10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

Transcend Wireless

September 2, 2021

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

RE: Notice of Exempt Modification
20 Seles Road, Ashford, Connecticut 06278
Latitude: 41.514815
Longitude: -72.105805
T-Mobile Site#: CTHA820A - Sprint Keep Project

Dear Ms. Bachman:

T-Mobile/Sprint currently maintains six (6) antennas at the 170-foot level of the existing 190-foot Monopole at 20 Seles Road, Ashford, Connecticut. The 190-foot Monopole is owned and operated by Everest Infrastructure. The ground space is owned by Raymond and Kathleen Baker. T-Mobile/Sprint now intends to remove all Sprint equipment including antennas, cables, and ground equipment. T-mobile will be adding six (6) antennas. The new antennas will be installed at the same 190-foot level. The new antennas support 5G services.

Planned Modifications:
Tower:
<u>Remove</u>
(6) Sprint Antennas
(12) Sprint RRHs
(1) Sprint Hybrid Cables

<u>Install New:</u>
(3) APX16DWV-16DWV Antennas
(3) APXVAALL24 43-U-NA20 Antennas
(3) AIR6449 Antennas
(3) Ericsson Radio 4460 B25+B66
(3) Ericsson 4480 B71+B85
(3) 6/24 Hybrid Cables

Ground:
Install New:
(1) 6160 Cabinet and (1) B160 Battery Cabinet

To Be Removed:
All Sprint Ground Equipment

This facility was not originally approved by the Connecticut Siting Council. The Town of Ashford does not have the original zoning permit on file. The Connecticut Siting Council ruled that shared use of the existing tower site is feasible.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman - Cathryn Silver-Smith, Elected Official, and Michael D'Amato, Zoning Enforcement Officer, as well as the tower and property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

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

Eric Breun
Transcend Wireless
Cell: 201-658-7728
Email: ebreun@transcendwireless.com

Attachments
cc: Cathryn Silver-Smith – as First Selectman of Ashford
Michael D’Amato - Zoning Enforcement Officer
Everest Infrastructure - Tower Owner
Raymond and Kathleen Baker - Land Owner

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS **1 OF 1**

SHIP TO:
ZEO
MICHAEL D'AMATO
5 TOWN HALL ROAD
ASHFORD CT 06278

CT 063 0-01

UPS GROUND
TRACKING #: 1Z V25 742 03 9212 0244

BILLING: P/P

Reference #1: CTHA820A

XOL 21.07.05 NV45 35.0A 08/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS **1 OF 1**

SHIP TO:
FIRST SELECTMAN
CATHRYN SILVER-SMITH
5 TOWN HALL ROAD
ASHFORD CT 06278

CT 063 0-01

UPS GROUND
TRACKING #: 1Z V25 742 03 9322 2230

BILLING: P/P

Reference #1: CTHA820A

XOL 21.07.05 NV45 35.0A 08/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS **1 OF 1**

SHIP TO:
EVEREST INFRASTRUCTURE
2 ALLEGHENY CENTER
PITTSBURGH PA 15212

PA 152 9-42

UPS GROUND

TRACKING #: 1Z V25 742 03 9022 2254

BILLING: P/P

Reference #1: CTHA820A

TM

XOL 21.07.05 NV45 35.0A 08/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS **1 OF 1**

SHIP TO:
RAYMOND AND KATHLEEN BAKER
20 SELES ROAD
ASHFORD CT 06278

CT 063 0-01

UPS GROUND

TRACKING #: 1Z V25 742 03 9681 5255

BILLING: P/P

Reference #1: CTHA820A

TM

XOL 21.07.05 NV45 35.0A 08/2021*

Hello, your package has been delivered.

Delivery Date: Wednesday, 09/01/2021

Delivery Time: 12:13 PM

Left At: FRONT DOOR

Set Delivery Instructions | Manage Preferences | View My Packages

TRANSCEND WIRELESS

Tracking Number:	1ZV257420396815255
Ship To:	RAYMOND AND KATHLEEN BAKER 20 SELES ROAD ASHFORD, CT 06278 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA820A

Hello, your package has been delivered.

Delivery Date: Wednesday, 09/01/2021

Delivery Time: 11:37 AM

Left At: OFFICE

Signed by: CLERK

TRANSCEND WIRELESS

Tracking Number:	1ZV257420393222230
Ship To:	CATHRYN SILVER-SMITH 5 TOWN HALL ROAD ASHFORD, CT 06278 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA820A

Hello, your package has been delivered.

Delivery Date: Wednesday, 09/01/2021

Delivery Time: 11:37 AM

Left At: OFFICE

Signed by: CLERK

TRANSCEND WIRELESS

Tracking Number:	1ZV257420392120244
Ship To:	MICHAEL D'AMATO 5 TOWN HALL ROAD ASHFORD, CT 06278 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA820A

Hello, your package has been delivered.

Delivery Date: Thursday, 09/02/2021

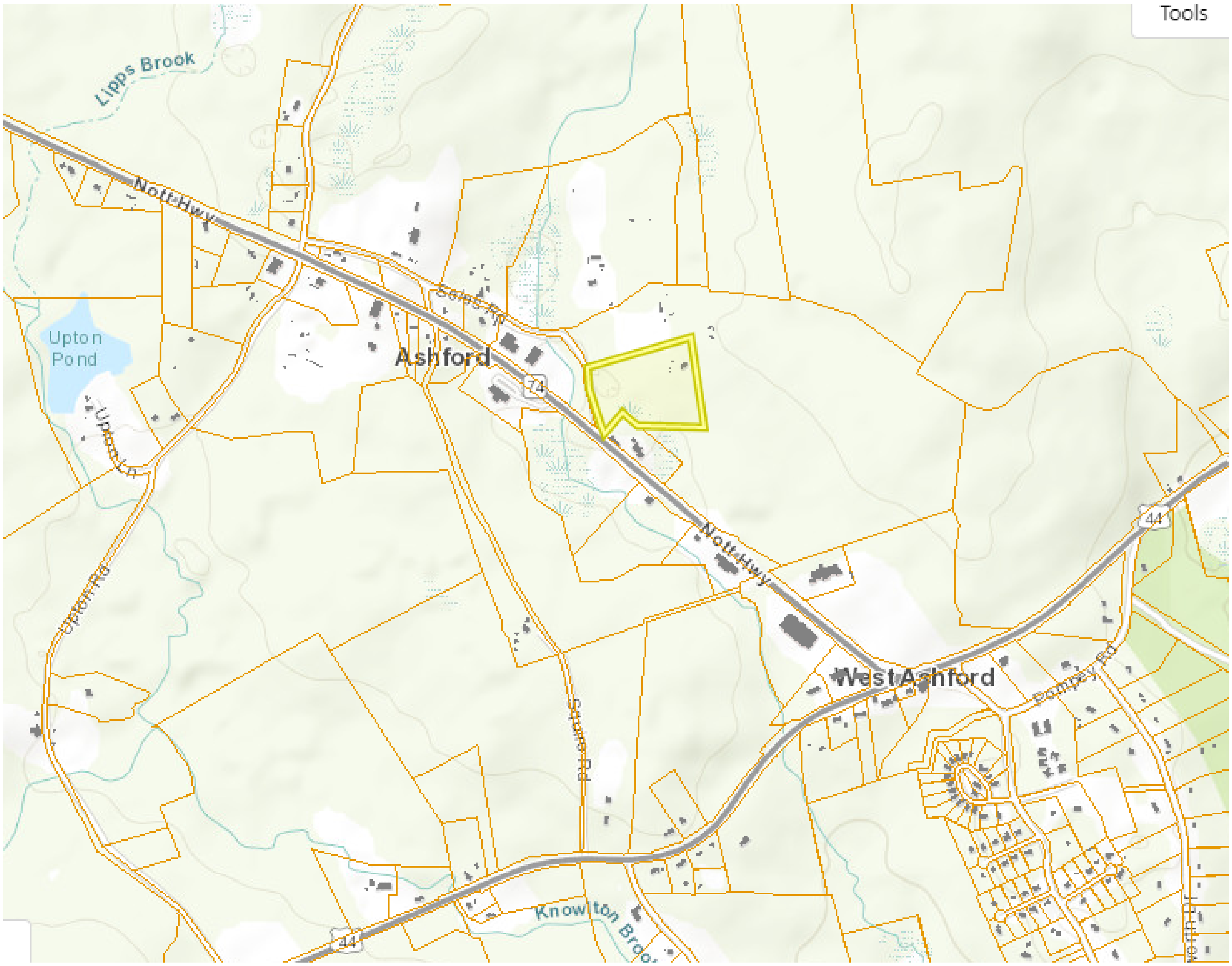
Delivery Time: 10:26 AM

Left At: FRONT DESK

Signed by: DOYLE

TRANSCEND WIRELESS

Tracking Number:	1ZV257420390222254
Ship To:	EVEREST INFRASTRUCTURE 2 ALLEGHENY CENTER PITTSBURGH, PA 15212 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA820A


Tools
Lipps Brook
Nott Hwy
Upton Pond
Ashford
74
Upton Ln
Upton Rd
Nott Hwy
West Ashford
Pompey Rd
44
Knowlton Brook
44

Parcel Information

Location:	20 SELES RD	Property Use:	Residential	Primary Use:	Residential
Unique ID:	00016400	Map Block Lot:	34 B 8	Acres:	10.00
490 Acres:	9.00	Zone:	RA	Volume / Page:	0058/0245
Developers Map / Lot:		Census:	8301000		

Location:	20 SELES RD	Property Use:	Residential	Primary Use:	Residential
Unique ID:	00016400	Map Block Lot:	34 B 8	Acres:	10.00
490 Acres:	9.00	Zone:	RA	Volume / Page:	0058/0245
Developers Map / Lot:		Census:	8301000		

Value Information

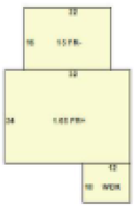
	Appraised Value	Assessed Value
Land	65,200	32,070
Buildings	111,000	77,700
Detached Outbuildings	1,800	1,400

Owner's Information

Owner's Data
BAKER RAYMOND C & KATHLEEN P 20 SELES RD ASHFORD CT 06278

Total	178,000	111,170

Building 1



Building Use:	Single Family	Style:	Cape	Living Area:	1,581
Stories:	1.50	Construction:	Wood Frame	Year Built:	1968
Total Rooms:	6	Bedrooms:	3	Full Baths:	1
Half Baths:	1	Fireplaces:	1	Heating:	Forced Hot Air
Fuel:	Oil	Cooling Percent:	0	Basement Area:	0
Basement Finished Area:	0	Basement Garages:	1	Roof Material:	Asphalt
Siding:	Clapboards/Vinyl Siding	Units:			

Special Features

Attached Components

Fireplace 1.5 Story	1
Unfinished Basement	768

Type:	Year Built:	Area:
Wood Deck	1968	120

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Canopy	1970	15.00	12.00	180
Generator	2017	0.00	0.00	1

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Sale Price
BAKER RAYMOND C & KATHLEEN P	0058	0245	07/15/1968		$0

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

April 7, 1999

Peter van Wilgen
SNET Mobility Inc.
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **TS-SCLP-003-990317** - Springwich Cellular Limited Partnership request for an order to approve tower sharing at an existing telecommunications facility located off 20 Seles Road in Ashford, Connecticut.

Dear Mr. van Wilgen:

At a public meeting held April 6,1999, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures.

This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequency now used on this tower. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated March 17, 1999, and additional information provided on April 16, 1999. Please notify the Council when all work is complete.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/kj

c: Honorable John M. Zulick, First Selectman, Town of Ashford

I:\siting\em\springwich\ashford\dc040699.doc

Sprint Now part of T Mobile

SPRINT ID: CT33XC015
SITE ID: CTHA820A
20 SELES ROAD, ASHFORD, CT 06278

T-MOBILE A+L TEMPLATE (PROVIDED BY RFDS)

67E5998E_1xAIR+1OP+1QP

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)

67D5A998E 6160

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. 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.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. 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.
7. 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.
8. 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.
9. 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.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.

SITE DIRECTIONS

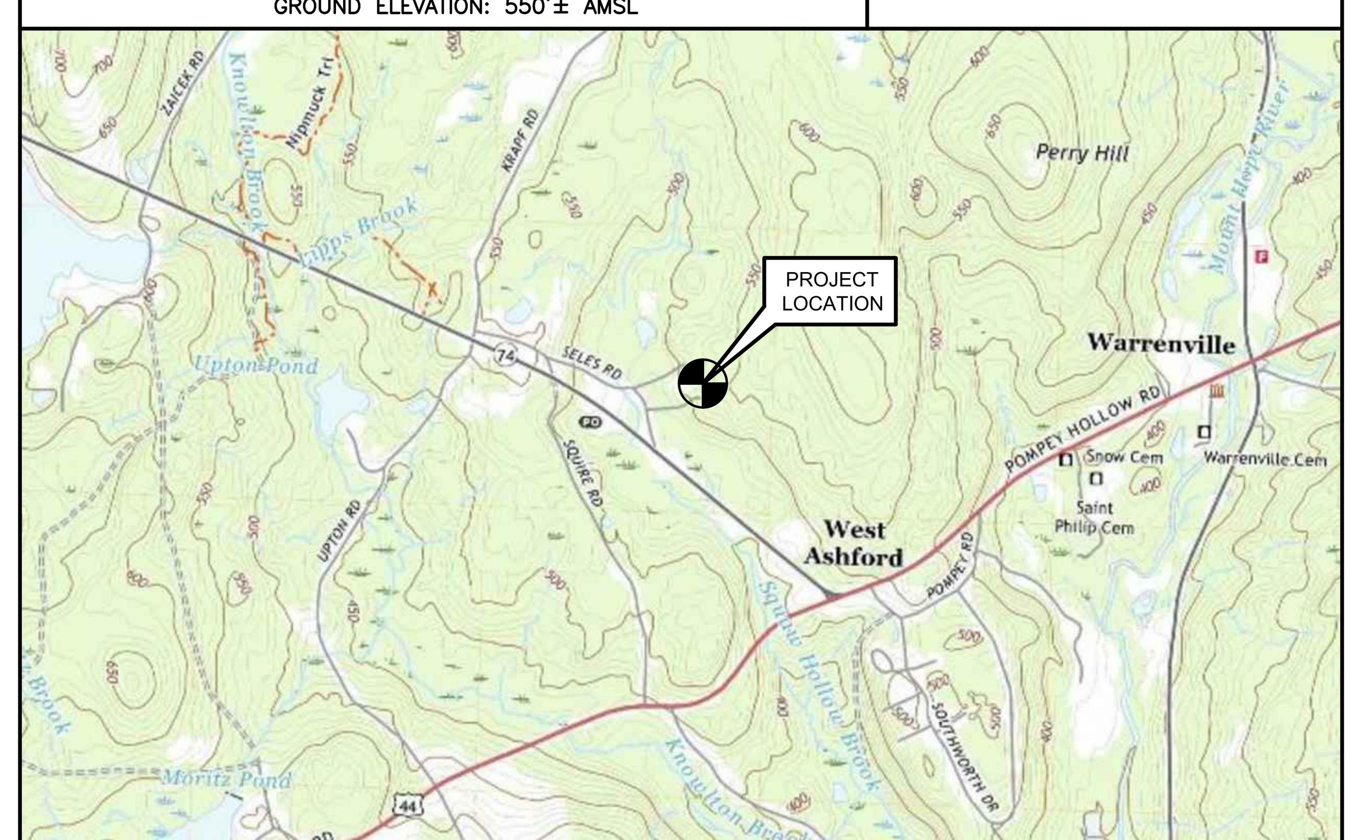
FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002

TO: 24 SELES ROAD, ASHFORD, CT 06278

1. HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	
2. TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.30 MI.
3. TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.14 MI.
4. STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	0.64 MI.
5. TURN LEFT ONTO PINE GROVE RD.	3.62 MI.
6. TURN RIGHT ONTO PACKARD ST.	0.29 MI.
7. TURN LEFT ONTO COTTAGE GROVE RD/CT-218. CONTINUE TO FOLLOW CT-218	0.44 MI.
8. MERGE ONTO I-291 E TOWARD SOUTH WINDSOR.	0.75 MI.
9. MERGE ONTO I-84 E VIA THE EXIT ON THE LEFT TOWARD BOSTON.	6.15 MI.
10. TAKE THE CT-74 EXIT, EXIT 69, TOWARD WILLINGTON/US-44	15.35 MI.
11. TURN RIGHT ONTO TOLLAND STAGE RD/CT-74. CONTINUE TO FOLLOW CT-74.	0.32 MI.
12. TURN LEFT ONTO SELES RD.	7.04 MI.
13. 24 SELES RD, ASHFORD, CT 06278-1324, 24 SELES RD. IS ON THE RIGHT.	0.11 MI.

SITE COORDINATES: LATITUDE: 41°-51'-48.15" N
LONGITUDE: 72°-10'-58.05" W
GROUND ELEVATION: 550'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

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

1. REMOVE ALL EXISTING SPRINT EQUIPMENT
2. EXISTING 100A CIRCUIT BREAKER TO BE REMOVED
3. INSTALL 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT
4. REMOVE ALL EXISTING COAX CABLES.
5. INSTALL (1) ENCLOSURE 6160 CABINET & (1) BATTERY B160 CABINET.
6. INSTALL (3) 6/24 4AWG HYBRID CABLES.
7. INSTALL (1) RFS APX16DWV-16DWV-S-E-A20 ANTENNA PER SECTOR, TOTAL OF (3).
8. INSTALL (1) RFS APXVAALL24_43-U-NA20 ANTENNA PER SECTOR, TOTAL OF (3).
9. INSTALL (1) ERICSSON AIR6449 B41 ANTENNA PER SECTOR, TOTAL OF (3).
10. INSTALL (1) RADIO 4460 B25+B66 PER SECTOR, TOTAL OF (3).
11. INSTALL (1) RADIO 4480 B71+B85 PER SECTOR, TOTAL OF (3).

PROJECT INFORMATION

SPRINT ID:	CT33XC015
SITE ID:	CTHA820A
SITE ADDRESS:	20 SELES ROAD ASHFORD, CT 06278
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	KYLE RICHERS TRANSCEND WIRELESS, LLC (908) 447-4716
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-51'-48.15" N LONGITUDE: 72°-10'-58.05" W GROUND ELEVATION: 550'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/17/21	BSP	RTS	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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

Sprint Now part of T Mobile

Transcend Wireless

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

SPRINT ID: CT33XC015
SITE ID: CTHA820A
20 SELES ROAD
ASHFORD, CT 06278

DATE:	06/09/21
SCALE:	AS NOTED
JOB NO.	21005.30

TITLE SHEET

T-1

Sheet No. 1 of 10

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 126 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10).

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

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
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10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S 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.
13. 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.
14. 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.
15. 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.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. 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.
18. 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.

18\. CONTRACTOR SHALL COMPLY WITH 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.

19\. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.

20\. 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.

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.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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T-MOBILE NORTHEAST LLC

SPRINT ID: CT33XC015

SITE ID: CTHA820A

20 SELES ROAD

ASHFORD, CT 06278

DATE: 06/09/21

SCALE: AS NOTED

JOB NO. 21005.30

GENERAL NOTES AND SPECIFICATIONS

N–1

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

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	170'	0°	(P) RADIO 4460 B25+B66 (1)		(1) 6x24 HYBRID CABLE (±230')
A2	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	170'	0°	(P) RADIO 4480 B71+B85 (1)		
A3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	170'	0°			
B1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	170'	120°	(P) RADIO 4460 B25+B66 (1)		(1) 6x24 HYBRID CABLE (±230')
B2	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	170'	120°	(P) RADIO 4480 B71+B85 (1)		
B3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	170'	120°			
C1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	170'	240°	(P) RADIO 4460 B25+B66 (1)		(1) 6x24 HYBRID CABLE (±230')
C2	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	170'	240°	(P) RADIO 4480 B71+B85 (1)		
C3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	170'	240°			

1 / C-1 SITE LOCATION PLAN
SCALE: NOT TO SCALE
TRUE NORTH

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SITE LOCATION PLAN

C-1

Sheet No. 3 of 10

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

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

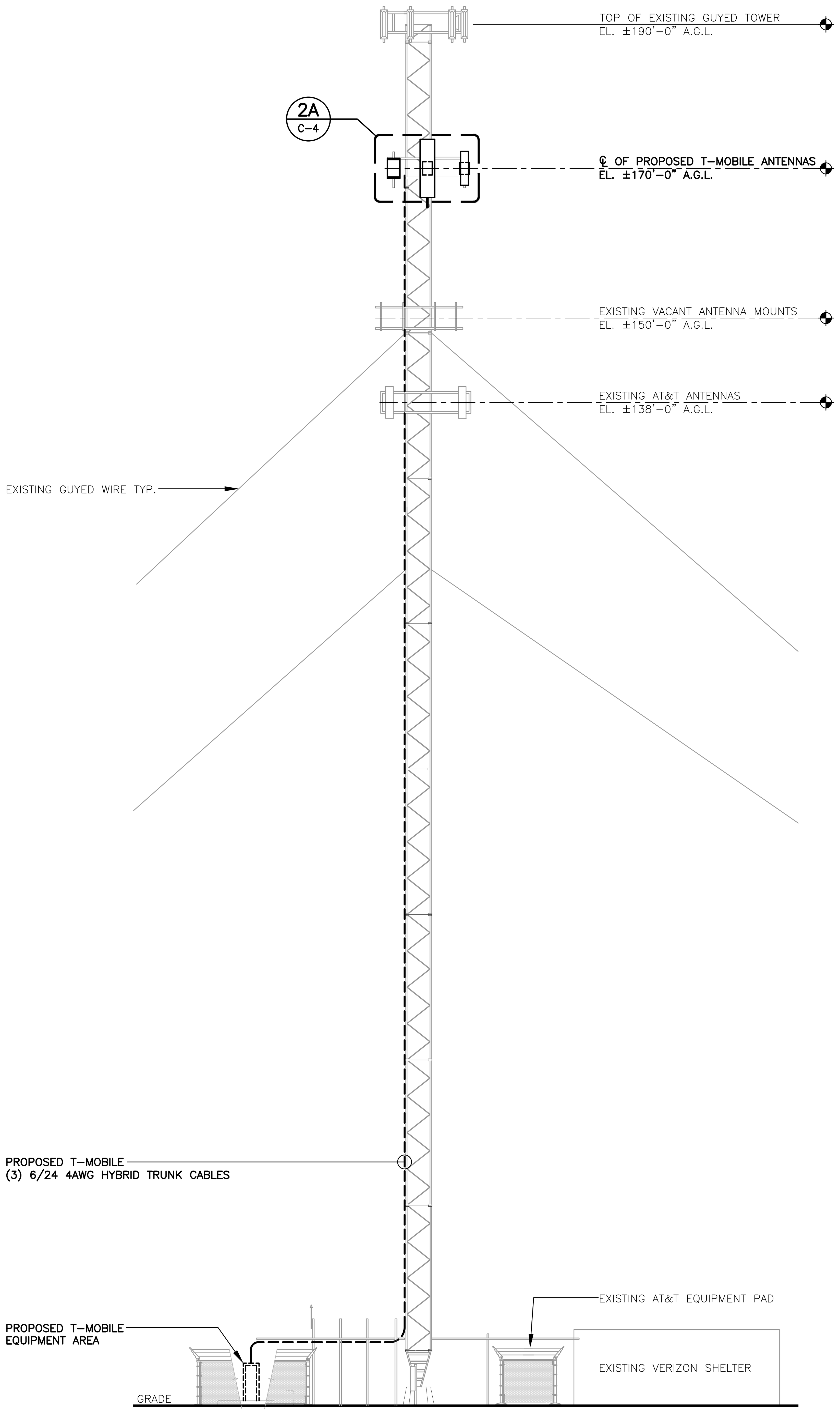
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21005.30) DATED 06/07/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

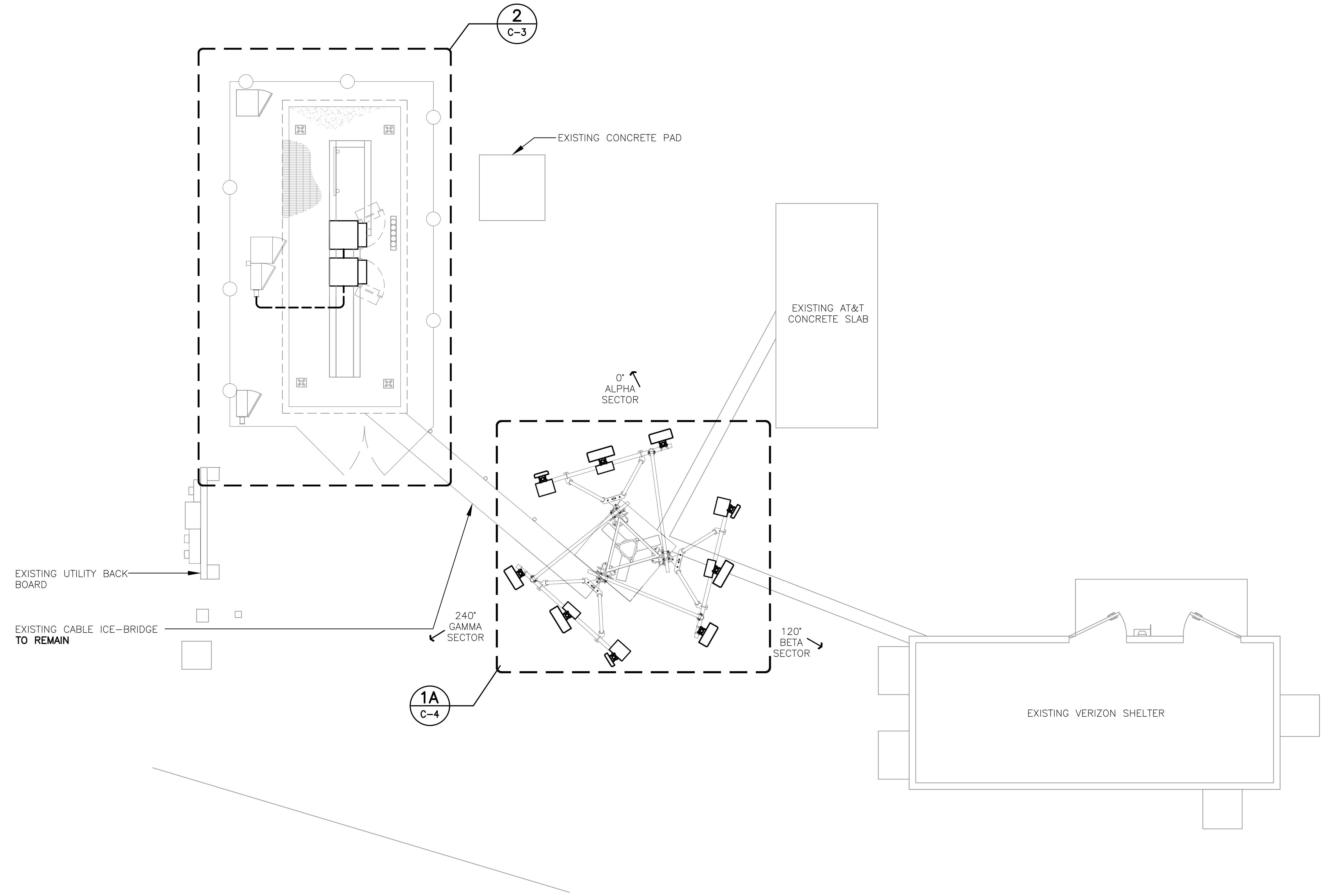
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY PAUL J. FORD & COMPANY (PROJECT # A13321-0013.001.8700) DATED 07/28/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: 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.



2 C-2 **ANTENNA ELEVATION - PROPOSED**
SCALE: 3/32" = 1'-0"



1 C-2 **COMPOUND PLAN - PROPOSED**
SCALE: 3/16" = 1'-0"

TRUE NORTH

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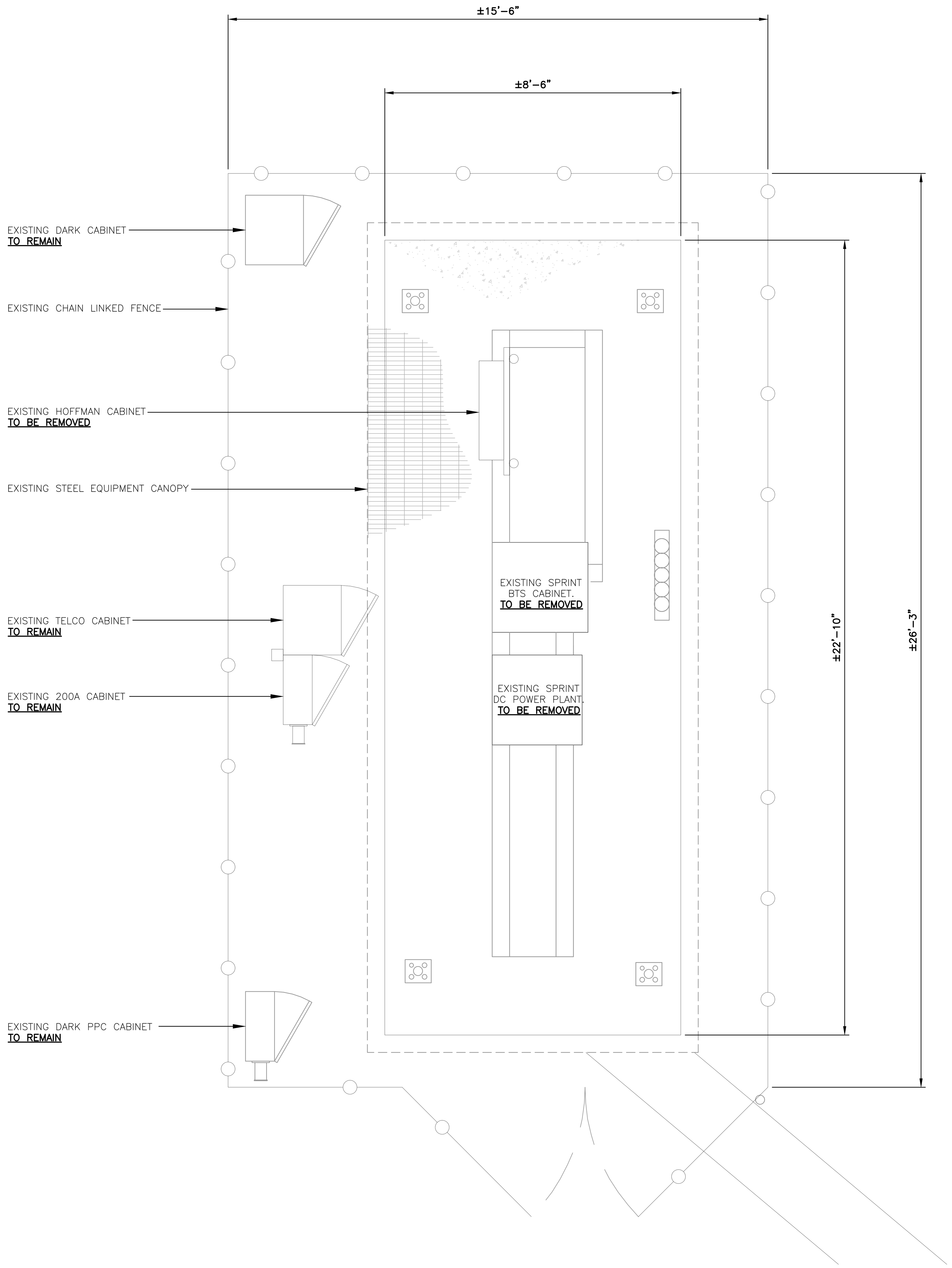
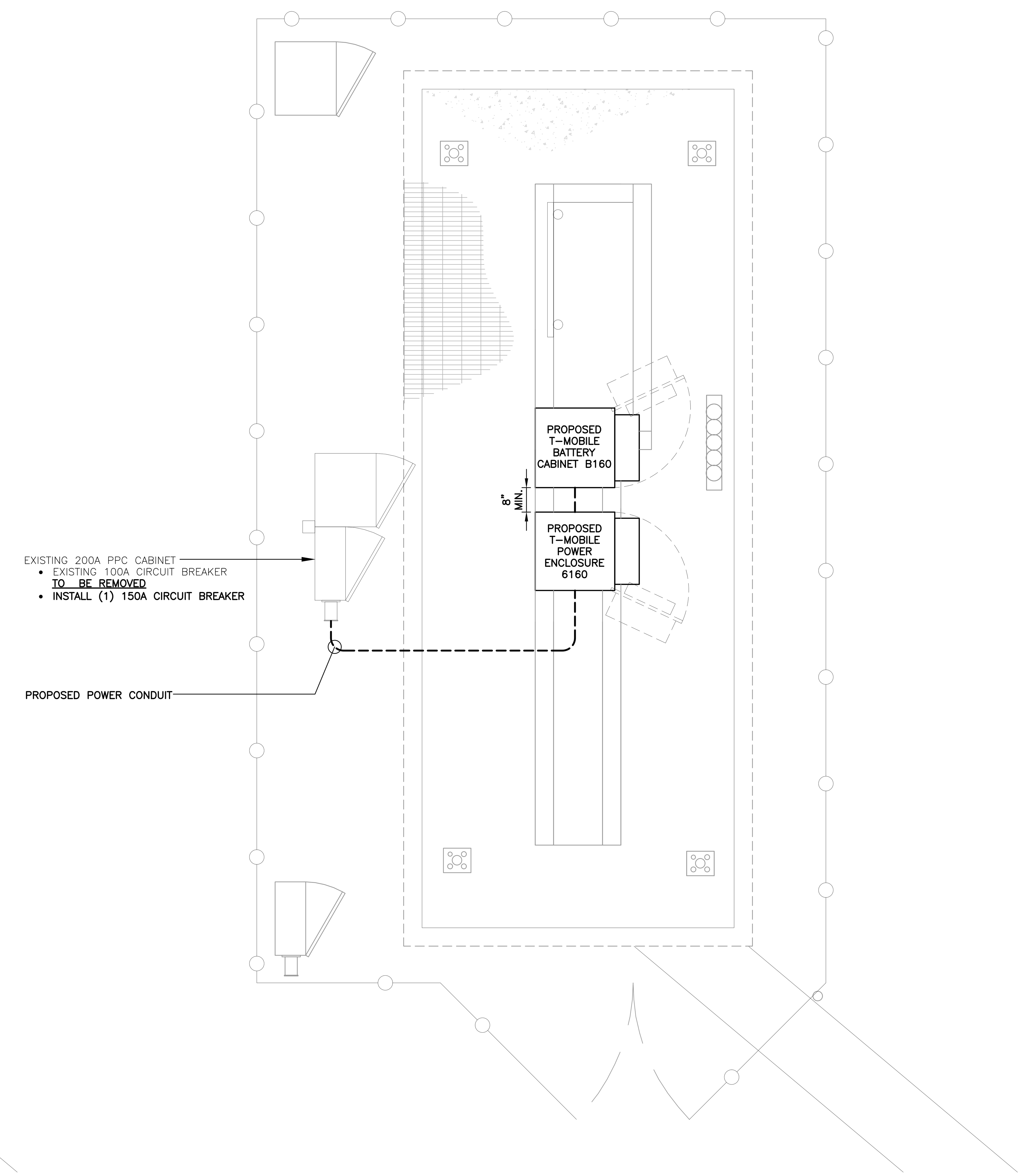
COMPOUND PLAN AND ELEVATION

C-2

Sheet No. 4 of 10



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



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

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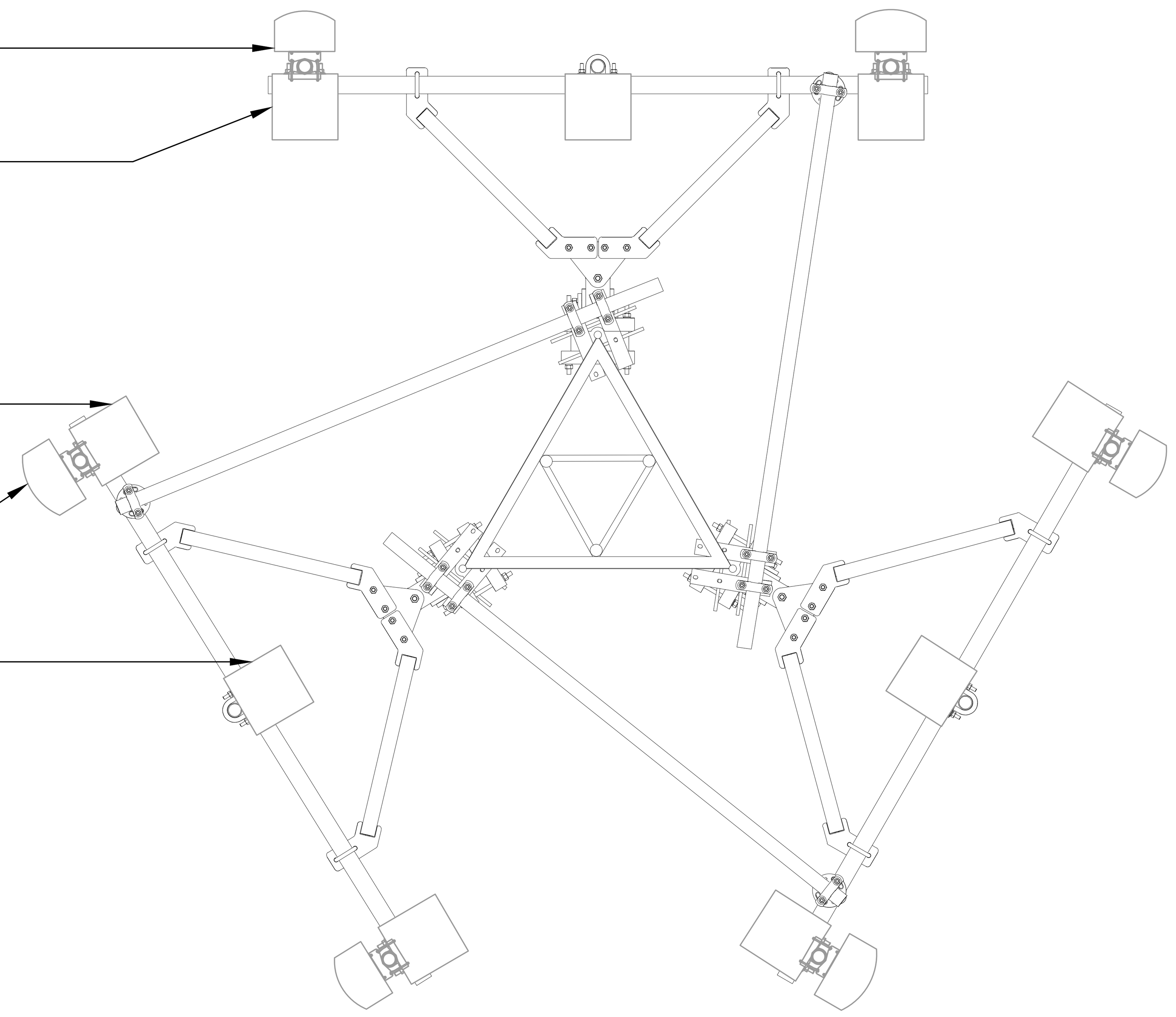
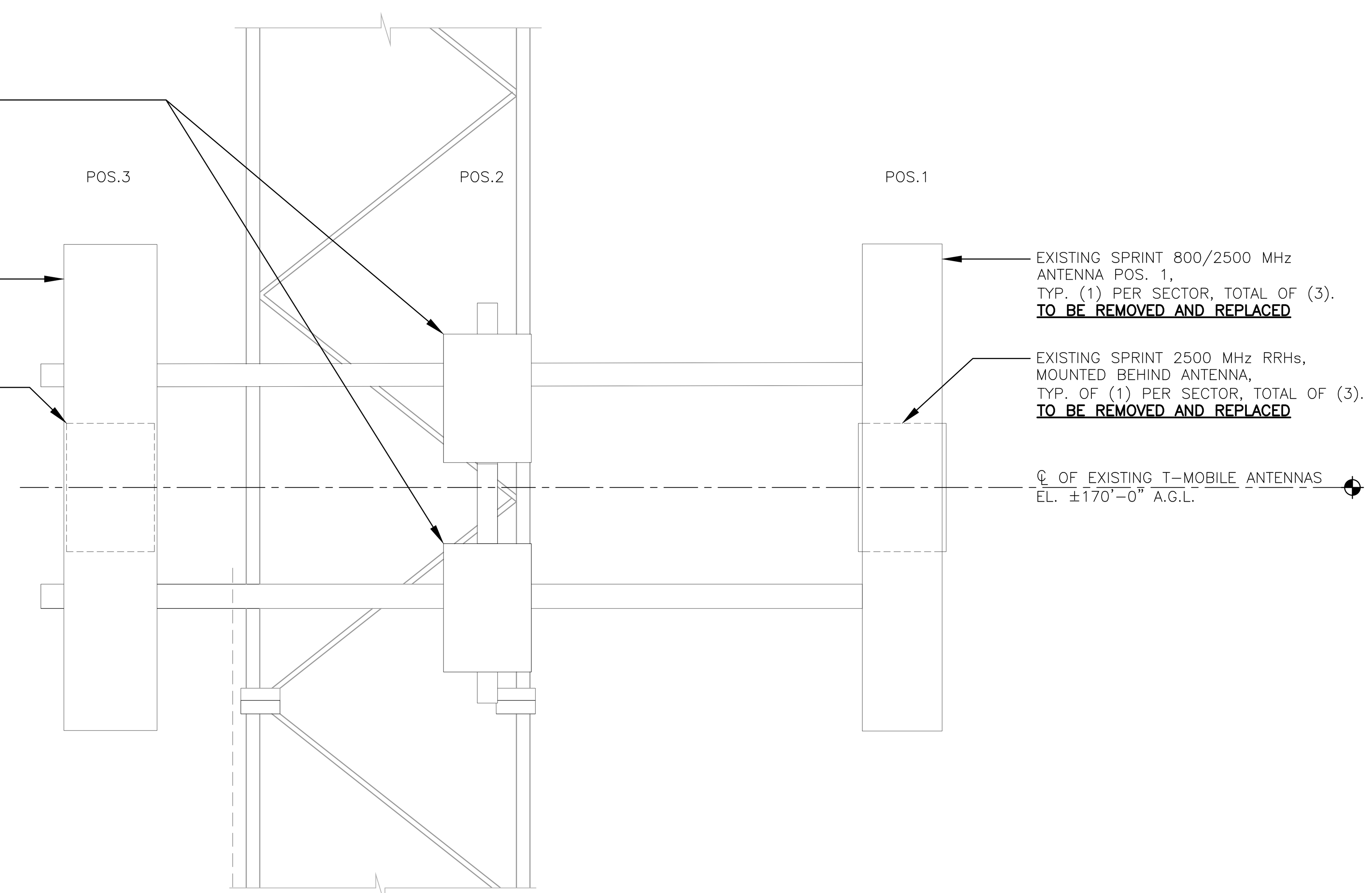
EQUIPMENT PLANS

C-3

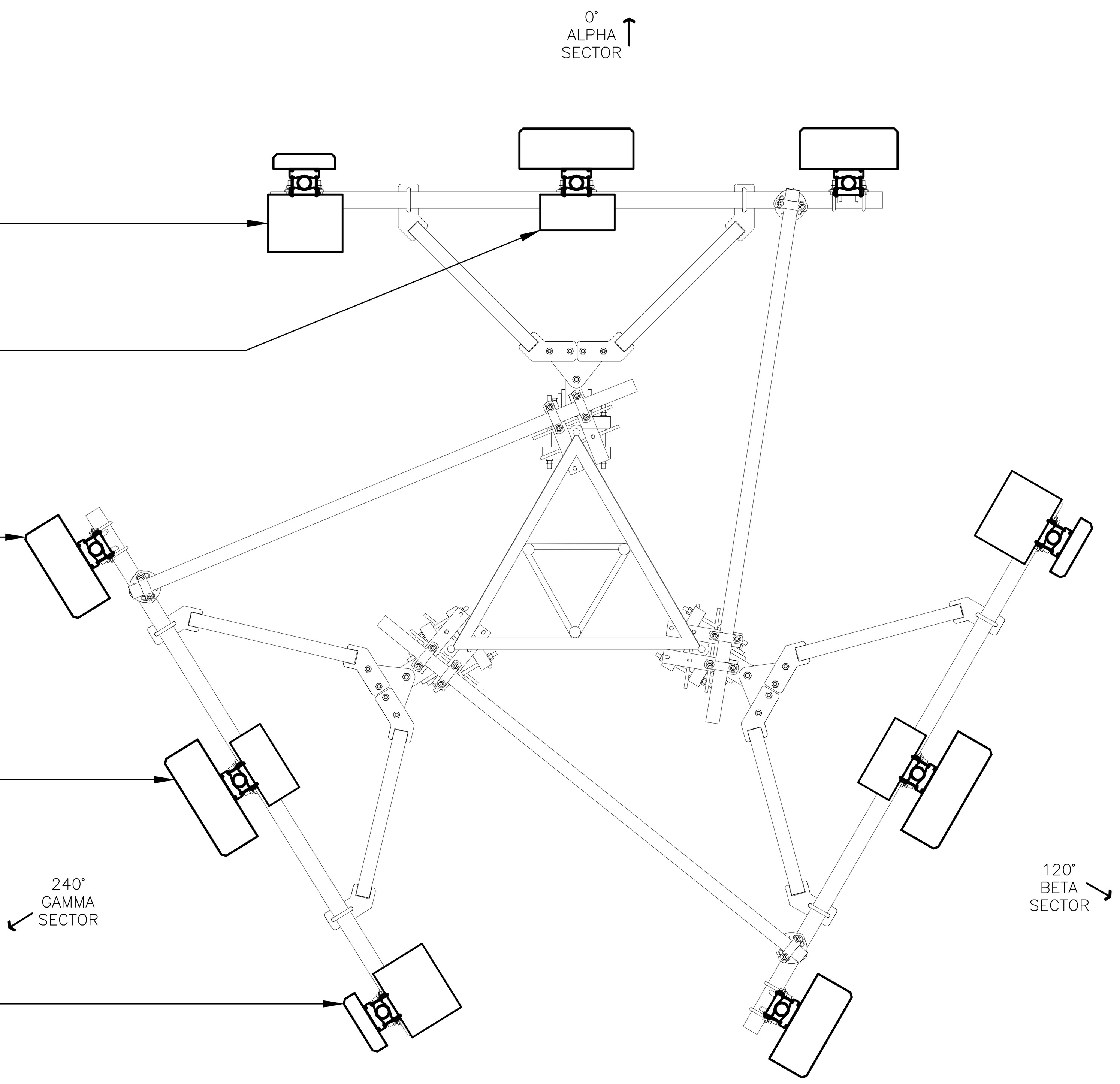
Sheet No. 5 of 10



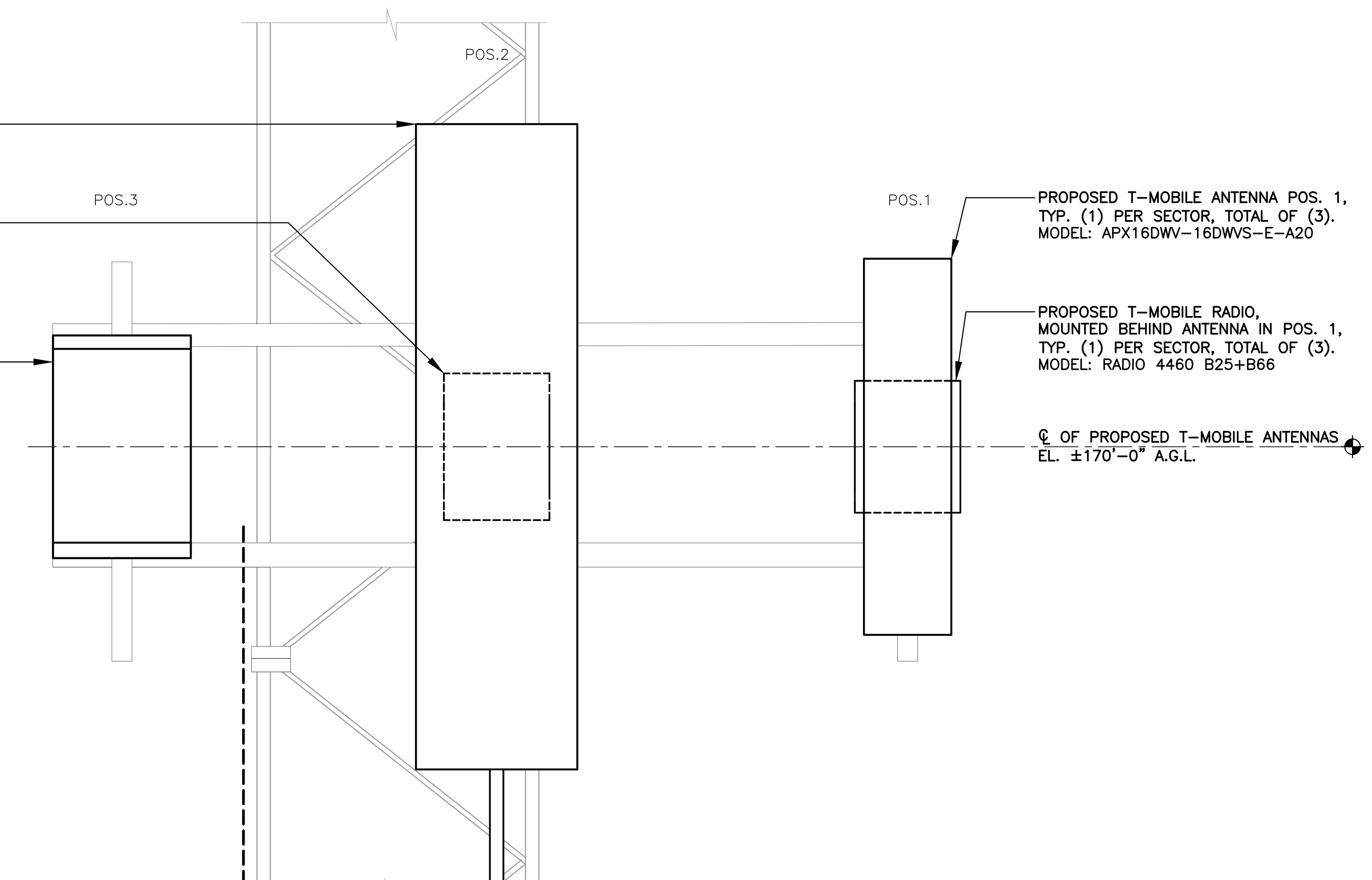
1 C-4 ANTENNA MOUNTING PLAN - EXISTING
SCALE: 1/2" = 1'-0"
TRUE NORTH



2 C-4 ANTENNA MOUNTING ELEVATION PLAN - EXISTING
SCALE: 3/4" = 1'-0"



1A C-4 ANTENNA MOUNTING PLAN - PROPOSED
SCALE: 1/2" = 1'-0"
TRUE NORTH



2A C-4 ANTENNA MOUNTING ELEVATION PLAN - PROPOSED
SCALE: 3/4" = 1'-0"

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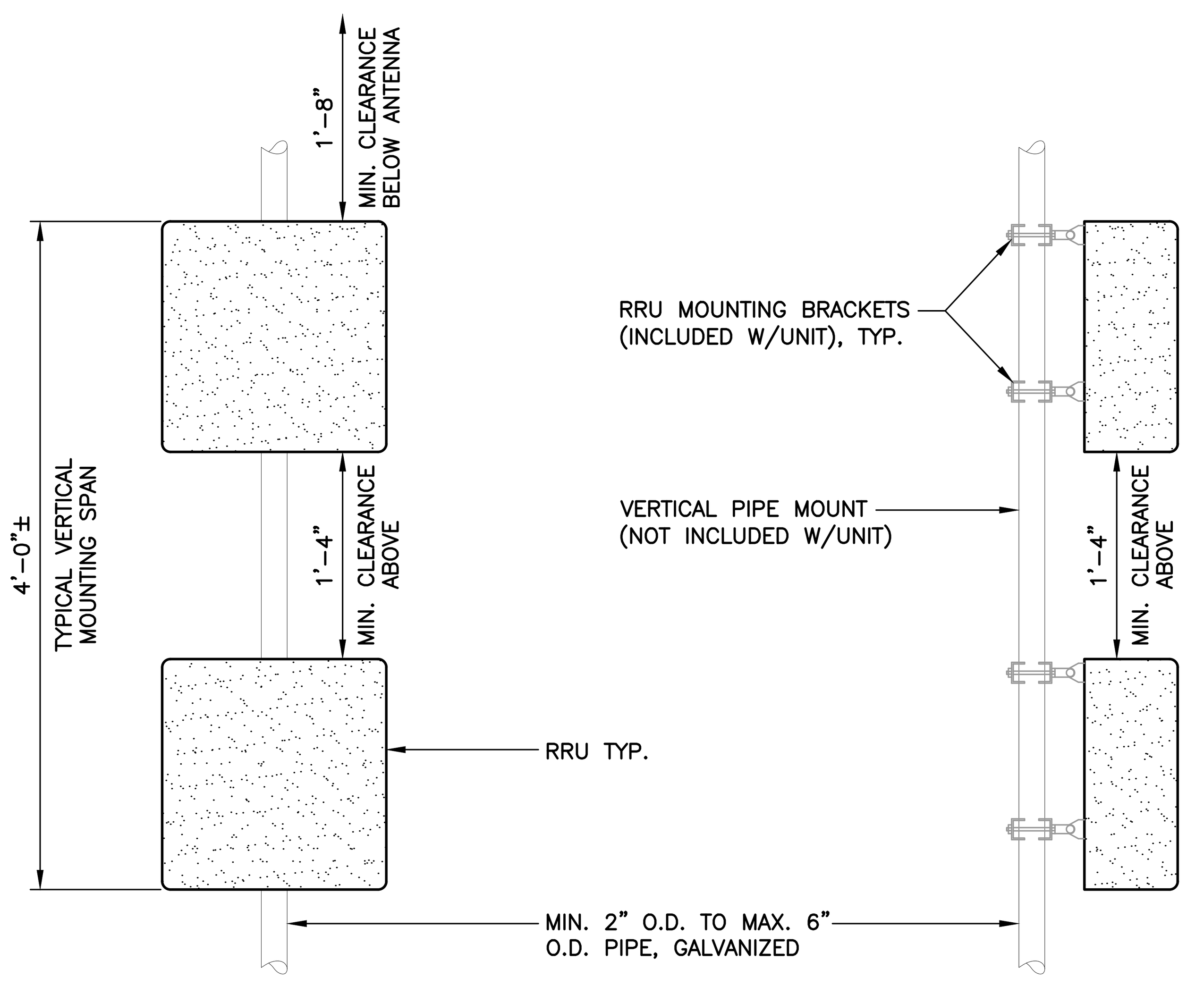
ANTENNA PLANS AND ELEVATION

C-4

Sheet No. 6 of 10



FRONT ELEVATION

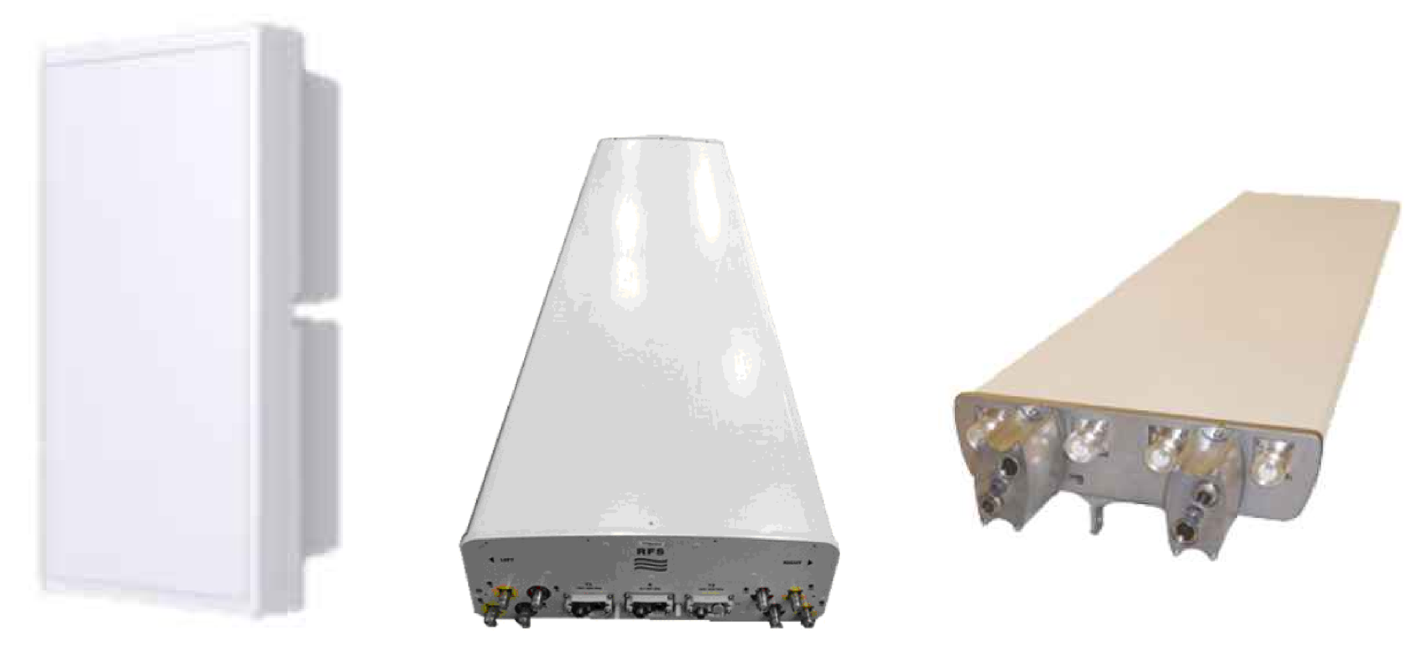
SIDE ELEVATION

NOTES:

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. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 (C-5) TYPICAL RRU MOUNTING DETAIL

SCALE: NOT TO SCALE



AIR6449 B41 | APXVAALL24_43-U-NA20 | APX16DWV-16DWV-S-E-A20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: RFS MODEL: APXVAALL24_43-U-NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.
MAKE: RFS MODEL: APX16WV-16DWV-S-E-A20	55.9"L x 13"W x 3.15"D	±132 LBS.

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

2 (C-5) PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

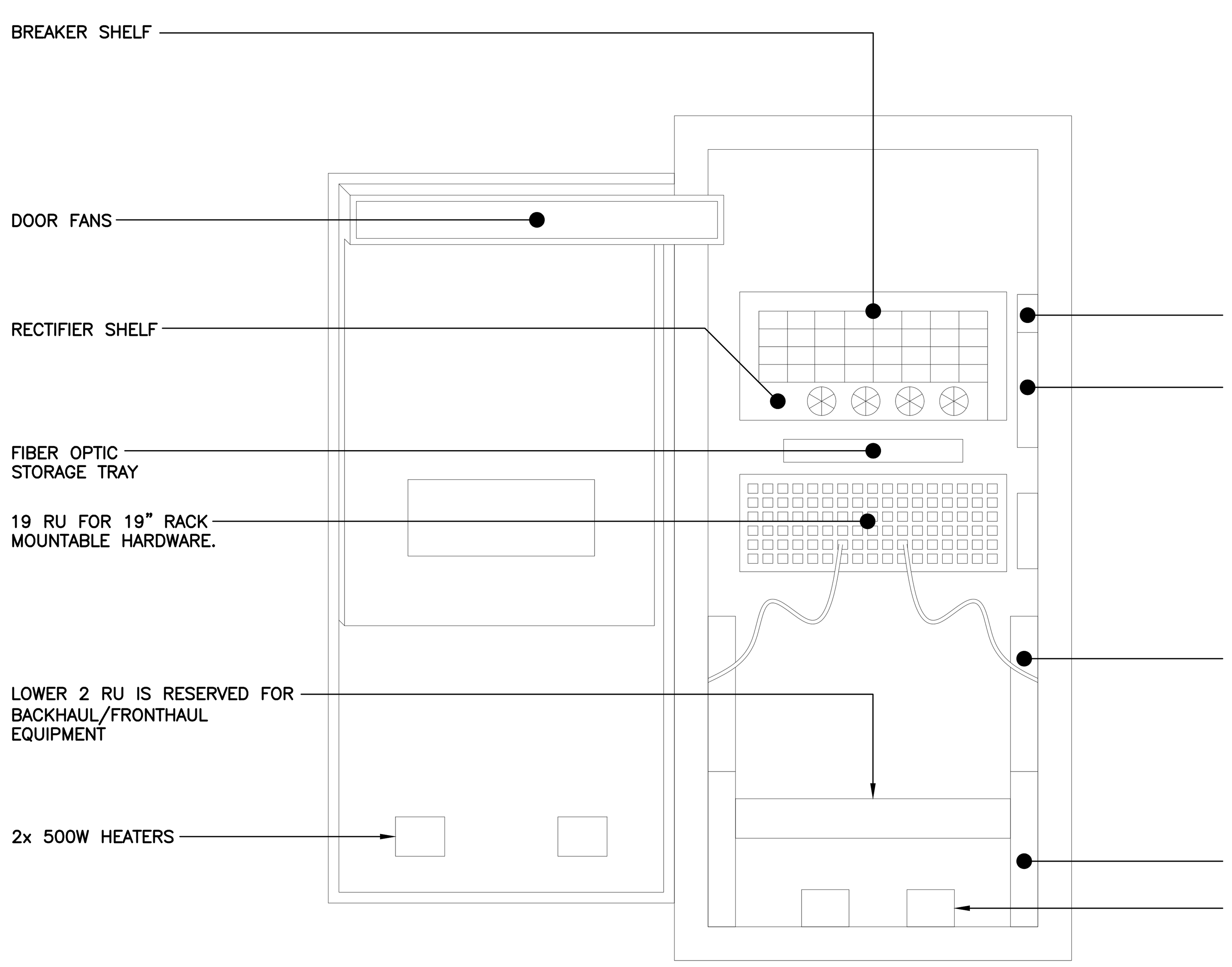
RADIO 4460 B25+B66 | RADIO 4480 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
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-5) PROPOSED RRU DETAIL

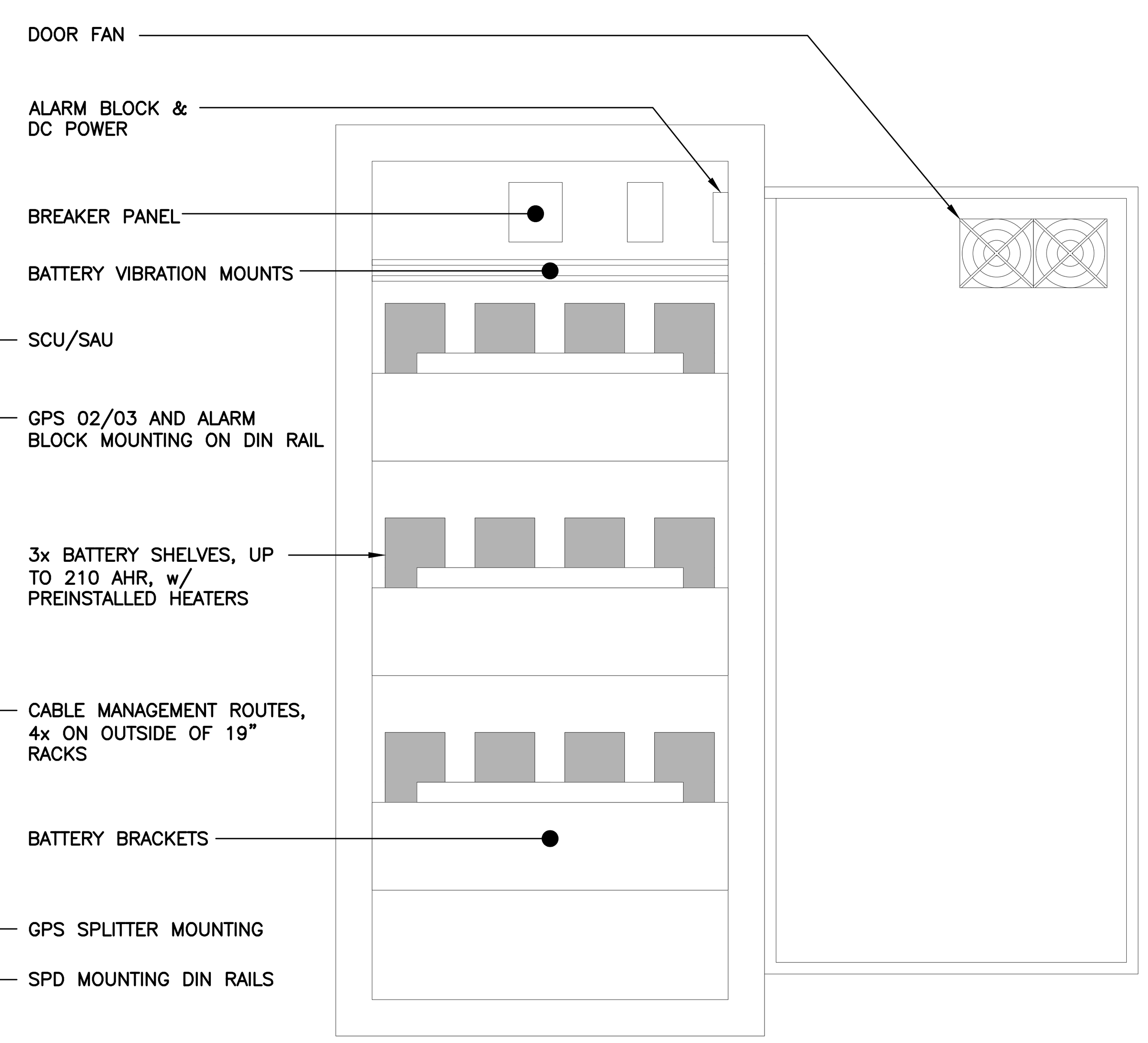
SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

4 (C-5) ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 (C-5) BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

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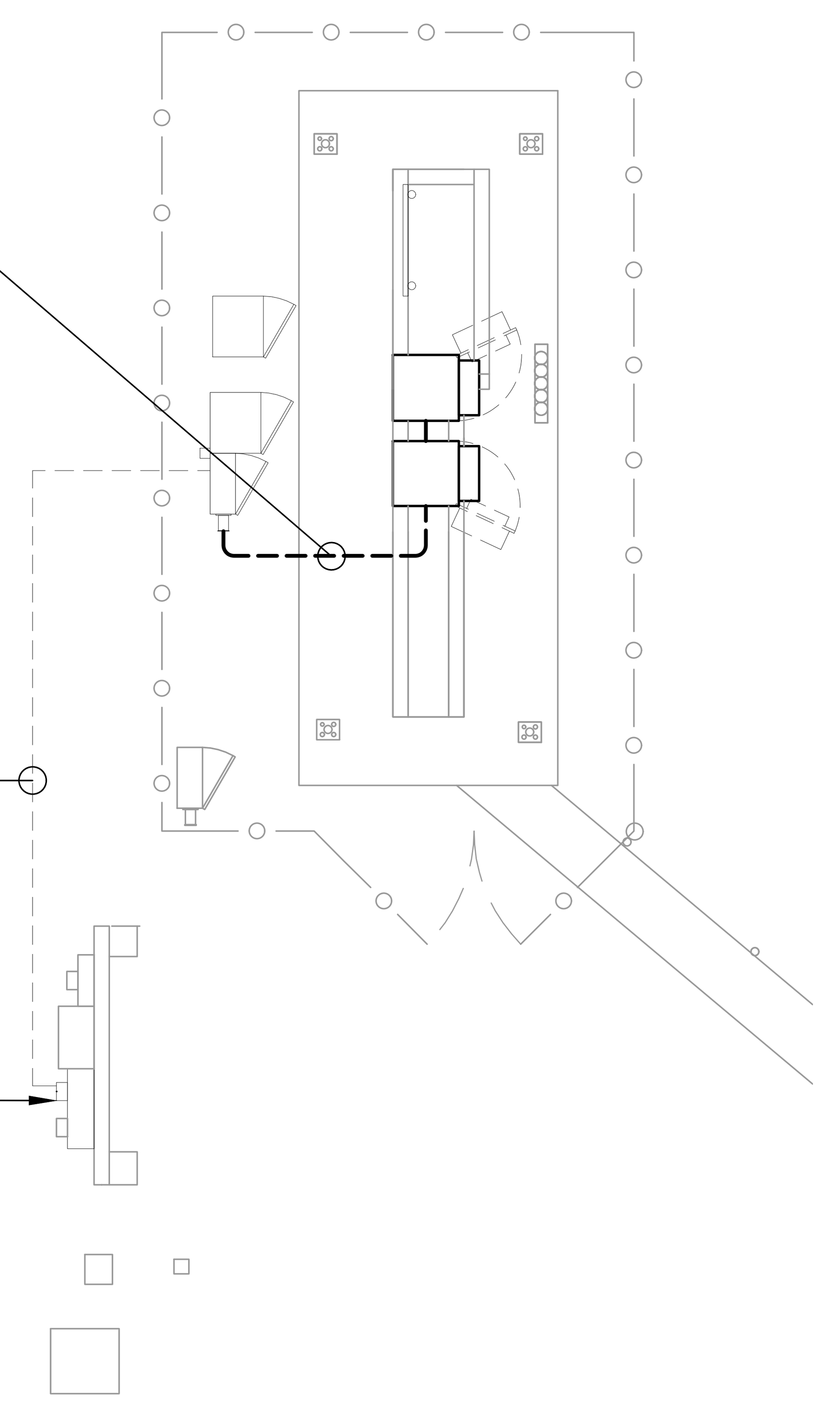
TYPICAL EQUIPMENT DETAILS

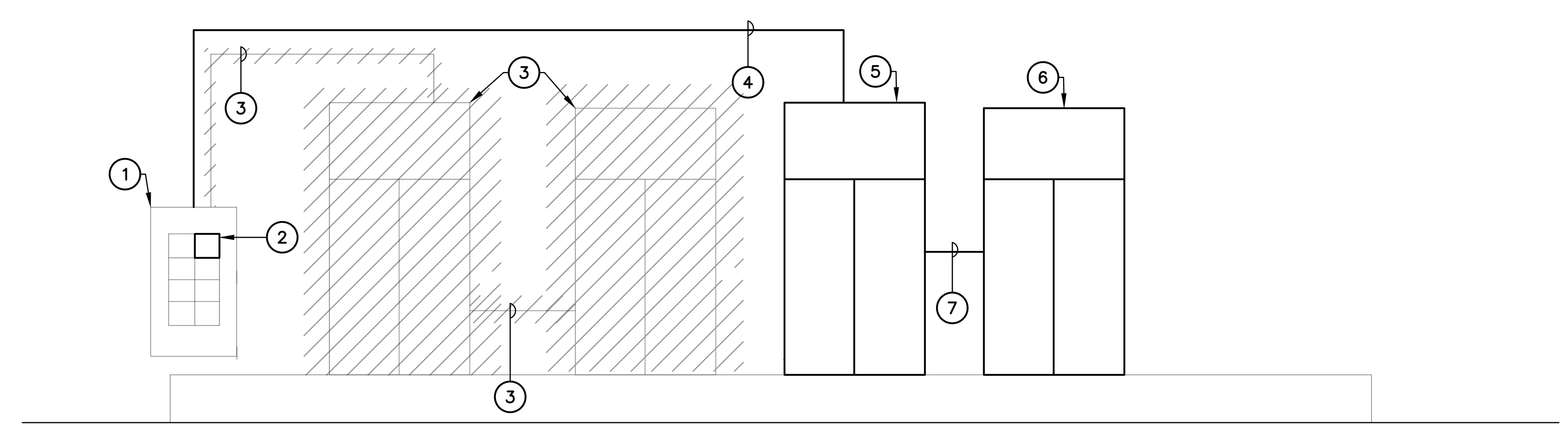
C-5



1 / E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1" = 5'

RISER DIAGRAM NOTES

1. EXISTING 200A, PPC CABINET TO REMAIN.
2. NEW 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
3. EXISTING CABINETS AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.
4. (3) 1/0 AWG, (1) #6 AWG GROUND, 1-1/2" CONDUIT.
5. NEW T-MOBILE EQUIPMENT CABINET
6. NEW T-MOBILE BATTERY CABINET
7. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



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

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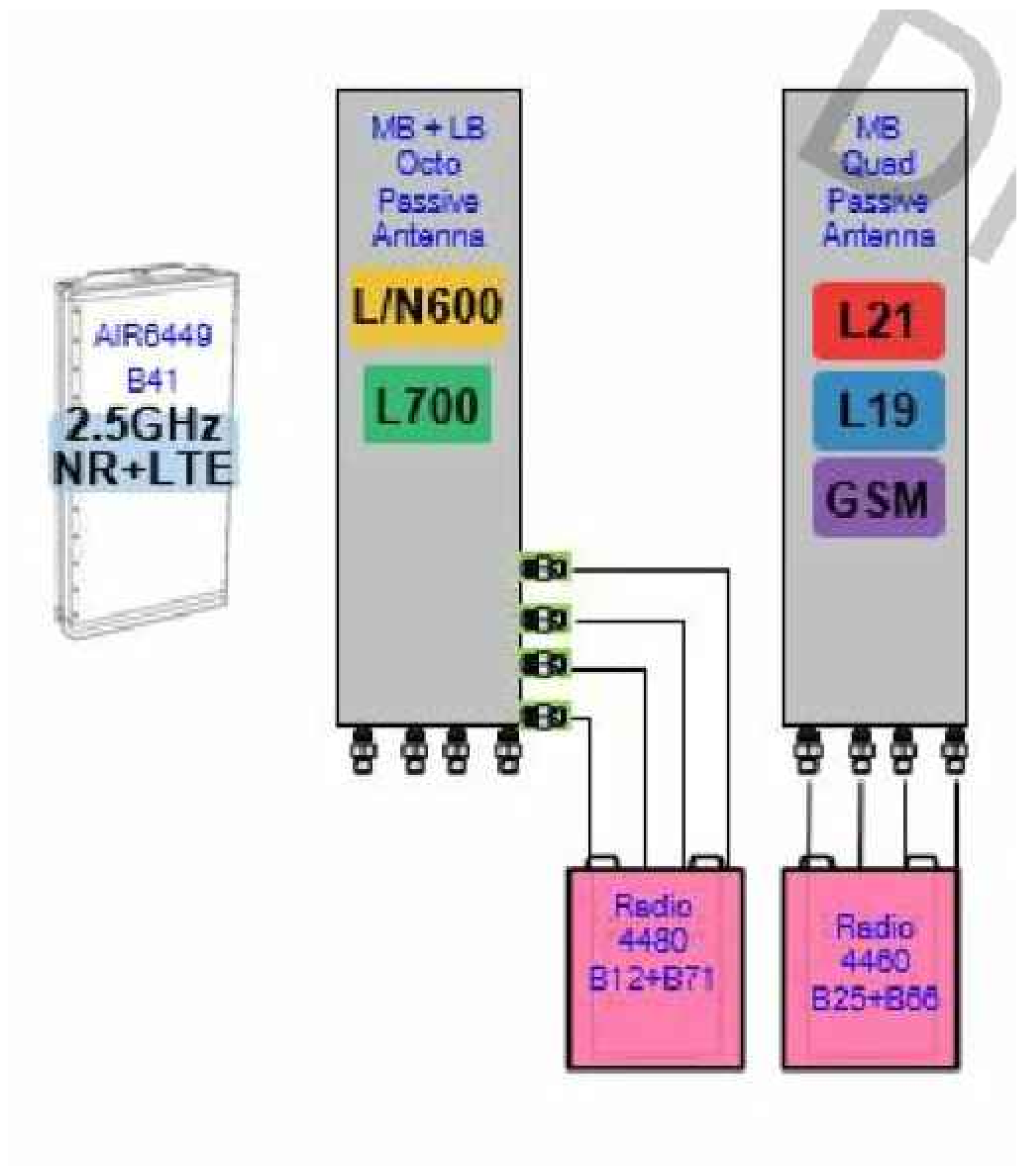
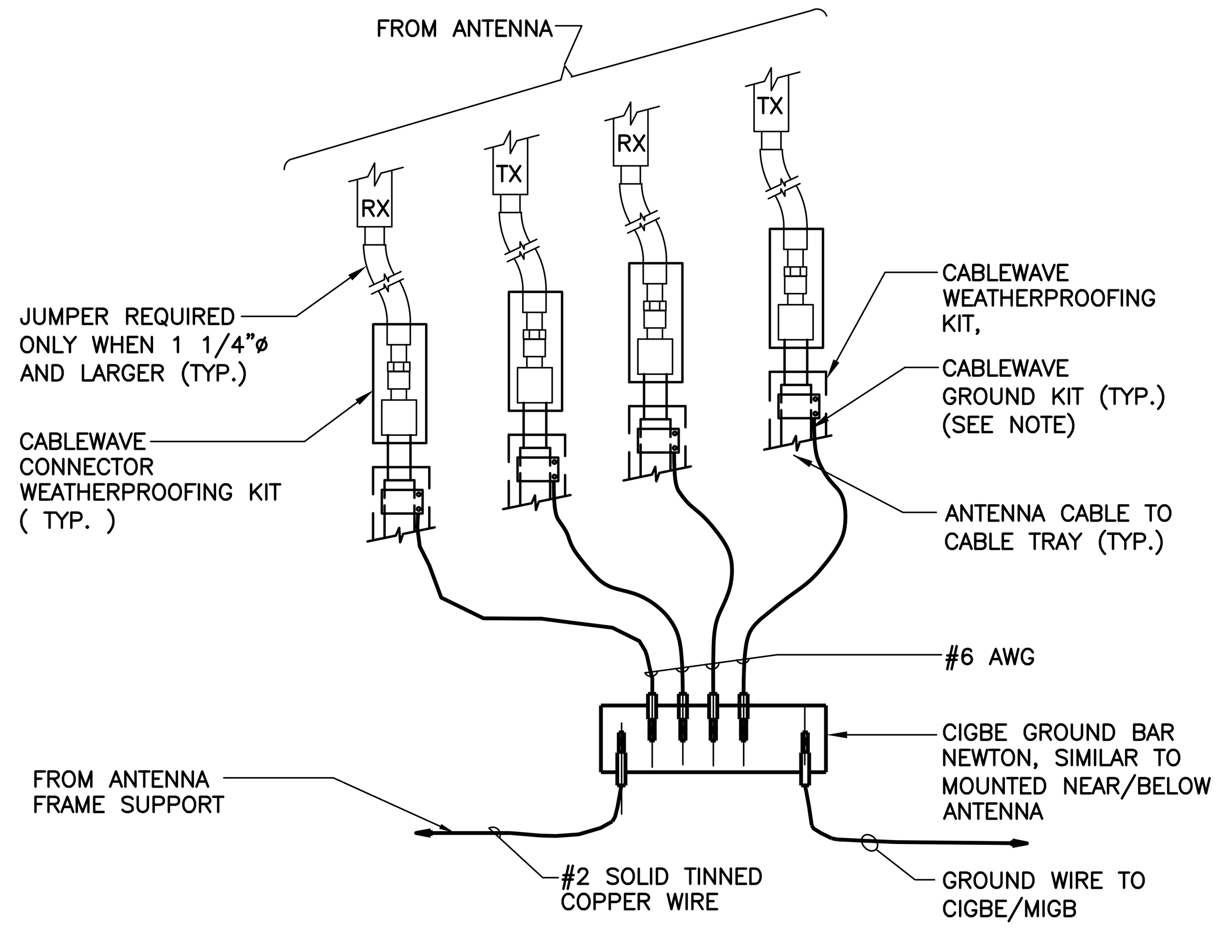
ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING

E-1



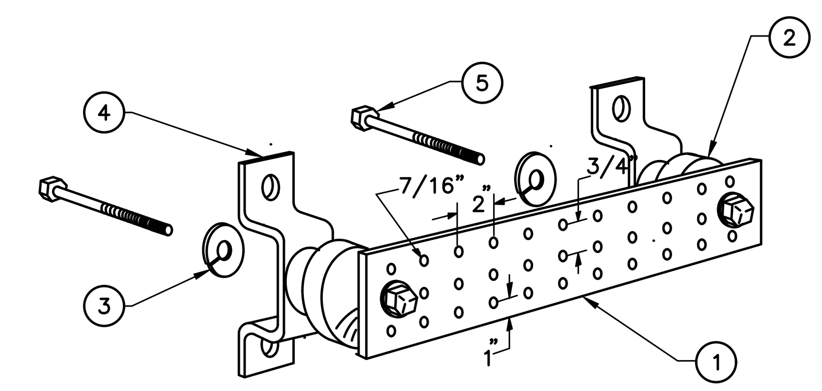
1 E-2 **RF DIAGRAM (PROVIDED BY RFDS)**
SCALE: NOT TO SCALE



NOTES:

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

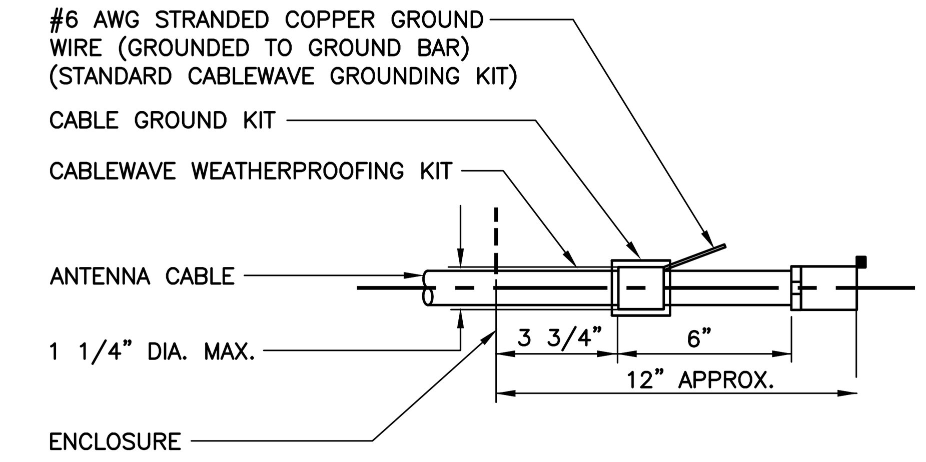
2 E-2 **CONNECTION OF GROUND WIRES TO GROUND BAR**
SCALE: NOT TO SCALE



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.

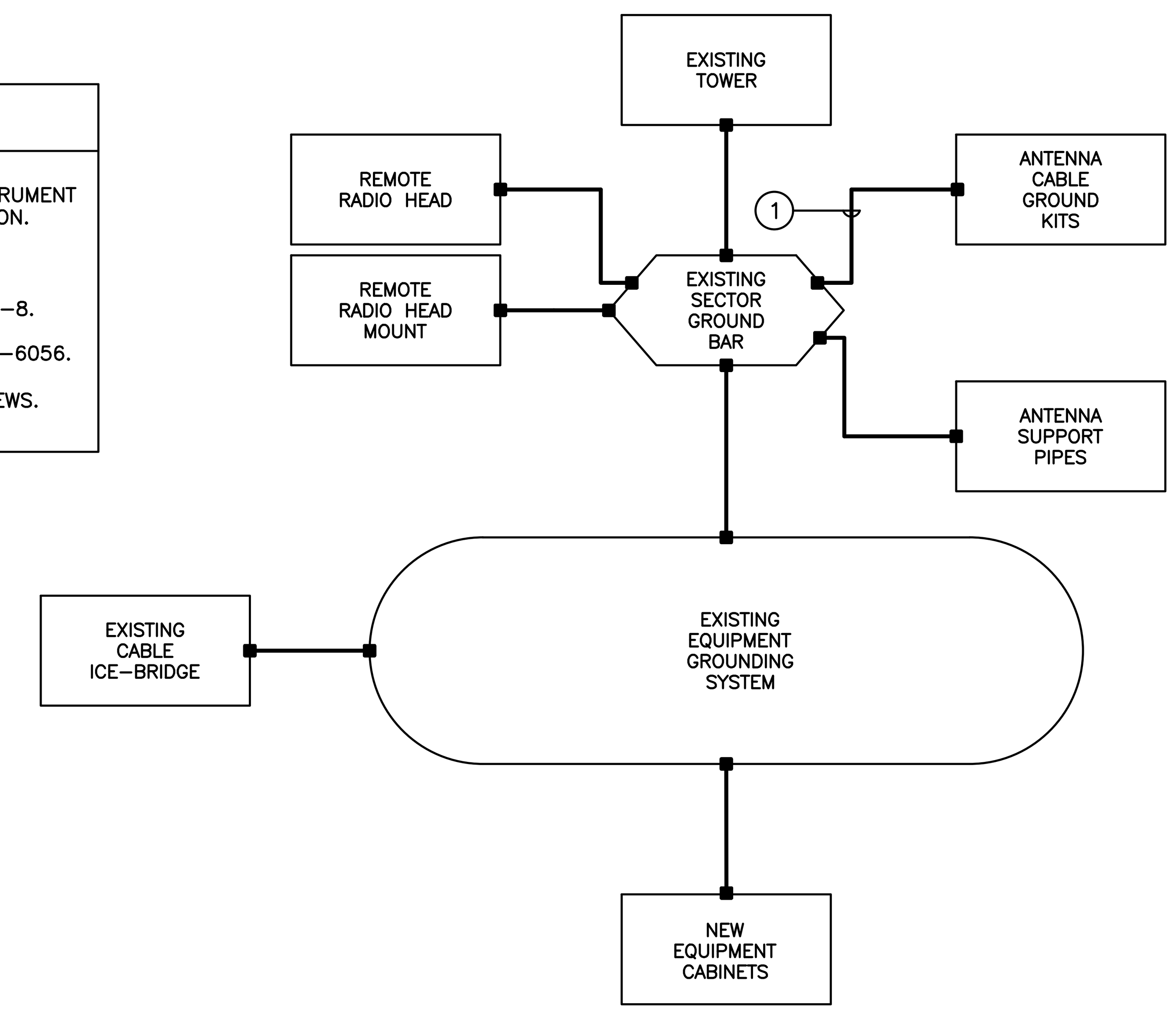
3 E-2 **GROUND BAR DETAIL**
SCALE: NOT TO SCALE

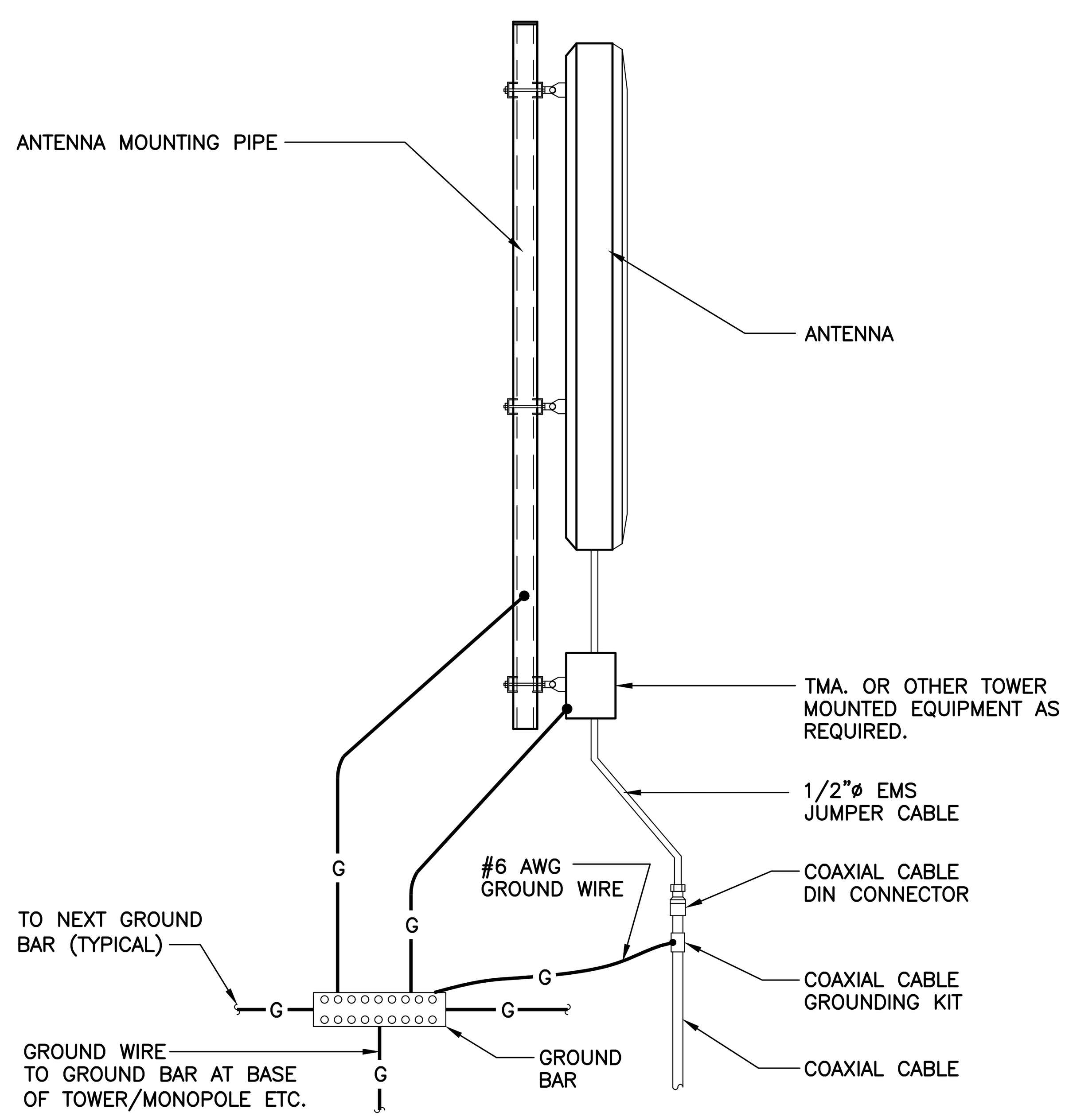


NOTES:

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

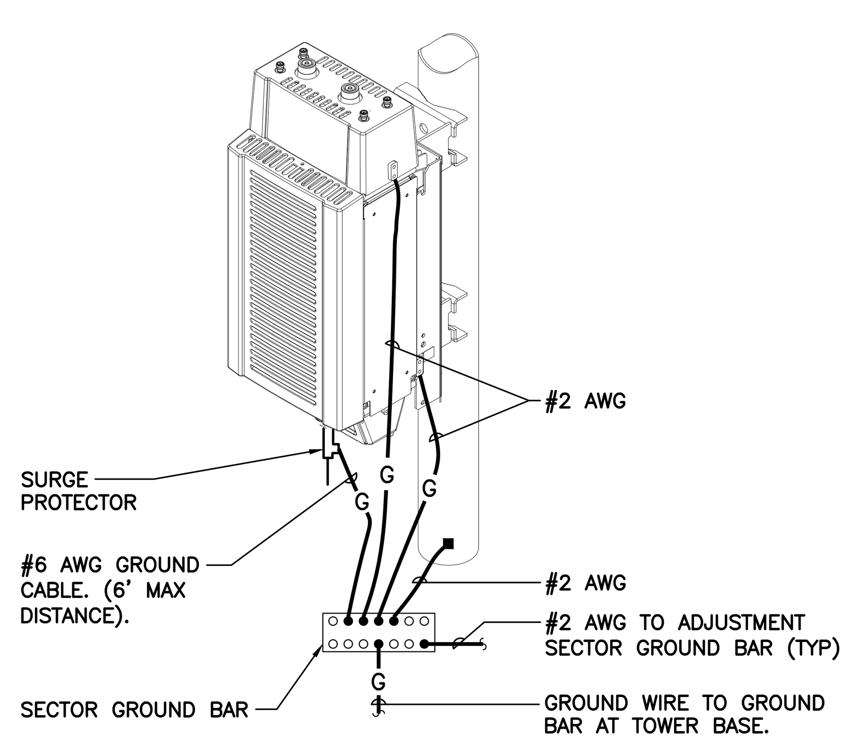
4 E-2 **ANTENNA CABLE GROUNDING DETAIL**
SCALE: NOT TO SCALE



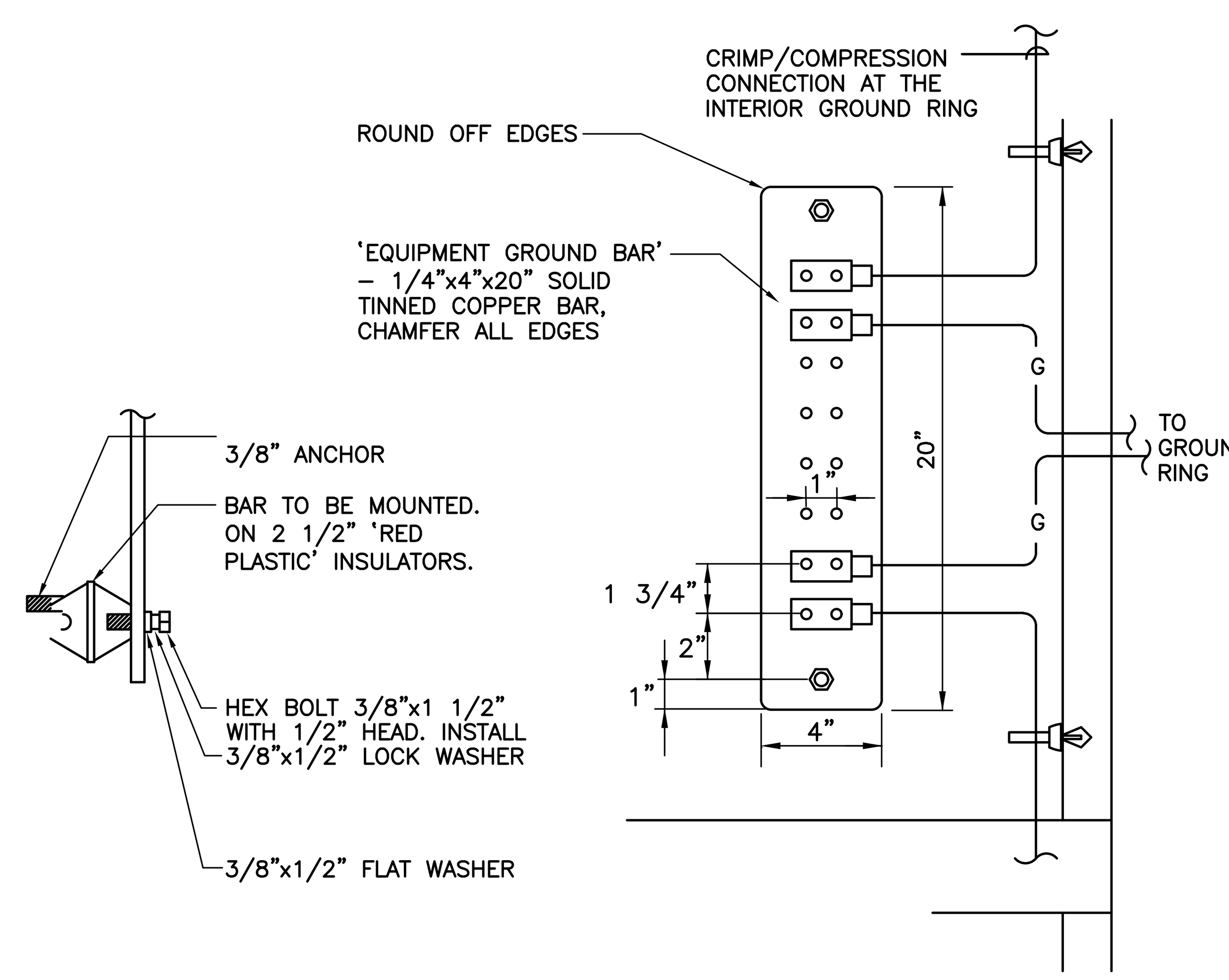


5 E-2 **TYPICAL ANTENNA GROUNDING DETAIL**
SCALE: NOT TO SCALE

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**
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 TOWER 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.

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/17/21	BSP	RTS	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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www.CentekEng.com

T-MOBILE NORTHEAST LLC
SPRINT ID: CT33XC015
SITE ID: CTHA820A
20 SELES ROAD
ASHFORD, CT 06278

DATE: 06/09/21
SCALE: AS NOTED
JOB NO. 21005.30

TYPICAL ELECTRICAL DETAILS

E-2

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.1. 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 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT
2. EXISTING 100A CIRCUIT BREAKER TO BE REMOVED
3. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS AND EQUIPMENTS AS INDICATED OR NOTED ON PLANS.
4. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.

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. 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.

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

E. 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.

F. 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.

G. 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.

H. 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.

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

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

K. 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.

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

M. 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. 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. CONDUIT

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. 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. GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A 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 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 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.

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 SO CONNECTED TO THE PANELBOARDS SUCH 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	CHK'D BY	DESCRIPTION
0	08/17/21	BSP	RTS	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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SPRINT ID: CT33XC015

SITE ID: CTHA820A

20 SELES ROAD

ASHFORD, CT 06278

DATE: 06/09/21

SCALE: AS NOTED

JOB NO. 21005.30

ELECTRICAL SPECIFICATIONS

E-3

Sheet No. 10 of 10

DEPARTMENT OF ADMINISTRATIVE SERVICES

August 23, 2021

Kyle Richers
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430

Re: Structural Analysis Report for Site #CTHA820A 702506
20 Seles Road, Ashford, CT

Mr. Richers,

Based on the Structural Analysis Report by Paul J. Ford & Company, dated July 28, 2021, the proposed additions to this tower comply with the structural requirements of the 2018 Connecticut State Building Code.

If you have any questions you may contact me as 860-713-5900.

Sincerely,

Darren Hobbs

Darren Hobbs
Deputy State Building Inspector

PAUL J. FORD & COMPANY

Report Date: July 28, 2021

Client: Everest Infrastructure Partners
Two Allegheny Center
Pittsburgh, PA 15212
Attn: Thomas Rigg
(603) 498-7462
tom.rigg@everestinfrastructure.com

Structure: Existing 190-ft Guyed Tower
Site Name: Ashford, CT
Site Reference #: 702506
Site Address: 20 Seles Road
City, County, State: Ashford, Litchfield County, CT
Latitude, Longitude: 41.5148°, -72.1057°

PJF Project: A13321-0013.001.8700

Paul J. Ford and Company is pleased to submit this “**Structural Analysis Report**” to determine the tower stress level.

Analysis Criteria:
This analysis utilizes an ultimate 3-second gust wind speed of 126 mph (converted to an equivalent 98 mph nominal 3-second gust wind speed per Section 1609.3.1 for use with TIA-222 G) as required by the 2018 Connecticut State Building Code and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Proposed Appurtenance Loads:
The structure was analyzed with the addition of the proposed appurtenance loads shown in Table 1 combined with the existing and reserved loads shown in Table 2 of this report.

Summary of Analysis Results:

Existing Structure:	Pass – 104.6%
Existing Foundation:	Pass – 102.1%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Everest Infrastructure Partners. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Christina Hedges, PE
Project Manager
chedges@pauljford.com

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER
2021.07.28
16:35:50-04'00'

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 190 ft Guyed tower designed by Nudd in June of 1998.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Wind Speed:	97.6 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
170.0	170.0	3	ericsson	AIR6449 B41 w/ Mount Pipe	3	1 5/8
		3	ericsson	RADIO 4460 B2/B25 B66_TMO		
		3	ericsson	RADIO 4480 B71_TMO		
		3	rfs celwave	APX16DWV-16DWVS-E-A20 w/ Mount Pipe		
		3	rfs celwave	APXVAALL24_43-U-NA20 w/ Mount Pipe		

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
190.0	190.0	3	alcatel lucent	B13 RRH 4X30	6 2	1 5/8 1 5/8 fiber	1
		3	alcatel lucent	B5 RRH 4T4R 160W			
		3	alcatel lucent	B66A RRH4X45			
		4	antel	LPA-80063/4CF w/ Mount Pipe			
		2	antel	LPA-80080/4CF w/ Mount Pipe			
		6	commscope	JAHH-65B-R3B w/ Mount Pipe			
		2	rfs celwave	DB-C1-12C-24AB-0Z			
		1	tower mounts	Sector Mount [SM 802-3]			
		1	tower mounts	Side Arm Mount [SO 601-3]			
178.0	178.0	1	tower mounts	Sector Mount [SM 803-3]			1
170.0	170.0	6	alcatel lucent	RRH2X50-800	4	1 1/4	2
		3	alcatel lucent	RRH4x45-AWS			
		3	alcatel lucent	TD-RRH8x20-25			
		3	commscope	DT465B-2XR w/ Mount Pipe			
		3	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe			
		1	tower mounts	Sector Mount [SM 803-3]			1
150.0	150.0	1	tower mounts	Sector Mount [SM 803-3]			1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
138.0	138.0	6	ericsson	RRUS 11	12 2 1	1 5/8 3/4 3/8	1
		6	generic	Dixplexor			
		6	generic	TMA			
		3	kmw communications	AM-X-CD-17-65-00T-RET w/ Mount Pipe			
		6	powerwave technologies	7770 w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Sector Mount [SM 404-3]			

Notes:
1) Existing Equipment
2) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference
Original Tower and Foundation Drawings	Nudd, 6/19/98	98-6111-1
Extension Design	Nudd, 7/1/02	02-9109-1
Geotechnical Report	TEP, 9/22/09	090004.13
Structural Analysis/Past Loading	Nudd, 7/8/18	118-23068

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	190 - 180	Leg	P2.875"x0.203" (2.5 STD)	1	-15.12	73.86	20.5	Pass
T2	180 - 160	Leg	P2.875"x0.203" (2.5 STD)	34	-38.13	73.73	51.7	Pass
T3	160 - 140	Leg	P2.875"x0.203" (2.5 STD)	94	-41.51	73.73	56.3	Pass
T4	140 - 120	Leg	P2.875"x0.203" (2.5 STD)	156	-51.76	73.73	70.2	Pass
T5	120 - 100	Leg	P2.875"x0.203" (2.5 STD)	216	-63.08	73.73	85.6	Pass
T6	100 - 80	Leg	P2.875"x0.203" (2.5 STD)	276	-62.18	73.73	84.3	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T7	80 - 60	Leg	P2.875"x0.203" (2.5 STD)	335	-64.13	73.73	87.0	Pass
T8	60 - 40	Leg	P2.875"x0.203" (2.5 STD)	395	-73.34	73.73	99.5	Pass
T9	40 - 20	Leg	P2.875"x0.203" (2.5 STD)	455	-77.11	73.73	104.6	Okay
T10	20 - 0	Leg	P2.875"x0.203" (2.5 STD)	515	-76.92	73.73	104.3	Okay
T1	190 - 180	Diagonal	5/8" solid	32	0.71	9.94	7.1	Pass
T2	180 - 160	Diagonal	5/8" solid	56	7.07	9.94	71.2	Pass
T3	160 - 140	Diagonal	5/8" solid	142	4.02	9.94	40.4	Pass
T4	140 - 120	Diagonal	5/8" solid	166	5.35	9.94	53.9	Pass
T5	120 - 100	Diagonal	5/8" solid	261	4.65	9.94	46.7	Pass
T6	100 - 80	Diagonal	5/8" solid	331	3.51	9.94	35.3	Pass
T7	80 - 60	Diagonal	5/8" solid	347	2.38	9.94	23.9	Pass
T8	60 - 40	Diagonal	5/8" solid	441	3.52	9.94	35.4	Pass
T9	40 - 20	Diagonal	5/8" solid	510	1.76	9.94	17.7	Pass
T10	20 - 0	Diagonal	5/8" solid	525	1.90	9.94	19.1	Pass
T1	190 - 180	Horizontal	L 1.5 x 1.5 x 3/16	26	-0.34	7.19	4.8	Pass
T2	180 - 160	Horizontal	L 1.5 x 1.5 x 3/16	51	-5.25	7.19	73.0	Pass
T3	160 - 140	Horizontal	L 1.5 x 1.5 x 3/16	146	-2.90	7.19	40.3	Pass
T4	140 - 120	Horizontal	L 1.5 x 1.5 x 3/16	170	-3.60	7.19	50.1	Pass
T5	120 - 100	Horizontal	L 1.5 x 1.5 x 3/16	257	-3.38	7.19	47.1	Pass
T6	100 - 80	Horizontal	L 1.5 x 1.5 x 3/16	326	-2.33	7.19	32.5	Pass
T7	80 - 60	Horizontal	L 1.5 x 1.5 x 3/16	351	-1.66	7.19	23.1	Pass
T8	60 - 40	Horizontal	L 1.5 x 1.5 x 3/16	446	-2.44	7.19	34.0	Pass
T9	40 - 20	Horizontal	L 1.5 x 1.5 x 3/16	506	-1.11	7.19	15.4	Pass
T10	20 - 0	Horizontal	L 1.5 x 1.5 x 3/16	530	-1.35	7.19	18.8	Pass
T1	190 - 180	Top Girt	L 1.5 x 1.5 x 3/16	6	4.93	17.09	28.8	Pass
T2	180 - 160	Top Girt	L 1.5 x 1.5 x 3/16	39	-0.50	7.19	7.0	Pass
T3	160 - 140	Top Girt	L 1.5 x 1.5 x 3/16	97	-2.20	7.19	30.5	Pass
T4	140 - 120	Top Girt	L 1.5 x 1.5 x 3/16	159	-0.58	7.19	8.1	Pass
T5	120 - 100	Top Girt	L 1.5 x 1.5 x 3/16	217	-2.05	7.19	28.5	Pass
T6	100 - 80	Top Girt	L 1.5 x 1.5 x 3/16	278	-1.34	7.19	18.6	Pass
T7	80 - 60	Top Girt	L 1.5 x 1.5 x 3/16	339	-0.52	7.19	7.2	Pass
T8	60 - 40	Top Girt	L 1.5 x 1.5 x 3/16	397	3.98	17.09	23.3	Pass
T9	40 - 20	Top Girt	L 1.5 x 1.5 x 3/16	458	-0.72	7.19	10.0	Pass
T10	20 - 0	Top Girt	L 1.5 x 1.5 x 3/16	519	-0.51	7.19	7.0	Pass
T1	190 - 180	Bottom Girt	L 1.5 x 1.5 x 3/16	9	-0.32	7.19	4.4	Pass
T2	180 - 160	Bottom Girt	L 1.5 x 1.5 x 3/16	40	-0.57	7.19	7.9	Pass
T3	160 - 140	Bottom Girt	L 1.5 x 1.5 x 3/16	101	-0.61	7.19	8.4	Pass
T4	140 - 120	Bottom Girt	L 1.5 x 1.5 x 3/16	161	-1.92	7.19	26.7	Pass
T5	120 - 100	Bottom Girt	L 1.5 x 1.5 x 3/16	221	-1.61	7.19	22.4	Pass
T6	100 - 80	Bottom Girt	L 1.5 x 1.5 x 3/16	281	-0.53	7.19	7.4	Pass
T7	80 - 60	Bottom Girt	L 1.5 x 1.5 x 3/16	342	-0.59	7.19	8.3	Pass
T8	60 - 40	Bottom Girt	L 1.5 x 1.5 x 3/16	401	-0.87	7.19	12.1	Pass
T9	40 - 20	Bottom Girt	L 1.5 x 1.5 x 3/16	462	-0.38	7.19	5.3	Pass
T10	20 - 0	Bottom Girt	L 1.5 x 1.5 x 3/16	522	1.05	17.09	6.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	190 - 180	Guy A@189.625	9/16	576	12.61	21.00	60.0	Pass
T3	160 - 140	Guy A@159.75	5/8	590	13.65	25.44	53.7	Pass
T5	120 - 100	Guy A@116.521	9/16	607	9.38	21.00	44.7	Pass
T8	60 - 40	Guy A@59.75	9/16	615	8.93	21.00	42.5	Pass
T1	190 - 180	Guy B@189.625	9/16	575	12.58	21.00	59.9	Pass
T3	160 - 140	Guy B@159.75	5/8	583	13.64	25.44	53.6	Pass
T5	120 - 100	Guy B@116.521	9/16	602	9.16	21.00	43.6	Pass
T8	60 - 40	Guy B@59.75	9/16	614	8.92	21.00	42.5	Pass
T1	190 - 180	Guy C@189.625	9/16	574	12.66	21.00	60.3	Pass
T3	160 - 140	Guy C@159.75	5/8	578	13.45	25.44	52.9	Pass
T5	120 - 100	Guy C@116.521	9/16	596	9.16	21.00	43.6	Pass
T8	60 - 40	Guy C@59.75	9/16	613	8.78	21.00	41.8	Pass
T3	160 - 140	Torque Arm Top@159.75	L 3 x 3 x 1/4	586	12.19	46.58	26.2 36.4 (b)	Pass
T5	120 - 100	Torque Arm Top@116.521	L 3 x 3 x 1/4	598	9.07	46.58	19.5 27.1 (b)	Pass
T3	160 - 140	Torque Arm Bottom@159.75	L 3 x 3 x 1/4	593	-8.04	30.52	26.4	Pass
T5	120 - 100	Torque Arm Bottom@116.521	L 3 x 3 x 1/4	612	-5.80	30.52	19.0	Pass
							Summary	
						Leg (T9)	104.6	Okay
						Diagonal (T2)	71.2	Pass
						Horizontal (T2)	73.0	Pass
						Top Girt (T3)	30.5	Pass
						Bottom Girt (T4)	26.7	Pass
						Guy A (T1)	60.0	Pass
						Guy B (T1)	59.9	Pass
						Guy C (T1)	60.3	Pass
						Torque Arm Top (T3)	36.4	Pass
						Torque Arm Bottom (T3)	26.4	Pass
						Bolt Checks	36.4	Pass
						Rating =	104.6	Okay

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Base Foundation (Structure)		65.3	Pass
2	Base Foundation (Soil Interaction)		102.1	Okay
	Guy Anchor Shaft		69.7	Pass
	Guy Anchor Foundation Structural		55.3	Pass
	Guy Anchor Foundation Soil Interaction		99.8	Pass

Structure Rating (max from all components) =	**104.6%**

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 105% are considered acceptable based on analysis methods used.

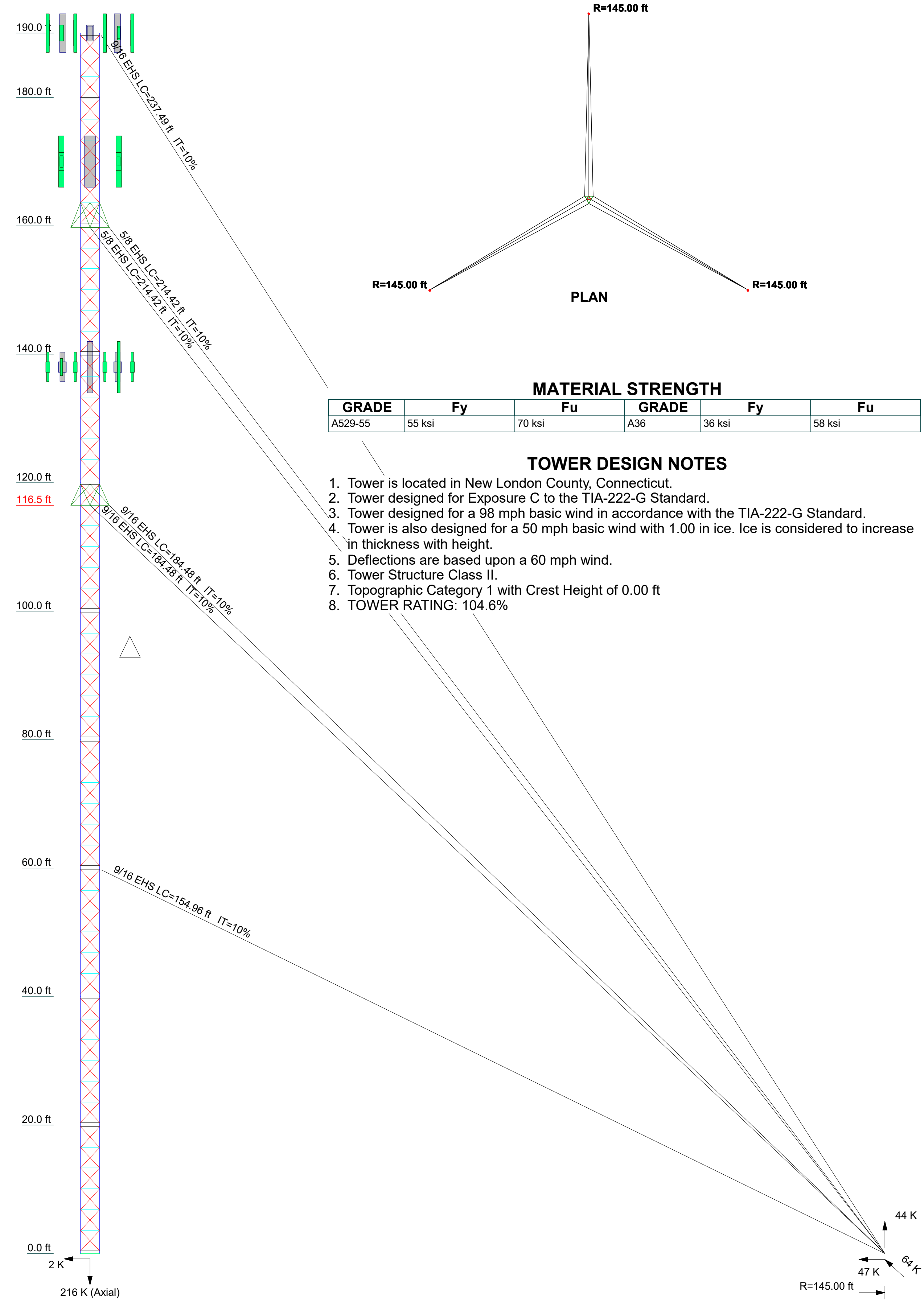
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P2.875"x0.203" (2.5 STD)									
Leg Grade	A529-55									
Diagonals	SR 5/8" solid									
Diagonal Grade	A36									
Top Girts	L 1.5 x 1.5 x 3/16									
Bottom Girts	L 1.5 x 1.5 x 3/16									
Horizontals	L 1.5 x 1.5 x 3/16									
Face Width (ft)	3.5									
# Panels @ (ft)	59 @ 3.20833									
Weight (K) 6.9	0.7	0.7	0.7	0.7	0.7	0.9	0.7	0.9	0.7	0.3



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A529-55	55 ksi	70 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 98 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 104.6%

ALL REACTIONS ARE FACTORED

Paul J. Ford and Company 250 E. Broad St., Ste 600 Columbus, OH 43215 Phone: 614-221-6679 FAX:	Job: ***Existing 190' GT Ashford, CT***	
	Project: ***702506 (PJF# 13321-0013)***	
	Client: Everest	Drawn by: Chrissy Hedges	App'd:
	Code: TIA-222-G	Date: 07/28/21	Scale: NTS
	Path: G:\TOWER\133_Everest Infrastructure Partners\2021\13321-0013_Ashford, CT\13321-0013.001.8700_SA\13321-0013.001.eri	Dwg No. E-1

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 190.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and 3.50 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in New London County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 98 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 30 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Safety factor used in guy design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

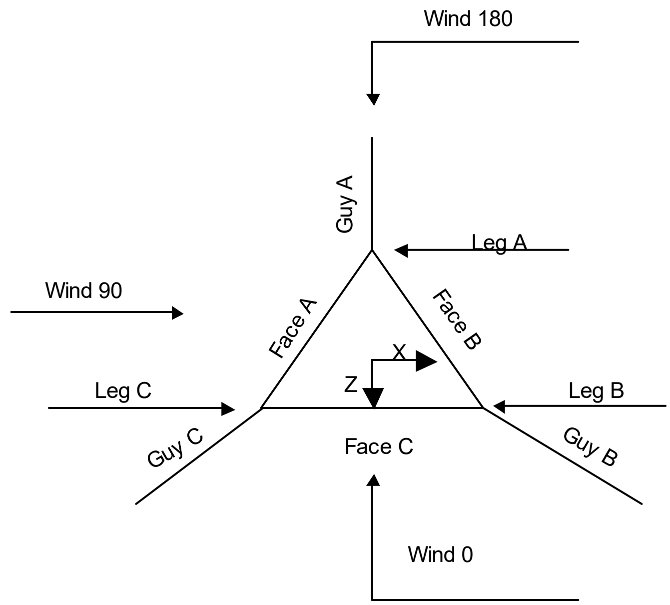
Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
√ SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
√ Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
√ Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-G Bracing Resist. Exemption
Use TIA-222-G Tension Splice Exemption

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	*Tower Elevation* ft	*Assembly Database*	*Description*	*Section Width* ft	*Number of Sections*	*Section Length* ft
T1	190.00-180.00			3.50	1	10.00
T2-T10	180.00-0.00			3.50	9	20.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation* ft	*Diagonal Spacing* ft	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset* in	*Bottom Girt Offset* in
T1	190.00-180.00	3.21	TX Brace	No	Yes	4.5000	0.0000
T2-T10	180.00-0.00	3.21	TX Brace	No	Yes	3.0000	4.5000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 190.00-180.00	Pipe	P2.875"x0.203" (2.5 STD)	A529-55 (55 ksi)	Solid Round	5/8" solid	A36 (36 ksi)
T2-T10	Pipe	P2.875"x0.203" (2.5 STD)	A529-55	Solid Round	5/8" solid	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
180.00-0.00			(55 ksi)			(36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 190.00-180.00	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2-T10 180.00-0.00	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 190.00-180.00	None	Solid Round		A36 (36 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)
T2-T10 180.00-0.00	None	Solid Round		A36 (36 ksi)	Single Angle	L 1.5 x 1.5 x 3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000	36.0000
T2-T10 180.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.02	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

			K Factors[1]							
Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 190.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.85 0.85	1 1
T2-T10 180.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.85 0.85	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg*		*Diagonal*		*Top Girt*		*Bottom Girt*		*Mid Girt*		*Long Horizontal*		*Short Horizontal*	
	Net Width Deduct in	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*
T1 190.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2-T10 180.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Elevation ft	*Redundant Horizontal*		*Redundant Diagonal*		*Redundant Sub-Diagonal*		*Redundant Sub-Horizontal*		*Redundant Vertical*		*Redundant Hip*		*Redundant Hip Diagonal*	
	Net Width Deduct in	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*	*Net Width Deduct in*	*U*
T1 190.00-180.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2-T10 180.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Connection Type*	*Leg*		*Diagonal*		*Top Girt*		*Bottom Girt*		*Mid Girt*		*Long Horizontal*		*Short Horizontal*	
		Bolt Size in	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*	*Bolt Size in*	*No.*
T1 190.00-180.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2-T10 180.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	*Guy Grade*		*Guy Size*	*Initial Tension K*	*%*	*Guy Modulus ksi*	*Guy Weight plf*	*L_u ft*	*Anchor Radius ft*	*Anchor Azimuth Adj. °*	*Anchor Elevation ft*	*End Fitting Efficiency %*
189.625	EHS	A	9/16	3.50	10%	23000	0.671	237.31	145.00	0.0000	0.00	100%
		B	9/16	3.50	10%	23000	0.671	237.31	145.00	0.0000	0.00	100%
		C	9/16	3.50	10%	23000	0.671	237.31	145.00	0.0000	0.00	100%
159.75	EHS	A	5/8	4.24	10%	23000	0.813	214.26	145.00	0.0000	0.00	100%
		B	5/8	4.24	10%	23000	0.813	214.26	145.00	0.0000	0.00	100%
		C	5/8	4.24	10%	23000	0.813	214.26	145.00	0.0000	0.00	100%
116.521	EHS	A	9/16	3.50	10%	23000	0.671	184.34	145.00	0.0000	0.00	100%
		B	9/16	3.50	10%	23000	0.671	184.34	145.00	0.0000	0.00	100%
		C	9/16	3.50	10%	23000	0.671	184.34	145.00	0.0000	0.00	100%
59.75	EHS	A	9/16	3.50	10%	23000	0.671	154.84	145.00	0.0000	0.00	100%
		B	9/16	3.50	10%	23000	0.671	154.84	145.00	0.0000	0.00	100%
		C	9/16	3.50	10%	23000	0.671	154.84	145.00	0.0000	0.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	*Mount Type*	*Torque-Arm Spread ft*	*Torque-Arm Leg Angle °*	*Torque-Arm Style*	*Torque-Arm Grade*	*Torque-Arm Type*	*Torque-Arm Size*
189.625	Corner						
159.75	Torque Arm	7.00	15.0000	Dog Ear	A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4
116.521	Torque Arm	7.00	15.0000	Dog Ear	A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4
59.75	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	*Diagonal Grade*	*Diagonal Type*	*Upper Diagonal Size*	*Lower Diagonal Size*	*Is Strap.*	*Pull-Off Grade*	*Pull-Off Type*	*Pull-Off Size*
189.63	A36 (36 ksi)	Solid Round				A36 (36 ksi)	Single Angle	
159.75	A36 (36 ksi)	Solid Round				A36 (36 ksi)	Single Angle	
116.52	A36 (36 ksi)	Solid Round				A36 (36 ksi)	Single Angle	
59.75	A36 (36 ksi)	Solid Round				A36 (36 ksi)	Single Angle	

Guy Data *(cont'd)*

Guy Elevation ft	*Cable Weight A K*	*Cable Weight B K*	*Cable Weight C K*	*Cable Weight D K*	*Tower Intercept A ft*	*Tower Intercept B ft*	*Tower Intercept C ft*	*Tower Intercept D ft*
189.625	0.16	0.16	0.16		5.31 4.0 sec/pulse	5.31 4.0 sec/pulse	5.31 4.0 sec/pulse	
159.75	0.17	0.17	0.17		4.34 3.6 sec/pulse	4.34 3.6 sec/pulse	4.34 3.6 sec/pulse	
116.521	0.12	0.12	0.12		3.22 3.1 sec/pulse	3.22 3.1 sec/pulse	3.22 3.1 sec/pulse	
59.75	0.10	0.10	0.10		2.29 2.6 sec/pulse	2.29 2.6 sec/pulse	2.29 2.6 sec/pulse	

Guy Data *(cont'd)*

			Torque Arm		*Pull Off*		*Diagonal*	
Guy Elevation ft	*Calc K Single Angles*	*Calc K Solid Rounds*	K_x	K_y	K_x	K_y	K_x	K_y
189.625	Yes	Yes			1	1	1	1
159.75	Yes	Yes	1	1	1	1	1	1
116.521	Yes	Yes	1	1	1	1	1	1
59.75	Yes	Yes			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
189.625	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
159.75	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
116.521	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1
59.75	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	No	No	Ar (CaAa)	190.00 - 5.00	0.0000	-0.45	1	1	0.3750	0.3750		0.22
5/8" ladder rung (12" long 16" oc)	A	No	No	Ar (CaAa)	190.00 - 0.00	0.0000	-0.4	1	1	0.4690	0.4690		0.78
LDF7-50A(1-5/8") (includes 2 hybrid)	C	No	No	Ar (CaAa)	190.00 - 5.00	0.0000	0.25	8	4	0.5000	1.9800		0.82
LDF7-50A(1-5/8")	B	No	No	Ar (CaAa)	138.00 - 5.00	0.0000	0.5	12	2	1.0000 0.5200	1.9800		0.82
FB-L98-002-XXX(3/8)	C	No	No	Ar (CaAa)	138.00 - 5.00	0.0000	-0.46	1	1	0.3937	0.3937		0.06
WR-VG86ST-BRD(3/4)	C	No	No	Ar (CaAa)	138.00 - 5.00	0.0000	-0.45	2	1	0.7950	0.7950		0.58
HCS 6X12 4AWG(1-5/8) ***	A	No	No	Ar (CaAa)	170.00 - 5.00	0.0000	0.25	3	3	0.5000	1.6600		2.40

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) LPA-80080/4CF w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.86 3.22 3.59	6.57 7.19 7.84	0.03 0.08 0.13
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	6.38 6.78 7.19	6.60 7.23 7.88	0.04 0.10 0.18
(2) LPA-80063/4CF w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice	6.38 6.78 7.19	6.60 7.23 7.88	0.04 0.10 0.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice			
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	9.35 9.92 10.46	7.65 8.83 9.73	0.09 0.17 0.25
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	9.35 9.92 10.46	7.65 8.83 9.73	0.09 0.17 0.25
(2) JAHH-65B-R3B_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	9.35 9.92 10.46	7.65 8.83 9.73	0.09 0.17 0.25
B66A RRH4X45	A	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	B	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B66A RRH4X45	C	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.58 2.79 3.01	1.63 1.81 2.00	0.07 0.09 0.11
B13 RRH 4X30	A	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	B	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B13 RRH 4X30	C	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.32 1.48 1.64	0.06 0.07 0.09
B5 RRH 4T4R 160W	A	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	1.79 1.96 2.14	1.15 1.29 1.44	0.04 0.05 0.07
B5 RRH 4T4R 160W	B	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	1.79 1.96 2.14	1.15 1.29 1.44	0.04 0.05 0.07
B5 RRH 4T4R 160W	C	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	1.79 1.96 2.14	1.15 1.29 1.44	0.04 0.05 0.07
DB-C1-12C-24AB-0Z	A	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	4.06 4.32 4.58	3.10 3.34 3.58	0.03 0.07 0.11
DB-C1-12C-24AB-0Z	C	From Leg	4.00 0.00 0.00	0.0000	190.00	No Ice 1/2" Ice 1" Ice	4.06 4.32 4.58	3.10 3.34 3.58	0.03 0.07 0.11
Sector Mount [SM 802-3]	C	None		0.0000	190.00	No Ice 1/2" Ice 1" Ice	25.34 33.44 41.56	25.34 33.44 41.56	0.93 1.39 1.98
***									
Sector Mount [SM 803-3]	C	None		0.0000	178.00	No Ice 1/2" Ice	40.01 50.70 61.54	40.01 50.70 61.54	0.98 1.69 2.58

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
						1" Ice			
***									
APX16DWV-16DWVS-E-A20_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	6.82 7.28 7.72	3.49 4.26 4.96	0.06 0.11 0.16
APX16DWV-16DWVS-E-A20_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	6.82 7.28 7.72	3.49 4.26 4.96	0.06 0.11 0.16
APX16DWV-16DWVS-E-A20_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	6.82 7.28 7.72	3.49 4.26 4.96	0.06 0.11 0.16
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	10.87 12.39 13.94	0.18 0.32 0.46
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	10.87 12.39 13.94	0.18 0.32 0.46
APXVAALL24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	10.87 12.39 13.94	0.18 0.32 0.46
AIR6449 B41_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	5.89 6.26 6.63	3.28 3.74 4.22	0.12 0.17 0.22
AIR6449 B41_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	5.89 6.26 6.63	3.28 3.74 4.22	0.12 0.17 0.22
AIR6449 B41_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	5.89 6.26 6.63	3.28 3.74 4.22	0.12 0.17 0.22
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	2.14 2.32 2.51	1.69 1.85 2.02	0.11 0.13 0.16
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	2.14 2.32 2.51	1.69 1.85 2.02	0.11 0.13 0.16
RADIO 4460 B2/B25 B66_TMO	C	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	2.14 2.32 2.51	1.69 1.85 2.02	0.11 0.13 0.16
RADIO 4480 B71_TMO	A	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.28	1.38 1.54 1.71	0.09 0.11 0.14
RADIO 4480 B71_TMO	B	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.28	1.38 1.54 1.71	0.09 0.11 0.14
RADIO 4480 B71_TMO	C	From Leg	4.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.28	1.38 1.54 1.71	0.09 0.11 0.14
Sector Mount [SM 803-3]	C	None		0.0000	170.00	No Ice 1/2" Ice	40.01 50.70 61.54	40.01 50.70 61.54	0.98 1.69 2.58

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
						1" Ice			
***									
Sector Mount [SM 803-3]	C	None		0.0000	150.00	No Ice 1/2" Ice 1" Ice	40.01 50.70 61.54	40.01 50.70 61.54	0.98 1.69 2.58
***									
(2) 7770_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) TMA (LGP 17201)	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) TMA (LGP 17201)	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) TMA (LGP 17201)	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.47 0.57 0.68	0.03 0.04 0.06
(2) Dixplexor (CBC7821-DF)	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.45 0.54 0.63	0.19 0.25 0.32	0.01 0.01 0.02
(2) Dixplexor (CBC7821-DF)	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.45 0.54 0.63	0.19 0.25 0.32	0.01 0.01 0.02
(2) Dixplexor (CBC7821-DF)	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	0.45 0.54 0.63	0.19 0.25 0.32	0.01 0.01 0.02
AM-X-CD-17-65-00T-RET_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.55 12.27 13.00	8.94 10.45 11.99	0.09 0.18 0.27
AM-X-CD-17-65-00T-RET_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.55 12.27 13.00	8.94 10.45 11.99	0.09 0.18 0.27
AM-X-CD-17-65-00T-RET_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	11.55 12.27 13.00	8.94 10.45 11.99	0.09 0.18 0.27
(2) RRUS 11	A	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
(2) RRUS 11	B	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
(2) RRUS 11	C	From Leg	4.00 0.00	0.0000	138.00	No Ice 1/2"	2.79 3.00	1.19 1.34	0.05 0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
			0.00			Ice 1" Ice	3.21	1.50	0.10
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
Sector Mount [SM 404-3]	C	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice	20.43 28.68 36.80	20.43 28.68 36.80	0.92 1.31 1.84
***									

Load Combinations

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

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy C @ 145 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-2.27	-1.95	1.13
	Max. H_x	10	-2.27	-1.95	1.13
	Max. H_z	3	-41.24	-37.90	22.49
	Min. Vert	4	-41.64	-38.63	22.29
	Min. H_x	4	-41.64	-38.63	22.29
	Min. H_z	10	-2.27	-1.95	1.13
Guy B @ 145 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-2.02	1.52	0.88
	Max. H_x	12	-42.92	40.38	23.32
	Max. H_z	13	-43.04	40.26	23.91
	Min. Vert	13	-43.04	40.26	23.91
	Min. H_x	6	-2.02	1.52	0.88
	Min. H_z	6	-2.02	1.52	0.88
Guy A @ 145 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-1.97	0.00	-1.68
	Max. H_x	24	-24.74	1.56	-32.58
	Max. H_z	2	-1.97	0.00	-1.68
	Min. Vert	8	-43.56	-0.02	-47.46
	Min. H_x	18	-24.74	-1.56	-32.58
	Min. H_z	8	-43.56	-0.02	-47.46
Mast	Max. Vert	19	215.72	-0.13	-0.04
	Max. H_x	12	89.66	1.40	0.81
	Max. H_z	2	100.32	-0.02	1.64
	Max. M_x	1	0.00	0.02	0.01
	Max. M_z	1	0.00	0.02	0.01
	Max. Torsion	1	0.00	0.02	0.01
	Min. Vert	1	66.50	0.02	0.01
	Min. H_x	6	99.05	-1.35	-0.78
	Min. H_z	8	90.07	0.00	-1.67
	Min. M_x	1	0.00	0.02	0.01
	Min. M_z	1	0.00	0.02	0.01
	Min. Torsion	1	0.00	0.02	0.01

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	1.686	29	0.0724	0.1050
T2	180 - 160	1.538	33	0.0798	0.0689
T3	160 - 140	1.153	33	0.0731	0.0142
T4	140 - 120	1.018	33	0.0647	0.1352
T5	120 - 100	0.679	33	0.0515	0.0599
T6	100 - 80	0.727	32	0.0230	0.2634
T7	80 - 60	0.702	32	0.0215	0.7192
T8	60 - 40	0.501	32	0.0183	0.9783
T9	40 - 20	0.599	38	0.0255	1.1900
T10	20 - 0	0.432	32	0.0552	1.5904

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	(2) LPA-80080/4CF w/ Mount Pipe	29	1.686	0.0724	0.1050	22580

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.63	Guy	29	1.681	0.0727	0.1036	22580
178.00	Sector Mount [SM 803-3]	33	1.500	0.0803	0.0619	16007
170.00	APX16DWV-16DWVS-E-A20_TIA w/ Mount Pipe	33	1.331	0.0788	0.0354	37027
159.75	Guy	33	1.150	0.0730	0.0152	8539
150.00	Sector Mount [SM 803-3]	33	1.086	0.0684	0.0842	221081
138.00	(2) 7770_TIA w/ Mount Pipe	33	0.991	0.0640	0.1313	9141
116.52	Guy	32	0.656	0.0466	0.0665	7795
59.75	Guy	32	0.501	0.0183	0.9805	8394

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	15.234	2	0.8498	0.2913
T2	180 - 160	13.618	2	0.8754	0.2121
T3	160 - 140	10.136	2	0.7964	0.0775
T4	140 - 120	7.693	2	0.6785	0.3863
T5	120 - 100	5.015	2	0.4979	0.3858
T6	100 - 80	4.007	2	0.2449	1.0414
T7	80 - 60	3.438	13	0.1660	1.9350
T8	60 - 40	2.636	13	0.1247	2.5248
T9	40 - 20	2.491	13	0.1465	2.9928
T10	20 - 0	1.640	13	0.2751	3.6616

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
190.00	(2) LPA-80080/4CF w/ Mount Pipe	2	15.234	0.8498	0.2913	7344
189.63	Guy	2	15.175	0.8512	0.2884	7344
178.00	Sector Mount [SM 803-3]	2	13.268	0.8748	0.1919	5261
170.00	APX16DWV-16DWVS-E-A20_TIA w/ Mount Pipe	2	11.813	0.8512	0.1091	8605
159.75	Guy	2	10.100	0.7949	0.0796	2406
150.00	Sector Mount [SM 803-3]	2	8.875	0.7396	0.2594	11539
138.00	(2) 7770_TIA w/ Mount Pipe	2	7.424	0.6648	0.3709	3681
116.52	Guy	2	4.713	0.4532	0.4415	1999
59.75	Guy	13	2.631	0.1243	2.5306	2794

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	190	Leg	A325N	0.7500	4	1.26	29.82	0.042 ✔	1	Bolt Tension
T2	180	Leg	A325N	0.7500	4	3.19	29.82	0.107 ✔	1	Bolt Tension
T3	160	Leg	A325N	0.7500	4	3.47	29.82	0.116 ✔	1	Bolt Tension
		Torque Arm Top@159.75	A325N	0.7500	2	6.09	16.75	0.364 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Torque Arm Bottom@159.75	A325N	0.7500	2	4.02	17.89	0.225 ✔	1	Bolt Shear
T4	140	Leg	A325N	0.7500	4	4.33	29.82	0.145 ✔	1	Bolt Tension
T5	120	Leg	A325N	0.7500	4	4.93	29.82	0.165 ✔	1	Bolt Tension
		Torque Arm Top@116.521	A325N	0.7500	2	4.54	16.75	0.271 ✔	1	Member Bearing
		Torque Arm Bottom@116.521	A325N	0.7500	2	2.90	17.89	0.162 ✔	1	Bolt Shear
T6	100	Leg	A325N	0.7500	4	5.17	29.82	0.174 ✔	1	Bolt Tension
T7	80	Leg	A325N	0.7500	4	5.36	29.82	0.180 ✔	1	Bolt Tension
T8	60	Leg	A325N	0.7500	4	6.13	29.82	0.206 ✔	1	Bolt Tension
T9	40	Leg	A325N	0.7500	4	6.39	29.82	0.214 ✔	1	Bolt Tension
T10	20	Leg	A325N	0.7500	4	6.03	29.82	0.202 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T1	189.63 (A) (576)	9/16 EHS	3.50	35.00	12.61	21.00	1.000	1.666 ✔
	189.63 (B) (575)	9/16 EHS	3.50	35.00	12.58	21.00	1.000	1.669 ✔
	189.63 (C) (574)	9/16 EHS	3.50	35.00	12.66	21.00	1.000	1.658 ✔
T3	159.75 (A) (589)	5/8 EHS	4.24	42.40	13.46	25.44	1.000	1.890 ✔
	159.75 (A) (590)	5/8 EHS	4.24	42.40	13.65	25.44	1.000	1.863 ✔
	159.75 (B) (583)	5/8 EHS	4.24	42.40	13.64	25.44	1.000	1.865 ✔
	159.75 (B) (584)	5/8 EHS	4.24	42.40	13.38	25.44	1.000	1.901 ✔
	159.75 (C) (577)	5/8 EHS	4.24	42.40	13.38	25.44	1.000	1.901 ✔
	159.75 (C) (578)	5/8 EHS	4.24	42.40	13.45	25.44	1.000	1.892 ✔
T5	116.52 (A) (607)	9/16 EHS	3.50	35.00	9.38	21.00	1.000	2.238 ✔
	116.52 (A) (608)	9/16 EHS	3.50	35.00	9.19	21.00	1.000	2.286 ✔
	116.52 (B) (601)	9/16 EHS	3.50	35.00	9.11	21.00	1.000	2.305 ✔
	116.52 (B) (602)	9/16 EHS	3.50	35.00	9.16	21.00	1.000	2.294 ✔
	116.52 (C) (595)	9/16 EHS	3.50	35.00	9.15	21.00	1.000	2.294 ✔
	116.52 (C) (596)	9/16 EHS	3.50	35.00	9.16	21.00	1.000	2.293 ✔
T8	59.75 (A) (615)	9/16 EHS	3.50	35.00	8.93	21.00	1.000	2.352 ✔
	59.75 (B) (614)	9/16 EHS	3.50	35.00	8.92	21.00	1.000	2.353 ✔
	59.75 (C) (613)	9/16 EHS	3.50	35.00	8.78	21.00	1.000	2.391 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	P2.875"x0.203" (2.5 STD)	10.00	3.21	40.6 K=1.00	1.7040	-15.12	73.86	0.205 [1] ✓
T2	180 - 160	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-38.13	73.73	0.517 [1] ✓
T3	160 - 140	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-41.51	73.73	0.563 [1] ✓
T4	140 - 120	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-51.76	73.73	0.702 [1] ✓
T5	120 - 100	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-63.08	73.73	0.856 [1] ✓
T6	100 - 80	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-62.18	73.73	0.843 [1] ✓
T7	80 - 60	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-64.13	73.73	0.870 [1] ✓
T8	60 - 40	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9 K=1.00	1.7040	-73.34	73.73	0.995 [1] ✓
T9	40 - 20	P2.875"x0.203" (2.5 STD) 4.8.1 (1.05 CR) - 455	20.00	3.23	40.9 K=1.00	1.7040	-77.11	73.73	**1.046** [1] ✗
T10	20 - 0	P2.875"x0.203" (2.5 STD) 4.8.1 (1.04 CR) - 515/6	20.00	3.23	40.9 K=1.00	1.7040	-76.92	73.73	**1.043** [1] ✗

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.34	7.19	0.048 [1] ✓
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-5.25	7.19	0.730 [1] ✓
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.90	7.19	0.403 [1] ✓
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.60	7.19	0.501 [1] ✓
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-3.38	7.19	0.471 [1] ✓
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.33	7.19	0.325 [1] ✓
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.66	7.19	0.231 [1] ✓
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.44	7.19	0.340 [1] ✓
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.11	7.19	0.154 [1] ✓
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2	0.5273	-1.35	7.19	0.188 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=0.96				✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.46	7.19	0.064 [1] ✔
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.50	7.19	0.070 [1] ✔
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.20	7.19	0.305 [1] ✔
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.58	7.19	0.081 [1] ✔
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-2.05	7.19	0.285 [1] ✔
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.34	7.19	0.186 [1] ✔
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.52	7.19	0.072 [1] ✔
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.72	7.19	0.100 [1] ✔
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.51	7.19	0.070 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.32	7.19	0.044 [1] ✔
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.57	7.19	0.079 [1] ✔
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.61	7.19	0.084 [1] ✔
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.92	7.19	0.267 [1] ✔
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-1.61	7.19	0.224 [1] ✔
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.53	7.19	0.074 [1] ✔
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.59	7.19	0.083 [1] ✔
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.87	7.19	0.121 [1] ✔
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	128.2 K=0.96	0.5273	-0.38	7.19	0.053 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140 (581)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-7.66	30.52	0.251 [1]
T3	160 - 140 (582)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-7.65	30.52	0.251 [1]
T3	160 - 140 (587)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-7.56	30.52	0.248 [1]
T3	160 - 140 (588)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-7.56	30.52	0.248 [1]
T3	160 - 140 (593)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-8.04	30.52	0.264 [1]
T3	160 - 140 (594)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-8.03	30.52	0.263 [1]
T5	120 - 100 (599)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-4.41	30.52	0.144 [1]
T5	120 - 100 (600)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-4.64	30.52	0.152 [1]
T5	120 - 100 (605)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-4.87	30.52	0.160 [1]
T5	120 - 100 (606)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-4.87	30.52	0.160 [1]
T5	120 - 100 (611)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-5.77	30.52	0.189 [1]
T5	120 - 100 (612)	L 3 x 3 x 1/4	3.50	2.92	89.6 K=1.51	1.4375	-5.80	30.52	0.190 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	P2.875"x0.203" (2.5 STD)	10.00	0.38	4.7	1.7040	0.00	84.35	0.000 [1]
T2	180 - 160	P2.875"x0.203" (2.5 STD)	20.00	3.23	40.9	1.7040	1.73	84.35	0.020 [1]
T4	140 - 120	P2.875"x0.203" (2.5 STD)	20.00	0.38	4.7	1.7040	0.68	84.35	0.008 [1]
T5	120 - 100	P2.875"x0.203" (2.5 STD)	20.00	0.25	3.2	1.7040	0.68	84.35	0.008 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	5/8" solid	4.75	4.42	339.7	0.3068	0.71	9.94	0.071 [1] ✔
T2	180 - 160	5/8" solid	4.76	4.44	340.7	0.3068	7.07	9.94	0.712 [1] ✔
T3	160 - 140	5/8" solid	4.76	4.44	340.7	0.3068	4.02	9.94	0.404 [1] ✔
T4	140 - 120	5/8" solid	4.76	4.44	340.7	0.3068	5.35	9.94	0.539 [1] ✔
T5	120 - 100	5/8" solid	4.76	4.44	340.7	0.3068	4.65	9.94	0.467 [1] ✔
T6	100 - 80	5/8" solid	4.76	4.44	340.7	0.3068	3.51	9.94	0.353 [1] ✔
T7	80 - 60	5/8" solid	4.76	4.44	340.7	0.3068	2.38	9.94	0.239 [1] ✔
T8	60 - 40	5/8" solid	4.76	4.44	340.7	0.3068	3.52	9.94	0.354 [1] ✔
T9	40 - 20	5/8" solid	4.76	4.44	340.7	0.3068	1.76	9.94	0.177 [1] ✔
T10	20 - 0	5/8" solid	4.76	4.44	340.7	0.3068	1.90	9.94	0.191 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.07	17.09	0.004 [1] ✔
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	4.17	17.09	0.244 [1] ✔
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.31	17.09	0.018 [1] ✔
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.31	17.09	0.018 [1] ✔
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	2.09	17.09	0.122 [1] ✔
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.08	17.09	0.005 [1] ✔
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.06	17.09	0.004 [1] ✔
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.01	17.09	0.001 [*1] ✔
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.08	17.09	0.005 [1] ✔
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.07	17.09	0.004 [1] ✔

[*] DL controls
[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio P_u / ϕP_n
T1	190 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	4.93	17.09	0.288 [1] ✔
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.10	17.09	0.006 [1] ✔
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.93	17.09	0.113 [1] ✔
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.14	17.09	0.008 [1] ✔
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	2.01	17.09	0.118 [1] ✔
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.22	17.09	0.013 [1] ✔
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.06	17.09	0.003 [1] ✔
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	3.98	17.09	0.233 [1] ✔
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.14	17.09	0.008 [1] ✔
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.11	17.09	0.006 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio P_u / ϕP_n
T1	190 - 180	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.06	17.09	0.003 [1] ✔
T2	180 - 160	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.67	17.09	0.039 [1] ✔
T3	160 - 140	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.12	17.09	0.007 [1] ✔
T4	140 - 120	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.99	17.09	0.058 [1] ✔
T5	120 - 100	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.33	17.09	0.020 [1] ✔
T6	100 - 80	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.05	17.09	0.003 [1] ✔
T7	80 - 60	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.42	17.09	0.024 [1] ✔
T8	60 - 40	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.21	17.09	0.012 [1] ✔
T9	40 - 20	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	0.07	17.09	0.004 [1] ✔
T10	20 - 0	L 1.5 x 1.5 x 3/16	3.50	3.26	85.7	0.5273	1.05	17.09	0.062 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140 (579)	L 3 x 3 x 1/4	5.21	4.75	67.2	1.4375	11.88	46.58	0.255 [1]
T3	160 - 140 (580)	L 3 x 3 x 1/4	5.21	4.75	67.2	1.4375	11.64	46.58	0.250 [1]
T3	160 - 140 (585)	L 3 x 3 x 1/4	5.21	4.75	67.2	1.4375	11.61	46.58	0.249 [1]
T3	160 - 140 (586)	L 3 x 3 x 1/4	5.21	4.75	67.2	1.4375	12.19	46.58	0.262 [1]
T3	160 - 140 (591)	L 3 x 3 x 1/4	5.21	4.75	67.2	1.4375	11.56	46.58	0.248 [1]
T3	160 - 140 (592)	L 3 x 3 x 1/4	5.21	4.75	67.2	1.4375	11.75	46.58	0.252 [1]
T5	120 - 100 (597)	L 3 x 3 x 1/4	4.76	4.14	59.3	1.4375	8.63	46.58	0.185 [1]
T5	120 - 100 (598)	L 3 x 3 x 1/4	4.76	4.14	59.3	1.4375	9.07	46.58	0.195 [1]
T5	120 - 100 (603)	L 3 x 3 x 1/4	4.76	4.14	59.3	1.4375	8.78	46.58	0.189 [1]
T5	120 - 100 (604)	L 3 x 3 x 1/4	4.76	4.14	59.3	1.4375	8.70	46.58	0.187 [1]
T5	120 - 100 (609)	L 3 x 3 x 1/4	4.76	4.14	59.3	1.4375	8.60	46.58	0.185 [1]
T5	120 - 100 (610)	L 3 x 3 x 1/4	4.76	4.14	59.3	1.4375	9.00	46.58	0.193 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140 (581)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.21	46.58	0.069 [1]
T3	160 - 140 (582)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.21	46.58	0.069 [1]
T3	160 - 140 (587)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.18	46.58	0.068 [1]
T3	160 - 140 (588)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.18	46.58	0.068 [1]
T3	160 - 140 (593)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.52	46.58	0.076 [1]
T3	160 - 140 (594)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.53	46.58	0.076 [1]
T5	120 - 100 (599)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	2.08	46.58	0.045 [1]
T5	120 - 100 (600)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	2.37	46.58	0.051 [1]
T5	120 - 100 (605)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	2.64	46.58	0.057 [1]
T5	120 - 100 (606)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	2.45	46.58	0.053 [1]
T5	120 - 100 (611)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.07	46.58	0.066 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100 (612)	L 3 x 3 x 1/4	3.50	2.92	43.6	1.4375	3.05	46.58	0.065 [1] ✔

[1] P_u / ϕP_n controls

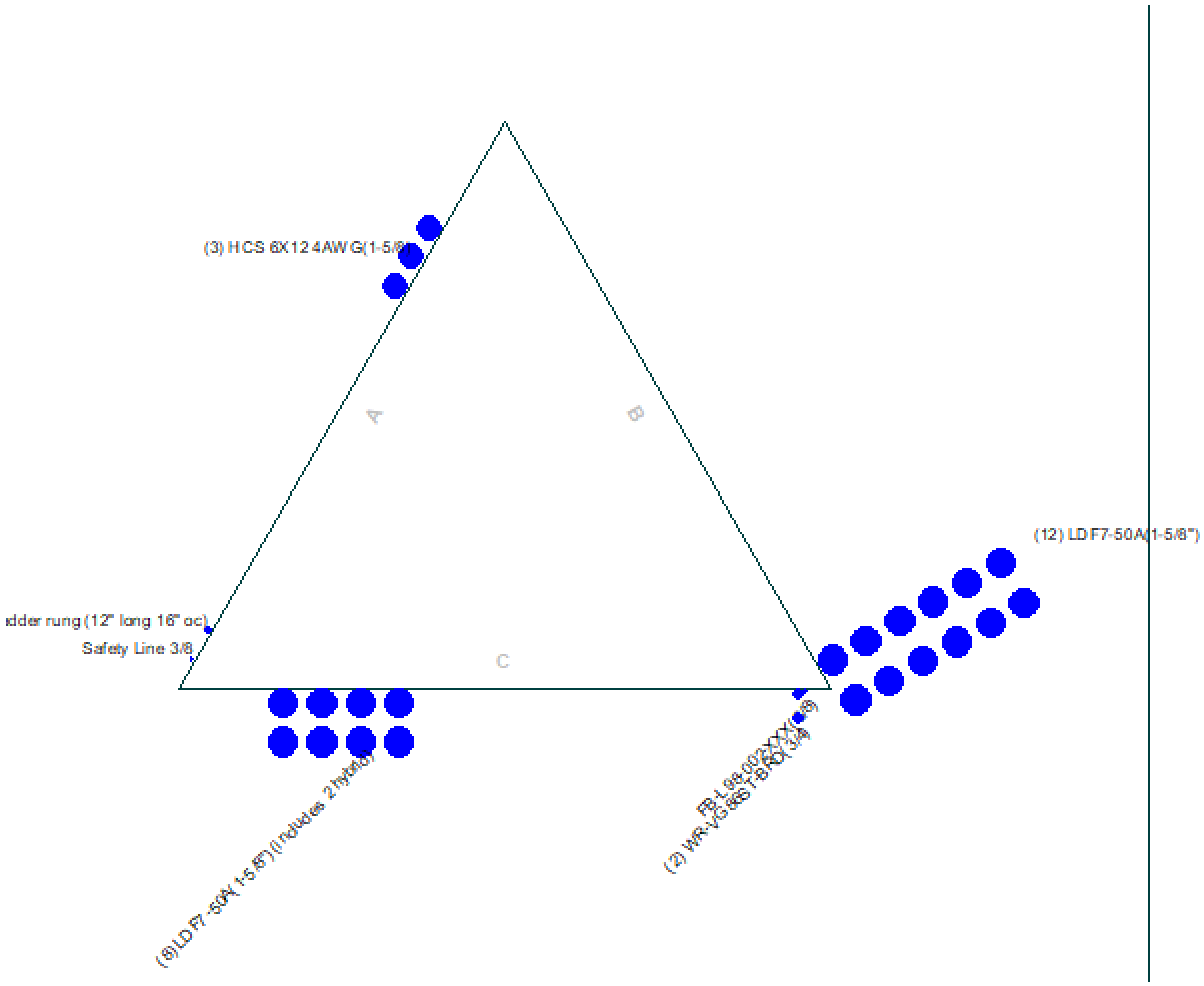
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T1	190 - 180	Leg	P2.875"x0.203" (2.5 STD)	1	-15.12	73.86	20.5	Pass
T2	180 - 160	Leg	P2.875"x0.203" (2.5 STD)	34	-38.13	73.73	51.7	Pass
T3	160 - 140	Leg	P2.875"x0.203" (2.5 STD)	94	-41.51	73.73	56.3	Pass
T4	140 - 120	Leg	P2.875"x0.203" (2.5 STD)	156	-51.76	73.73	70.2	Pass
T5	120 - 100	Leg	P2.875"x0.203" (2.5 STD)	216	-63.08	73.73	85.6	Pass
T6	100 - 80	Leg	P2.875"x0.203" (2.5 STD)	276	-62.18	73.73	84.3	Pass
T7	80 - 60	Leg	P2.875"x0.203" (2.5 STD)	335	-64.13	73.73	87.0	Pass
T8	60 - 40	Leg	P2.875"x0.203" (2.5 STD)	395	-73.34	73.73	99.5	Pass
T9	40 - 20	Leg	P2.875"x0.203" (2.5 STD)	455	-77.11	73.73	104.6	Okay
T10	20 - 0	Leg	P2.875"x0.203" (2.5 STD)	515	-76.92	73.73	104.3	Okay
T1	190 - 180	Diagonal	5/8" solid	32	0.71	9.94	7.1	Pass
T2	180 - 160	Diagonal	5/8" solid	56	7.07	9.94	71.2	Pass
T3	160 - 140	Diagonal	5/8" solid	142	4.02	9.94	40.4	Pass
T4	140 - 120	Diagonal	5/8" solid	166	5.35	9.94	53.9	Pass
T5	120 - 100	Diagonal	5/8" solid	261	4.65	9.94	46.7	Pass
T6	100 - 80	Diagonal	5/8" solid	331	3.51	9.94	35.3	Pass
T7	80 - 60	Diagonal	5/8" solid	347	2.38	9.94	23.9	Pass
T8	60 - 40	Diagonal	5/8" solid	441	3.52	9.94	35.4	Pass
T9	40 - 20	Diagonal	5/8" solid	510	1.76	9.94	17.7	Pass
T10	20 - 0	Diagonal	5/8" solid	525	1.90	9.94	19.1	Pass
T1	190 - 180	Horizontal	L 1.5 x 1.5 x 3/16	26	-0.34	7.19	4.8	Pass
T2	180 - 160	Horizontal	L 1.5 x 1.5 x 3/16	51	-5.25	7.19	73.0	Pass
T3	160 - 140	Horizontal	L 1.5 x 1.5 x 3/16	146	-2.90	7.19	40.3	Pass
T4	140 - 120	Horizontal	L 1.5 x 1.5 x 3/16	170	-3.60	7.19	50.1	Pass
T5	120 - 100	Horizontal	L 1.5 x 1.5 x 3/16	257	-3.38	7.19	47.1	Pass
T6	100 - 80	Horizontal	L 1.5 x 1.5 x 3/16	326	-2.33	7.19	32.5	Pass
T7	80 - 60	Horizontal	L 1.5 x 1.5 x 3/16	351	-1.66	7.19	23.1	Pass
T8	60 - 40	Horizontal	L 1.5 x 1.5 x 3/16	446	-2.44	7.19	34.0	Pass
T9	40 - 20	Horizontal	L 1.5 x 1.5 x 3/16	506	-1.11	7.19	15.4	Pass
T10	20 - 0	Horizontal	L 1.5 x 1.5 x 3/16	530	-1.35	7.19	18.8	Pass
T1	190 - 180	Top Girt	L 1.5 x 1.5 x 3/16	6	4.93	17.09	28.8	Pass
T2	180 - 160	Top Girt	L 1.5 x 1.5 x 3/16	39	-0.50	7.19	7.0	Pass
T3	160 - 140	Top Girt	L 1.5 x 1.5 x 3/16	97	-2.20	7.19	30.5	Pass
T4	140 - 120	Top Girt	L 1.5 x 1.5 x 3/16	159	-0.58	7.19	8.1	Pass
T5	120 - 100	Top Girt	L 1.5 x 1.5 x 3/16	217	-2.05	7.19	28.5	Pass
T6	100 - 80	Top Girt	L 1.5 x 1.5 x 3/16	278	-1.34	7.19	18.6	Pass
T7	80 - 60	Top Girt	L 1.5 x 1.5 x 3/16	339	-0.52	7.19	7.2	Pass
T8	60 - 40	Top Girt	L 1.5 x 1.5 x 3/16	397	3.98	17.09	23.3	Pass
T9	40 - 20	Top Girt	L 1.5 x 1.5 x 3/16	458	-0.72	7.19	10.0	Pass
T10	20 - 0	Top Girt	L 1.5 x 1.5 x 3/16	519	-0.51	7.19	7.0	Pass
T1	190 - 180	Bottom Girt	L 1.5 x 1.5 x 3/16	9	-0.32	7.19	4.4	Pass
T2	180 - 160	Bottom Girt	L 1.5 x 1.5 x 3/16	40	-0.57	7.19	7.9	Pass
T3	160 - 140	Bottom Girt	L 1.5 x 1.5 x 3/16	101	-0.61	7.19	8.4	Pass
T4	140 - 120	Bottom Girt	L 1.5 x 1.5 x 3/16	161	-1.92	7.19	26.7	Pass
T5	120 - 100	Bottom Girt	L 1.5 x 1.5 x 3/16	221	-1.61	7.19	22.4	Pass
T6	100 - 80	Bottom Girt	L 1.5 x 1.5 x 3/16	281	-0.53	7.19	7.4	Pass
T7	80 - 60	Bottom Girt	L 1.5 x 1.5 x 3/16	342	-0.59	7.19	8.3	Pass
T8	60 - 40	Bottom Girt	L 1.5 x 1.5 x 3/16	401	-0.87	7.19	12.1	Pass
T9	40 - 20	Bottom Girt	L 1.5 x 1.5 x 3/16	462	-0.38	7.19	5.3	Pass
T10	20 - 0	Bottom Girt	L 1.5 x 1.5 x 3/16	522	1.05	17.09	6.2	Pass
T1	190 - 180	Guy A@189.625	9/16	576	12.61	21.00	60.0	Pass
T3	160 - 140	Guy A@159.75	5/8	590	13.65	25.44	53.7	Pass
T5	120 - 100	Guy A@116.521	9/16	607	9.38	21.00	44.7	Pass
T8	60 - 40	Guy A@59.75	9/16	615	8.93	21.00	42.5	Pass
T1	190 - 180	Guy B@189.625	9/16	575	12.58	21.00	59.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\o P_{allow}$ K	% Capacity	Pass Fail
T3	160 - 140	Guy B@159.75	5/8	583	13.64	25.44	53.6	Pass
T5	120 - 100	Guy B@116.521	9/16	602	9.16	21.00	43.6	Pass
T8	60 - 40	Guy B@59.75	9/16	614	8.92	21.00	42.5	Pass
T1	190 - 180	Guy C@189.625	9/16	574	12.66	21.00	60.3	Pass
T3	160 - 140	Guy C@159.75	5/8	578	13.45	25.44	52.9	Pass
T5	120 - 100	Guy C@116.521	9/16	596	9.16	21.00	43.6	Pass
T8	60 - 40	Guy C@59.75	9/16	613	8.78	21.00	41.8	Pass
T3	160 - 140	Torque Arm Top@159.75	L 3 x 3 x 1/4	586	12.19	46.58	26.2 36.4 (b)	Pass
T5	120 - 100	Torque Arm Top@116.521	L 3 x 3 x 1/4	598	9.07	46.58	19.5 27.1 (b)	Pass
T3	160 - 140	Torque Arm Bottom@159.75	L 3 x 3 x 1/4	593	-8.04	30.52	26.4	Pass
T5	120 - 100	Torque Arm Bottom@116.521	L 3 x 3 x 1/4	612	-5.80	30.52	19.0	Pass
							Summary	
						Leg (T9)	104.6	Okay
						Diagonal (T2)	71.2	Pass
						Horizontal (T2)	73.0	Pass
						Top Girt (T3)	30.5	Pass
						Bottom Girt (T4)	26.7	Pass
						Guy A (T1)	60.0	Pass
						Guy B (T1)	59.9	Pass
						Guy C (T1)	60.3	Pass
						Torque Arm Top (T3)	36.4	Pass
						Torque Arm Bottom (T3)	26.4	Pass
						Bolt Checks	36.4	Pass
						RATING =	**104.6**	**Okay**

APPENDIX B

BASE LEVEL DRAWING


(3) HCS 6X12 4AWG(1-5/8")
A
B
C
(12) LDF7-50A(1-5/8")
dder rung (12" long 16" oc)
Safety Line 3/8
(8) LDF7-50A(1-5/8")(Includes 2 hybrid)
FB-L98-002-XXX(3/8")
(2) WR-VG86ST-BRD(3/4)

APPENDIX C

ADDITIONAL CALCULATIONS

Factored Foundation Loads: LC1

Factored Axial Load (+Comp, -Ten) =	**216**	kips
Factored Horiz. Load at Top of Pier =	**2**	kips
Factored OTM at Top of Pier =	**0**	k-ft

LRFD Resistance and Load Factors:

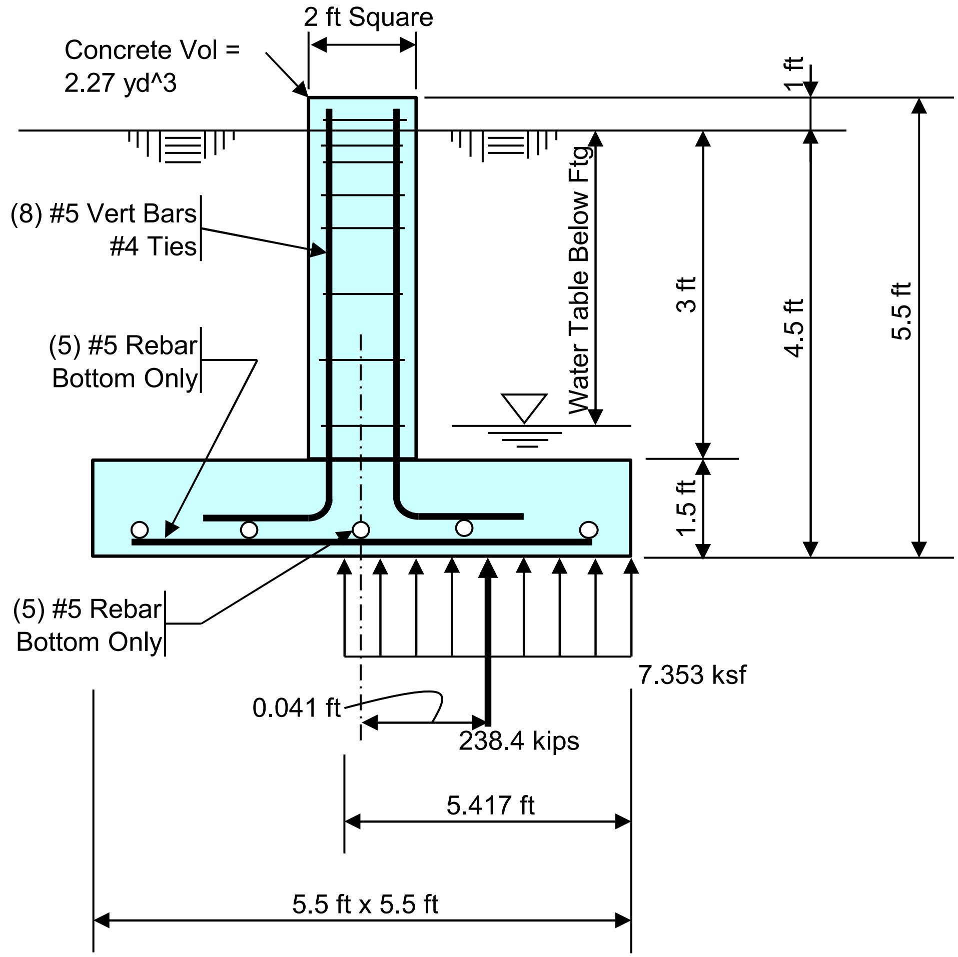
	Φ	Dead Load Factors
Soil Bearing =	**0.6**	
Soil Weight =	**0.75**	1.2
Concrete Weight =	**0.75**	1.2

Soil Properties:

Depth to Water Table =	**99**	ft
Uplift Cone from	**Top**	of footing
Depth to Ignore for Uplift and PP =	**3.333**	ft

Passive Pressure has been included on the pier and pad.

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
5	**120**	**0**	**34**	**12**	**5.00**



Dimensions:

Pier Shape =	**Square**	
Pier Width =	**2**	ft Square
Pier Height above Grade =	**1**	ft
Depth to Bottom of Footing =	**4.5**	ft
Footing Thickness =	**1.5**	ft
Footing Width, B =	**5.5**	ft
Footing Length, L =	**5.5**	ft

Concrete:

Concrete Strength =	**3**	ksi
Rebar Strength =	**60**	ksi

Total Pad Reinf Stl =	**1.55**	**in^2 < 2.14 in^2 = Min Stl**
Total Pier Reinf Stl =	**2.48**	**in^2 < 2.88 in^2 = Min Stl**
Footing Thickness =	**1.50**	ft >= 1.05 ft = Min Ftg Thk, OK

Summary Results:

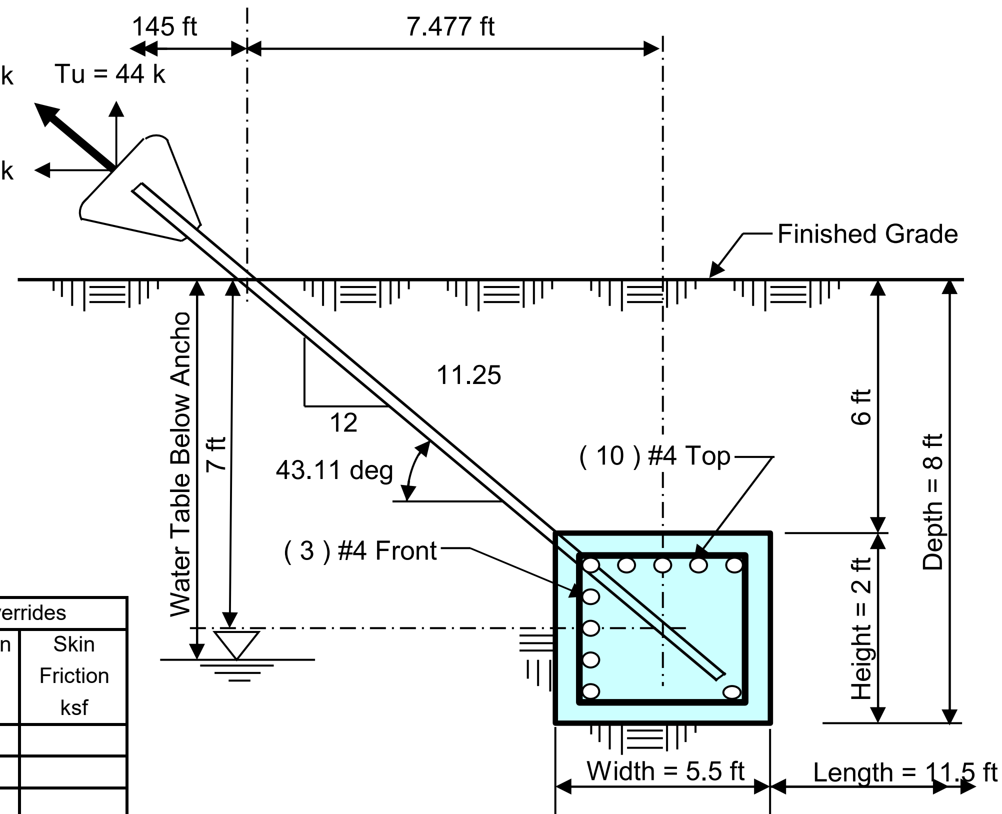
	Required		Available			Stress Ratio	
Maximum Net Soil Bearing =	**7.353**	ksf	**7.200**	ksf	Stress Ratio =	**102.1%**	in Soil Bearing
Uplift =	**0.0**	kips	**21.5**	kips	Stress Ratio =	**0.0%**	in Uplift
Punching Shear Stress =	**0.069**	ksi	**0.164**	ksi	Stress Ratio =	**41.9%**	in Punching Shear
Bending Shear Stress =	**23.8**	kips	**76.3**	kips	Stress Ratio =	**31.3%**	in Bending Shear
Bending Moment =	**62.824**	k-ft	**96.2**	k-ft	Stress Ratio =	**65.3%**	in Bending Moment
Conc Pier Reinforcing Steel =	**218.9**	kips	**837.9**	kips	Stress Ratio =	**26.1%**	in Pier Rebar

Deadman Guy Anchor Analysis (LRFD)

Guy Anchor

PJF Job No. **A13321-0013.001.8700** Project Name: **702506-Ashford, CT** Engineer: **CMH**

Uplift Force =	**44**	k
Horizontal Force =	**47**	k
Load Factor, Concrete Weight =	**0.9**	
Φ, Soil Weight =	**0.75**	
Depth to Water Table =	**99**	ft
Toe Width (If Any) =	**0**	in
Toe Height (If Any) =	**0**	in
Depth to Bottom of Deadman =	**8**	ft
Deadman Block Height =	**2**	ft
Deadman Block Width =	**5.5**	ft
Deadman Block Length =	**11.5**	ft
Guy Rod Steel Strength, Fy =	**48**	ksi
Guy Rod Cross-Sectional Area =	**2.405**	in^2
Concrete Strength, f'c =	**3**	ksi
Rebar Strength, Fy =	**60**	ksi
Minimum Cover Over Rebar =	**6**	in
Horiz. Ult. Passive Press. Override =		ksf/ft



			Uplift		Horizontal		Overrides	
Layer Thk ft	Dry Soil Density pcf	Sat Soil Density pcf	Cohesion ksf	Friction Angle degrees	Cohesion ksf	Friction Angle degrees	Adhesion ksf	Skin Friction ksf
10	115	115		33		33		
1.5	120	120		36		36		

Uplift Based on: **Soil Cone**

Inverted pyramid of soil in uplift will be taken from the top of the anchor.

Concrete Volume per Anchor = **4.69** yd^3
Concrete Volume for (3) Anchors = **14.06** yd^3

Summary Results:

	Required		Available				
Guy Rod Tensile Force =	**64.38**	k	**92.4**	k	Capacity Ratio =	**69.7%**	in Tensile Force
Soil, Horizontal Resistance =	**47.0**	k	**47.1**	k	Capacity Ratio =	**99.8%**	in Horiz Resistance
Soil, Uplift Resistance =	**44.0**	k	**110.4**	k	Capacity Ratio =	**39.8%**	in Uplift Resistance
Steel, Uplift Bending Moment =	**79.9**	k-ft	**144.6**	k-ft	Capacity Ratio =	**55.3%**	in Bending Moment
Steel, Horizontal Bending Moment =	**67.6**	k-ft	**132.8**	k-ft	Capacity Ratio =	**50.9%**	in Bending Moment
Toe Shear =		k/ft		k/ft	Capacity Ratio =		in Shear

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-G. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

5) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

6) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

Site Ref: CTHA820A

20 Seles Road
Ashford, CT

Centek Project No. 21005.30

Date: June 7, 2021

Max Stress Ratio = 93.7%

Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

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June 7, 2021

Mr. Kyle Richers
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA820A
20 Seles Road
Ashford, CT 06278

Centek Project No. 21005.30

Dear Mr. Richers,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) 12-ft gate booms to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Gate Booms: Three (3) RFS APX16DWV-16DWV-S-E-A20 panel antennas, three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson AIR6449 B41 panel antennas, three (3) Ericsson 4460 B25+B66 remote radio units and three (3) Ericsson 4480 B71+B85 remote radio units mounted on three (3) gate booms with a RAD center elevation of 170-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 101 mph for Ashford as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

Based on our review of the installation, it is our opinion that the subject antenna mount have sufficient capacity to support the aforementioned antenna configuration. If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

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

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

Figure 1 Antenna Mount

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

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

Wind Speeds

Basic Wind Speed	$V := 101$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	Structure_Type := Lattice		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := B		(User Input)
Structure Height =	$h := 190$	ft	(User Input)
Height to Center of Antennas =	$z := 170$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.00$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topographic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 1.11$		(User Input)

Output

Wind Direction Probability Factor =

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

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

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

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.15 & \text{if SC = 3} \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.00 & \text{if SC = 3} \end{cases} = 1$$

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

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.178$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.356$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.15$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 26$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 6$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model = RFS APX16DWV-16DWV-S-E-A20

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 55.9$ in (User Input)

Antenna Width = $W_{ant} := 13.0$ in (User Input)

Antenna Thickness = $T_{ant} := 3.2$ in (User Input)

Antenna Weight = $WT_{ant} := 41.8$ lbs (User Input)

Number of Antennas = $N_{ant} := 1$ (User Input)

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$

Antenna Force Coefficient = $Ca_{ant} = 1.28$

Wind Load (without ice)

Surface Area for One Antenna = $SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$ sf

Total Antenna Wind Force Front = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 183$ lbs

Surface Area for One Antenna = $SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$ sf

Total Antenna Wind Force Side = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 45$ lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEantF} := \frac{\left(L_{ant} + 2 \cdot t_{iz}\right) \cdot \left(W_{ant} + 2 \cdot t_{iz}\right)}{144} = 7.5$ sf

Total Antenna Wind Force w/ Ice Front = $Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 66$ lbs

Surface Area for One Antenna w/ Ice = $SA_{ICEantS} := \frac{\left(L_{ant} + 2 \cdot t_{iz}\right) \cdot \left(T_{ant} + 2 \cdot t_{iz}\right)}{144} = 3.3$ sf

Total Antenna Wind Force w/ Ice Side = $Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 30$ lbs

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 42$ lbs

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2325$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot t_{iz}\right) \cdot \left(W_{ant} + 2 \cdot t_{iz}\right) \cdot \left(T_{ant} + 2 \cdot t_{iz}\right) - V_{ant} = 6169$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 200$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 200$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24.0$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 149.$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 574$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 203$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 20.1$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 176$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 9.2$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 81$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 149$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 603$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 603$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model = Ericsson AIR6449 B41

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 33.1$ in (User Input)

Antenna Width = $W_{ant} := 20.5$ in (User Input)

Antenna Thickness = $T_{ant} := 8.3$ in (User Input)

Antenna Weight = $WT_{ant} := 103$ lbs (User Input)

Number of Antennas = $N_{ant} := 1$ (User Input)

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$

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

Wind Load (without ice)

Surface Area for One Antenna = $SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$ sf

Total Antenna Wind Force Front = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 160$ lbs

Surface Area for One Antenna = $SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$ sf

Total Antenna Wind Force Side = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 65$ lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.6$ sf

Total Antenna Wind Force w/ Ice Front = $Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 55$ lbs

Surface Area for One Antenna w/ Ice = $SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.4$ sf

Total Antenna Wind Force w/ Ice Side = $Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 28$ lbs

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 103$ lbs

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 6774$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 220$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 220$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4480 B71+B85		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 21.8$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 7.8$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 84$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.4$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 81$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.2$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 40$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.8$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 31$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.3$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 19$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 84$ lbs

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2670$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 4102$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 133$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 133$ lbs

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Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4460 B25+B66		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 19.6$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 12.1$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 109$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 73$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 56$	lbs

Wind Load (with ice)

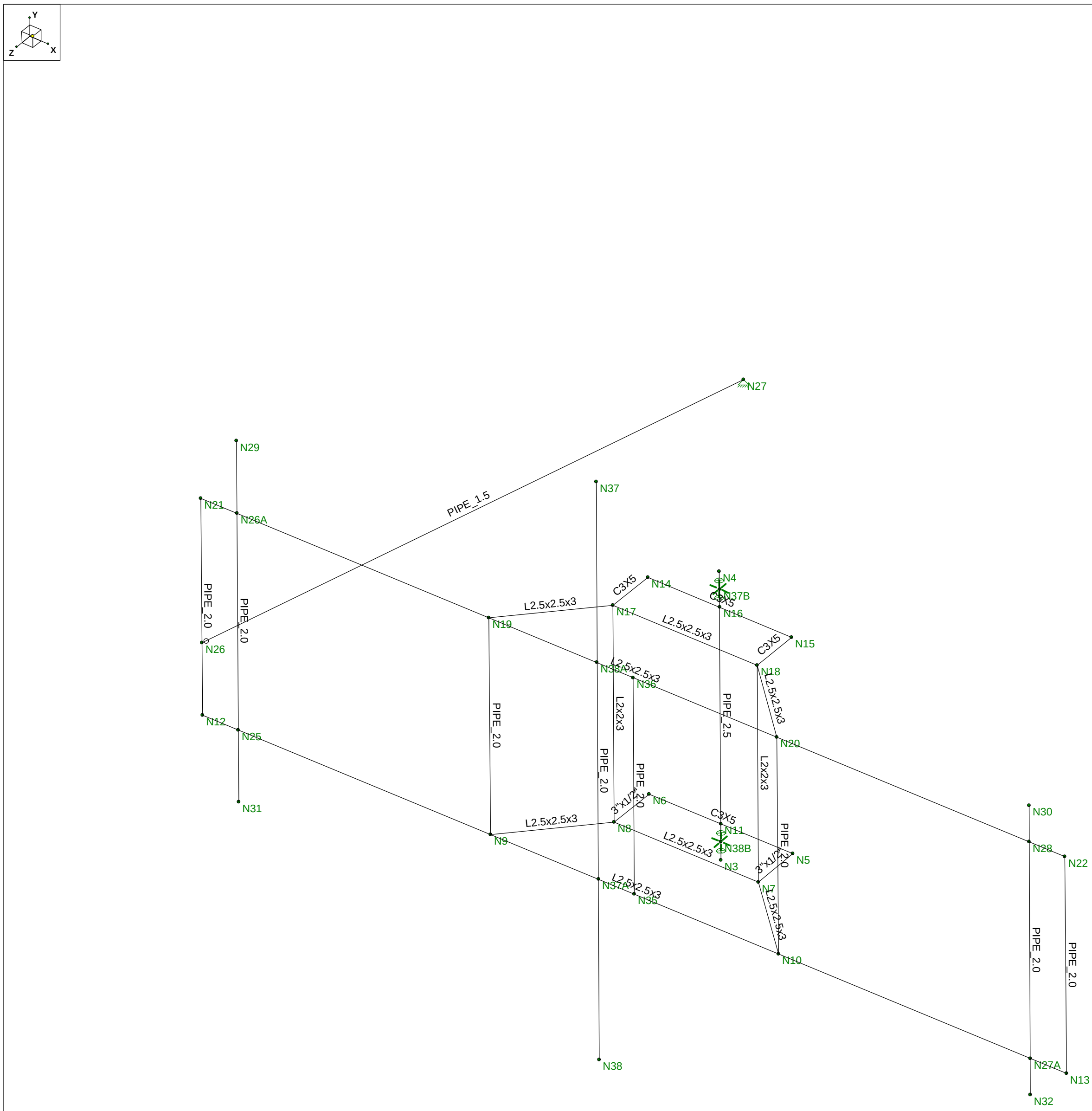
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 29$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.8$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 24$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 109$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 4620$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 150$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 150$	lbs



Envelope Only Solution

Centek		SK - 1
FJP	CTHA820A - AMA	June 7, 2021 at 12:36 PM
21005.30	Member Framing	CTHA820A_AMA.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(E) Antenna Mast	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
2	(E)HSS4x4x1/4	HSS4X3X4	Beam	Pipe	A500 Gr.46	Typical	2.91	3.91	6.15	7.96
3	(E)Plat	3"x1/2"	Beam	Pipe	A36 Gr.36	Typical	1.5	.031	1.125	.112
4	(E)C3	C3X5	Beam	Pipe	A36 Gr.36	Typical	1.47	.241	1.85	.043
5	(E)L2.5x2.5x3/16	L2.5x2.5x3	Beam	Pipe	A36 Gr.36	Typical	.901	.535	.535	.011
6	(E)Vert	PIPE_2.5	Beam	Pipe	A53 Grad...	Typical	1.61	1.45	1.45	2.89
7	(E)L2x2x3/16	L2x2x3	Beam	Pipe	A36 Gr.36	Typical	.722	.271	.271	.009
8	(E) Stablizer Arm	PIPE_1.5	Beam	Pipe	A53 Grad...	Typical	.749	.293	.293	.586
9	(P)Antenna Mast_Pipe 2.0 STD	PIPE_2.0	Column	Wide Flan...	A53 Grad...	Typical	1.02	.627	.627	1.25

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M3	(E)Vert	4			Lbyy						Lateral
2	M4	(E)C3	2			Lbyy						Lateral
3	M5	(E)Plat	.67			Lbyy						Lateral
4	M6	(E)Plat	.67			Lbyy						Lateral
5	M7	(E)L2.5x2....	2			Lbyy						Lateral
6	M8	(E)L2.5x2....	1.414			Lbyy						Lateral
7	M9	(E)L2.5x2....	1.414			Lbyy						Lateral
8	M10	(E)L2.5x2....	12	4	4	4	4	4				Lateral
9	M11	(E)C3	2			Lbyy						Lateral
10	M12	(E)C3	.67			Lbyy						Lateral
11	M13	(E)C3	.67			Lbyy						Lateral
12	M14	(E)L2.5x2....	2			Lbyy						Lateral
13	M15	(E)L2.5x2....	1.414			Lbyy						Lateral
14	M16	(E)L2.5x2....	1.414			Lbyy						Lateral
15	M17	(E)L2.5x2....	12	4	4	4	4	4				Lateral
16	M18	(E)L2x2x3/...	3			Lbyy						Lateral
17	M19	(E)L2x2x3/...	3			Lbyy						Lateral
18	M20	(E) Antenn...	3			Lbyy						Lateral
19	M21	(E) Antenn...	3			Lbyy						Lateral
20	M22	(E) Antenn...	3			Lbyy						Lateral
21	M23	(E) Antenn...	3			Lbyy						Lateral
22	M25	(E) Stabliz...	7.926			Lbyy						Lateral
23	PS.1	(P)Antenna...	5			Lbyy						Lateral
24	PS.3	(P)Antenna...	4			Lbyy						Lateral
25	M27	(P)Antenna...	3			Lbyy						Lateral
26	PS.2	(P)Antenna...	8			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M3	N3	N4			(E)Vert	Beam	Pipe	A53 Gr...	Typical
2	M4	N6	N5			(E)C3	Beam	Pipe	A36 Gr...	Typical
3	M5	N6	N8			(E)Plat	Beam	Pipe	A36 Gr...	Typical
4	M6	N5	N7			(E)Plat	Beam	Pipe	A36 Gr...	Typical
5	M7	N8	N7			(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
6	M8	N7	N10			(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
7	M9	N8	N9		270	(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
8	M10	N12	N13			(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
9	M11	N14	N15			(E)C3	Beam	Pipe	A36 Gr...	Typical
10	M12	N15	N18		180	(E)C3	Beam	Pipe	A36 Gr...	Typical
11	M13	N14	N17			(E)C3	Beam	Pipe	A36 Gr...	Typical
12	M14	N17	N18		90	(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
13	M15	N18	N20		90	(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
14	M16	N17	N19		180	(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
15	M17	N21	N22		90	(E)L2.5x2.5x3/16	Beam	Pipe	A36 Gr...	Typical
16	M18	N8	N17		90	(E)L2x2x3/16	Beam	Pipe	A36 Gr...	Typical
17	M19	N18	N7		270	(E)L2x2x3/16	Beam	Pipe	A36 Gr...	Typical
18	M20	N21	N12			(E) Antenna Mast	Beam	Pipe	A53 Gr...	Typical
19	M21	N19	N9			(E) Antenna Mast	Beam	Pipe	A53 Gr...	Typical
20	M22	N20	N10			(E) Antenna Mast	Beam	Pipe	A53 Gr...	Typical
21	M23	N22	N13			(E) Antenna Mast	Beam	Pipe	A53 Gr...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
22	M25	N26	N27			(E) Stablizer Arm	Beam	Pipe	A53 Gr...	Typical
23	PS.1	N29	N31			(P)Antenna Mast_Pipe 2.0 STD	Colu...	Wide Flan...	A53 Gr...	Typical
24	PS.3	N30	N32			(P)Antenna Mast_Pipe 2.0 STD	Colu...	Wide Flan...	A53 Gr...	Typical
25	M27	N36	N35			(P)Antenna Mast_Pipe 2.0 STD	Colu...	Wide Flan...	A53 Gr...	Typical
26	PS.2	N37	N38			(P)Antenna Mast_Pipe 2.0 STD	Colu...	Wide Flan...	A53 Gr...	Typical

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N27	Reaction	Reaction	Reaction			
2	N37B	Reaction	Reaction	Reaction		Reaction	
3	N38B	Reaction	Reaction	Reaction		Reaction	

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Y	-.021	.167
2	PS.1	Y	-.021	4.833
3	PS.1	Y	-.109	2.5
4	PS.2	Y	-.075	.583
5	PS.2	Y	-.075	7.5
6	PS.3	Y	-.052	.667
7	PS.3	Y	-.052	3.417
8	PS.2	Y	-.084	4

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Y	-.1	.167
2	PS.1	Y	-.1	4.833
3	PS.1	Y	-.15	2.5
4	PS.2	Y	-.302	.583
5	PS.2	Y	-.302	7.5
6	PS.3	Y	-.11	.667
7	PS.3	Y	-.11	3.417
8	PS.2	Y	-.133	4

Member Point Loads (BLC 4 : Wind w/ Ice X (6 psf))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.015	.167
2	PS.1	X	.015	4.833
3	PS.1	X	.024	2.5
4	PS.2	X	.041	.583
5	PS.2	X	.041	7.5
6	PS.3	X	.014	.667
7	PS.3	X	.014	3.417
8	PS.2	X	.019	4

Member Point Loads (BLC 5 : Wind X (30 psf))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]

Member Point Loads (BLC 5 : Wind X (30 psf)) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	X	.023	.167
2	PS.1	X	.023	4.833
3	PS.1	X	.056	2.5
4	PS.2	X	.102	.583
5	PS.2	X	.102	7.5
6	PS.3	X	.033	.667
7	PS.3	X	.033	3.417
8	PS.2	X	.04	4

Member Point Loads (BLC 6 : Wind w/ Ice Z (6 psf))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.033	.167
2	PS.1	Z	.033	4.833
3	PS.1	Z	.029	2.5
4	PS.2	Z	.088	.583
5	PS.2	Z	.088	7.5
6	PS.3	Z	.028	.667
7	PS.3	Z	.028	3.417
8	PS.2	Z	.031	4

Member Point Loads (BLC 7 : Wind Z (30 psf))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.1	Z	.093	.167
2	PS.1	Z	.093	4.833
3	PS.1	Z	.073	2.5
4	PS.2	Z	.287	.583
5	PS.2	Z	.287	7.5
6	PS.3	Z	.08	.667
7	PS.3	Z	.08	3.417
8	PS.2	Z	.081	4

Member Distributed Loads (BLC 4 : Wind w/ Ice X (6 psf))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M16	X	.001	.001	0	0
2	M9	X	.001	.001	0	0
3	M15	X	.001	.001	0	0
4	M8	X	.001	.001	0	0
5	M18	X	.001	.001	0	0
6	M19	X	.001	.001	0	0
7	M3	X	.001	.001	0	0

Member Distributed Loads (BLC 5 : Wind X (30 psf))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M16	X	.006	.006	0	0
2	M9	X	.006	.006	0	0
3	M15	X	.006	.006	0	0
4	M8	X	.006	.006	0	0
5	M18	X	.006	.006	0	0
6	M19	X	.006	.006	0	0

Member Distributed Loads (BLC 5 : Wind X (30 psf)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
7	M3	X	.006	.006	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z (6 psf))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M17	Z	.001	.001	0	0
2	M10	Z	.001	.001	0	0
3	M16	Z	.001	.001	0	0
4	M9	Z	.001	.001	0	0
5	M15	Z	.001	.001	0	0
6	M8	Z	.001	.001	0	0
7	M4	Z	.001	.001	0	0
8	M11	Z	.001	.001	0	0
9	M18	Z	.001	.001	0	0
10	M19	Z	.001	.001	0	0
11	M3	Z	.001	.001	0	0

Member Distributed Loads (BLC 7 : Wind Z (30 psf))

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M17	Z	.006	.006	0	0
2	M10	Z	.006	.006	0	0
3	M16	Z	.006	.006	0	0
4	M9	Z	.006	.006	0	0
5	M15	Z	.006	.006	0	0
6	M8	Z	.006	.006	0	0
7	M4	Z	.006	.006	0	0
8	M11	Z	.006	.006	0	0
9	M18	Z	.006	.006	0	0
10	M19	Z	.006	.006	0	0
11	M3	Z	.006	.006	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	J...	Point	Distribu...	Area(M...	Surface...
1	Self Weight	DL		-1						
2	Equipment Weight	DL					8			
3	Ice Weight	LL					8			
4	Wind w/ Ice X (6 psf)	WLX					8	7		
5	Wind X (30 psf)	WLX					8	7		
6	Wind w/ Ice Z (6 psf)	WLZ					8	11		
7	Wind Z (30 psf)	WLZ					8	11		

Load Combinations

	Description	Solve	PDelta	...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-directi...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-directi...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-directi...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-directi...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N27	max	.076	5	.013	4	-.007	3	0	6	0	6	0	6
2		min	.002	3	.009	2	-.291	5	0	1	0	1	0	1
3	N37B	max	.465	6	1.154	6	-.274	2	0	6	.089	5	0	6
4		min	-.29	2	.361	2	-1.365	4	0	1	-.378	1	0	1
5	N38B	max	-.169	5	1.099	3	1.034	3	0	6	.135	5	0	6
6		min	-.588	1	.305	5	-.6	5	0	1	-.365	1	0	1
7	Totals:	max	0	6	2.259	6	0	3						
8		min	-.816	1	.714	2	-2.155	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N3	max	0	6	0	5	.001	3	1.42e-3	5	0	6	1.391e-4	6
2		min	-.002	2	0	1	-.004	5	-4.133e-4	3	0	1	-5.207e-4	2
3	N4	max	0	5	0	5	0	2	-5.844e-5	2	0	6	6.504e-4	1
4		min	-.002	1	0	1	-.005	4	-1.747e-3	4	0	1	-1.47e-4	5
5	N5	max	.002	2	0	5	.031	5	7.558e-3	6	6.547e-3	3	-1.529e-5	5
6		min	0	6	-.007	1	-.057	3	1.519e-3	2	-2.61e-3	5	-6.628e-4	1
7	N6	max	.002	2	.002	2	.015	5	1.035e-2	3	2.242e-3	2	1.221e-3	6
8		min	0	4	-.012	6	-.03	6	2.354e-3	5	-2.584e-3	6	-1.125e-4	2
9	N7	max	.047	1	-.018	5	.031	5	7.184e-3	6	2.939e-3	1	1.554e-3	6
10		min	-.001	5	-.064	3	-.057	3	1.412e-3	2	-8.108e-4	5	1.303e-4	2
11	N8	max	.047	1	-.023	5	.016	5	9.761e-3	3	3.918e-3	1	5.841e-5	5
12		min	-.001	5	-.093	3	-.031	6	2.163e-3	5	-7.912e-4	5	-5.406e-4	1
13	N9	max	.091	1	-.056	5	.054	2	3.461e-3	3	2.883e-3	1	3.795e-3	6
14		min	-.019	5	-.225	3	-.021	6	7.987e-4	5	-1.662e-3	5	9.701e-4	2
15	N10	max	.091	1	-.04	5	.05	5	3.908e-3	3	3.435e-3	1	-8.673e-5	2
16		min	-.02	5	-.144	6	-.091	1	-1.343e-5	5	-2.941e-3	5	-6.472e-4	4
17	N11	max	.002	2	0	5	.004	5	1.341e-3	5	4.074e-4	1	2.03e-4	6
18		min	0	4	0	3	-.001	3	-2.749e-4	3	-1.503e-4	5	-4.482e-4	2
19	N12	max	.091	1	-.194	5	-.019	2	7.918e-3	6	1.843e-3	6	2.207e-3	3
20		min	-.018	5	-.632	3	-.092	6	3.328e-3	2	-1.627e-3	2	3.105e-4	5
21	N13	max	.091	1	-.09	2	.524	5	8.159e-3	3	3.299e-3	1	8.435e-4	3
22		min	-.02	5	-.304	6	-.296	1	1.436e-3	5	-1.338e-2	5	-3.484e-5	5
23	N14	max	.002	1	-.001	5	.035	1	9.823e-3	6	3.719e-3	1	1.428e-3	3
24		min	0	5	-.014	3	.025	5	2.318e-3	2	5.816e-4	5	1.456e-4	5
25	N15	max	.002	1	.005	2	.041	4	7.791e-3	3	2.91e-3	2	3.859e-4	2
26		min	0	5	-.005	4	-.02	2	1.75e-3	5	-2.522e-3	4	-4.371e-4	4
27	N16	max	.002	1	0	2	.005	4	-2.174e-5	2	4.219e-4	1	6.18e-4	1
28		min	0	5	0	6	0	2	-1.565e-3	4	-9.931e-5	5	-1.346e-4	5
29	N17	max	.029	2	-.023	5	.035	1	9.45e-3	6	2.882e-3	2	6.572e-4	2
30		min	-.009	4	-.093	3	.025	5	2.208e-3	2	-1.545e-3	4	-3.415e-4	4
31	N18	max	.029	2	-.018	5	.041	4	7.551e-3	3	3.14e-3	1	1.591e-3	3
32		min	-.008	4	-.064	3	-.02	2	1.643e-3	5	-4.207e-4	5	3.993e-4	5
33	N19	max	.068	2	-.055	5	.075	1	3.338e-3	6	2.46e-3	2	3.925e-3	3
34		min	-.025	4	-.225	3	.01	5	5.16e-4	2	-1.223e-3	4	9.705e-4	5
35	N20	max	.068	2	-.04	5	.059	4	3.964e-3	6	3.478e-3	1	2.592e-5	2
36		min	-.026	4	-.144	3	-.059	2	1.134e-3	2	-2.638e-3	5	-2.242e-4	4
37	N21	max	.068	2	-.194	5	.203	6	8.485e-3	4	1.63e-3	4	2.213e-3	3
38		min	-.026	4	-.632	3	.117	2	4.15e-3	2	-1.569e-3	2	3.918e-4	5

Envelope Joint Displacements (Continued)

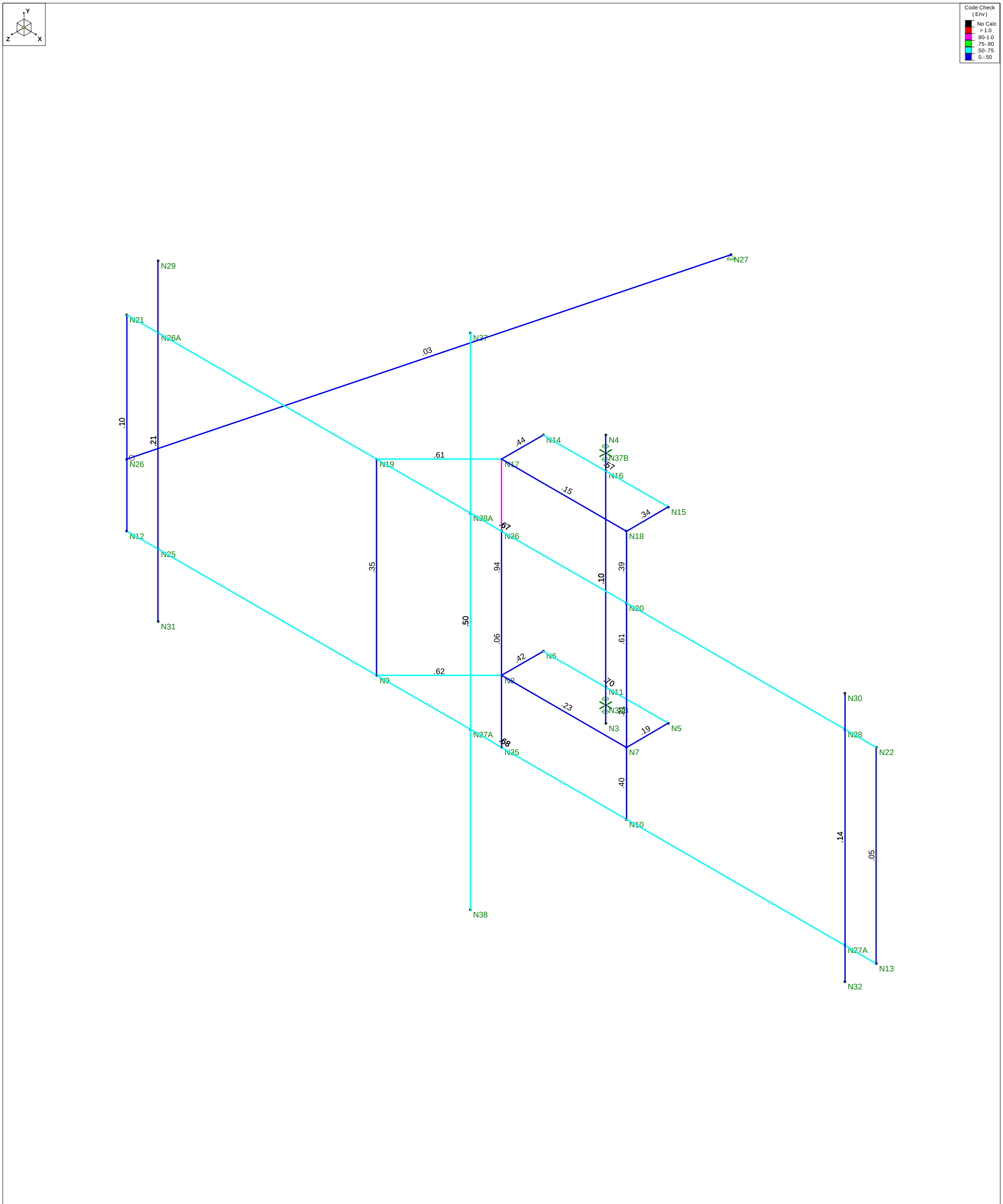
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
39	N22	max	.069	2	-.09	2	.586	4	8.159e-3	3	3.528e-3	1	8.418e-4	3
40		min	-.026	4	-.304	6	-.191	2	1.425e-3	5	-1.31e-2	5	-1.619e-5	5
41	N26	max	.083	1	-.194	5	.022	1	8.079e-3	6	1.547e-3	6	1.181e-3	3
42		min	-.02	5	-.632	3	-.003	5	3.602e-3	2	-1.608e-3	2	5.004e-5	5
43	N27	max	0	6	0	6	0	6	7.931e-3	6	9.012e-4	1	1.26e-3	3
44		min	0	1	0	1	0	1	3.223e-3	2	-2.09e-4	5	-6.033e-4	5
45	N25	max	.091	1	-.19	5	-.009	2	7.977e-3	6	1.305e-3	6	3.435e-3	3
46		min	-.018	5	-.615	3	-.101	6	3.721e-3	2	-1.832e-3	2	8.871e-4	5
47	N26A	max	.068	2	-.19	5	.196	6	8.484e-3	6	2.246e-3	4	3.404e-3	3
48		min	-.026	4	-.615	3	.126	2	3.739e-3	2	-1.302e-3	2	7.92e-4	5
49	N27A	max	.091	1	-.091	2	.444	5	8.166e-3	3	3.469e-3	1	9.007e-5	2
50		min	-.02	5	-.306	6	-.276	1	1.657e-3	5	-1.329e-2	5	-3.009e-4	4
51	N28	max	.069	2	-.091	2	.508	4	8.166e-3	3	3.374e-3	1	1.137e-4	2
52		min	-.026	4	-.306	6	-.17	2	1.221e-3	5	-1.32e-2	5	-3.028e-4	4
53	N29	max	.055	2	-.19	5	.298	6	8.69e-3	4	2.246e-3	4	3.353e-3	3
54		min	-.056	6	-.615	3	.171	2	3.739e-3	2	-1.302e-3	2	7.92e-4	5
55	N30	max	.068	2	-.091	2	.52	4	8.166e-3	3	3.374e-3	1	1.137e-4	2
56		min	-.024	4	-.306	6	-.156	2	1.221e-3	5	-1.32e-2	5	-3.028e-4	4
57	N31	max	.111	1	-.19	5	-.053	2	7.861e-3	6	1.305e-3	6	3.485e-3	3
58		min	-.008	5	-.615	3	-.196	6	3.721e-3	2	-1.832e-3	2	8.871e-4	5
59	N32	max	.091	1	-.091	2	.434	5	8.166e-3	3	3.469e-3	1	9.007e-5	2
60		min	-.022	5	-.306	6	-.296	1	1.657e-3	5	-1.329e-2	5	-3.009e-4	4
61	N35	max	.091	1	-.047	5	.035	5	3.245e-3	3	2.923e-3	1	1.893e-3	3
62		min	-.019	5	-.193	3	-.066	3	1.21e-4	5	-2.512e-5	5	2.802e-4	5
63	N36	max	.068	2	-.047	5	.056	6	3.247e-3	3	2.824e-3	1	1.913e-3	3
64		min	-.026	4	-.193	3	.018	2	7.492e-4	5	-5.544e-5	5	3.45e-4	5
65	N37	max	.14	2	-.049	5	.626	4	2.121e-2	4	2.071e-3	2	1.183e-3	6
66		min	-.051	6	-.203	3	.06	2	8.671e-4	2	-1.272e-3	4	-3.132e-3	2
67	N38	max	.203	1	-.049	5	.591	5	3.023e-3	3	2.569e-3	1	4.568e-3	1
68		min	-.014	5	-.203	3	-.148	3	-2.096e-2	5	-9.635e-4	5	1.677e-4	5
69	N37A	max	.091	1	-.049	5	.033	5	3.042e-3	3	2.569e-3	1	1.425e-3	3
70		min	-.019	5	-.203	3	-.057	3	-1.189e-2	5	-9.635e-4	5	1.679e-4	5
71	N38A	max	.068	2	-.049	5	.054	6	1.283e-2	4	2.071e-3	2	1.175e-3	6
72		min	-.026	4	-.203	3	.034	2	8.661e-4	2	-1.272e-3	4	-1.621e-4	2
73	N37B	max	0	6	0	6	0	6	-5.844e-5	2	0	6	6.505e-4	1
74		min	0	1	0	1	0	1	-1.747e-3	4	0	1	-1.47e-4	5
75	N38B	max	0	6	0	6	0	6	1.42e-3	5	0	6	1.391e-4	6
76		min	0	1	0	1	0	1	-4.133e-4	3	0	1	-5.208e-4	2

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Me...	Sha...	Code Ch...	Lo...	LC	Shear...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn ...	Cb	Eqn
1	M3	PIP...	.102	3.5	6	.164	.25		1	44.491	50.715	3.596	3.596	2.033	H1-1b
2	M4	C3X5	.700	1	3	.238	1	y	3	39.585	47.628	.981	4.104	1.415	H1-1b
3	M5	3"x...	.420	0	3	.082	0	y	3	41.276	48.6	.506	3.038	1.854	H1-1b
4	M6	3"x...	.192	.67	1	.096	0	y	3	41.276	48.6	.506	3.038	1.836	H1-1b
5	M7	L2....	.233	0	1	.028	0	z	1	25.261	29.192	.873	1.972	2.262	H2-1
6	M8	L2....	.397	1.4...	3	.065	0	y	6	26.937	29.192	.873	1.972	2.154	H2-1
7	M9	L2....	.620	1.4...	3	.114	0	z	3	26.937	29.192	.873	1.972	2.168	H2-1
8	M10	L2....	.684	4	3	.212	5.5	z	4	17.185	29.192	.873	1.702	1	H2-1
9	M11	C3X5	.571	1	3	.241	1	z	6	39.585	47.628	.981	4.104	1.427	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Me...	Sha...	Code Ch...	Lo...	LC	Shear...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn ...	Cb	Eqn
10	M12	C3X5	.338	0	4	.094	.335	z	6	46.563	47.628	.981	4.104	1.861	H1-1b
11	M13	C3X5	.441	0	6	.093	.335	z	6	46.563	47.628	.981	4.104	1.844	H1-1b
12	M14	L2....	.155	2	2	.017	0	y	6	25.261	29.192	.873	1.972	2.233	H2-1
13	M15	L2....	.394	1.4...	6	.065	0	z	3	26.937	29.192	.873	1.972	2.161	H2-1
14	M16	L2....	.613	1.4...	3	.109	0	y	6	26.937	29.192	.873	1.972	2.164	H2-1
15	M17	L2....	.667	.5	6	.209	5.5	y	4	17.185	29.192	.873	1.702	1	H2-1
16	M18	L2x...	.937	0	3	.066	.188	y	3	14.903	23.393	.558	1.239	2.27	H2-1
17	M19	L2x...	.614	0	3	.038	0	y	6	14.903	23.393	.558	1.239	2.268	H2-1
18	M20	PIP...	.104	2	5	.041	2		5	28.843	32.13	1.872	1.872	2.75	H1-1b
19	M21	PIP...	.345	3	3	.091	0		3	28.843	32.13	1.872	1.872	2.268	H1-1b
20	M22	PIP...	.213	0	6	.032	0		3	28.843	32.13	1.872	1.872	2.266	H1-1b
21	M23	PIP...	.052	3	6	.016	0		6	28.843	32.13	1.872	1.872	2.272	H1-1b
22	M25	PIP...	.028	3.9...	4	.002	7.9...		6	7.316	23.593	1.105	1.105	1.136	H1-1b
23	PS.1	PIP...	.213	3.9...	3	.048	2.5		4	23.809	32.13	1.872	1.872	1.645	H1-1b
24	PS.3	PIP...	.138	.5	3	.025	.5		3	26.521	32.13	1.872	1.872	1.933	H1-1b
25	M27	PIP...	.058	0	3	.016	0		3	28.843	32.13	1.872	1.872	2.27	H1-1b
26	PS.2	PIP...	.500	5.5	4	.056	2.5		4	14.916	32.13	1.872	1.872	3.718	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek	CTHA820A - AMA Member Unity Check	
FJP		June 7, 2021 at 5:18 PM
21005.30		CTHA820A_AMA.r3d

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 1 - Site Information

Site ID: CTHA820A
Status: Draft
Version: 1
Project Type: Sprint Retain
Approved: Not Approved
Approved By: Not Approved
Last Modified: 5/11/2021 11:3:10 AM
Last Modified By: Michael.Low1@T-Mobile.com

Site Name: mohonk_lake_cdt
Site Class: Guyed Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.86336666
Longitude: -72.18278611
Address: 20 Seles Rd
City, State: Ashford, CT
Region: NORTHEAST

RAN Template: 67D5A998E 6160		**AL Template:** 67E5998E_1xAIR+1OP+1QP		
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

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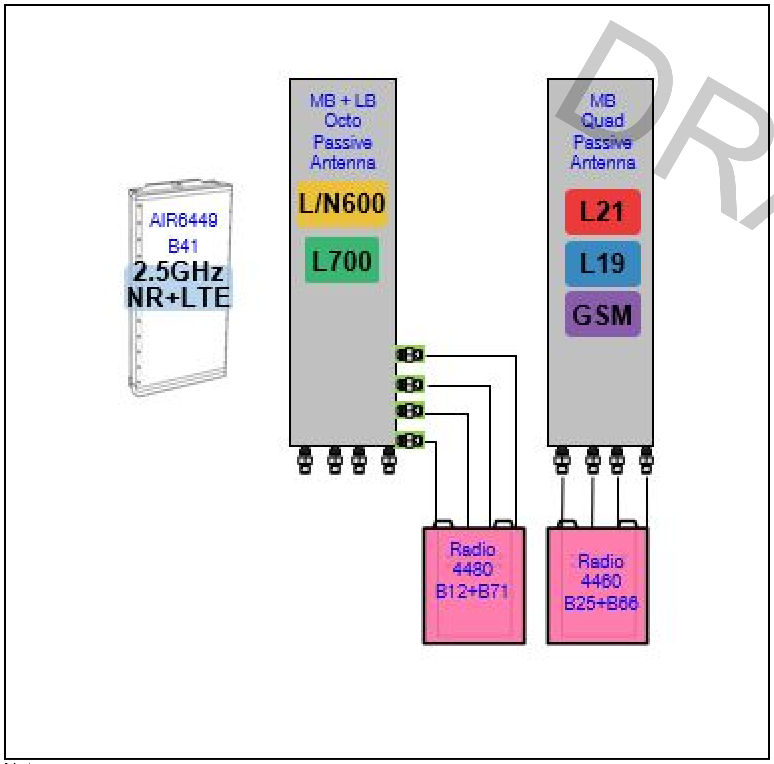
Section 3 - Proposed Template Images

67E5A998E.JPG



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 5 - RAN Equipment

Existing RAN Equipment

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

Proposed RAN Equipment

Template: 67D5A998E 6160

Enclosure	1	2	3	4
Enclosure Type	Ancillary Equipment (Ericsson)	Enclosure 6160	B160	RBS 6601
Baseband		BB 6648 (L2500, N2500); BB 6648 (L2100, L1900); BB 6648 (L700, L600, N600)		DUG20 (G1900)
Hybrid Cable System	PSU 4813			
Transport System		CSR IXRe V2 (Gen2)		
Functionality Groups	Ericsson Hybrid Trunk 6/24 4AWG *Select Length* **(x 3)**			

RAN Scope of Work:

CT33XC015
Existing/Planned Azimuth 0/120/240
200A service at site.

RAN Template: 67D5A998E 6160	**A&L Template:** 67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template: 67E5998E_1xAIR+1OP+1QP

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	0		0				0	
M. Tilt	0		0				0	
Height	170		170				170	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**				
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

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

RAN Template: 67D5A998E 6160	A&L Template: 67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	120		120				120	
M. Tilt	0		0				0	
Height	170		170				170	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**				
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	240		240				240	
M. Tilt	0		0				0	
Height	170		170				170	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**				
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

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

RAN Template: 67D5A998E 6160	**A&L Template:** 67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 1 - Site Information

Site ID: CTHA820A
Status: Draft
Version: 1
Project Type: Sprint Retain
Approved: Not Approved
Approved By: Not Approved
Last Modified: 5/11/2021 11:3:10 AM
Last Modified By: Michael.Low1@T-Mobile.com

Site Name: mohonk_lake_cdt
Site Class: Guyed Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.86336666
Longitude: -72.18278611
Address: 20 Seles Rd
City, State: Ashford, CT
Region: NORTHEAST

RAN Template: 67D5A998E 6160		**AL Template:** 67E5998E_1xAIR+1OP+1QP		
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

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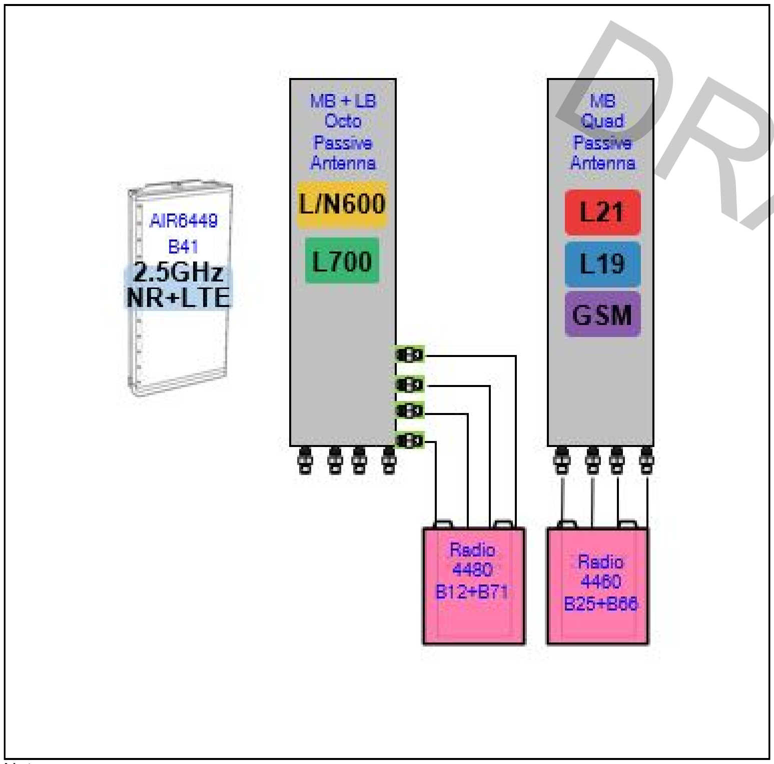
Section 3 - Proposed Template Images

67E5A998E.JPG



Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 5 - RAN Equipment

Existing RAN Equipment

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

Proposed RAN Equipment

Template: 67D5A998E 6160

Enclosure	1	2	3	4
Enclosure Type	Ancillary Equipment (Ericsson)	Enclosure 6160	B160	RBS 6601
Baseband		BB 6648 (L2500, N2500); BB 6648 (L2100, L1900); BB 6648 (L700, L600, N600)		DUG20 (G1900)
Hybrid Cable System	PSU 4813			
Transport System		CSR IXRe V2 (Gen2)		
Functionality Groups	Ericsson Hybrid Trunk 6/24 4AWG *Select Length* **(x 3)**			

RAN Scope of Work:

CT33XC015
Existing/Planned Azimuth 0/120/240
200A service at site.

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template: 67E5998E_1xAIR+1OP+1QP

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	0		0				0	
M. Tilt	0		0				0	
Height	170		170				170	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**				
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	120		120				120	
M. Tilt	0		0				0	
Height	170		170				170	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**				
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Sector 3 (Proposed) view from behind								
Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	240		240				240	
M. Tilt	0		0				0	
Height	170		170				170	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 G1900	L2100 L1900 G1900	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**				
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

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

RAN Template:	A&L Template:
67D5A998E 6160	67E5998E_1xAIR+1OP+1QP

CTHA820A_Sprint Retain_1_draft

Print Name: Standard
PORs: New Build_Sprint Keep

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTHA820A

mohonk_lake_cdt
20 Seles Road
Ashford, Connecticut 06287

August 25, 2021

EBI Project Number: 6221004634

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**12.81%**

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

August 25, 2021

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTHA820A - mohonk_lake_cdt

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **20 Seles Road** in **Ashford, Connecticut** 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 ($\mu W/cm^2$). 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.

Public 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 and 700 MHz frequency 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), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 20 Seles Road in Ashford, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

11) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

12) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

13) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and

associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

14) The antenna mounting height centerline of the proposed antennas is 170 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	14,005.63	ERP (W):	14,005.63	ERP (W):	14,005.63
Antenna A1 MPE %:	**1.87%**	Antenna B1 MPE %:	**1.87%**	Antenna C1 MPE %:	**1.87%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A2 MPE %:	**1.32%**	Antenna B2 MPE %:	**1.32%**	Antenna C2 MPE %:	**1.32%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	170 feet	Height (AGL):	170 feet	Height (AGL):	170 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A3 MPE %:	**4.86%**	Antenna B3 MPE %:	**4.86%**	Antenna C3 MPE %:	**4.86%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	8.05%
Verizon	2.72%
AT&T	2.04%
Site Total MPE % :	12.81%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	8.05%
T-Mobile Sector B Total:	8.05%
T-Mobile Sector C Total:	8.05%
Site Total MPE % :	12.81%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1167.14	170.0	6.24	1900 MHz GSM	1000	0.62%
T-Mobile 1900 MHz LTE	2	2334.27	170.0	6.24	1900 MHz LTE	1000	0.62%
T-Mobile 2100 MHz LTE	2	2334.27	170.0	6.24	2100 MHz LTE	1000	0.62%
T-Mobile 600 MHz LTE	2	591.73	170.0	1.58	600 MHz LTE	400	0.40%
T-Mobile 600 MHz NR	1	1577.94	170.0	2.11	600 MHz NR	400	0.53%
T-Mobile 700 MHz LTE	2	695.22	170.0	1.86	700 MHz LTE	467	0.40%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	11044.63	170.0	14.76	2500 MHz LTE 1C & 2C Traffic	1000	1.48%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	170.0	1.44	2500 MHz LTE 1C & 2C Broadcast	1000	0.14%
T-Mobile 2500 MHz NR Traffic	1	22089.26	170.0	29.53	2500 MHz NR Traffic	1000	2.95%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	170.0	2.87	2500 MHz NR Broadcast	1000	0.29%
						Total:	**8.05%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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 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 A:	8.05%
Sector B:	8.05%
Sector C:	8.05%
T-Mobile Maximum MPE % (Sector A):	8.05%
Site Total:	12.81%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.81%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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