Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

November 12, 2020

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

RE: Notice of Exempt Modification
11 West Peak Drive, Meriden, CT 06037
Latitude: 41.56110000
Longitude: -72.844100000
T-Mobile Site#: CT11132B – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 127-foot level of the existing 125-foot lattice tower at 11 West Peak Drive, Meriden, CT. The 125-foot lattice tower is owned and operated by Everest Communications. The property is owned by Southern New England Telephone Company. T-Mobile now intends to remove the six (6) existing antennas and add nine (9) new 600/700/1900/2100/2500 MHz antennas. The new antennas will be installed at the same 127-foot level of the tower. Mount modifications are also required as detailed in the enclosed mount analysis.

Planned Modifications:
Tower:
Remove
(9) 1-5/8" coax

Remove and Replace:
(3) Ericsson AIR 21 antennas for (3) Ericsson AIR 6449 2500 MHz antennas
(3) Ericsson AIR 21 antennas for (3) Ericsson AIR 32 1900/2100 MHz antennas

Install New:
(3) RFS APXVARR24_43 600/700/1900/2100 MHz antennas
(3) Ericsson Radio 4415 B25 RRU
(3) Radio 4449 B71+ B85
(3) Commscope SDX1926Q-43
(3) 1-5/8" Hybrid

Existing to Remain:
(3) TMA
(3) 1-5/8" Hybrid

(6) 1-5/8” coax

Ground:
Install New:
5’ X 2’ Concrete Pad
(1) 6160 Cabinet and (1) B160 Battery Cabinet

This tower was originally approved by the Connecticut Siting Council in Petition No. 67 dated March 31, 1981. T-Mobile has been approved for subsequent modifications at their facility. This proposed modification complies with the original approval.

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 Mayor -Kevin Scarpati, Elected Official, and Paul Dickson, Acting Director of Planning, Development, and Enforcement, 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,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: Kevin Scarpati – Mayor of the City of Meriden
Paul Dickson– Acting Director of Planning, Development and Enforcement
Everest Communications – Tower Owner
Southern New England Telephone Company- Property Owner

View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialogue box that appears. Note: If your browser does not support this function, select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a scheduled Pickup
   - Your driver will pickup your shipment(s) as usual.

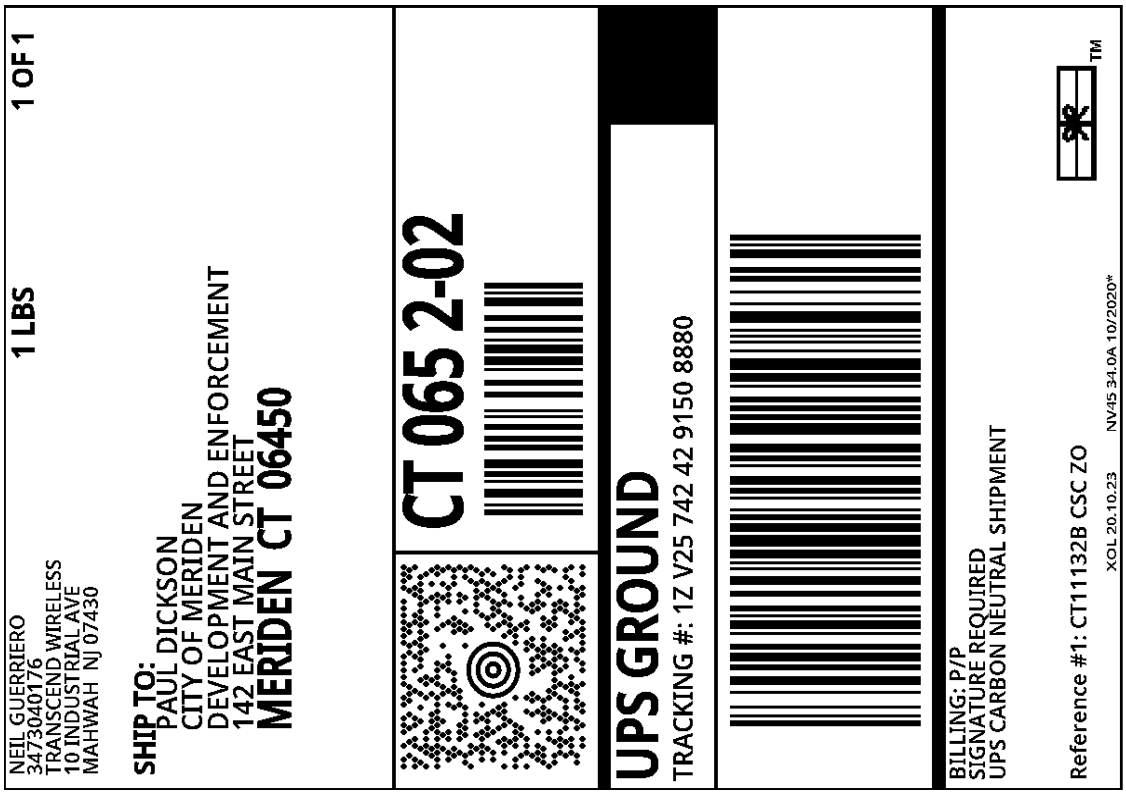
   Customers without a scheduled Pickup
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find the location nearest you, please visit the 'Locations' Quick link at ups.com.

UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY NJ 07446-1130

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH NJ 07430-1325

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY NJ 07446-1925

FOLD HERE



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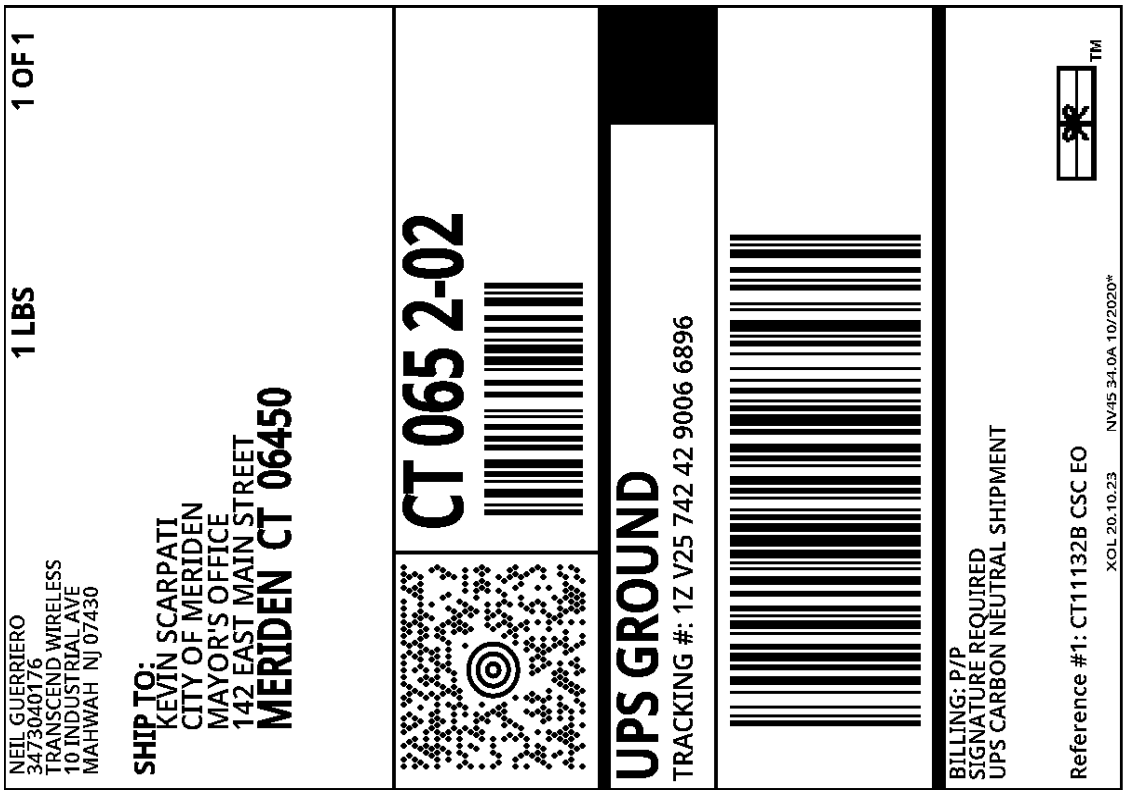

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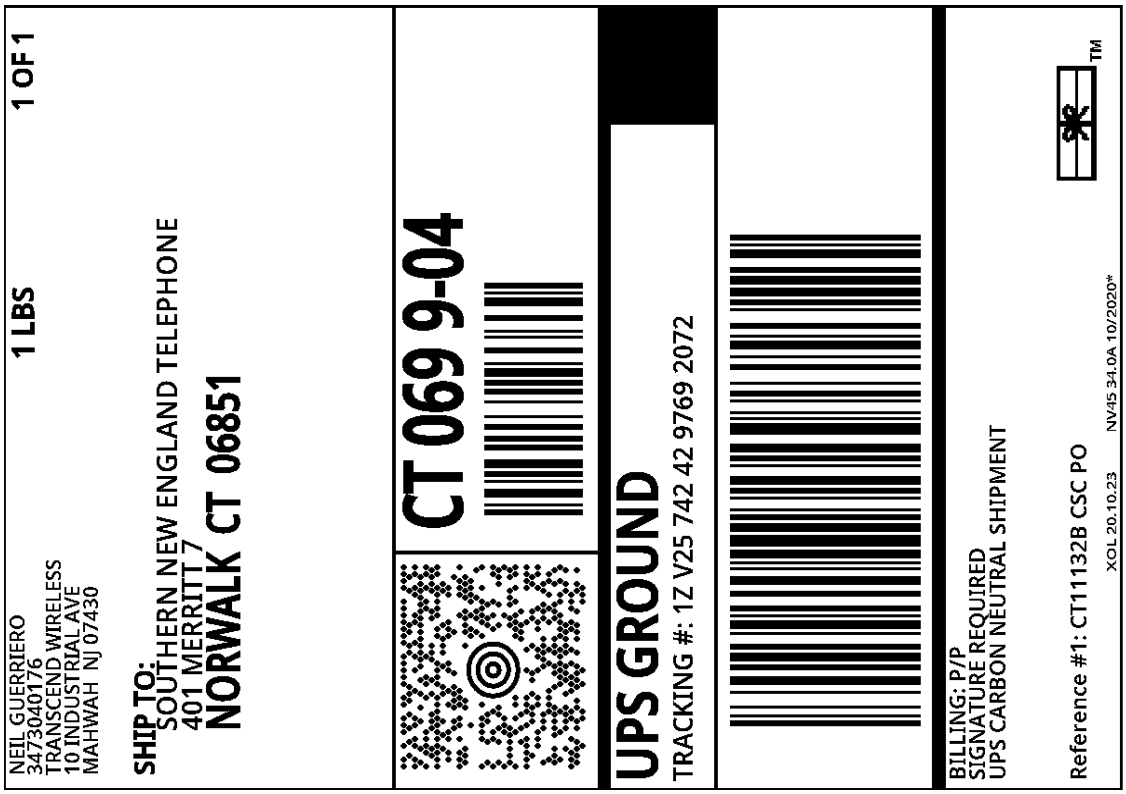

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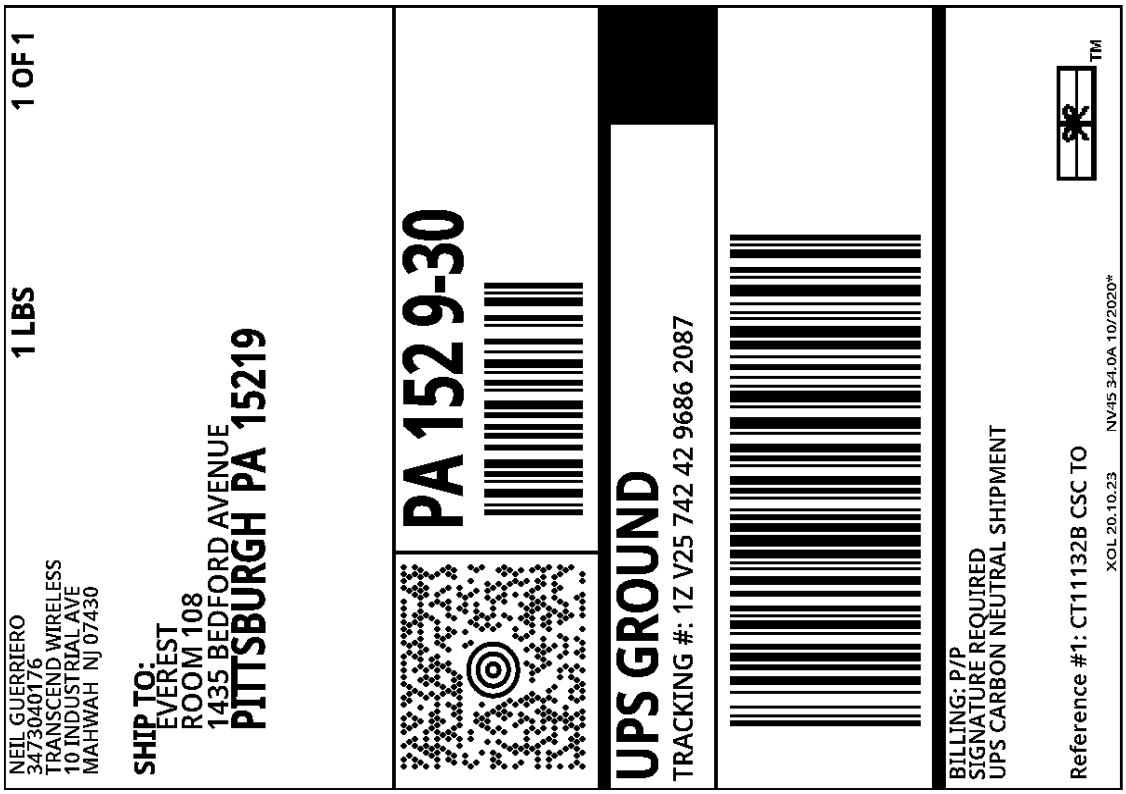


CITY OF MERIDEN
GIS Services

PROPERTY INFORMATION Location: **11 WEST PEAK DR** Map/Lot: 1214-0352-0021-0000

OWNER INFORMATION

Owner(s):
SOUTHERN NEW ENGLAND TEL CO
C/O FRONTIER COMMUNICATIONS

Owner Address:
ATTN: TAX DEPT 401 MERRIT 7
NORWALK, CT 06851

BUILDING INFORMATION

Card Number: 1

Total Units: 1

OVERVIEW	
Building ID	19560
Finished Area	1,542
Comm/Rental Units	1
Living Units	0
Building Type	MultiPurp
Year Built	1979
Effective Yr Built	
Building Number	1
Condo Name	

INTERIOR DETAILS	
Rooms	
BedRooms	
Full Bath	0
Full Bath Rating	
Half Bath	0
Half Bath Rating	
Kitchens	0
Kitchen Rating	
Fireplaces	0

CONSTRUCTION DETAILS	
Exterior	Concrete Blo
Roof Structure	Gable
Roof Cover	Asphalt
Quality	C+
Heat Fuel	Gas
Heat Type	Forced Air
Prcnt. Heated	100.00
Prcnt. AC	0.00
Stories	1 story
Foundation	Conc Slab

Sub Area Summary

Building ID	Description	Total Area	Fin. Area	Perimeter
19560	1st FLOOR	1,542	1,542	204

Special Features

BuildingID	Description	Quantity	Area	Length	Width	YearBuilt	Quality
19560	SHED FRAME	1	160			1979	Average
19560	FENCE 4	1	400			1979	Average

APPRAISAL INFORMATION

Tax District: 1 **District Name:** OUTER DISTRICT **District Mill Rate:** 40.86

Grand List Year: 2019

Land Appraised	Building Appraised	Yard Appraised	Total Appraised Value	Land Assessed	Building Assessed	Yard Assessed	Special Land Value	Total Assessed Value
$600,000	$137,000	$4,200	$741,200	$420,000	$95,900	$2,940	$0	$518,840

Previous Year: 2018

Land Value	Building Value	Yard Items	Appraised Value	Land Value	Building Value	Yard Items	Assessed Value
$600,000	$137,000	$4,200	$741,200	$420,000	$95,900	$2,940	**$518,840**

LAND INFORMATION

Land Use	Zoning	Land Area	Neighborhood Description
Comm Bldg	R-R	0.82874	N OF W MAIN E&W OF RT 71

*Confirm zoning with Planning Office.
Zoning map is the official document to determine zone.

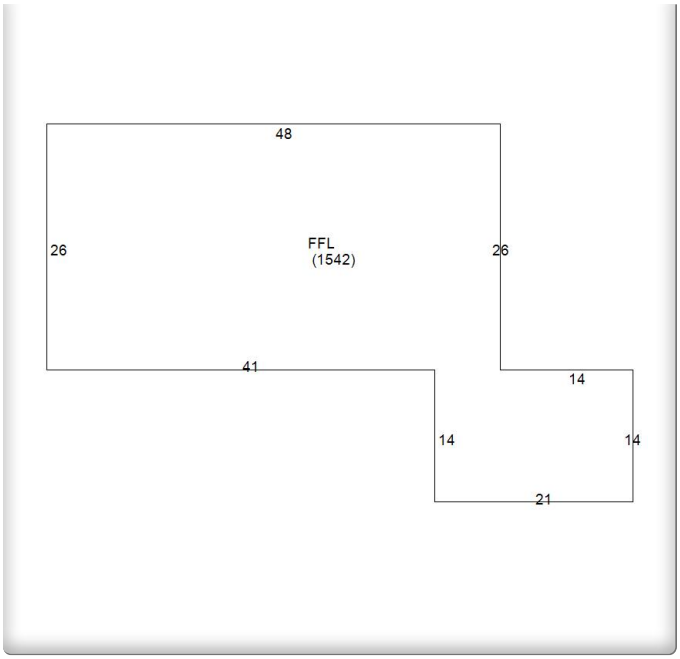
SALES INFORMATION

Sale Date	Sale Price	Book	Page	Grantor	Grantee	Deed Type
3/8/1947	$0	281	483			

ASSESSOR'S PERMIT HISTORY

No data found.

PROPERTY IMAGES



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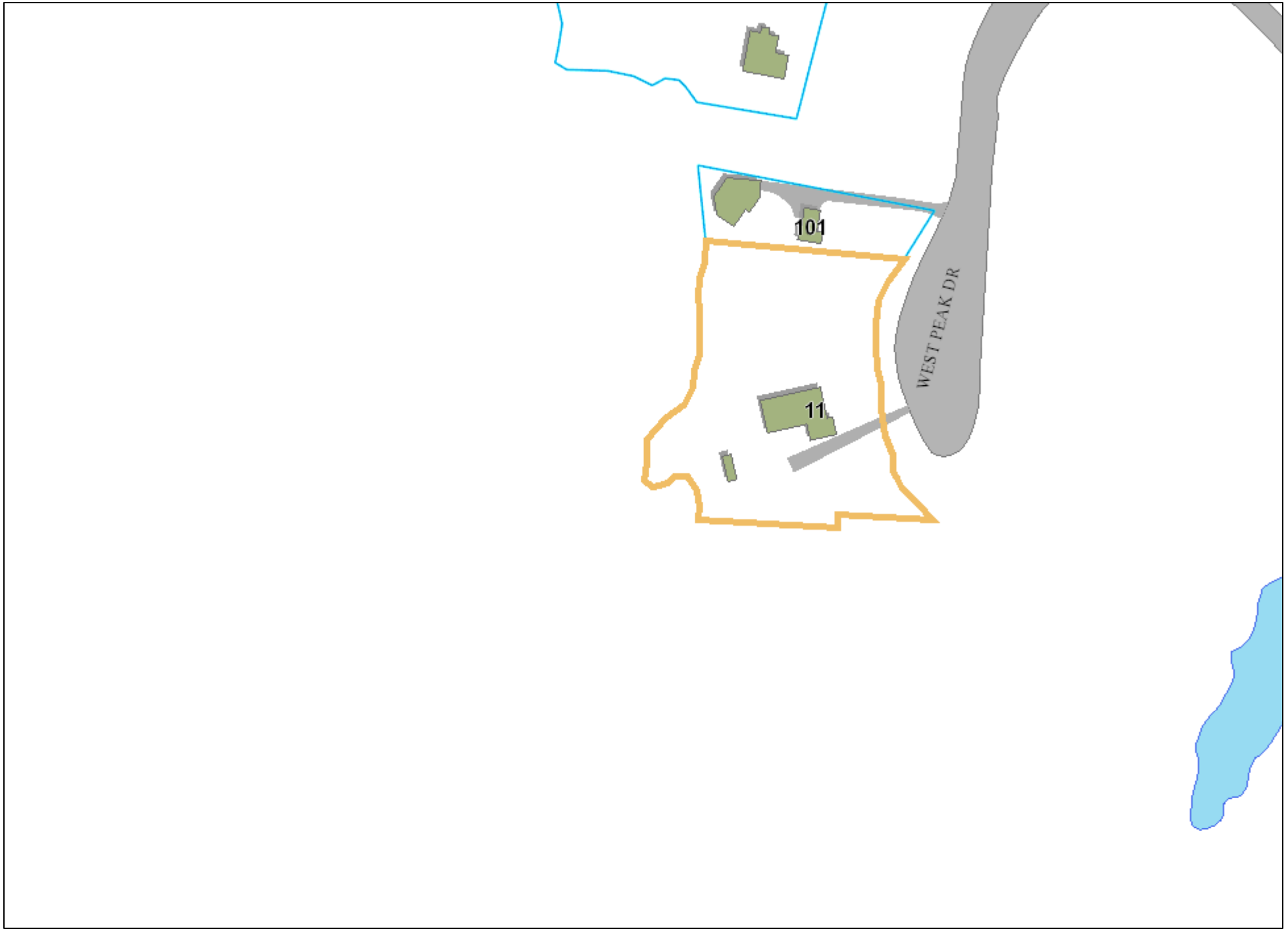


CITY OF MERIDEN

Date: 11/12/2020

CITY OF MERIDEN, CT GIS

11 WEST PEAK DR

1 inch = 100 feet

STATE OF CONNECTICUT

DEPARTMENT OF BUSINESS REGULATION

POWER FACILITY EVALUATION COUNCIL

Petition No. 67
Wolcott, Connecticut
March 26, 1981

Mr. Doocy, Mr. Clapp, Mr. Wood, and Mr. Reid met Mr. Kischell and Mr. Bailey of the Southern New England Telephone Company to review the first half of Petition No. 67. Telecommunication facilities were viewed in Wolcott, Waterbury, and Meriden. The second half of Petition No. 67 involves facilities in Shelton, Norwalk, and Bridgeport. These were reviewed on March 31, 1981.

The first half of this petition involves the following changes at the Barry Avenue site in Wolcott: (a) replacing an existing 90 foot tall triangular lattice steel tower with an 80 foot tall square lattice steel tower; (b) replacing two microwave dishes and two reflectors with four new microwave dishes; (c) adding a 12' x 16' concrete radio building and a new fuel storage tank at the base of the tower and extending the fence to encompass the new facilities. Additional changes include: (d) adding two microwave antennae to the Waterbury East Tower in Waterbury and another concrete radio building; and (e) adding one microwave antenna to the West Peak tower in Meriden.

The Wolcott site is in a single family dwelling residential area near the top of Clinton Hill. The tower is visible from several locations within the area. The tower base and radio building are partially screened by vegetation from the nearest residence and are not visible from other residences. The new tower will be located several feet northeast of the existing tower at approximately the same ground elevation. The proposed tower will be 80 feet tall and more narrow than the existing tower; it will be square instead of triangular. The new microwave antennae are to be mounted on a platform at the top of the tower.

The soil appears shallow but stable, and a few bedrock outcrops appear on the site. The proposed tower will require new foundations which will be set in soil or bedrock. If the soil is too shallow or the bedrock unsuitable, some blasting may be necessary.

A new concrete building will be constructed at the base of the tower and will accomodate the generator used for emergency power. The existing fence will be extended to enclose this facility.

The existing tower will remain in place for approximately six months or until the new facility is operating properly. Then the existing tower will be dismantled and removed.

According to the SNETCO representatives, this proposal has been approved by the Wolcott Planning and Zoning Commission.

The Waterbury East tower is located adjacent to a water tower and several other cable TV or telecommunication towers on top of Long Hill in Waterbury. The site is surrounded by single and multiple family dwellings, commercial, and industrial properties. Both the telecommunication tower and the water tower are visible

from many viewpoints in the Waterbury area. Two microwave antennae are to be mounted at the 80 foot level to the existing 90 foot tower. Once the new facilities are operating, two narrow 80 foot tall towers presently on the site can be removed. These two towers now support reflectors which relay signals from the Waterbury central office to Wolcott. A new radio building will be constructed at the base of the tower and the existing fence will be extended to surround this new building. The radio building will house an emergency generator, the new radio equipment, and future radio equipment when existing facilities are replaced. An existing building presently storing a temporary generator may be removed after the new building is constructed. According to SNETCO representatives, this proposal has received planning and zoning approval.

The Meriden tower is adjacent to West Peak State Park and several telecommunication towers on the top of West Peak. The existing telecommunication facilities on West Peak are relatively well screened from most locations within the state park, but they are a prominent feature on the ridge top as seen from viewpoints in the Meriden area and can be seen up to many miles away on clear days.

The telephone company's tower presently supports seven microwave antennae. SNETCO proposes to add one microwave dish to the existing tower at the 90 foot level to complete a route from Meriden to the Wolcott Tower. The existing North Branform to Wolcott route will be eliminated, and an antenna at the North Branford tower may be removed when the Meriden to Wolcott route is in service. No additional buildings are proposed at this site.

Duncan C. Reid
Environmentalist
March 30, 1981

STATE OF CONNECTICUT

DEPARTMENT OF BUSINESS REGULATION

POWER FACILITY EVALUATION COUNCIL

Petition No. 67
Norwalk, Connecticut
March 31, 1981

Commissioner Boucher, Mr. Clapp, Christopher Wood and Duncan Reid met Mr. Bailey and Mr. Kischell of the Southern New England Telephone Company to review the second part of Petition No. 67 which involved facilities in Norwalk, Bridgeport, and Shelton. The first part of this petition involves facilities located in Wolcott, Waterbury, and Meriden which were visited on Thursday, March 26th.

In Norwalk one dish is to be mounted on an existing 350 foot tower located at a telephone company service center immediately north of Route 1. The dish will be directed toward the existing tower in Bridgeport. The general area around the Norwalk site appears to be commercial, residential, and industrial. The tower is visible from many locations in the area.

The Bridgeport tower (40 feet tall) is located on top of the Central Office Building in downtown Bridgeport. One dish will be mounted at approximately the 30 foot level and directed tower the new dish in Norwalk. The location of the tower on top of the office building diminishes its visual impact.

The 181 foot tower in Shelton is located in a rural residential area. One 5 foot dish will be removed and a 12 foot dish mounted in the same location and directed toward an existing facility in Derby. A new and large dish is required in Shelton to prevent interference with transmissions from Shelton to New Haven. This tower is visible from selected locations within the immediate area and from some distant viewpoints.

No additional radio buildings, generators, or fuel tanks, are planned for the facilities in Norwalk, Bridgeport, and Shelton.

Duncan C. Reid
Environmentalist
March 31, 1981

Phone 566-5612
State Office Building — Hartford, Connecticut 06115

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

MERIDEN/JN RT-691+MA_1
SITE ID: CT11132B
11 WEST PEAK DRIVE
MERIDEN, CT 06037

T-MOBILE RF CONFIGURATION

67D5997DB_2xAIR+1OP

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 CONSTRUCTON, 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 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

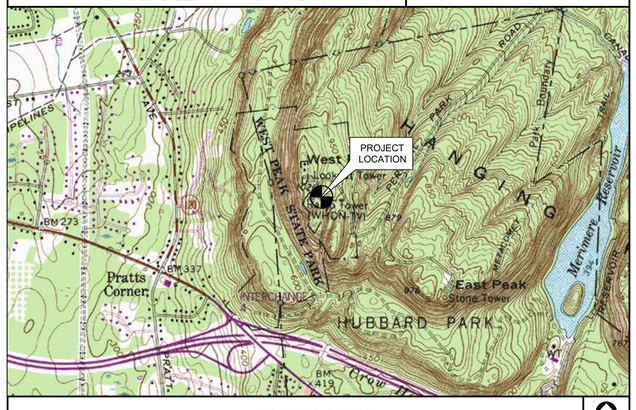
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 11 WEST PEAK DR
MERIDEN, CT 06037

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.21 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187	1.89 MI.
4.	TURN LEFT ONTO CT-305/OLD WINDSOR RD.	2.32 MI.
5.	STAY STRAIGHT TO GO ONTO BLOOMFIELD AVE/CT-305.	0.01 MI.
6.	MERGE ONTO I-91 S TOWARD HARTFORD	25.6 MI.
7.	TAKE EXIT 18 FOR I-691 W TOWARD MERIDEN/WATERBURY	0.03 MI.
8.	CONTINUE ONTO I-691 W	4.40 MI.
9.	TAKE EXIT 4 FOR CT-322 TOWARD SOUTHINGTON	0.02 MI.
10.	TURN LEFT ONTO CT-322 E/MERIDEN-WATERBURY TURNPIKE	0.02 MI.
11.	CONTINUE ONTO W MAIN ST	0.09 MI.
12.	TURN LEFT ONTO HUBBARD PARK DR	0.04 MI.
13.	CONTINUE ONTO RESERVOIR AVE	0.04 MI.
14.	CONTINUE ONTO PARK DR	0.08 MI.
15.	TURN LEFT ONTO W PEAK DR	1.40 MI.
16.	CONTINUE STRAIGHT TO STAY ON W PEAK DR	

SITE COORDINATES: LATITUDE: 41°-33'-40.1" N
LONGITUDE: 72°-50'-39.04" W
GROUND ELEVATION: 1015'± 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. ADD (1) ENCLOSURE 6160
2. ADD (3) BB6630 FOR L2500
3. ADD (1) BB6648 FOR N2500
4. ADD (1) BATTERY CABINET B160
5. REMOVE (6) AIR21 ANTENNAS
6. REMOVE (9) COAX LINES
7. ADD (3) 6X12 HCS
8. ADD (3) AIR 6449 B41 ANTENNAS
9. ADD (3) AIR32 ANTENNAS
10. ADD (3) RFS ANTENNAS
11. ADD (3) RRUS 4449 B71+B85 AND (3) RRUS4415 B25
12. ADD (3) COMMSCOPE DIPLEXERS
13. INSTALL 100 AMP BREAKER
14. INSTALL (1) NEW CONCRETE SLAB-ON-GRADE (5'-0" x 2'-0")

PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS. ANTENNA MOUNTS AND CONCRETE PAD BEING INSTALLED.

PROJECT INFORMATION

SITE NAME:	MERIDEN/JN RT-691&MA_1
SITE ID:	CT11132B
SITE ADDRESS:	11 WEST PEAK DR MERIDEN, CT 06037
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
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°-33'-40.1" N LONGITUDE: 72°-50'-39.04" W GROUND ELEVATION: 1015'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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MERIDEN/JN RT-691+MA_1
SITE ID: CT11132B
11 WEST PEAK DR
MERIDEN, CT 06037

DATE: 07/10/20
SCALE: AS NOTED
JOB NO. 20074.43

TITLE SHEET

T-1

Sheet No. 1 of 9

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): 97 MPH (Vasd) (EXPOSURE C/ 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.
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 IT'S 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 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 "DIG SAFE" (DIAL 811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. 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.
20. 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.
21. 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.

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GENERAL NOTES AND SPECIFICATIONS

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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	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	127'	350°			(1) 6x12 HYBRID CABLE (±150')
A2	PROPOSED	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	127'	350°			
A3	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	127'	350°	(P) RADIO 4449 B71+B85 (1), (P) RADIO 4415 B25 (1)	(P) COMMSCOPE SDX1926Q-43 (1), (E) GENERIC TWIN STYLE 1B (1)	
B1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	127'	110°			(1) 6x12 HYBRID CABLE (±150')
B2	PROPOSED	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	127'	110°			
B3	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	127'	110°	(P) RADIO 4449 B71+B85 (1), (P) RADIO 4415 B25 (1)	(P) COMMSCOPE SDX1926Q-43 (1), (E) GENERIC TWIN STYLE 1B (1)	
C1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	127'	230°			(1) 6x12 HYBRID CABLE (±150')
C2	PROPOSED	ERICCSON (AIR32 KRD901146-1_B66A_B2A)	56.6 x 12.9 x 8.7	127'	230°			
C3	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	127'	230°	(P) RADIO 4449 B71+B85 (1), (P) RADIO 4415 B25 (1)	(P) COMMSCOPE SDX1926Q-43 (1), (E) GENERIC TWIN STYLE 1B (1)	

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

TRUE NORTH

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SITE LOCATION PLAN

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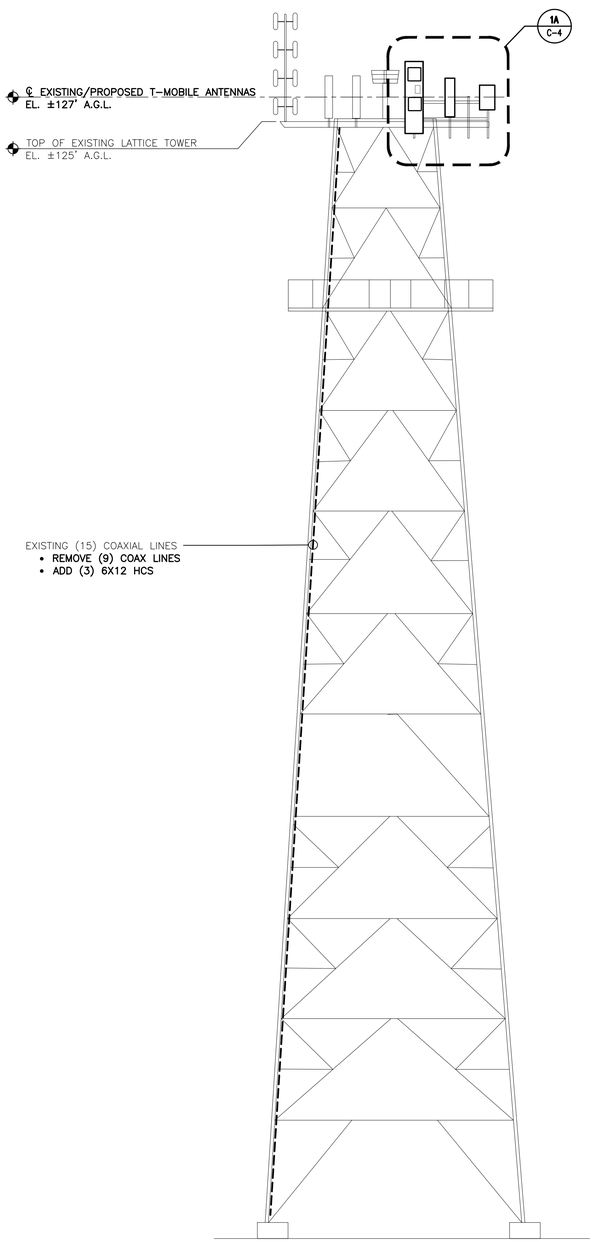


1 C-2 **TOWER ELEVATION - PROPOSED**
SCALE: 1" = 8'

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 DEFICIENT AND WARRANTING MODIFICATION PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT. FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS.

REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.43) DATED 08/07/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

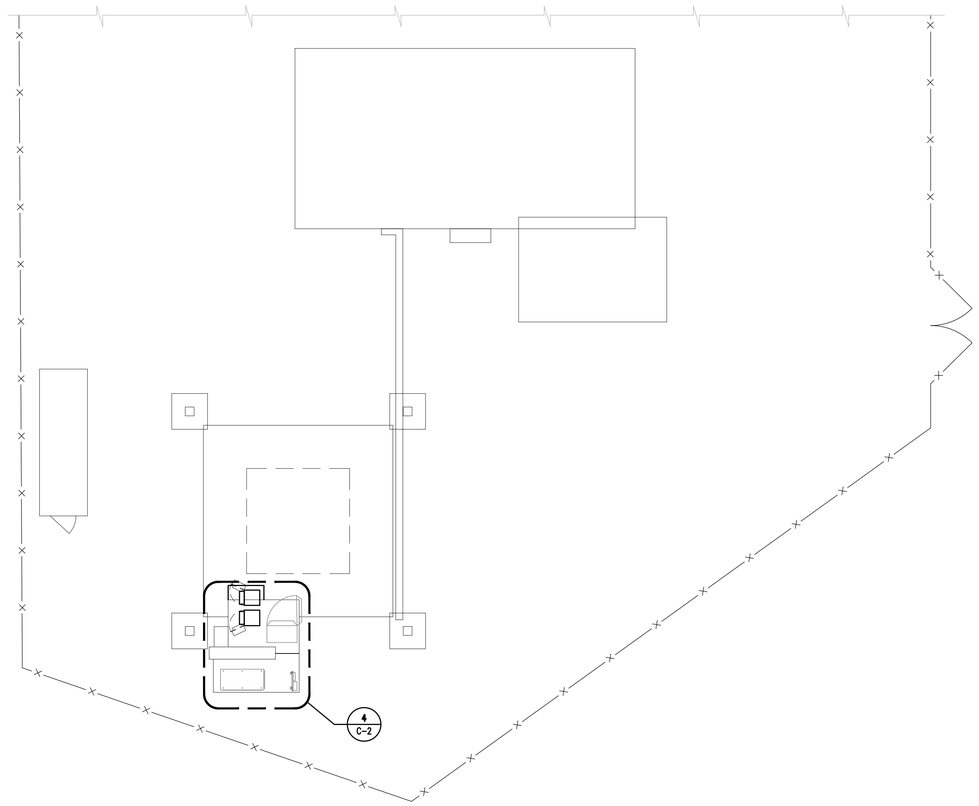
TOWER AND TOWER FOUNDATION

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 "ARMOR TOWER ENGINEERING" DATED 10/30/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

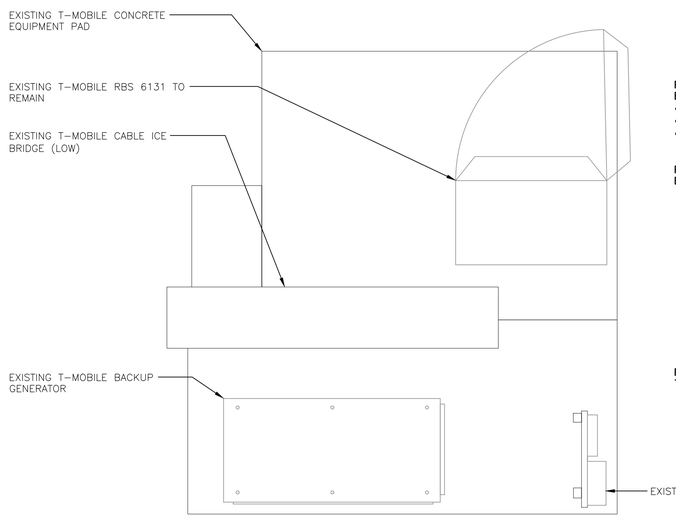
NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.

GRAPHIC SCALE
8 0 4 8 16 32
1" = 8'-0"

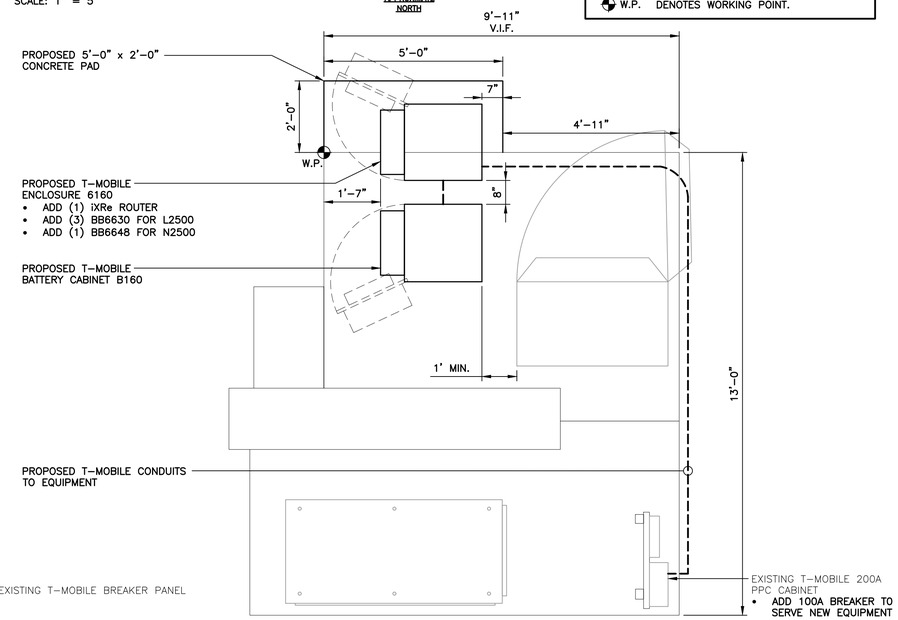


2 C-2 **PARTIAL COMPOUND PLAN - PROPOSED**
SCALE: 1" = 5'
APPROXIMATE NORTH

LEGEND
W.P. DENOTES WORKING POINT.



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



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

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COMPOUND PLAN, EQUIPMENT PLAN, AND ELEVATION

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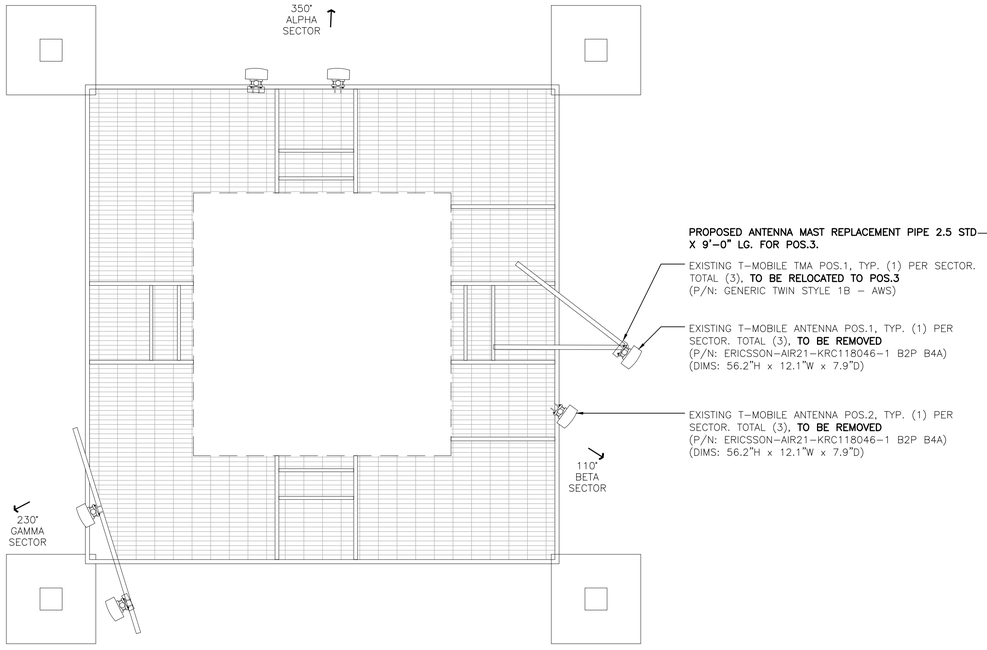
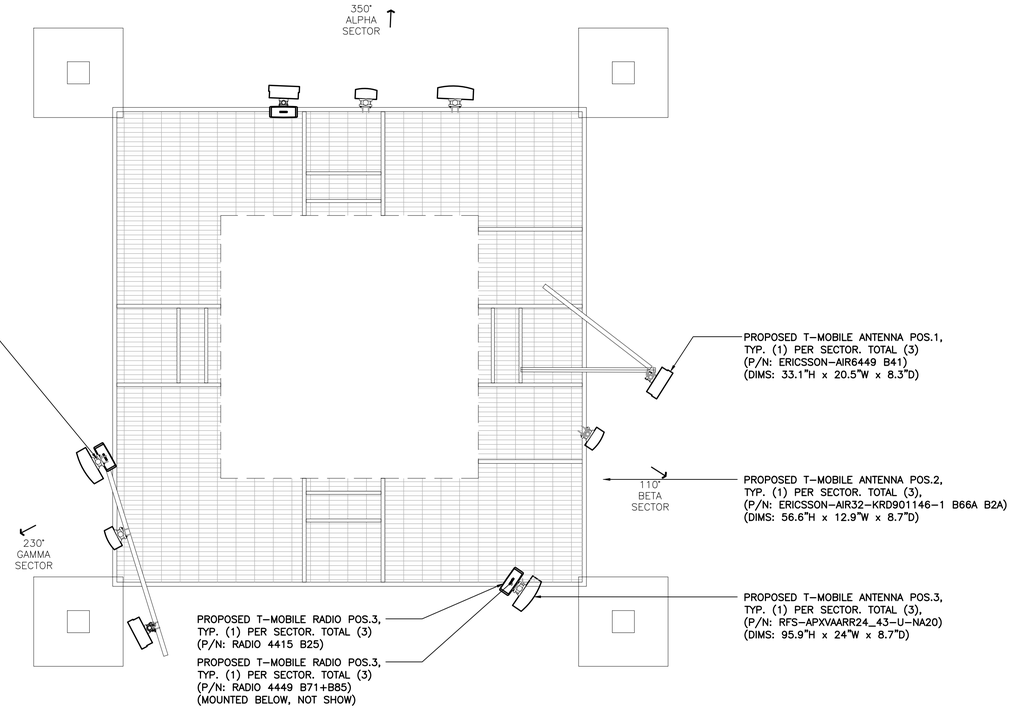


1 C-3 **ANTENNA PLAN - EXISTING**
SCALE: 1/2" = 1'

APPROXIMATE NORTH



2 C-3 **ANTENNA PLAN - PROPOSED**
SCALE: 1/2" = 1'

APPROXIMATE NORTH

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ANTENNA PLANS

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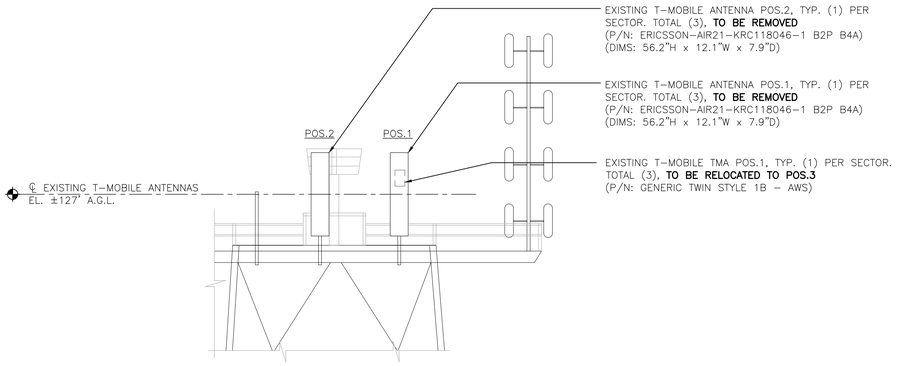
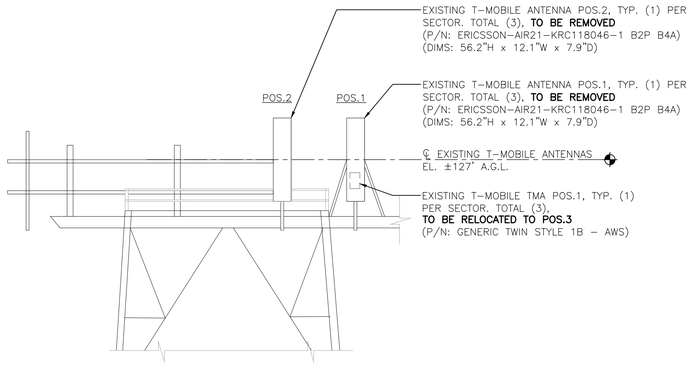
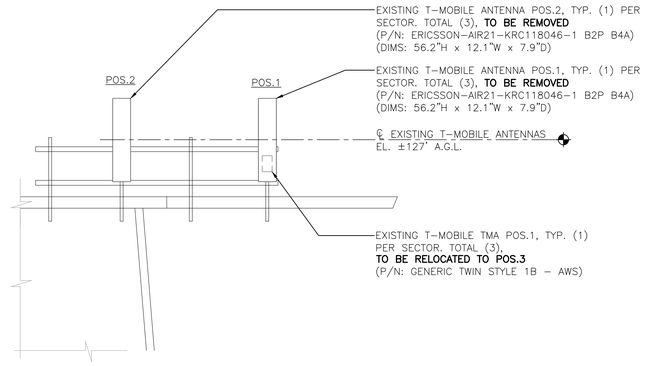


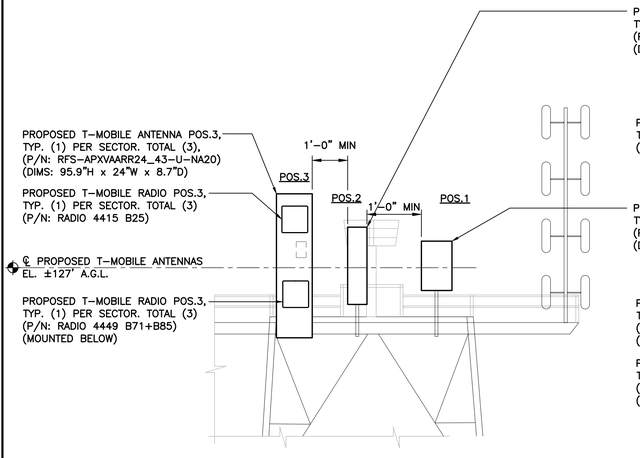
1 C-4 **ANTENNA ELEVATION (ALPHA) - EXISTING**
SCALE: 1/4" = 1'



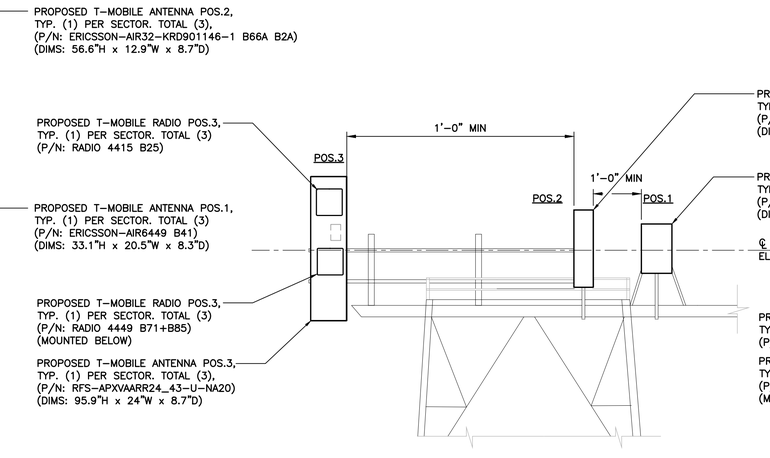
2 C-4 **ANTENNA ELEVATION (BETA) - EXISTING**
SCALE: 1/4" = 1'



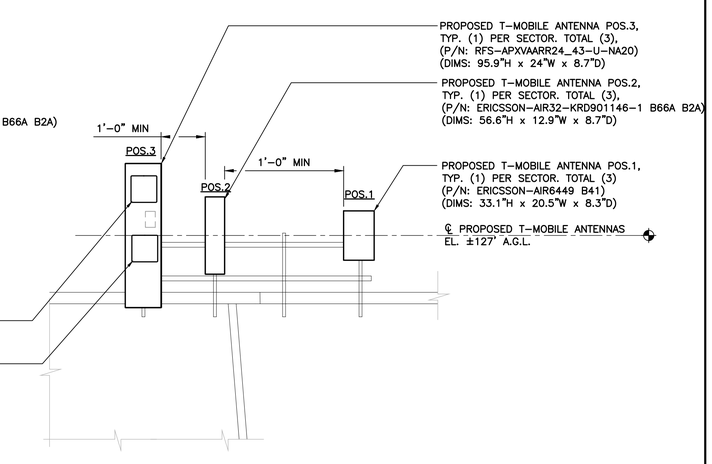
3 C-4 **ANTENNA ELEVATION (GAMMA) - EXISTING**
SCALE: 1/4" = 1'



1A C-4 **ANTENNA ELEVATION (ALPHA) - PROPOSED**
SCALE: 1/4" = 1'



2A C-4 **ANTENNA ELEVATION (BETA) - PROPOSED**
SCALE: 1/4" = 1'



3A C-4 **ANTENNA ELEVATION (GAMMA) - PROPOSED**
SCALE: 1/4" = 1'

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Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY

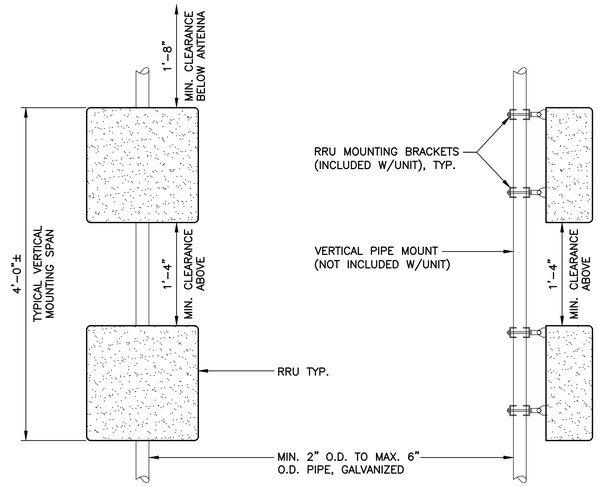
MERIDEN/JN RT-691+MA_1
SITE ID: CT11132B
11 WEST PEAK DR
MERIDEN, CT 06037

DATE:	07/10/20
SCALE:	AS NOTED
JOB NO.	20074.43

ANTENNA ELEVATIONS

C-4

Sheet No. 6 of 9

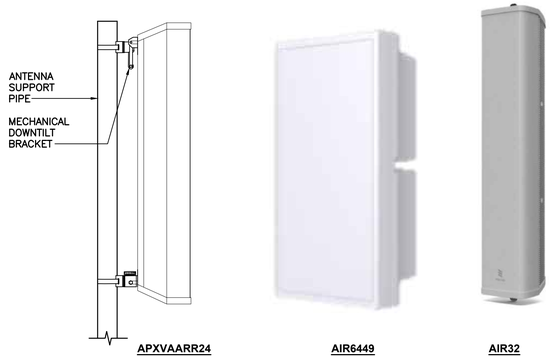


FRONT ELEVATION SIDE ELEVATION

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.

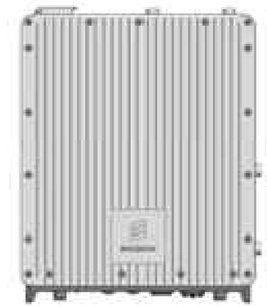
1 / C-5 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NOT TO SCALE



APXVAARR24 AIR6449 AIR32

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: APXVAARR24_43–U–NA20	95.9"L x 24"W x 8.7"D	±128 LBS.
MAKE: ERICSSON MODEL: AIR6449 B41	56.6"L x 12.8"W x 8.6"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



4415

4449

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	17.9"L x 13.2"W x 9.5"D	±71 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4415 B25	14.9"L x 13.2"W x 5.4"D	±46 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.			

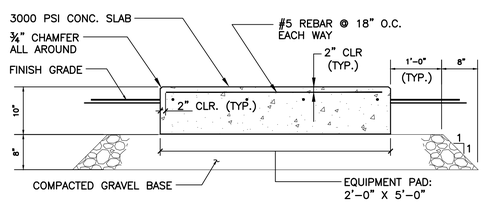
3 / C-5 **PROPOSED RRU DETAIL**
SCALE: NOT TO SCALE

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

4 / C-5 **ENCLOSURE 6160 CABINET DETAIL**
NOT TO SCALE

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

5 / C-5 **BATTERY B160 CABINET DETAIL**
NOT TO SCALE



NOTE:
REFER TO EQUIPMENT UNIT MANUFACTURER FOR RECOMMENDED HOLD–DOWN HARDWARE.

6 / C-5 **CONCRETE PAD DETAIL**
NOT TO SCALE

DIPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: SDX1926Q–43(E14F05P86)	4.2"L x 7.0"W x 3.0"D	–
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

7 / C-5 **PROPOSED DIPLEXER DETAIL**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/04/20	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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T-Mobile
Transcend Wireless

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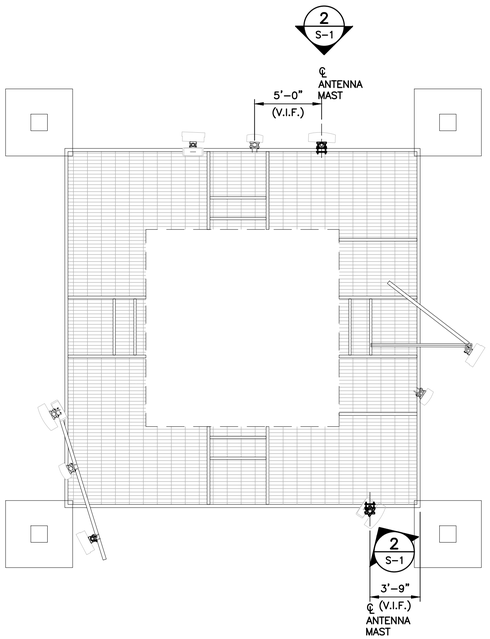
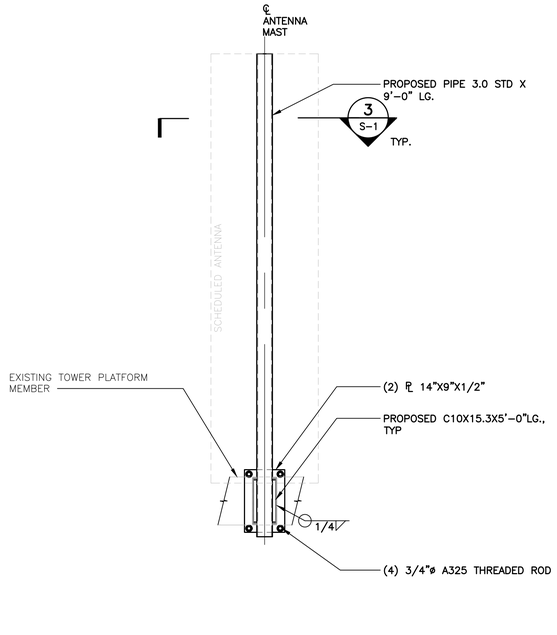
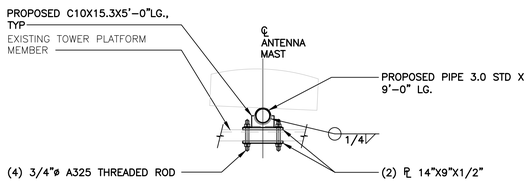
TYPICAL EQUIPMENT DETAILS

C-5

Sheet No. 7 of 9







1 / S-1 **ANTENNA PLAN - PROPOSED ANTENNA MOUNTS**
SCALE: 3/16" = 1'

APPROXIMATE NORTH

2 / S-1 **TYP. PROPOSED ANTENNA MOUNT SECTION VIEW**
SCALE: 3/4" = 1'

3 / S-1 **TYP. PROPOSED ANTENNA MOUNT SECTION VIEW**
SCALE: 3/4" = 1'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/04/20	ASC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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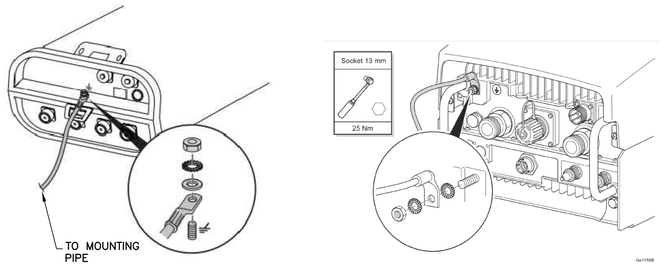
PROPOSED ANT. MOUNT STRUCT. DETAILS

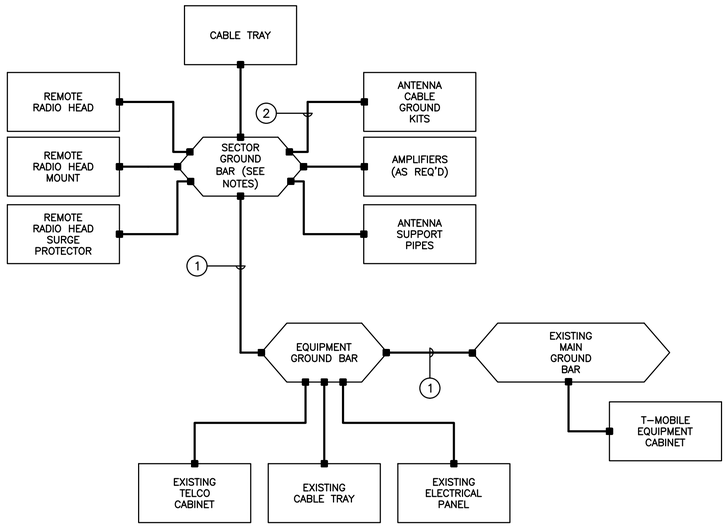
S-1

Sheet No. 8 of 9



1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

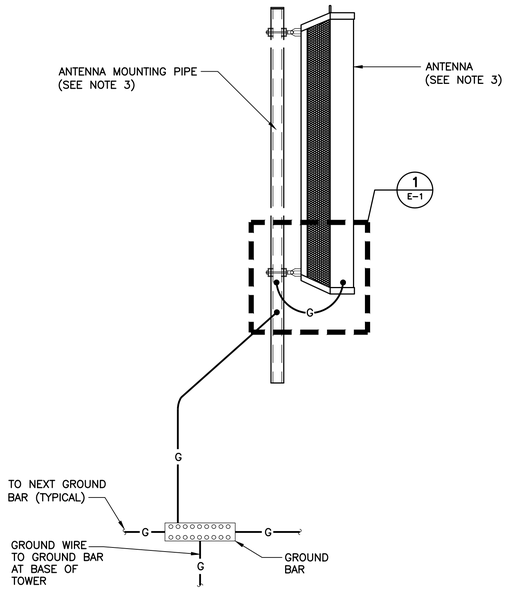
(2) #6 AWG

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. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
4. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
5. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
6. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
7. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

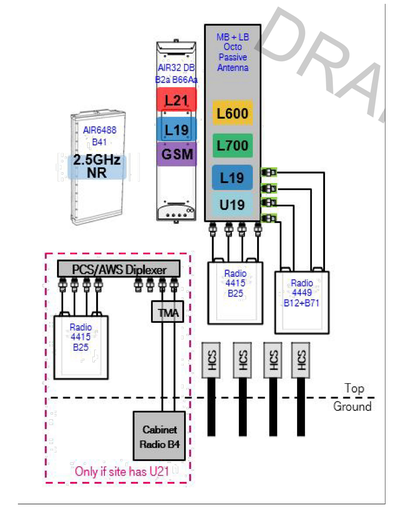


NOTES:

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

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE



3 PROPOSED PLUMBING DIAGRAM

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

(1) EXISTING 200A, PPC CABINET TO REMAIN.

(2) EXISTING CONDUITS AND CONDUCTORS TO REMAIN.

(3) EXISTING EQUIPMENT CABINET TO REMAIN.

(4) NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.

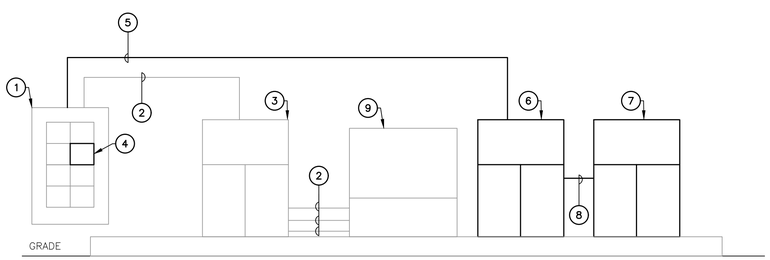
(5) (3) #1 AWG, (1) #8 AWG GROUND, 1–1/4" CONDUIT.

(6) NEW RADIO EQUIPMENT CABINET.

(7) NEW BATTERY CABINET.

(8) DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.

(9) 15 KW DC GENERATOR TO REMAIN.



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/04/20	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

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11 WEST PEAK DR

MERIDEN, CT 06037

DATE:	07/10/20
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JOB NO.	20074.43

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 9 of 9

Reanalysis of a 125 ft Self-Supporting Tower

Site Number T-Mobile CT11132B
Site Name: West Peak
County: New Haven, CT
Location: 11 West Peak Drv, Meriden, CT

Two Allegheny Ctr

Nova Tower 2, Ste 703

Pittsburgh, PA 15212

October 2020

9 North Main Street, 2nd Floor, Cortland, NY 13045
(607)591-5381 Fax: (866)870-0840 www.ArmorTower.com

October 30, 2020

Tom Rigg
Everest Infrastructure Partners
Two Allegheny Ctr
Nova Center 2, Ste 703
Pittsburgh, PA 15212

RE: T-Mobile – CT11132B – West Peak
11 West Peak Drv, Meriden, CT

Tom:

We have completed the structural analysis of the subject tower and **have found it to be adequate within the scope of this analysis to support the proposed antenna loading**. The tower was analyzed according to the code wind and ice parameters outlined in the *Code Requirements Table* following this letter.

The subject tower is a 125' square self-supporting tower consisting of all-bolted sections with angle legs and bracing. Tower face dimensions range from 12'6" at the top to 31'3" at the base. Foundation capacities are based on manufacturer's design details.

The loading used in the analysis consisted of the existing antennas/lines as well as the following for T-Mobile at 127':

- (3) AIR 6449(B41), (3) APXVARR24_43-C-NA20, (3) AIR32(B2A/B66A) antennas
- (3) KRY 112 144/1 TMAs, (3) Radio 4449 (B85/B71), RRUS 4415 (B25), (3) SDX1926Q-43 Diplexers
- (6) 1-5/8" coax, (6) hybrid fiber cables stacked on the existing feed line ladder as shown on drawing E-7.

The results of the analysis showed all tower and foundation elements to be loaded within allowable limits with a maximum stress rating of 85%. For a detailed listing of tower performance, please see pages 25 to 27 of the calculations.

We appreciate the opportunity to provide our professional services to Everest Infrastructure and T-Mobile and if you have any questions concerning this analysis, please contact us.

Sincerely,

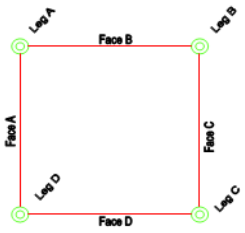
ARMOR TOWER, INC.

Patrick Botimer
Structural Design Engineer V

CODE REQUIREMENTS

Governing code:	CT State Building Code
Code basis:	2018 IBC
Referenced standard:	ANSI/TIA 222-H
Basic wind speed: (3-sec. gust):	V_{ult}: 118 mph with no ice 50 mph with 1" concurrent ice
County of site location:	**New Haven**
ASCE 7 Special wind region:	No
Structure/Risk Category:	II
Exposure Category:	B
Topographic Category:	3 - hill
Crest Height/Tower Base Elevation	922 ft/1004 ft
Spectral Response:	S_s=0.200, S_1=0.055

PRIMARY ASSUMPTIONS CONSIDERED IN THIS PROJECT

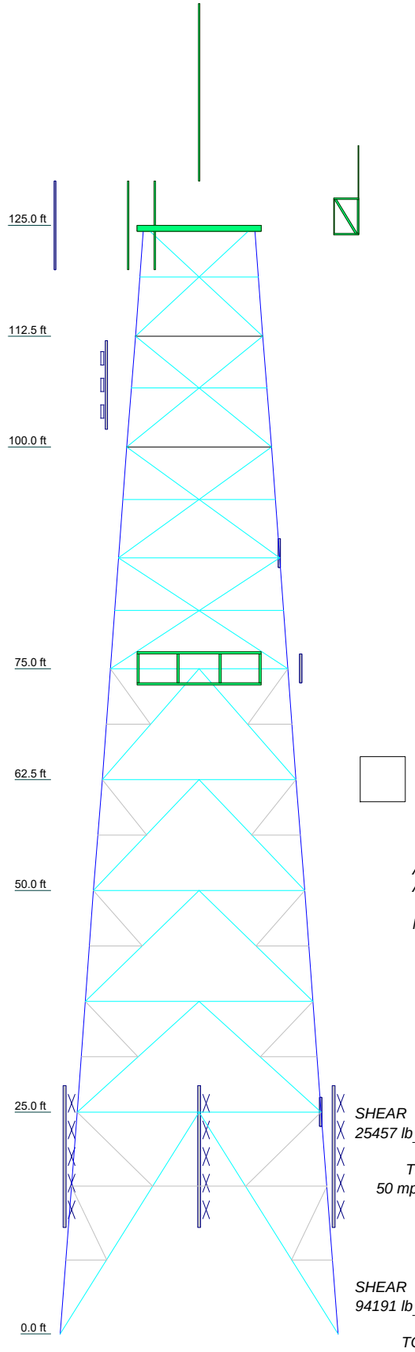


1. Leg A is assumed to be oriented Northest.
2. Allowable steel stresses are defined by AISC-LRFD-99/360-16 and all welds conform to AWS D1.1 specification.
3. If reserved antennas/feed lines by other carriers or the tower owner are to be considered in this analysis, it is the responsibility of Everest Infrastructure and its affiliates to provide this information.
4. Any deviation from the analyzed antenna loading will require a re-analysis of the tower for verification of structural integrity. This analysis has considered the proposed feed lines to be stacked and located as shown on drawing E-7.
5. This analysis assumes all tower members are galvanized adequately to prevent corrosion of the steel and that all tower members are in “like new” condition with no physical deterioration. This analysis also assumes the tower has been maintained properly per TIA 222-H Annex J recommended inspection and maintenance procedures for tower owners and is in a plumb condition. Armor Tower has not completed a condition assessment of the tower.
6. No accounting for residual stresses due to incorrect tower erection can be made. This analysis assumes all bolts are appropriately tightened providing necessary connection continuity and that the installation of the tower was performed by a qualified tower erector.
7. No conclusions, expressed or implied, shall indicate that Armor Tower has made an evaluation of the original design, materials, fabrication, or potential installation or erection deficiencies. Any information contrary to that assumed for the purpose of preparing this analysis could alter the findings and conclusions stated herein.
8. Tower member sizes and geometry are based on a tower mapping completed by this office in 2017. Field measurements included NDT-ultrasonic thickness testing. Existing antenna loading is based on our 2017 tower analysis. It is our assumption that this data is complete and accurately reflects the existing conditions of the tower and equipment. Armor Tower has not been commissioned to field-validate this data. Armor Tower reserves the right to add to or modify this report as more information

becomes available. Proposed equipment was outlined in *638281 (CT11132B)TMO Collo App (Anchor)_8.26.2020.xlsx*.

9. The investigation of the load carrying capacities of the antenna supporting frames/mounts is outside the scope of this analysis. Antenna mount certification can be completed under a separate contract.
10. Armor Tower can assist the contractor in providing a Class IV rigging plan for equipment lifting.

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Horizontals	Sec. Horizontals	Red. Horizontals	Red. Diagonals	Red. Sub-Horizs	Inner Bracing	Face Width (ft)	# Panels @ (ft)	Weight (lb)
T1	L6x6x1/2	A36	L3 1/2x3 1/2x1/4	A36	C9x13.4	N.A.	L2 1/2x2x1/4	N.A.	N.A.	N.A.	N.A.	12.5	8 @ 12.5	2978.0
T2			L3x3 1/2x1/4		A		C6x8.2					14.375		3673.2
T3	L6x6x5/8		L4x3x1/4		2L3x2 1/2x1/4x3/8	2L3x2 1/2x1/4x3/8	L3x2 1/2x1/4					16.25		6724.6
T4	L6x6x3/4								L2 1/2x2x3/16		2L2 1/2x2x3/16x3/8	20		4160.4
T5	L6x6x7/8		2L2 1/2x2 1/2x1/4x3/8			2L2 1/2x2 1/2x1/4x3/8		L2x2x3/16				21.875		4252.2
T6	L6x8x7/8				N.A.		N.A.		L2 1/2x2 1/2x3/16		2L2 1/2x2 1/2x3/16x3/8	23.75		9402.8
T7	L8x8x7/8		2L3x3 1/2x3/8x3/8			2L3x2 1/2x5/16x3/8		L2 1/2x2x3/16	L2-1/2x2-1/2x3/16	2L3x2 1/2x1/4x3/8	L2 1/2x2 1/2x1/4	27.5	1 @ 25	12597.6
												31.25		43788.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	140	Commscope SDX1926Q-43 Diplexer (P-TMO-Alpha)	127
BA40-67-DIN UHF Omni Dipole	129	Commscope SDX1926Q-43 Diplexer (P-TMO-Beta)	127
4' Sidearm Mount	129	Commscope SDX1926Q-43 Diplexer (P-TMO-Gamma)	127
12' GENERIC BOOM	127	3"Sch40 x 10ft	125
12' GENERIC BOOM	127	3"Sch40 x 10ft	125
12' GENERIC BOOM	127	3"Sch40 x 10ft	125
Ericsson AIR 6449 B41 w. MtgPipe (P-TMO-Alpha)	127	3"Sch40 x 10ft	125
Ericsson AIR 6449 B41 w. MtgPipe (P-TMO-Beta)	127	Top Platform - West Peak	125
Ericsson AIR 6449 B41 w. MtgPipe (P-TMO-Gamma)	127	2L 2 1/2x2 1/2x1/4x3/8 @ 10ft (Knee Bracing)	119
APXVARR24_43-C-NA20 (P-TMO-Alpha)	127	Full Access Platform	107
APXVARR24_43-C-NA20 (P-TMO-Beta)	127	SD235-SF2PASNM VHF Dipole	107
APXVARR24_43-C-NA20 (P-TMO-Gamma)	127	Mount Frames	88
Ericsson AIR32 (B2A/B66A) w. Mtg Pipe (P-TMO-Alpha)	127	Rest Platform-Half	88
Ericsson AIR32 (B2A/B66A) w. Mtg Pipe (P-TMO-Beta)	127	Mount Frames	75
Ericsson AIR32 (B2A/B66A) w. Mtg Pipe (P-TMO-Gamma)	127	Rest Platform-full	75
KRY 112 144/1 Double TMA (TMO-Alpha)	127	Rest Platform-full	75
KRY 112 144/1 Double TMA (TMO-Beta)	127	Mount Frames	75
KRY 112 144/1 Double TMA (TMO-Gamma)	127	22' Protection Frame/ Shield	34 - 12
Ericsson Radio 4449 B85/B71 (P-TMO-Alpha)	127	22' Protection Frame/ Shield	34 - 12
Ericsson Radio 4449 B85/B71 (P-TMO-Beta)	127	Old Hardline cage	28 - 12
Ericsson Radio 4449 B85/B71 (P-TMO-Gamma)	127	Old Hardline cage	28 - 12
Ericsson RRUS 4415 B25 (P-TMO-Alpha)	127	Old Hardline cage	28 - 12
Ericsson RRUS 4415 B25 (P-TMO-Beta)	127	Rest Platform-Half	25
Ericsson RRUS 4415 B25 (P-TMO-Gamma)	127		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2L 3 1/2 x 3 x 7/16 x 3/8		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-H Standard.
2. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 3 with Crest Height of 650.00 ft
7. Connections use galvanized A307 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
9. (P)roposed/(E)xisting/(P)roposed equipment.
10. TOWER RATING: 84.8%

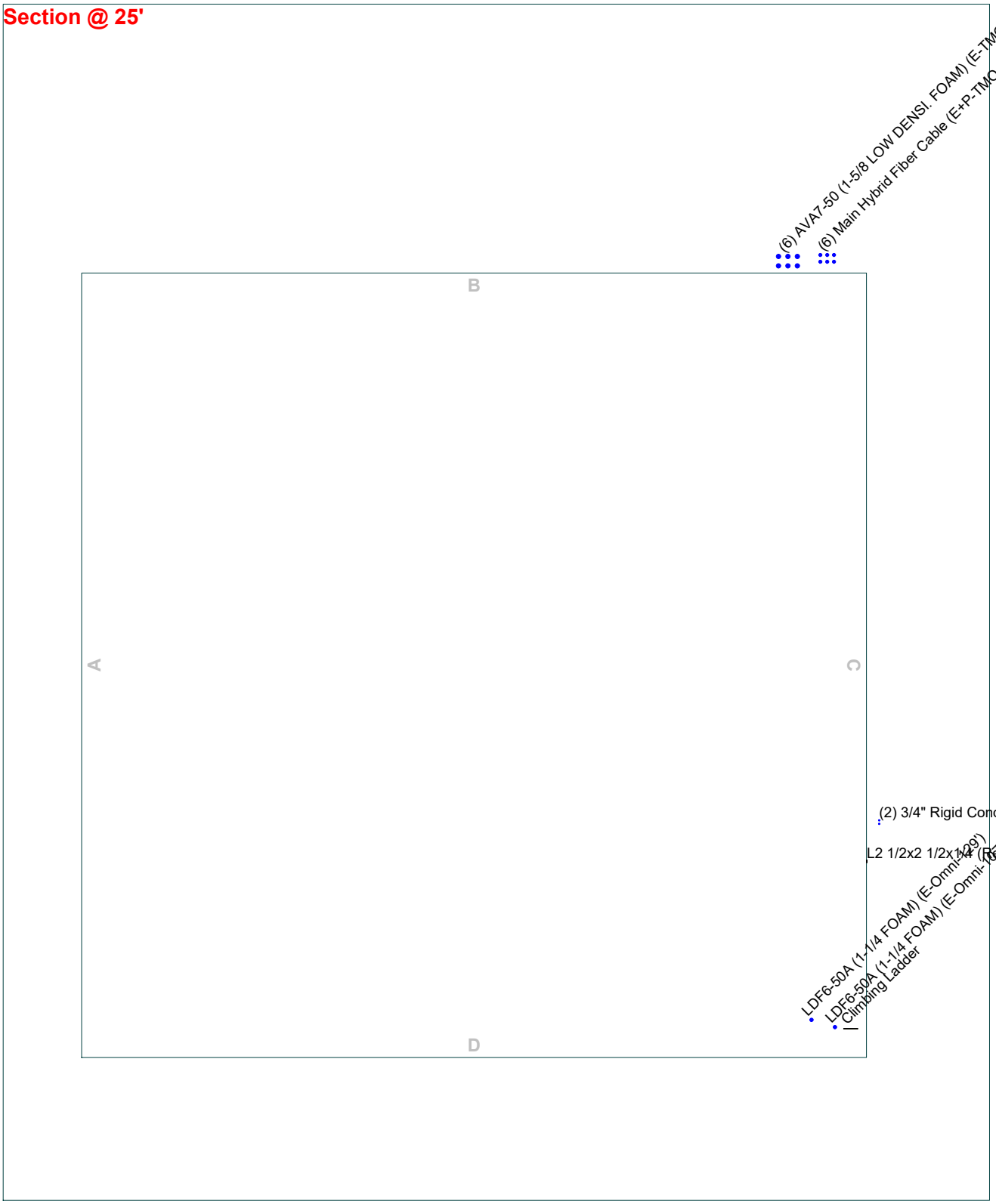
ARMOR TOWER
Armor Tower Inc
9 North Main
Cortland, NY 13045
Phone: 607-591-5381
FAX: 866-870-0840

Job: ***125' SQR SELF-SUPPORTING TOWER ANALYSIS***
Project: ***T-Mobile CT11-132B West Peak/Meriden, CT***
Client: Everest Infrastructure | Drawn by: PB | App'd:
Code: TIA-222-H | Date: 10/30/20 | Scale: NTS
Path: | Dwg No. E-1

Feed Line Plan
25'

Round Flat App In Face App Out Face

Section @ 25'



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9 North Main
Cortland, NY 13045
Phone: 607-591-5381
FAX: 866-870-0840

Job:	***125' SQR SELF-SUPPORTING TOWER ANALYSIS***		
Project:	***T-Mobile CT11-132B West Peak/Meriden, CT***		
Client: Everest Infrastructure		Drawn by: PB	App'd:
Code: TIA-222-H		Date: 10/30/20	Scale: NTS
Path:			Dwg No. E-7

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 125.00 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 12.50 ft at the top and 31.25 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 1004.00 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 3.
Crest Height: 650.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Connections use galvanized A307 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
(P)roposed/(E)xisting/(P)roposed equipment..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
√ Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

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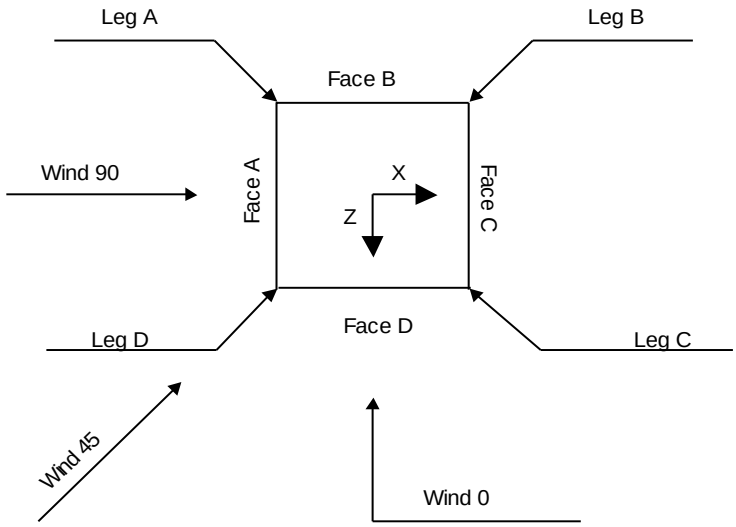

Square Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	125.00-112.50			12.50	1	12.50
T2	112.50-100.00			14.38	1	12.50
T3	100.00-75.00			16.25	1	25.00
T4	75.00-62.50			20.00	1	12.50
T5	62.50-50.00			21.88	1	12.50
T6	50.00-25.00			23.75	1	25.00
T7	25.00-0.00			27.50	1	25.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	125.00-112.50	12.50	X Brace	No	Yes	0.0000	0.0000
T2	112.50-100.00	12.50	X Brace	No	Yes	0.0000	0.0000
T3	100.00-75.00	12.50	X Brace	No	Yes	0.0000	0.0000
T4	75.00-62.50	12.50	K1 Down	No	Yes	0.0000	0.0000
T5	62.50-50.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T6	50.00-25.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T7	25.00-0.00	25.00	K2 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 125.00-112.50	Equal Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T2 112.50-100.00	Equal Angle	L6x6x1/2	A36 (36 ksi)	Single Angle	L3x3 1/2x1/4	A36 (36 ksi)
T3 100.00-75.00	Equal Angle	L6x6x5/8	A36 (36 ksi)	Single Angle	L4x3x1/4	A36 (36 ksi)
T4 75.00-62.50	Equal Angle	L6x6x3/4	A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T5 62.50-50.00	Equal Angle	L6x6x3/4	A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T6 50.00-25.00	Equal Angle	L6x6x7/8	A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T7 25.00-0.00	Equal Angle	L8x8x7/8	A36 (36 ksi)	Double Angle	2L3x3 1/2x3/8x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T1 125.00-112.50	Channel	C9x13.4	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 112.50-100.00	Double Angle	2L 3 1/2 x 3 x 7/16 x 3/8	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T3 100.00-75.00	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)	Flat Bar		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*
T3 100.00-75.00	None	Flat Bar		A36 (36 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T4 75.00-62.50	None	Wide Flange		A36 (36 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T5 62.50-50.00	None	Flat Bar		A36 (36 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T6 50.00-25.00	None	Flat Bar		A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T7 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Double Angle	2L3x2 1/2x5/16x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 125.00-112.50	Single Angle	L2 1/2x2x1/4	A36 (36 ksi)	Double Angle		A36 (36 ksi)
T2 112.50-100.00	Channel	C6x8.2	A36 (36 ksi)	Double Angle		A36 (36 ksi)
T3 100.00-75.00	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)	Double Angle		A36 (36 ksi)
T4 75.00-62.50	Solid Round		A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T5 62.50-50.00	Solid Round		A36 (36 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T6 50.00-25.00	Solid Round		A36 (36 ksi)	Double Angle	2L2 1/2x2 1/2x3/16x3/8	A36 (36 ksi)
T7 25.00-0.00	Solid Round		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T4	A36	Horizontal (1)	Equal Angle	L2x2x3/16	0.9
75.00-62.50	(36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2x3/16	0.9
T5	A36	Horizontal (1)	Equal Angle	L2x2x3/16	0.9
62.50-50.00	(36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2x3/16	0.9
T6	A36	Horizontal (1)	Equal Angle	L2x2x3/16	0.9
50.00-25.00	(36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	0.9
T7 25.00-0.00	A36	Horizontal (1)	Arbitrary Shape	L2 1/2x2x3/16	0.9
	(36 ksi)	Horizontal (2)		2L2 1/2x2 1/2x1/4x3/8	
		Diagonal (1)	Arbitrary Shape	L2-1/2x2-1/2x3/16	0.9
		Diagonal (2)		2L2 1/2x2x1/4x3/8	
		Sub-Horizontal	Double Angle	2L3x2 1/2x1/4x3/8	1

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 125.00-112.50	4.80	0.3750	A36 (36 ksi)	1	1	1	24.0000	24.0000	24.0000
T2 112.50-100.00	4.80	0.3750	A36 (36 ksi)	1	1	1	24.0000	24.0000	24.0000
T3 100.00-75.00	6.10	0.3750	A36 (36 ksi)	1	1	1	24.0000	24.0000	24.0000
T4 75.00-62.50	3.50	0.3750	A36 (36 ksi)	1	1	1.1	24.0000	24.0000	24.0000
T5 62.50-50.00	3.50	0.3750	A36 (36 ksi)	1	1	1.1	24.0000	24.0000	24.0000
T6 50.00-25.00	3.50	0.3750	A36 (36 ksi)	1	1	1.1	24.0000	24.0000	24.0000

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Tower Elevation	*Gusset Area (per face)*	*Gusset Thickness*	*Gusset Grade*	*Adjust. Factor A_f*	*Adjust. Factor A_r*	*Weight Mult.*	*Double Angle Stitch Bolt Spacing Diagonals*	*Double Angle Stitch Bolt Spacing Horizontals*	*Double Angle Stitch Bolt Spacing Redundants*
ft	*ft²*	*in*					*in*	*in*	*in*
T7 25.00-0.00	9.80	0.3750	A36 (36 ksi)	1	1	1.1	24.0000	24.0000	24.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	*Calc K Single Angles*	*Calc K Solid Rounds*	*K Factors*[1] *Legs*	*X Brace Diags*	*K Brace Diags*	*Single Diags*	*Girts*	*Horiz.*	*Sec. Horiz.*	*Inner Brace*
ft				*X* *Y*	*X* *Y*	*X* *Y*	*X* *Y*	*X* *Y*	*X* *Y*	*X* *Y*
T1	No	No	1	0.9	1	1	1	1	1	1
125.00-112.50				0.9	1	1	1	1	1	1
T2	No	No	1	0.9	1	1	1	1	1	1
112.50-100.00				0.9	1	1	1	1	1	1
T3	No	No	1	0.9	1	1	1	1	1	1
100.00-75.00				0.9	1	1	1	1	1	1
T4	No	No	1	1	0.9	1	1	0.9	1	0.5
75.00-62.50				1	0.9	1	1	0.9	1	0.5
T5	No	No	1	1	0.9	1	1	0.9	1	0.5
62.50-50.00				1	0.9	1	1	0.9	1	0.5
T6	No	No	1	1	0.9	1	1	0.9	1	0.5
50.00-25.00				1	0.9	1	1	0.9	1	0.5
T7 25.00-0.00	No	No	1	1	0.9	1	1	0.9	1	0.5
				1	0.9	1	1	0.9	1	0.5

[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 125.00-112.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 112.50-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 100.00-75.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 75.00-62.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 62.50-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 50.00-25.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 25.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 125.00-112.50	8.0000	8.0000	8.0000	8.0000	0.0000	0.0000	0.0000	0.0000
T2 112.50-100.00	8.0000	8.0000	8.0000	8.0000	0.0000	0.0000	0.0000	0.0000
T3 100.00-75.00	8.0000	8.0000	8.0000	8.0000	0.0000	0.0000	0.0000	0.0000
T4 75.00-62.50	0.0000	0.0000	0.0000	0.0000	5.0000	5.0000	10.0000	5.0000
T5 62.50-50.00	0.0000	0.0000	0.0000	0.0000	5.0000	5.0000	10.0000	5.0000
T6 50.00-25.00	0.0000	0.0000	0.0000	0.0000	5.0000	5.0000	10.0000	5.0000
T7 25.00-0.00	0.0000	0.0000	0.0000	0.0000	5.0000	5.0000	10.0000	5.0000

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 125.00-112.50	Sleeve DS	0.7500 A307	16	0.7500 A307	5	0.7500 A307	4	0.0000 A325N	0	0.7500 A307	0	0.7500 A307	3	0.7500 A307	2
T2 112.50-100.00	Sleeve DS	0.7500 A307	0	0.7500 A307	4	0.7500 A307	3	0.6250 A325N	0	0.7500 A307	0	0.7500 A307	3	0.7500 A307	2
T3 100.00-75.00	Sleeve DS	0.7500 A307	16	0.7500 A307	4	0.7500 A307	3	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	3	0.7500 A307	2
T4 75.00-62.50	Sleeve DS	0.7500 A307	0	0.7500 A307	2	0.6250 A325N	0	0.6250 A325N	0	0.7500 A325N	0	0.7500 A307	2	0.7500 A307	0
T5 62.50-50.00	Sleeve DS	0.7500 A307	20	0.7500 A307	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	2	0.7500 A307	0
T6 50.00-25.00	Sleeve DS	0.7500 A307	24	0.7500 A307	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	2	0.7500 A307	0
T7 25.00-0.00	Sleeve DS	0.7500 A307	28	0.7500 A307	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	2	0.7500 A307	0

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
Climbing Ladder **	D	No	No	Af (CaAa)	125.00 - 0.00	-12.000 0	-0.48	1	1	6.0000	6.0000		7.80
TMobile *(18) coax existing, (12)													

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*
2B removed AVA7-50 (1-5/8 LOW DENSI. FOAM) (E-TMO-127')	B	No	No	Ar (CaAa)	125.00 - 0.00	2.0000	0.4	6	3	1.9800	1.9800		0.72
Main Hybrid Fiber Cable (E+P-TMO-127') *	B	No	No	Ar (CaAa)	125.00 - 0.00	4.0000	0.45	6	3	1.4300	1.4300		1.63
LDF6-50A (1-1/4 FOAM) (E-Omni-129')	D	No	No	Ar (CaAa)	125.00 - 0.00	-15.0000	-0.43	1	1	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM) (E-Omni-107')	D	No	No	Ar (CaAa)	107.00 - 0.00	-12.0000	-0.46	1	1	1.5500	1.5500		0.66
3/4" Rigid Conduit ** ** ** **	C	No	No	Ar (CaAa)	125.00 - 0.00	5.0000	0.2	2	2	0.7500	0.7500		0.80
L2 1/2x2 1/2x1/4 (Redundant Vert)	C	No	No	Af (CaAa)	75.00 - 25.00	0.0000	0.25	1	1	1.2500	1.2500		2.00

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement ft*	*Total Number*	C_AA_A ft^2/ft	*Weight plf*
** *TMobile* ** **								

Feed Line/Linear Appurtenances Section Areas

Tower Section	*Tower Elevation ft*	*Face*	A_R ft^2	A_F ft^2	C_AA_A *In Face* ft^2	C_AA_A *Out Face* ft^2	*Weight lb*
T1	125.00-112.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	25.575	0.000	176.25
		C	0.000	0.000	1.875	0.000	20.00
		D	0.000	0.000	14.438	0.000	105.75
T2	112.50-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	25.575	0.000	176.25

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Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	1.875	0.000	20.00
		D	0.000	0.000	15.522	0.000	110.37
T3	100.00-75.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	51.150	0.000	352.50
		C	0.000	0.000	3.750	0.000	40.00
		D	0.000	0.000	32.750	0.000	228.00
T4	75.00-62.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	25.575	0.000	176.25
		C	0.000	0.000	4.479	0.000	45.00
		D	0.000	0.000	16.375	0.000	114.00
T5	62.50-50.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	25.575	0.000	176.25
		C	0.000	0.000	4.479	0.000	45.00
		D	0.000	0.000	16.375	0.000	114.00
T6	50.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	51.150	0.000	352.50
		C	0.000	0.000	8.958	0.000	90.00
		D	0.000	0.000	32.750	0.000	228.00
T7	25.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	51.150	0.000	352.50
		C	0.000	0.000	3.750	0.000	40.00
		D	0.000	0.000	32.750	0.000	228.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	125.00-112.50	A	1.388	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	43.078	0.000	875.73
		C		0.000	0.000	9.595	0.000	88.91
		D		0.000	0.000	21.380	0.000	287.90
T2	112.50-100.00	A	1.382	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	43.026	0.000	873.71
		C		0.000	0.000	9.569	0.000	88.50
		D		0.000	0.000	24.370	0.000	326.13
T3	100.00-75.00	A	1.370	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	85.840	0.000	1739.26
		C		0.000	0.000	19.032	0.000	175.35
		D		0.000	0.000	53.304	0.000	708.08
T4	75.00-62.50	A	1.352	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	42.765	0.000	863.67
		C		0.000	0.000	15.424	0.000	164.85
		D		0.000	0.000	26.518	0.000	349.73
T5	62.50-50.00	A	1.336	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	42.619	0.000	858.09
		C		0.000	0.000	15.309	0.000	162.65
		D		0.000	0.000	26.393	0.000	345.72
T6	50.00-25.00	A	1.298	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	84.580	0.000	1691.09
		C		0.000	0.000	30.099	0.000	315.52
		D		0.000	0.000	52.218	0.000	673.50
T7	25.00-0.00	A	1.182	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	82.568	0.000	1615.49
		C		0.000	0.000	17.397	0.000	150.89
		D		0.000	0.000	50.483	0.000	620.40

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Feed Line Center of Pressure

Section	*Elevation*	CP_X	CP_Z	CP_X *Ice*	CP_Z *Ice*
	ft	*in*	*in*	*in*	*in*
T1	125.00-112.50	12.0809	-5.6642	16.1570	-4.7898
T2	112.50-100.00	13.8656	-5.7953	18.5069	-4.1142
T3	100.00-75.00	16.1473	-6.1122	21.2507	-3.5735
T4	75.00-62.50	20.6034	-6.4954	28.0783	-1.7276
T5	62.50-50.00	22.1226	-6.9038	29.7523	-1.7646
T6	50.00-25.00	24.6506	-7.6021	32.2806	-1.8782
T7	25.00-0.00	23.1021	-8.3029	28.5634	-4.6095

Shielding Factor Ka

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	K_a *No Ice*	K_a *Ice*
T1	1	Climbing Ladder	112.50 - 125.00	0.6000	0.6000
T1	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	112.50 - 125.00	0.6000	0.6000
T1	6	Main Hybrid Fiber Cable	112.50 - 125.00	0.6000	0.6000
T1	8	LDF6-50A (1-1/4 FOAM)	112.50 - 125.00	0.6000	0.6000
T1	10	3/4" Rigid Conduit	112.50 - 125.00	0.6000	0.6000
T2	1	Climbing Ladder	100.00 - 112.50	0.6000	0.6000
T2	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 112.50	0.6000	0.6000
T2	6	Main Hybrid Fiber Cable	100.00 - 112.50	0.6000	0.6000
T2	8	LDF6-50A (1-1/4 FOAM)	100.00 - 112.50	0.6000	0.6000
T2	9	LDF6-50A (1-1/4 FOAM)	100.00 - 107.00	0.6000	0.6000
T2	10	3/4" Rigid Conduit	100.00 - 112.50	0.6000	0.6000
T3	1	Climbing Ladder	75.00 - 100.00	0.6000	0.6000
T3	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	75.00 - 100.00	0.6000	0.6000
T3	6	Main Hybrid Fiber Cable	75.00 - 100.00	0.6000	0.6000
T3	8	LDF6-50A (1-1/4 FOAM)	75.00 - 100.00	0.6000	0.6000
T3	9	LDF6-50A (1-1/4 FOAM)	75.00 - 100.00	0.6000	0.6000
T3	10	3/4" Rigid Conduit	75.00 - 100.00	0.6000	0.6000
T4	1	Climbing Ladder	62.50 - 75.00	0.6000	0.6000
T4	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	62.50 - 75.00	0.6000	0.6000
T4	6	Main Hybrid Fiber Cable	62.50 - 75.00	0.6000	0.6000
T4	8	LDF6-50A (1-1/4 FOAM)	62.50 - 75.00	0.6000	0.6000
T4	9	LDF6-50A (1-1/4 FOAM)	62.50 - 75.00	0.6000	0.6000
T4	10	3/4" Rigid Conduit	62.50 - 75.00	0.6000	0.6000
T4	19	L2 1/2x2 1/2x1/4	62.50 - 75.00	1.0000	1.0000
T5	1	Climbing Ladder	50.00 - 62.50	0.6000	0.6000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T5	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	50.00 - 62.50	0.6000	0.6000
T5	6	Main Hybrid Fiber Cable	50.00 - 62.50	0.6000	0.6000
T5	8	LDF6-50A (1-1/4 FOAM)	50.00 - 62.50	0.6000	0.6000
T5	9	LDF6-50A (1-1/4 FOAM)	50.00 - 62.50	0.6000	0.6000
T5	10	3/4" Rigid Conduit	50.00 - 62.50	0.6000	0.6000
T5	19	L2 1/2x2 1/2x1/4	50.00 - 62.50	1.0000	1.0000
T6	1	Climbing Ladder	25.00 - 50.00	0.6000	0.6000
T6	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	25.00 - 50.00	0.6000	0.6000
T6	6	Main Hybrid Fiber Cable	25.00 - 50.00	0.6000	0.6000
T6	8	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T6	9	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T6	10	3/4" Rigid Conduit	25.00 - 50.00	0.6000	0.6000
T6	19	L2 1/2x2 1/2x1/4	25.00 - 50.00	1.0000	1.0000
T7	1	Climbing Ladder	0.00 - 25.00	0.6000	0.6000
T7	5	AVA7-50 (1-5/8 LOW DENSI. FOAM)	0.00 - 25.00	0.6000	0.6000
T7	6	Main Hybrid Fiber Cable	0.00 - 25.00	0.6000	0.6000
T7	8	LDF6-50A (1-1/4 FOAM)	0.00 - 25.00	0.6000	0.6000
T7	9	LDF6-50A (1-1/4 FOAM)	0.00 - 25.00	0.6000	0.6000
T7	10	3/4" Rigid Conduit	0.00 - 25.00	0.6000	0.6000

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* *lb*
Flash Beacon Lighting	A	None		0.0000	140.00	No Ice	2.70	2.70	50.00
						1/2" Ice	3.10	3.10	70.00
						1" Ice	3.50	3.50	90.00
**									
Top Platform - West Peak	C	None		0.0000	125.00	No Ice	147.00	147.00	9100.00
						1/2" Ice	198.00	198.00	12300.00
						1" Ice	249.00	249.00	15500.00
2L 2 1/2x2 1/2x1/4x3/8 @ 10ft	A	None		0.0000	119.00	No Ice	62.30	62.30	1360.00
						1/2" Ice	84.10	84.10	1850.00
(Knee Bracing)						1" Ice	105.90	105.90	2340.00
**									
Full Access Platform	C	None		0.0000	107.00	No Ice	100.00	100.00	5100.00
						1/2" Ice	135.00	135.00	6900.00
						1" Ice	170.00	170.00	8700.00
SD235-SF2PASNM VHF	A	From Leg	5.00	0.0000	107.00	No Ice	3.43	3.43	25.00
Dipole			1.00			1/2" Ice	5.68	5.68	37.00
			0.00			1" Ice	7.93	7.93	49.00
**									
T-Mobile									
12' GENERIC BOOM	A	From Leg	10.00	45.0000	127.00	No Ice	16.60	16.60	560.00
			8.00			1/2" Ice	19.80	19.80	700.00
			0.00			1" Ice	23.00	23.00	840.00
12' GENERIC BOOM	C	From Leg	10.00	45.0000	127.00	No Ice	16.60	16.60	560.00

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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* lb
			10.00			1/2" Ice	19.80	19.80	700.00
			0.00			1" Ice	23.00	23.00	840.00
12' GENERIC BOOM	D	From Leg	10.00	45.0000	127.00	No Ice	16.60	16.60	560.00
			-10.00			1/2" Ice	19.80	19.80	700.00
			0.00			1" Ice	23.00	23.00	840.00
*Proposed TMobile Sept2020									
Ericsson AIR 6449 B41 w.	A	From Face	10.00	0.0000	127.00	No Ice	5.72	3.00	135.95
MtgPipe			8.00			1/2" Ice	6.03	3.41	182.56
(P-TMO-Alpha)			0.00			1" Ice	6.36	3.84	234.46
Ericsson AIR 6449 B41 w.	C	From Face	10.00	0.0000	127.00	No Ice	5.72	3.00	135.95
MtgPipe			10.00			1/2" Ice	6.03	3.41	182.56
(P-TMO-Beta)			0.00			1" Ice	6.36	3.84	234.46
Ericsson AIR 6449 B41 w.	D	From Face	10.00	0.0000	127.00	No Ice	5.72	3.00	135.95
MtgPipe			-10.00			1/2" Ice	6.03	3.41	182.56
(P-TMO-Gamma)			0.00			1" Ice	6.36	3.84	234.46
APXVARR24_43-C-NA20	A	From Face	10.00	0.0000	127.00	No Ice	17.15	8.74	89.30
(P-TMO-Alpha)			8.00			1/2" Ice	17.77	9.34	186.52
			0.00			1" Ice	18.40	9.95	291.98
APXVARR24_43-C-NA20	C	From Face	10.00	0.0000	127.00	No Ice	17.15	8.74	89.30
(P-TMO-Beta)			10.00			1/2" Ice	17.77	9.34	186.52
			0.00			1" Ice	18.40	9.95	291.98
APXVARR24_43-C-NA20	D	From Face	10.00	0.0000	127.00	No Ice	17.15	8.74	89.30
(P-TMO-Gamma)			-10.00			1/2" Ice	17.77	9.34	186.52
			0.00			1" Ice	18.40	9.95	291.98
Ericsson AIR32 (B2A/B66A)	A	From Face	10.00	0.0000	127.00	No Ice	6.51	5.58	146.80
w. Mtg Pipe			8.00			1/2" Ice	6.89	6.18	203.30
(P-TMO-Alpha)			0.00			1" Ice	7.27	6.80	266.34
Ericsson AIR32 (B2A/B66A)	C	From Face	10.00	0.0000	127.00	No Ice	6.51	5.58	146.80
w. Mtg Pipe			10.00			1/2" Ice	6.89	6.18	203.30
(P-TMO-Beta)			0.00			1" Ice	7.27	6.80	266.34
Ericsson AIR32 (B2A/B66A)	D	From Face	10.00	0.0000	127.00	No Ice	6.51	5.58	146.80
w. Mtg Pipe			-10.00			1/2" Ice	6.89	6.18	203.30
(P-TMO-Gamma)			0.00			1" Ice	7.27	6.80	266.34
KRY 112 144/1 Double TMA	A	From Face	10.00	0.0000	127.00	No Ice	0.35	0.16	11.00
(TMO-Alpha)			8.00			1/2" Ice	0.43	0.22	14.10
			0.00			1" Ice	0.51	0.28	18.42
KRY 112 144/1 Double TMA	C	From Face	10.00	0.0000	127.00	No Ice	0.35	0.16	11.00
(TMO-Beta)			10.00			1/2" Ice	0.43	0.22	14.10
			0.00			1" Ice	0.51	0.28	18.42
KRY 112 144/1 Double TMA	D	From Face	10.00	0.0000	127.00	No Ice	0.35	0.16	11.00
(TMO-Gamma)			-10.00			1/2" Ice	0.43	0.22	14.10
			0.00			1" Ice	0.51	0.28	18.42
Ericsson Radio 4449	A	From Face	10.00	0.0000	127.00	No Ice	0.00	0.00	0.00
B85/B71			8.00			1/2" Ice	0.00	0.00	0.00
(P-TMO-Alpha)			0.00			1" Ice	0.00	0.00	0.00
Ericsson Radio 4449	C	From Face	10.00	0.0000	127.00	No Ice	0.00	0.00	0.00
B85/B71			10.00			1/2" Ice	0.00	0.00	0.00
(P-TMO-Beta)			0.00			1" Ice	0.00	0.00	0.00
Ericsson Radio 4449	D	From Face	10.00	0.0000	127.00	No Ice	0.00	0.00	0.00
B85/B71			-10.00			1/2" Ice	0.00	0.00	0.00
(P-TMO-Gamma)			0.00			1" Ice	0.00	0.00	0.00
Ericsson RRUS 4415 B25	A	From Face	10.00	0.0000	127.00	No Ice	1.64	0.68	46.00
(P-TMO-Alpha)			8.00			1/2" Ice	1.80	0.79	58.43
			0.00			1" Ice	1.97	0.91	73.23
Ericsson RRUS 4415 B25	C	From Face	10.00	0.0000	127.00	No Ice	1.64	0.68	46.00
(P-TMO-Beta)			10.00			1/2" Ice	1.80	0.79	58.43
			0.00			1" Ice	1.97	0.91	73.23

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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* lb
Ericsson RRUS 4415 B25	D	From Face	10.00	0.0000	127.00	No Ice	1.64	0.68	46.00
(P-TMO-Gamma)			-10.00			1/2" Ice	1.80	0.79	58.43
			0.00			1" Ice	1.97	0.91	73.23
Commscope SDX1926Q-43	A	From Face	10.00	0.0000	127.00	No Ice	0.24	0.17	6.20
Diplexer			8.00			1/2" Ice	0.31	0.22	8.67
(P-TMO-Alpha)			0.00			1" Ice	0.38	0.29	12.24
Commscope SDX1926Q-43	B	From Face	10.00	0.0000	127.00	No Ice	0.24	0.17	6.20
Diplexer			10.00			1/2" Ice	0.31	0.22	8.67
(P-TMO-Beta)			0.00			1" Ice	0.38	0.29	12.24
Commscope SDX1926Q-43	D	From Face	10.00	0.0000	127.00	No Ice	0.24	0.17	6.20
Diplexer			-10.00			1/2" Ice	0.31	0.22	8.67
(P-TMO-Gamma)			0.00			1" Ice	0.38	0.29	12.24
*									
*									
3"Sch40 x 10ft	A	From Face	10.00	0.0000	125.00	No Ice	2.92	2.92	75.00
			5.00			1/2" Ice	4.54	4.54	99.95
			0.00			1" Ice	5.30	5.30	131.52
3"Sch40 x 10ft	A	From Face	10.00	0.0000	125.00	No Ice	2.92	2.92	75.00
			8.00			1/2" Ice	4.54	4.54	99.95
			0.00			1" Ice	5.30	5.30	131.52
3"Sch40 x 10ft	D	From Face	10.00	0.0000	125.00	No Ice	2.92	2.92	75.00
			5.00			1/2" Ice	4.54	4.54	99.95
			0.00			1" Ice	5.30	5.30	131.52
3"Sch40 x 10ft	D	From Face	10.00	0.0000	125.00	No Ice	2.92	2.92	75.00
			8.00			1/2" Ice	4.54	4.54	99.95
			0.00			1" Ice	5.30	5.30	131.52
*Proposed TMobile Sept2020									
*									
*									
BA40-67-DIN UHF Omni	C	From Leg	10.00	0.0000	129.00	No Ice	2.00	2.00	11.00
Dipole			-5.00			1/2" Ice	3.30	3.30	18.00
			0.00			1" Ice	4.60	4.60	25.00
4' Sidearm Mount	C	From Leg	10.00	0.0000	129.00	No Ice	0.51	2.54	43.00
			-5.00			1/2" Ice	0.96	4.03	64.00
			0.00			1" Ice	1.41	5.52	85.00
**									
Mount Frames	D	From Face	2.00	0.0000	75.00	No Ice	30.00	20.00	750.00
			-7.00			1/2" Ice	40.50	27.00	1012.50
			0.00			1" Ice	51.00	34.00	1275.00
Mount Frames	C	From Face	2.00	0.0000	75.00	No Ice	30.00	20.00	750.00
			7.00			1/2" Ice	40.50	27.00	1012.50
			0.00			1" Ice	51.00	34.00	1275.00
Mount Frames	D	From Face	2.00	0.0000	88.00	No Ice	30.00	20.00	750.00
			-6.00			1/2" Ice	40.50	27.00	1012.50
			0.00			1" Ice	51.00	34.00	1275.00
**									
**									
Rest Platform-Half	C	From Face	0.00	0.0000	25.00	No Ice	35.20	22.00	1066.60
			10.00			1/2" Ice	47.00	27.00	1523.70
			0.00			1" Ice	58.80	33.00	1980.80
Rest Platform-full	D	From Face	1.50	0.0000	75.00	No Ice	40.90	38.00	1235.80
			0.00			1/2" Ice	52.70	44.00	1765.40
			0.00			1" Ice	64.50	50.00	2295.00
Rest Platform-full	C	From Face	1.50	0.0000	75.00	No Ice	40.90	38.00	1235.80
			0.00			1/2" Ice	52.70	44.00	1765.40
			0.00			1" Ice	64.50	50.00	2295.00
Rest Platform-Half	C	From Face	0.00	0.0000	88.00	No Ice	35.20	22.00	1066.60

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* *lb*
			5.00			1/2" Ice	47.00	27.00	1523.70
			0.00			1" Ice	58.80	32.00	1980.80
**									
22' Protection Frame/ Shield	C	From Face	1.00	0.0000	34.00 - 12.00	No Ice	69.20	31.70	1000.00
			-9.50			1/2" Ice	93.42	42.80	1350.00
			0.00			1" Ice	117.64	53.89	1700.00
22' Protection Frame/ Shield	A	From Face	1.00	0.0000	34.00 - 12.00	No Ice	69.20	31.70	1000.00
			-9.50			1/2" Ice	93.42	42.80	1350.00
			0.00			1" Ice	117.64	53.89	1700.00
**									
Old Hardline cage	A	From Face	1.00	0.0000	28.00 - 12.00	No Ice	31.50	9.40	790.00
			0.00			1/2" Ice	42.52	12.69	1066.50
			0.00			1" Ice	53.55	15.98	1343.00
Old Hardline cage	C	From Face	1.00	0.0000	28.00 - 12.00	No Ice	31.50	9.40	790.00
			0.00			1/2" Ice	42.52	12.69	1066.50
			0.00			1" Ice	53.55	15.98	1343.00
Old Hardline cage	C	From Centroid-Face	0.00	0.0000	28.00 - 12.00	No Ice	31.50	9.40	790.00
			0.00			1/2" Ice	42.52	12.69	1066.50
			0.00			1" Ice	53.55	15.98	1343.00

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 45 deg - No Ice
5	0.9 Dead+1.0 Wind 45 deg - No Ice
6	1.2 Dead+1.0 Wind 90 deg - No Ice
7	0.9 Dead+1.0 Wind 90 deg - No Ice
8	1.2 Dead+1.0 Wind 135 deg - No Ice
9	0.9 Dead+1.0 Wind 135 deg - No Ice
10	1.2 Dead+1.0 Wind 180 deg - No Ice
11	0.9 Dead+1.0 Wind 180 deg - No Ice
12	1.2 Dead+1.0 Wind 225 deg - No Ice
13	0.9 Dead+1.0 Wind 225 deg - No Ice
14	1.2 Dead+1.0 Wind 270 deg - No Ice
15	0.9 Dead+1.0 Wind 270 deg - No Ice
16	1.2 Dead+1.0 Wind 315 deg - No Ice
17	0.9 Dead+1.0 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service

Comb. No.	Description
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg D	Max. Vert	12	175685.22	28485.58	-25122.46
	Max. H_x	12	175685.22	28485.58	-25122.46
	Max. H_z	5	-135421.97	-24057.90	21052.16
	Min. Vert	5	-135421.97	-24057.90	21052.16
	Min. H_x	5	-135421.97	-24057.90	21052.16
	Min. H_z	12	175685.22	28485.58	-25122.46
Leg C	Max. Vert	8	179045.58	-27091.25	-27151.83
	Max. H_x	17	-132720.70	22382.42	22397.27
	Max. H_z	17	-132720.70	22382.42	22397.27
	Min. Vert	17	-132720.70	22382.42	22397.27
	Min. H_x	8	179045.58	-27091.25	-27151.83
	Min. H_z	8	179045.58	-27091.25	-27151.83
Leg B	Max. Vert	4	176616.40	-26124.47	27786.45
	Max. H_x	13	-134941.32	21970.16	-23135.34
	Max. H_z	4	176616.40	-26124.47	27786.45
	Min. Vert	13	-134941.32	21970.16	-23135.34
	Min. H_x	4	176616.40	-26124.47	27786.45
	Min. H_z	13	-134941.32	21970.16	-23135.34
Leg A	Max. Vert	16	173100.81	27677.19	25829.29
	Max. H_x	16	173100.81	27677.19	25829.29
	Max. H_z	16	173100.81	27677.19	25829.29
	Min. Vert	9	-137120.57	-23563.59	-21712.25
	Min. H_x	9	-137120.57	-23563.59	-21712.25
	Min. H_z	9	-137120.57	-23563.59	-21712.25

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	78802.96	0.17	0.19	66985.43	-86526.09	-23.93
1.2 Dead+1.0 Wind 0 deg - No Ice	94560.69	38.49	-87758.92	-6322002.48	-108495.28	162953.24
0.9 Dead+1.0 Wind 0 deg - No Ice	70920.17	38.61	-87758.78	-6340544.96	-82507.55	162933.05
1.2 Dead+1.0 Wind 45 deg - No Ice	94561.19	68772.97	-64357.96	-4625568.49	-4949071.04	145897.74
0.9 Dead+1.0 Wind 45 deg - No Ice	70920.61	68772.77	-64357.92	-4644532.06	-4921914.43	145872.19
1.2 Dead+1.0 Wind 90 deg - No Ice	94561.17	89835.84	-32.40	75911.78	-6446110.28	65510.91
0.9 Dead+1.0 Wind 90 deg - No	70920.52	89835.45	-32.62	55793.78	-6418584.95	65497.41

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice						
1.2 Dead+1.0 Wind 135 deg - No Ice	94563.08	68722.27	64311.88	4780031.76	-4942606.05	-59853.27
0.9 Dead+1.0 Wind 135 deg - No Ice	70921.64	68722.10	64311.37	4758723.77	-4915415.90	-59842.38
1.2 Dead+1.0 Wind 180 deg - No Ice	94563.09	-31.30	87760.42	6482812.87	-99429.85	-162995.17
0.9 Dead+1.0 Wind 180 deg - No Ice	70921.89	-31.48	87759.65	6461124.26	-73446.44	-162964.50
1.2 Dead+1.0 Wind 225 deg - No Ice	94565.68	-68771.68	64361.57	4786578.29	4741239.18	-145947.60
0.9 Dead+1.0 Wind 225 deg - No Ice	70923.49	-68770.83	64361.38	4765292.08	4766032.94	-145904.20
1.2 Dead+1.0 Wind 270 deg - No Ice	94563.10	-89836.85	37.69	85032.48	6238438.23	-65560.87
0.9 Dead+1.0 Wind 270 deg - No Ice	70921.74	-89836.24	37.33	64898.12	6262863.47	-65534.25
1.2 Dead+1.0 Wind 315 deg - No Ice	94561.21	-68720.28	-64311.69	-4619245.41	4734850.45	59757.31
0.9 Dead+1.0 Wind 315 deg - No Ice	70920.67	-68720.24	-64311.69	-4638216.68	4759654.98	59760.75
1.2 Dead+1.0 Ice+1.0 Temp	180400.54	0.10	0.53	108493.43	-259671.98	-109.95
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	180399.33	15.16	-23077.25	-1625573.23	-261641.74	48500.61
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	180399.25	18727.81	-17242.77	-1182073.78	-1593408.13	49389.30
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	180399.45	24451.16	-15.14	106463.23	-2010007.67	25640.73
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	180399.33	18706.49	17221.25	1396169.51	-1590607.87	-14636.17
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	180399.28	-15.21	23077.90	1842496.79	-257674.28	-48700.12
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	180398.61	-18727.37	17243.17	1399000.13	1074073.61	-49579.99
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	180398.74	-24450.60	15.77	110465.64	1490677.79	-25830.61
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	180398.77	-18706.38	-17220.38	-1179225.25	1071282.79	14443.08
Dead+Wind 0 deg - Service	78802.79	8.65	-22688.70	-1587983.65	-87706.14	42105.81
Dead+Wind 45 deg - Service	78802.72	17778.92	-16638.88	-1149494.09	-1338957.62	37693.64
Dead+Wind 90 deg - Service	78802.69	23225.78	-9.36	65817.85	-1725958.36	16924.33
Dead+Wind 135 deg - Service	78802.50	17766.51	16625.76	1281803.91	-1337289.72	-15488.11
Dead+Wind 180 deg - Service	78802.40	-8.98	22688.90	1721958.26	-85335.81	-42157.48
Dead+Wind 225 deg - Service	78802.32	-17779.02	16638.52	1283478.23	1165904.46	-37749.41
Dead+Wind 270 deg - Service	78802.48	-23225.41	9.29	68146.07	1552892.96	-16971.80
Dead+Wind 315 deg - Service	78802.61	-17766.37	-16625.42	-1147841.44	1164239.76	15433.60

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	125 - 112.5	0.505	30	0.0248	0.0079
T2	112.5 - 100	0.434	30	0.0243	0.0073
T3	100 - 75	0.362	30	0.0228	0.0067
T4	75 - 62.5	0.229	30	0.0179	0.0056
T5	62.5 - 50	0.171	30	0.0151	0.0043
T6	50 - 25	0.120	28	0.0117	0.0032

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	25 - 0	0.044	34	0.0049	0.0014

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Flash Beacon Lighting	30	0.505	0.0248	0.0079	907394
129.00	BA40-67-DIN UHF Omni Dipole	30	0.505	0.0248	0.0079	907394
127.00	12' GENERIC BOOM	30	0.505	0.0248	0.0079	907394
125.00	Top Platform - West Peak	30	0.505	0.0248	0.0079	907394
119.00	2L 2 1/2x2 1/2x1/4x3/8 @ 10ft	30	0.471	0.0246	0.0076	756168
107.00	Full Access Platform	30	0.402	0.0238	0.0070	Inf
88.00	Mount Frames	30	0.296	0.0206	0.0063	401801
75.00	Mount Frames	30	0.229	0.0179	0.0056	348629
34.00	22' Protection Frame/ Shield	34	0.068	0.0072	0.0020	180627
28.50	22' Protection Frame/ Shield	34	0.052	0.0058	0.0016	155241
28.00	Old Hardline cage	34	0.051	0.0056	0.0016	153586
25.00	Rest Platform-Half	34	0.044	0.0049	0.0014	150127
23.00	22' Protection Frame/ Shield	34	0.039	0.0045	0.0013	156474
22.67	Old Hardline cage	34	0.039	0.0044	0.0012	158202
17.50	22' Protection Frame/ Shield	34	0.028	0.0033	0.0009	203090
17.33	Old Hardline cage	34	0.028	0.0032	0.0009	205042
12.00	22' Protection Frame/ Shield	34	0.018	0.0022	0.0006	296172

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 112.5	1.858	8	0.0861	0.0311
T2	112.5 - 100	1.607	8	0.0850	0.0286
T3	100 - 75	1.350	8	0.0800	0.0264
T4	75 - 62.5	0.872	8	0.0626	0.0220
T5	62.5 - 50	0.655	8	0.0534	0.0170
T6	50 - 25	0.466	12	0.0418	0.0127
T7	25 - 0	0.166	16	0.0176	0.0056

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	Flash Beacon Lighting	8	1.858	0.0861	0.0311	291989
129.00	BA40-67-DIN UHF Omni Dipole	8	1.858	0.0861	0.0311	291989
127.00	12' GENERIC BOOM	8	1.858	0.0861	0.0311	291989
125.00	Top Platform - West Peak	8	1.858	0.0861	0.0311	291989
119.00	2L 2 1/2x2 1/2x1/4x3/8 @ 10ft	8	1.738	0.0858	0.0299	243324
107.00	Full Access Platform	8	1.493	0.0833	0.0275	689638

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
88.00	Mount Frames	8	1.113	0.0723	0.0249	131122
75.00	Mount Frames	8	0.872	0.0626	0.0220	136883
34.00	22' Protection Frame/ Shield	16	0.259	0.0258	0.0080	50184
28.50	22' Protection Frame/ Shield	16	0.200	0.0207	0.0065	42790
28.00	Old Hardline cage	16	0.195	0.0202	0.0063	42263
25.00	Rest Platform-Half	16	0.166	0.0176	0.0056	41012
23.00	22' Protection Frame/ Shield	16	0.149	0.0159	0.0051	42659
22.67	Old Hardline cage	16	0.146	0.0157	0.0050	43122
17.50	22' Protection Frame/ Shield	16	0.106	0.0117	0.0038	55335
17.33	Old Hardline cage	16	0.104	0.0116	0.0037	55867
12.00	22' Protection Frame/ Shield	16	0.069	0.0078	0.0025	80697

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	125	Leg	A307	0.7500	16	1237.75	24850.50	0.050 ✔	1	Bolt DS
		Diagonal	A307	0.7500	5	1216.52	10222.50	0.119 ✔	1	Member Block Shear
		Secondary Horizontal	A307	0.7500	2	492.51	10467.20	0.047 ✔	1	Member Block Shear
		Top Girt	A307	0.7500	4	279.26	12425.20	0.022 ✔	1	Bolt Shear
T2	112.5	Diagonal	A307	0.7500	4	1975.68	9855.47	0.200 ✔	1	Member Block Shear
		Secondary Horizontal	A307	0.7500	2	657.57	12425.20	0.053 ✔	1	Bolt Shear
		Top Girt	A307	0.7500	3	1146.99	24850.50	0.046 ✔	1	Bolt Shear
T3	100	Leg	A307	0.7500	16	7127.04	24850.50	0.287 ✔	1	Bolt DS
		Diagonal	A307	0.7500	4	2593.49	10535.20	0.246 ✔	1	Member Block Shear
		Horizontal	A307	0.7500	3	1052.82	20843.80	0.051 ✔	1	Member Block Shear
		Secondary Horizontal	A307	0.7500	2	428.82	11146.90	0.038 ✔	1	Member Block Shear
		Top Girt	A307	0.7500	3	1060.38	20843.80	0.051 ✔	1	Member Block Shear
T4	75	Diagonal	A307	0.7500	2	8650.99	20118.80	0.430 ✔	1	Member Block Shear
		Horizontal	A307	0.7500	2	5961.74	22293.80	0.267 ✔	1	Member Block Shear
T5	62.5	Leg	A307	0.7500	20	8836.99	24850.50	0.356 ✔	1	Bolt DS
		Diagonal	A307	0.7500	2	8705.02	20118.80	0.433 ✔	1	Member Block Shear
		Horizontal	A307	0.7500	2	6173.61	20934.40	0.295 ✔	1	Member Block Shear
T6	50	Leg	A307	0.7500	24	10389.10	24850.50	0.418 ✔	1	Bolt DS
		Diagonal	A307	0.7500	2	8748.03	20118.80	0.435 ✔	1	Member Block Shear
		Horizontal	A307	0.7500	2	6693.30	20934.40	0.320 ✔	1	Member Block Shear
T7	25	Leg	A307	0.7500	28	9468.08	24850.50	0.381 ✔	1	Bolt DS

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A307	0.7500	4	8056.73	24850.50	0.324 ✔	1	Bolt Shear
		Horizontal	A307	0.7500	2	8648.22	24850.50	0.348 ✔	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $P_u / \phi P_n$
T1	125 - 112.5	L6x6x1/2	12.57	6.72	68.4 K=1.00	5.7500	-9901.97	176569.00	0.056 [1] ✔
T2	112.5 - 100	L6x6x1/2	12.57	6.67	67.8 K=1.00	5.7500	-23820.10	177053.00	0.135 [1] ✔
T3	100 - 75	L6x6x5/8	25.14	6.63	67.4 K=1.00	7.1100	-57016.30	219395.00	0.260 [1] ✔
T4	75 - 62.5	L6x6x3/4	12.57	6.29	64.5 K=1.00	8.4400	-69931.30	264139.00	0.265 [1] ✔
T5	62.5 - 50	L6x6x3/4	12.57	6.29	64.5 K=1.00	8.4400	-88369.90	264139.00	0.335 [1] ✔
T6	50 - 25	L6x6x7/8	25.14	6.29	64.5 K=1.00	9.7300	-124669.00	304511.00	0.409 [1] ✔
T7	25 - 0	L8x8x7/8	25.14	8.38	64.1 K=1.00	13.2000	-132740.00	413897.00	0.321 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $P_u / \phi P_n$
T1	125 - 112.5	L3 1/2x3 1/2x1/4	16.49	8.82	137.3 K=0.90	1.6900	-7297.85	25667.50	0.284 [1] ✔
T2	112.5 - 100	L3x3 1/2x1/4	17.91	9.51	162.7 K=0.90	1.5600	-9075.29	16869.90	0.538 [1] ✔
T3	100 - 75	L4x3x1/4	20.97	11.00	182.5 K=0.90	1.6900	-11349.60	14521.10	0.782 [1] ✔
T4	75 - 62.5	2L2 1/2x2 1/2x1/4x3/8	15.15	15.15	145.9 K=0.90	2.3800	-17913.00	31288.50	0.573 [1] ✔
T5	62.5 - 50	2L2 1/2x2 1/2x1/4x3/8	15.79	15.79	151.4 K=0.90	2.3800	-17884.20	29110.90	0.614 [1] ✔
T6	50 - 25	2L2 1/2x2 1/2x1/4x3/8	17.15	17.15	163.2	2.3800	-18010.40	25143.30	0.716 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	25 - 0	2L3x3 1/2x3/8x3/8	28.04	28.04	K=0.90 185.4 K=0.90	4.5900	-32226.90	37976.50	0.849 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	100 - 75	2L3x2 1/2x1/4x3/8	18.13	18.13	230.2 K=1.00	2.6300	-1662.76	14210.10	0.117 [1] ✔
T4	75 - 62.5	KL/R > 200 (C) - 59 2L3x2 1/2x1/4x3/8	20.00	10.00	114.3 K=0.90	2.6300	-11426.00	55794.60	0.205 [1] ✔
T5	62.5 - 50	2L2 1/2x2 1/2x1/4x3/8	21.88	10.94	153.6 K=0.90	2.3800	-12280.80	28869.80	0.425 [1] ✔
T6	50 - 25	2L2 1/2x2 1/2x1/4x3/8	25.63	12.81	179.9 K=0.90	2.3800	-13237.30	21038.40	0.629 [1] ✔
T7	25 - 0	2L3x2 1/2x5/16x3/8	27.50	13.75	158.5 K=0.90	3.2422	-15123.20	36926.20	0.410 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 112.5	L2 1/2x2x1/4	13.37	13.37	270.9 K=1.00	1.0600	-1064.84	4135.04	0.258 [1] ✔
T2	112.5 - 100	KL/R > 250 (C) - 18 C6x8.2	15.26	15.26	340.9 K=1.00	2.4000	-1315.13	4665.59	0.282 [1] ✔
T3	100 - 75	KL/R > 250 (C) - 38 L3x2 1/2x1/4 KL/R > 250 (C) - 61	19.02	19.02	303.6 K=1.00	1.3100	-857.63	4067.34	0.211 [1] ✔

[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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 112.5	C9x13.4	12.50	12.50	224.2 K=1.00	3.9400	-232.34	17705.40	0.013 [1] ✔
		KL/R > 200 (C) - 7							
T2	112.5 - 100	2L 3 1/2 x 3 x 7/16 x 3/8	14.38	14.38	159.6 K=1.00	5.3047	-567.07	59609.60	0.010 [1] ✔
T3	100 - 75	2L3x2 1/2x1/4x3/8	16.25	16.25	206.3 K=1.00	2.6300	-1050.73	17678.60	0.059 [1] ✔
		KL/R > 200 (C) - 47							

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	75 - 62.5	L2x2x3/16	5.00	5.00	137.1 K=0.90	0.7150	-1051.90	10894.50	0.097 [1] ✔
T5	62.5 - 50	L2x2x3/16	5.47	5.47	149.9 K=0.90	0.7150	-1329.25	9106.94	0.146 [1] ✔
T6	50 - 25	L2x2x3/16	6.41	6.41	175.6 K=0.90	0.7150	-1875.25	6636.53	0.283 [1] ✔
T7	25 - 0	L2 1/2x2x3/16	4.58	4.58	115.9 K=0.90	0.8090	-1996.66	12919.40	0.155 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (2) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	25 - 0	2L2 1/2x2 1/2x1/4x3/8	9.17	9.17	128.7 K=0.90	2.3800	-1996.66	32225.20	0.062 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	75 - 62.5	L2 1/2x2x3/16	7.73	7.73	195.6 K=0.90	0.8090	-813.54	6051.30	0.134 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	62.5 - 50	L2 1/2x2x3/16	8.02	8.02	202.8 K=0.90	0.8090	-974.39	5630.72	0.173 [1] ✔
T6	50 - 25	L2 1/2x2 1/2x3/16	8.63	8.63	188.4 K=0.90	0.9020	-1263.60	7276.13	0.174 [1] ✔
T7	25 - 0	L2-1/2x2-1/2x3/16	9.25	9.25	128.2 K=0.90	0.9020	-2014.11	12295.70	0.164 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (2) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	25 - 0	2L2 1/2x2x1/4x3/8	11.95	11.95	164.6 K=0.90	2.1300	-9064.55	17768.50	0.510 [1] ✔

[1] P_u / ϕP_n controls

Redundant Sub-Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	25 - 0	2L3x2 1/2x1/4x3/8	10.42	10.42	132.3 K=1.00	2.6300	-10665.40	43022.60	0.248 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	75 - 62.5	2L2 1/2x2x3/16x3/8	14.14	14.14	107.8 K=0.50	1.6200	-53.49	34620.20	0.002 [1] ✔
T5	62.5 - 50	2L2 1/2x2x3/16x3/8	15.47	15.47	117.0 K=0.50	1.6200	-53.98	31664.10	0.002 [1] ✔
T6	50 - 25	2L2 1/2x2 1/2x3/16x3/8	18.12	18.12	139.7 K=0.50	1.8000	-65.18	26383.30	0.002 [1] ✔
T7	25 - 0	L2 1/2x2 1/2x1/4	19.45	19.45	237.6 K=0.50	1.1900	-173.08	6032.12	0.029 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	125 - 112.5	L6x6x1/2	12.57	6.72	43.4	5.7500	2903.14	186300.00	0.016 [1] ✔
T2	112.5 - 100	L6x6x1/2	12.57	6.67	43.0	5.7500	12941.20	186300.00	0.069 [1] ✔
T3	100 - 75	L6x6x5/8	25.14	6.63	43.2	7.1100	39743.40	230364.00	0.173 [1] ✔
T4	75 - 62.5	L6x6x3/4	12.57	6.29	41.2	8.4400	47620.40	273456.00	0.174 [1] ✔
T5	62.5 - 50	L6x6x3/4	12.57	6.29	41.2	8.4400	63584.70	273456.00	0.233 [1] ✔
T6	50 - 25	L6x6x7/8	25.14	6.29	41.7	9.7300	93952.10	315252.00	0.298 [1] ✔
T7	25 - 0	L8x8x7/8	25.14	8.38	41.0	13.2000	101221.00	427680.00	0.237 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	125 - 112.5	L3 1/2x3 1/2x1/4	16.49	8.82	97.1	1.1034	6082.59	47999.50	0.127 [1] ✔
T2	112.5 - 100	L3x3 1/2x1/4	17.91	9.51	124.9	1.0059	7902.73	43758.30	0.181 [1] ✔
T3	100 - 75	L4x3x1/4	20.97	11.00	147.2	1.1034	10374.00	47999.50	0.216 [1] ✔
T4	75 - 62.5	2L2 1/2x2 1/2x1/4x3/8	15.15	15.15	152.7	1.4569	17302.00	63374.10	0.273 [1] ✔
T5	62.5 - 50	2L2 1/2x2 1/2x1/4x3/8	15.79	15.79	159.2	1.4569	17410.00	63374.10	0.275 [1] ✔
T6	50 - 25	2L2 1/2x2 1/2x1/4x3/8	16.46	16.46	166.0	1.4569	17496.10	63374.10	0.276 [1] ✔
T7	25 - 0	2L3x3 1/2x3/8x3/8	28.04	28.04	201.5	2.9503	28467.50	128339.00	0.222 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T3	100 - 75	2L3x2 1/2x1/4x3/8	18.13	18.13	230.2	1.6444	3158.46	71530.30	0.044 [1] ✔
T4	75 - 62.5	2L3x2 1/2x1/4x3/8	20.00	10.00	127.0	1.6444	11923.50	71530.30	0.167 [1] ✔
T5	62.5 - 50	2L2 1/2x2 1/2x1/4x3/8	21.88	10.94	170.7	1.4569	12347.20	63374.10	0.195 [1] ✔
T6	50 - 25	2L2 1/2x2 1/2x1/4x3/8	25.63	12.81	199.9	1.4569	13386.60	63374.10	0.211 [1] ✔
T7	25 - 0	2L3x2 1/2x5/16x3/8	27.50	13.75	176.1	2.0215	17296.40	87934.60	0.197 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	125 - 112.5	L2 1/2x2x1/4	13.37	13.37	270.9	0.6309	985.02	27445.80	0.036 [1] ✔
T2	112.5 - 100	C6x8.2	15.26	15.26	340.9	1.6688	1107.51	72590.60	0.015 [1] ✔
T3	100 - 75	L3x2 1/2x1/4	19.02	19.02	303.6	0.8184	857.63	35602.00	0.024 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	125 - 112.5	C9x13.4	12.50	12.50	224.2	2.8021	1117.04	121891.00	0.009 [1] ✔
T2	112.5 - 100	2L 3 1/2 x 3 x 7/16 x 3/8	14.38	14.38	159.6	3.4043	3440.96	148087.00	0.023 [1] ✔
T3	100 - 75	2L3x2 1/2x1/4x3/8	16.25	16.25	206.3	1.6444	3181.15	71530.30	0.044 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T4	75 - 62.5	L2x2x3/16	5.00	5.00	97.2	0.7150	1051.90	23166.00	0.045 [1] ✔
T5	62.5 - 50	L2x2x3/16	5.47	5.47	106.4	0.7150	1329.25	23166.00	0.057 [1] ✔
T6	50 - 25	L2x2x3/16	6.41	6.41	124.6	0.7150	1875.25	23166.00	0.081 [1] ✔
T7	25 - 0	L2 1/2x2x3/16	4.58	4.58	128.8	0.8090	1996.66	26211.60	0.076 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (2) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T7	25 - 0	2L2 1/2x2 1/2x1/4x3/8	9.17	9.17	143.0	2.3800	1996.66	77112.00	0.026 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T4	75 - 62.5	L2 1/2x2x3/16	7.73	7.73	154.7	0.8090	813.54	26211.60	0.031 [1] ✔
T5	62.5 - 50	L2 1/2x2x3/16	8.02	8.02	160.4	0.8090	974.39	26211.60	0.037 [1] ✔
T6	50 - 25	L2 1/2x2 1/2x3/16	8.32	8.32	128.3	0.9020	1313.55	29224.80	0.045 [1] ✔
T7	25 - 0	L2-1/2x2-1/2x3/16	9.25	9.25	142.5	0.9020	2014.11	29224.80	0.069 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (2) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	25 - 0	2L2 1/2x2x1/4x3/8	11.95	11.95	182.8	2.1300	6414.27	69012.00	0.093 [1] ✔

[1] P_u / ϕP_n controls

Redundant Sub-Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	25 - 0	2L3x2 1/2x1/4x3/8	10.42	10.42	132.3	2.6300	6838.38	85212.00	0.080 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	75 - 62.5	2L2 1/2x2x3/16x3/8	14.14	14.14	214.0	1.6200	1.45	52488.00	0.000 [1] ✔
T6	50 - 25	2L2 1/2x2 1/2x3/16x3/8	18.12	18.12	279.5	1.8000	3.62	58320.00	0.000 [1] ✔
T7	25 - 0	L2 1/2x2 1/2x1/4	19.45	19.45	303.4	1.1900	38.04	38556.00	0.001 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	125 - 112.5	Leg	L6x6x1/2	1	-9901.97	176569.00	5.6	Pass
T2	112.5 - 100	Leg	L6x6x1/2	22	-23820.10	177053.00	13.5	Pass
T3	100 - 75	Leg	L6x6x5/8	42	-57016.30	219395.00	26.0 28.7 (b)	Pass
T4	75 - 62.5	Leg	L6x6x3/4	78	-69931.30	264139.00	26.5	Pass
T5	62.5 - 50	Leg	L6x6x3/4	115	-88369.90	264139.00	33.5 35.6 (b)	Pass
T6	50 - 25	Leg	L6x6x7/8	152	-124669.00	304511.00	40.9 41.8 (b)	Pass
T7	25 - 0	Leg	L8x8x7/8	222	-132740.00	413897.00	32.1 38.1 (b)	Pass
T1	125 - 112.5	Diagonal	L3 1/2x3 1/2x1/4	10	-7297.85	25667.50	28.4	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T2	112.5 - 100	Diagonal	L3x3 1/2x1/4	29	-9075.29	16869.90	53.8	Pass
T3	100 - 75	Diagonal	L4x3x1/4	52	-11349.60	14521.10	78.2	Pass
T4	75 - 62.5	Diagonal	2L2 1/2x2 1/2x1/4x3/8	92	-17913.00	31288.50	57.3	Pass
T5	62.5 - 50	Diagonal	2L2 1/2x2 1/2x1/4x3/8	129	-17884.20	29110.90	61.4	Pass
T6	50 - 25	Diagonal	2L2 1/2x2 1/2x1/4x3/8	166	-18010.40	25143.30	71.6	Pass
T7	25 - 0	Diagonal	2L3x3 1/2x3/8x3/8	226	-32226.90	37976.50	84.8	Pass
T3	100 - 75	Horizontal	2L3x2 1/2x1/4x3/8	59	-1662.76	14210.10	11.7	Pass
T4	75 - 62.5	Horizontal	2L3x2 1/2x1/4x3/8	88	-11426.00	55794.60	20.5 26.7 (b)	Pass
T5	62.5 - 50	Horizontal	2L2 1/2x2 1/2x1/4x3/8	125	-12280.80	28869.80	42.5	Pass
T6	50 - 25	Horizontal	2L2 1/2x2 1/2x1/4x3/8	162	-13237.30	21038.40	62.9	Pass
T7	25 - 0	Horizontal	2L3x2 1/2x5/16x3/8	225	-15123.20	36926.20	41.0	Pass
T1	125 - 112.5	Secondary Horizontal	L2 1/2x2x1/4	18	-1064.84	4135.04	25.8	Pass
T2	112.5 - 100	Secondary Horizontal	C6x8.2	38	-1315.13	4665.59	28.2	Pass
T3	100 - 75	Secondary Horizontal	L3x2 1/2x1/4	62	-857.63	4067.34	21.1	Pass
T1	125 - 112.5	Top Girt	C9x13.4	7	-232.34	17705.40	1.3 2.2 (b)	Pass
T2	112.5 - 100	Top Girt	2L 3 1/2 x 3 x 7/16 x 3/8	25	3440.96	148087.00	2.3 4.6 (b)	Pass
T3	100 - 75	Top Girt	2L3x2 1/2x1/4x3/8	47	-1050.73	17678.60	5.9	Pass
T4	75 - 62.5	Redund Horz 1 Bracing	L2x2x3/16	86	-1051.90	10894.50	9.7	Pass
T5	62.5 - 50	Redund Horz 1 Bracing	L2x2x3/16	123	-1329.25	9106.94	14.6	Pass
T6	50 - 25	Redund Horz 1 Bracing	L2x2x3/16	160	-1875.25	6636.53	28.3	Pass
T7	25 - 0	Redund Horz 1 Bracing	L2 1/2x2x3/16	232	-1996.66	12919.40	15.5	Pass
T7	25 - 0	Redund Horz 2 Bracing	2L2 1/2x2 1/2x1/4x3/8	233	-1996.66	32225.20	6.2	Pass
T4	75 - 62.5	Redund Diag 1 Bracing	L2 1/2x2x3/16	87	-813.54	6051.30	13.4	Pass
T5	62.5 - 50	Redund Diag 1 Bracing	L2 1/2x2x3/16	124	-974.39	5630.72	17.3	Pass
T6	50 - 25	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	161	-1263.60	7276.13	17.4	Pass
T7	25 - 0	Redund Diag 1 Bracing	L2-1/2x2-1/2x3/16	234	-2014.11	12295.70	16.4	Pass
T7	25 - 0	Redund Diag 2 Bracing	2L2 1/2x2x1/4x3/8	230	-9064.55	17768.50	51.0	Pass
T7	25 - 0	Redund Sub Horz Bracing	2L3x2 1/2x1/4x3/8	236	-10665.40	43022.60	24.8	Pass
T4	75 - 62.5	Inner Bracing	2L2 1/2x2x3/16x3/8	113	-13.94	20248.70	1.0	Pass
T5	62.5 - 50	Inner Bracing	2L2 1/2x2x3/16x3/8	150	-15.23	16926.20	1.1	Pass
T6	50 - 25	Inner Bracing	2L2 1/2x2 1/2x3/16x3/8	187	-18.19	13191.70	1.3	Pass
T7	25 - 0	Inner Bracing	L2 1/2x2 1/2x1/4	276	-173.08	6032.12	2.9	Pass
						Summary		
						Leg (T6)	41.8	Pass
						Diagonal (T7)	84.8	Pass
						Horizontal (T6)	62.9	Pass
						Secondary Horizontal (T2)	28.2	Pass
						Top Girt (T3)	5.9	Pass
						Redund Horz 1 Bracing (T6)	28.3	Pass
						Redund	6.2	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$øP_{allow}$ lb	% Capacity	Pass Fail
						Horz 2 Bracing (T7)		
						Redund Diag 1 Bracing (T6)	17.4	Pass
						Redund Diag 2 Bracing (T7)	51.0	Pass
						Redund Sub Horz Bracing (T7)	24.8	Pass
						Inner Bracing (T7)	2.9	Pass
						Bolt Checks	43.5	Pass
						RATING =	**84.8**	**Pass**

Client: Everest Infrastructure
Project: TMO CT11132 West Peak
Calculated By: PB
Date: Oct 2020

ARMOR TOWER, INC.
9 N. Main St. 2nd Floor
Cortland, NY 13045

ARMOR TOWER ENGINEERING

Check Foundation

Applied Load Factored:

Download $Download := 179kip$

Uplift $Uplift := 137kip$

Shear $Shear := 32.0kip$

Check Uplift Capacity:

Top radius of the anchor rods: $r := 41.5in$

Slope of rod: $\theta := 14 \cdot deg$

Length of rod from the base of the pier: $l := 20ft$

Depth of anchor rod to the bed rock: $h_r := l \cdot \cos(\theta) = 19.4 \cdot ft$

Bottom radius of the anchor rod: $R := r + l \cdot \sin(\theta) = 8.3 \cdot ft$

Frustum base length for top of the rock: $x := 2(R + 19.4ft \cdot \tan(45deg)) = 55.4 \cdot ft$

Frustum base length for bottom og the rock: $y := 2 \cdot R = 16.6 \cdot ft$

Unit wt. of rock: $\gamma_r := 150pcf$

Weight of inverted frustum of the rock: $W_r := \frac{h_r}{3}\left(x^2 + x \cdot y + y^2\right) \cdot \gamma_r = 4136.3 \cdot kip$

Concrete foundation dimension:

Length of top base: $a := 5ft$

Length of the foundation: $b := 8.25ft$

Height of the foundation: $h_f := 6.5ft$

Unit wt. of concrete: $\mu_c := 150pcf$

Concrete foundation weight: $W_c := \frac{1}{3} \cdot \left(a^2 + a \cdot b + b^2\right) h_f \cdot \mu_c = 43.7 \cdot kip$

Top base length of the soil: $x_s := x + 2 \cdot h_f \cdot \tan(10deg) = 57.7 \cdot ft$

Unit wt. of soil: $\gamma_s := 110pcf$

Weight of soil fill above the rock:

$$W_s := \left[\frac{1}{3} \cdot \left(x_s{}^2 + x_s \cdot x + x^2\right) - \frac{1}{3}\left(a^2 + a \cdot b + b^2\right)\right] \cdot h_f \cdot \gamma_s = 2254 \cdot kip$$

Total uplift capacity: $\phi := 0.75$ $P_n := W_r + W_c + W_s = 6434 \cdot kip$

$$\frac{Uplift}{\phi \cdot P_n} = 2.8 \cdot \%$$

Client: Everest Infrastructure
Project: TMO CT11132 West Peak
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Date: Oct 2020

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Check Bearing Capacity:

Area of the bottom footing: $A := b^2 = 68.1 \cdot ft^2$

Overturning moment for a single pier: $OTM := Shear \cdot h_f = 208 \cdot kip \cdot ft$

Overturning moment soil bearing: $f_b := \frac{OTM}{\left(b^3 \cdot \frac{\sqrt{2}}{12}\right)} = 3143.2 \cdot psf$

Total ultimate Bearing Load: $P_b := \frac{Download + 1.2W_c}{A} + f_b = 6542.7 \cdot psf$

Allowable bearing capacity of the Bedrock: $P_n := 8ksf$ Very conservative

Safety factor: $FS := 2.0$

Ultimate Bearing capacity of the Bedrock: $P_{ult} := FS \cdot P_n = 16 \cdot ksf$

$$\frac{P_b}{\phi \cdot P_{ult}} = 54.5 \cdot \%$$

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Anchor Bolt

Number of bolts: $n := 4$

Bolt diameter: $Bolt\theta := 2in$

Bolt ultimate tensile stress: $F_u := 58ksi$ Assuming F1554-36

Bolt cross section area: $A_g := \frac{\pi}{4} \cdot Bolt\theta^2$

Design bolt shear strength: $\phi := 0.80$ $\phi R_n := \phi \cdot F_u \cdot (0.75 \cdot A_g) = 109.3 \cdot kip$
TIA 4.9.6.1, 4.9.9

Total applied shear: $P := \frac{\left(Uplift + \frac{Shear}{\eta}\right)}{n} = 48.8 \cdot kip$
(grouted flange) $\eta := 0.55$

$\frac{P}{\phi R_n} = 44.6 \cdot \%$

Rock Anchors

Rock bolt QTY: $n := 6$

Shear moment on the bolts: $M := Shear \cdot h_f = 208 \cdot kip \cdot ft$

Bolt Area: $Bar\theta := 2.0 \cdot in$ $BarXArea := \frac{\pi}{4} \cdot Bar\theta^2 = 3.1 \cdot in^2$

Section modulus of bolt cluster: $S := 10.38 \frac{ft^3}{ft^2}$

Resultant load: $P_r := \frac{Uplift}{n} + \frac{M}{S} = 42.9 \cdot kip$

Steel grade: A306 Gr.80: $F_u := 80ksi$

Nominal tensile capacity: $\phi_t := 0.8$ $\phi F_n := \phi_t \cdot F_u \cdot (0.75 \cdot A_g) = 150.8 \cdot kip$

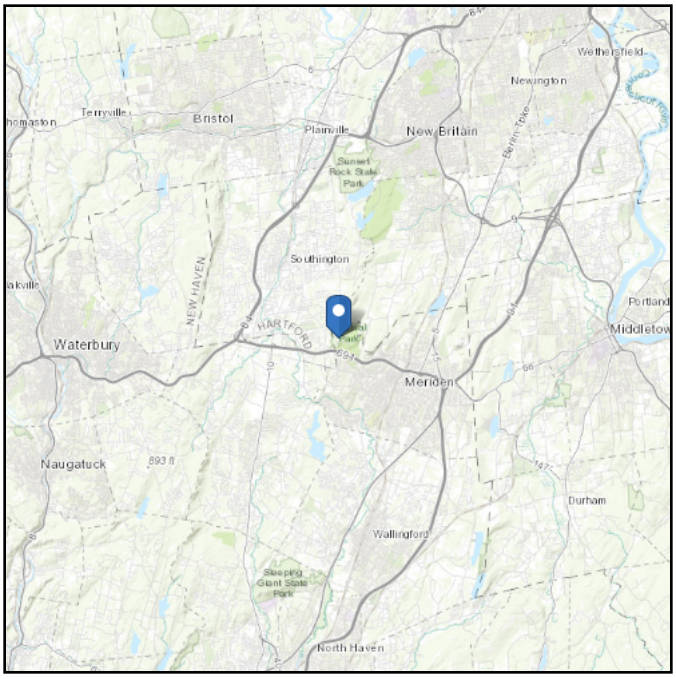
$\frac{P_r}{\phi F_n} = 28.4 \cdot \%$

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: B - Rock

Elevation: 1004.55 ft (NAVD 88)
Latitude: 41.561168
Longitude: -72.843646



Wind

Results:

Wind Speed:	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph
Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4
Date Accessed:	Fri Sep 25 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

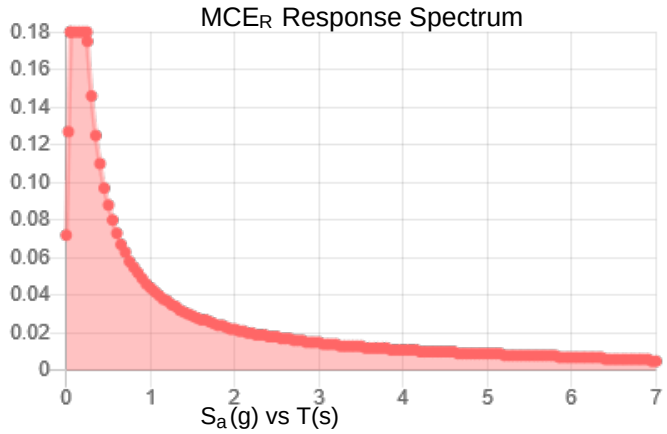
Seismic

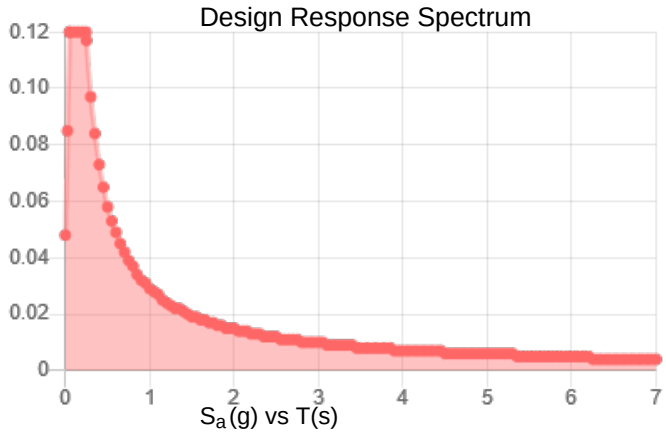
Site Soil Class: B - Rock

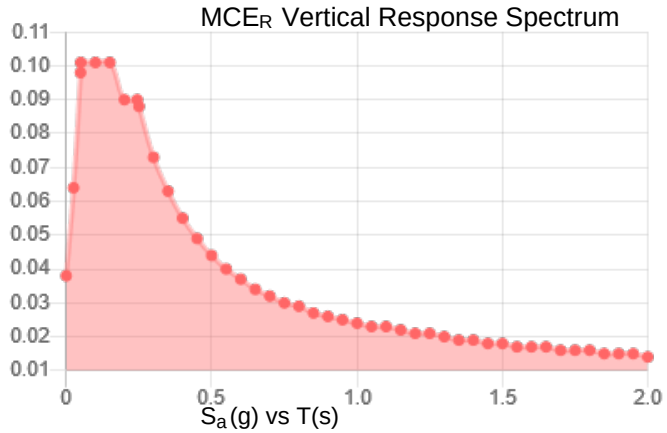
Results:

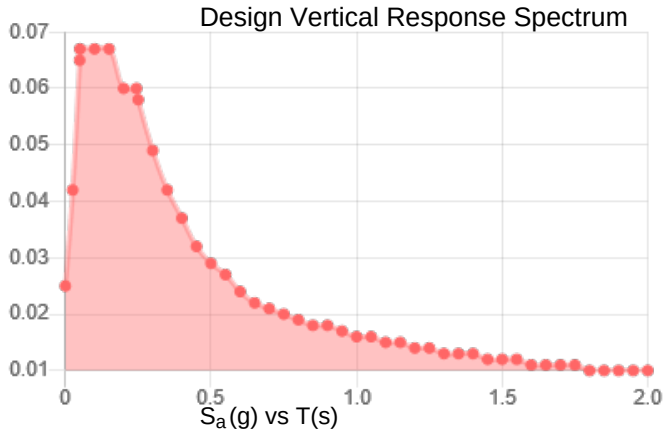
S_S :	0.2	S_{D1} :	0.029
S_1 :	0.055	T_L :	6
F_a :	0.9	PGA :	0.11
F_v :	0.8	PGA_M :	0.099
S_{MS} :	0.18	F_{PGA} :	0.9
S_{M1} :	0.044	I_e :	1
S_{DS} :	0.12	C_v :	0.7

Seismic Design Category A









Data Accessed: Fri Sep 25 2020

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri Sep 25 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

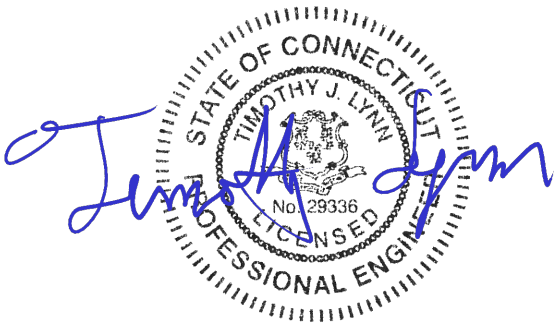
Antenna Mount Analysis

T-Mobile Site #: CT11132B

11 West Peak Drive
Meriden, CT

Centek Project No. 20074.43

Date: August 7, 2020



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

August 7, 2020

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11132B
11 West Peak Drive
Meriden, CT 06037

Centek Project No. 20074.43

Dear Mr. Reid,

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 antenna mounts. 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:
  Pipe mounts/ Sector Frame: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAARR24_43 panel antennas, three (3) TMAs, three (3) Ericsson 4449 remote radio units, three (3) Ericsson 4415 remote radio units and three (3) Commscope SDX1926Q-43 diplexers mounted on pipe mounts (Alpha & Beta Sectors) and a sector frame (Gamma Sector) with a RAD center elevation of 127 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 97 mph for Meriden as required in Appendix N.

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 mounts with the replacement of one (1) antenna pipe at Alpha and Gamma sectors and the installation of one (1) antenna pipe at Beta Sector 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

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Subject: Loads on Equipment

Location: Meriden, CT

Rev. 0: 08/05/2020

Prepared by: F.J.P Checked by: T.J.L.
Job No. 20074.43

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

Wind Speeds

Basic Wind Speed	$V := 97$	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 =	$Exp := C$		(User Input)
Structure Height =	$h := 125$	ft	(User Input)
Height to Center of Antennas =	$z := 127$	ft	(User Input)
Radial Ice Thickness =	$t_i := 0.75$	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 =	$G_H = 1.175$		(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)

Importance Factors =

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

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

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

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

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.144$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.331$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 27$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 7$ psf

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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 =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 181$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 73$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.1$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 62$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3$	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 =	$WT_{ant} \cdot N_{ant} = 103$	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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4626$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 150$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 150$	lbs

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS - APXVAARR24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153.3$	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 =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 648$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 235$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18.9$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 204$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 90$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 423$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 423$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson - AIR32 KRD901146-1_B66A_B2A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 56.6$	in	(User Input)
Antenna Width =	$W_{ant} := 12.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 208$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 3.4$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 141$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.8$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 74$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 5.1$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 55$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 133$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6352$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5544$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 180$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 180$	lbs

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Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4449 B71+B85		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 17.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 9.5$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 75$	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 =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 63$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.2$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 45$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.5$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 25$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.9$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 20$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 75$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2245$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2344$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 76$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 76$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4415 b25		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 5.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 46.3$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 52$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 21$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 22$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 11$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 46$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1631$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 53$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 53$	lbs

Development of Wind & Ice Load on TMA's

TMA Data:

TMA Model =	Ericsson KRY112 TMA		
TMA Shape =	Flat	in	(User Input)
TMA Height =	$L_{TMA} := 7.7$	in	(User Input)
TMA Width =	$W_{TMA} := 7.5$	in	(User Input)
TMA Thickness =	$T_{TMA} := 3.4$	lbs	(User Input)
TMA Weight =	$WT_{TMA} := 11$		(User Input)
Number of TMA's =	$N_{TMA} := 1$		(User Input)
TMA Aspect Ratio =	$Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1$		
TMA Force Coefficient =	$Ca_{TMA} = 1.2$		

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.4$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 15$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.2$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 7$	lbs

Wind Load (with ice)

Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.8$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 9$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.5$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 5$	lbs

Gravity Load (without ice)

Weight of All TMAs =	$WT_{TMA} \cdot N_{TMA} = 11$	lbs

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 196$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 635$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 21$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 21$	lbs

Development of Wind & Ice Load on Dipl's

Dipl Data:

Dipl Model =	Commscope SDX1926Q-43 Diplexer		
Dipl Shape =	Flat		(User Input)
Dipl Height =	$L_{Dipl} := 8$	in	(User Input)
Dipl Width =	$W_{Dipl} := 6.45$	in	(User Input)
Dipl Thickness =	$T_{Dipl} := 6.2$	in	(User Input)
Dipl Weight =	$WT_{Dipl} := 18.3$	lbs	(User Input)
Number of Dipl's =	$N_{Dipl} := 1$		(User Input)
Dipl Aspect Ratio =	$Ar_{Dipl} := \frac{L_{Dipl}}{W_{Dipl}} = 1.2$		
Dipl Force Coefficient =	$Ca_{Dipl} = 1.2$		

Wind Load (without ice)

Surface Area for One Dipl = $SA_{DiplF} := \frac{L_{Dipl} \cdot W_{Dipl}}{144} = 0.4$ sf

Total Dipl Wind Force = $F_{Dipl} := qz \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{DiplF} = 14$ lbs

Surface Area for One Dipl = $SA_{DiplS} := \frac{L_{Dipl} \cdot T_{Dipl}}{144} = 0.3$ sf

Total Dipl Wind Force = $F_{Dipl} := qz \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{DiplS} = 13$ lbs

Wind Load (with ice)

Surface Area for One Dipl w/ Ice = $SA_{ICEDiplF} := \frac{(L_{Dipl} + 2 \cdot t_{iz}) \cdot (W_{Dipl} + 2 \cdot t_{iz})}{144} = 0.8$ sf

Total Dipl Wind Force w/ Ice = $Fi_{Dipl} := qz_{ice} \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{ICEDiplF} = 8$ lbs

Surface Area for One Dipl w/ Ice = $SA_{ICEDiplS} := \frac{(L_{Dipl} + 2 \cdot t_{iz}) \cdot (T_{Dipl} + 2 \cdot t_{iz})}{144} = 0.8$ sf

Total Dipl Wind Force w/ Ice = $Fi_{Dipl} := qz_{ice} \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{ICEDiplS} = 8$ lbs

Gravity Load (without ice)

Weight of All Dipls = $WT_{Dipl} \cdot N_{Dipl} = 18$ lbs

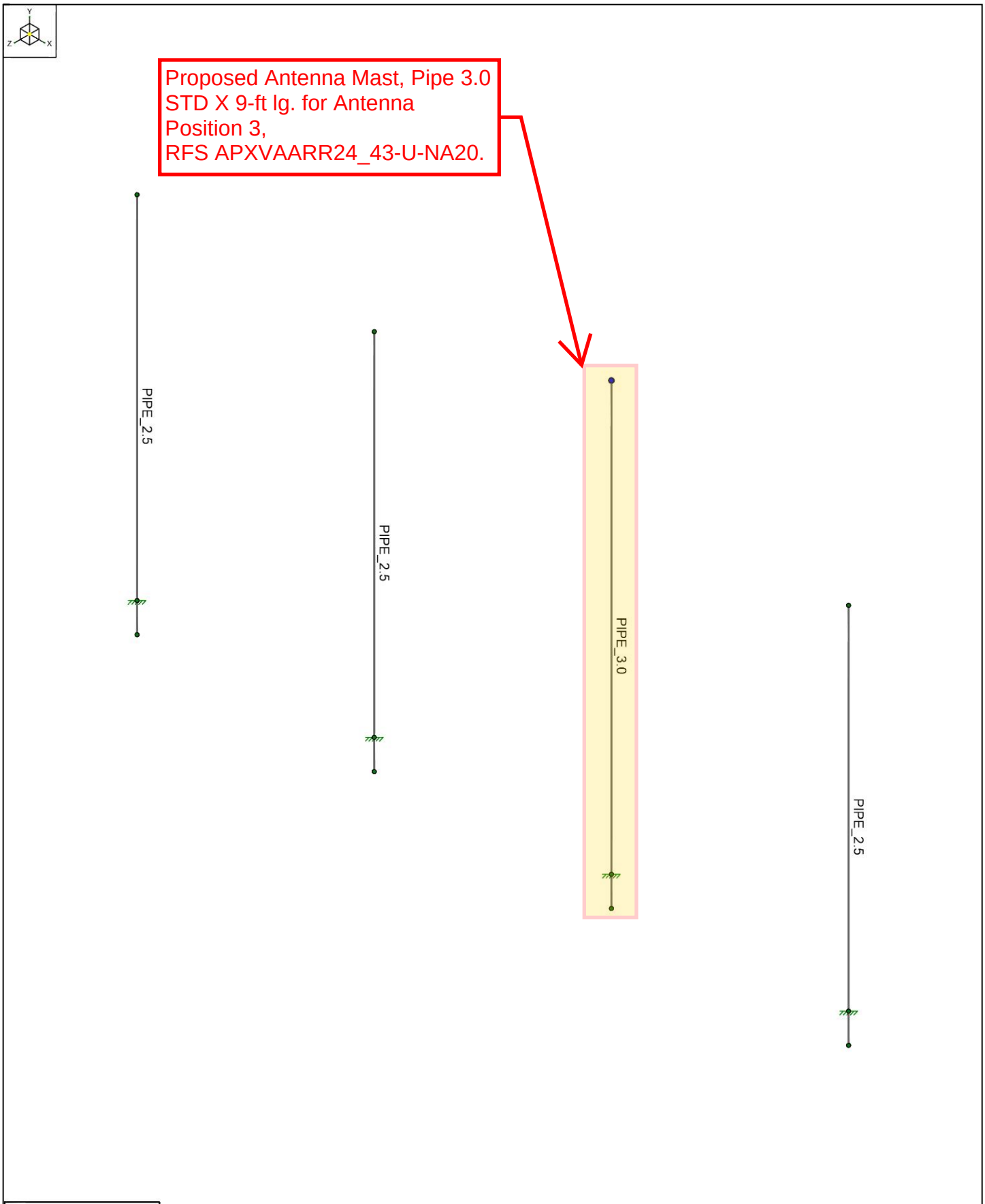
Gravity Loads (ice only)

Volume of Each Dipl = $V_{Dipl} := L_{Dipl} \cdot W_{Dipl} \cdot T_{Dipl} = 320$ cu in

Volume of Ice on Each Dipl = $V_{ice} := (L_{Dipl} + 2 \cdot t_{iz}) \cdot (W_{Dipl} + 2 \cdot t_{iz}) \cdot (T_{Dipl} + 2 \cdot t_{iz}) - V_{Dipl} = 768$

Weight of Ice on Each Dipl = $W_{ICEDipl} := \frac{V_{ice}}{1728} \cdot Id = 25$ lbs cu in

Weight of Ice on All Dipls = $W_{ICEDipl} \cdot N_{Dipl} = 25$ lbs



Envelope Only Solution

Centek Engineering	CT1132B - Alpha Sector Mount	SK-2
FJP		Aug 07, 2020 at 09:55 AM
20074.43	Member Framing	CT1132B_Alpha Sector_AMA.r3d

Model Settings

Number of Reported Sections	5
Number of Internal Sections	97
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Global Plane for z-axis	XZ

Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): ASD
Cold Formed Steel	AISI S100-10: ASD
Stiffness Adjustment	Yes (Iterative)
Wood	AWC NDS-12: ASD
Temperature	< 100F
Concrete	ACI 318-11
Masonry	ACI 530-11: ASD
Aluminum	AA ADM1-10: ASD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65
Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-10

Model Settings (Continued)

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. C…	Density [k…	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Grad…	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	(E) Anten…	PIPE_2.5	Column	Pipe	A53 Grad…	Typical	1.61	1.45	1.45	2.89
2	(P) Anten…	PIPE_3.0	Column	Pipe	A53 Grad…	Typical	2.07	2.85	2.85	5.69

Hot Rolled Member Properties

	Label	Shape	Length [ft]	Lb y-y [ft]	Lb z-z [ft]	Lcomp t…	Lcomp…	L-Torqu…	K y-y	K z-z	Cb	Function
1	PS.1	(E) Ante…	7.5	Segment		Lbyy						Lateral
2	PS.2	(E) Ante…	7.5	Segment		Lbyy						Lateral
3	PS.3	(P) Ante…	9	Segment		Lbyy						Lateral
4	PS.4	(E) Ante…	7.5	Segment		Lbyy						Lateral

Primary Member Properties

	Label	I Node	J Node	K Node	Rotate(deg)	Section/S…	Type	Design List	Material	Design Rule
1	PS.1	N2	N1			(E) Anten…	Column	Pipe	A53 Grad…	Typical
2	PS.2	N4	N3			(E) Anten…	Column	Pipe	A53 Grad…	Typical
3	PS.3	N6	N5			(P) Anten…	Column	Pipe	A53 Grad…	Typical
4	PS.4	N7	N8			(E) Anten…	Column	Pipe	A53 Grad…	Typical

Nodes

	Label	X [ft]	Y [ft]	Z [ft]	Temp [deg F]	Detach From Dia…
1	N1	0	0	0		
2	N2	0	7.5	0		
3	N3	4.666667	0	0		
4	N4	4.666667	7.5	0		
5	N5	9.333333	0	0		
6	N6	9.333333	9	0		
7	N7	14	7.5	0		
8	N8	14	0	0		
9	N9	0	0.583333	0		
10	N10	4.666667	0.583333	0		
11	N11	9.333333	0.583333	0		
12	N12	14	0.583333	0		

Boundary Conditions

	Node 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	N9	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N12	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Desc…	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me…	Surface(P…
1	Self Weight	None		-1						
2	Dead Load	None					10			
3	Ice Load	None					10			
4	Wind with…	None					10	4		
5	Wind X (2…	None					10	4		

Basic Load Cases (Continued)

	BLC Desc…	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me…	Surface(P…
6	Wind with…	None					10	6		
7	Wind Z (2…	None					10	6		

Dead Load

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Y	-0.052	1.583	Active
2	PS.1	Y	-0.052	4.333	Active
3	PS.2	Y	-0.067	0.625	Active
4	PS.2	Y	-0.067	5.375	Active
5	PS.3	Y	-0.077	0.25	Active
6	PS.3	Y	-0.077	8.25	Active
7	PS.3	Y	-0.011	2.083	Active
8	PS.3	Y	-0.018	3.75	Active
9	PS.3	Y	-0.075	4.75	Active
10	PS.3	Y	-0.046	5.75	Active

Ice Load

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Y	-0.075	1.583	Active
2	PS.1	Y	-0.075	4.333	Active
3	PS.2	Y	-0.09	0.625	Active
4	PS.2	Y	-0.09	5.375	Active
5	PS.3	Y	-0.212	0.25	Active
6	PS.3	Y	-0.212	8.25	Active
7	PS.3	Y	-0.021	2.083	Active
8	PS.3	Y	-0.025	3.75	Active
9	PS.3	Y	-0.076	4.75	Active
10	PS.3	Y	-0.053	5.75	Active

Wind with Ice X (7 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	X	-0.015	1.583	Active
2	PS.1	X	-0.015	4.333	Active
3	PS.2	X	-0.028	0.625	Active
4	PS.2	X	-0.028	5.375	Active
5	PS.3	X	-0.045	0.25	Active
6	PS.3	X	-0.045	8.25	Active
7	PS.3	X	-0.009	2.083	Active
8	PS.3	X	-0.008	3.75	Active
9	PS.3	X	-0.025	4.75	Active
10	PS.3	X	-0.022	5.75	Active

Wind X (27 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	X	-0.037	1.583	Active
2	PS.1	X	-0.037	4.333	Active
3	PS.2	X	-0.071	0.625	Active
4	PS.2	X	-0.071	5.375	Active
5	PS.3	X	-0.118	0.25	Active
6	PS.3	X	-0.118	8.25	Active
7	PS.3	X	-0.015	2.083	Active
8	PS.3	X	-0.014	3.75	Active
9	PS.3	X	-0.063	4.75	Active
10	PS.3	X	-0.052	5.75	Active

Wind with Ice Z (7 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Z	-0.031	1.583	Active
2	PS.1	Z	-0.031	4.333	Active
3	PS.2	Z	-0.037	0.625	Active
4	PS.2	Z	-0.037	5.375	Active
5	PS.3	Z	-0.102	0.25	Active
6	PS.3	Z	-0.102	8.25	Active
7	PS.3	Z	-0.005	2.083	Active
8	PS.3	Z	-0.008	3.75	Active
9	PS.3	Z	-0.02	4.75	Active
10	PS.3	Z	-0.011	5.75	Active

Wind Z (27 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Z	-0.091	1.583	Active
2	PS.1	Z	-0.091	4.333	Active
3	PS.2	Z	-0.104	0.625	Active
4	PS.2	Z	-0.104	5.375	Active
5	PS.3	Z	-0.324	0.25	Active
6	PS.3	Z	-0.324	8.25	Active
7	PS.3	Z	-0.007	2.583	Active
8	PS.3	Z	-0.013	4.25	Active
9	PS.3	Z	-0.045	5.25	Active
10	PS.3	Z	-0.021	6.25	Active

Wind with Ice X (7 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	X	-0.002	-0.002	0	%100	Active
2	PS.2	X	-0.002	-0.002	0	%100	Active
3	PS.3	X	-0.002	-0.002	0	%100	Active
4	PS.4	X	-0.002	-0.002	0	%100	Active

Wind X (27 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	X	-0.007	-0.007	0	%100	Active
2	PS.2	X	-0.007	-0.007	0	%100	Active
3	PS.3	X	-0.008	-0.008	0	%100	Active
4	PS.4	X	-0.007	-0.007	0	%100	Active

Wind with Ice Z (7 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	Z	-0.002	-0.002	0	1.583	Active
2	PS.1	Z	-0.002	-0.002	4.333	%100	Active
3	PS.2	Z	-0.002	-0.002	0	0.625	Active
4	PS.2	Z	-0.002	-0.002	5.375	%100	Active
5	PS.3	Z	-0.002	-0.002	0	0.25	Active
6	PS.4	Z	-0.002	-0.002	0	%100	Active

Wind Z (27 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	Z	-0.007	-0.007	0	1.583	Active
2	PS.1	Z	-0.007	-0.007	4.333	%100	Active
3	PS.2	Z	-0.007	-0.007	0	0.625	Active
4	PS.4	Z	-0.007	-0.007	0	%100	Active
5	PS.3	Z	-0.008	-0.008	0	0.25	Active
6	PS.2	Z	-0.007	-0.007	5.375	%100	Active

Load Combinations

	De…	So…	PD…	SR…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…
1	1.2…	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9…	Yes	Y		1	0.9	2	0.9	5	1.6														
3	1.2…	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2…	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9…	Yes	Y		1	0.9	2	0.9	7	1.6														
6	1.2…	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Node Reactions

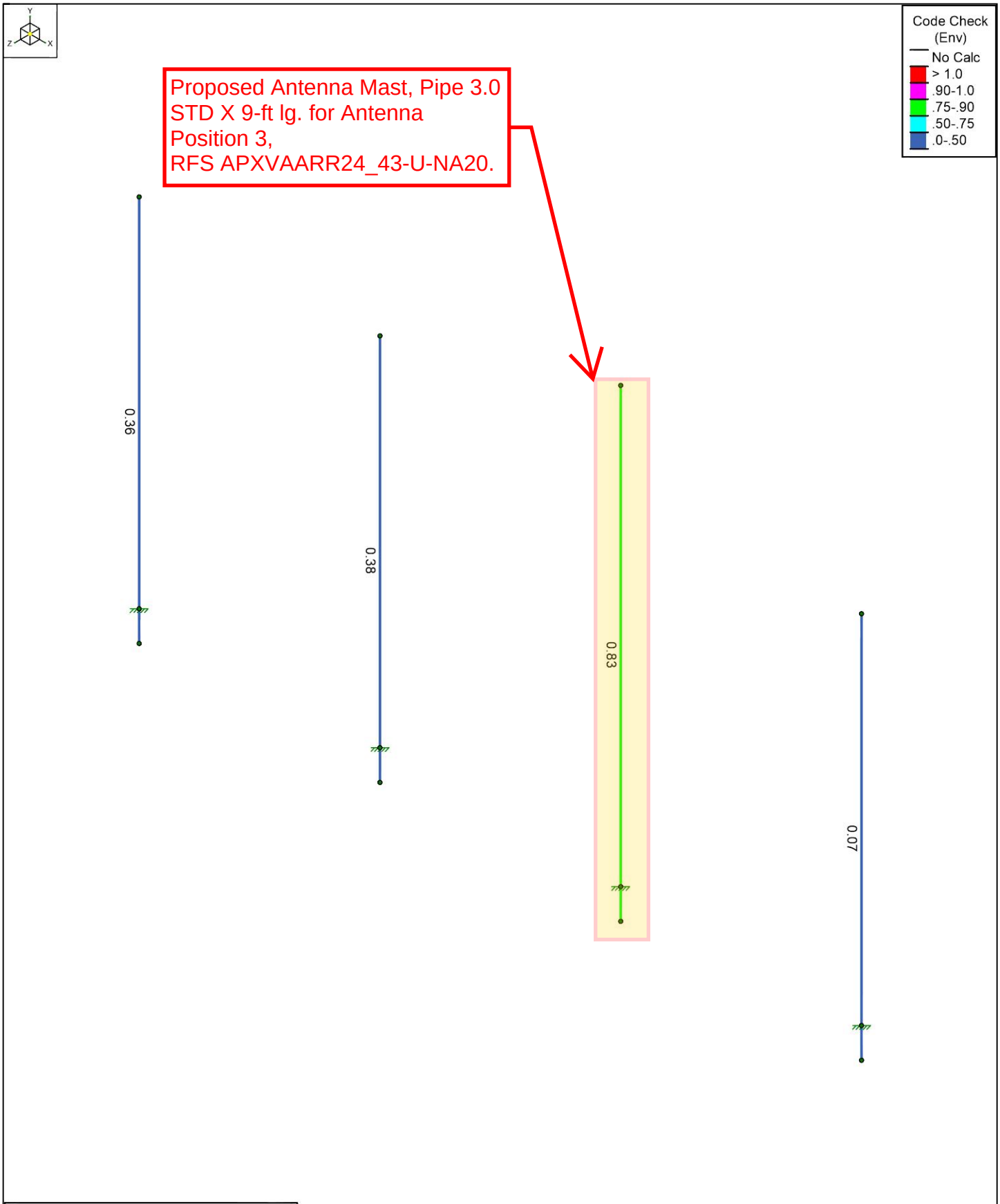
	Node…		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	0.199	2	0.324	6	0.342	5	1.297	4	0	6	0	6
2		min	0	4	0.131	2	0	1	0	1	0	1	-0.728	1
3	N10	max	0.308	2	0.39	6	0.362	5	1.367	4	0	6	0	6
4		min	0	4	0.158	2	0	1	0	1	0	1	-1.153	1
5	N11	max	0.721	2	1.04	6	1.178	5	4.849	4	0	6	0	6
6		min	0	4	0.331	2	0	1	0	1	0	1	-2.892	1
7	N12	max	0.081	2	0.049	6	0.081	5	0.257	4	0	6	0	6
8		min	0	4	0.037	2	0	1	0	1	0	1	-0.257	1
9	Totals:	max	1.31	2	1.803	6	1.964	5						
10		min	0	4	0.656	2	0	1						

Node Displacements

	Node…		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota…	LC	Y Rota…	LC	Z Rota…	LC
1	N1	max	0	6	0	5	0	3	1.529e…	5	0	6	0	6
2		min	0	2	0	3	0	5	0	1	0	1	-1.529…	2
3	N2	max	0	6	0	5	0	3	0	3	0	6	7.046e…	1
4		min	-0.446	1	0	3	-0.794	4	-1.254…	4	0	1	0	4
5	N3	max	0	6	0	5	0	3	1.529e…	5	0	6	0	6
6		min	0	2	0	3	0	5	0	1	0	1	-1.529…	2
7	N4	max	0	6	0	5	0	3	0	3	0	6	1.285e…	1
8		min	-0.767	1	0	3	-0.926	4	-1.572…	4	0	1	0	4
9	N5	max	0	6	0	5	0	4	0	3	0	6	0	6
10		min	0	2	0	3	0	1	0	4	0	1	-9.078…	2
11	N6	max	0	6	0	5	0	3	0	3	0	6	2.039e…	1
12		min	-1.472	1	-0.001	3	-2.777	4	-4.013…	4	0	1	0	4
13	N7	max	0	6	0	5	0	3	0	3	0	6	2.554e…	1
14		min	-0.159	1	0	1	-0.159	4	-2.554…	4	0	1	0	4
15	N8	max	0	6	0	5	0	3	1.529e…	5	0	6	0	6
16		min	0	2	0	1	0	5	0	1	0	1	-1.529…	2
17	N9	max	0	6	0	5	0	3	0	3	0	6	0	1
18		min	0	1	0	3	0	4	0	4	0	1	0	4
19	N10	max	0	6	0	5	0	3	0	3	0	6	0	1
20		min	0	1	0	3	0	4	0	4	0	1	0	4
21	N11	max	0	6	0	5	0	3	0	3	0	6	0	1
22		min	0	1	0	3	0	4	0	4	0	1	0	4
23	N12	max	0	6	0	5	0	3	0	3	0	6	0	1
24		min	0	1	0	1	0	4	0	4	0	1	0	4

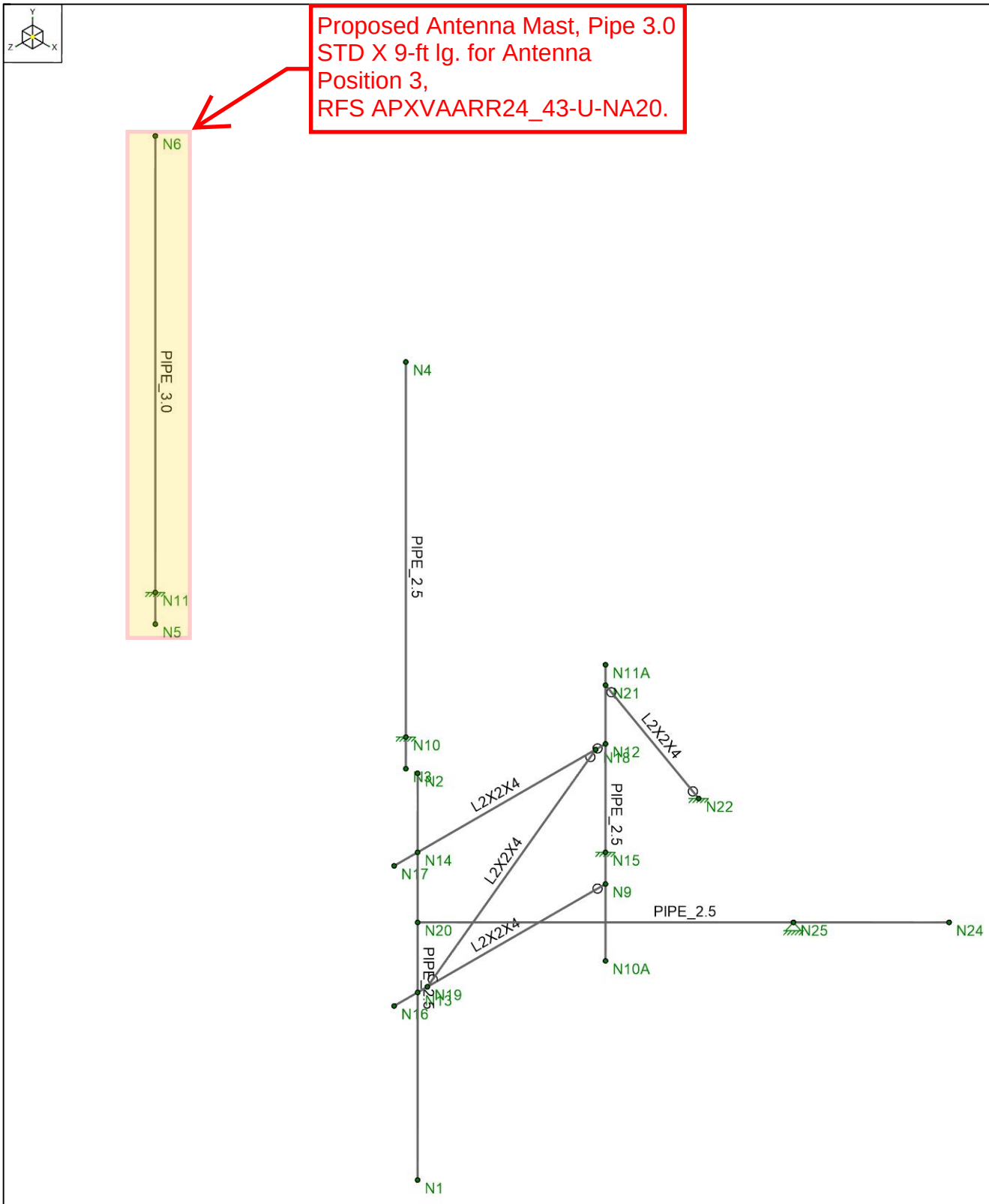
LRFD

	Member	Shape	Code…	Loc [ft]	LC	Shear…	Loc [ft]	Dir	LC	phi*P…	phi*P…	phi*M…	phi*M…	Cb	Eqn
1	PS.1	PIPE…	0.360	6.875	4	0.022	6.875		4	32.005	50.715	3.596	3.596	1	H1-1b
2	PS.2	PIPE…	0.380	6.875	4	0.023	6.875		4	32.005	50.715	3.596	3.596	1	H1-1b
3	PS.3	PIPE…	0.834	8.344	4	0.061	8.344		4	42.264	65.205	5.749	5.749	1	H1-1b
4	PS.4	PIPE…	0.072	6.875	4	0.005	6.875		4	32.005	50.715	3.596	3.596	1	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering	CT1132B - Alpha Sector Mount	SK-3
FJP		Aug 07, 2020 at 09:57 AM
20074.43	Member Unity Check	CT1132B_Alpha Sector_AMA.r3d



Envelope Only Solution

Centek Engineering	CT1132B - Beta Sector Mount	SK-1
FJP		Aug 07, 2020 at 11:22 AM
20074.43	Member Framing	CT1132B_Beta Sector_AMA.r3d

Model Settings

Number of Reported Sections	5
Number of Internal Sections	97
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Global Plane for z-axis	XZ

Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): ASD
Cold Formed Steel	AISI S100-10: ASD
Stiffness Adjustment	Yes (Iterative)
Wood	AWC NDS-12: ASD
Temperature	< 100F
Concrete	ACI 318-11
Masonry	ACI 530-11: ASD
Aluminum	AA ADM1-10: ASD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65
Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-10

Model Settings (Continued)

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. C…	Density [k…	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Grad…	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	(E) Anten…	PIPE_2.5	Column	Pipe	A53 Grad…	Typical	1.61	1.45	1.45	2.89
2	(E)Kickba…	L2X2X4	Beam	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021
3	(E) Stabili…	PIPE_2.5	Beam	Pipe	A53 Grad…	Typical	1.61	1.45	1.45	2.89
4	(P)Antenn…	PIPE_3.0	Column	Pipe	A53 Grad…	Typical	2.07	2.85	2.85	5.69

Hot Rolled Member Properties

	Label	Shape	Length [ft]	Lb y-y [ft]	Lb z-z [ft]	Lcomp t…	Lcomp…	L-Torqu…	K y-y	K z-z	Cb	Function
1	PS.1	(E) Ante…	7.5	Segment		Lbyy						Lateral
2	PS.2	(E) Ante…	7.5	Segment		Lbyy						Lateral
3	PS.3	(P)Ante…	9	Segment		Lbyy						Lateral
4	M4	(E) Ante…	5.458	Segment		Lbyy						Lateral
5	M5	(E)Kick…	4.5			Lbyy						Lateral
6	M6	(E)Kick…	4.5			Lbyy						Lateral
7	M7	(E)Kick…	4.417			Lbyy						Lateral
8	M8	(E)Kick…	3.667			Lbyy						Lateral
9	M9	(E) Stab…	8			Lbyy						Lateral

Primary Member Properties

	Label	I Node	J Node	K Node	Rotate(deg)	Section/S…	Type	Design List	Material	Design Rule
1	PS.1	N2	N1			(E) Anten…	Column	Pipe	A53 Grad…	Typical
2	PS.2	N4	N3			(E) Anten…	Column	Pipe	A53 Grad…	Typical
3	PS.3	N6	N5			(P)Antenn…	Column	Pipe	A53 Grad…	Typical
4	M4	N11A	N10A			(E) Anten…	Column	Pipe	A53 Grad…	Typical
5	M5	N12	N17			(E)Kickba…	Beam	Single Angle	A36 Gr.36	Typical
6	M6	N9	N16			(E)Kickba…	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N18	N19			(E)Kickba…	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N21	N22			(E)Kickba…	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N20	N24			(E) Stabili…	Beam	Pipe	A53 Grad…	Typical

Nodes

	Label	X [ft]	Y [ft]	Z [ft]	Temp [deg F]	Detach From Dia…
1	N1	8.916667	-3.458333	4		
2	N2	8.916667	4.041667	4		
3	N3	4.666667	0	0		
4	N4	4.666667	7.5	0		
5	N5	-0.666667	0	0		
6	N6	-0.666667	9	0		
7	N9	8.916667	0.	0.		
8	N10	4.666667	0.583333	0		
9	N11	-0.666667	0.583333	0		
10	N10A	8.916667	-1.416667	0.		
11	N11A	8.916667	4.041667	0.		
12	N12	8.916667	2.583333	0.		
13	N13	8.916667	0.	4		
14	N14	8.916667	2.583333	4		
15	N15	8.916667	0.583333	0.		
16	N16	8.916667	0.	4.5		

Nodes (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [deg F]	Detach From Dia…
17	N17	8.916667	2.583333	4.5		
18	N18	8.916667	2.583333	0.208333		
19	N19	8.916667	0.	3.791667		
20	N20	8.916667	1.291667	4		
21	N21	8.916667	3.666667	0.		
22	N22	8.916667	0.583333	-1.984308		
23	N25	12.916667	1.291667	0		
24	N24	14.573536	1.291667	-1.656869		

Boundary Conditions

	Node 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	N9						
2	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N12						
5	N13						
6	N14						
7	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N16						
9	N17						
10	N18						
11	N19						
12	N20						
13	N22	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
14	N25	Reaction	Reaction	Reaction			
15	N24						

Basic Load Cases

	BLC Desc…	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me…	Surface(P…
1	Self Weight	None		-1						
2	Dead Load	None					10			
3	Ice Load	None					10			
4	Wind with…	None					10	9		
5	Wind X (2…	None					10	9		
6	Wind with…	None					10	9		
7	Wind Z (2…	None					10	9		

Dead Load

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Y	-0.052	2.375	Active
2	PS.1	Y	-0.052	5.125	Active
3	PS.2	Y	-0.067	0.625	Active
4	PS.2	Y	-0.067	5.375	Active
5	PS.3	Y	-0.077	0.25	Active
6	PS.3	Y	-0.077	8.25	Active
7	PS.3	Y	-0.011	2.083	Active
8	PS.3	Y	-0.018	3.75	Active
9	PS.3	Y	-0.075	4.75	Active
10	PS.3	Y	-0.046	5.75	Active

Ice Load

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Y	-0.075	2.375	Active
2	PS.1	Y	-0.075	5.125	Active
3	PS.2	Y	-0.09	0.625	Active
4	PS.2	Y	-0.09	5.375	Active

Ice Load (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
5	PS.3	Y	-0.212	0.25	Active
6	PS.3	Y	-0.212	8.25	Active
7	PS.3	Y	-0.021	2.083	Active
8	PS.3	Y	-0.025	3.75	Active
9	PS.3	Y	-0.076	4.75	Active
10	PS.3	Y	-0.053	5.75	Active

Wind with Ice X (7 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	X	-0.015	2.375	Active
2	PS.1	X	-0.015	5.125	Active
3	PS.2	X	-0.028	0.625	Active
4	PS.2	X	-0.028	5.375	Active
5	PS.3	X	-0.045	0.25	Active
6	PS.3	X	-0.045	8.25	Active
7	PS.3	X	-0.009	2.083	Active
8	PS.3	X	-0.008	3.75	Active
9	PS.3	X	-0.025	4.75	Active
10	PS.3	X	-0.022	5.75	Active

Wind X (27 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	X	-0.037	2.375	Active
2	PS.1	X	-0.037	5.125	Active
3	PS.2	X	-0.071	0.625	Active
4	PS.2	X	-0.071	5.375	Active
5	PS.3	X	-0.118	0.25	Active
6	PS.3	X	-0.118	8.25	Active
7	PS.3	X	-0.015	2.083	Active
8	PS.3	X	-0.014	3.75	Active
9	PS.3	X	-0.063	4.75	Active
10	PS.3	X	-0.052	5.75	Active

Wind with Ice Z (7 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Z	-0.031	2.375	Active
2	PS.1	Z	-0.031	5.125	Active
3	PS.2	Z	-0.037	0.625	Active
4	PS.2	Z	-0.037	5.375	Active
5	PS.3	Z	-0.102	0.25	Active
6	PS.3	Z	-0.102	8.25	Active
7	PS.3	Z	-0.005	2.083	Active
8	PS.3	Z	-0.008	3.75	Active
9	PS.3	Z	-0.02	4.75	Active
10	PS.3	Z	-0.011	5.75	Active

Wind Z (27 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	PS.1	Z	-0.091	2.375	Active
2	PS.1	Z	-0.091	5.125	Active
3	PS.2	Z	-0.104	0.625	Active
4	PS.2	Z	-0.104	5.375	Active
5	PS.3	Z	-0.324	0.25	Active
6	PS.3	Z	-0.324	8.25	Active
7	PS.3	Z	-0.007	2.583	Active
8	PS.3	Z	-0.013	4.25	Active

Wind Z (27 psf) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
9	PS.3	Z	-0.045	5.25	Active
10	PS.3	Z	-0.021	6.25	Active

Wind with Ice X (7 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	X	-0.002	-0.002	0	%100	Active
2	PS.2	X	-0.002	-0.002	0	%100	Active
3	PS.3	X	-0.002	-0.002	0	%100	Active
4	M5	X	-0.001	-0.001	0	%100	Active
5	M6	X	-0.001	-0.001	0	%100	Active
6	M7	X	-0.001	-0.001	0	%100	Active
7	M8	X	-0.001	-0.001	0	%100	Active
8	M4	X	-0.002	-0.002	0	%100	Active
9	M9	X	-0.002	-0.002	0	%100	Active

Wind X (27 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	X	-0.007	-0.007	0	%100	Active
2	PS.2	X	-0.007	-0.007	0	%100	Active
3	PS.3	X	-0.008	-0.008	0	%100	Active
4	M5	X	-0.005	-0.005	0	%100	Active
5	M6	X	-0.005	-0.005	0	%100	Active
6	M7	X	-0.005	-0.005	0	%100	Active
7	M8	X	-0.005	-0.005	0	%100	Active
8	M4	X	-0.007	-0.007	0	%100	Active
9	M9	X	-0.007	-0.007	0	%100	Active

Wind with Ice Z (7 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	Z	-0.002	-0.002	0	2.375	Active
2	PS.1	Z	-0.002	-0.002	5.125	%100	Active
3	PS.2	Z	-0.002	-0.002	0	0.625	Active
4	PS.2	Z	-0.002	-0.002	5.375	%100	Active
5	PS.3	Z	-0.002	-0.002	0	0.25	Active
6	M7	Z	-0.001	-0.001	0	%100	Active
7	M8	Z	-0.001	-0.001	0	%100	Active
8	M4	Z	-0.002	-0.002	0	%100	Active
9	M9	Z	-0.002	-0.002	0.5	%100	Active

Wind Z (27 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	PS.1	Z	-0.007	-0.007	0	2.375	Active
2	PS.1	Z	-0.007	-0.007	5.125	%100	Active
3	PS.2	Z	-0.007	-0.007	0	0.625	Active
4	PS.3	Z	-0.008	-0.008	0	0.25	Active
5	PS.2	Z	-0.007	-0.007	5.375	%100	Active
6	M7	Z	-0.005	-0.005	0	%100	Active
7	M8	Z	-0.005	-0.005	0	%100	Active
8	M4	Z	-0.007	-0.007	0	%100	Active
9	M9	Z	-0.007	-0.007	0.5	%100	Active

Load Combinations

	De…	So…	PD…	SR…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…
1	1.2…	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9…	Yes	Y		1	0.9	2	0.9	5	1.6														
3	1.2…	Yes	Y		1	1.2	2	1.2	3	1	4	1												

Load Combinations (Continued)

	De…	So…	PD…	SR…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…
4	1.2…	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9…	Yes	Y		1	0.9	2	0.9	7	1.6														
6	1.2…	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Node Reactions

	Node…		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N10	max	0.308	2	0.39	6	0.362	5	1.367	4	0	6	0	6
2		min	0	4	0.158	2	0	1	0	1	0	1	-1.153	1
3	N11	max	0.721	2	1.04	6	1.178	5	4.849	4	0	6	0	6
4		min	0	4	0.331	2	0	1	0	1	0	1	-2.892	1
5	N15	max	0.115	1	0.846	6	0.569	4	-0.286	2	0	1	-0.005	6
6		min	0.001	5	0.253	2	0.318	3	-0.652	6	0	6	-0.102	1
7	N22	max	0.013	1	-0.081	2	-0.048	5	0	6	0	6	0	6
8		min	0	5	-0.406	6	-0.263	6	0	1	0	1	0	1
9	N25	max	0.34	2	0.084	1	0.061	4	0	6	0	6	0	6
10		min	-0.001	4	0.029	5	-0.277	1	0	1	0	1	0	1
11	Totals:	max	1.497	1	1.908	3	2.081	4						
12		min	0	5	0.735	5	0	2						

Node Displacements

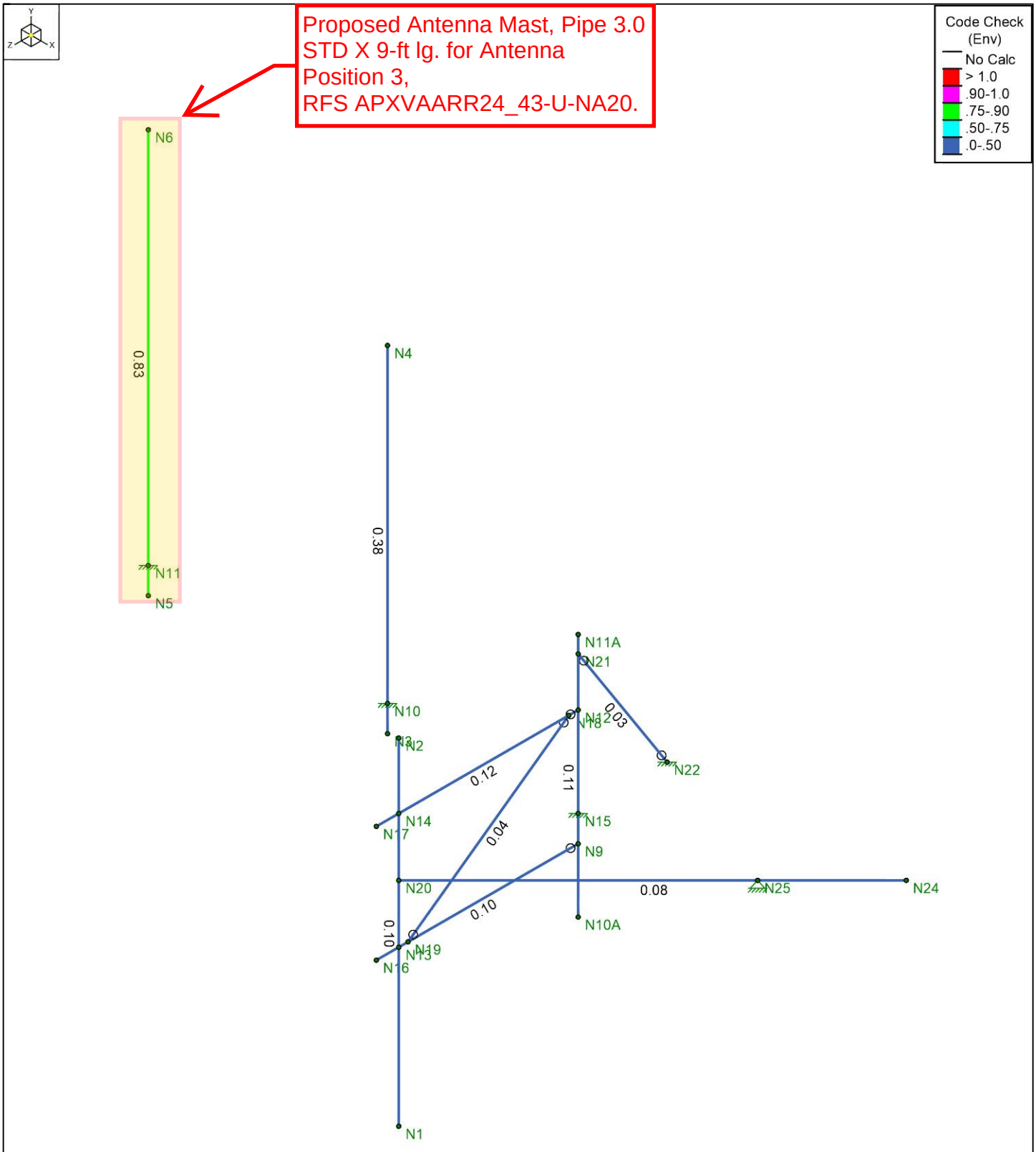
	Node…		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota…	LC	Y Rota…	LC	Z Rota…	LC
1	N1	max	0.006	6	-0.009	2	0.003	2	1.622e…	4	2.05e-04	4	1.547e…	5
2		min	-0.264	1	-0.033	6	-0.067	4	-1.302…	2	-1.276…	2	-4.893…	1
3	N2	max	0.097	1	-0.009	2	0.014	3	3.234e…	1	3.995e…	1	1.189e…	5
4		min	0.001	5	-0.033	6	0.003	5	8.309e…	5	4.357e…	6	-2.997…	1
5	N3	max	0	6	0	5	0	3	1.529e…	5	0	6	0	6
6		min	0	2	0	3	0	5	0	1	0	1	-1.529…	2
7	N4	max	0	6	0	5	0	3	0	3	0	6	1.285e…	1
8		min	-0.767	1	0	3	-0.926	4	-1.572…	4	0	1	0	4
9	N5	max	0	6	0	5	0	4	0	3	0	6	0	6
10		min	0	2	0	3	0	1	0	4	0	1	-9.078…	2
11	N6	max	0	6	0	5	0	3	0	3	0	6	2.039e…	1
12		min	-1.472	1	-0.001	3	-2.777	4	-4.013…	4	0	1	0	4
13	N9	max	0	4	0	5	-0.002	2	5.253e…	4	0	6	1.052e…	4
14		min	0	2	0	1	-0.003	4	2.85e-04	2	0	1	-6.226…	2
15	N10	max	0	6	0	5	0	3	0	3	0	6	0	1
16		min	0	1	0	3	0	4	0	4	0	1	0	4
17	N11	max	0	6	0	5	0	3	0	3	0	6	0	1
18		min	0	1	0	3	0	4	0	4	0	1	0	4
19	N10A	max	0	4	0	5	-0.006	2	5.472e…	4	0	6	1.052e…	4
20		min	-0.002	2	0	1	-0.012	4	2.849e…	2	0	1	-8.417…	2
21	N11A	max	0	6	0	2	0	2	-1.479…	2	-5.409…	6	7.231e…	1
22		min	-0.023	1	0	6	0	6	-7.318…	6	-1.992…	1	1.963e…	6
23	N12	max	0	6	0	2	0.01	6	-9.157…	2	-3.509…	6	6.664e…	1
24		min	-0.01	1	0	6	0.002	2	-5.486…	6	-1.292…	1	1.964e…	6
25	N13	max	0.005	6	-0.009	2	-0.002	2	9.492e…	4	2.05e-04	4	1.548e…	5
26		min	-0.065	2	-0.033	6	-0.004	4	-1.303…	2	-1.276…	2	-4.431…	1
27	N14	max	0.045	1	-0.009	2	0.01	6	3.234e…	1	3.995e…	1	1.189e…	5
28		min	0.002	5	-0.033	6	0.002	2	3.221e…	5	4.357e…	6	-3.021…	1
29	N15	max	0	5	0	2	0	3	0	6	0	6	0	1
30		min	0	1	0	6	0	4	0	2	0	1	0	6
31	N16	max	0.006	6	-0.008	2	-0.002	2	9.514e…	4	2.063e…	4	1.548e…	5
32		min	-0.066	2	-0.038	6	-0.004	4	-1.311…	2	-1.308…	2	-4.431…	1
33	N17	max	0.047	1	-0.011	2	0.01	6	3.231e…	1	3.966e…	1	1.189e…	5
34		min	0.002	5	-0.034	6	0.002	2	3.387e…	5	4.488e…	6	-3.021…	1
35	N18	max	0.003	6	-0.002	2	0.01	6	2.938e…	6	1.788e…	1	3.841e…	1
36		min	-0.006	2	-0.008	6	0.002	2	6.53e-04	2	5.84e-04	5	2.91e-05	5

Node Displacements (Continued)

	Node…		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota…	LC	Y Rota…	LC	Z Rota…	LC
37	N19	max	0.005	6	-0.009	2	-0.002	2	9.792e…	6	2.296e…	4	7.361e…	5
38		min	-0.065	2	-0.031	6	-0.004	4	-5.17e…	2	-2.177…	2	-4.113…	1
39	N20	max	0.005	6	-0.009	2	0.005	6	4.581e…	3	1.7e-04	4	2.096e…	5
40		min	-0.004	2	-0.033	6	-0.003	2	1.022e…	5	7.981e…	3	-3.291…	1
41	N21	max	0	6	0	2	0.003	6	-1.479…	2	-5.409…	6	7.227e…	1
42		min	-0.019	1	0	6	0	2	-7.317…	6	-1.992…	1	1.963e…	6
43	N22	max	0	5	0	6	0	6	0	6	0	1	0	1
44		min	0	1	0	2	0	5	0	1	0	6	0	6
45	N25	max	0	4	0	5	0	1	2.772e…	1	1.188e…	6	2.163e…	4
46		min	0	2	0	1	0	4	2.744e…	5	-1.779…	2	-9.182…	2
47	N24	max	0.002	2	0.036	1	0.002	2	2.73e-03	1	1.302e…	6	1.736e…	4
48		min	-0.003	6	0.008	5	-0.003	6	2.424e…	5	-1.078…	2	-9.501…	2

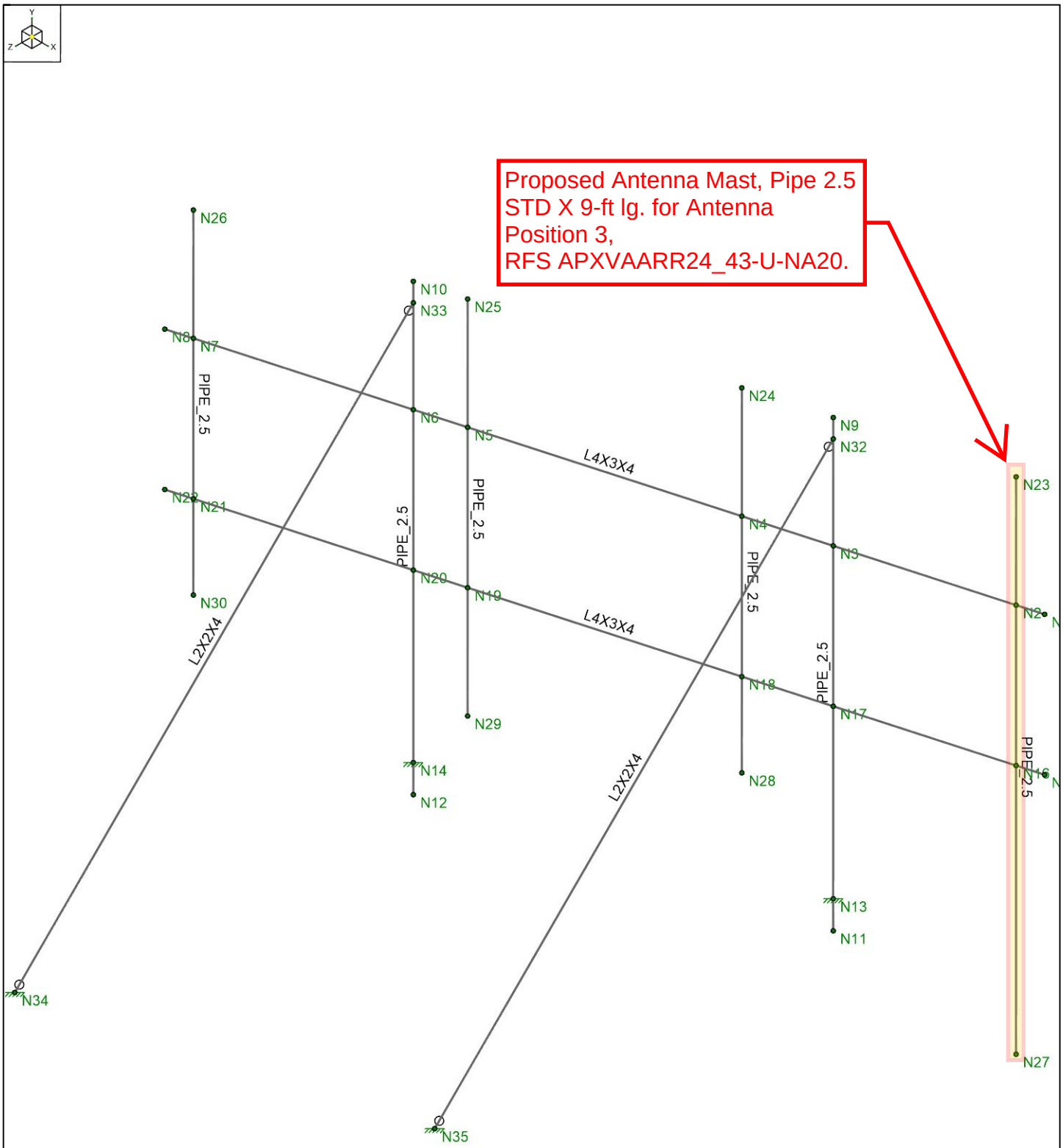
LRFD

	Member	Shape	Code…	Loc [ft]	LC	Shear…	Loc [ft]	Dir	LC	phi*P…	phi*P…	phi*M…	phi*M…	Cb	Eqn
1	PS.1	PIPE…	0.098	2.813	2	0.030	2.813		1	32.005	50.715	3.596	3.596	1.253	H1-1b
2	PS.2	PIPE…	0.380	6.875	4	0.023	6.875		4	32.005	50.715	3.596	3.596	1	H1-1b
3	PS.3	PIPE…	0.834	8.344	4	0.061	8.344		4	42.264	65.205	5.749	5.749	1	H1-1b
4	M4	PIPE…	0.112	3.468	4	0.045	3.468		4	39.742	50.715	3.596	3.596	2.441	H1-1b
5	M5	L2X2X4	0.124	0.187	6	0.041	0	y	6	10.953	30.586	0.691	1.577	1.943	H2-1
6	M6	L2X2X4	0.098	3.984	3	0.040	3.797	y	3	10.953	30.586	0.691	1.577	3.549	H2-1
7	M7	L2X2X4	0.040	2.209	4	0.007	4.417	z	2	11.367	30.586	0.691	1.474	1.136	H2-1
8	M8	L2X2X4	0.026	1.833	1	0.002	3.667	z	1	15.487	30.586	0.691	1.522	1.136	H2-1
9	M9	PIPE…	0.077	0	1	0.005	5.583		1	30.038	50.715	3.596	3.596	2.049	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering	CT1132B - Beta Sector Mount	SK-2
FJP		Aug 07, 2020 at 11:25 AM
20074.43	Member Unity Check	CT1132B_Beta Sector_AMA.r3d



Envelope Only Solution

Centek Engineering	CT1132B - Gamma Sector Mount	SK-1
FJP		Aug 05, 2020 at 11:02 AM
20074.43	Member Framing	CT1132B_Gamma Sector_AMA.r3d

Model Settings

Number of Reported Sections	5
Number of Internal Sections	97
Member Area Load Mesh Size (in^2)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	Yes
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Y
Convert Existing Data	Yes

Default Global Plane for z-axis	XZ

Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 14th (360-10): ASD
Cold Formed Steel	AISI S100-10: ASD
Stiffness Adjustment	Yes (Iterative)
Wood	AWC NDS-12: ASD
Temperature	< 100F
Concrete	ACI 318-11
Masonry	ACI 530-11: ASD
Aluminum	AA ADM1-10: ASD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65
Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-10

Model Settings (Continued)

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. C…	Density [k…	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Grad…	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	(E)Horz.…	L4X3X4	Beam	Single Angle	A36 Gr.36	Typical	1.69	1.33	2.75	0.039
2	(E) Vert. A…	PIPE_2.5	Column	Pipe	A53 Grad…	Typical	1.61	1.45	1.45	2.89
3	(E) Anten…	PIPE_2.5	Column	Pipe	A53 Grad…	Typical	1.61	1.45	1.45	2.89
4	(P) Anten…	PIPE_2.5	Column	Pipe	A53 Grad…	Typical	1.61	1.45	1.45	2.89
5	(E) Kickb…	L2X2X4	VBrace	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021

Hot Rolled Member Properties

	Label	Shape	Length [ft]	Lb y-y [ft]	Lb z-z [ft]	Lcomp t…	Lcomp…	L-Torqu…	K y-y	K z-z	Cb	Function
1	M1	(E)Horz…	12.833	Segment		Lbyy						Lateral
2	M2	(E)Horz…	12.833	Segment		Lbyy						Lateral
3	M3	(E) Vert.…	8			Lbyy						Lateral
4	M4	(E) Vert.…	8			Lbyy						Lateral
5	M5	(E) Kick…	10.135									Lateral
6	M6	(E) Kick…	10.135									Lateral
7	M7	(E) Ante…	6									Lateral
8	M8	(E) Ante…	6.5									Lateral
9	M9	(P) Ante…	9									Lateral
10	M10	(E) Ante…	6									Lateral

Primary Member Properties

	Label	I Node	J Node	K Node	Rotate(deg)	Section/S…	Type	Design List	Material	Design Rule
1	M1	N15	N22		90	(E)Horz.…	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N1	N8		90	(E)Horz.…	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N12	N10			(E) Vert. A…	Column	Pipe	A53 Grad…	Typical
4	M4	N11	N9			(E) Vert. A…	Column	Pipe	A53 Grad…	Typical
5	M5	N33	N34		180	(E) Kickb…	VBrace	Single Angle	A36 Gr.36	Typical
6	M6	N32	N35		180	(E) Kickb…	VBrace	Single Angle	A36 Gr.36	Typical
7	M7	N26	N30			(E) Anten…	Column	Pipe	A53 Grad…	Typical
8	M8	N25	N29			(E) Anten…	Column	Pipe	A53 Grad…	Typical
9	M9	N23	N27			(P) Anten…	Column	Pipe	A53 Grad…	Typical
10	M10	N24	N28			(E) Anten…	Column	Pipe	A53 Grad…	Typical

Nodes

	Label	X [ft]	Y [ft]	Z [ft]	Temp [deg F]	Detach From Dia…
1	N1	8.866306	6	-0.832538		
2	N2	8.465116	6	-0.720033		
3	N3	5.897497	6	0.		
4	N4	4.613688	6	0.360016		
5	N5	0.762261	6	1.440066		
6	N6	-0.000001	6	1.653826		
7	N7	-3.089167	6	2.520115		
8	N8	-3.490357	6	2.63262		
9	N9	5.897497	8	0.		
10	N10	-0.000001	8	1.653826		
11	N11	5.897497	0	0		
12	N12	-0.000001	0	1.653826		
13	N13	5.897497	0.5	0		

Nodes (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [deg F]	Detach From Dia…
14	N14	-0.000001	0.5	1.653826		
15	N15	8.866306	3.5	-0.832538		
16	N16	8.465116	3.5	-0.720033		
17	N17	5.897497	3.5	0.		
18	N18	4.613688	3.5	0.360016		
19	N19	0.762261	3.5	1.440066		
20	N20	-0.000001	3.5	1.653826		
21	N21	-3.089167	3.5	2.520115		
22	N22	-3.490357	3.5	2.63262		
23	N23	8.465116	8	-0.720033		
24	N24	4.613688	8	0.360016		
25	N25	0.762261	8	1.440066		
26	N26	-3.089167	8	2.520115		
27	N27	8.465116	-1	-0.720033		
28	N28	4.613688	2	0.360017		
29	N29	0.762261	1.5	1.440066		
30	N30	-3.089167	2	2.520115		
31	N32	5.897497	7.666667	0		
32	N33	-0.000001	7.666667	1.653826		
33	N34	-0.000001	0.5	8.820492		
34	N35	5.897497	0.5	7.166667		

Boundary Conditions

	Node 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	N13	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N14	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N34	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N35	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Desc…	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me…	Surface(P…
1	Self Weight	None		-1				2		
2	Dead Load	None					10			
3	Ice Load	None					10			
4	Wind with…	None					10	8		
5	Wind X (2…	None					10	8		
6	Wind with…	None					10	12		
7	Wind Z (2…	None					10	9		

Self Weight

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […]	End Location [(…	Inactive [(k, k-f…
1	M5	Y	0	0	0	%100	Active
2	M6	Y	0	0	0	%100	Active

Wind with Ice X (7 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […]	End Location [(…	Inactive [(k, k-f…
1	M7	X	-0.002	-0.002	0	%100	Active
2	M8	X	-0.002	-0.002	0	%100	Active
3	M9	X	-0.002	-0.002	0	%100	Active
4	M10	X	-0.002	-0.002	0	%100	Active
5	M5	X	-0.001	-0.001	0	%100	Active
6	M6	X	-0.001	-0.001	0	%100	Active
7	M3	X	-0.002	-0.002	0	%100	Active
8	M4	X	-0.002	-0.002	0	%100	Active

Wind X (27 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	M10	X	-0.007	-0.007	0	%100	Active
2	M7	X	-0.007	-0.007	0	%100	Active
3	M8	X	-0.007	-0.007	0	%100	Active
4	M5	X	-0.005	-0.005	0	%100	Active
5	M6	X	-0.005	-0.005	0	%100	Active
6	M3	X	-0.007	-0.007	0	%100	Active
7	M4	X	-0.007	-0.007	0	%100	Active
8	M9	X	-0.007	-0.007	0	%100	Active

Wind with Ice Z (7 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	M7	Z	-0.002	-0.002	0	1.583	Active
2	M7	Z	-0.002	-0.002	4.333	%100	Active
3	M2	Z	-0.002	-0.002	0	%100	Active
4	M1	Z	-0.002	-0.002	0	%100	Active
5	M8	Z	-0.002	-0.002	0	%100	Active
6	M10	Z	-0.002	-0.002	0	%100	Active
7	M9	Z	-0.002	-0.002	0	0.5	Active
8	M9	Z	-0.002	-0.002	8.5	%100	Active
9	M5	Z	-0.001	-0.001	0	%100	Active
10	M6	Z	-0.001	-0.001	0	%100	Active
11	M3	Z	-0.002	-0.002	0	%100	Active
12	M4	Z	-0.002	-0.002	0	%100	Active

Wind Z (27 psf)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	M10	Z	-0.007	-0.007	0	%100	Active
2	M2	Z	-0.009	-0.009	0	%100	Active
3	M1	Z	-0.009	-0.009	0	%100	Active
4	M7	Z	-0.007	-0.007	0	1.583	Active
5	M7	Z	-0.007	-0.007	4.333	%100	Active
6	M5	Z	-0.005	-0.005	0	%100	Active
7	M6	Z	-0.005	-0.005	0	%100	Active
8	M3	Z	-0.007	-0.007	0	%100	Active
9	M4	Z	-0.007	-0.007	0	%100	Active

Dead Load

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	M7	Y	-0.052	1.583	Active
2	M7	Y	-0.052	4.333	Active
3	M8	Y	-0.067	0.625	Active
4	M8	Y	-0.067	5.375	Active
5	M9	Y	-0.077	0.5	Active
6	M9	Y	-0.077	7.5	Active
7	M9	Y	-0.011	0.667	Active
8	M9	Y	-0.018	1.667	Active
9	M9	Y	-0.075	2.667	Active
10	M9	Y	-0.046	3.667	Active

Ice Load

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	M7	Y	-0.075	1.583	Active
2	M7	Y	-0.075	4.333	Active
3	M8	Y	-0.09	0.625	Active
4	M8	Y	-0.09	5.375	Active
5	M9	Y	-0.212	0.5	Active

Ice Load (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
6	M9	Y	-0.212	7.5	Active
7	M9	Y	-0.021	0.667	Active
8	M9	Y	-0.025	1.667	Active
9	M9	Y	-0.076	2.667	Active
10	M9	Y	-0.053	3.667	Active

Wind with Ice X (7 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	M7	X	-0.015	1.583	Active
2	M7	X	-0.015	4.333	Active
3	M8	X	-0.028	0.625	Active
4	M8	X	-0.028	5.375	Active
5	M9	X	-0.045	0.5	Active
6	M9	X	-0.045	7.5	Active
7	M9	X	-0.009	0.667	Active
8	M9	X	-0.008	1.667	Active
9	M9	X	-0.025	2.667	Active
10	M9	X	-0.022	3.667	Active

Wind X (27 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	M7	X	-0.037	1.583	Active
2	M7	X	-0.037	4.333	Active
3	M8	X	-0.071	0.625	Active
4	M8	X	-0.071	5.375	Active
5	M9	X	-0.118	0.5	Active
6	M9	X	-0.118	7.5	Active
7	M9	X	-0.015	0.667	Active
8	M9	X	-0.014	1.667	Active
9	M9	X	-0.063	2.667	Active
10	M9	X	-0.052	3.667	Active

Wind with Ice Z (7 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	M7	Z	-0.031	1.583	Active
2	M7	Z	-0.031	4.333	Active
3	M8	Z	-0.037	0.625	Active
4	M8	Z	-0.037	5.375	Active
5	M9	Z	-0.102	0.5	Active
6	M9	Z	-0.102	7.5	Active
7	M9	Z	-0.005	0.667	Active
8	M9	Z	-0.008	1.667	Active
9	M9	Z	-0.02	2.667	Active
10	M9	Z	-0.011	3.667	Active

Wind Z (27 psf)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
1	M7	Z	-0.091	1.583	Active
2	M7	Z	-0.091	4.333	Active
3	M8	Z	-0.104	0.625	Active
4	M8	Z	-0.104	5.375	Active
5	M9	Z	-0.324	0.5	Active
6	M9	Z	-0.324	7.5	Active
7	M9	Z	-0.007	0.667	Active
8	M9	Z	-0.013	1.667	Active
9	M9	Z	-0.045	2.667	Active

Wind Z (27 psf) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]	Inactive [(k, k-ft), (in,…
10	M9	Z	-0.021	3.667	Active

Load Combinations

	De…	So…	PD…	SR…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…
1	1.2…	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9…	Yes	Y		1	0.9	2	0.9	5	1.6														
3	1.2…	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2…	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9…	Yes	Y		1	0.9	2	0.9	7	1.6														
6	1.2…	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Node Reactions

	Node…		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N13	max	0.799	1	1.65	6	1.075	5	1.992	5	-0.023	2	-0.005	6
2		min	0.095	6	0.067	2	-0.032	3	-0.022	3	-0.677	4	-1.422	2
3	N14	max	0.705	2	1.069	1	0.38	4	0.699	4	0.147	5	0.256	4
4		min	-0.146	4	0.659	6	-0.148	2	-0.207	2	0.004	3	-1.303	2
5	N34	max	0.037	2	0.007	3	0.403	4	0	6	0	2	0	6
6		min	0	4	-0.351	5	0.013	3	0	1	0	6	0	2
7	N35	max	0.037	2	-0.011	3	0.733	4	0	6	0	2	0	4
8		min	0	4	-0.681	5	0.031	3	0	1	0	4	0	2
9	Totals:	max	1.569	1	2.121	6	2.587	4						
10		min	0	5	0.894	2	0	2						

Node Displacements

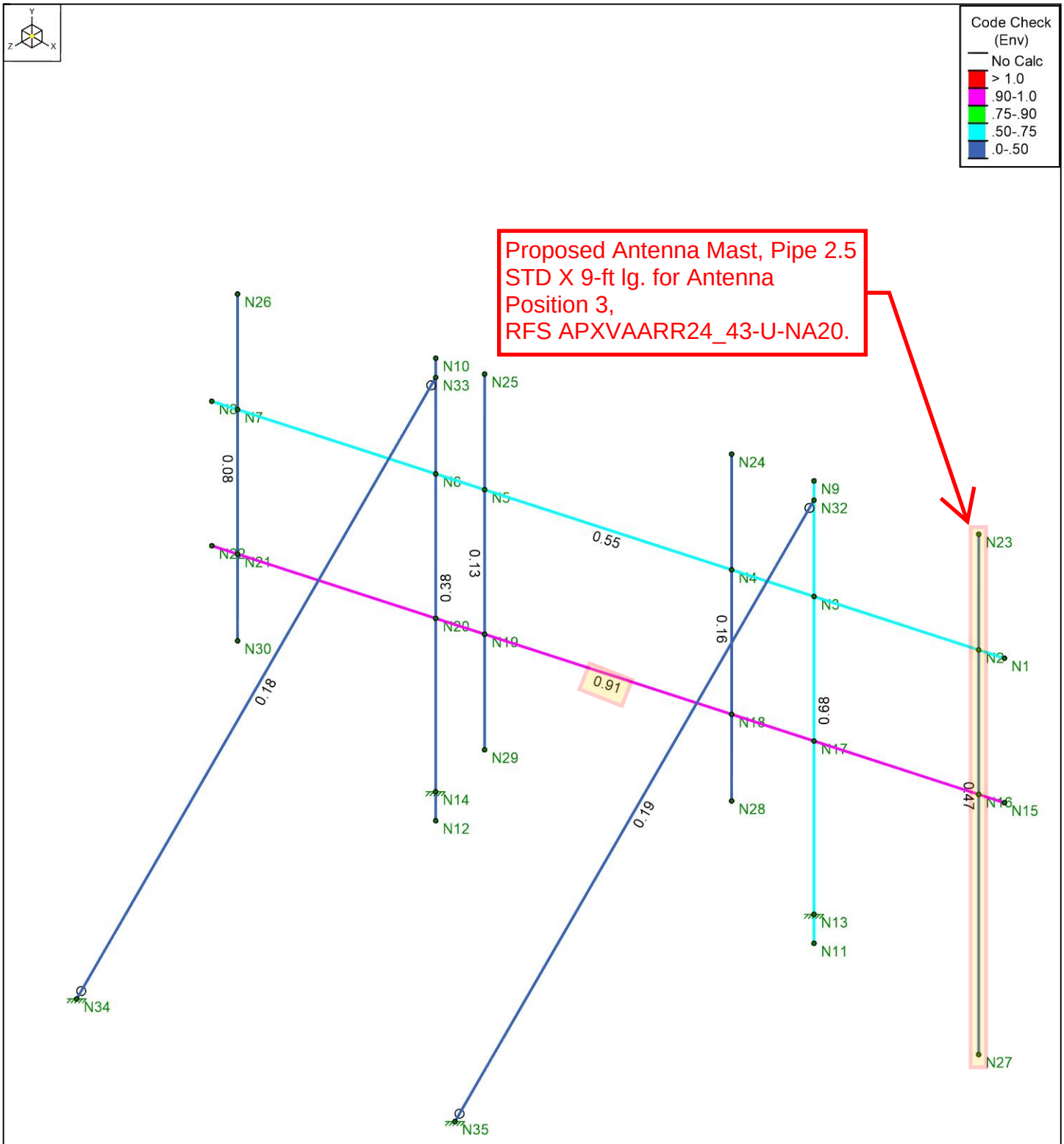
	Node…		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota…	LC	Y Rota…	LC	Z Rota…	LC
1	N1	max	0.028	6	0.047	2	-0.071	3	-4.396…	3	1.238e…	4	3.101e…	2
2		min	-0.242	2	-0.178	6	-0.599	4	-1.818…	4	1.131e…	2	-2.871…	6
3	N2	max	0.033	6	0.033	2	-0.066	3	-4.394…	3	1.238e…	4	3.102e…	2
4		min	-0.241	2	-0.163	6	-0.54	4	-1.818…	4	1.131e…	2	-2.871…	6
5	N3	max	0.067	6	0	2	-0.003	3	6.396e…	5	7.98e-03	4	1.567e…	2
6		min	-0.228	2	-0.002	6	-0.191	5	-7.17e…	3	6.692e…	2	-3.089…	4
7	N4	max	0.074	6	0.018	6	0.004	3	6.319e…	4	4.647e…	4	1.74e-03	2
8		min	-0.226	2	-0.026	2	-0.096	5	-5.074…	2	1.431e…	2	-9.69e…	6
9	N5	max	0.071	6	0.018	2	0.012	2	-7.824…	3	3.435e…	3	2.144e…	2
10		min	-0.219	2	-0.01	6	-0.061	4	-8.109…	5	-1.549…	5	-9.38e…	6
11	N6	max	0.071	6	0	6	0.002	2	2.382e…	4	-4.604…	3	2.568e…	2
12		min	-0.222	2	-0.001	1	-0.079	4	-3.253…	2	-2.697…	5	-1.048…	4
13	N7	max	0.059	6	-0.013	6	-0.025	3	-3.727…	3	-1.472…	3	3.116e…	2
14		min	-0.242	2	-0.132	1	-0.249	4	-1.057…	5	-4.727…	5	-8.702…	6
15	N8	max	0.058	6	-0.009	6	-0.025	3	-3.711…	3	-1.475…	3	3.116e…	2
16		min	-0.244	2	-0.146	1	-0.271	4	-1.057…	5	-4.728…	5	-8.696…	6
17	N9	max	0.132	6	0	2	0.031	5	1.029e…	5	7.973e…	4	1.845e…	2
18		min	-0.271	2	-0.003	4	-0.002	3	1.105e…	3	6.699e…	2	-3.092…	4
19	N10	max	0.096	6	0	3	0.012	5	4.292e…	4	-4.614…	3	2.844e…	2
20		min	-0.289	2	-0.002	4	-0.002	1	-9.347…	2	-2.696…	5	-1.049…	4
21	N11	max	0	5	0	2	0	2	9.631e…	5	0	4	0	5
22		min	0	2	0	6	0	5	0	2	0	2	-9.631…	2
23	N12	max	0	6	0	5	0	3	9.631e…	5	0	3	0	6
24		min	0	2	0	1	0	5	0	3	0	5	-9.631…	2
25	N13	max	0	6	0	2	0	3	0	3	0	4	0	2
26		min	0	1	0	6	0	5	0	5	0	2	0	6
27	N14	max	0	4	0	6	0	2	0	2	0	3	0	2
28		min	0	2	0	1	0	4	0	4	0	5	0	4
29	N15	max	-0.024	6	0.035	2	-0.071	3	1.002e…	5	1.447e…	4	3.802e…	2
30		min	-0.169	2	-0.176	6	-0.72	4	-3.31e…	3	1.345e…	3	-3.752…	4
31	N16	max	-0.019	6	0.033	2	-0.063	2	1.002e…	5	1.447e…	4	3.807e…	2

Node Displacements (Continued)

	Node…		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota…	LC	Y Rota…	LC	Z Rota…	LC
32		min	-0.166	2	-0.163	6	-0.65	4	-3.309…	3	1.345e…	3	-3.751…	4
33	N17	max	0.02	6	0	2	-0.002	3	-3.421…	3	9.067e…	4	3.344e…	2
34		min	-0.152	2	-0.002	6	-0.218	4	-5.087…	4	3.134e…	2	-1.741…	6
35	N18	max	0.028	6	0.018	6	0.005	3	6.542e…	4	5.067e…	4	1.47e-03	2
36		min	-0.15	2	-0.026	2	-0.112	5	-5.695…	2	3.187e…	2	-9.902…	6
37	N19	max	0.03	4	0.018	2	0.023	2	9.805e…	4	1.256e…	3	1.573e…	2
38		min	-0.141	2	-0.01	6	-0.063	4	-4.568…	2	-1.348…	5	-1.007…	6
39	N20	max	0.028	6	0	6	0.014	2	-5.804…	3	-5.023…	3	3.413e…	2
40		min	-0.143	2	-0.001	1	-0.078	4	-1.955…	4	-1.968…	5	-9.308…	6
41	N21	max	0.018	6	-0.013	6	-0.02	3	-3.529…	6	-1.063…	3	2.86e-03	2
42		min	-0.16	2	-0.132	1	-0.222	4	-6.468…	5	-4.226…	5	-8.126…	6
43	N22	max	0.018	6	-0.009	6	-0.02	3	-3.511…	6	-1.066…	3	2.861e…	2
44		min	-0.162	2	-0.144	1	-0.242	4	-6.465…	5	-4.227…	5	-8.119…	6
45	N23	max	0.102	6	0.033	2	-0.076	3	-4.402…	3	1.238e…	4	4.171e…	2
46		min	-0.335	2	-0.163	6	-0.63	4	-4.364…	4	1.131e…	2	-2.875…	6
47	N24	max	0.097	6	0.018	6	0.005	3	5.703e…	4	4.647e…	4	1.802e…	2
48		min	-0.269	2	-0.026	2	-0.083	5	-5.075…	2	1.431e…	2	-9.691…	6
49	N25	max	0.094	6	0.018	2	-0.005	2	-7.83e…	3	3.435e…	3	2.666e…	2
50		min	-0.281	2	-0.01	6	-0.093	4	-1.485…	5	-1.549…	5	-9.387…	6
51	N26	max	0.08	6	-0.013	6	-0.026	3	-3.729…	3	-1.472…	3	3.2e-03	2
52		min	-0.318	2	-0.132	1	-0.276	4	-1.173…	5	-4.727…	5	-8.708…	6
53	N27	max	-0.191	6	0.033	2	-0.046	3	1.998e…	5	1.447e…	4	-3.178…	6
54		min	-0.341	1	-0.163	6	-1.61	4	-3.285…	3	1.345e…	3	-4.205…	1
55	N28	max	0.01	6	0.018	6	0.005	3	6.802e…	4	5.067e…	4	1.444e…	2
56		min	-0.124	2	-0.026	2	-0.124	5	-5.695…	2	3.187e…	2	-9.902…	6
57	N29	max	0.009	4	0.018	2	0.034	2	1.253e…	4	1.256e…	3	1.324e…	2
58		min	-0.109	2	-0.01	6	-0.092	4	-4.567…	2	-1.348…	5	-1.007…	6
59	N30	max	0.004	6	-0.013	6	-0.019	3	-3.108…	6	-1.063…	3	2.834e…	2
60		min	-0.109	2	-0.132	1	-0.211	4	-6.332…	2	-4.226…	5	-8.126…	6
61	N32	max	0.121	6	0	2	-0.002	2	1.029e…	5	7.973e…	4	1.844e…	2
62		min	-0.263	2	-0.003	4	-0.01	4	1.105e…	3	6.699e…	2	-3.092…	4
63	N33	max	0.092	6	0	3	-0.001	3	4.292e…	4	-4.614…	3	2.844e…	2
64		min	-0.277	2	-0.002	4	-0.006	4	-9.347…	2	-2.696…	5	-1.049…	4
65	N34	max	0	4	0	5	0	3	0	6	0	6	0	2
66		min	0	2	0	3	0	4	0	1	0	2	0	6
67	N35	max	0	4	0	5	0	3	0	6	0	4	0	2
68		min	0	2	0	3	0	4	0	1	0	2	0	4

LRFD

	Member	Shape	Code…	Loc [ft]	LC	Shear…	Loc [ft]	Dir	LC	phi*P…	phi*P…	phi*M…	phi*M…	Cb	Eqn
1	M1	L4X3X4	0.906	3.075	4	0.103	3.075	y	4	28.301	54.756	1.795	4.697	1.577	H2-1
2	M2	L4X3X4	0.552	3.075	4	0.056	3.208	y	4	28.301	54.756	1.795	4.522	1.285	H2-1
3	M3	PIPE…	0.383	0.5	2	0.080	0.5		2	30.038	50.715	3.596	3.596	3.139	H1-1b
4	M4	PIPE…	0.678	0.5	4	0.285	0.5		4	30.038	50.715	3.596	3.596	1.791	H3-6
5	M5	L2X2X4	0.179	5.068	4	0.007	10.135	z	2	2.159	30.586	0.691	1.193	1.136	H2-1
6	M6	L2X2X4	0.194	5.068	4	0.012	10.135	y	4	2.159	30.586	0.691	1.193	1.136	H2-1
7	M7	PIPE…	0.084	4.5	6	0.031	4.5		4	37.774	50.715	3.596	3.596	2.013	H1-1b
8	M8	PIPE…	0.130	4.469	2	0.032	4.469		2	35.89	50.715	3.596	3.596	2.911	H1-1b
9	M9	PIPE…	0.472	4.5	4	0.093	4.5		4	26.137	50.715	3.596	3.596	1.558	H1-1b
10	M10	PIPE…	0.156	4.5	2	0.033	4.5		2	37.774	50.715	3.596	3.596	2.032	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering	CT1132B - Gamma Sector Mount	SK-2
FJP		Aug 05, 2020 at 11:04 AM
20074.43	Member Unity Check	CT1132B_Gamma Sector_AMA.r3d

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 1 - Site Information

Site ID: CT11132B
Status: Draft
Version: 4
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 7/1/2020 11:52:45 AM
Last Modified By: Hansraj.Rana4@T-Mobile.com

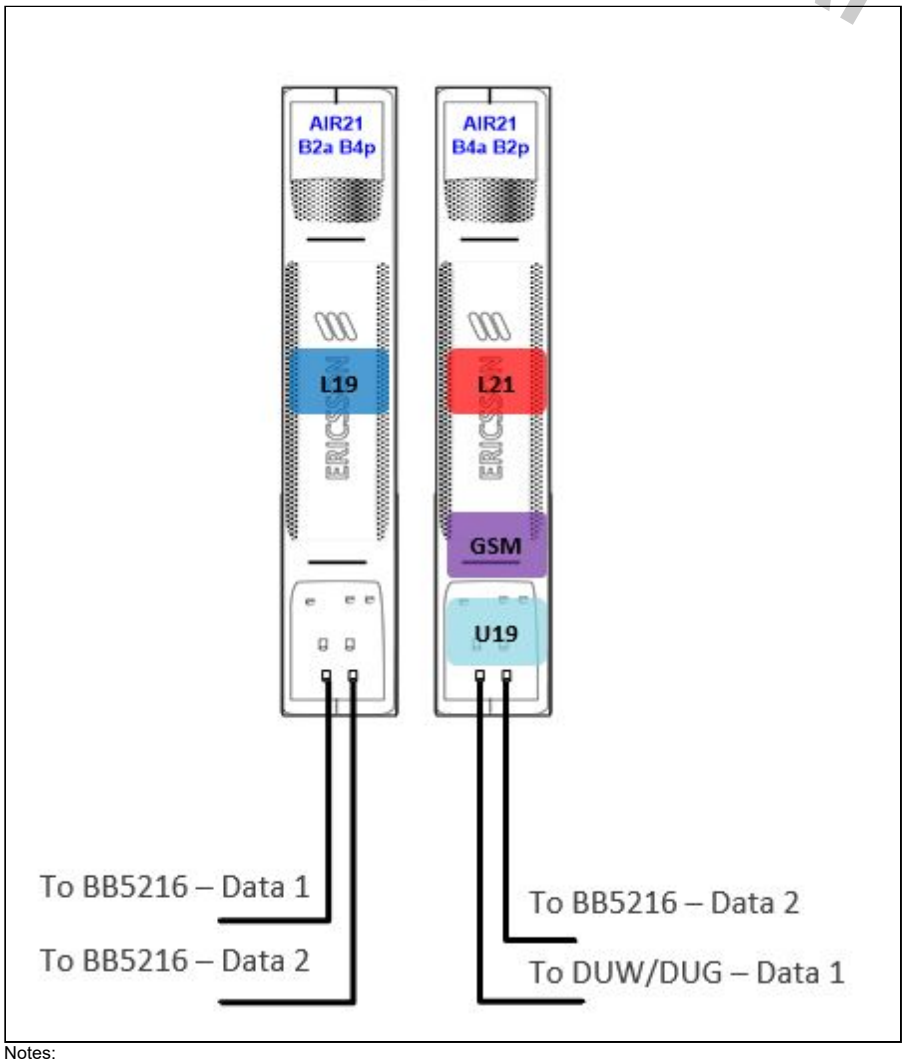
Site Name: Meriden/ Jn Rt-691& Ma_1
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: AT&T CORP

Latitude: 41.56110000
Longitude: -72.84410000
Address: 11 West Peak Dr
City, State: Meriden, CT
Region: NORTHEAST

RAN Template: 67D5A997DB Outdoor			AL Template: 67D5997DB_2xAIR+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 6	**TMA Count:** 3	**RRU Count:** 6

Section 2 - Existing Template Images

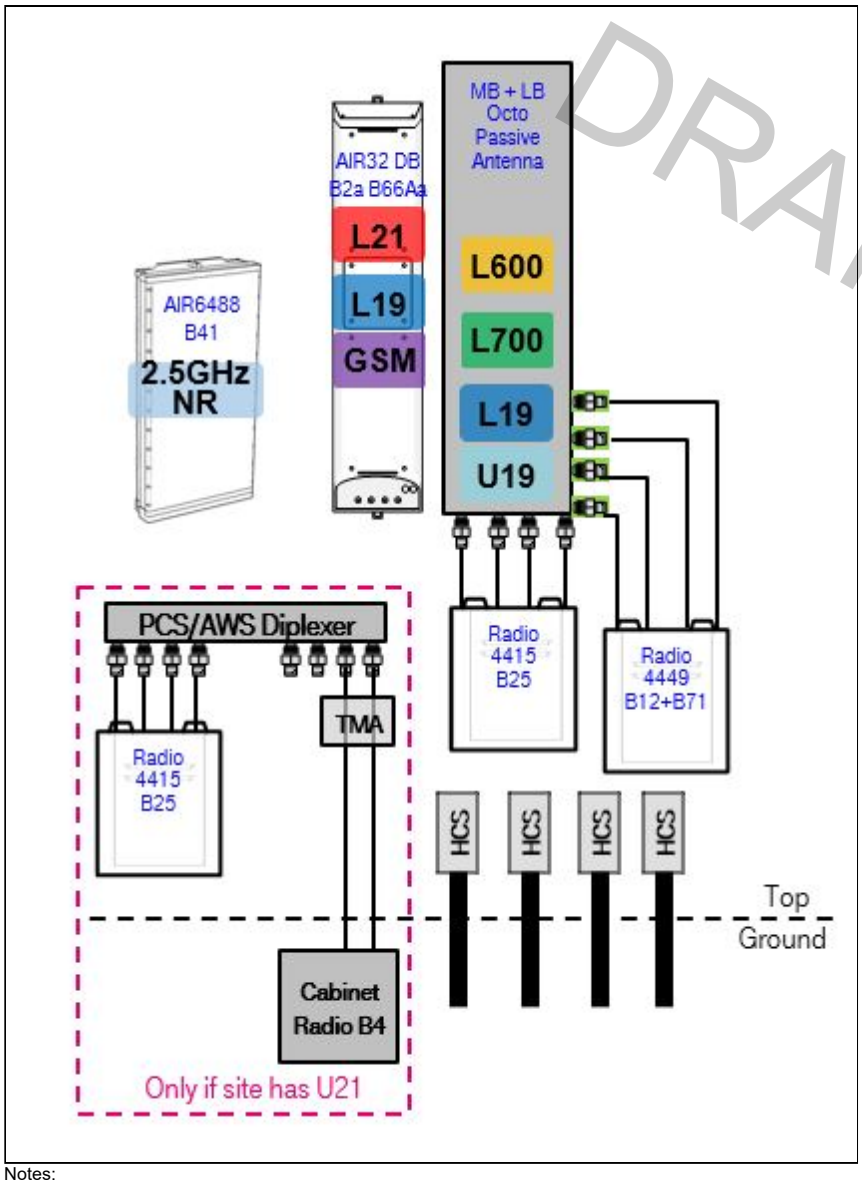
92C_2xAIR.JPG



Notes:

Section 3 - Proposed Template Images

67D5997DB_2xAIR+1OP.JPG



Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 92C Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment (Ericsson)
Baseband	DUW30 (U2100); DUW30 (U1900 (DARK)); DUG20 (G1900); BB 6630 (L1900, L2100)	
Hybrid Cable System		Ericsson 9x18 HCS *Select Length*
Radio	RU22 **(x 6)** (U2100)	

Proposed RAN Equipment

Template: 67D5A997DB Outdoor

Enclosure	1	2	3
Enclosure Type	RBS 6131	Enclosure 6160	B160
Baseband	DUW30 (U2100); DUG20 (G1900); BB 6630 (L700, L600, L1900, L2100); BB 6630 (N600)	BB 6630 (L2500); BB 6648 (N2500)	
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length* **(x 3)**	Ericsson 6x12 HCS *Select AWG & Length* **(x 3)**	
Radio	RU22 **(x 6)** (U2100)		

RAN Scope of Work:

Check AC service, and upgrade AC Service, Breakers, and PPC where necessary.

Add (1) BB6630 for N600 to Existing RBS6131 cabinet.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6630 for L2500 to new Enclosure 6160.

Add (1) BB6648 for N2500 to new Enclosure 6160.

Existing: (15) Coaxial Lines; (3) - 6x12 HCS (**Incorrect on Existing RAN / Ref Side **)

Add (3) 6X12 HCS ([1] for new AIR32 Dual Band; [1] for new Radio 4449 and Radio 4415; [1] for AIR6449). Length of new HCS will match that of existing HCS.

Keep (6) coax lines for U2100.

Remove (9) unconnected coax lines .

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 6 - A&L Equipment

Existing Template: 92C_2xAIR
Proposed Template: 67D5997DB_2xAIR+1OP (U21 Market)

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	350		350	
M. Tilt	4		4	
Height	127		127	
Ports	P1	P2	P3	P4
Active Tech.	G1900, L1900	U2100	L2100	
Dark Tech.	U1900			
Restricted Tech.				
Decomm. Tech.				
E. Tilt	7	7	7	
Cables	Fiber Jumper - 15 ft. **(x2)** 1-5/8" Coax - 170 ft. **(x4)**	1-5/8" Coax - 170 ft. **(x4)**	Fiber Jumper - 15 ft. **(x2)**	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	1		2				3			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	350		350				350			
M. Tilt	4		4				4			
Height	127		127				127			
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	L2500 N2500	L2500 N2500	L2100	L2100	G1900 L1900	L1900	L700 L600 N600	L700 L600 N600	L1900	L1900 U2100
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	7	7	7							
Cables	Fiber Jumper - 15 ft. **(x2)**		Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		Coax Jumper **(x2)** Fiber Jumper - 15 ft.	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper - 15 ft.	Coax Jumper **(x2)** 1-5/8" Coax - 170 ft. **(x2)**
TMAs										Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners									Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)
Radio							Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	SHARED Radio 4415 B25 (At Antenna)
Sector Equipment										

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Remove AIR21 B2P/B4A from Position 2.

Install (1) AIR32 B66A/B2A Dual Band for L2100, L1900 1st Carrier, and GSM in Position 2. GSM will share B2 Radios with L1900 1st Carrier.

Install (1) Low-Band/Mid-Band Octo in new Position 3.

Add (1) Radio 4449 B71+B85 for L600, L700, and N600 to Position 3 at antenna, and connect its ports to Low-Band ports of the Octo antenna.

Add (1) PCS/AWS 8:4 diplexer to Position 3 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 3 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 3 near antenna, and connect its ports to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of AWS/PCS diplexer for load balancing.

Ensure RET control is enabled for all technology layers according to the Design Documents.

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

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 2 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	110		110	
M. Tilt	4		4	
Height	127		127	
Ports	**P1**	**P2**	**P3**	**P4**
Active Tech.	G1900 L1900	U2100	L2100	
Dark Tech.	U1900			
Restricted Tech.				
Decomm. Tech.				
E. Tilt	7	7	7	
Cables	Fiber Jumper - 15 ft. **(x2)** 1-5/8" Coax - 170 ft. **(x4)**	1-5/8" Coax - 170 ft. **(x4)**	Fiber Jumper - 15 ft. **(x2)**	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro									
Antenna	**1**		**2**				**3**			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	110		110				110			
M. Tilt	4		4				4			
Height	127		127				127			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**
Active Tech.	L2500 N2500	L2500 N2500	L2100	L2100	G1900 L1900	L1900	L700 L600 N600	L700 L600 N600	L1900	L1900 U2100
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	7	7	7	7	7	7	7	7	7	7
Cables	Fiber Jumper - 15 ft. **(x2)**		Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		Coax Jumper **(x2)** Fiber Jumper - 15 ft.	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper - 15 ft.	Coax Jumper **(x2)** 1-5/8" Coax - 170 ft. **(x2)**
TMAs										Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners									Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)
Radio							Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	SHARED Radio 4415 B25 (At Antenna)
Sector Equipment										

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Remove AIR21 B2P/B4A from Position 2.

Install (1) AIR32 B66A/B2A Dual Band for L2100, L1900 1st Carrier, and GSM in Position 2. GSM will share B2 Radios with L1900 1st Carrier.

Install (1) Low-Band/Mid-Band Octo in new Position 3.

Add (1) Radio 4449 B71+B85 for L600, L700, and N600 to Position 3 at antenna, and connect its ports to Low-Band ports of the Octo antenna.

Add (1) PCS/AWS 8:4 diplexer to Position 3 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 3 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 3 near antenna, and connect its ports to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of AWS/PCS diplexer for load balancing.

Ensure RET control is enabled for all technology layers according to the Design Documents.

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

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 3 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1		2	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	230		230	
M. Tilt	4		4	
Height	127		127	
Ports	P1	P2	P3	P4
Active Tech.	G1900 L1900	U2100	L2100	
Dark Tech.	U1900			
Restricted Tech.				
Decomm. Tech.				
E. Tilt	7	7	7	
Cables	Fiber Jumper - 15 ft. **(x2)** 1-5/8" Coax - 170 ft. **(x4)**	1-5/8" Coax - 170 ft. **(x4)**	Fiber Jumper - 15 ft. **(x2)**	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)		
Diplexers / Combiners				
Radio				
Sector Equipment				

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Sector 3 (Proposed) view from behind										
Coverage Type	A - Outdoor Macro									
Antenna	1		2				3			
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	230		230				230			
M. Tilt	4		4				4			
Height	127		127				127			
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Active Tech.	L2500 N2500	L2500 N2500	L2100	L2100	G1900 L1900	L1900	L700 L600 N600	L700 L600 N600	L1900	L1900 U2100
Dark Tech.										
Restricted Tech.										
Decomm. Tech.										
E. Tilt	7	7	7	7	7	7	7	7	7	7
Cables	Fiber Jumper - 15 ft. **(x2)**		Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		Coax Jumper **(x2)** Fiber Jumper - 15 ft.	Coax Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper - 15 ft.	Coax Jumper **(x2)** 1-5/8" Coax - 170 ft. **(x2)**
TMAs										Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners									Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)
Radio							Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B25 (At Antenna)	SHARED Radio 4415 B25 (At Antenna)
Sector Equipment										

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Remove AIR21 B2P/B4A from Position 2.

Install (1) AIR32 B66A/B2A Dual Band for L2100, L1900 1st Carrier, and GSM in Position 2. GSM will share B2 Radios with L1900 1st Carrier.

Install (1) Low-Band/Mid-Band Octo in new Position 3.

Add (1) Radio 4449 B71+B85 for L600, L700, and N600 to Position 3 at antenna, and connect its ports to Low-Band ports of the Octo antenna.

Add (1) PCS/AWS 8:4 diplexer to Position 3 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 3 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 3 near antenna, and connect its ports to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of AWS/PCS diplexer for load balancing.

Ensure RET control is enabled for all technology layers according to the Design Documents.

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

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11132B_Anchor_4_draft

Print Name: Standard (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L1900 Capacity_Regional Capacity

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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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: CT11132B

Meriden/ Jn Rt-691& Ma_1
11 West Peak Drive
Meriden, Connecticut 06037

November 10, 2020

EBI Project Number: 6220005800

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**89.61%**

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

November 10, 2020

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

Emissions Analysis for Site: CT11132B - Meriden/ Jn Rt-691& Ma_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **11 West Peak Drive** in **Meriden, 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.

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

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 11 West Peak Drive in Meriden, 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 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) 4 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 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 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.

8) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

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

10) 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.

11) 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.

12) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 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.

13) The antenna mounting height centerline of the proposed antennas is 127 feet above ground level (AGL).

14) 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.

15) 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:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	127 feet	Height (AGL):	127 feet	Height (AGL):	127 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	38,477.89	ERP (W):	38,477.89	ERP (W):	38,477.89
Antenna A1 MPE %:	**8.58%**	Antenna B1 MPE %:	**8.58%**	Antenna C1 MPE %:	**8.58%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
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:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	127 feet	Height (AGL):	127 feet	Height (AGL):	127 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):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A2 MPE %:	**2.86%**	Antenna B2 MPE %:	**2.86%**	Antenna C2 MPE %:	**2.86%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	127 feet	Height (AGL):	127 feet	Height (AGL):	127 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,055.53	ERP (W):	11,055.53	ERP (W):	11,055.53
Antenna A3 MPE %:	**3.72%**	Antenna B3 MPE %:	**3.72%**	Antenna C3 MPE %:	**3.72%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	15.16%
Verizon	1.87%
PageNet	0.54%
SNET TMRS	0.31%
XM Sat Radio	0.12%
Arrow Bus	0.07%
Sprint	14.85%
Field Measurements	56.5%
Clearwire	0.19%
Site Total MPE % :	89.61%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	15.16%
T-Mobile Sector B Total:	15.16%
T-Mobile Sector C Total:	15.16%
Site Total MPE % :	89.61%

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 2500 MHz LTE	1	19238.94	127.0	42.88	2500 MHz LTE	1000	4.29%
T-Mobile 2500 MHz NR	1	19238.94	127.0	42.88	2500 MHz NR	1000	4.29%
T-Mobile 1900 MHz GSM	4	1028.30	127.0	9.17	1900 MHz GSM	1000	0.92%
T-Mobile 1900 MHz LTE	2	2056.61	127.0	9.17	1900 MHz LTE	1000	0.92%
T-Mobile 2100 MHz LTE	2	2307.55	127.0	10.29	2100 MHz LTE	1000	1.03%
T-Mobile 600 MHz LTE	2	591.73	127.0	2.64	600 MHz LTE	400	0.66%
T-Mobile 600 MHz NR	1	1577.94	127.0	3.52	600 MHz NR	400	0.88%
T-Mobile 700 MHz LTE	2	648.82	127.0	2.89	700 MHz LTE	467	0.62%
T-Mobile 1900 MHz LTE	2	2203.69	127.0	9.82	1900 MHz LTE	1000	0.98%
T-Mobile 2100 MHz UMTS	2	1294.56	127.0	5.77	2100 MHz UMTS	1000	0.58%
						Total:	**15.16%**

• 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:	15.16%
Sector B:	15.16%
Sector C:	15.16%
T-Mobile Maximum MPE % (Sector A):	15.16%
Site Total:	89.61%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **89.61%** 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.