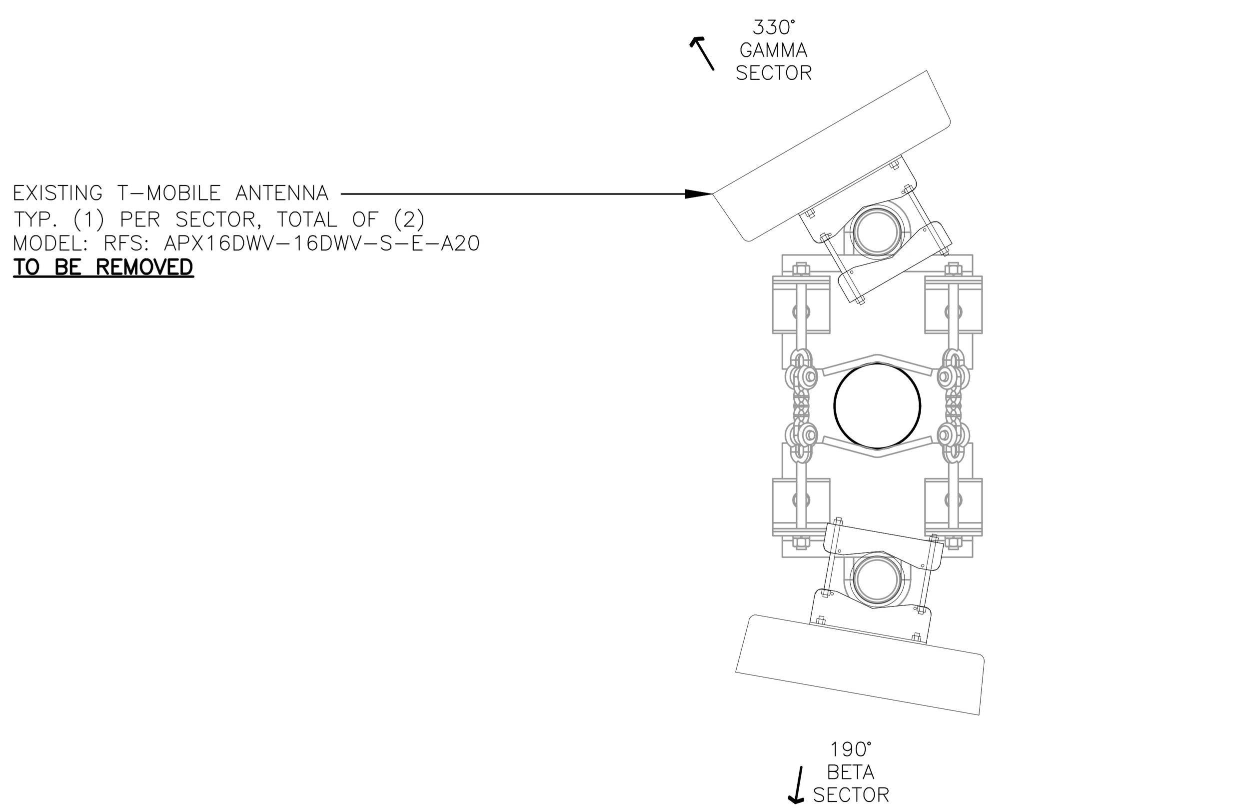
SITE AND EQUIPMENT PLANS

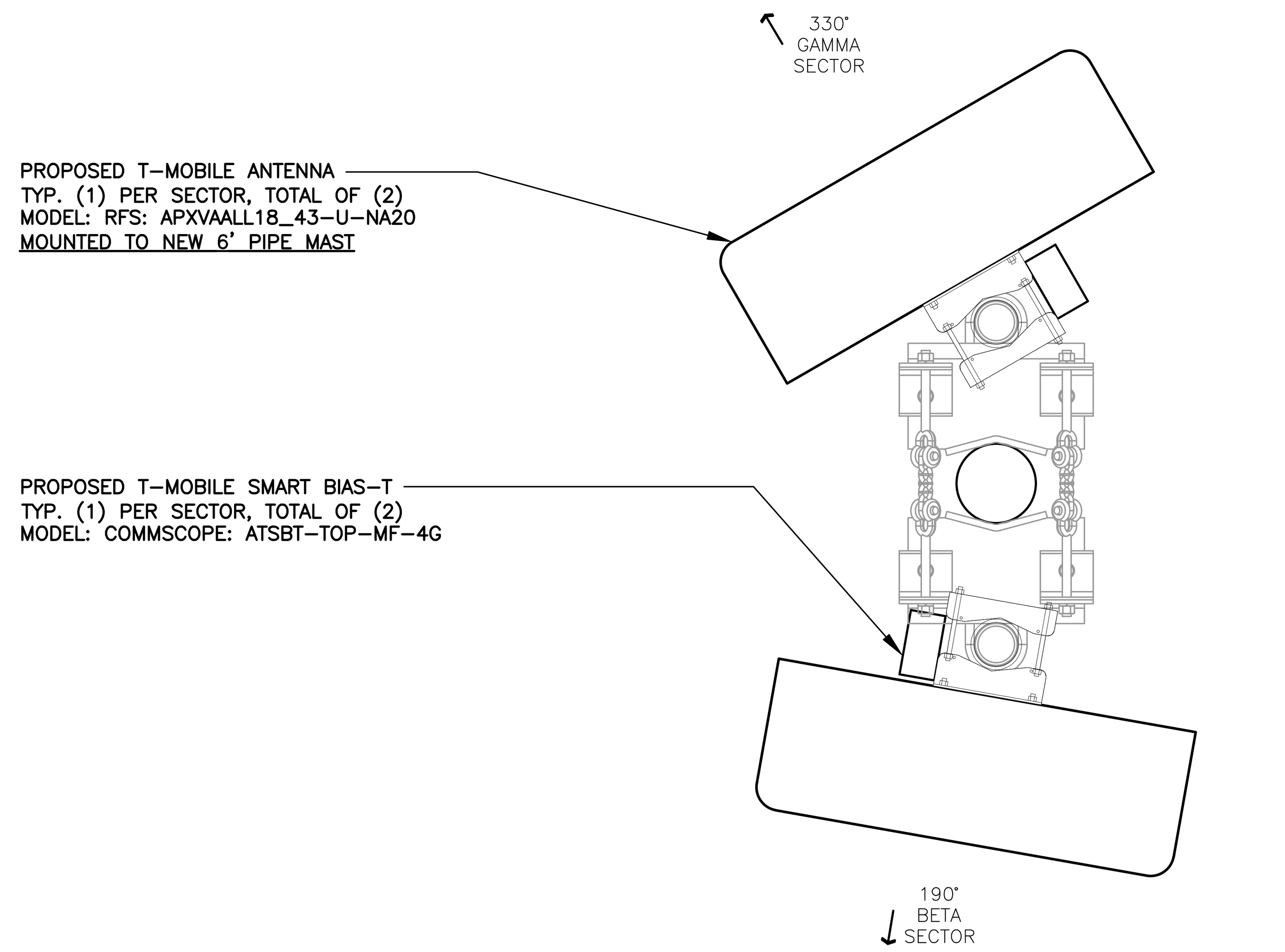
C-1

SHEET NO. 5 OF 11



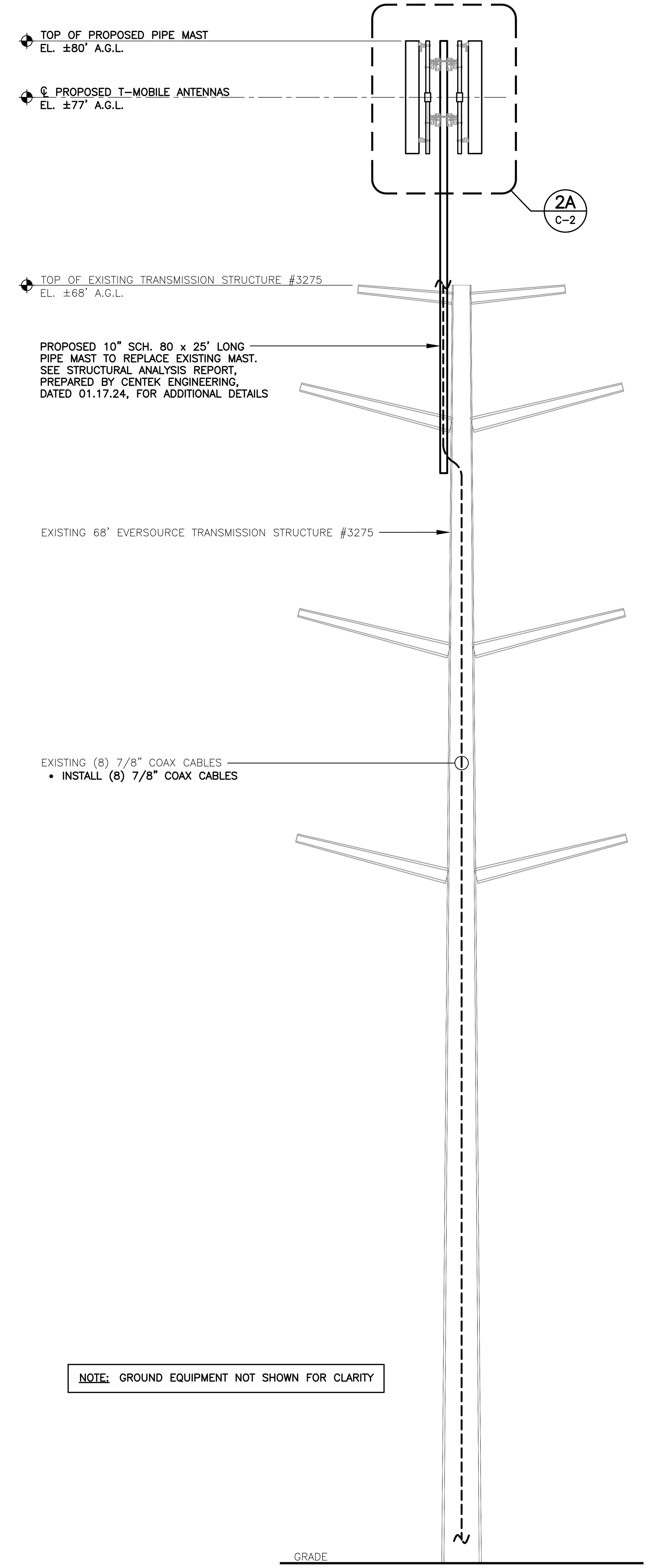
1 C-2 ANTENNA PLAN - EXISTING

SCALE: 1-1/2" = 1'



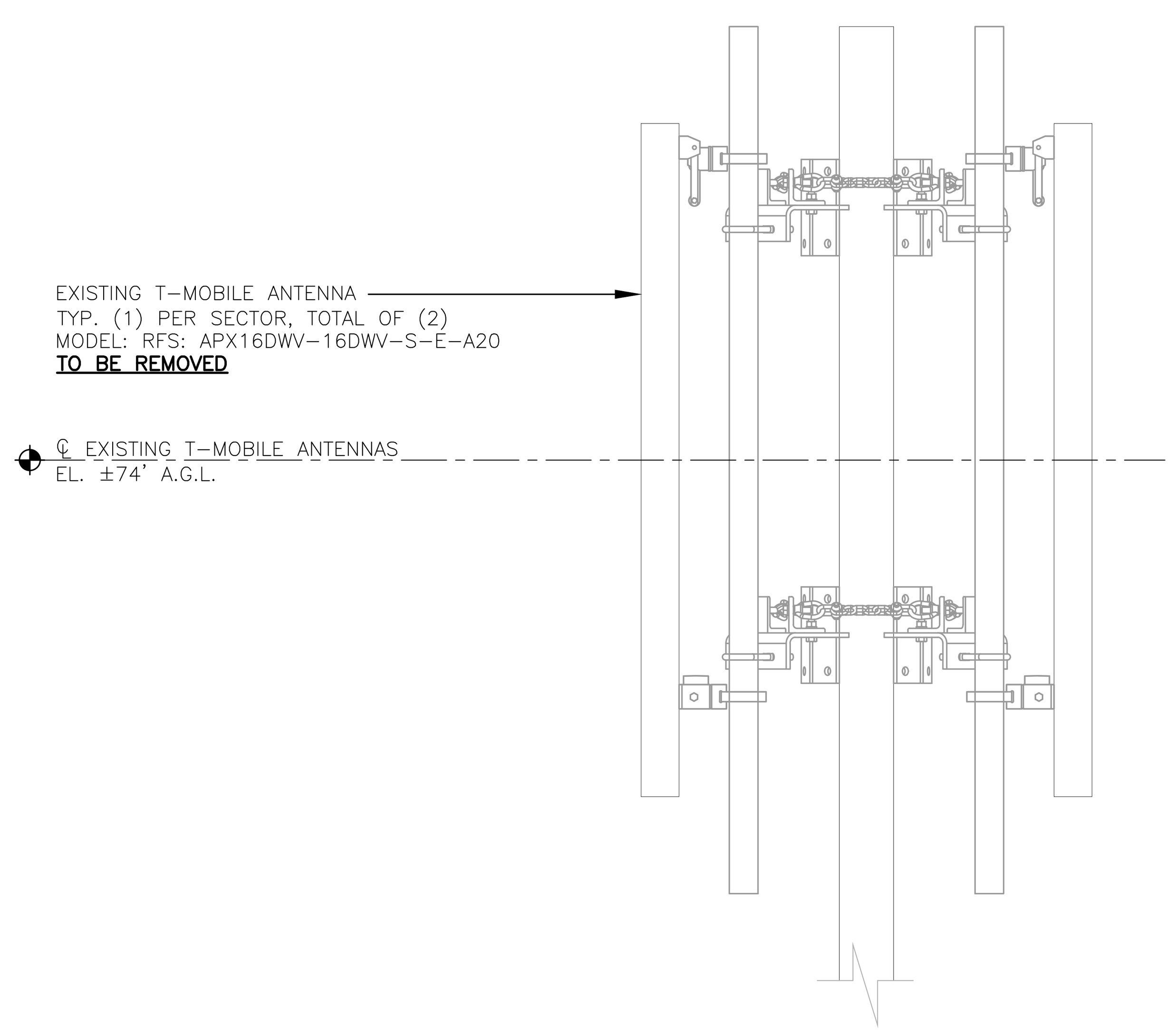
2 C-2 ANTENNA PLAN - PROPOSED

SCALE: 1-1/2" = 1'



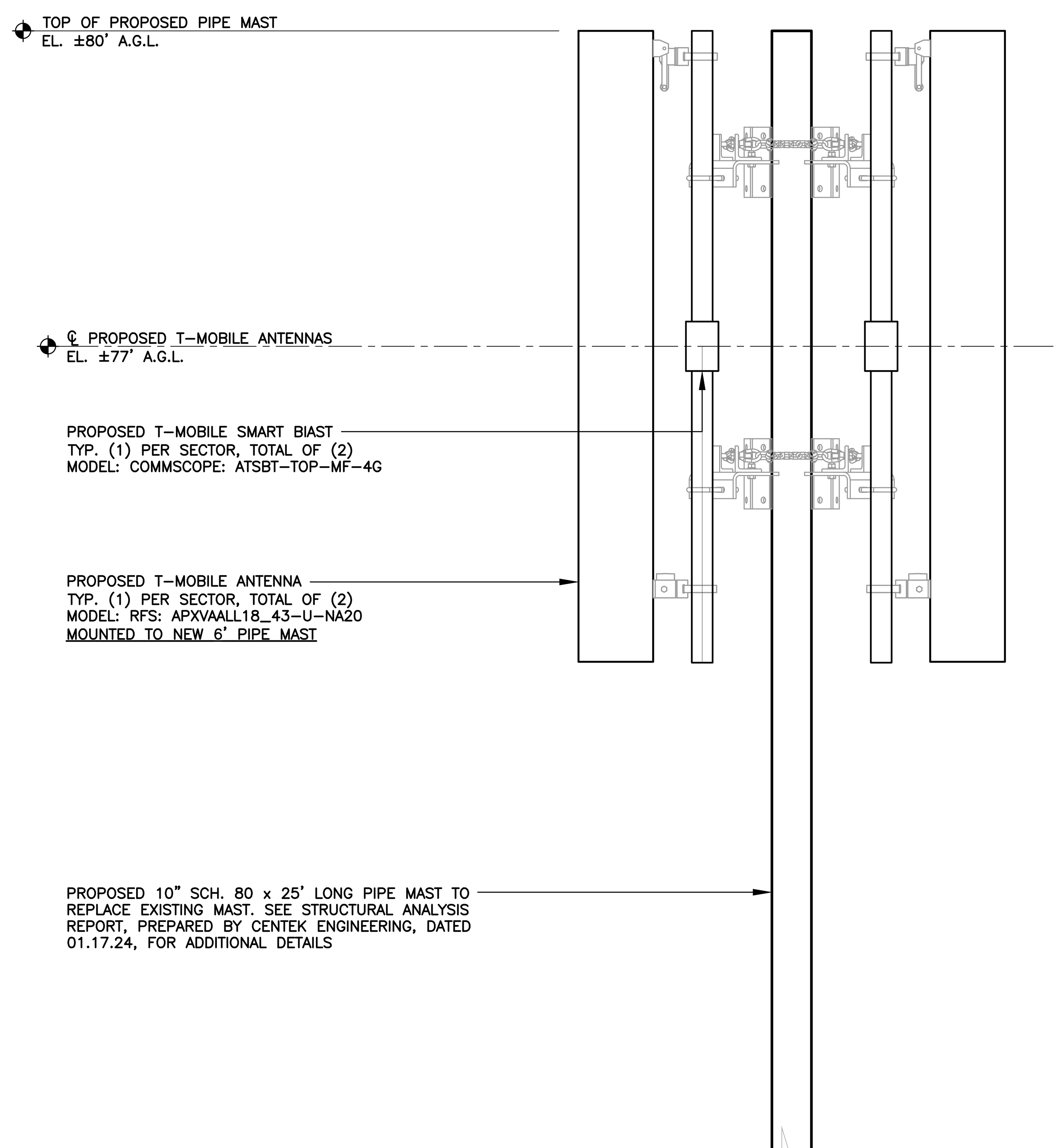
3 C-2 TOWER ELEVATION - PROPOSED

SCALE: 1" = 4'



1A C-2 ANTENNA ELEVATION - EXISTING

SCALE: 1" = 1'



2A C-2 ANTENNA ELEVATION - PROPOSED

SCALE: 1" = 1'

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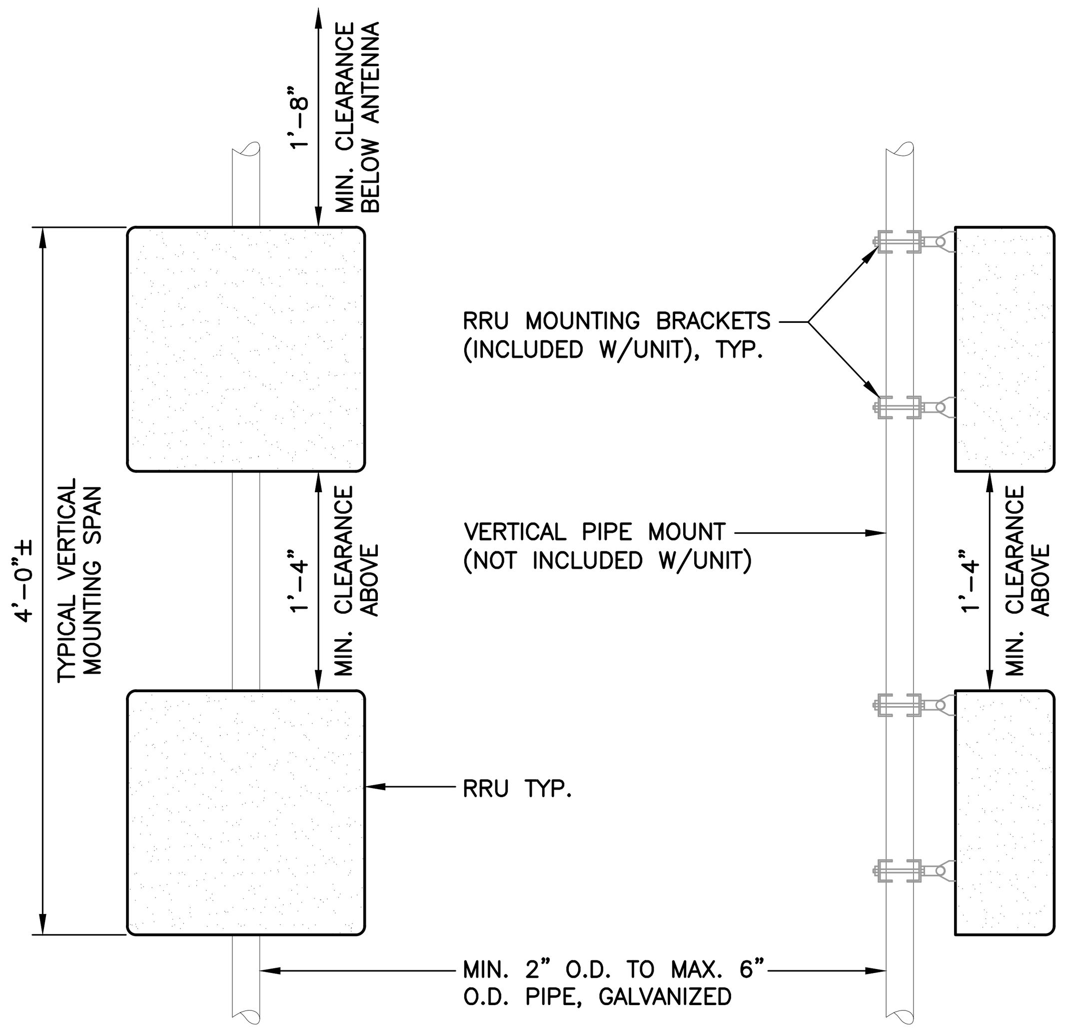
JOB NO.	22006.03

ANTENNA PLANS AND ELEVATIONS

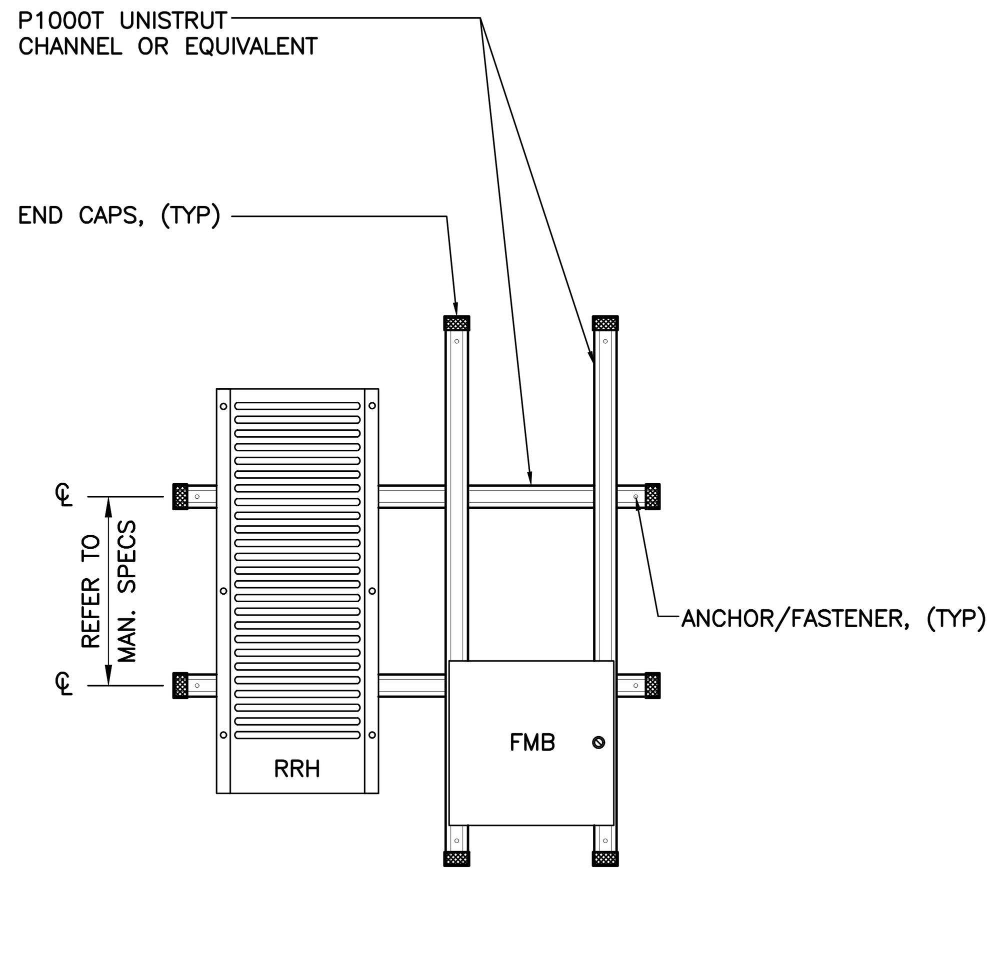
C-2

SHEET NO. 6 OF 11



FRONT ELEVATION

SIDE ELEVATION



FRONT ELEVATION

NOTES: (PIPE MOUNTING)

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

NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 (C-3) TYPICAL RRU MOUNTING DETAILS
SCALE: NOT TO SCALE

APXVAALL18_43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL18_43-U-NA20	72"L x 24.0"W x 8.5"D	±110 LBS.

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

2 (C-3) PROPOSED ANTENNA DETAIL
SCALE: NOT TO SCALE

RADIO 4480 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4480 B71+B85	21.8"L x 15.7"W x 7.5"D	±84 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

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

3 (C-3) PROPOSED RRU DETAIL
SCALE: NOT TO SCALE

VERTIV MINI PPC CABINET					
EQUIPMENT	PHASE	VOLTAGE	LOAD CENTER	AMP	DIMENSIONS
MAKE: VERTIV CATALOG: CACA75214090	1-PHASE	120/240	30 POSITIONS	200	39"H x 20"L x 10"W

4 (C-3) 30 POSITION MINI PPC CABINET
SCALE: NOT TO SCALE

ANDREW SMART BIAS-T		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: ATSBT-TOP-MF-4G	5.63"L x 3.7"W x 2"D	±1.7 LBS.

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

5 (C-3) PROPOSED BIAS-T DETAIL
SCALE: NOT TO SCALE

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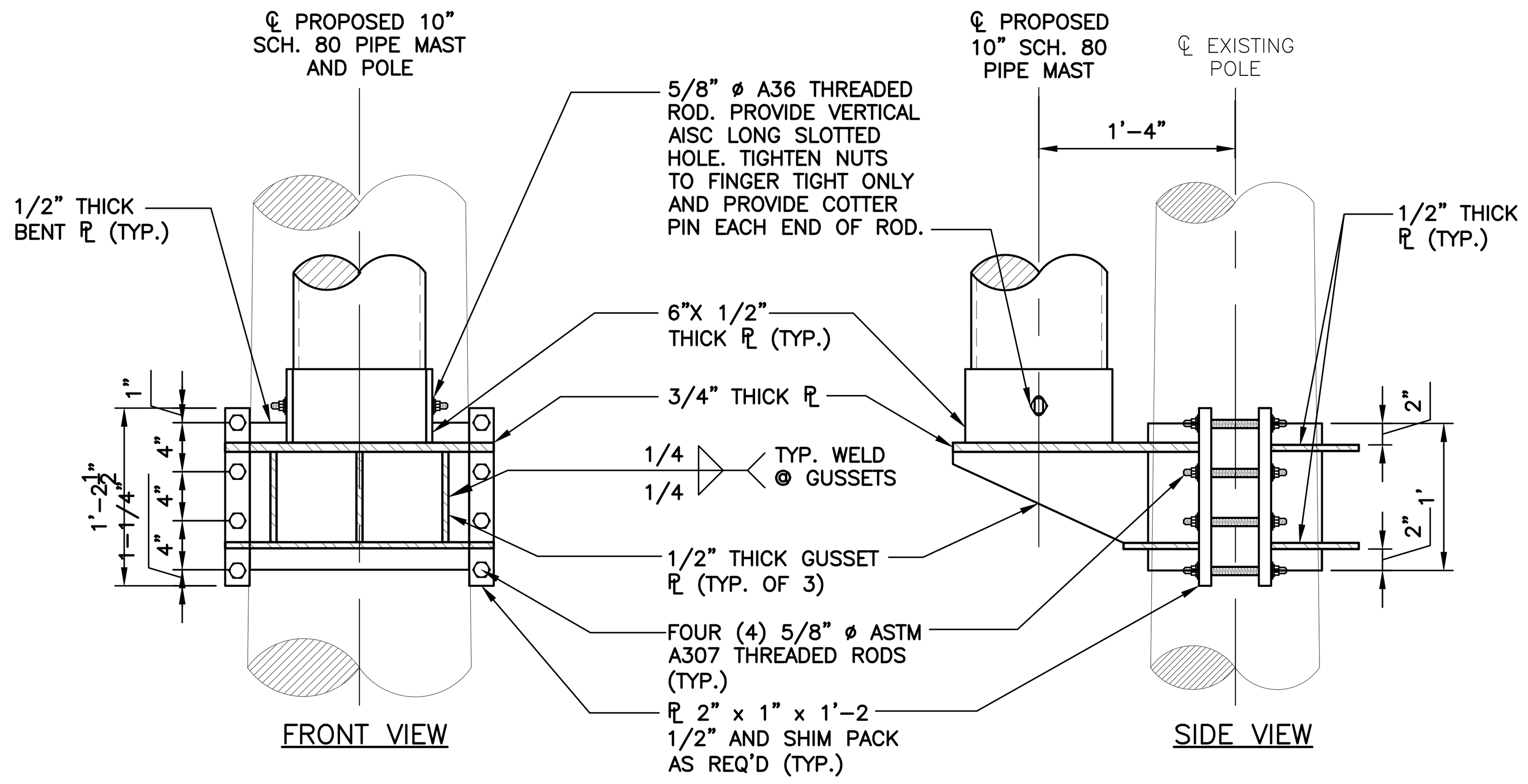
T-MOBILE NORTHEAST LLC
SITE NAME: RIDGEFIELD/ ETHAN ALLEN H
SITE ID: CT11116C
101 MOUNTAIN RD, CL+P POLE #3275
REDDING, CT 06896

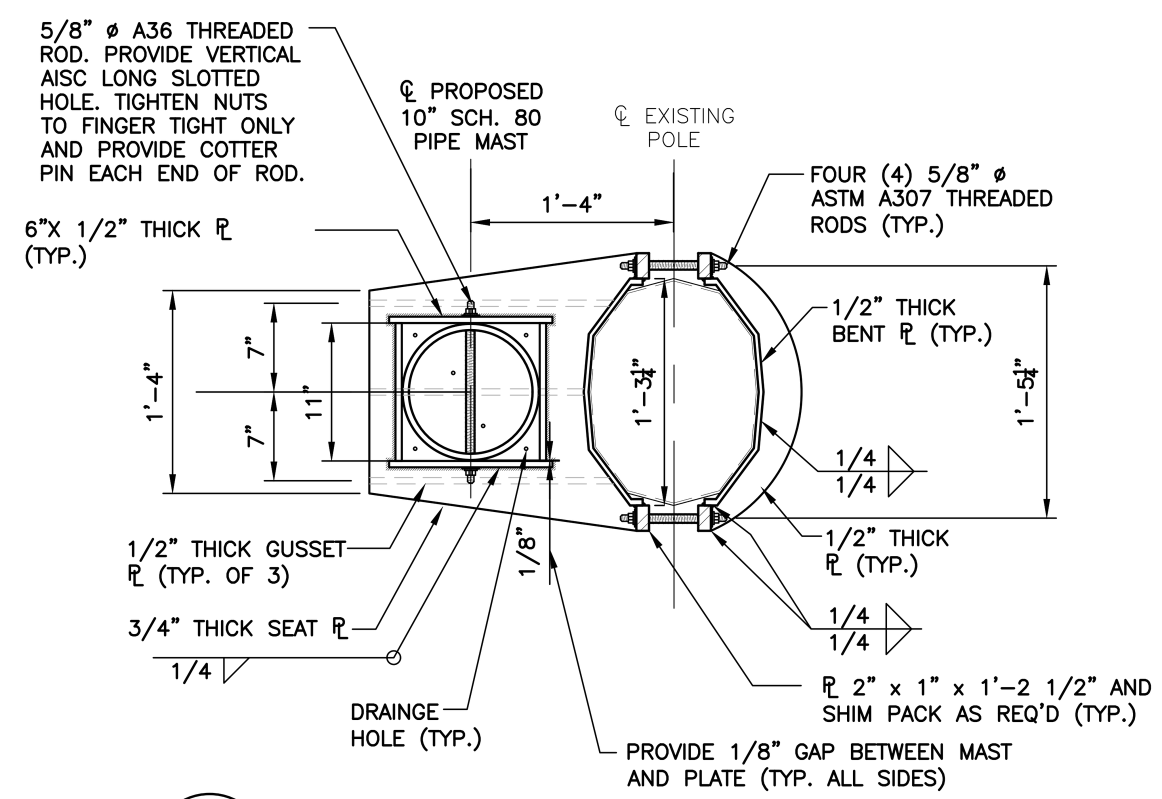
DATE: 08/10/23
SCALE: AS NOTED
JOB NO. 22006.03

TYPICAL EQUIPMENT DETAILS

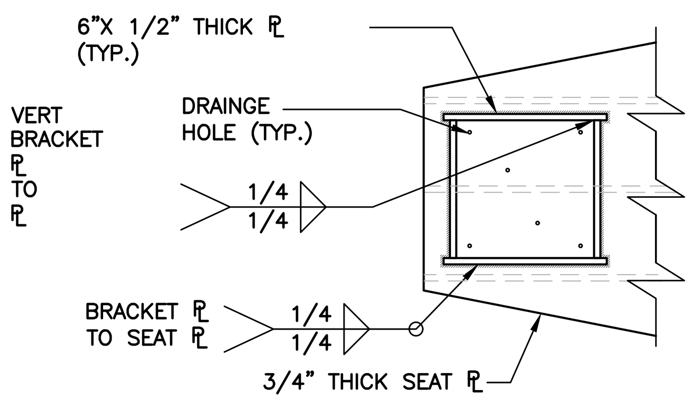
C-3



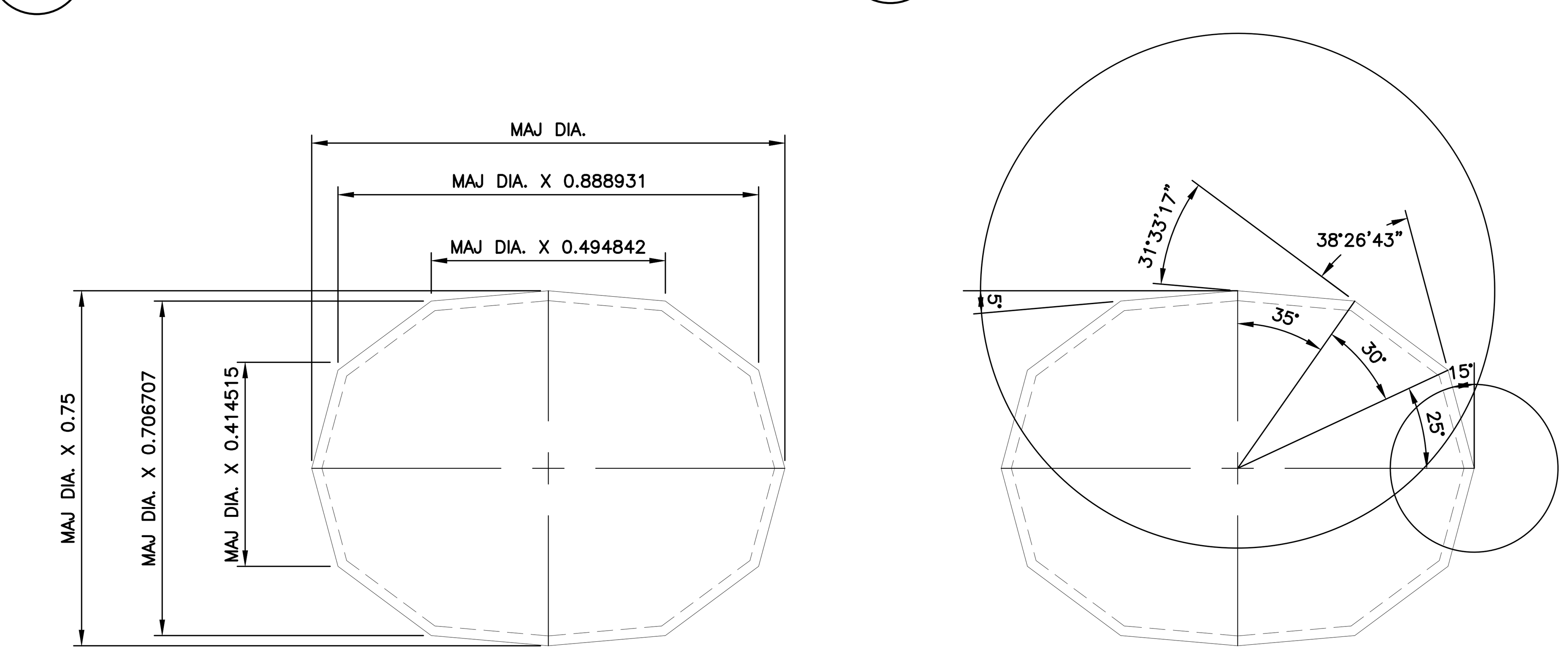
6 S-1 **BOTTOM PCS BRACKET DETAIL**
SCALE: 1" = 1'-0"



7 S-1 **BOTTOM PCS BRACKET PLAN VIEW**
SCALE: 1" = 1'-0"

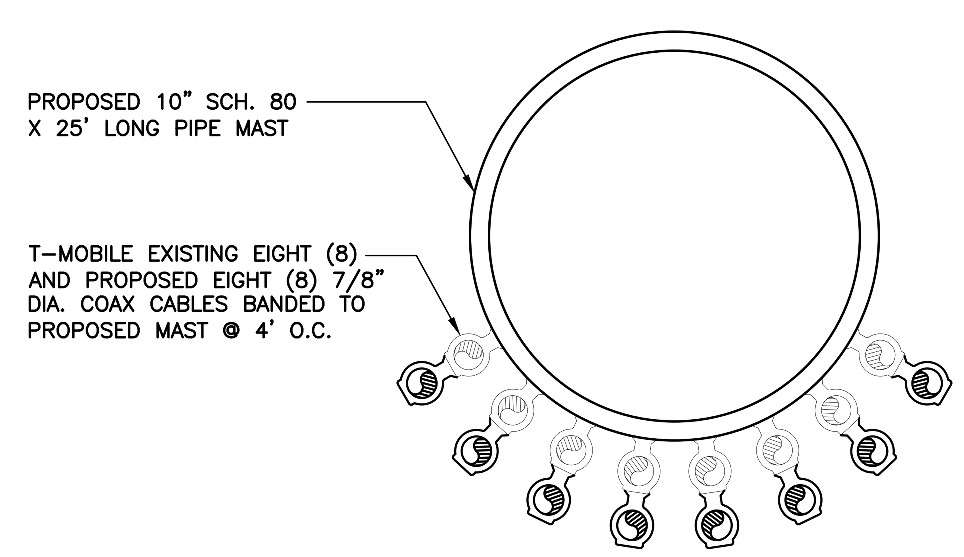


8 S-1 **BRACKET ASSEMBLY DETAIL**
SCALE: 1" = 1'-0"

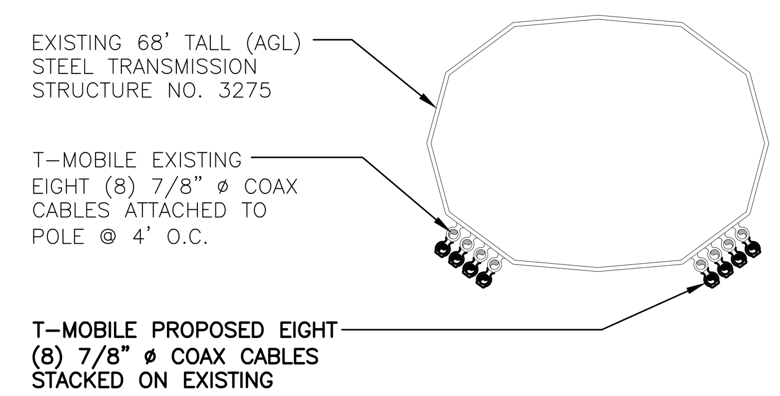


NOTE CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO FABRICATION

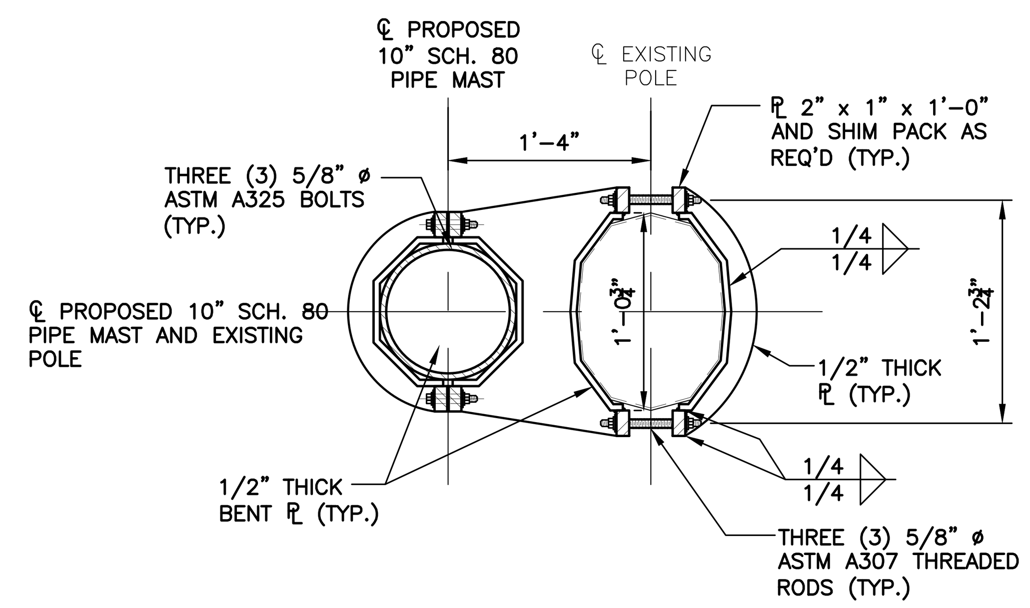
9 S-1 **POLE DIMENSIONS**
SCALE: 3" = 1'-0"



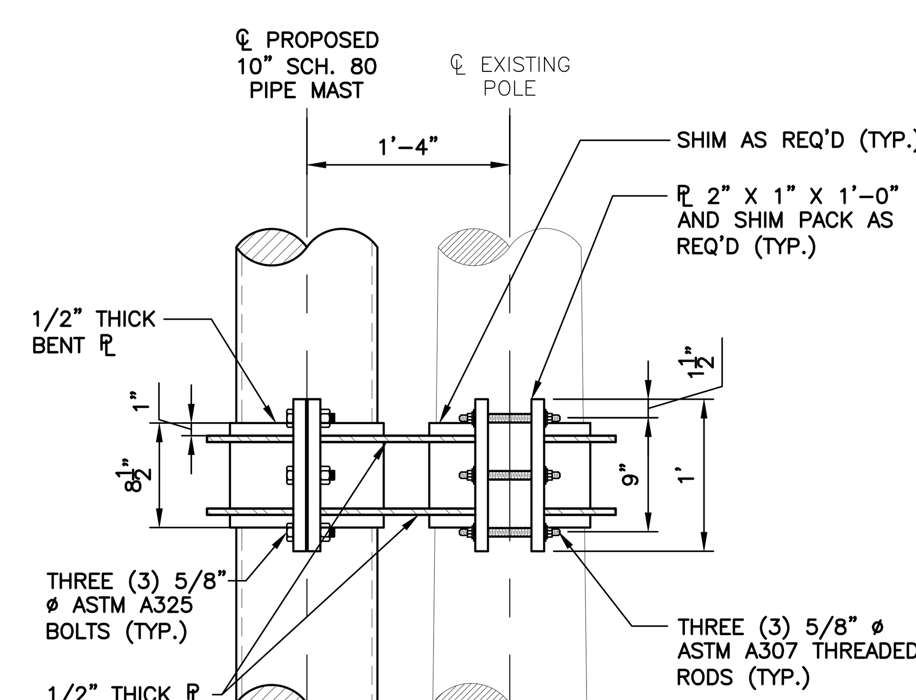
2 S-1 **COAX CABLE PLAN (55'-74' ATB)**
SCALE: 3" = 1'-0"



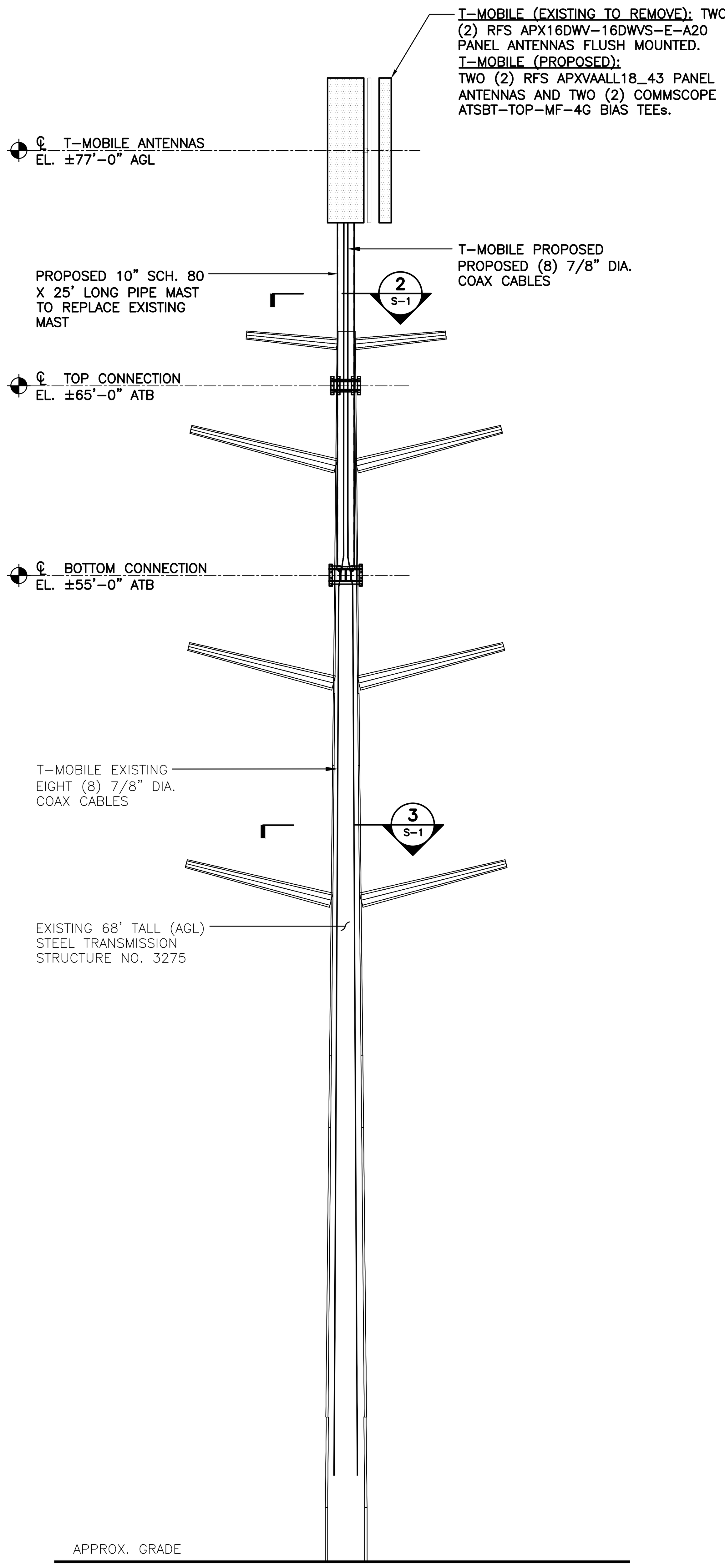
3 S-1 **COAX CABLE PLAN (0'-55' ATB)**
SCALE: 1" = 1'-0"



4 S-1 **TOP PCS BRACKET PLAN VIEW**
SCALE: 1" = 1'-0"



5 S-1 **TOP PCS BRACKET DETAIL**
SCALE: 1" = 1'-0"



1 S-1 **TOWER AND MAST ELEVATION**
SCALE: NTS

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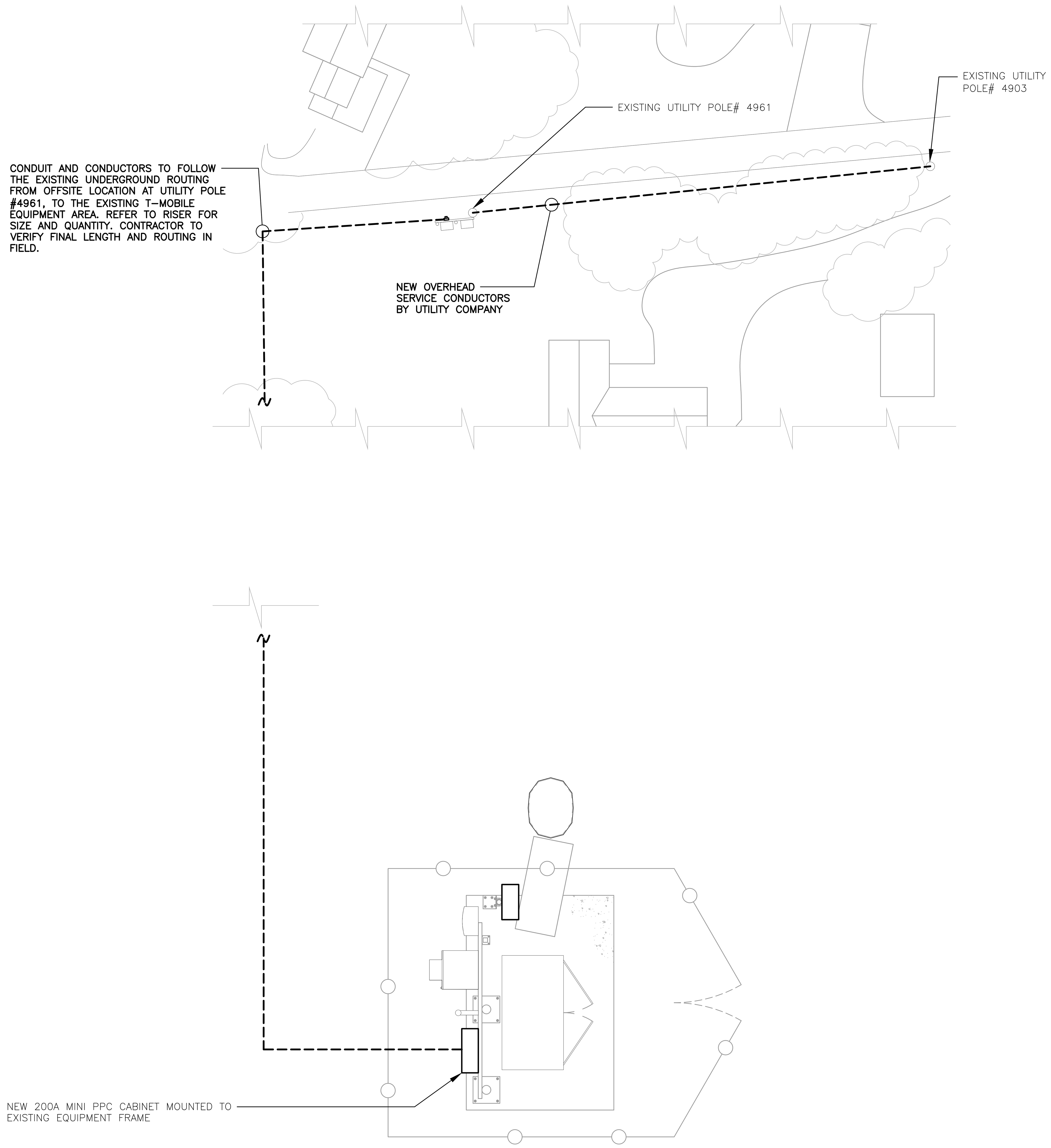
REDDING, CT 06896

DATE: 08/10/23
SCALE: AS NOTED
JOB NO. 22006.03

STRUCTURAL DETAILS

S-1

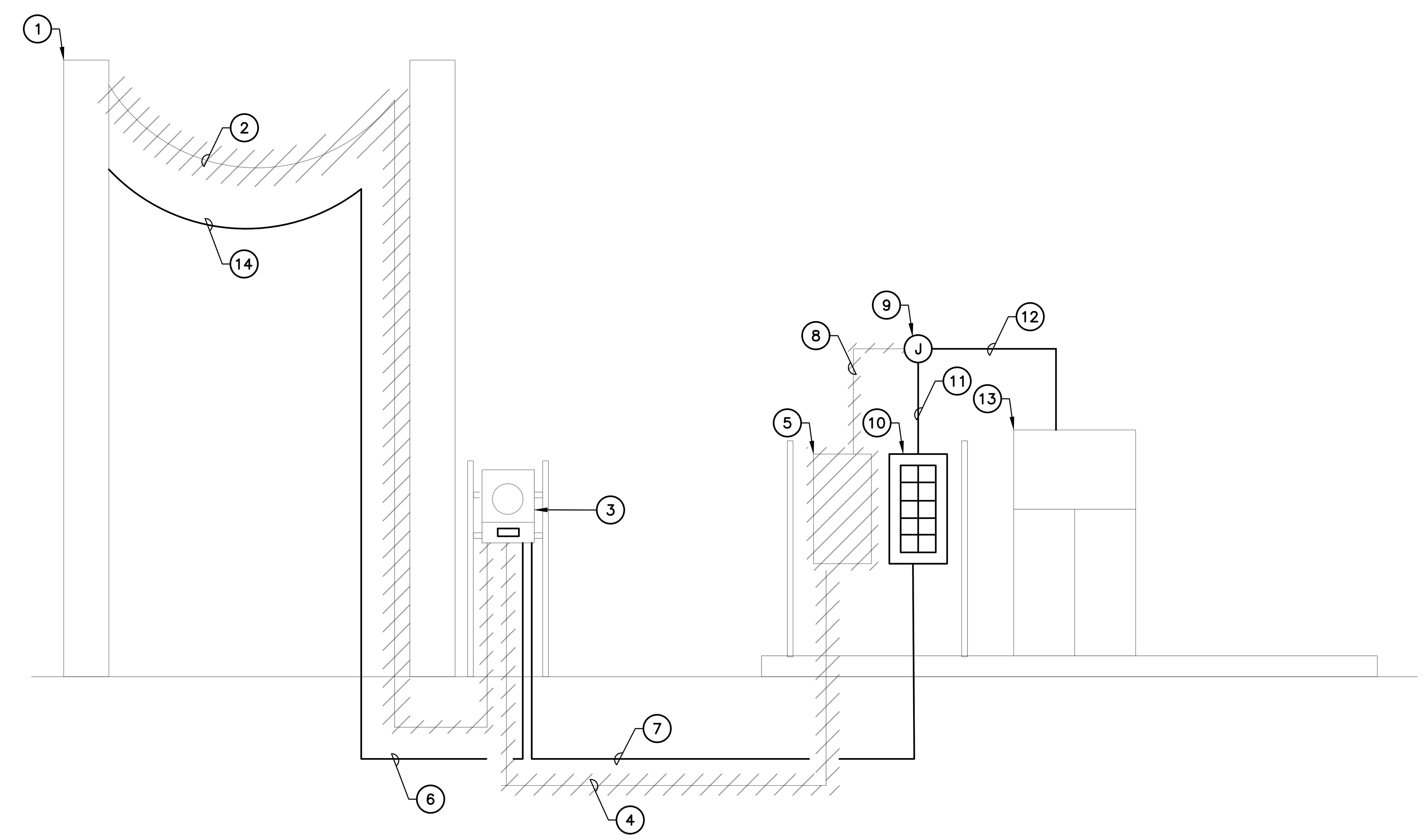
SHEET NO. 8 OF 11



1 E-1 **CONDUIT ROUTING PLAN**
SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

1. EXISTING UTILITY POLE #4903 TO BE USED.
2. EXISTING OVERHEAD SERVICE CONDUCTORS TO BE REMOVED BY UTILITY COMPANY.
3. EXISTING 200A, 240V RATED UTILITY METER WITH 100A/2P CIRCUIT BREAKER. 100A/2P CIRCUIT BREAKER TO BE REMOVED AND REPLACED WITH NEW 200A/2P CIRCUIT BREAKER. COORDINATE ALL UPGRADES WITH UTILITY COMPANY.
4. EXISTING UNDERGROUND CONDUITS AND CONDUCTORS TO BE REMOVED.
5. EXISTING 100A ELECTRICAL PANEL TO BE REMOVED AND REPLACED. RELOCATE ALL EXISTING TO REMAIN CIRCUIT BREAKERS TO NEW PPC CABINET.
6. (3) 3/0 AWG, 3" CONDUIT. COORDINATE EXACT CONDUCTOR SIZE WITH UTILITY COMPANY.
7. (3) 250KCMIL, (1) #4 AWG GROUND, 3" CONDUIT. CONDUIT TO FOLLOW ROUTING OF EXISTING TO BE REMOVED CONDUIT
8. SECTION OF EXISTING CONDUITS AND CONDUCTORS TO BE REMOVED.
9. JUNCTION BOX SIZED PER N.E.C. AS REQUIRED.
10. NEW 200A MINI PPC CABINET.
11. EXTEND EXISTING CONDUITS AND CONDUCTORS TO NEW PPC CABINET.
12. SECTION OF CONDUITS AND CONDUCTORS TO REMAIN.
13. EXISTING CABINET TO REMAIN.
14. NEW OVERHEAD SERVICE CONDUCTORS BY UTILITY COMPANY.



2 E-1 **ELECTRICAL RISER DIAGRAM**
SCALE: NOT TO SCALE

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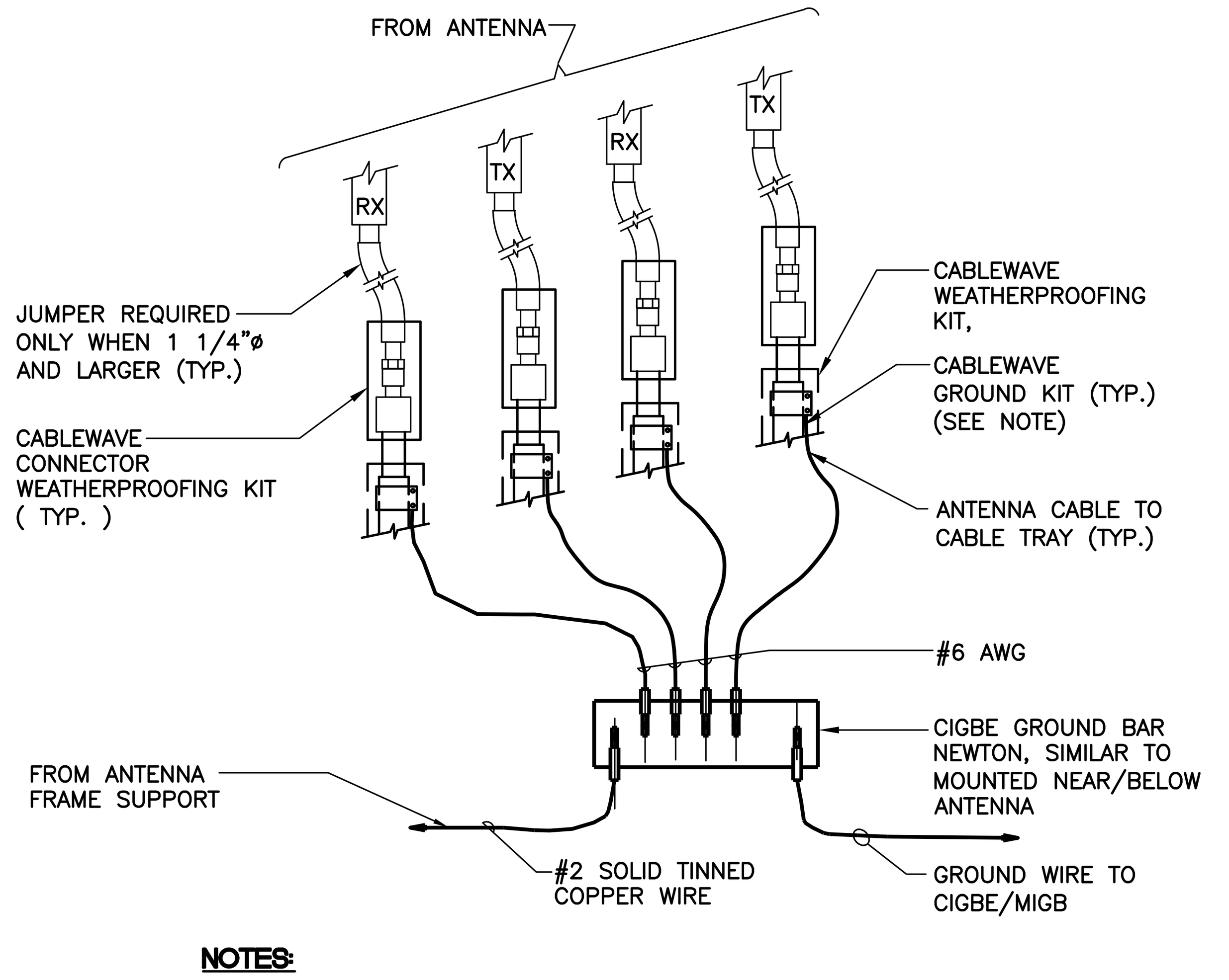
CONDUIT ROUTING AND RISER DIAGRAM

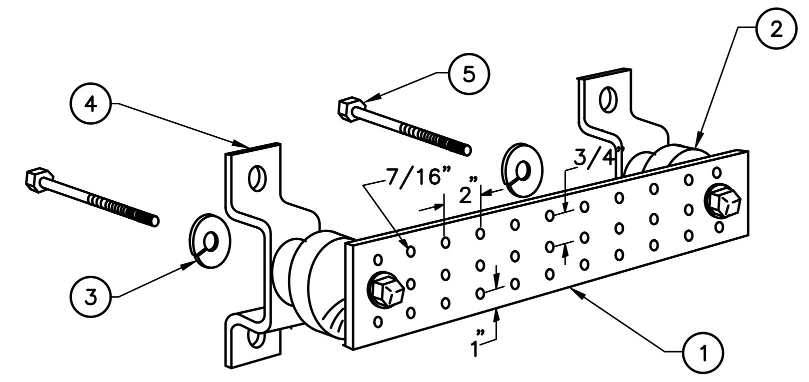
E-1



NOTES:

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

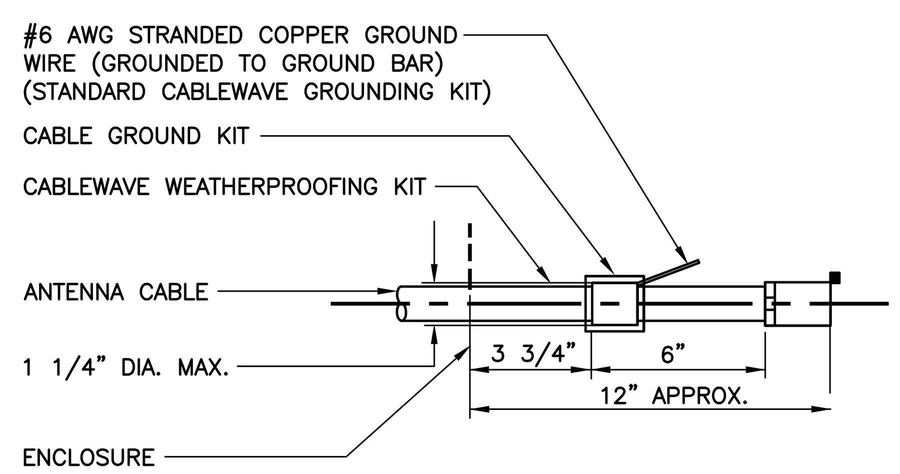
1 E-2 **CONNECTION OF GROUND WIRES TO GROUND BAR**
SCALE: NOT TO SCALE



NOTES

1	TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2	INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3	5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4	WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5	5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

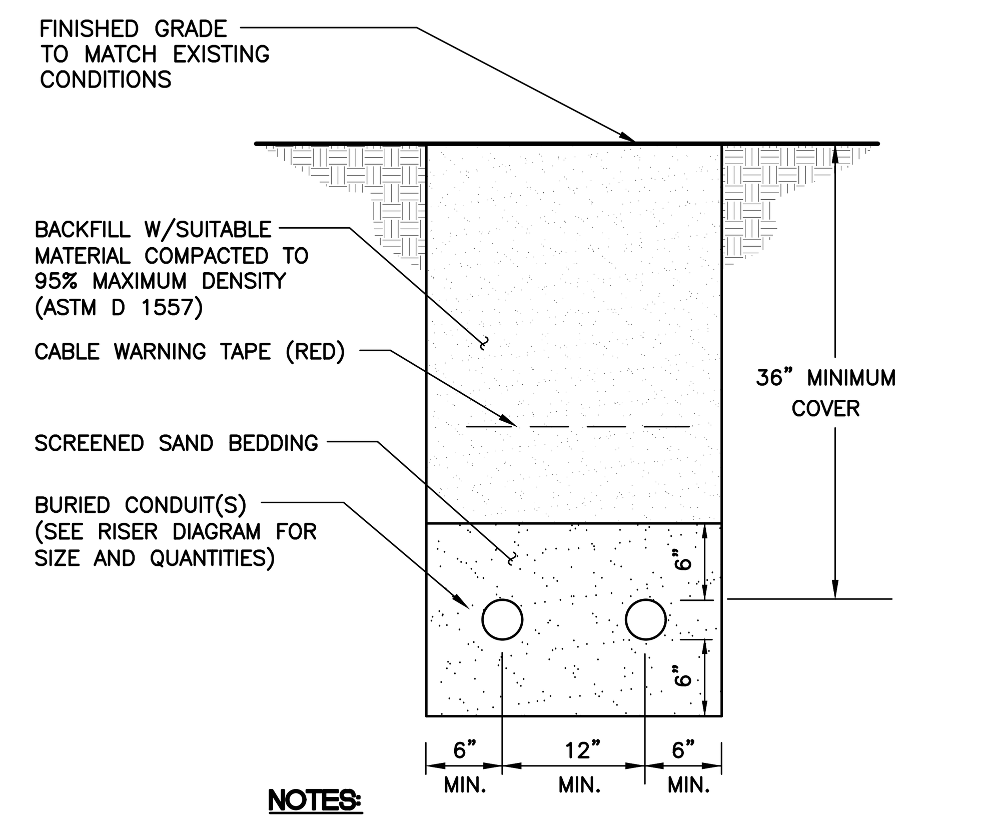
2 E-2 **GROUND BAR DETAIL**
SCALE: NOT TO SCALE



NOTES:

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

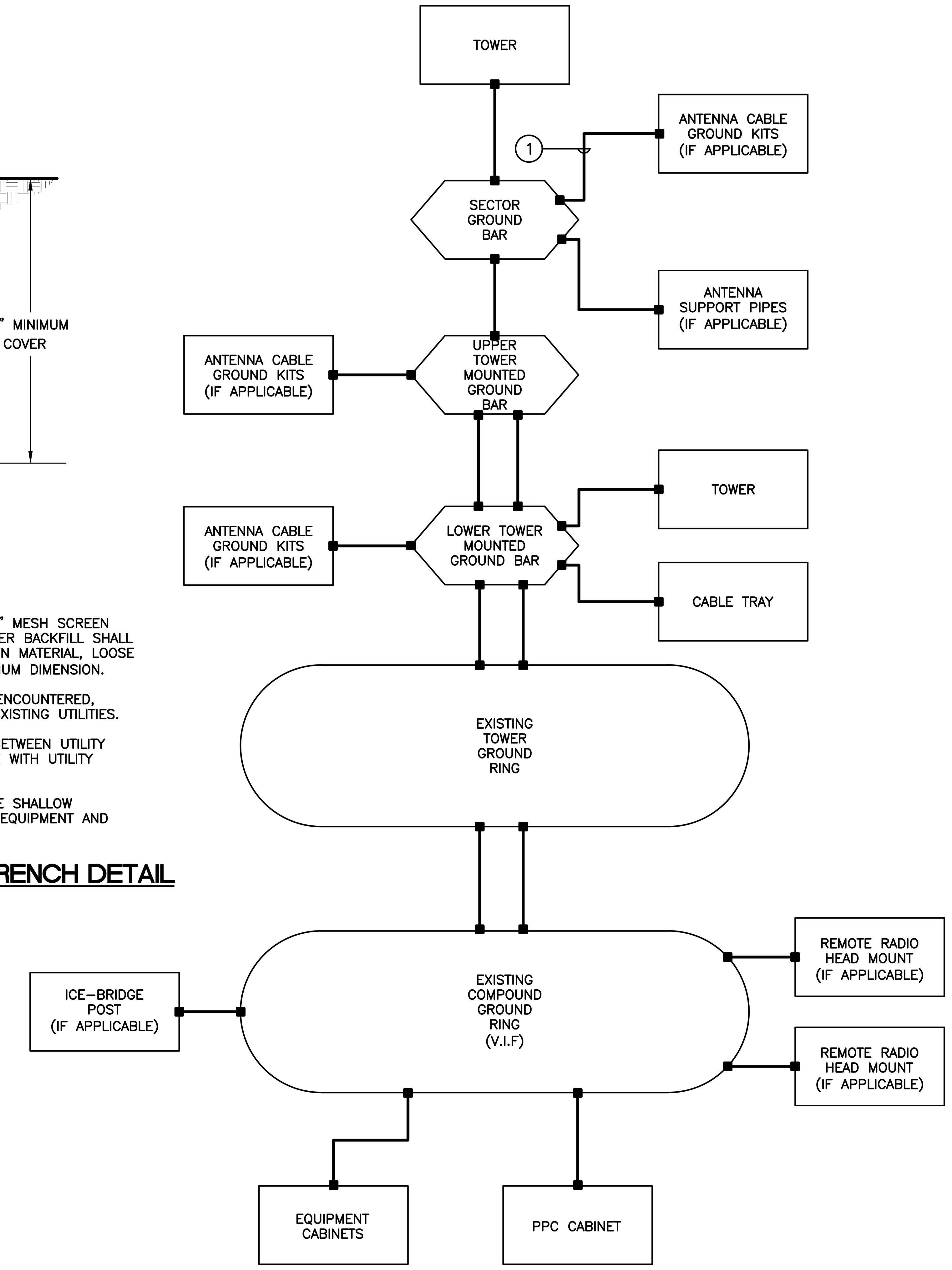
3 E-2 **ANTENNA CABLE GROUNDING DETAIL**
SCALE: NOT TO SCALE



NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3. WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN UTILITY SOURCE AND SERVICE EQUIPMENT, COORDINATE WITH UTILITY COMPANY FOR BURIAL DEPTH REQUIREMENTS.
4. COORDINATE WITH ELECTRICAL ENGINEER WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN SERVICE EQUIPMENT AND EQUIPMENT SHELTER.

4 E-2 **TYPICAL ELECTRICAL TRENCH DETAIL**
NOT TO SCALE

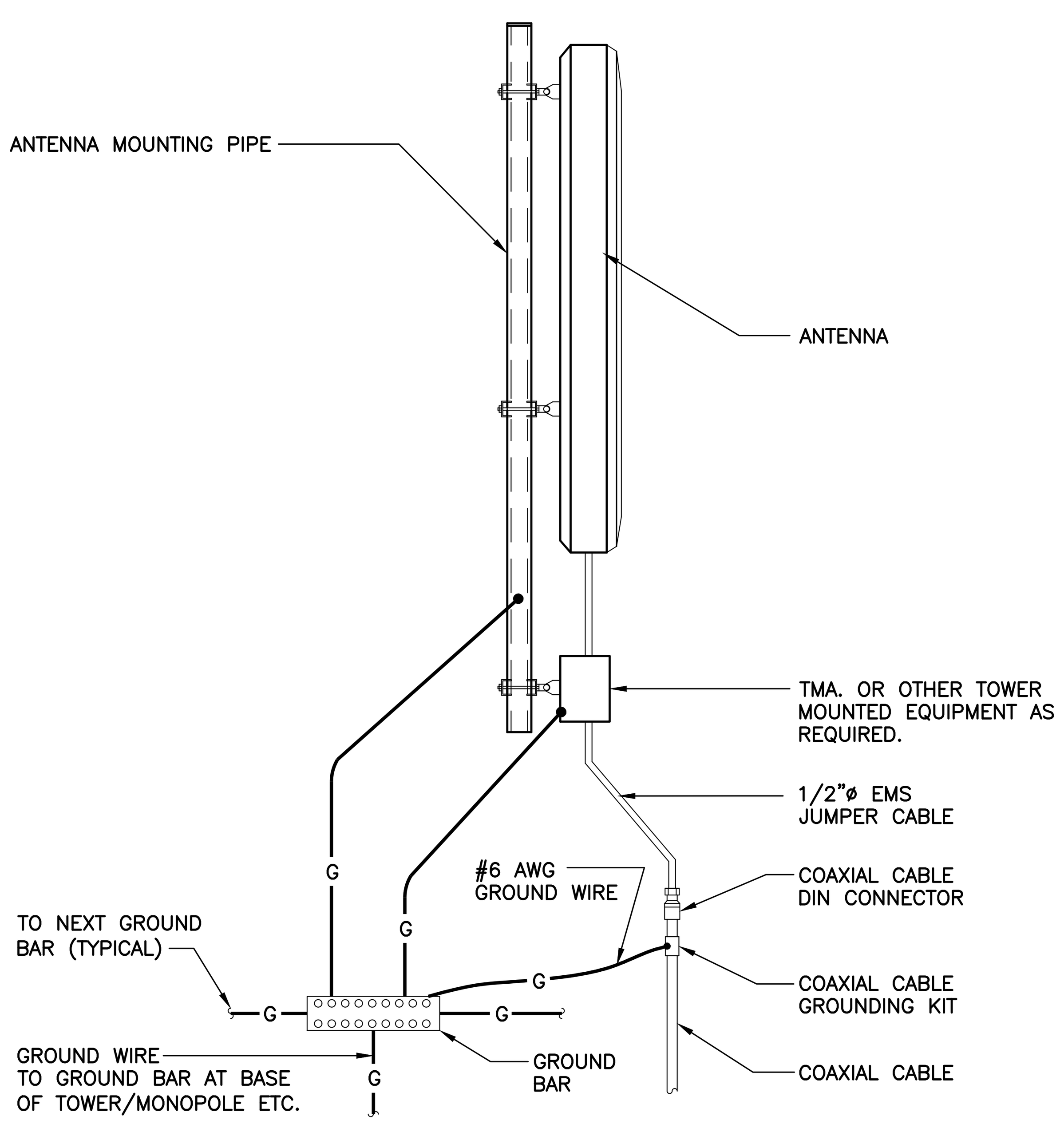


GROUNDING SCHEMATIC NOTES

(1) #6 AWG

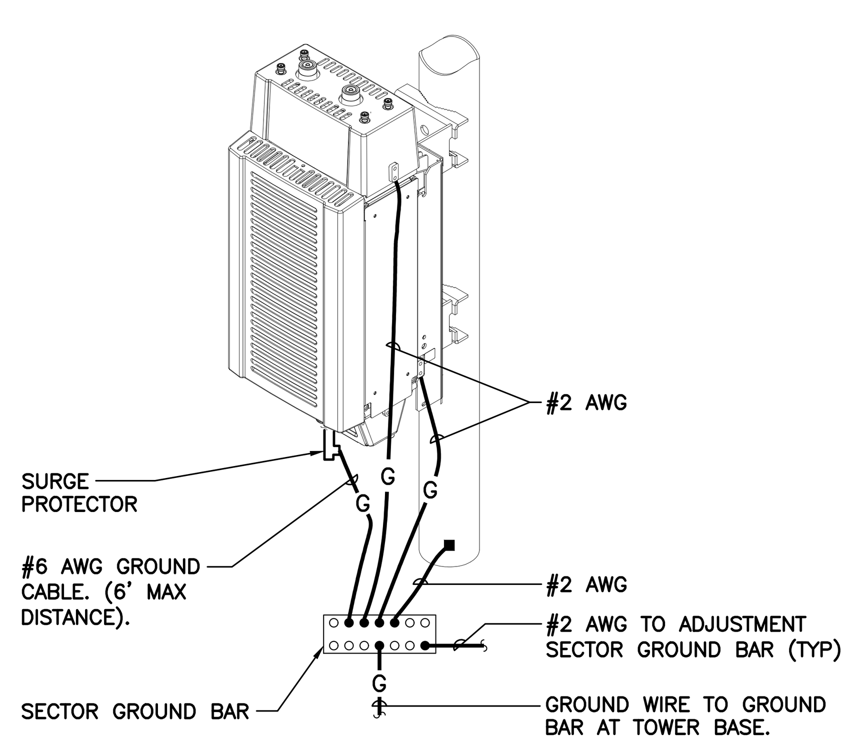
GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND CABLE TRAY SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
8. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

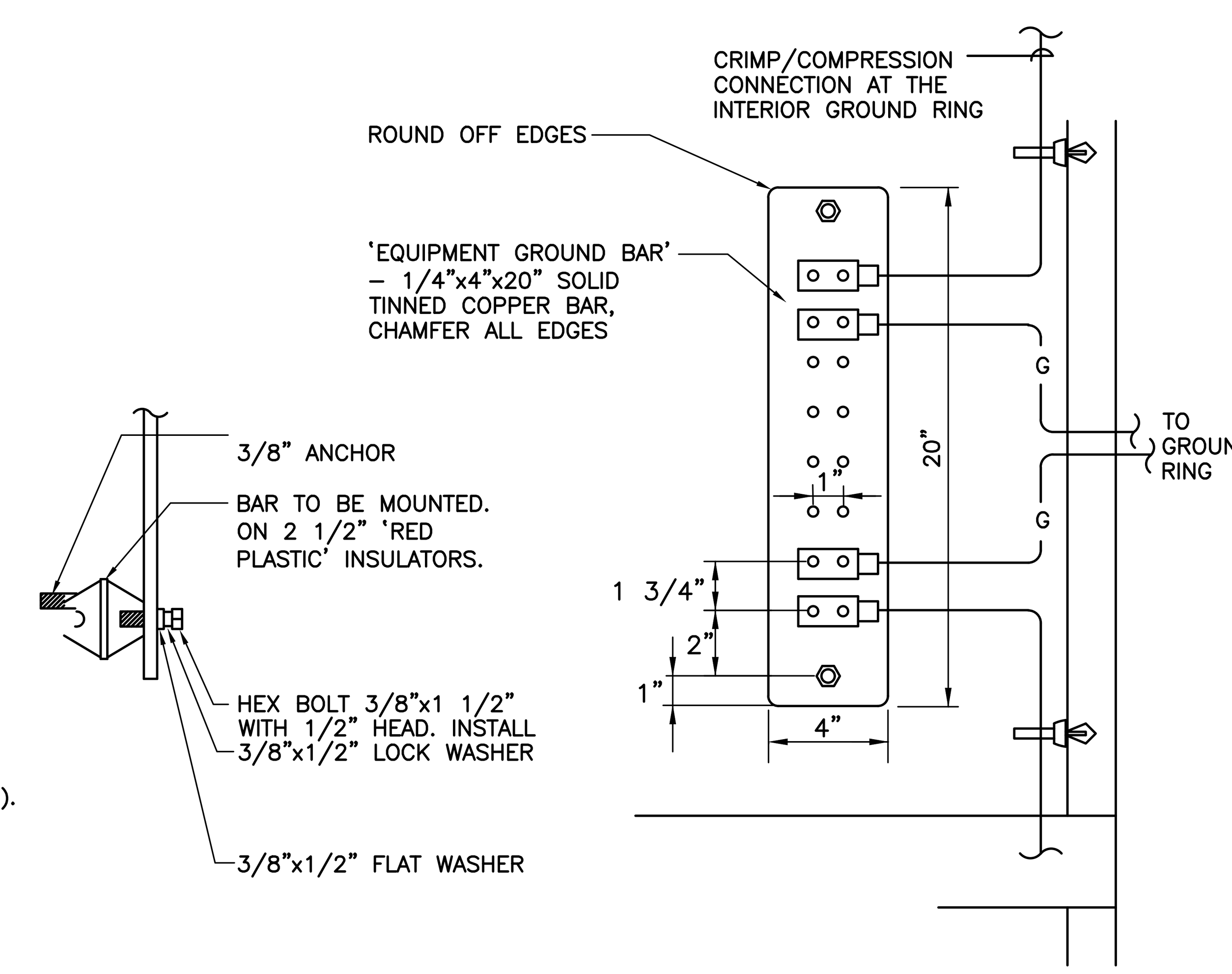


5 E-2 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NOT TO SCALE

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



6 E-2 **RRH POLE MOUNT GROUNDING**
SCALE: NOT TO SCALE



7 E-2 **EQUIPMENT GROUND BAR DETAIL**
SCALE: NOT TO SCALE

7 E-2 **ELECTRICAL SCHEMATIC DIAGRAM**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-2

SHEET NO. 10 OF 11

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL 200A, 240/120V, 1P, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
2. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, EQUIPMENT, ETC. AS INDICATED OR NOTED ON PLANS.
3. CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, GROUND BARS, ETC.
4. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:

1. SHUTDOWN OF SERVICE (COORDINATE WITH OWNER).

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

1.02. GENERAL REQUIREMENTS

A. 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.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

G. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

H. 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.

I. 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.

J. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

K. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

L. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

M. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

N. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

O. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUITS

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. 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:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. 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.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.
2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. 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: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: 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. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S 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.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE CONNECTED TO THE PANELBOARDS SO THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
3	01/17/24	BSP	TJR	CONSTRUCTION DRAWINGS – REVISED PER NEWLY ISSUED RFDS
2	11/06/23	BSP	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
1	09/12/23	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
0	08/10/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NORTHEAST SITE SOLUTIONS Turnkey Wireless Development

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

T-MOBILE NORTHEAST LLC

SITE NAME: RIDGEFIELD/ ETHAN ALLEN H
SITE ID: CT11116C
101 MOUNTAIN RD. CL+P POLE #3275
REDDING, CT 06896

DATE: 08/10/23
SCALE: AS NOTED
JOB NO. 22006.03

ELECTRICAL SPECIFICATIONS

E-3

SHEET NO. 11 OF 11

Exhibit D

Structural Analysis Report

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Pole

T-Mobile Site Ref: CT11116C

Eversource Structure No. 3275
68' (AGL) Electric Transmission Pole

101 Mountain Road
Redding, CT

CENTEK Project No. 22006.03

~~Date: May 25, 2022~~
Rev 5: January 17, 2024

Max Stress Ratio = 80%

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to analyze the antenna mast and 68' (AGL) utility pole located at 101 Mountain Road in Redding, CT for the proposed antenna and equipment upgrade by T-Mobile.

The existing/proposed loads consist of the following:

- T-MOBILE (Existing to Remain):
  Coax Cables: Eight (8) 7/8" ∅ coax cables mounted to the exterior of the pole/mast.
- T-MOBILE (Existing to be Removed):
  Antennas: Two (2) RFS APX16DWV-16DWVS panel antennas flush mounted with a RAD center elevation of 74-ft above grade.
  Mast: 4" Sch. 40 Pipe.
- **T-MOBILE (Proposed):**
  Antennas: Two (2) RFS APXVAALL18_43 panel antennas and two (2) Andrew ATSBT-TOP-MF-4G Smart Bias Tees flush mounted with a RAD center elevation of 77-ft above grade.
  Coax Cables: Eight (8) 7/8" ∅ coax cables mounted to the exterior of the pole/mast.
  Mast: 10" Sch. 80 Pipe.

Primary assumptions used in the analysis

- ASCE Manual No. 48-19, "Design of Steel Transmission Pole Structures", defines steel stresses for evaluation of the utility pole.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the antenna mast unless specified otherwise.
- Antenna mast will be properly installed and maintained.
- No residual stresses exist due to incorrect pole erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Antenna mast and utility pole will be in plumb condition.
- Utility pole was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.
- Direct embedment evaluation assumes ½" deflection at top of steel canister under worst case loading is acceptable.
- Backfill within the steel canister has been properly compacted to allow for transfer of tower base forces to the steel canister with minimal deflection of backfill material.
- Per Meyer Industries original pole design drawings the steel pole tapers at 0.25 in/ft from top to 68'-5" below top (with 3'-5" slip joint). The bottom 15-ft of the pole is straight (with 12-ft embedment).
- Steel canister/casing diameter based on Eversource standard size of pole base diameter + 20".

Analysis

The proposed replacement mast consisting of a 10-in x 25.0-ft long SCH. 80 pipe (O.D. = 10.75") connected at two points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA-222H standard. Section 5 of this report details these gravity and lateral wind loads. NESC prescribed loads were also applied to the mast in order to obtain reactions needed for analyzing the utility pole structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA-222-H loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

Design Basis

Our analysis was performed in accordance with ASCE 48-19, "Design of Steel Transmission Pole Structures", NESC C2-2023 and Eversource Design Criteria.

- UTILITY POLE ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the EVERSOURCE Design Criteria Table, NESC C2-2023 ~ Construction Grade B, and ASCE Manual No. 48-19, "Design Of Steel Transmission Pole Structures".

  Load cases considered:

  Load Case 1: NESC Heavy
  Wind Pressure………………………………… 4.0 psf
  Radial Ice Thickness……………………….. 0.5"
  Vertical Overload Capacity Factor…………. 1.50
  Wind Overload Capacity Factor……………. 2.50
  Wire Tension Overload Capacity Factor…… 1.65

  Load Case 2: NESC Extreme
  Wind Speed………………………………… 110 mph (1)
  Radial Ice Thickness……………………….. 0"

  Note 1: NESC C2-2023, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- MAST ASSEMBLY ANALYSIS

  Mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with TIA-222-H and AISC standards.

  Load cases considered:

  Load Case 1:
  Wind Speed………………………………... 125 mph (2022 CSBC Appendix-P)
  Radial Ice Thickness……………………….. 0"

  Load Case 2:
  Wind Pressure………………………………. 50 mph wind pressure
  Radial Ice Thickness………………………... 1.0"

Results

- MAST ASSEMBLY

The proposed pipe mast was determined to be structurally **adequate**.

Component	Stress Ratio (percentage of capacity)	Result
10" Sch. 80	23.0%	**PASS**
Connection to Tower	22.0%	**PASS**

- UTILITY POLE

This analysis finds that the subject utility pole is adequate to support the antenna mast and related appurtenances. The pole stresses meet the requirements set forth by the ASCE 48-19, "Design of Steel Transmission Pole Structures" for the applied NESC Heavy and Extreme load cases. The detailed analysis results are provided in Section 9 of this report. The analysis results are summarized as follows:

A maximum usage of **80.17%** occurs in the utility pole under the **NESC Extreme** loading condition.

POLE SECTION:

The utility pole was found to be structurally **adequate**.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 1	0.00' -3.00' (AGL)	80.17%	**PASS**

BASE REACTIONS:

From PLS-Pole analysis based on NESC/EVERSOURCE prescribed loads.

Load Case	Shear	Axial	Moment
NESC Heavy Wind	8.73 kips	30.39 kips	474.44 ft-kips
NESC Extreme Wind	13.40 kips	16.13 kips	651.02 ft-kips

Note 1 – 10% increase to be be applied to tower base reactions for foundation verification per OTRM 051

POLE DIRECT EMBEDMENT:

The existing utility pole is directly embedded 12-ft into the ground, which consists of solid rock ledge (Refer to the boring log located in section 10 of this report), within a 5' diameter steel canister. The embedment was determined to be structurally sufficient to support the proposed loading.

Type	Embedment Required	Embedment Provided	Result
Direct Embedment	10.1-ft	12-ft	**PASS**

Note 1: 10% increase to PLS base reactions used in embedment analysis per OTRM 051.

Conclusion

This analysis shows that the subject utility pole **and proposed replacement antenna mast are adequate** to support the proposed equipment upgrade.

The analysis is based, in part on the information provided to this office by Eversource and T-Mobile. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.

- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.

- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.

- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222.

- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

Modeling Features:

- Comprehensive CAD-like graphic drawing/editing capabilities that let you draw, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, etc.
- Versatile drawing grids (orthogonal, radial, skewed)
- Universal snaps and object snaps allow drawing without grids
- Versatile general truss generator
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet selection, with locking
- Saved selections to quickly recall desired selections
- Modification tools that modify single items or entire selections
- Real spreadsheets with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and views so you can edit or view any data in the plotted views or in the spreadsheets
- Simultaneous view of multiple spreadsheets
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection libraries
- Import DXF, RISA-2D, STAAD and ProSteel 3D files
- Export DXF, SDNF and ProSteel 3D files

Analysis Features:

- Static analysis and P-Delta effects
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS mode combinations
- Automatic inclusion of mass offset (5% or user defined) for dynamic analysis
- Physical member modeling that does not require members to be broken up at intermediate joints
- State of the art 3 or 4 node plate/shell elements
- High-end automatic mesh generation — draw a polygon with any number of sides to create a mesh of well-formed quadrilateral (NOT triangular) elements.
- Accurate analysis of tapered wide flanges - web, top and bottom flanges may all taper independently
- Automatic rigid diaphragm modeling
- Area loads with one-way or two-way distributions
- Multiple simultaneous moving loads with standard AASHTO loads and custom moving loads for bridges, cranes, etc.
- Torsional warping calculations for stiffness, stress and design
- Automatic Top of Member offset modeling
- Member end releases & rigid end offsets
- Joint master-slave assignments
- Joints detachable from diaphragms
- Enforced joint displacements
- 1-Way members, for tension only bracing, slipping, etc.

- 1-Way springs, for modeling soils and other effects
- Euler members that take compression up to their buckling load, then turn off.
- Stress calculations on any arbitrary shape
- Inactive members, plates, and diaphragms allows you to quickly remove parts of structures from consideration
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members and plates
- Automatic subgrade soil spring generator

Graphics Features:

- Unlimited simultaneous model view windows
- Extraordinary "true to scale" rendering, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamic scrolling stops right where you want
- Plot & print virtually everything with color coding & labeling
- Rotate, zoom, pan, scroll and snap views
- Saved views to quickly restore frequent or desired views
- Full render or wire-frame animations of deflected model and dynamic mode shapes with frame and speed control
- Animation of moving loads with speed control
- High quality customizable graphics printing

Design Features:

- Designs concrete, hot rolled steel, cold formed steel and wood
- ACI 1999/2002, BS 8110-97, CSA A23.3-94, IS456:2000,EC 2-1992 with consistent bar sizes through adjacent spans
- Exact integration of concrete stress distributions using parabolic or rectangular stress blocks
- Concrete beam detailing (Rectangular, T and L)
- Concrete column interaction diagrams
- Steel Design Codes: AISC ASD 9th, LRFD 2nd & 3rd, HSS Specification, CAN/CSA-S16.1-1994 & 2004, BS 5950-1-2000, IS 800-1984, Euro 3-1993 including local shape databases
- AISI 1999 cold formed steel design
- NDS 1991/1997/2001 wood design, including Structural Composite Lumber, multi-ply, full sawn
- Automatic spectra generation for UBC 1997, IBC 2000/2003
- Generation of load combinations: ASCE, UBC, IBC, BOCA, SBC, ACI
- Unbraced lengths for physical members that recognize connecting elements and full lengths of members
- Automatic approximation of K factors
- Tapered wide flange design with either ASD or LRFD codes
- Optimization of member sizes for all materials and all design codes, controlled by standard or user-defined lists of available sizes and criteria such as maximum depths
- Automatic calculation of custom shape properties
- Steel Shapes: AISC, HSS, CAN, ARBED, British, Euro, Indian, Chilean
- Light Gage Shapes: AISI, SSMA, Dale / Incor, Dietrich, Marino\WARE
- Wood Shapes: Complete NDS species/grade database
- Full seamless integration with RISAFoot (Ver 2 or better) for advanced footing design and detailing
- Plate force summation tool

Results Features:

- Graphic presentation of color-coded results and plotted designs
- Color contours of plate stresses and forces with quadratic smoothing, the contours may also be animated
- Spreadsheet results with sorting and filtering of: reactions, member & joint deflections, beam & plate forces/stresses, optimized sizes, code designs, concrete reinforcing, material takeoffs, frequencies and mode shapes
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams that display magnitudes at any dialed location
- Saved solutions quickly restore analysis and design results.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

PLS-POLE provides all of the capabilities a structural engineer requires to design transmission, substation or communications structures. It does so using a simple easy to use graphical interface that rests upon our time tested finite element engine. Regardless of whether you want to model a simple wood pole or a guyed steel X-Frame; PLS-POLE can handle the job simply, reliably and efficiently.

Modeling Features:

- Structures are made of standard reusable components that are available in libraries. You can easily create your own libraries or get them from a manufacturer
- Structure models are built interactively using interactive menus and graphical commands
- Automatic generation of underlying finite element model of structure
- Steel poles can have circular, 4, 6, 8, 12, 16, or 18-sided, regular, elliptical or user input cross sections (flat-to-flat or tip-to-tip orientations)
- Steel and concrete poles can be selected from standard sizes available from manufacturers
- Automatic pole class selection
- Cross brace position optimizer
- Capability to specify pole ground line rotations
- Capability to model foundation displacements
- Can optionally model foundation stiffness
- Guys are easily handled (modeled as exact cable elements in nonlinear analysis)
- Powerful graphics module (members color-coded by stress usage)
- Graphical selection of joints and components allows graphical editing and checking
- Poles can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces

Analysis Features:

- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Design checks for ASCE, ANSI/TIA/EIA 222 (Revisions F and G) or other requirements
- Automatic calculation of dead and wind loads
- Automated loading on structure (wind, ice and drag coefficients) according to:
    - ASCE 74-1991
    - NESC 2002
    - NESC 2007
    - IEC 60826:2003
    - EN50341-1:2001 (CENELEC)
    - EN50341-3-9:2001 (UK NNA)
    - EN50341-3-17:2001 (Portugal NNA)
    - ESAA C(b)1-2003 (Australia)
    - TPNZ (New Zealand)
    - REE (Spain)
    - EIA/TIA 222-F
    - ANSI/TIA 222-G
    - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Detects buckling by nonlinear analysis

Results Features:

- Detects buckling by nonlinear analysis
- Easy to interpret text, spreadsheet and graphics design summaries
- Automatic determination of allowable wind and weight spans
- Automatic determination of interaction diagrams between allowable wind and weight spans
- Automatic tracking of part numbers and costs

Criteria for Design of PCS Facilities On or Extending Above Metal Electric Transmission Towers & Analysis of Transmission Towers Supporting PCS Masts [(1)]

Introduction

This criteria is the result from an evaluation of the methods and loadings specified by the separate standards, which are used in designing telecommunications towers and electric transmission towers. That evaluation is detailed elsewhere, but in summary; the methods and loadings are significantly different. This criteria specifies the manner in which the appropriate standard is used to design PCS facilities including masts and brackets (hereafter referred to as “masts”), and to evaluate the electric transmission towers to support PCS masts. The intent is to achieve an equivalent level of safety and security under the extreme design conditions expected in Connecticut and Massachusetts.

ANSI Standard TIA-222-H covering the design of telecommunications structures specifies LRFD design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that it does not exceed code defined percentage of failure strength.

ANSI Standard C2-2023 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the Eversource effort in “unifying” both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 1700-year recurrence for TIA-22-H risk category III and a 100-year recurrence for NESC Grade B. The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

Note 1: Prepared from documentation provide from Northeast Utilities.

PCS Mast

The PCS facility (mast, external cable/trays, including the initial and any planned future support platforms, antennas, etc. extending the full height above the top level of the electric transmission structure) shall be designed in accordance with the provisions of TIA 222-H:

ELECTRIC TRANSMISSION TOWER

The electric transmission tower shall be analyzed using yield stress theory in accordance with the attached table titled "Eversource Design Criteria". This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

- PCS mast for its total height above ground level, including the initial and planned future support platforms, antennas, etc. above the top of an electric transmission structure.
- Conductors are related devices and hardware.
- Electric transmission structure. The loads from the PCS facility and from the electric conductors shall be applied to the structure at conductor and PCS mast attachment points, where those load transfer to the tower.

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2023 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

In the event that the electric transmission tower is not sufficient to support the additional loadings of the PCS mast, reinforcement will be necessary to upgrade the strength of the overstressed members.

Attachment A
Eversource Design Criteria

		Attachment A ES Design Criteria	Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
Ice Condition	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
Ice Condition	NESC Heavy	Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
Ice Condition	NESC Heavy	Conductors:	Conductor Loads Provided by ES					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
High Wind Condition	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
High Wind Condition	NESC Extreme Wind	Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
High Wind Condition	NESC Extreme Wind	Conductors:	Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 x Gust Response Factor Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
NESC Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
NESC Extreme Ice with Wind Condition*		Conductors:	Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		*Only for structures installed after 2007						

determined from NESC applied loading conditions (not TIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

The structure shall be analyzed using yield stress theory in accordance with Attachment A, “Eversource Design Criteria.” This specifies uniform loadings (different from the TIA loadings) on each of the following components of the installed facility:

a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA’s etc.) above the top of an electric transmission structure.

b) Conductors and related devices and hardware (wire loads will be provided by Eversource).

c) Electric Transmission Structure

i) The loads from the wireless communication equipment components based on NESC and Eversource Criteria in Attachment A, and from the electric conductors shall be applied to the structure at conductor and wireless communication mast attachment points, where those loads transfer to the tower. ii)

ii) Shape Factor Multiplier:

NESC Structure Shape	Cd
Polyround (for polygonal steel poles)	1.3
Flat	1.6
Open Lattice	3.2
Pole with Coaxial Cable	See Below Table

iii) When Coaxial Cables are mounted alongside the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.6

d) The uniform loadings and factors specified for the above components in Attachment A, “Eversource Design Criteria” are based upon the National Electric Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to the TIA and its loads and factors with the exceptions noted above.

Project: PCS Wire Loads for Structure 3275
Date: 4/28/2022
Engineer: RB
Purpose: Calculate wire loads for existing T-Mobile site.

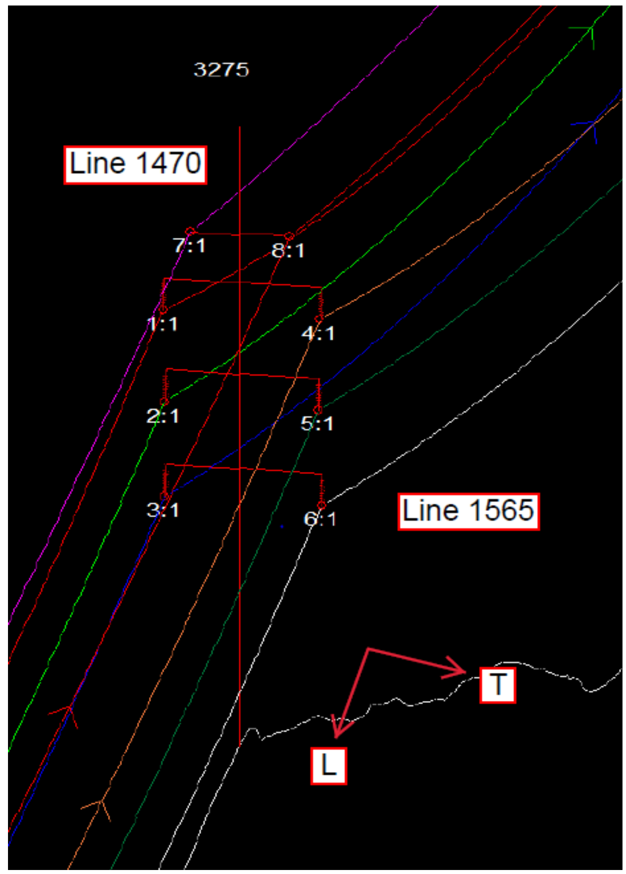
Shield Wires:
7#8 ALWLD, sagged in PLS-CADD

Conductors:
336 kcmil 26/7 "Linnet" ACSR, sagged in PLS-CADD

NESC 250B **Wind: NA -**

1470 Line ← **1565 Line**

		1470 Line	1565 Line	
Shield Wire:	**V**	1489	1489	**V**
	T	-627	-640	**T**
	L	24	24	**L**
Top Phase:	**V**	2095	2116	**V**
	T	-785	-750	**T**
	L	22	19	**L**
Mid Phase:	**V**	2291	2186	**V**
	T	-809	-730	**T**
	L	26	20	**L**
Bot Phase:	**V**	2272	2157	**V**
	T	-794	-743	**T**
	L	25	20	**L**



Project: PCS Wire Loads for Structure 3275
Date: 4/26/2022
Engineer: RB
Purpose: Calculate wire loads for existing T-Mobile site.

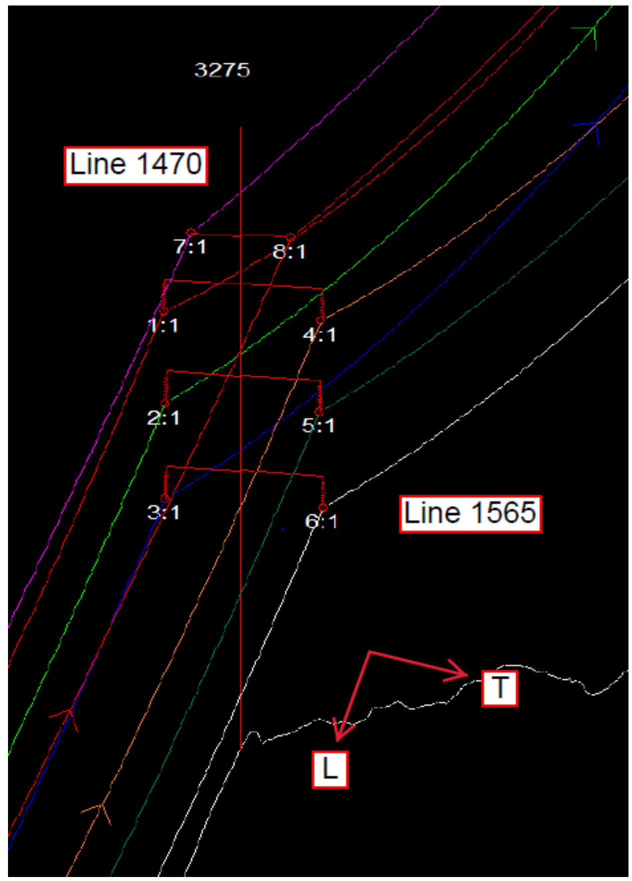
Shield Wires:
7#8 ALWLD, sagged in PLS-CADD

Conductors:
336 kcmil 26/7 "Linnet" ACSR, sagged in PLS-CADD

NESC 250C **Wind: NA -**

1470 Line ← **1565 Line**

		1470 Line	1565 Line	
Shield Wire:	**V**	699	696	**V**
	T	-460	-466	**T**
	L	41	41	**L**
Top Phase:	**V**	1064	1075	**V**
	T	-894	-876	**T**
	L	56	53	**L**
Mid Phase:	**V**	1166	1101	**V**
	T	-874	-836	**T**
	L	63	55	**L**
Bot Phase:	**V**	1134	1066	**V**
	T	-826	-804	**T**
	L	59	51	**L**



MAST REPLACEMENT DESIGN

STRUCT. NO. 3275
T-MOBILE - CT11116C
101 MOUNTAIN ROAD
REDDING, CT 06896

VICINITY MAP

PROJECT SUMMARY

SITE ADDRESS:	101 MOUNTAIN ROAD REDDING, CT 06896
PROJECT COORDINATES:	LAT: 41°–16'–42.40"N LON: 73°–26'–33.10"W ELEV:±570' AMSL
EVERSOURCE STRUCT NO:	3275
EVERSOURCE CONTACT:	RICHARD BADON 860.728.4852
T–MOBILE SITE REF.:	CT11116C
T–MOBILE CONTACT:	MATTHEW BANDLE 508.642.8801
ANTENNA CL HEIGHT:	78'–0"
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	TIMOTHY J. LYNN, PE 203.433.7507

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	1/17/24	TJL	CFC	REVISED BUILDING CODE
4	8/9/23	TJL	CFC	REVISED BUILDING CODE
3	7/21/23	TJL	CFC	REVISED BUILDING CODE
2	9/12/22	TJL	CFC	REVISED MAST BASE CONNECTION
1	7/14/22	TJL	CFC	ISSUED FOR REVIEW
0	5/25/22	TJL	CFC	ISSUED FOR REVIEW

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REDDING, CT 06896

DATE: 5/25/22
SCALE: AS SHOWN
JOB NO. 22006.03

TITLE SHEET

SHEET NO. T–1

DESIGN BASIS

1. GOVERNING CODE: 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CT STATE BUILDING CODE.

2. TIA-222-H, ASCE MANUAL NO. 48-19 - "DESIGN OF STEEL TRANSMISSION POLE STRUCTURES SECOND EDITION", NESC C2-2023 AND EVERSOURCE DESIGN CRITERIA.

3. DESIGN CRITERIA

   WIND LOAD: (ANTENNA MAST)
   ULTIMATE DESIGN WIND SPEED (V) = 125 MPH (2022 CSBC: APPENDIX 'P')

   WIND LOAD: (UTILITY POLE & FOUNDATION)
   BASIC WIND SPEED (V) =110 MPH (3-SECOND GUST) BASED ON NESC C2-2023, SECTION 25 RULE 250C.

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND MAST DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR T-MOBILE, DATED 1/17/24.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM THE TOWER DESIGN DRAWINGS PREPARED BY MEYER INDUSTRIES INC.; JOB NO. T-4011-RR DATED FEBRUARY 26, 1973.

3. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE GOVERNING BUILDING CODE.

4. 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 SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

5. 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. THIS INCLUDES VERIFYING ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.

6. PCS MAST INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF TRANSMISSION STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

7. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

8. 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.

9. NO DRILLING WELDING OR TAPING IS PERMITTED ON CL&P OWNED EQUIPMENT.

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SCALE: AS SHOWN
JOB NO. 22006.03

DESIGN BASIS AND GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 8

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY LOAD RESISTANCE FACTOR DESIGN (LRFD).

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL STEEL (SOLID ROUND BAR)--- ASTM A572_GR50 (50 KSI)
   D. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   E. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   F. PIPE---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B. U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEEL, ASTM E80XX FOR A572_65.
   E. BLIND BOLTS---AS1252 PROPERTY CLASS 8.8 (FU=120 KSI).

4. 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.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. 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.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 14TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. 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.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. 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.

16. ALL BOLTS SHALL BE INSTALLED PER THE REQUIREMENTS OF AISC 14TH EDITION & RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS".

17. ALL BOLTS SHALL BE INSTALLED AS SNUG-TIGHT CONNECTIONS UNLESS OTHERWISE INDICATED. CONNECTIONS SPECIFIED AS PRETENSIONED OR SLIP-CRITICAL SHALL BE TIGHTENED TO A BOLT TENSION NOT LESS THAN THAT GIVEN IN TABLE J3.1 OF AISC 14TH EDITION.

18. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

19. LOAD INDICATOR WASHERS SHALL BE UTILIZED ON ALL PRETENSIONED OR SLIP-CRITICAL CONNECTIONS.

20. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

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

22. FABRICATE BEAMS WITH MILL CAMBER UP.

23. 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.

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

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STRUCTURAL STEEL NOTES

SHEET NO. N-2

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST–INSTALLED ANCHOR ROD PULL–OUT TEST
–	EOR APPROVED POST–INSTALLED ANCHOR MPII	–	REBAR & FORMWORK GEOMETRY VERIFICATION	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	–	CONCRETE TESTING		
–	FABRICATOR CERTIFIED WELDER INSPECTION	X	STEEL INSPECTION		
X	MATERIAL CERTIFICATIONS	–	POST INSTALLED ANCHOR ROD VERIFICATION		
		–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON–SITE COLD GALVANIZING VERIFICATION		
		X	CONTRACTOR AS–BUILT REDLINE DRAWINGS		

NOTES:
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.

3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.

4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.

5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON–SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS–BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE–CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST–CONSTRUCTION: FINAL CONDITION OF THE SITE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	1/17/24	TJL	CFC	REVISED BUILDING CODE
4	8/9/23	TJL	CFC	REVISED BUILDING CODE
3	7/21/23	TJL	CFC	REVISED BUILDING CODE
2	9/12/22	TJL	CFC	REVISED MAST BASE CONNECTION
1	7/14/22	TJL	CFC	ISSUED FOR REVIEW
0	5/25/22	TJL	CFC	ISSUED FOR REVIEW

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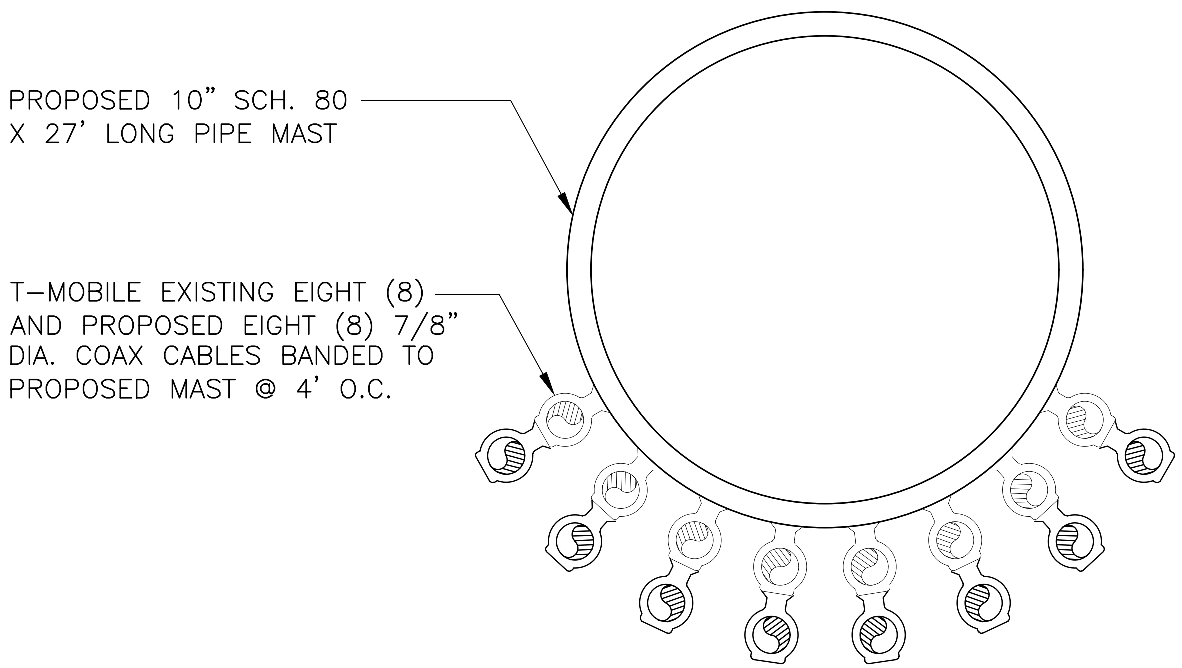
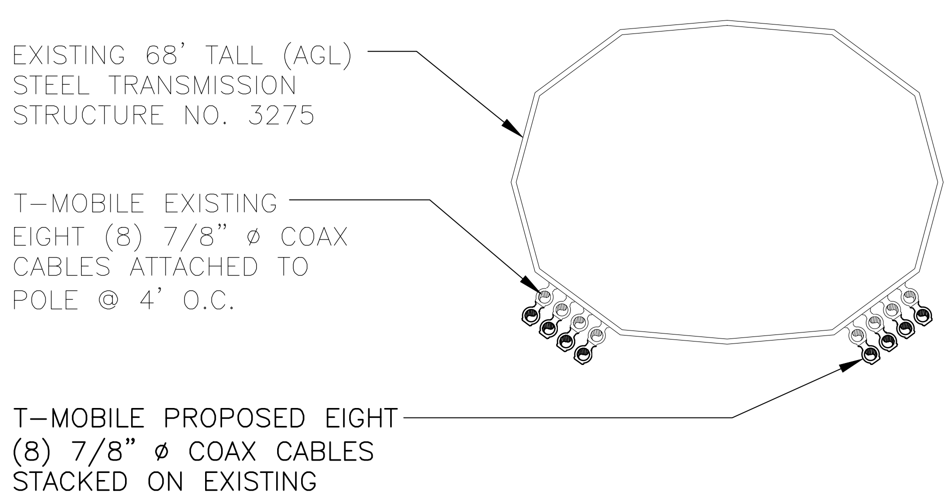
MODIFICATION INSPECTION REQUIREMENTS

SHEET NO.
MI–1
Sheet No. 4 of 8



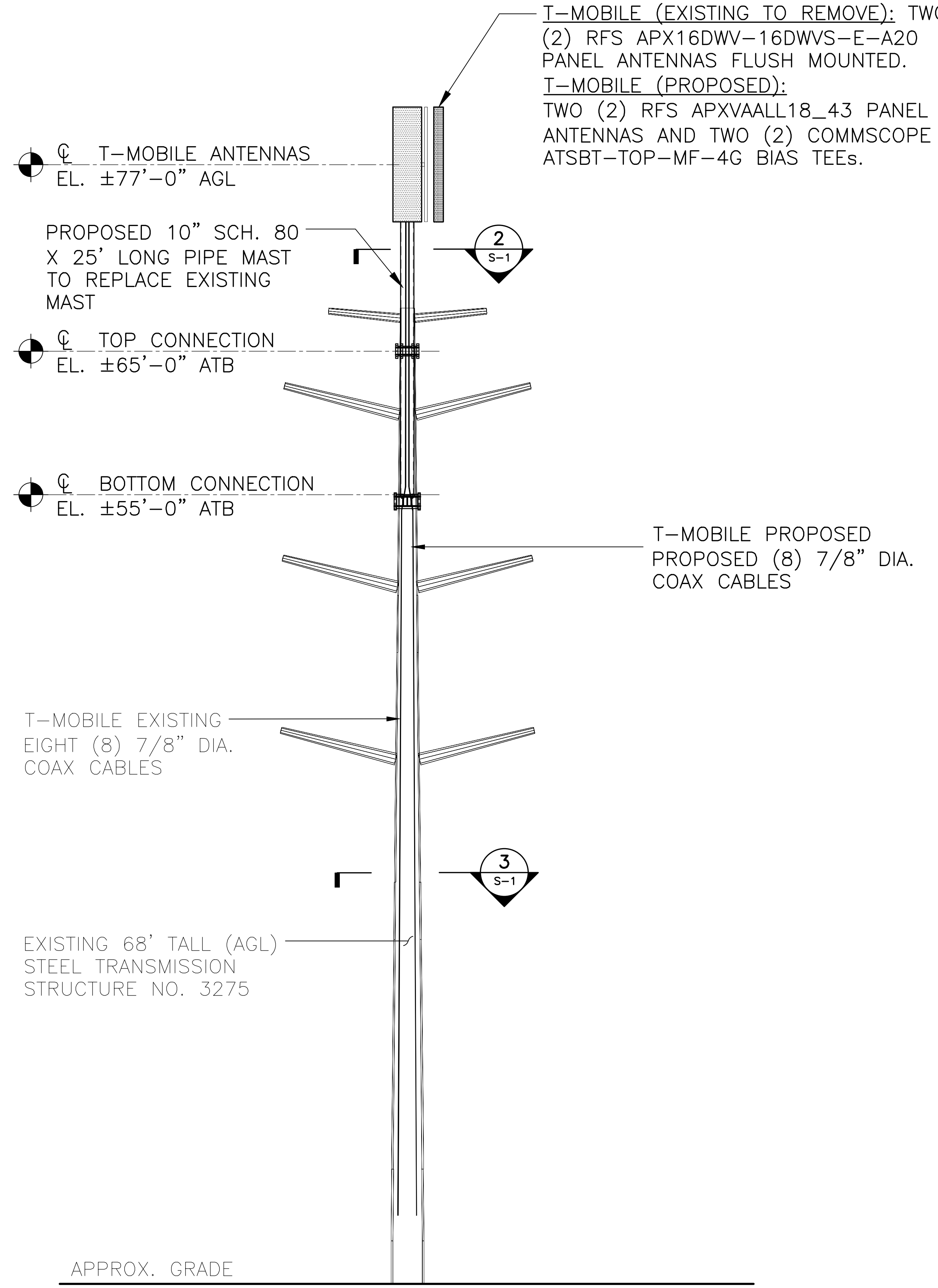
2 S–1 COAX CABLE PLAN (55'-74' ATB)

SCALE: 3" = 1'–0"



3 S–1 COAX CABLE PLAN (0'-55' ATB)

SCALE: 1/2" = 1'–0"



1 S–1 TOWER AND MAST ELEVATION

SCALE: NTS

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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4	8/9/23	TJL	CFC	REVISED BUILDING CODE
3	7/21/23	TJL	CFC	REVISED BUILDING CODE
2	9/12/22	TJL	CFC	REVISED MAST BASE CONNECTION
1	7/14/22	TJL	CFC	ISSUED FOR REVIEW
0	5/25/22	TJL	CFC	ISSUED FOR REVIEW

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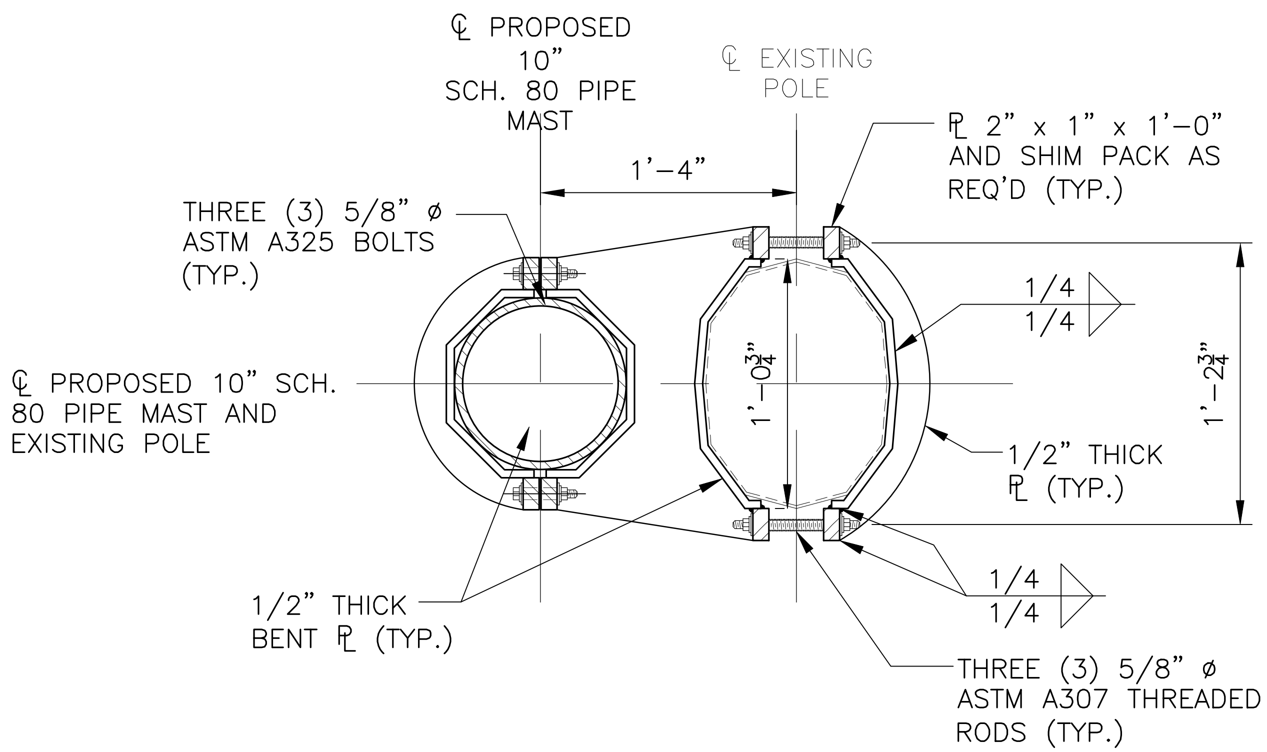
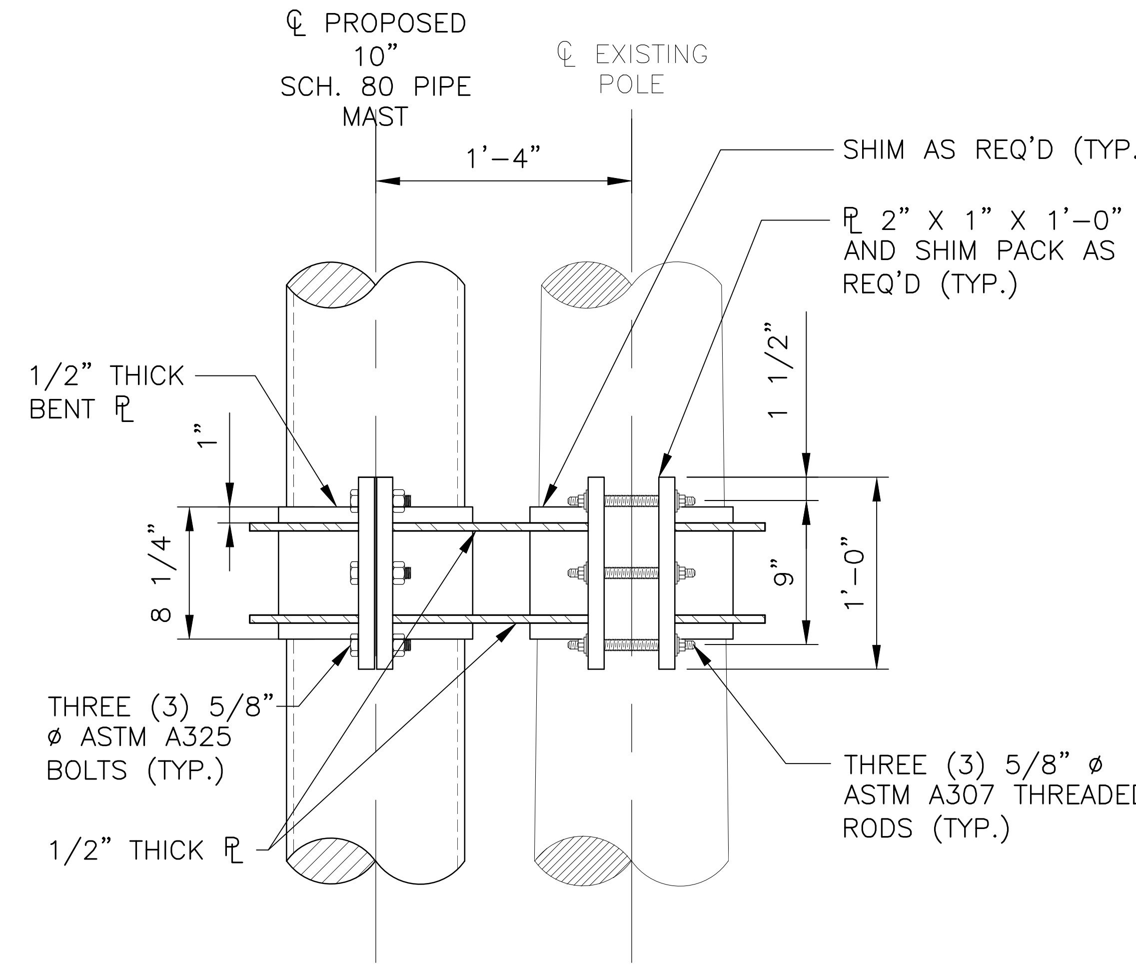
TOWER ELEVATION AND FEEDLINE PLAN

SHEET NO.
S–1



2 S-2 TOP PCS BRACKET PLAN VIEW

SCALE: 1" = 1'-0"



1 S-2 TOP PCS BRACKET DETAIL

SCALE: 1" = 1'-0"

NOTE:

1. POLE TAPER = 0.25"/FT (V.I.F.)
2. REFER TO SHEET S-4 FOR ADDITIONAL POLE DIMENSIONS

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	1/17/24	TJL	CFC	REVISED BUILDING CODE
4	8/9/23	TJL	CFC	REVISED BUILDING CODE
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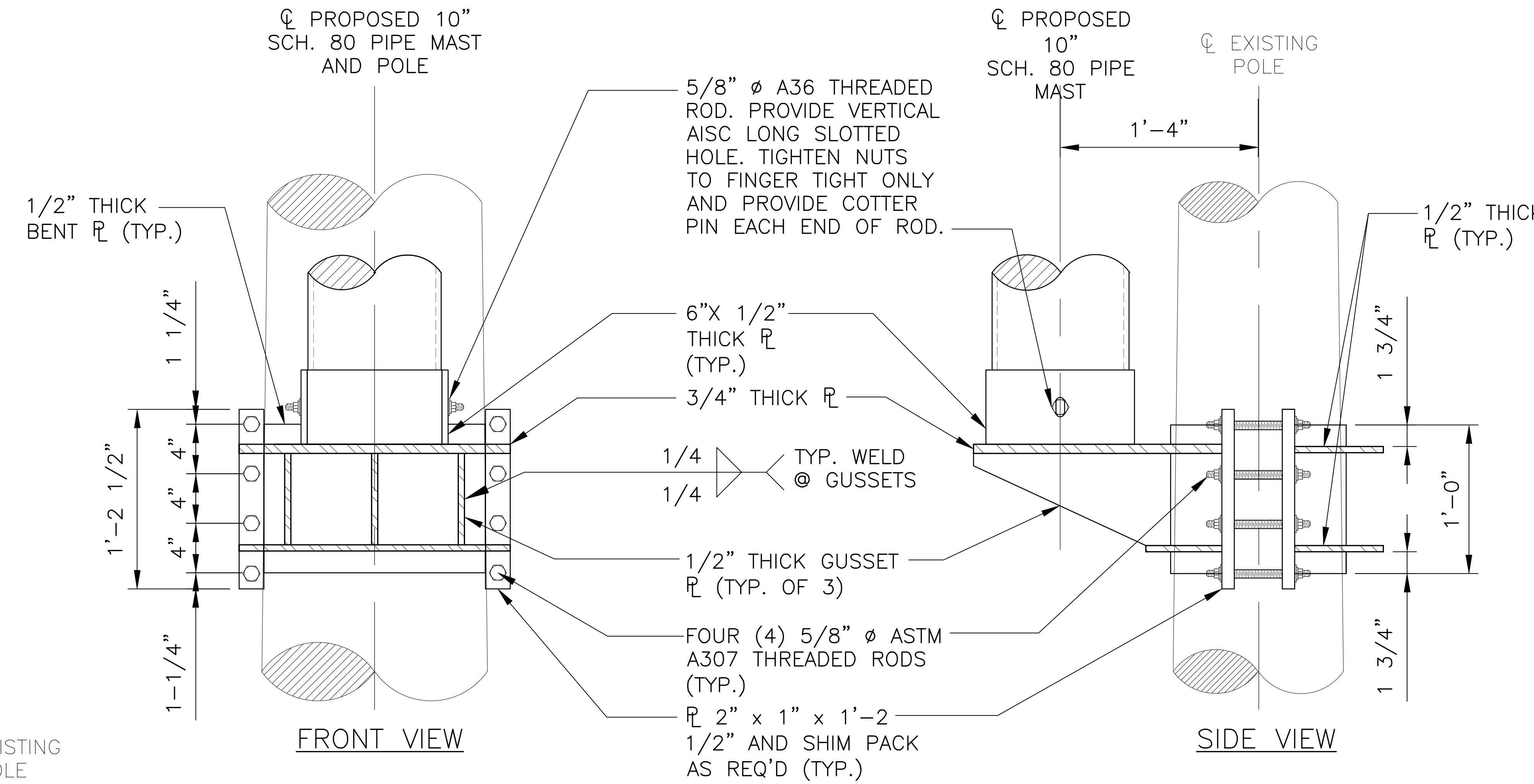
TOP CONNECTION DETAILS

SHEET NO. S-2

Sheet No. 6 of 8

NOTE:

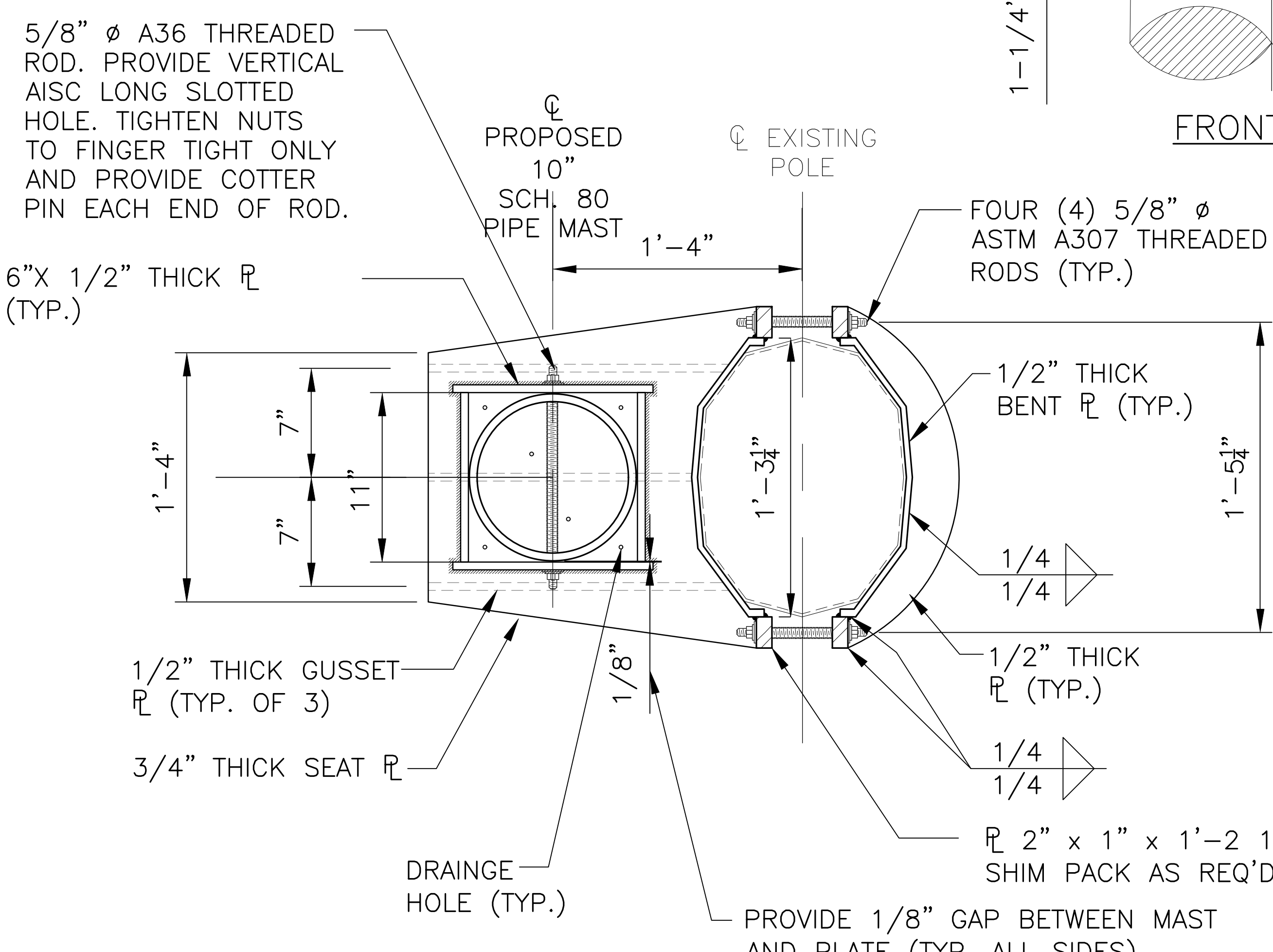
1. POLE TAPER = 0.25"/FT (V.I.F.)
2. REFER TO SHEET S-4 FOR ADDITIONAL POLE DIMENSIONS



1 / S-3

BOTTOM PCS BRACKET DETAIL

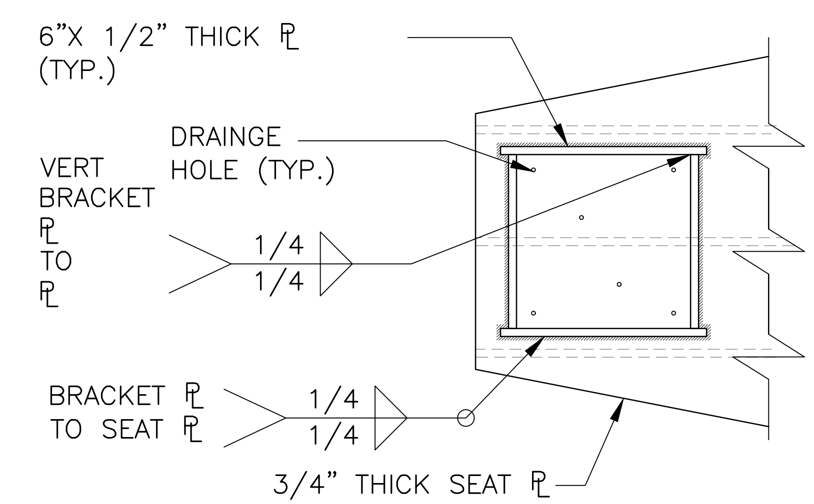
SCALE: 1" = 1'-0"



2 / S-3

BOTTOM PCS BRACKET PLAN VIEW

SCALE: 1" = 1'-0"



3 / S-3

BRACKET ASSEMBLY DETAIL

SCALE: 1" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	1/17/24	TJL	CFC	REVISED BUILDING CODE
4	8/9/23	TJL	CFC	REVISED BUILDING CODE
3	7/21/23	TJL	CFC	REVISED BUILDING CODE
2	9/12/22	TJL	CFC	REVISED MAST BASE CONNECTION
1	7/14/22	TJL	CFC	ISSUED FOR REVIEW
0	5/25/22	TJL	CFC	ISSUED FOR REVIEW

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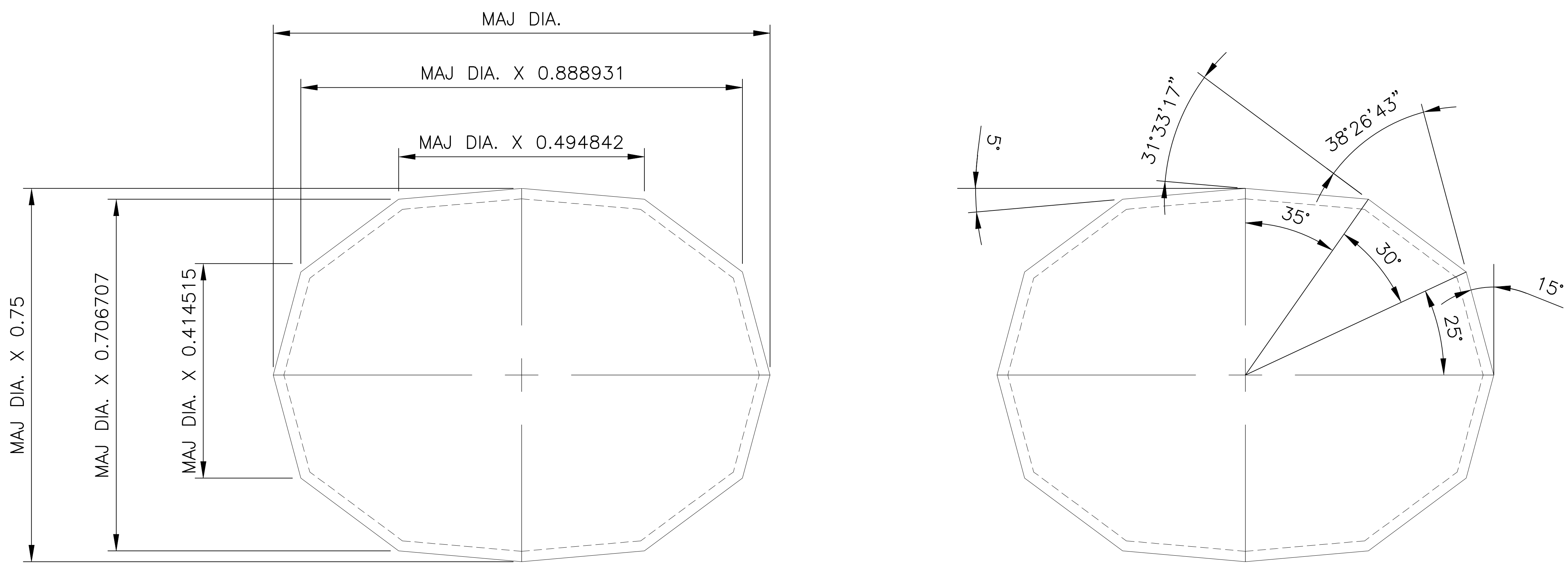
BOTTOM CONNECTION DETAILS

SHEET NO.
S-3
Sheet No. 7 of 8



NOTE CONTRACTOR TO VERIFY ALL DIMENSIONS PRIOR TO FABRICATION

1 / S-4 POLE DIMENSIONS

SCALE: 3" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	1/17/24	TJL	CFC	REVISED BUILDING CODE
4	8/9/23	TJL	CFC	REVISED BUILDING CODE
3	7/21/23	TJL	CFC	REVISED BUILDING CODE
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1	7/14/22	TJL	CFC	ISSUED FOR REVIEW
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CL&P POLE DIMENSIONS

SHEET NO.
S-4
Sheet No. 8 of 8

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 125$	mph	(User Input - 2022 CSBC Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-H)
Basic Wind Speed Service Loads	$V_{Ser} := 60$	mph	(User Input - TIA-222-H Section 2.8.3)

Input

Structure Type =	Structure_Type := Pole		(User Input)
Structure Category =	$SC := III$		(User Input)
Exposure Category =	$Exp := C$		(User Input)
Structure Height =	$h := 68$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 78$	ft	(User Input)
Height to Center of Mast =	$z_{Mast1} := 78.5$	ft	(User Input)
Height to Center of Mast =	$z_{Mast2} := 65$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input - Section 2.6.9.4 of TIA-222-H)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type} = \text{Pole} \\ 0.85 & \text{if Structure\_Type} = \text{Lattice} \end{cases} = 0.95$$

(Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \\ 1.25 & \text{if } SC = 4 \end{cases} = 1.15$$

(Per Table 2-3 of TIA-222-H)

Wind Direction Probability Factor (Service) = $K_{dSer} := 0.85$ (Per Section 2.8.3 of TIA-222-H)

$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.09$ $\qquad t_{izant} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.253$

Velocity Pressure Coefficient Antennas = $Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.201$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 45.441$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.271$

Velocity Pressure Service = $qz_{ant.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{ant} \cdot V_{Ser}^2 = 9.368$

$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 1.091$ $\qquad t_{izMast1} := t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 1.254$

Velocity Pressure Coefficient Mast = $Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.203$

Velocity Pressure w/o Ice Mast = $qz_{Mast1} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast1} \cdot V^2 = 45.503$

Velocity Pressure with Ice Mast = $qz_{ice.Mast1} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 = 7.28$

Velocity Pressure Service = $qz_{Mast1.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{Mast1} \cdot V_{Ser}^2 = 9.38$

$K_{izMast2} := \left(\frac{z_{Mast2}}{33}\right)^{0.1} = 1.07$ $\qquad t_{izMast2} := t_i \cdot I_{ice} \cdot K_{izMast2} \cdot K_{zt}^{0.35} = 1.231$

Velocity Pressure Coefficient Mast = $Kz_{Mast2} := 2.01\left(\left(\frac{z_{Mast2}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.156$

Velocity Pressure w/o Ice Mast = $qz_{Mast2} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast2} \cdot V^2 = 43.73$

Velocity Pressure with Ice Mast = $qz_{ice.Mast2} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast2} \cdot V_i^2 = 6.997$

Velocity Pressure Service = $qz_{Mast2.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{Mast2} \cdot V_{Ser}^2 = 9.015$

Development of Wind & Ice Load on Mast

Mast Data: (Pipe 10 Sc. 80) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 10.75$ in (User Input)

Mast Length = $L_{mast} := 25$ ft (User Input)

Mast Thickness = $t_{mast} := 0.5$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12L_{mast}}{D_{mast}} = 27.9$

Mast Force Coefficient = $Ca_{mast} = 1.2$

Gravity Loads (without ice)

Weight of the mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1} \cdot 2\right)^2 - D_{mast}{}^2\right] = 47.3$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 18$ plf **BLC 3**

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast2} \cdot 2\right)^2 - D_{mast}{}^2\right] = 46.3$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 18$ plf **BLC 3**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast1}\right)}{12} = 1.105$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 13$ plf **BLC 4**

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast2}\right)}{12} = 1.101$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 13$ plf **BLC 4**

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.896$ sf/ft

Total Mast Wind Force = $qz_{Mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 66$ plf **BLC 5**

Total Mast Wind Force = $qz_{Mast2} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 63$ plf **BLC 5**

Wind Load (Service)

Total Mast Wind Force Service Loads = $qz_{Mast1.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 14$ plf **BLC 6**

Total Mast Wind Force Service Loads = $qz_{Mast2.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 13$ plf **BLC 6**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAALL18_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 118$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 2$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.22$		

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 236$	lbs	**BLC 2**

Gravity Loads (ice only)

		cu in	
Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^4$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izant})(W_{ant} + 2 \cdot t_{izant}) \cdot (T_{ant} + 2 \cdot t_{izant}) - V_{ant} = 7049$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 228$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 457$	lbs	**BLC 3**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izant}) \cdot (W_{ant} + 2 \cdot t_{izant})}{144} = 13.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 27.4$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 329$	lbs	**BLC 4**

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 12$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 24$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1799$	lbs	**BLC 5**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 371$	lbs	**BLC 6**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model = Commscope ATSBT-TOP-MF-4G Bias Tee

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 5.63$ in (User Input)

Antenna Width = $W_{ant} := 3.7$ in (User Input)

Antenna Thickness = $T_{ant} := 2$ in (User Input)

Antenna Weight = $WT_{ant} := 2$ lbs (User Input)

Number of Antennas = $N_{ant} := 2$ (User Input)

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.5$

Antenna Force Coefficient = $Ca_{ant} = 1.2$

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 4$ lbs **BLC 2**

Gravity Loads (ice only) cu in

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot t_{izant}\right)\left(W_{ant} + 2 \cdot t_{izant}\right) \cdot \left(T_{ant} + 2 \cdot t_{izant}\right) - V_{ant} = 186$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 6$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 12$ lbs **BLC 3**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot t_{izant}\right) \cdot \left(W_{ant} + 2 \cdot t_{izant}\right)}{144} = 0.4$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.7$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 8$ lbs **BLC 4**

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.3$ sf

Total Antenna Wind Force = $F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 21$ lbs **BLC 5**

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 4$ lbs **BLC 6**

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type: Universal Tri-Bracket

Mount Shape = Flat (User Input)

Pipe Mount Length = $L_{mnt} := 96$ in (User Input)

2 inch Pipe Mount Linear Weight = $W_{mnt} := 3.66$ plf (User Input)

Pipe Mount Outside Diameter = $D_{mnt} := 2.375$ in (User Input)

Number of Mounting Pipes = $N_{mnt} := 2$ (User Input)

Tri-Bracket Weight = $W_{tb.mnt} := 197$ lbs (User Input)

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area = $A_{mnt} := 0.0$ sf

Total Mount Wind Force = $F_{mnt} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{mnt} = 0$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice = $A_{ICEmnt} := 0.0$ sf

Total Mount Wind Force = $Fi_{mnt} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEmnt} = 0$ lbs **BLC 4**

Wind Load (Service)

Assumes Mount is Shielded by Antenna

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{ant.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{mnt} = 0$ lbs **BLC 6**

Gravity Loads (without ice)

Weight Each Pipe Mount = $WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 29$ lbs

Weight of All Mounts = $WT_{mnt} \cdot N_{mnt} + W_{tb.mnt} = 256$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Pipe = $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 425$ cu in

Volume of Ice on Each Pipe = $V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 2 \cdot t_{izant}\right)^2\right] \cdot \left(L_{mnt} + 2 \cdot t_{izant}\right)\right] - V_{mnt} = 1418$ cu in

Weight of Ice each mount (incl, hardware) = $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 46$ lbs

Weight of Ice on All Mounts = $W_{ICEmnt} \cdot N_{mnt} + 5 = 97$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables

Cable Data:

Type = 7/8"

Shape = Round (User Input)

Coax Outside Diameter = $D_{coax} := 1.11$ in (User Input)

Coax Cable Length = $L_{coax} := 13$ ft (User Input)

Weight of Coax per foot = $Wt_{coax} := 0.54$ plf (User Input)

Total Number of Coax = $N_{coax} := 16$ (User Input)

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 2$ (User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 140.5$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 9$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast1}\right)^2 - D_{coax}{}^2\right] = 9.3$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 58$ plf **BLC 3**

Wind Load (with ice)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{\left(NP_{coax} \cdot D_{coax} + 2 \cdot t_{izMast1}\right)}{12} = 0.4$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast1} \cdot G_H \cdot AICE_{coax} = 5$ plf **BLC 4**

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{\left(NP_{coax} D_{coax}\right)}{12} = 0.2$ sf/ft

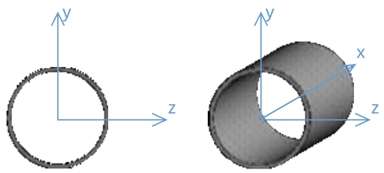
Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 14$ plf **BLC 5**

Wind Load (Service)

Total Coax Wind Force Service Loads = $F_{coax} := Ca_{coax} \cdot qz_{Mast1.Ser} \cdot G_H \cdot A_{coax} = 3$ plf **BLC 6**

Detail Report: M1

Load Combination: LC 4: 1.0D + 1.0WService   Code check: 0.049 (axial/bending)



Input Data

Shape:	PIPE_10.0X	I Node:	BOTCONNECTION
Member Type:	Column	J Node:	TOPMAST
Length (ft):	25	I Release:	Fixed
Material Type:	Hot Rolled Steel	J Release:	Fixed
Design Rule:	Typical	I Offset:	N/A
Internal Sections:	97	J Offset:	N/A
Design Code:	AISC 14th (360-10): LRFD	T/C Only:	Both Way

Material Properties

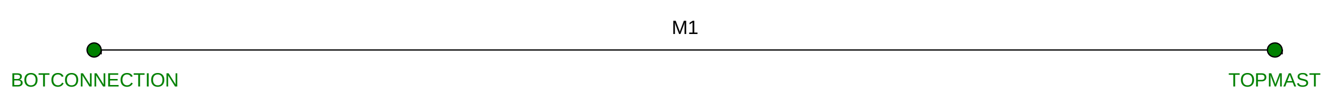
Material:	A53 Gr. B	Therm. Coeff. (/1E5 F):	0.65	F_u (ksi):	60
E (ksi):	29000	Density (k/ft^3):	0.49	R_t:	1.2
G (ksi):	11154	F_y (ksi):	35		
Nu:	0.3	R_y:	1.5		

Shape Properties

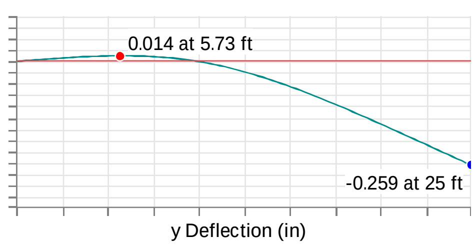
d (in):	10.75	Area (in^2):	15.1	I_{zz} (in^4):	199
t (in):	0.465	J (in^4):	398		
Z (in^3):	49.2	I_{yy} (in^4):	199		

Design Properties

$L_{b\ y\text{-}y}$ (ft):	25	$K_{y\text{-}y}$:	1	Max Defl Ratio:	L/1156
$L_{b\ z\text{-}z}$ (ft):	25	$K_{z\text{-}z}$:	1	Max Defl Location:	25
$L_{comp\ top}$ (ft):	25	y sway:	No	Span:	N/A
$L_{comp\ bot}$ (ft):	25	z sway:	No	τ_b:	1
L_{torque} (ft):	25	Function:	Lateral		
C_b:	1	Seismic DR:	None		



Diagrams:



Mast Top Connection:

Maximum Design Reactions at Brace:

Vertical =	$Vert := 0 \cdot kips$	(User Input)
Horizontal =	$Horz := 6.3 \cdot kips$	(User Input)
Moment =	$Moment := 0$	(User Input)

Bolt Data:

Bolt Grade =	A307 Rod	(User Input)
Number of Bolts =	$n_b := 6$	(User Input)
Bolt Diameter =	$d_b := 0.625in$	(User Input)
Nomianl Tensile Strength =	$F_{nt} := 45 \cdot ksi$	(User Input)
Nomianl Shear Strength =	$F_{nv} := 27 \cdot ksi$	(User Input)
Resistance Factor =	$\phi := 0.75$	(User Input)
Bolt Eccentricity from C.L. Mast =	$e := 16 \cdot in$	(User Input)
Vetical Spacing Between Top and Bottom Bolts =	$S_{vert} := 9 \cdot in$	(User Input)
Horizontal Spacing Between Bolts =	$S_{horz} := 14.75 \cdot in$	(User Input)

Bolt Area = $a_b := \frac{1}{4} \cdot \pi \cdot d_b^{\,2} = 0.307 \cdot in^2$

Check Bolt Stresses:

Wind Acting Parallel to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \dfrac{Vert}{n_b \cdot a_b} = 0 \cdot ksi$

Condition1 := if($f_v < \phi \cdot F_{nv}$, "OK", "Overstressed")

Condition1 = "OK"

$\dfrac{f_v}{(\phi \cdot F_{nv})} = 0 \cdot \%$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 45 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \dfrac{Horz}{n_b} + \dfrac{Vert \cdot e}{S_{vert} \cdot 2} = 1.05 \cdot kips$

Tension Stress Each Bolt = $f_t := \dfrac{F_{tension.bolt}}{a_b} = 3.4 \cdot ksi$

Condition2 := if($f_t < \phi \cdot F'_{nt}$, "OK", "Overstressed")

Condition2 = "OK"

$\dfrac{f_t}{(\phi \cdot F'_{nt})} = 10.1 \cdot \%$

Wind Acting Perpendicular to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \dfrac{\sqrt{Vert^2 + Horz^2}}{n_b \cdot a_b} = 3.422 \cdot ksi$

Condition3 := if($f_v < \phi \cdot F_{nv}$, "OK", "Overstressed")

Condition3 = "OK"

$\dfrac{f_v}{(\phi \cdot F_{nv})} = 16.9 \cdot \%$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 45 \cdot ksi$

Tension Force per Bolt = $F_{tension.conn} := \dfrac{Horz \cdot e}{S_{horz} \cdot \dfrac{n_b}{2}} + \dfrac{Vert \cdot e}{S_{vert} \cdot 2} = 2.278 \cdot kips$

Tension Stress Each Bolt = $f_t := \dfrac{F_{tension.conn}}{a_b} = 7.425 \cdot ksi$

Condition4 := if($f_t < \phi \cdot F'_{nt}$, "OK", "Overstressed")

Condition4 = "OK"

$\dfrac{f_t}{(\phi \cdot F'_{nt})} = 22 \cdot \%$

Mast Connection to Bottom Bracket:

Design Reactions at Brace:

Axial (Max) =	$Axial_{max} := 2.3 \cdot kips$	(User Input)
Axial (Min) =	$Axial_{min} := 1.8 \cdot kips$	(User Input)
Horz =	$Horz := 2.6 \cdot kips$	(User Input)
Moment =	$Moment := 0 \cdot kips \cdot ft$	(User Input)

Resistance Factors:

Yielding Factor =	$\phi_t := 0.9$	(User Input)
Rupture Factor =	$\phi_r := 0.75$	(User Input)
Shear Factor =	$\phi_v := 0.9$	(User Input)

Bolt Data:

Bolt Type =	ASTMA36 Rod	(User Input)
Bolt Diameter =	$D := 0.625 \cdot in$	(User Input)
Number of Bolts =	$N_b := 1$	(User Input)
Design Tensile Strength =	$F_t := 10.4 \cdot kips$	(User Input)
Design Shear Strength =	$F_v := 12.5 \cdot kips$	(User Input - Double Shear)
Distance from Seat Plate to Threaded Rod =	$dist := 3 \cdot in$	(User Input)

Check Bolt:

Shear Force = $f_v := \frac{Horz}{N_b} = 2.6 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 20.8 \cdot \%$

Check Bolt Shear = $Condition1 := if\left(\frac{f_v}{F_v} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

$Condition1 = \text{"OK"}$

Check Bracket:

Yield Strength =	$F_y := 36 \cdot ksi$	(User Input)
Plate Height =	$Pl_h := 6 \cdot in$	(User Input)
Plate Thickness =	$Pl_t := 0.5 \cdot in$	(User Input)
Inside Box Plate Length =	$Pl_l := 11 \cdot in$	(User Input)
Number of Plates =	$n_{plt} := 4$	(User Input)
Plate Gross Area =	$A_g := Pl_l \cdot Pl_t = 5.5 \cdot in^2$	
Inside of Bracket Box Dimension =	$d_1 := 11 \cdot in$	(User Input)
Outside of Bracket Box Dimension =	$d_2 := d_1 + 2 \cdot Pl_t = 12 \cdot in$	
Section Modulus Bracket Assembly =	$S_x := \frac{(d_2)^4 - (d_1)^4}{6 \cdot (d_2)} = 84.7 \cdot in^3$	(User Input)
Design Bending Stress =	$F_b := 0.9 \cdot F_y = 32.4 \cdot ksi$	
Design Shear =	$V_n := \phi_v \cdot 0.6 \cdot F_y \cdot A_g = 106.92 \cdot kips$	
Local Moment =	$M_{minor} := Horz \cdot dist = 0.7 \cdot ft \cdot kips$	
Bending Stress =	$f_b := \frac{M_{minor}}{S_x} = 0.09 \cdot ksi$	
Max Shear =	$V_{max} := \frac{Horz}{n_{plt} \cdot 0.5} = 1.3 \cdot kips$	

$$Condition2 := if\left(\frac{f_b}{F_b} + \frac{V_{max}}{V_n} < 1, \text{"OK"}, \text{"Overstressed"}\right)$$

Condition2 = "OK"

$$\frac{f_b}{F_b} + \frac{V_{max}}{V_n} = 1.5 \cdot \%$$

Weld Yield Stress =	$F_{yw} := 70 \cdot ksi$	(User Input)
Design Weld Stress =	$F_w := 0.45 \cdot F_{yw} = 31.5 \cdot ksi$	
Weld Size =	$sw := 0.25 \cdot in$	(User Input)
Weld Area =	$A_w := (d_2 + 2 \cdot 0.707 \cdot sw)^2 - d_2^2 = 8.609 \cdot in^2$	(User Input)
Section Modulus of Weld =	$S_x := \frac{(d_2 + 2 \cdot 0.707 \cdot sw)^4 - (d_2)^4}{6 \cdot (d_2 + 2 \cdot 0.707 \cdot sw)} = 34.45 \cdot in^3$	(User Input)
Weld Stress =	$f_w := \frac{M_{minor}}{S_x} + \frac{Horz}{A_w \cdot 0.5} = 0.83 \cdot ksi$	

$$Condition3 := if\left(f_w < F_w, \text{"OK"}, \text{"Overstressed"}\right)$$

$$\frac{f_w}{F_w} = 2.6 \cdot \%$$

Condition3 = "OK"

Gusset Plate Data:

Yield Strength =	$F_y := 36 \cdot ksi$	(User Input)
Tensile Strength =	$F_u := 58 \cdot ksi$	(User Input)
Plate Height =	$Pl_h := 7.5 \cdot in$	(User Input)
Plate Thickness =	$Pl_t := 0.5 \cdot in$	(User Input)
Number of Plates =	$n_{plt} := 3$	(User Input)
Distance from CL Pole to Face of Collar =	$d := 10.28 \cdot in$	(User Input)
Section Modulus Gusset Assembly =	$S_x := \frac{152.1}{5.875} \cdot in^3 = 25.9 \cdot in^3$	(User Input)
Dist Between Outter 2 Gusset Plates =	$d_{plt} := 14 \cdot in$	(User Input)
Vertical Distance from Rod to Center of Bracket =	$S_{vert} := 7.25 \cdot in$	(User Input)

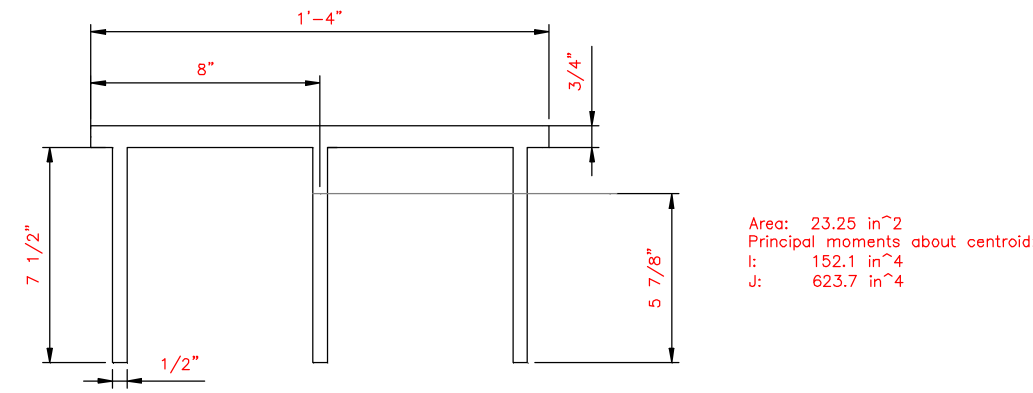


Plate Gross Area =	$A_g := Pl_h \cdot Pl_t = 3.75 \cdot in^2$
Effective Net Area =	$A_{en} := A_g = 3.75 \cdot in^2$
Tensile Yielding =	$P_{at} := \phi_t \cdot F_y \cdot A_g = 121.5 \cdot kips$
Tensile Rupture =	$P_{ar} := \phi_r \cdot F_u \cdot A_{en} = 163.125 \cdot kips$
Design Tension =	$Pa := \min(P_{at}, P_{ar}) = 121.5 \cdot kips$
Design Shear =	$V_n := \phi_v \cdot 0.6 \cdot F_y \cdot A_g = 72.9 \cdot kips$
Design Bending Stress =	$F_b := 0.9 \cdot F_y = 32.4 \cdot ksi$

Wind Acting Parallel to Stiffiner Plates:

Moment Parallel = $M_{par} := Moment + Axial_{max} \cdot d + M_{minor} + Horz \cdot S_{vert} = 50.3 \cdot in \cdot kips$

Bending Stress = $f_b := \frac{M_{par}}{S_x} = 1.94 \cdot ksi$

Max Tension = $T_{max} := \frac{Horz}{n_{plt}} = 0.867 \cdot kips$

Max Shear = $V_{max} := \frac{Axial_{max}}{n_{plt}} = 0.767 \cdot kips$

$\frac{f_b}{F_b} + \frac{T_{max}}{Pa} + \frac{V_{max}}{V_n} = 7.8 \cdot \%$

$Condition4 := if\left(\frac{f_b}{F_b} + \frac{T_{max}}{Pa} + \frac{V_{max}}{V_n} < 1, \text{"OK"}, \text{"Overstressed"}\right)$

Condition4 = "OK"

Wind Acting Perpendicular to Stiffiner Plates:

Moment Parallel = $M_{par} := Axial_{max} \cdot d = 23.644 \cdot in \cdot kips$

Moment **Perpendicular** = $M_{perp} := Horz \cdot d = 26.728 \cdot in \cdot kips$

Bending Stress = $f_b := \frac{M_{par}}{S_x} = 0.91 \cdot ksi$

Max Tension = $T_{max} := \frac{M_{perp}}{d_{plt}} = 1.909 \cdot kips$

Max Shear = $V_{max} := \frac{Axial_{max} + Horz}{n_{plt}} + \frac{Moment + M_{minor} + Horz \cdot S_{vert}}{d_{plt}} = 3.537 \cdot kips$

$Condition5 := if\left(\frac{f_b}{F_b} + \frac{T_{max}}{Pa} + \frac{V_{max}}{V_n} < 1, \text{"OK"}, \text{"Overstressed"}\right)$

Condition5 = "OK"

$\frac{f_b}{F_b} + \frac{T_{max}}{Pa} + \frac{V_{max}}{V_n} = 9.2 \cdot \%$

Weld Data:

Weld Yield Stress = $F_{yw} := 70 \cdot ksi$ (User Input)

Design Weld Stress = $F_w := 0.45 \cdot F_{yw} = 31.5 \cdot ksi$

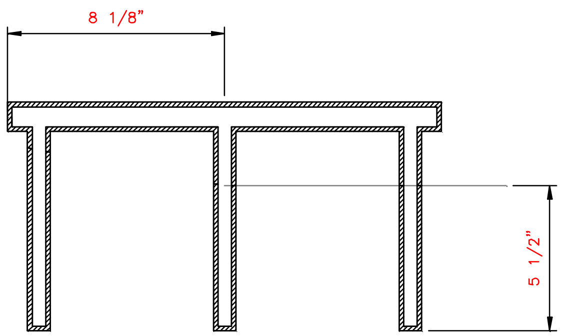
Weld Size = $sw := 0.25 \cdot in$ (User Input)

Weld Area = $A_w := 14.0 \cdot in^2$ (User Input)

Section Modulus of Weld = $S_x := \frac{108.9}{5.5} \cdot in^3 = 19.8 \cdot in^3$ (User Input)

Section Modulus of Weld = $S_z := \frac{406.9}{8.125} \cdot in^3 = 50.1 \cdot in^3$ (User Input)

Weld Area of 1 Gusset = $A_{w1} := 2.8 \cdot in^2$ (User Input)



Wind Acting Parallel to Stiffiner Plates:

Moment Parallel = $M_{par} := Moment + Axial_{max} \cdot d + M_{minor} + Horz \cdot S_{vert} = 50.3 \cdot in \cdot kips$

Weld Stress = $f_w := \frac{M_{par}}{S_x} + \frac{Axial_{max} + Horz}{A_w} = 2.89 \cdot ksi$

Condition6 := if($f_w < F_w$, "OK", "Overstressed") $\frac{f_w}{F_w} = 9.2 \cdot \%$

Condition6 = "OK"

Wind Acting Perpendicular to Stiffiner Plates:

Moment Parallel = $M_{par} := Axial_{max} \cdot d = 23.644 \cdot in \cdot kips$

Moment **Perpendicular** = $M_{perp} := Horz \cdot d = 26.728 \cdot in \cdot kips$

Weld Stress = $f_w := \frac{M_{par}}{S_x} + \frac{M_{perp}}{S_z} + \frac{Axial_{max} + Horz}{A_w} + \frac{Moment + M_{minor} + Horz \cdot S_{vert}}{(d_{plt} \cdot A_{w1})} = 2.76 \cdot ksi$

Condition7 := if($f_w < F_w$, "OK", "Overstressed") $\frac{f_w}{F_w} = 8.8 \cdot \%$

Condition7 = "OK"

Mast Bottom Connection:

Maximum Design Reactions at Brace:

Vertical =	$Vert := 1.8 \cdot kips$	(User Input)
Horizontal =	$Horz := 2.6 \cdot kips$	(User Input)
Moment =	$Moment := 0 \cdot ft \cdot kips$	(User Input)

Bolt Data:

Bolt Grade =	A307 Rod	(User Input)
Number of Bolts =	$n_b := 8$	(User Input)
Bolt Diameter =	$d_b := 0.625in$	(User Input)
Nomianl Tensile Strength =	$F_{nt} := 45 \cdot ksi$	(User Input)
Nomianl Shear Strength =	$F_{nv} := 27 \cdot ksi$	(User Input)
Resistance Factor =	$\phi := 0.75$	(User Input)
Bolt Eccentricity from C.L. Mast =	$e := 16 \cdot in$	(User Input)
Horizontal Spacing Between Bolts =	$S_{horz} := 17.25 \cdot in$	(User Input)
Vertical Distance from Bot of Mast to Center of Barcket =	$S_{vert} := 7.25 \cdot in$	(User Input)
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^{\ 2} = 0.307 \cdot in^2$	
Vetical Spacing From Plate CL to Bolt 1 =	$d_1 := 2 \cdot in$	(User Input)
Vetical Spacing From Plate CL to Bolt 2 =	$d_2 := 6 \cdot in$	(User Input)
Bolt Polar Moment of Inertia =	$I_p := 4 \cdot (d_1)^2 + 4 \cdot (d_2)^2 = 160 \cdot in^2$	
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^{\ 2} = 0.307 \cdot in^2$	

Check Bolt Stresses:

Wind Acting Parallel to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \frac{Vert}{n_b \cdot a_b} = 0.733 \cdot ksi$

$Condition1 := if(f_v < \phi \cdot F_{nv}, "OK", "Overstressed")$

$\frac{f_v}{(\phi \cdot F_{nv})} = 3.6 \cdot \%$

$Condition1 = "OK"$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 45 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Horz}{n_b} + \frac{(Vert \cdot e + Moment + Horz \cdot S_{vert}) \cdot d_2}{I_p} = 2.1 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 6.9 \cdot ksi$

$Condition2 := if(f_t < \phi \cdot F'_{nt}, "OK", "Overstressed")$

$\frac{f_t}{(\phi \cdot F'_{nt})} = 20.4 \cdot \%$

$Condition2 = "OK"$

Wind Acting Perpendicular to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \sqrt{\left[\frac{Vert}{n_b \cdot a_b} + \frac{(Moment + Horz \cdot S_{vert}) \cdot 2}{S_{horz} \cdot n_b \cdot a_b}\right]^2 + \left(\frac{Horz}{n_b \cdot a_b}\right)^2} = 1.939 \cdot ksi$

$Condition3 := if(f_v < \phi \cdot F_{nv}, "OK", "Overstressed")$

$\frac{f_v}{(\phi \cdot F_{nv})} = 9.6 \cdot \%$

$Condition3 = "OK"$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 45 \cdot ksi$

Tension Force per Bolt = $F_{tension.conn} := \frac{Horz \cdot e}{S_{horz} \cdot \frac{n_b}{2}} + \frac{Vert \cdot e \cdot d_2}{I_p} = 1.683 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.conn}}{a_b} = 5.485 \cdot ksi$

$Condition4 := if(f_t < \phi \cdot F'_{nt}, "OK", "Overstressed")$

$\frac{f_t}{(\phi \cdot F'_{nt})} = 16.3 \cdot \%$

$Condition4 = "OK"$

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Subject:	Load Analysis of AT&T Equipment on Structure #3275
Location:	Redding, CT
Rev. 5: 12/21/23	Prepared by: T.J.L Checked by: C.F.C. Job No. 22006.03

Basic Components

Heavy Wind Pressure =	$p := 4.00$	psf	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Basic Windspeed =	$V := 110$	mph	(User Input)
Radial Ice Thickness =	$Ir := 0.50$	in	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Density =	$Id := 56.0$	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Mast Above Grade = $TME := 82$ ft (User Input)

Multiplier Gust Response Factor = $m := 1.25$ (User Input - Only for NESC Extreme wind case)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.214$ (NESC 2023 Table 250-2)

Turbulence Intensity Constant = $C_{exp} := 0.2$ (NESC 2023 Table 250-3)

Integral Length Scale of Turbulence Constant = $L_s := 220$ (NESC 2023 Table 250-3)

Effective Height = $z_s := 0.67 \cdot TME = 54.94$ (NESC 2023 Table 250-3)

Turbulence Intensity = $I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.184$ (NESC 2023 Table 250-3)

Response Term = $B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.937$ (NESC 2023 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.846$ (NESC 2023 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 31.8$ (NESC 2023 Section 250.C.1)

Shape Factors

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Open Lattice =	$Cd_{OL} := 3.2$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.6$	(User Input)

Overload Factors

Overload Factors for Wind Loads:

NESC Heavy Loading =	**2.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	**1.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Development of Wind & Ice Load on Mast

Mast Data: (Pipe 10 Sch. 80)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 10.75$	in	(User Input)
Mast Length =	$L_{mast} := 25$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.5$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.896$ sf/ft

Total Mast Wind Force (Above Structure) = $qz \cdot Cd_{coax} \cdot A_{mast} \cdot m = 57$ plf **BLC 5**

Total Mast Wind Force (Below Structure) = $qz \cdot Cd_{coax} \cdot A_{mast} = 46$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.979$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_{coax} \cdot AICE_{mast} = 6$ plf **BLC 4**

Gravity Loads (without ice)

Weight of the Mast = Self Weight **(Computed internally by Risa-3D)** plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^{\ 2}\right] = 17.7$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 7$ plf **BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAALL18_43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 118$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 2$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 236$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^4$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 2650$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 86$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 172$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 12.67$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 4.8$

Antenna Projected Surface Area =

$$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 12.67$$

$$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 6.78$$

$$EPA_{tot} := EPA_{A1} + EPA_{A2} = 19.454$$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 125$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 12$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 4.25$

Antenna Projected Surface Area =

$$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 12$$

$$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 6.19$$

$$EPA_{tot} := EPA_{A1} + EPA_{A2} = 18.188$$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 1157$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model = Commscope ATSBT-TOP-MF-4G

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 5.63$ in (User Input)

Antenna Width = $W_{ant} := 3.7$ in (User Input)

Antenna Thickness = $T_{ant} := 2$ in (User Input)

Antenna Weight = $WT_{ant} := 2$ lbs (User Input)

Number of Antennas = $N_{ant} := 2$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 4$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 52$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 3$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 0.22$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 0.:$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 0.22$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.16$

$EPA_{tot} := EPA_{A1} + EPA_{A2} = 0.374$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 2$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 0.14$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 0.08$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 0.14$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.09$

$EPA_{tot} := EPA_{A1} + EPA_{A2} = 0.239$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 15$ lbs

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Universal Tri-Bracket		
Mount Shape =	Flat		(User Input)
Pipe Mount Length =	$L_{mnt} := 96$	in	(User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)
Number of Mounting Pipes =	$N_{mnt} := 2$		(User Input)
Tri-Bracket Weight =	$W_{tb.mnt} := 197$	lbs	(User Input)

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area = $A_{mnt} := 0.0$ sf

Total Mount Wind Force = $F_{mnt} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 0$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice = $A_{ICEmnt} := 0.0$ sf

Total Mount Wind Force = $Fi_{mnt} := p \cdot Cd_F \cdot A_{ICEmnt} = 0$ lbs **BLC 4**

Gravity Loads (without ice)

Weight Each Pipe Mount = $WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 29$ lbs

Weight of All Mounts = $WT_{mnt} \cdot N_{mnt} + W_{tb.mnt} = 256$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Pipe = $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{\ 2} \cdot L_{mnt} = 425$ cu in

Volume of Ice on Each Pipe = $V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 1\right)^2\right] \cdot \left(L_{mnt} + 1\right)\right] - V_{mnt} = 442$ cu in

Weight of Ice each mount (incl, hardware) = $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 14$ lbs

Weight of Ice on All Mounts = $W_{ICEmnt} \cdot N_{mnt} + 5 = 34$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 7/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.11$	in	(User Input)
Coax Cable Length =	$L_{coax} := 13$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 0.54$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 16$		(User Input)
No. of Coax Projecting Outside Face of Member =	$NP_{coax} := 2$		(User Input)

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.2$ ft

Total Coax Wind Force (Above Top of Tower) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 12$ plf **BLC 5**

Total Coax Wind Force (Below Top of Tower) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 9$ plf **BLC 5**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 0.3$ ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 2$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 9$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^{\;2}\right] = 2.5$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 16$ plf **BLC 3**

Coax Cable on CL&P Pole

Coaxial Cable Span	$Coax_{Span} := 10ft$		*(User Input)*
Heavy Wind Pressure =	$p := 4 \cdot psf$		(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Thickness =	$Ir := 0.5 \cdot in$		(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Density =	$Id := 56 \cdot pcf$		(User Input)
Basic Windspeed =	$V := 110$	mph	(User Input)
Height to Top of Coax Above Grade =	$TC := 68$	ft	(User Input)
Multiplier Gust Response Factor =	$m := 1.25$		(User Input - Only for NESC Extreme wind case)

Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.073$		(NESC 2023 Table 250-2)
Turbulence Intensity Constant =	$C_{exp} := 0.2$		(NESC 2023 Table 250-3)
Integral Length Scale of Turbulence Constant =	$L_s := 220$		(NESC 2023 Table 250-3)
Effective Height =	$z_s := 0.67 \cdot TC = 45.56$		(NESC 2023 Table 250-3)
Turbulence Intensity =	$I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.19$		(NESC 2023 Table 250-3)
Response Term =	$B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.947$		(NESC 2023 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.847$		(NESC 2023 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 28.2$	psf	(NESC 2023 Section 250.C.1)

Diameter of Coax Cable = $D_{coax} := 1.11 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 0.54 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax} := 16$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax} := 2$ *(User Input)*

Shape Factor = $Cd_{coax} := 1.6$ *(User Input)*

Overload Factor for NESC Heavy Wind Transverse Load = $OF_{HWT} := 2.5$ *(User Input)*

Overload Factor for NESC Heavy Wind Vertical Load = $OF_{HWV} := 1.5$ *(User Input)*

Overload Factor for NESC Extreme Wind Transverse Load = $OF_{EWT} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Wind Vertical Load = $OF_{EWV} := 1.0$ *(User Input)*

Project Width without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 2.22 \cdot in$

Project Width with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 3.22 \cdot in$

Ice Area per Liner Ft = $Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}{}^2\right] = 0.018 \, ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 15.736 \cdot plf$

Heavy Wind Vertical Load =

$$Heavy\_WInd_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HWV}\right]}$$

Heavy Wind Transverse Load =

$$Heavy\_Wind_{Trans} := \overrightarrow{\left(p \cdot A_{ice} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{HWT}\right)}$$

$Heavy\_WInd_{Vert} = 366 \, lb$ $Heavy\_Wind_{Trans} = 43 \, lb$

Extreme Wind Vertical Load =

$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

Extreme Wind Transverse Load =

$$Extreme\_Wind_{Trans} := \overrightarrow{\left[\left(qz \cdot psf \cdot A \cdot Cd_{coax}\right) \cdot Coax_{Span} \cdot OF_{EWT}\right]}$$

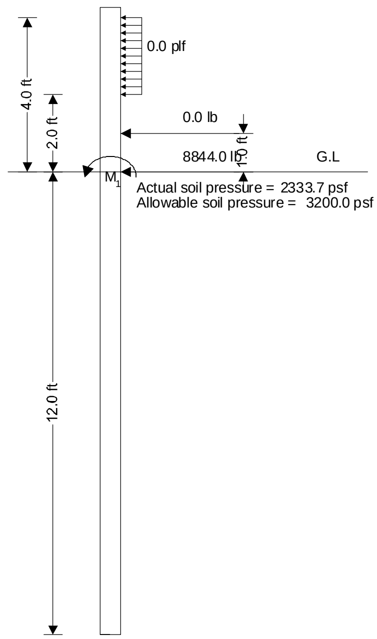
$Extreme\_Wind_{Vert} = 86 \, lb$ $Extreme\_Wind_{Trans} = 83 \, lb$

Tekla Tedds Centek Engineering, Inc, 63-2 North Branford Road Branford, CT 06405	Project Structure 3275 / T-Mobile - CT11116C				Job Ref. 22006.03	
	Section Pole Embedment				Sheet no./rev. 1	
	Calc. by TJL	Date 12/21/2023	Chk'd by	Date	App'd by	Date

FLAGPOLE EMBEDMENT (IBC)

In accordance with IBC 2015

Tedds calculation version 1.2.02



Soil capacity data

Allowable passive pressure	L_{sbc} = **400** pcf
Maximum allowable passive pressure	P_{max} = **2000** psf
Load factor 1 (1806.1)	LDF_1 = **1.00**
Load factor 2 (1806.3.4)	LDF_2 = **2.0**

Pole geometry

DIAMETER OF STEEL CANISTER

Shape of the pole	**Round**
Diameter of the pole	Dia = **48** in
Laterally restrained	**No**

(13.4 kips)*(1.1)*(0.6) = 8844 lbs

Load data

First point load	P_1 = **8844** lbs
Distance of P_1 from ground surface	H_1 = **0** ft
Second point load	P_2 = **0** lbs
Distance of P_2 from ground surface	H_2 = **1** ft
Uniformly distributed load	W = **0** plf
Start distance of W from ground surface	a = **2** ft
End distance of W from ground surface	a_1 = **4** ft
Applied moment	M_1 = **429660** lb_ft
Distance of M_1 from ground surface	H_3 = **0** ft

(651.0 ft-k)*(1.1)*(0.6) = 429,660 lb-ft

Shear force and bending moment

Total shear force $F = P_1 + P_2 + W \times (a_1 - a) =$ **8844** lbs

Total bending moment at grade $M_g = P_1 \times H_1 + P_2 \times H_2 + W \times (a_1 - a) \times (a + a_1) / 2 + M_1 =$ **429660** lb_ft

Distance of resultant lateral force $h = abs(M_g / F) =$ **48.58** ft

Embedment depth (1807.3.2.1)

Embedment depth provided $D =$ **12** ft

Allowable lateral passive pressure $S_1 = min(P_{max}, L_{sbc} \times min(D, 12\ ft) / 3) \times LDF_1 \times LDF_2 =$ **3200** psf

Factor A $A = 2.34 \times abs(F) / (S_1 \times Dia) =$ **1.6** ft

Embedment depth required $D_1 = 0.5 \times A \times (1 + (1 + ((4.36 \times h) / A))^{0.5}) =$ **10.1** ft

Actual lateral passive pressure $S_2 = (2.34 \times abs(F) \times ((4.36 \times h) + (4 \times D))) / (4 \times D^2 \times Dia) =$ **2333.7** psf

PASS - Provided depth is adequate

RAN Template: 67E04B Outdoor	A&L Template:

CT11116C_L600_3_draft

Print Name: Standard
PORs: L600_L600 Coverage

Section 1 - Site Information

Site ID: CT11116C
Status: Draft
Version: 3
Project Type: L600
Approved: Not approved
Approved By: Not approved
Last Modified: 12/19/2023 11:24:04 AM
Last Modified By: SHERAZ.SOOFI1@T-MOBILE.COM

Site Name: Ridgefield/ Ethan Allen H
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Northeast Utilities

Latitude: 41.27845755
Longitude: -73.4425574
Address: 101 Mountain Rd. CL&P Pole #3275
City, State: Redding, CT
Region: NORTHEAST

RAN Template: 67E04B Outdoor			**AL Template:**	
Sector Count: 2	**Antenna Count:** 2	**Coax Line Count:** 16	**TMA Count:** 2	**RRU Count:** 2

Section 2 - Existing Template Images

----- This section is intentionally blank. -----

Section 3 - Proposed Template Images

----- This section is intentionally blank. -----

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:
67E04B Outdoor	

CT11116C_L600_3_draft

Print Name: Standard
PORs: L600_L600 Coverage

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 4B Outdoor

Enclosure	**1**
Enclosure Type	RBS 6102
Radio	RUS01 B2 **(x3)**: G1900; RUS01 B2 **(x3)**: U1900 (DECOMMISSIONED); RUS01 B4 **(x6)**: L2100, U2100 (DECOMMISSIONED)
Baseband	BB 5216: L2100; DUG20: G1900; DUW30: U1900 (DECOMMISSIONED); DUW30: U2100 (DECOMMISSIONED)

Proposed RAN Equipment

Template: 67E04B Outdoor

Enclosure	**1**	**2**
Enclosure Type	RBS 6102	Ancillary Equipment (Ericsson)
Radio	RUS01 B2 **(x3)**: G1900; RUS01 B4 **(x6)**: L2100	
Baseband	BB 5216: L2100; DUG20: G1900; DUW30; RP 6651: N600, L600, L700	
Hybrid Cable System		Hybrid Trunk 6/24 4AWG 10m

RAN Scope of Work:

RF NOTES:
12/14/2023 - In order to avoid delays in resubmitting the CT Sitting Council and reduce structural loading, it is necessary to switch to a 6-foot Octo antenna. Additionally, the Rad Ctr needs to be changed to the new 77-foot rad ctr in order to provide clearance with the transmission tower.

RAN Template:	A&L Template:
67E04B Outdoor	

CT11116C_L600_3_draft

Print Name: Standard
PORs: L600_L600 Coverage

Section 6 - A&L Equipment

Existing Template: 4B_2DP
Proposed Template:

Sector 2 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	190	
M. Tilt	0	
Height (ft)	74	
Ports	P1	P2
Active Tech	G1900	L2100
Dark Tech		
Restricted Tech		
Decomm. Tech	U1900	U2100
E. Tilt	2	2
Cables	7/8" Coax - 95 ft.	7/8" Coax - 95 ft.
TMAs		
Diplexer / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E04B Outdoor	

CT11116C_L600_3_draft

Print Name: Standard
PORs: L600_L600 Coverage

Sector 2 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL18_43-U-NA20 (Octo)			
Azimuth	190			
M. Tilt	0			
Height (ft)	77			
Ports	P1	P2	P3	P4
Active Tech	L600 N600 L700	L600 N600 L700	G1900	L2100
Dark Tech				
Restricted Tech				
Decomm. Tech				
E. Tilt				
Cables	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**
TMAs		Commscope - Smart BiasT - ATSBT-TOP-MF-4G (At Antenna)		
Diplexer / Combiners				
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)		
Sector Equipment				

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67E04B Outdoor	

CT11116C_L600_3_draft

Print Name: Standard
PORs: L600_L600 Coverage

Sector 3 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	330	
M. Tilt	0	
Height (ft)	74	
Ports	P1	P2
Active Tech	G1900	L2100
Dark Tech		
Restricted Tech		
Decomm. Tech	U1900	U2100
E. Tilt	2	2
Cables	7/8" Coax - 95 ft.	7/8" Coax - 95 ft.
TMAs		
Diplexer / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template: 67E04B Outdoor	**A&L Template:**

CT11116C_L600_3_draft

Print Name: Standard
PORs: L600_L600 Coverage

Sector 3 (Proposed) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1			
Antenna Model	RFS - APXVAALL18_43-U-NA20 (Octo)			
Azimuth	330			
M. Tilt	0			
Height (ft)	77			
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech	L600 N600 L700	L600 N600 L700	G1900	L2100
Dark Tech				
Restricted Tech				
Decomm. Tech				
E. Tilt				
Cables	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**	7/8" Coax - 95 ft. **(x2)** Coax Jumper **(x2)**
TMAs		Commscope - Smart BiasT - ATSBT-TOP-MF-4G (At Antenna)		
Diplexer / Combiners				
Radio	Radio 4480 B71+B85 (At Cabinet)	SHARED Radio 4480 B71+B85 (At Cabinet)		
Sector Equipment				

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

RADIO FREQUENCY SYSTEMS

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 15.0/14.6/18.4/18.3dBi, 1.8m (6ft), RET, 2-12°/2-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600, 700, 800, AWS, PCS & BRS applications.

- 24 Inch Width For Easier Zoning
- Field Replaceable (Integrated) AISG RET platform for reduced environmental exposure and long lasting quality
- Superior elevation pattern performance across the entire electrical down tilt range
- Includes three AISG RET motors - Includes 0.5m AISG jumper for optional daisy chain of two high band RET motors for one single AISG point of high band tilt control.
- Low band arrays driven by a single RET motor

Technical Features

LOW BAND LEFT ARRAY (617-894 MHZ) [R1]

Frequency Band	MHz	617-698	698-746	746-806	806-894
Gain Typical	dBi	14.3	15.0	14.8	15.0
Gain Over All Tilts	dBi	13.8+/-.5	14.5+/-.5	14.3+/-.5	14.6+/.4
Horizontal Beamwidth @3dB	Deg	65+/-2	64+/-2	66+/-2	62+/-5
Vertical Beamwidth @3dB	Deg	14+/-1	13+/-.9	12+/-.7	11+/-.9
Electrical Downtilt Range	Deg	2 to 12			
Upper Side Lobe Suppression Peak to +20	dB	15	15	15	14
Front-to-Back, at +/-30°, Copolar	dB	22	22	24	27
Cross Polar Discrimination (XPD) @ Boresight	dB	18	18	16	15
Cross Polar Discrimination (XPD) @ +/-60	dB	4	3	7	5
3rd Order PIM 2 x 43dBm	dBc	-153			
VSWR	-	1.5:1			
Cross Polar Isolation	dB	25			
Maximum Effective Power per Port	Watt	400			

RADIO FREQUENCY SYSTEMS

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 15.0/14.6/18.4/18.3dBi, 1.8m (6ft), RET, 2-12°/2-12°/2-12°/2-12°

HIGH BAND RIGHT ARRAY (1695-2690 MHZ) [Y2]

Frequency Band	MHz	1695-1880	1850-1990	1920-2200	2200-2490	2490-2690
Gain Typical	dBi	17.5	17.8	18.3	18.1	17.9
Gain Over All Tilts	dBi	17+/-.5	17.3+/-.5	17.6+/-.7	17.4+/-.7	17.1+/-.8
Horizontal Beamwidth @3dB	Deg	66+/-6	64+/-5	64+/-7	62+/-4	61+/-7
Vertical Beamwidth @3dB	Deg	5.5+/-.3	5.1+/-.2	4.9+/-.3	4.4+/-.3	4+/-.3
Electrical Downtilt Range	Deg	2 to 12				
Upper Side Lobe Suppression Peak to +20	dB	14	16	15	14	13
Front-to-Back, at +/-30°, Copolar	dB	25	23	23	23	20
Cross Polar Discrimination (XPD) @ Boresight	dB	22	17	16	17	17
Cross Polar Discrimination (XPD) @ +/-60	dB	8	8	9	4	1
3rd Order PIM 2 x 43dBm	dBc	-153				
VSWR	-	1.5:1				
Cross Polar Isolation	dB	25				
Maximum Effective Power per Port	Watt	300				

ELECTRICAL SPECIFICATIONS

Impedance	Ohm	50.0
Polarization	Deg	±45°

MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	1829 x 609 x 215 (72 x 24 x 8.5)
Weight (Antenna Only)	kg (lb)	42 (92.6)
Weight (Mounting Hardware only)	kg (lb)	11.5 (25.3)
Shipping Weight	kg (lb)	63 (138.9)
Connector type		8 x 4.3-10 female at bottom
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		Direct Ground
Survival/Rated Wind Velocity	km/h	240 (150)
Wind Load @Rated Wind Front	N	1072.0
Wind Load @Rated Wind Side	N	326.0
Wind Load @Rated Wind Rear	N	1160.0

ATSBT-TOP-MF-4G

Top Smart Bias Tee

- Reduces cable and site lease costs by eliminating the need for AISG home run cables
- AISG 1.1 and 2.0 compliant
- Operates at 10-30 Vdc
- Weatherproof AISG connectors
- Intuitive schematics simplify and ensure proper installation
- Enhanced lightning protection plus grounding stud for additional surge protection
- 7-16 DIN female connector (ANT)
- 7-16 DIN male connector (BTS)

Product Classification

Product Type	RET bias tee

General Specifications

AISG Input Connector	8-pin DIN Female
Antenna Interface	7-16 DIN Female
Antenna Interface Signal	RF | dc Blocked
BTS Interface	7-16 DIN Male
BTS Interface Signal	AISG data | RF | dc
Color	Silver
EU Certification	CE
Grounding Lug Thread Size	M8
Smart Bias Tee Type	10–30 V Top

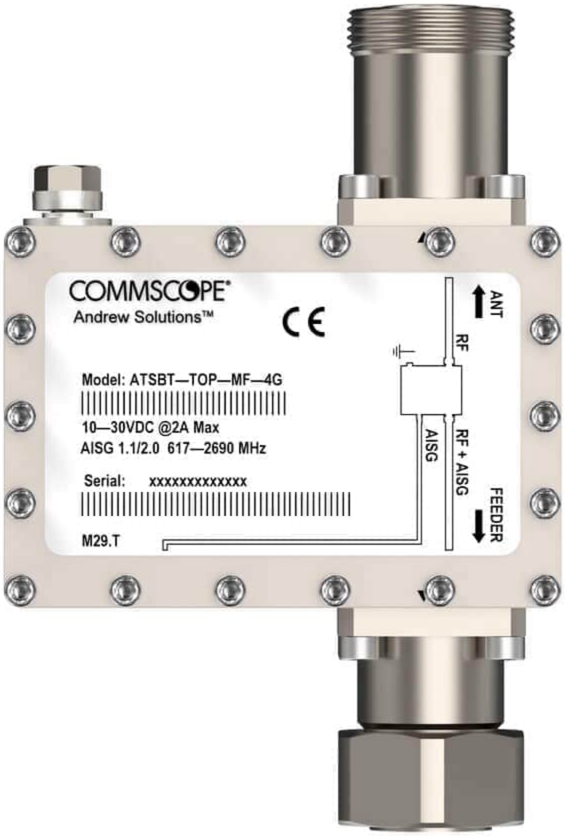
Dimensions

Height	143 mm | 5.63 in
Width	94 mm | 3.701 in
Depth	50 mm | 1.969 in

Electrical Specifications

3rd Order IMD	-158 dBc
3rd Order IMD Test Method	Two +43 dBm carriers
Insertion Loss, typical	0.1 dB
Electromagnetic Compatibility (EMC)	CFR 47 Part 15, Subpart B, Class B | EN 55022, Class B | ICES-003 Issue 4 CAN

ATSBT-TOP-MF-4G



Material Specifications

Material Type	Aluminum

Environmental Specifications

Operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)
Ingress Protection Test Method	IEC 60529:2001, IP66

Packaging and Weights

Weight, net	0.8 kg | 1.764 lb

Regulatory Compliance/Certifications

Agency	**Classification**

THE CONNECTICUT LIGHT & POWER COMPANY
Berlin, Conn.

TEST BORING & SOIL SAMPLING RECORD

PROJECT	PEACEABLE STREET TO RIDGEFIELD	HOLE NO.	9
TOWN	RIDGEFIELD, CONN.	MAP NO.	
CONTRACTOR	CLARENCE WELTI ASSOCIATES	STRUCTURE NO.	
STATION OR OFFSET	BAR SOUNDING	DRILLER	MASON
ELEVATION	DATE START: 12/8/72 FINISH: 12/8/72	HELPER	

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 IN.	SAMPLE NO.	SAMPLE DEPTH RANGE	ROCK CORE RECOV'D	FIELD CLASSIFICATION AND REMARKS
	1.5						BROKEN LEDGE
							REFUSAL AT 1.5
5							

GROUNDWATER		
DEPTH	HOUR	DATE

CASING HAMMER ______ lbs.
CASING SIZE ______ IN.
SPOON HAMMER ______ lbs.
SPOON SIZE ______ IN.
HAMMER FALL ______ IN.
SIZE OF CORE ______ IN.

TRACE 1 - 10 %
LITTLE 10 - 20
SOME 20 - 35
AND 35 - 50
+ = UPPER LIMIT OF RANGE
− = LOWER LIMIT OF RANGE

Exhibit C

Power Density/RF Emissions Report

FOX HILL TELECOM

Radio Frequency Emissions Analysis Report

T Mobile

Site ID: CT11116C

Ridgefield/ Ethan Allen H
101 Mountain Rd. CL&P Pole #3275
Redding, CT 06896

January 30, 2024

Fox Hill Telecom Project Number: 231001

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	4.99 %

Fox Hill Telecom, Inc Worcester MA 01609

January 30, 2024

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CT11116C – Ridgefield/ Ethan Allen H**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **101 Mountain Rd. CL&P Pole #3275, Redding, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE 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.

<u>General population/uncontrolled exposure</u> 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.

General 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 600 MHz & 700 MHz bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) 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 the percentage 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 upgrades to the T-MOBILE antenna facility located at **101 Mountain Rd. CL&P Pole #3275, Redding, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4\ ERP}{R^2}$$

S = Power Density (in $\mu w/cm^2$)
ERP = Effective Radiated Power from antenna (watts)
R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.

For each T-Mobile 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)
LTE / 5G NR	600 MHz	2	60
LTE	700 MHz	2	20
LTE	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	4	40

Table 1: Channel Data Table

The following T-Mobile antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) 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.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
B	1	RFS APXVAALL18_43-C-NA20	78
C	1	RFS APXVAALL18_43-C-NA20	78

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed T-MOBILE 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 B1	RFS APXVAALL18_43-C-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	12.85 / 13.55 / 15.85 / 17.15	13	495	18,250.04	4.99
						Sector B Composite MPE%	**4.99**
Antenna C1	RFS APXVAALL18_43-C-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	12.85 / 13.55 / 15.85 / 17.15	13	495	18,250.04	4.99
						Sector C Composite MPE%	**4.99**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional identified carriers on site and their emissions contribution estimates, along with the newly calculated maximum T-MOBILE 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, both T-Mobile sectors have the same configuration yielding the same results for both sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite estimated MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**4.99 %**
No Additional Carriers on Site	NA
Site Total MPE %:	**4.99 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector B Total:	4.99 %
T-MOBILE Sector C Total:	4.99 %
Site Total:	4.99 %

Table 5: Site MPE Summary

Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, both T-Mobile sectors have the same configuration yielding the same results for both sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm^2)	Frequency (MHz)	Allowable MPE (µW/cm^2)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	1,390.44	78	8.32	600 MHz	400	2.08%
T-Mobile 700 MHz LTE	2	485.32	78	2.76	700 MHz	467	0.59%
T-Mobile 1900 MHz (PCS) LTE	4	1,849.52	78	11.10	1900 MHz (PCS)	1000	1.11%
T-Mobile 1900 MHz (PCS) GSM	1	693.57	78	1.00	1900 MHz (PCS)	1000	0.10%
T-Mobile 2100 MHz (AWS) LTE	4	1,981.80	78	11.10	2100 MHz (AWS)	1000	1.11%
						Total:	**4.99 %**

Table 6: T-MOBILE 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 T-MOBILE facility as well as the site composite emissions estimates value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-MOBILE Sector	Power Density Value (%)
Sector B:	4.99 %
Sector C:	4.99 %
T-MOBILE Maximum Total (per sector):	4.99 %
Site Total:	4.99 %
Site Compliance Status:	**COMPLIANT**

The estimated composite MPE value for this site assuming all carriers present is **4.99 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

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 estimated values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01609
(978)660-3998

Exhibit D

Letter of Authorization

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

February 05, 2024

Ms. Amanda Olsen
Northeast Site Solutions
420 Main St,
Sturbridge, MA 01566

RE: T-Mobile Antenna Site CT11116C, Mountain Road, Redding CT, Eversource Structure 3275

Ms. Olsen:

Based on our reviews of the site drawings, the structural analysis and foundation review provided by Centek Engineering, along with a third-party review performed by Paul J. Ford and Company, we accept the proposed modification.

Please work with Christopher Gelinas of Eversource Real Estate to process the site lease amendment. Please do not hesitate to contact us with questions or concerns. Christopher can be contacted at 860-665-2008, and I can be contacted at (860) 728-4862.

Sincerely,

Masie Hartt

Masie Hartt
Transmission Line Engineering

Ref: 2024-0117 - CT11116C - Structural Analysis Rev5 (22006.03)
2023-0920 - CT11832C - Mount Analysis Rev0 (22006.03)
2024-0117_22006.03 CT11116C - Rev3 CDs (S&S)

Exhibit E

Recipient Mailings

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com 9405 5036 9930 0658 0744 76 0098 5000 0020 6875

$9.85
US POSTAGE
Flat Rate Env

U.S. POSTAGE PAID
Click-N-Ship®

02/06/2024 Mailed from 01606 986740232877648

PRIORITY MAIL®

Expected Delivery Date: 02/08/24
Ref#: CT11116C
0003

DEBORAH A CHASE
NORTHEAST SITE SOLUTIONS
46 HUNTINGTON AVE
WORCESTER MA 01606-3543

B001

AIMEE PARDEE
LAND USE DIRECTOR
PO BOX 1028
REDDING CTR CT 06875-1028

USPS TRACKING #

9405 5036 9930 0658 0744 76

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0658 0744 76

Trans. #:	599705347	Priority Mail® Postage:	**$9.85**
Print Date:	02/06/2024	Total:	**$9.85**
Ship Date:	02/06/2024		
Expected Delivery Date:	02/08/2024		

From: DEBORAH A CHASE
NORTHEAST SITE SOLUTIONS
46 HUNTINGTON AVE
WORCESTER MA 01606-3543

Ref#: CT11116C

To: AIMEE PARDEE
LAND USE DIRECTOR
PO BOX 1028
REDDING CTR CT 06875-1028

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

P

usps.com 9405 5036 9930 0658 0744 90 0098 5000 0020 6141

$9.85

US POSTAGE

Flat Rate Env

U.S. POSTAGE PAID

Click-N-Ship®

02/06/2024 Mailed from 01606 986740232875105

PRIORITY MAIL®

DEBORAH A CHASE
NORTHEAST SITE SOLUTIONS
46 HUNTINGTON AVE
WORCESTER MA 01606-3543

Expected Delivery Date: 02/08/24

Ref#: CT11116C

0003

B060

CONNECTICUT LIGHT & POWER-EVERSOURCE
PO BOX 270
HARTFORD CT 06141-0270

USPS TRACKING #

9405 5036 9930 0658 0744 90

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

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4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :

9405 5036 9930 0658 0744 90

Trans. #:	599705347	Priority Mail® Postage:	$9.85
Print Date:	02/06/2024	Total:	$9.85
Ship Date:	02/06/2024		
Expected Delivery Date:	02/08/2024		

From: DEBORAH A CHASE
NORTHEAST SITE SOLUTIONS
46 HUNTINGTON AVE
WORCESTER MA 01606-3543

Ref#: CT11116C

To: CONNECTICUT LIGHT & POWER-EVERSOURCE
ENERGY
PO BOX 270
HARTFORD CT 06141-0270

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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Click-N-Ship®

P

usps.com 9405 5036 9930 0658 0745 13 0098 5000 0020 6875

$9.85
US POSTAGE
Flat Rate Env

U.S. POSTAGE PAID
Click-N-Ship®

02/06/2024 Mailed from 01606 986740232873419

PRIORITY MAIL®

DEBORAH A CHASE
NORTHEAST SITE SOLUTIONS
46 HUNTINGTON AVE
WORCESTER MA 01606-3543

Expected Delivery Date: 02/08/24
Ref#: CT11116C

0003

B001

JULIA PEMBERTON
REDDING - FIRST SELECTMAN
PO BOX 1028
REDDING CTR CT 06875-1028

USPS TRACKING #

9405 5036 9930 0658 0745 13

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**

2. **Place your label so it does not wrap around the edge of the package.**

3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**

4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**

5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0658 0745 13

Trans. #:	599705347
Print Date:	02/06/2024
Ship Date:	02/06/2024
Expected Delivery Date:	02/08/2024

Priority Mail® Postage:	**$9.85**
Total:	**$9.85**

From: DEBORAH A CHASE
NORTHEAST SITE SOLUTIONS
46 HUNTINGTON AVE
WORCESTER MA 01606-3543

Ref#: CT11116C

To: JULIA PEMBERTON
REDDING - FIRST SELECTMAN
PO BOX 1028
REDDING CTR CT 06875-1028

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

CT11116C—TMO

UNITED STATES POSTAL SERVICE.

GREENDALE
290 W BOYLSTON ST
WORCESTER, MA 01606-2378
(800)275-8777

02/06/2024 02:01 PM

Product	Qty	Unit Price	Price
Prepaid Mail Redding Center, CT 06875 Weight: 1 lb 2.20 oz Acceptance Date: Tue 02/06/2024 Tracking #: 9405 5036 9930 0658 0745 13	1		$0.00
Prepaid Mail Hartford, CT 06141 Weight: 1 lb 2.20 oz Acceptance Date: Tue 02/06/2024 Tracking #: 9405 5036 9930 0658 0744 90	1		$0.00
Prepaid Mail Redding Center, CT 06875 Weight: 1 lb 2.20 oz Acceptance Date: Tue 02/06/2024 Tracking #: 9405 5036 9930 0658 0744 76	1		$0.00
Grand Total:			$0.00

Text your tracking number to 28777 (2USPS) to get the latest status. Standard Message and Data rates may apply. You may also visit www.usps.com USPS Tracking or call 1-800-222-1811.

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Track your Packages
Sign up for FREE @
https://informeddelivery.usps.com

All sales final on stamps and postage.
Refunds for guaranteed services only.
Thank you for your business.

Tell us about your experience.
Go to: https://postalexperience.com/Pos
or scan this code with your mobile device,

or call 1-800-410-7420.

UFN: 249629-1103
Receipt #: 840-50180231-1-11011155-1
Clerk: 15