10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 2, 2021

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

RE: Notice of Exempt Modification
119 Empire Ave., Meriden, CT 06450
Latitude: 41.57320000
Longitude: -72.779200000
T-Mobile Site#: CT11603E – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 115-foot level of the existing monopole/water tank at 119 Empire Ave., Meriden, CT. The 115-foot monopole/water tank is on property owned by 119 Empire Avenue LLC. The monopole is owned and operated by American Tower Corporation. T-Mobile now intends to replace all nine (9) existing antennas with nine (9) new 600/700/1900/2100/2500 MHz antennas. The new antennas will support 5G services and will be installed at the same 115-foot level of the tower.

Planned Modifications:
Tower:
Remove
(6) 1-5/8" coax
(1) 1-5/8" hybrid

Remove and Replace:
(3) Ericsson AIR 21 for (3) Ericsson AIR 6449 2500 MHz antennas
(3) Ericsson AIR 21 for (3) RFS APX16DWV-16DWVS 2100 MHz antennas
(3) LNX-6515DS for (3) APXVAALL24_43 600/700/1900 MHz antennas
(3) RRUS11B12 for (3) Radio 4449 RRU

Install New:
(3) Radio 4415 RRU
(3) Radio 4424 RRU
(3) SDX1926Q-43 Diplexers
(3) 1-5/8" Hybrid

Existing to Remain:
(3) TMA

(6) 1-5/8” coax

Ground:
Add: (1) B160 cabinet and (1) 6160 cabinet

This tower facility was approved by the City of Meriden, as referenced in the enclosed CSC staff report dated August 24, 2005 for a proposed Verizon installation. T-Mobile has been approved for subsequent exempt modifications. The proposed modification complies with previous approvals.

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, and Paul Dickson, Director of Planning, Development, and Enforcement for the City of Meriden, as well as the tower and property owners.

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 – City of Meriden
Paul Dickson– Director of Planning, Development, and Enforcement – City of Meriden
American Tower Corporation – Tower Owner
119 Empire Avenue LLC – 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.

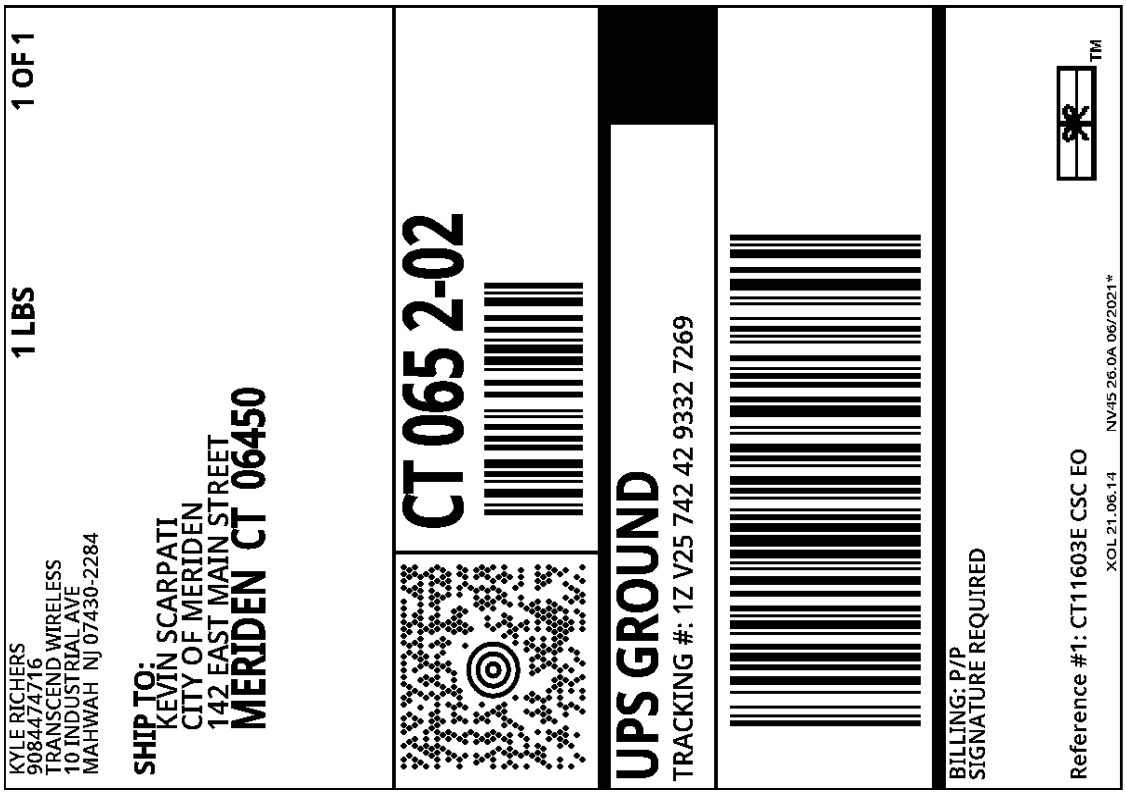
   Customers without a scheduled Pickup
   - Schedule a Pickup on ups.com to have a UPS driver pickup all of your packages.
   - Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. To find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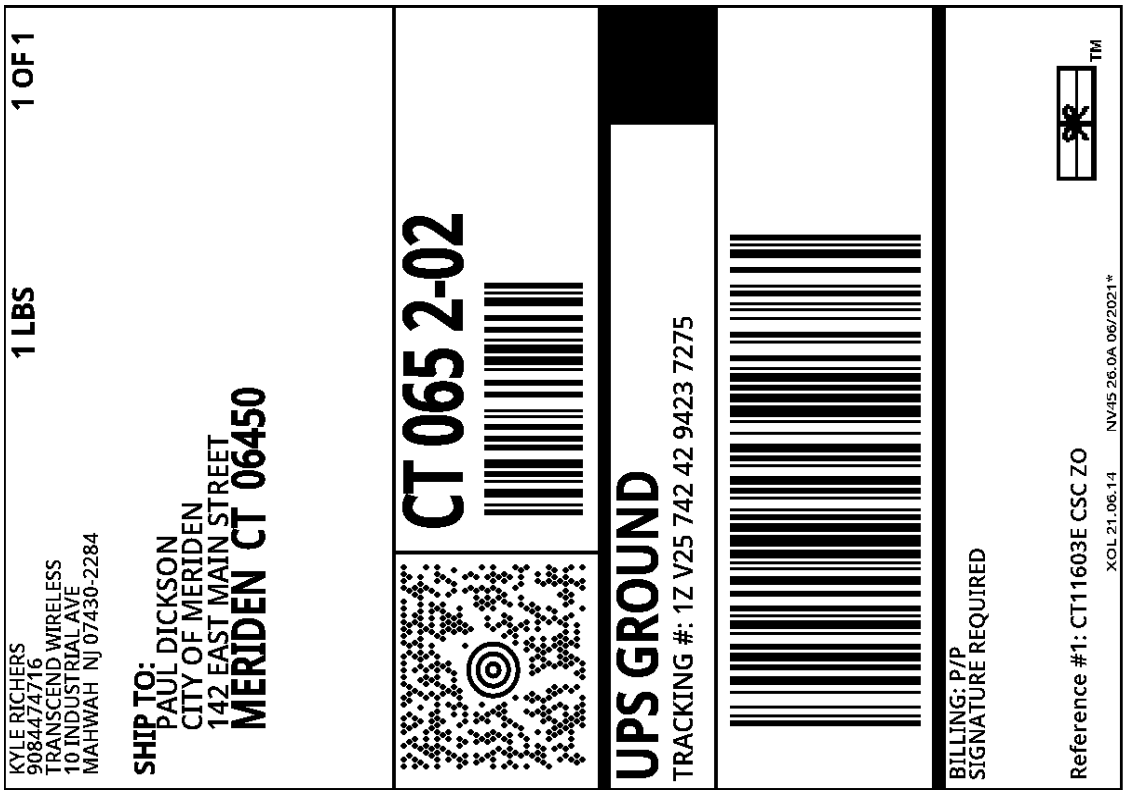

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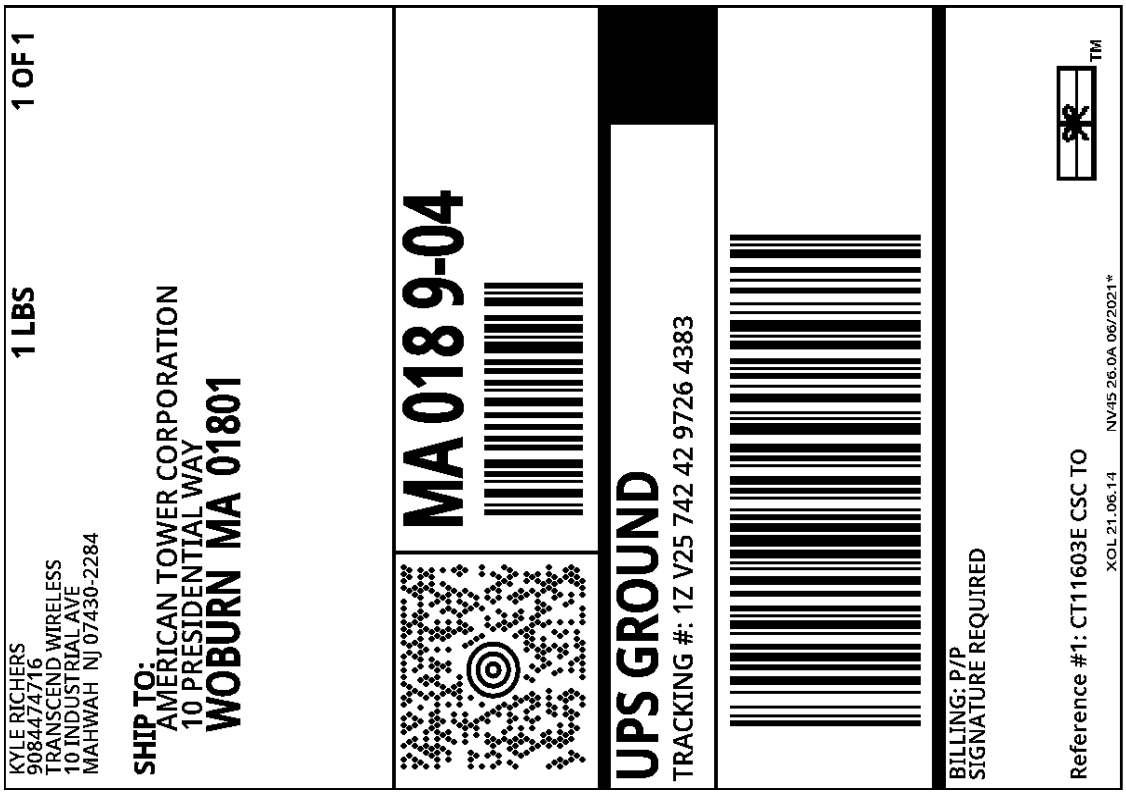

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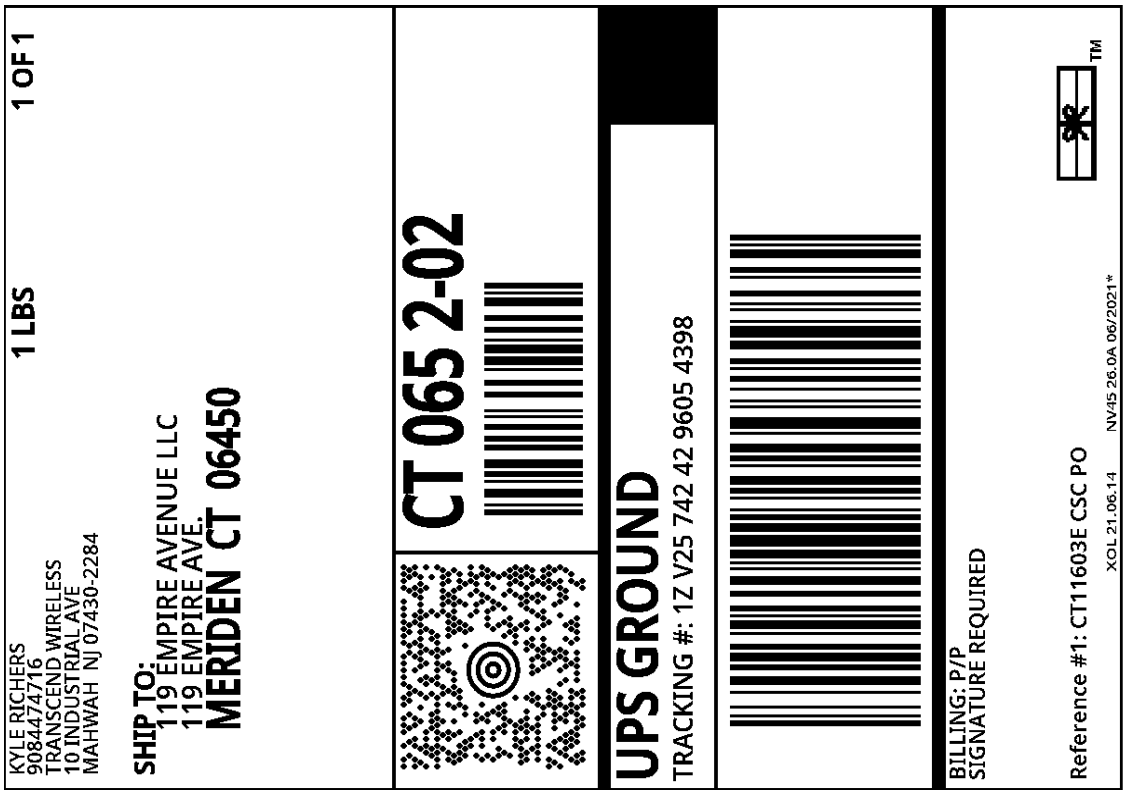

Print Card

CITY OF MERIDEN
GIS Services

PROPERTY INFORMATION

Location: **119 EMPIRE AVE** Map/Lot: 0417-0154-0007-0000

OWNER INFORMATION

Owner(s):
119 EMPIRE AVENUE LLC

Owner Address:
119 EMPIRE AVE
MERIDEN, CT 06450

BUILDING INFORMATION

Card Number: 1

OVERVIEW	
Building ID	7429
Finished Area	160,720
Comm/Rental Units	1
Living Units	0
Building Type	Ind Mfg (L)
Year Built	1976
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	
Roof Structure	
Roof Cover	
Quality	C
Heat Fuel	Oil
Heat Type	Steam w/Boil

Print Card

Foundation

Sub Area Summary

Building ID	Description	Total Area	Fin. Area	Perimeter
7429	1st FLOOR	38,400	38,400	880
7429	1st FLOOR	12,000	12,000	520
7429	1st FLOOR	63,200	63,200	1,120
7429	1st FLOOR	40,560	40,560	972
7429	1st FLOOR	1,120	1,120	136
7429	1st FLOOR	400	400	80
7429	1st FLOOR	480	480	88
7429	1st FLOOR	4,560	4,560	272
7429	CANOPY	10,266	0	734
7429	LOAD DOCK	10,266	0	734

Special Features

BuildingID	Description	Quantity	Area	Length	Width	YearBuilt	Quality
7429	PAVING-ASPT	1	50,000			1976	Average
7429	SHED	1	312			1976	Average
7429	FENCE 10	1	3,700			1976	Average

APPRAISAL INFORMATION

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

Grand List Year: 2020

Land Appraised	Building Appraised	Yard Appraised	Total Appraised Value	Land Assessed	Building Assessed	Yard Assessed	Special Land Value	A
$713,800	$1,856,400	$129,800	$2,700,000	$499,660	$1,299,480	$90,860	$0	$

Previous Year: 2019

Land Appraised	Building Appraised	Yard Appraised	Appraised Value	Land Assesed	Building Assessed	Yard Assessed	Assessed Value
$713,800	$1,856,400	$129,800	$2,700,000	$499,660	$1,299,480	$90,860	**$1,890,000**

LAND INFORMATION

Print Card

*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
4/8/2016	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/8/2016	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/8/2016	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/8/2016	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
4/2/2015	$1,200,000	4985	258	ATLAS CONTAINER LLC,	119 EMPIRE AVE LLC	Warranty Deed
10/19/2001	$2,450,000	2756	182	WEYERHAEUSER COMPANY		
12/2/1995	$0	2142	136			

ASSESSOR'S PERMIT HISTORY

ADVISORY: Residents should not use Assessor Field Cards on the City of Meriden's GIS website to determine the status of building permits. Field cards on GIS do not list building permit status. The building department is the ONLY place where citizens can determine whether a building permit is open or not. For a record of all permits and their status, homeowners and title searchers who need to check permits when selling a home are welcome to contact the Building Department at 203-630-4091.

Date	Permit#	Description	Permit Type	Cost
11/28/2001	3843	2000AMP SERV BACKFEED	CA	$92,000

Print Card

11/15/2002	3802	INSTALL PC ANTENNAS ON WA	CA	$70,000
4/16/2003	1140	ALSO INSTALL 200 AMP SERV	CA	$5,000
4/16/2003	1140	INSTALL 400 AMP SERV	CA	$5,000
7/25/2003	2591	AT&T COMMUN TOWER	CA	$122,000
9/9/2003	3154	WIRE CELLULAR EQUIP	CA	$6,000
5/13/2005	1626	ANTENNAS ON EX WATER TANK	CA	$51,000
5/13/2005	1626	INSTALL PRE FAB SHELTER,A	CA	$51,000
5/24/2005	1786	INSTALL POWER & GROUNDING	CA	$6,000
5/24/2005	1786	PREWIRED NEXTEL COMM SHEL	CA	$6,000
11/30/2005	4507	T-MOBILE MOUNTED EQUIP	CA	$225,000
11/30/2005	4507	INSTALL VERIZON 12X30 PRE	CA	$225,000
11/30/2005	4507	128' MONOPOLE FOR WIRELES	CA	$225,000
3/9/2006	734	1VERIZON, 1TMOBILE SERV	CA	$28,000
3/9/2006	741		CA	$28,000
3/9/2006	734		CA	$28,000
3/9/2006	734	NEW AMP SERV ,1PH WIRE	CA	$28,000
3/9/2006	734	1VERIZON,1T MOBILE SERV	CA	$28,000
7/18/2006	2672		CA	$5,000
5/29/2009	1586	SWAP EXISTING ANTENNAS ON EXISTING TOWER, ADD ONE TELE CABINET		
9/23/2009	2822	REROOF BLDG W/ RUBBER ROOF		
3/3/2010	504	SPRINT-MODIFICATIONS TO EXISTING TELECOMMUNICATIONS SITE PER PLANS AND TO CODE(REQUIRES SEPARATE ELECTRICAL PERMIT)		$20,000
		VERIZON REMOVAL OF EXISTING ANTENNAE		

Print Card

		MATCH EXISTING)		
6/12/2012	1847	AT&T REMOVE AND REPLACE 9 EXISTING ANTENNAS INSTALL 6 REMOTE RED HEADS AND INSTALL 1 3" CONDUIT TO HOUSE FIBER AND DC POWER ALL TO CODE	C	$25,000
3/8/2013	611	SPRINT - MODIF. OF TELECOMM. INST. ON WATER TANK, REPL. 3 ANTS. & CABLES AND ADD RRH`S AND NOTCH FILTERS BEHIND ANTS. ON WATER TANK, ADD CIENA EQUIP. ENCL. & FIBER JUNC. BOX & EITHER RETROFIT OR REPL. BTS CABINET WITHIN SPRINT`S EXISTING EQUIP. SHELTER		$30,000
7/26/2013	2377	CELL TOWER		$12,500
1/26/2015	E-14-154	CELL TOWER/RUN DC CIRCUITS TO INVERTERS/RADIO HEADS ON CABINETS.		$3,000
3/24/2015	B-15-71	NEW ANTENNA W/NEW MASTS/RELOCATE EXISTING TMA		$20,000
7/23/2015	E-15-322	FIT-OUT LOGAN STEEL.INSTALL NEW LIGHTING AT WAREHOUSE AND OFFICE/WIRE NEW MACHINE TO EXISTING BUSDUCT.		$83,800
11/23/2015	B-15-965	NEW ANTENNAE ON NEW PIPE MOUNTS.Approved by Bldg Dept.		$20,000
1/20/2016	P-16-16	GAS PIPING TO CONNECT OWNER SUPPLIED RADIANT HEAT PANELS.Approved by Bldg Dept.		$10,000
12/21/2016	B-16-1235	REPLACING ANTENNAE PANELS/ADDING REMOTE RADIO HEADS TO CELL TOWER.		$15,000

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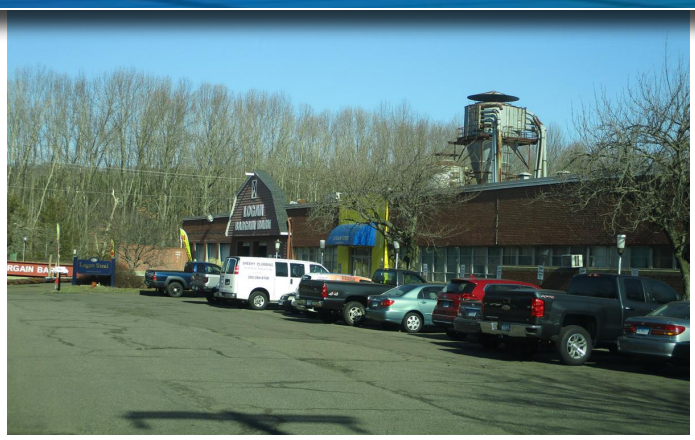

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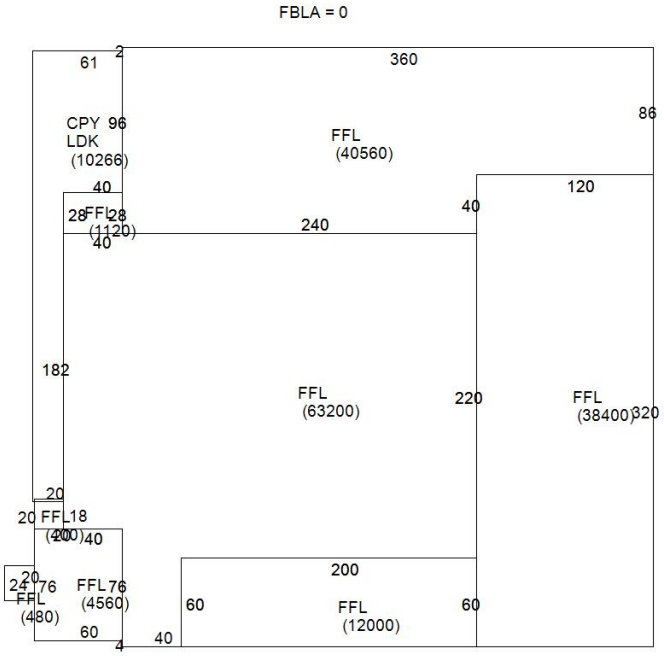
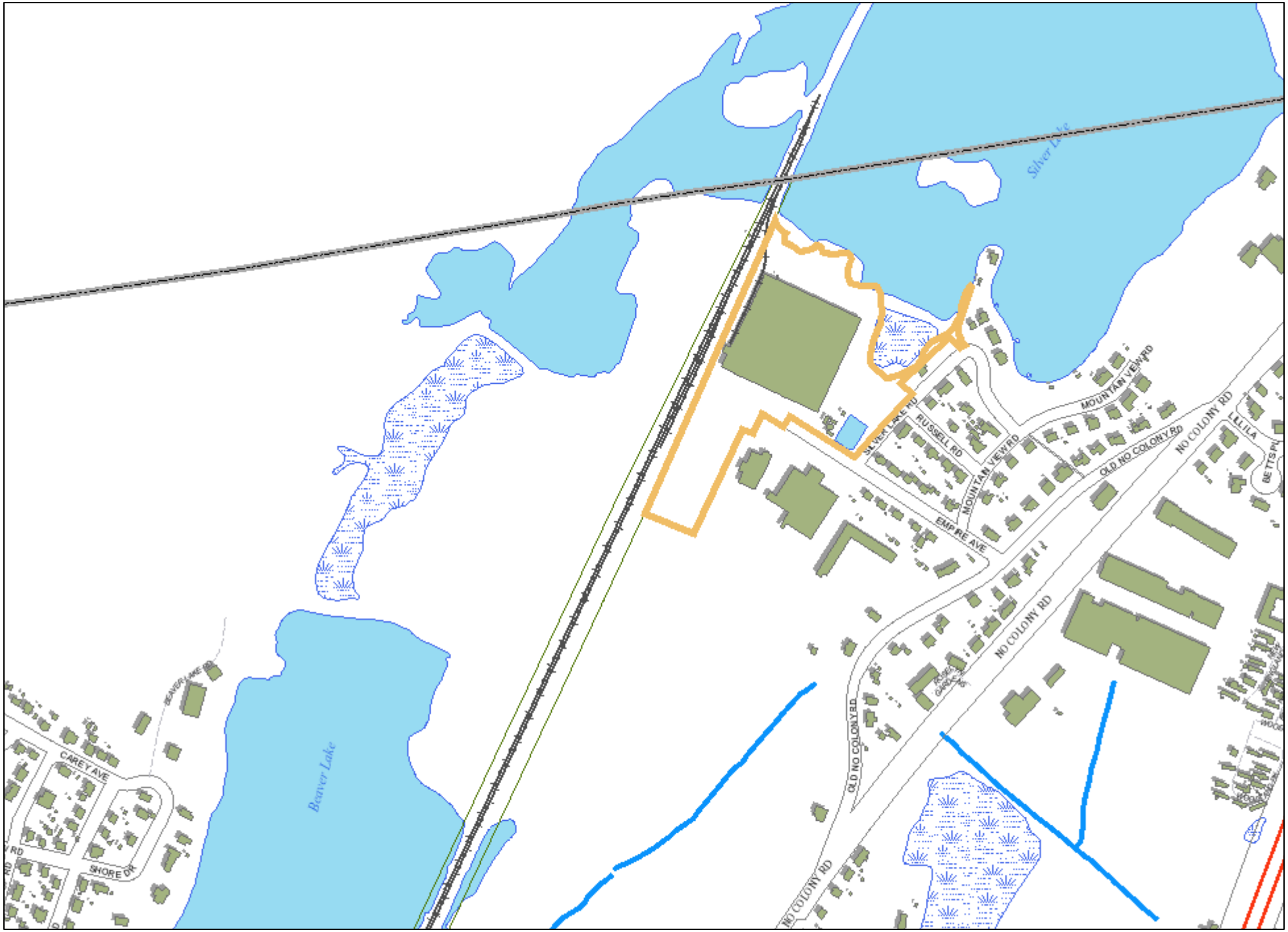


7431
0417-0154-0007-0000
1



CITY OF MERIDEN

Date: 7/2/2021

CITY OF MERIDEN, CT GIS

119 EMPIRE AVE

1 inch = 500 feet

Filing Guides
Meetings & Minutes
Public Participation
Audio Link to New Britain Hearing Rooms
Programs & Services
Telecommunications Database
Maps
Publications
Other Resources
Statutes & Regulations
Electric Transmission Upgrade Projects
Frequently Asked Questions

Petition Staff Reports

Printable Version

Petition No. 727
Cellco/Verizon
Meriden, Connecticut
Staff Report
August 24, 2005

Verizon seeks to add antennas to an existing water tank to which four carriers have previously attached antennas and one carrier, T-Mobile, has been granted permission to add its antennas as well. Council member Phil Ashton and staff person David Martin met with Verizon representative, Ken Baldwin, to conduct a field review of this petition.

At this site, Nextel has attached its antennas to the legs of the water tank at the 75 foot level. Cingular's antennas are attached to the body of the tank at 95 feet. AT&T's antennas are at 85 feet behind a RF transparent shroud. Sprint's antennas are at 105 feet, on top of the water tank also behind a RF transparent shroud. T-Mobile has received permission from the City of Meriden to install antennas at 115 feet.

Verizon identified this site as suitable for filling coverage gaps on the nearby Berlin Turnpike and determined that its antennas would need to be located at 125 feet. To maintain consistency with the other carriers whose antennas are behind RF transparent shrouds, Verizon proposed to erect a shroud to shield the view of its antennas. The additional wind load of this shroud, however, would overstress the structural capacity of the water tank. Verizon's solution would be to build a new monopole tower through the center of the water tank that would extend above it to allow Verizon and T-Mobile to install antennas at their respective heights. The monopole would not compromise the structural capacity of the water tank for the four carriers whose antennas were already installed.

The water tank is a significant visual presence within the small residential and industrial neighborhood in which it is located. Adding 20 to 25 feet of RF transparent shroud to the top of it will increase is visibility.

During the field review Council member Ashton suggested replacing the water tank with a monopole in lieu of erecting a monopole through the existing tank. The tank is no longer used for water storage and a monopole will have less of a visual presence in the landscape. Mr. Ashton discussed this idea with the Meriden city planner who was amenable to the suggestion. Attorney Baldwin had discussions with the water tank's owner who described several practical impediments to replacing the water tank.

View of Existing Water Tank from Parking Lot of Atlas Container

Melanie Bachman,
Executive Director

Close up View of Existing Water Tank

View of Existing Tank from Empire Avenue

Content Last Modified on 8/25/2005 2:35:35 PM

Ten Franklin Square New Britain, CT 06051 / 860- 827-2935

T-Mobile

CT603/ATLAS CONTAINER WT
SITE ID: CT11603E
119 EMPIRE AVE.
MERIDEN, CT 06450

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

67D5998C_1xAIR+1QP+1OP

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)

67D5A998C_OUTDOOR

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

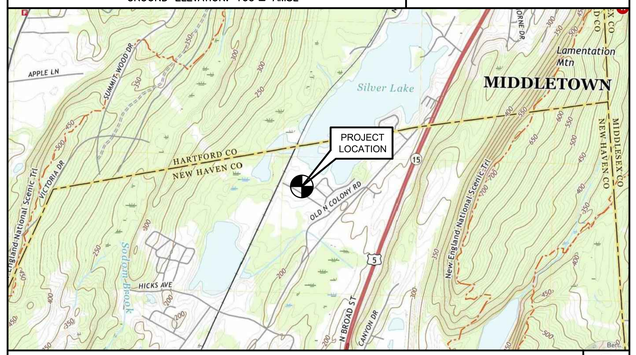
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 119 EMPIRE AVE,
MERIDEN, CT 06450

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	
2.	TURN RIGHT ONTO DAY HILL RD.	0.30 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.14 MI.
4.	STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	0.64 MI.
5.	TURN LEFT ONTO E WINTONBURY AVE/CT-178. CONTINUE TO FOLLOW CT-178.	2.72 MI.
6.	MERGE ONTO I-91 S TOWARD HARTFORD.	1.77 MI.
7.	MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN.	15.79 MI.
8.	TAKE THE CT-372 EXIT, EXIT 21, TOWARD EAST BERLIN/US-5 N/CT-15 N.	2.21 MI.
9.	KEEP RIGHT TO TAKE THE RAMP TOWARD BERLIN/HARTFORD.	0.23 MI.
10.	TURN RIGHT ONTO MILL ST/CT-372.	0.04 MI.
11.	TURN LEFT ONTO WORTHINGTON RDG/CT-372.	0.57 MI.
12.	TURN LEFT.	0.07 MI.
13.	TAKE THE US-5/CT-15 S RAMP TOWARD NEW HAVEN.	0.24 MI.
14.	TURN SLIGHT RIGHT ONTO BERLIN TURNPIKE/US-5 S/CT-15 S.	0.06 MI.
15.	TURN RIGHT ONTO N COLONY RD.	3.35 MI.
16.	TURN SLIGHT RIGHT ONTO OLD NORTH COLONY RD.	0.43 MI.
17.	TAKE THE 1ST RIGHT ONTO EMPIRE AVE.	0.20 MI.
18.	119 EMPIRE AVE, MERIDEN, CT 06450-1928, 119 EMPIRE AVE IS ON THE RIGHT.	0.17 MI.

SITE COORDINATES: LATITUDE: 41°-34'-23.52" N
LONGITUDE: 72°-46'-45.12" W
GROUND ELEVATION: 160'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP — NORTH

PROJECT SUMMARY

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

1. REMOVE EXISTING NORTEL CABINET.
7. INSTALL (1) ENCLOSURE 6160 & (1) BATTERY CABINET B160.
8. REMOVE DUW30 FOR U1900 FROM EXISTING RBS6131 CABINET.
9. INSTALL (1) BB6648 TO EXISTING RBS6131 CABINET.
6. INSTALL (1) BB6648 TO NEW ENCLOSURE 6160.
7. INSTALL (1) IXRE ROUTER & (1) PSU4813 VOLTAGE BOOSTER TO NEW ENCLOSURE 6160.
8. RETAIN (6) COAXIAL LINES FOR U2100 & INSTALL (3) 6X24 HYBRID CABLES.
9. REMOVE (9) EXISTING ANTENNA.
10. INSTALL (1) AIR6449 B41 ANTENNA PER SECTOR, TOTAL OF (3).
11. INSTALL (1) APXVAALL24_43-U-NA20 ANTENNA PER SECTOR, TOTAL OF (3).
11. INSTALL (1) APX16DWV-16DWV-S-E-A20 ANTENNA PER SECTOR, TOTAL OF (3).
12. REMOVE (3) EXISTING RADIO RRUS11 B12.
13. INSTALL (1) RADIO 4449 B71+B85 PER SECTOR, TOTAL OF (3).
17. INSTALL (1) RADIO 4415 B66 PER SECTOR, TOTAL OF (3).
18. INSTALL (1) RADIO 4424 B25 PER SECTOR, TOTAL OF (3).
18. INSTALL (1) PCS/AWS 8:4 DIPLEXER PER SECTOR, TOTAL OF (3).
19. INSTALL 100A CIRCUIT BREAKER
20. INSTALL HAND-RAIL KIT

PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS. INSTALL HAND-RAIL KIT

PROJECT INFORMATION

SITE NAME:	CT603/ATLAS CONTAINER WT
SITE ID:	CT11603E
SITE ADDRESS:	119 EMPIRE AVE, MERIDEN, CT 06450
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°-34'-23.52" N LONGITUDE: 72°-46'-45.12" W GROUND ELEVATION: 160'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/07/21	ANC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
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T-MOBILE NORTHEAST LLC

CT603/ATLAS CONTAINER WT
SITE ID: CT11603E
119 EMPIRE AVE,
MERIDEN, CT 06450

DATE: 05/20/21
SCALE: AS NOTED
JOB NO. 21022.12

TITLE SHEET

T-1

Sheet No. 1 of 8

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): 124 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 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/07/21	ANC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	06/21/21	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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T-MOBILE NORTHEAST LLC

CT603/ATLAS CONTAINER WT
SITE ID: CT11603E
119 EMPIRE AVE.
MERIDEN, CT 06450

DATE: 05/20/21
SCALE: AS NOTED
JOB NO. 21022.12

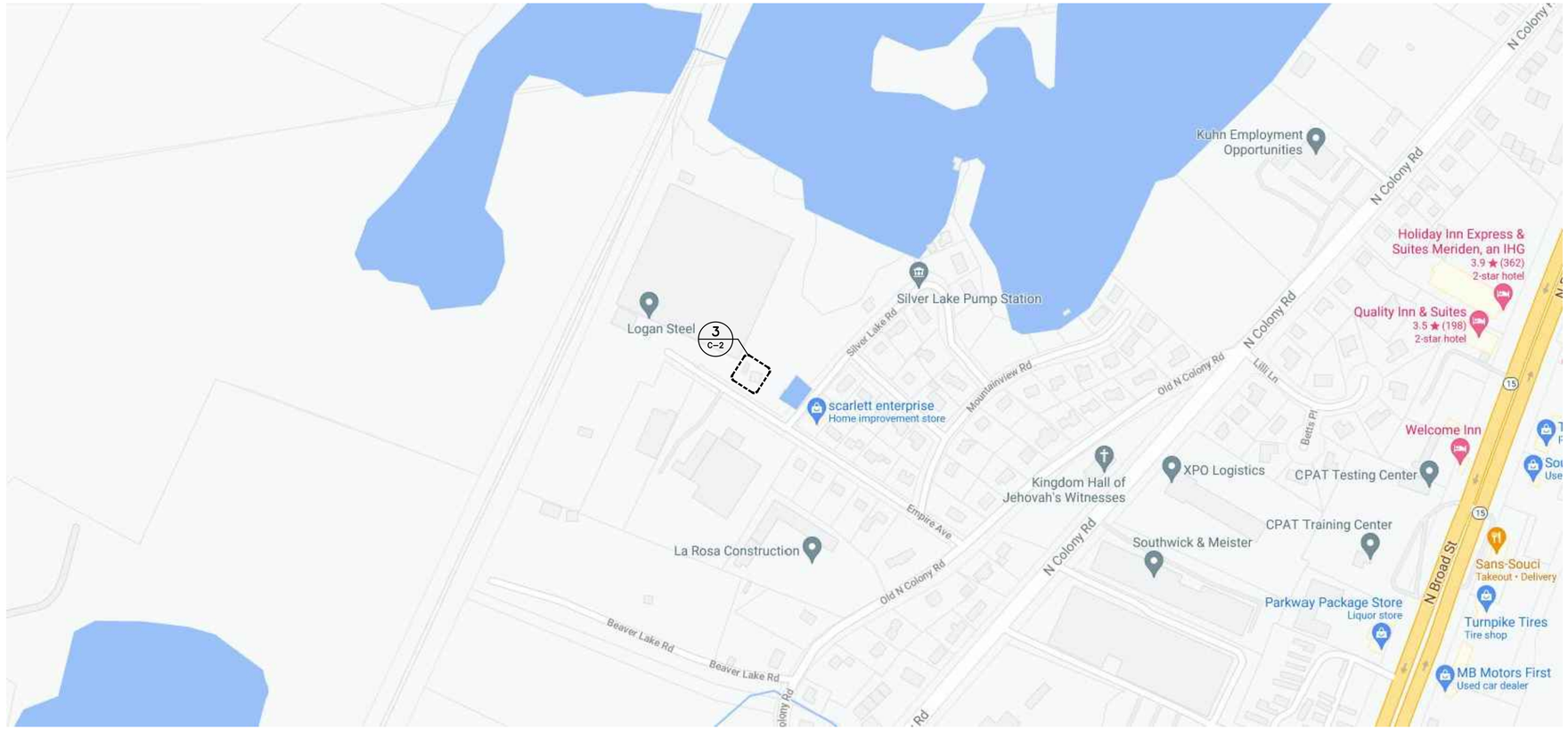
GENERAL NOTES AND SPECIFICATIONS

N-1

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

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA & DIPLEXER (QTY)	(QTY) PROPOSED COAX
A1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	115'	60°			(1) 6x24 HYBRID CABLE
A2	PROPOSED	RFS (APXVAALL24_43-U_NA20)	95.9 x 24 x 8.5	115'	60°	(P) RADIO 4449 B71+B85 (1), (P) RADIO 4424 B25 (1)	(E) GENERIC TWIN STYLE 1B (1), (P) COMMSCOPE SDX1926Q-43 (1)	
A3	EXISTING	EMPTY ANTENNA MOUNT		115'				
A4	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	115'	60°	(P) RADIO 4415 B66A (1)		
B1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	115'	180°			(1) 6x24 HYBRID CABLE
B2	PROPOSED	RFS (APXVAALL24_43-U_NA20)	95.9 x 24 x 8.5	115'	180°	(P) RADIO 4449 B71+B85 (1), (P) RADIO 4424 B25 (1)	(E) GENERIC TWIN STYLE 1B (1), (P) COMMSCOPE SDX1926Q-43 (1)	
B3	EXISTING	EMPTY ANTENNA MOUNT		115'	180°			
B4	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	115'	180°	(P) RADIO 4415 B66A (1)		
C1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	115'	290°			(1) 6x24 HYBRID CABLE
C2	PROPOSED	RFS (APXVAALL24_43-U_NA20)	95.9 x 24 x 8.5	115'	290°	(P) RADIO 4449 B71+B85 (1), (P) RADIO 4424 B25 (1)	(E) GENERIC TWIN STYLE 1B (1), (P) COMMSCOPE SDX1926Q-43 (1)	
C3	EXISTING	EMPTY ANTENNA MOUNT		115'	290°			
C4	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	115'	290°	(P) RADIO 4415 B66A (1)		



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

TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	06/07/21	ANC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	06/21/21	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

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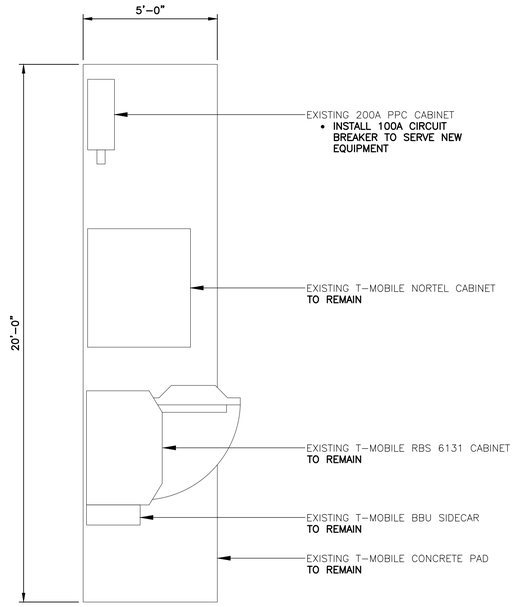
SITE LOCATION PLAN

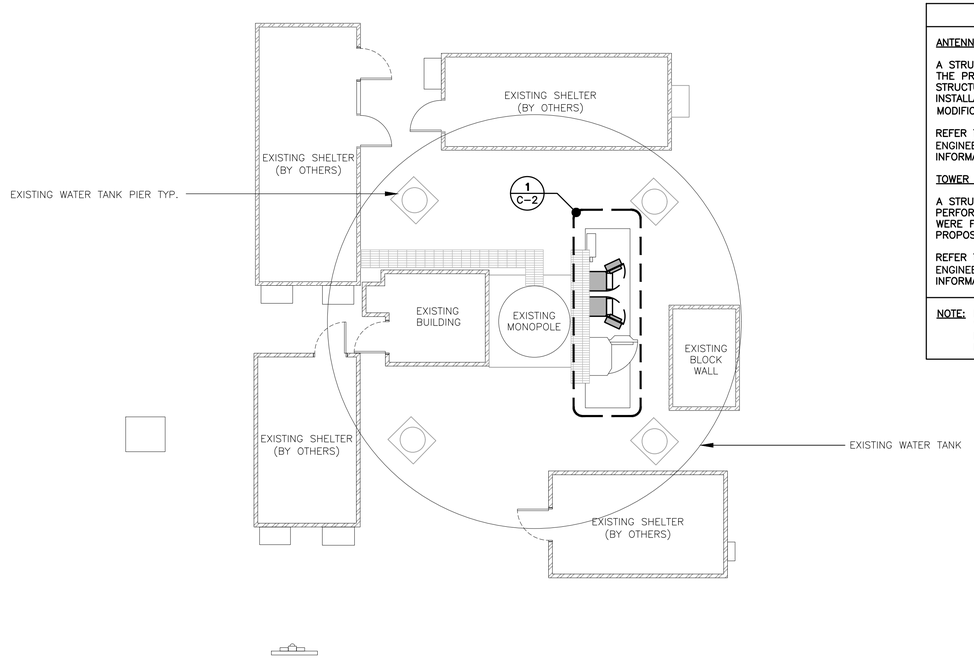
C-1

Sheet No. 3 of 8



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

TRUE NORTH



3 C-2 **PARTIAL COMPOUND PLAN - PROPOSED**
SCALE: 1/8" = 1'

TRUE NORTH

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.

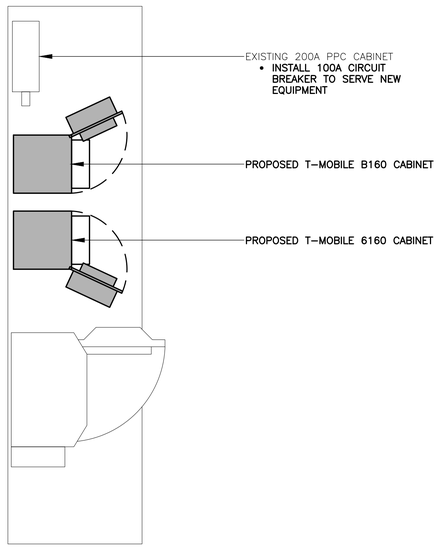
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.12) DATED 05/20/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

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

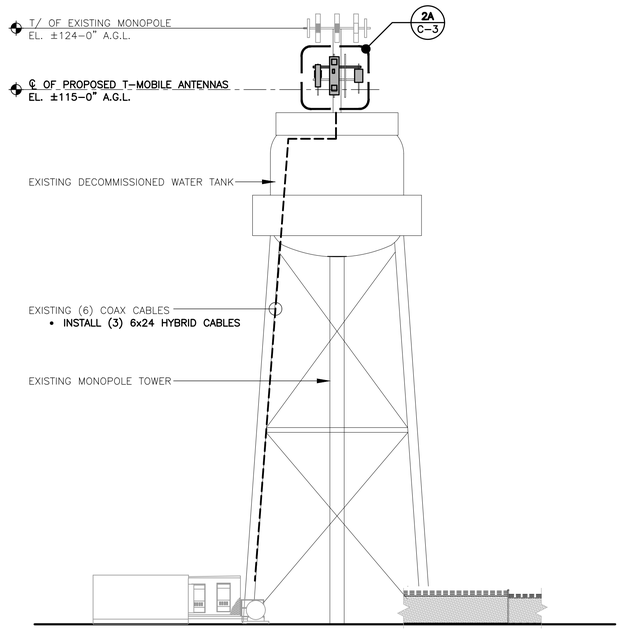
REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.12) DATED 05/20/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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



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

TRUE NORTH



4 C-2 **SOUTH ELEVATION - PROPOSED**
SCALE: 1" = 15'

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MERIDEN, CT 06450

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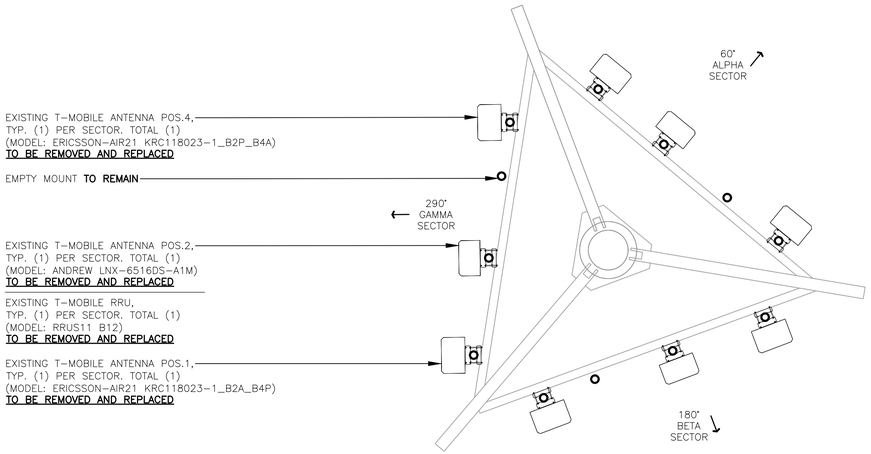
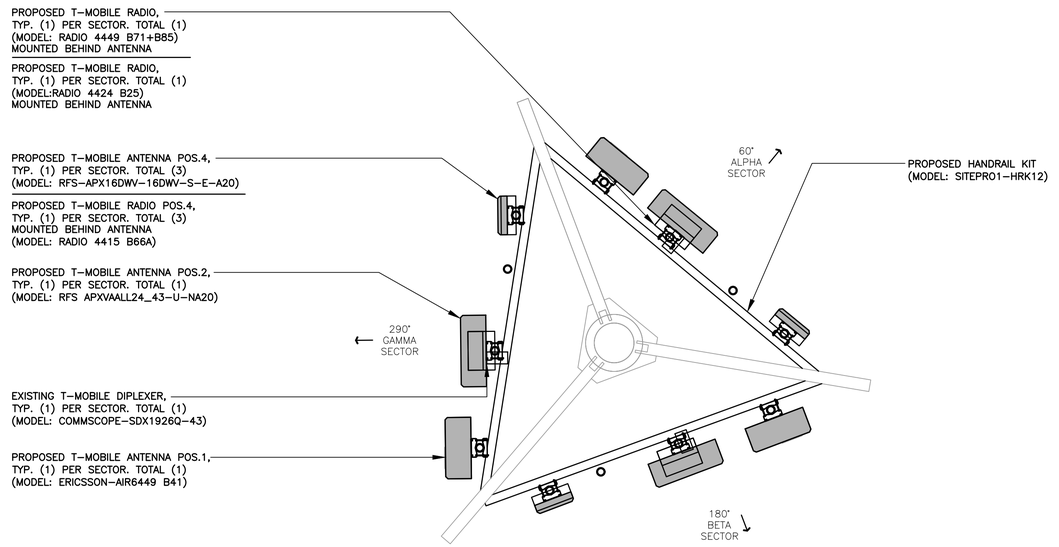
COMPOUND PLAN, EQUIPMENT PLAN, AND ELEVATION

C-2

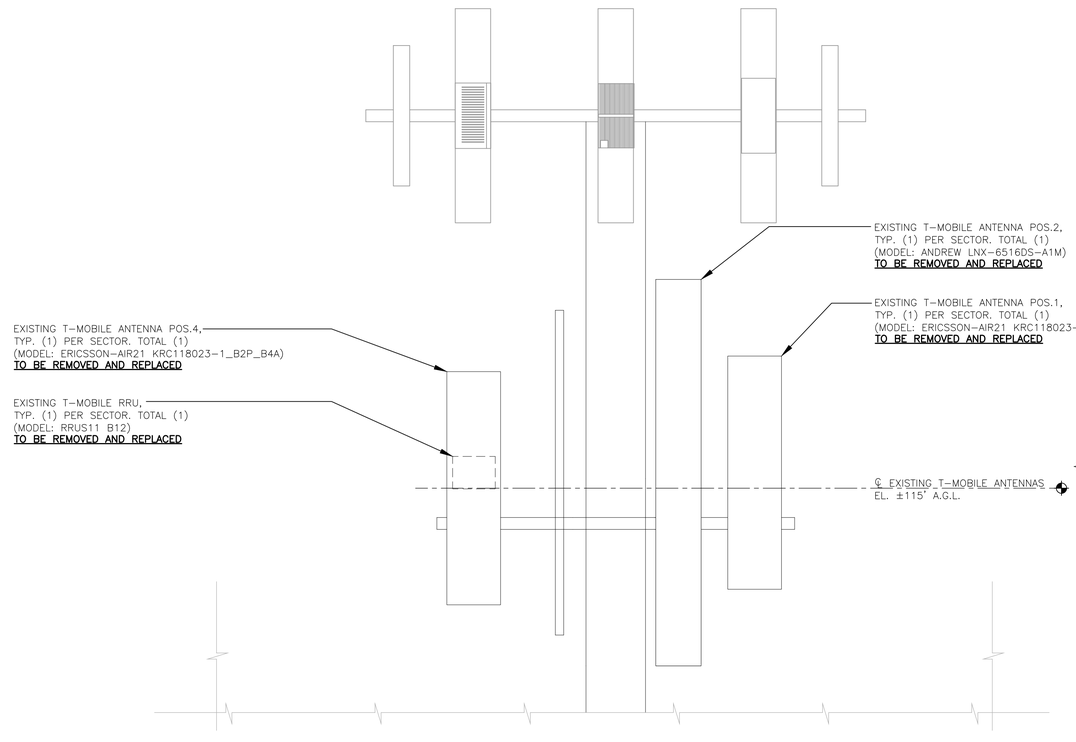
Sheet No. 4 of 8



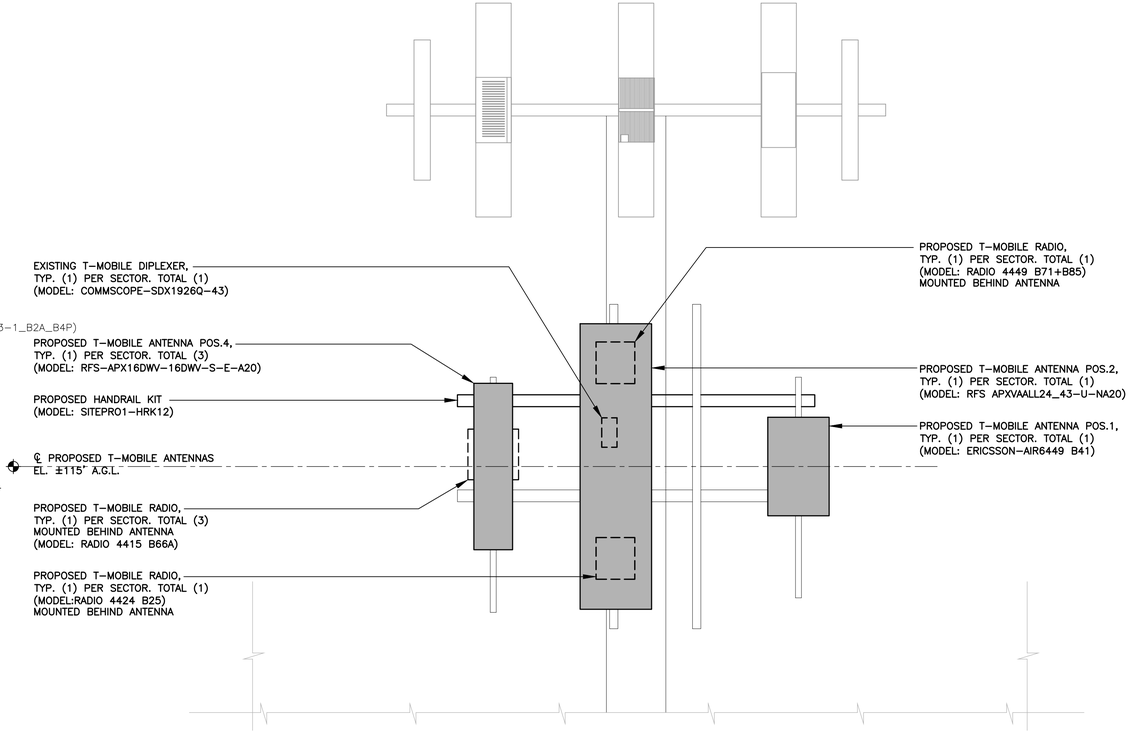
1 C-3 **ANTENNA PLAN - EXISTING**
SCALE: 1/2" = 1'
TRUE NORTH



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



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



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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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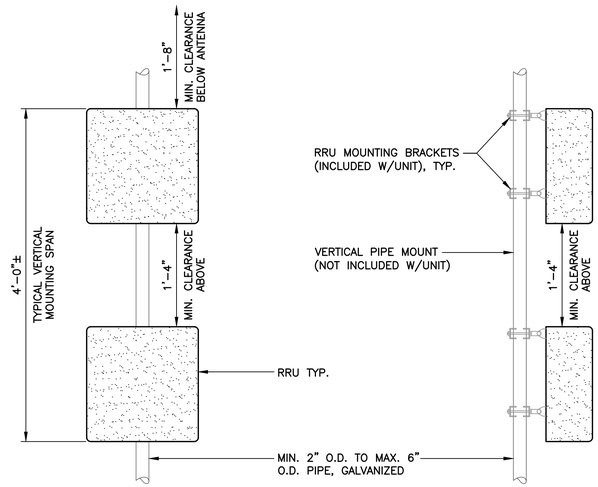
ANTENNA PLANS AND ELEVATIONS

C-3

Sheet No. 5 of 8



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–4 TYPICAL RRU MOUNTING DETAIL

SCALE: NOT TO SCALE

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

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: RFS MODEL: APXVAALL24_43–U–NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.
MAKE: RFS MODEL: APX16DWV–16DWV–S–E–A20	55.9"L x 13"W x 3.15"D	±40.7 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 C–4 PROPOSED ANTENNA DETAIL

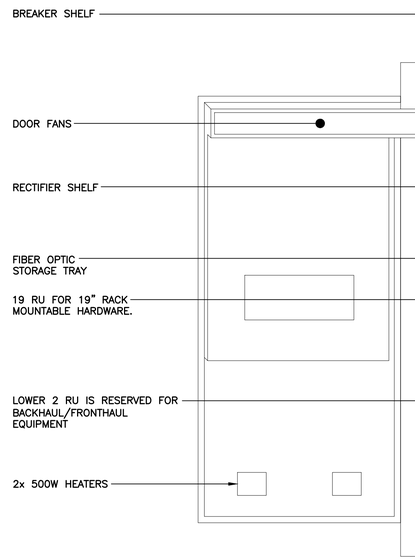
SCALE: NOT TO SCALE

RADIO 4415 B25 | RADIO 4449 B71+B85 | RADIO 4424 B25

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4415 B25	16.5"L x 13.4"W x 5.9"D	±46 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	14.9"L x 13.2"W x 5.4"D	±74 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4424 B25	16.5"L x 13.5"W x 9.6"D	±86 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–4 PROPOSED RRU DETAIL

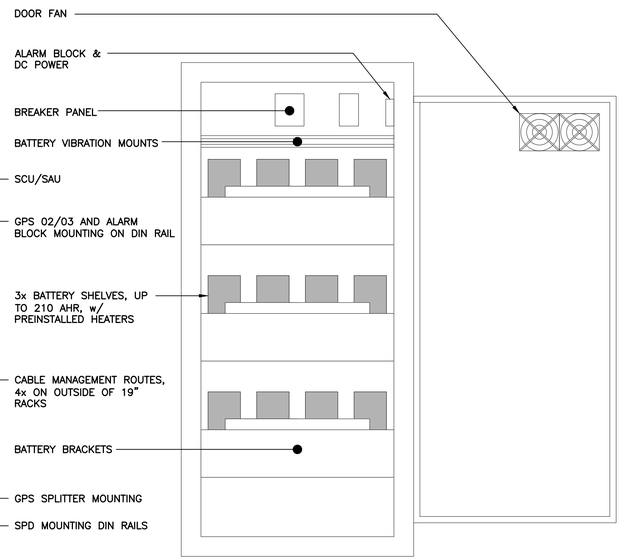
SCALE: NOT TO SCALE



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

4 C–4 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE



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

5 C–4 BATTERY B160 CABINET DETAIL

SCALE: 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.		

6 C–4 PROPOSED DIPLEXER DETAIL

SCALE: NOT TO SCALE

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TYPICAL EQUIPMENT DETAILS

C-4

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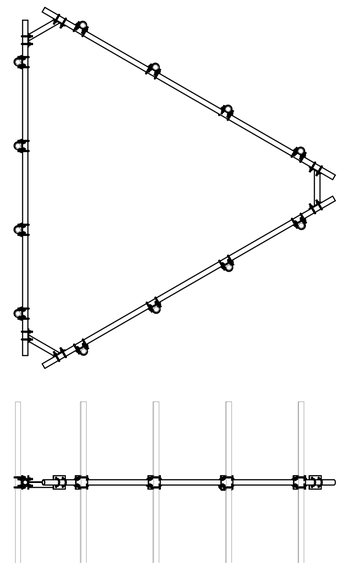

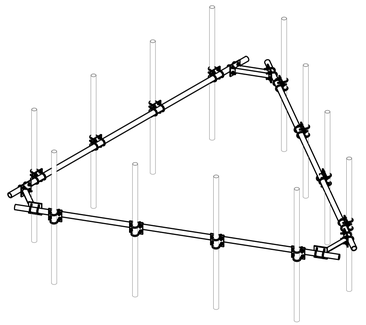

SITEPRO1-HRK12

1 / S-1 PROPOSED HAND-RAIL KIT DETAIL

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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STATE OF CONNECTICUT – TIMOTHY J. ROSS – LICENSED PROFESSIONAL ENGINEER

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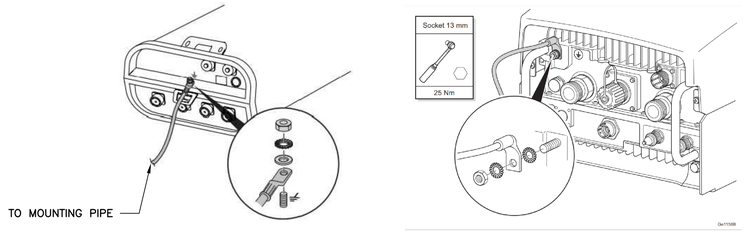
SCALE: AS NOTED

JOB NO. 21022.12

STRUCTURAL DETAILS

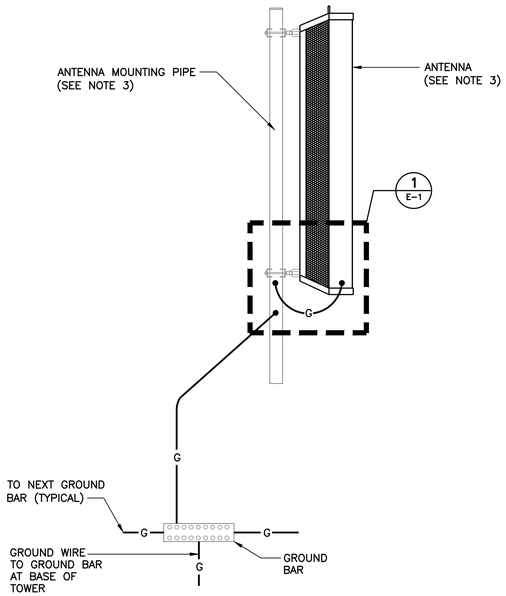
S-1

Sheet No. 7 of 8



1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE

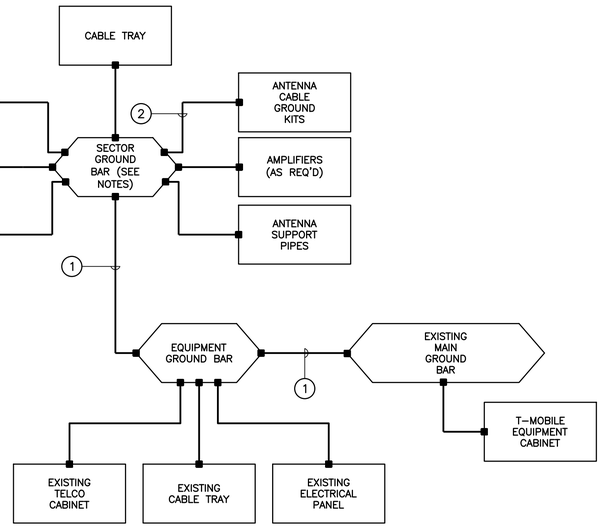


NOTES:

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



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

(2) #6 AWG

GENERAL NOTES:

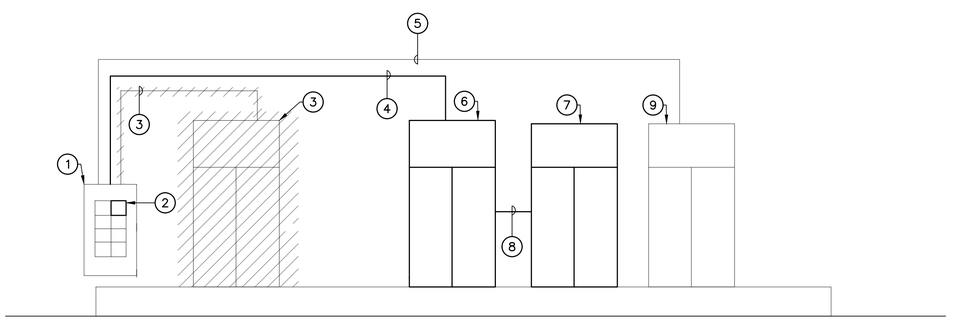
1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER 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.

3 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

(1) EXISTING 200A, PPC CABINET TO REMAIN.
(2) NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
(3) EXISTING CABINETS AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.
(4) (3) #1 AWG, (1) #8 AWG GROUND, 1-1/4" CONDUIT.
(5) EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
(6) NEW T-MOBILE EQUIPMENT CABINET
(7) NEW T-MOBILE BATTERY CABINET
(8) DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
(9) EXISTING CABINET TO REMAIN.



4 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 8 of 8

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

125-ft Existing EEI Monopole

Proposed T-Mobile
Antenna Upgrade

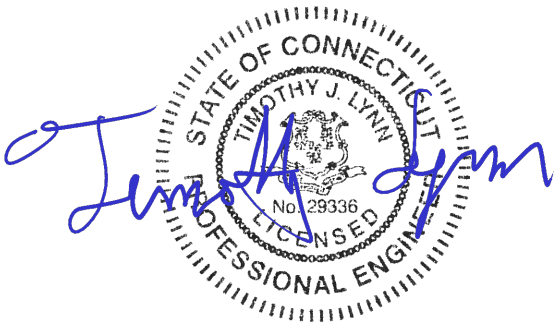
T-Mobile Site Ref: CT11603E

119 Empire Avenue
Meriden, CT

Centek Project No. 21022.12

Date: May 20, 2021

Max Stress Ratio = 60%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing monopole (tower) located in Meriden, Connecticut.

The host tower is a 125-ft tall, four-section, eighteen sided, tapered monopole, originally designed and manufactured by Engineered Endeavors Incorporated (EEI); project no. 13454 dated October 20, 2005. The tower geometry and structure member sizes were obtained from the original manufacturers design documents. Foundation information was taken from foundation analysis conducted by Gibble Norden Champion Brown Consulting Engineers Inc., project no. 05060; dated May 31, 2005.

Antenna and appurtenance information were obtained a previous structural analysis report prepared by American Tower Corporation; job no;.13000519 dated April 10, 2020 and a T-Mobile RF data sheet.

The tower is made up of four (4) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 30.0-in at the top and 70.0-in at the base.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- TOWN (EXISTING):
  Antennas: One (1) lighting rod mounted with an elevation of 125-ft above grade level.
- T-MOBILE (EXISTING TO REMAIN):
  Antennas: Three (3) TMAs mounted on a low profile platform with a RAD center elevation of 115-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables inside the monopole.
- T-MOBILE (EXISTING TO REMOVE):
  Antennas: Six (6) Ericsson AIR21 panel antennas, three (3) Andrew LNX-6515DS panel antennas and three (3) Ericsson RRUS-11 remote radio heads mounted on a low profile platform with a RAD center elevation of 115-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables and one (1) 9x18 fiber cable inside the monopole.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas, three (3) RFS APXVAALL24_43 panel antennas, three (3) Ericsson 4449 remote radio heads, three (3) Ericsson 4415 remote radio heads, three (3) Ericsson 4424 remote radio heads and three (3) diplexers mounted to the tower with a RAD center elevation of ±115-ft above grade level.
  Mount Mods: Installation of one (1) handrail kit (SitePro p/n HRK-12).
  Coax Cables: Three (3) 6x24 ∅ fiber cable running inside the monopole.

- VERIZON (PROPOSED):
  Antennas: Three (3) Antel LPA-80080-4CF panel antennas, nine (9) Andrew JAHH-65B-R3B panel antennas, three (3) JMA DX12FRO260 panel antennas, three (3) Samsung B2/B66A remote radio heads, three (3) Samsung B5/B13 remote radio heads, three (3) diplexers and two (2) RFS DB-T1-6Z-8AB-0Z main distribution boxes mounted on a 13-ft low profile platform with a RAD center elevation of 125-ft above grade level.
  Coax Cables: Two (2) 1-5/8" ∅ fiber cables running inside the monopole.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Meriden; v = 97 mph (Vasd – Risk Cat II)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 97 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 4-8 of the TIA code.

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **26.8%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L3)	26.06'-69.84'	26.8%	**PASS**

Foundation and Anchors

The existing foundation consists of a four (4) 7-ft x 4-ft x 4-ft and one (1) 7-ft x 10-ft x 10-ft concrete piers bearing on a 50.0 square x 2.5-ft thick reinforced concrete mat. The existing foundation properties were obtained from the aforementioned GNCB design report; project no. 05060; dated May 31, 2005. The base of the tower is connected to the foundation by means of (12) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 7-ft into the concrete foundation structure.

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	25 kips
	Compression	45 kips
	Moment	2172 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Pad and Pier	OTM[(2)]	1.0	6.5	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Axial and Bending	44.9%	**PASS**
Base Plate	Bending	60.0%	**PASS**

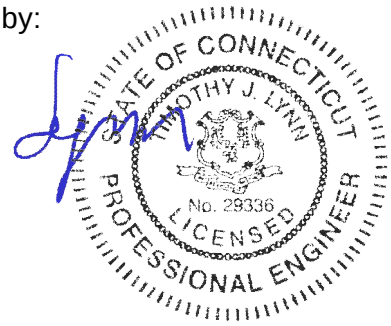
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

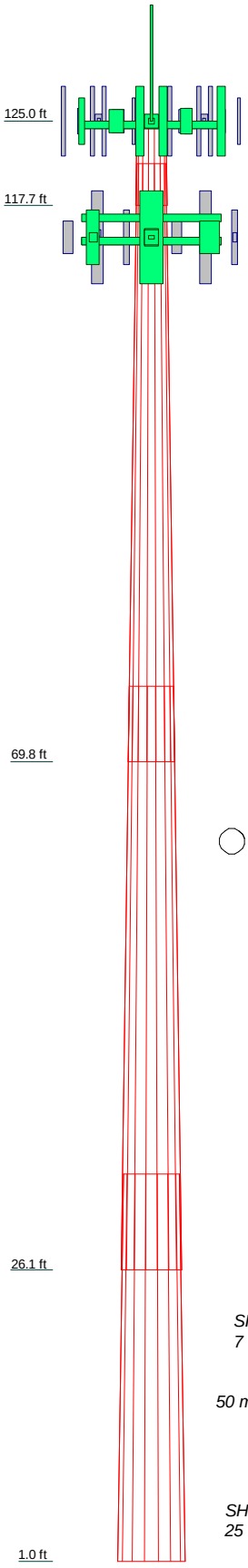
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

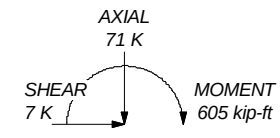
tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

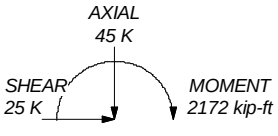
Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	7.28	18	0.2500	3.64	30.0000	32.4600	A572-65	0.6
2	51.52	18	0.3750	6.50	30.7300	47.9200		8.1
3	50.28	18	0.3750	8.25	45.0012	62.0800		10.8
4	33.31	18	0.4375		58.5277	70.0000		10.0



ALL REACTIONS ARE FACTORED



TORQUE 0 kip-ft
50 mph WIND - 0.7500 in ICE



TORQUE 0 kip-ft
REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 1"x10'	130	APXVAALL24-43 (T-Mobile)	115
LPA-80080-4CF (Verizon)	125	APX16DWV-16DWVS-E-A20 (T-Mobile)	115
DX12FRO260-20/26 (Verizon)	125	AIR6449 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	APXVAALL24-43 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	APX16DWV-16DWVS-E-A20 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	AIR6449 (T-Mobile)	115
LPA-80080-4CF (Verizon)	125	APXVAALL24-43 (T-Mobile)	115
DX12FRO260-20/26 (Verizon)	125	APX16DWV-16DWVS-E-A20 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	TMA 10"x8"x3" (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	TMA 10"x8"x3" (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	TMA 10"x8"x3" (T-Mobile)	115
LPA-80080-4CF (Verizon)	125	4449 B12,B71 (T-Mobile)	115
DX12FRO260-20/26 (Verizon)	125	4449 B12,B71 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	4449 B12,B71 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	4424 B25 (T-Mobile)	115
JAHH-65B-R3B (Verizon)	125	4424 B25 (T-Mobile)	115
B2/B66A RRH (Verizon)	125	4424 B25 (T-Mobile)	115
B2/B66A RRH (Verizon)	125	4415 B25 (T-Mobile)	115
B2/B66A RRH (Verizon)	125	4415 B25 (T-Mobile)	115
B5/B13 RRH (Verizon)	125	4415 B25 (T-Mobile)	115
B5/B13 RRH (Verizon)	125	SDX1926Q-43 (T-Mobile)	115
B5/B13 RRH (Verizon)	125	SDX1926Q-43 (T-Mobile)	115
CBC78T-DS-43 (Verizon)	125	SDX1926Q-43 (T-Mobile)	115
CBC78T-DS-43 (Verizon)	125	EEI Low Profile Platform (T-Mobile)	115
CBC78T-DS-43 (Verizon)	125	AIR6449 (T-Mobile)	115
DB-T1-6Z-8AB-0Z (Verizon)	125		
DB-T1-6Z-8AB-0Z (Verizon)	125		
EEI Low Profile Platform (Verizon)	125		
SitePro 12' Handrail Kit HRK12 (T-Mobile)	117		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 26.8%

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job:	***21022.12 - CT11603E***		
Project:	***125' EEI Monopole - 119 Empire Ave., Meriden, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/20/21	Scale: NTS	
Path: J:\Jobs\21022000.WI\12_CT11603E\05_Structural\Tower\Backup Documentation\Calcs\EIR Files\125-ft EEI Monopole.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 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.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	125.00-117.72	7.28	3.64	18	30.0000	32.4600	0.2500	1.0000	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L2	117.72-69.84	51.52	6.50	18	30.7300	47.9200	0.3750	1.5000	A572-65 (65 ksi)
L3	69.84-26.06	50.28	8.25	18	45.0012	62.0800	0.3750	1.5000	A572-65 (65 ksi)
L4	26.06-1.00	33.31		18	58.5277	70.0000	0.4375	1.7500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	30.4242	23.6066	2639.6436	10.5612	15.2400	173.2050	5282.7605	11.8056	4.8400	19.36
	32.9222	25.5586	3350.0906	11.4346	16.4897	203.1629	6704.5894	12.7817	5.2730	21.092
L2	32.3795	36.1300	4205.9718	10.7760	15.6108	269.4264	8417.4778	18.0685	4.7485	12.663
	48.6014	56.5904	16161.8174	16.8785	24.3434	663.9107	32344.9009	28.3006	7.7739	20.73
L3	47.8795	53.1164	13364.3016	15.8423	22.8606	584.5991	26746.1883	26.5632	7.2602	19.361
	62.9798	73.4444	35329.4365	21.9053	31.5366	1120.2663	70705.3603	36.7292	10.2661	27.376
L4	62.2483	80.6655	34389.9034	20.6220	29.7321	1156.6603	68825.0578	40.3404	9.5309	21.785
	71.0124	96.5962	59053.8172	24.6947	35.5600	1660.6810	118185.3388	48.3073	11.5500	26.4

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
L1 125.00-117.72				1	1	1			
L2 117.72-69.84				1	1	1			
L3 69.84-26.06				1	1	1			
L4 26.06-1.00				1	1	1			

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
1 5/8 (T-Mobile)	C	No	No	Inside Pole	115.00 - 1.00	6	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
HYBRIFLEX 1-5/8" (T-Mobile)	C	No	No	Inside Pole	115.00 - 1.00	3	No Ice	0.00	1.90
							1/2" Ice	0.00	1.90
							1" Ice	0.00	1.90
HYBRIFLEX 1-5/8" (Verizon)	C	No	No	Inside Pole	125.00 - 1.00	2	No Ice	0.00	1.90
							1/2" Ice	0.00	1.90
							1" Ice	0.00	1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	125.00-117.72	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.03
L2	117.72-69.84	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.72
L3	69.84-26.06	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.69
L4	26.06-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.39

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	125.00-117.72	A	1.709	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.03
L2	117.72-69.84	A	1.663	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.72
L3	69.84-26.06	A	1.556	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.69
L4	26.06-1.00	A	1.369	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.39

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	125.00-117.72	0.0000	0.0000	0.0000	0.0000
L2	117.72-69.84	0.0000	0.0000	0.0000	0.0000
L3	69.84-26.06	0.0000	0.0000	0.0000	0.0000
L4	26.06-1.00	0.0000	0.0000	0.0000	0.0000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 1"x10'	C	None		0.0000	130.00	No Ice	1.00	1.00	0.04
						1/2" Ice	2.02	2.02	0.05
						1" Ice	3.05	3.05	0.06
LPA-80080-4CF	A	From Face	4.00	0.0000	125.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
DX12FRO260-20/26	A	From Face	4.00	0.0000	125.00	No Ice	3.00	1.13	0.02
(Verizon)			3.00			1/2" Ice	3.22	1.29	0.03
			0.00			1" Ice	3.45	1.46	0.06
JAHH-65B-R3B	A	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			1.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
JAHH-65B-R3B	A	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			-1.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
JAHH-65B-R3B	A	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			-6.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
LPA-80080-4CF	B	From Face	4.00	0.0000	125.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
DX12FRO260-20/26	B	From Face	4.00	0.0000	125.00	No Ice	3.00	1.13	0.02
(Verizon)			3.00			1/2" Ice	3.22	1.29	0.03
			0.00			1" Ice	3.45	1.46	0.06
JAHH-65B-R3B	B	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			1.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
JAHH-65B-R3B	B	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			-1.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
JAHH-65B-R3B	B	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			-6.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
LPA-80080-4CF	C	From Face	4.00	0.0000	125.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
DX12FRO260-20/26	C	From Face	4.00	0.0000	125.00	No Ice	3.00	1.13	0.02
(Verizon)			3.00			1/2" Ice	3.22	1.29	0.03
			0.00			1" Ice	3.45	1.46	0.06
JAHH-65B-R3B	C	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			1.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
JAHH-65B-R3B	C	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			-1.00			1/2" Ice	6.44	9.58	0.15
			0.00			1" Ice	6.91	10.05	0.22
JAHH-65B-R3B	C	From Face	4.00	0.0000	125.00	No Ice	5.98	9.11	0.09
(Verizon)			-6.00			1/2" Ice	6.44	9.58	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	6.91	10.05	0.22
B2/B66A RRH	A	From Face	4.00	0.0000	125.00	No Ice	2.54	1.61	0.06
(Verizon)			-3.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B2/B66A RRH	B	From Face	4.00	0.0000	125.00	No Ice	2.54	1.61	0.06
(Verizon)			-3.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B2/B66A RRH	C	From Face	4.00	0.0000	125.00	No Ice	2.54	1.61	0.06
(Verizon)			-3.00			1/2" Ice	2.75	1.79	0.08
			0.00			1" Ice	2.97	1.98	0.10
B5/B13 RRH	A	From Face	4.00	0.0000	125.00	No Ice	1.87	1.02	0.07
(Verizon)			0.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
B5/B13 RRH	B	From Face	4.00	0.0000	125.00	No Ice	1.87	1.02	0.07
(Verizon)			0.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
B5/B13 RRH	C	From Face	4.00	0.0000	125.00	No Ice	1.87	1.02	0.07
(Verizon)			0.00			1/2" Ice	2.03	1.15	0.09
			0.00			1" Ice	2.21	1.29	0.11
CBC78T-DS-43	A	From Face	4.00	0.0000	125.00	No Ice	0.37	0.26	0.01
(Verizon)			0.00			1/2" Ice	0.45	0.32	0.02
			0.00			1" Ice	0.53	0.40	0.02
CBC78T-DS-43	B	From Face	4.00	0.0000	125.00	No Ice	0.37	0.26	0.01
(Verizon)			0.00			1/2" Ice	0.45	0.32	0.02
			0.00			1" Ice	0.53	0.40	0.02
CBC78T-DS-43	C	From Face	4.00	0.0000	125.00	No Ice	0.37	0.26	0.01
(Verizon)			0.00			1/2" Ice	0.45	0.32	0.02
			0.00			1" Ice	0.53	0.40	0.02
DB-T1-6Z-8AB-0Z	A	From Face	2.00	0.0000	125.00	No Ice	4.80	2.00	0.04
(Verizon)			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	B	From Face	2.00	0.0000	125.00	No Ice	4.80	2.00	0.04
(Verizon)			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
EEI Low Profile Platform	C	None		0.0000	125.00	No Ice	22.50	22.50	1.50
(Verizon)						1/2" Ice	28.20	28.20	2.25
						1" Ice	33.90	33.90	3.00
AIR6449	A	From Face	4.00	0.0000	115.00	No Ice	5.65	2.42	0.10
(T-Mobile)			-5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APXVAALL24-43	A	From Face	4.00	0.0000	115.00	No Ice	20.24	8.89	0.15
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APX16DWV-16DWVS-E-A20	A	From Face	4.00	0.0000	115.00	No Ice	6.46	2.15	0.04
			5.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile)			0.00			1" Ice	7.21	2.84	0.11
AIR6449	B	From Face	4.00	0.0000	115.00	No Ice	5.65	2.42	0.10
(T-Mobile)			-5.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APXVAALL24-43	B	From Face	4.00	0.0000	115.00	No Ice	20.24	8.89	0.15
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APX16DWV-16DWVS-E-A20	B	From Face	4.00	0.0000	115.00	No Ice	6.46	2.15	0.04
			5.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile)			0.00			1" Ice	7.21	2.84	0.11
AIR6449	C	From Face	4.00	0.0000	115.00	No Ice	5.65	2.42	0.10
(T-Mobile)			-5.00			1/2" Ice	5.96	2.64	0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	6.26	2.87	0.18
APXVAALL24-43	C	From Face	4.00	0.0000	115.00	No Ice	20.24	8.89	0.15
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
APX16DWV-16DWVS-E-A	C	From Face	4.00	0.0000	115.00	No Ice	6.46	2.15	0.04
20			5.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile)			0.00			1" Ice	7.21	2.84	0.11
TMA 10"x8"x3"	A	From Face	4.00	0.0000	115.00	No Ice	0.67	0.26	0.02
(T-Mobile)			5.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
TMA 10"x8"x3"	B	From Face	4.00	0.0000	115.00	No Ice	0.67	0.26	0.02
(T-Mobile)			5.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
TMA 10"x8"x3"	C	From Face	4.00	0.0000	115.00	No Ice	0.67	0.26	0.02
(T-Mobile)			5.00			1/2" Ice	0.77	0.33	0.02
			0.00			1" Ice	0.88	0.41	0.03
4449 B12,B71	A	From Face	4.00	0.0000	115.00	No Ice	1.65	1.16	0.08
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B12,B71	B	From Face	4.00	0.0000	115.00	No Ice	1.65	1.16	0.08
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B12,B71	C	From Face	4.00	0.0000	115.00	No Ice	1.65	1.16	0.08
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4424 B25	A	From Face	4.00	0.0000	115.00	No Ice	2.05	1.61	0.09
(T-Mobile)			0.00			1/2" Ice	2.23	1.77	0.11
			0.00			1" Ice	2.42	1.94	0.13
4424 B25	B	From Face	4.00	0.0000	115.00	No Ice	2.05	1.61	0.09
(T-Mobile)			0.00			1/2" Ice	2.23	1.77	0.11
			0.00			1" Ice	2.42	1.94	0.13
4424 B25	C	From Face	4.00	0.0000	115.00	No Ice	2.05	1.61	0.09
(T-Mobile)			0.00			1/2" Ice	2.23	1.77	0.11
			0.00			1" Ice	2.42	1.94	0.13
4415 B25	A	From Face	4.00	0.0000	115.00	No Ice	1.84	0.82	0.05
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	B	From Face	4.00	0.0000	115.00	No Ice	1.84	0.82	0.05
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
4415 B25	C	From Face	4.00	0.0000	115.00	No Ice	1.84	0.82	0.05
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
SDX1926Q-43	A	From Face	4.00	0.0000	115.00	No Ice	0.24	0.10	0.03
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	0.03
			0.00			1" Ice	0.38	0.19	0.04
SDX1926Q-43	B	From Face	4.00	0.0000	115.00	No Ice	0.24	0.10	0.03
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	0.03
			0.00			1" Ice	0.38	0.19	0.04
SDX1926Q-43	C	From Face	4.00	0.0000	115.00	No Ice	0.24	0.10	0.03
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	0.03
			0.00			1" Ice	0.38	0.19	0.04
EEI Low Profile Platform	C	None		0.0000	115.00	No Ice	22.50	22.50	1.50
(T-Mobile)						1/2" Ice	28.20	28.20	2.25
						1" Ice	33.90	33.90	3.00
SitePro 12' Handrail Kit	C	From Face	0.00	0.0000	117.00	No Ice	5.00	5.00	0.27
HRK12			0.00			1/2" Ice	8.00	8.00	0.35

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile)			0.00			1" Ice	11.00	11.00	0.44

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	121.31	1.318	30	19.215	A	0.000	19.215	19.215	100.00	0.000	0.000
125.00-117.72					B	0.000	19.215		100.00	0.000	0.000
					C	0.000	19.215		100.00	0.000	0.000
L2	92.50	1.245	28	161.557	A	0.000	161.557	161.557	100.00	0.000	0.000
117.72-69.84					B	0.000	161.557		100.00	0.000	0.000
					C	0.000	161.557		100.00	0.000	0.000
L3 69.84-26.06	47.49	1.082	25	202.226	A	0.000	202.226	202.226	100.00	0.000	0.000
					B	0.000	202.226		100.00	0.000	0.000
					C	0.000	202.226		100.00	0.000	0.000
L4 26.06-1.00	13.26	0.85	19	139.146	A	0.000	139.146	139.146	100.00	0.000	0.000
					B	0.000	139.146		100.00	0.000	0.000
					C	0.000	139.146		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	121.31	1.318	8	1.7086	21.288	A	0.000	21.288	21.288	100.00	0.000	0.000
125.00-117.72						B	0.000	21.288		100.00	0.000	0.000
						C	0.000	21.288		100.00	0.000	0.000
L2 117.72-69.84	92.50	1.245	8	1.6629	175.191	A	0.000	175.191	175.191	100.00	0.000	0.000
						B	0.000	175.191		100.00	0.000	0.000
						C	0.000	175.191		100.00	0.000	0.000
L3 69.84-26.06	47.49	1.082	7	1.5556	214.359	A	0.000	214.359	214.359	100.00	0.000	0.000
						B	0.000	214.359		100.00	0.000	0.000
						C	0.000	214.359		100.00	0.000	0.000
L4 26.06-1.00	13.26	0.85	5	1.3692	145.644	A	0.000	145.644	145.644	100.00	0.000	0.000
						B	0.000	145.644		100.00	0.000	0.000
						C	0.000	145.644		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	121.31	1.318	10	19.215	A	0.000	19.215	19.215	100.00	0.000	0.000
125.00-117.72					B	0.000	19.215		100.00	0.000	0.000
					C	0.000	19.215		100.00	0.000	0.000
L2	92.50	1.245	10	161.557	A	0.000	161.557	161.557	100.00	0.000	0.000
117.72-69.84					B	0.000	161.557		100.00	0.000	0.000
					C	0.000	161.557		100.00	0.000	0.000
L3 69.84-26.06	47.49	1.082	8	202.226	A	0.000	202.226	202.226	100.00	0.000	0.000
					B	0.000	202.226		100.00	0.000	0.000
					C	0.000	202.226		100.00	0.000	0.000
L4 26.06-1.00	13.26	0.85	7	139.146	A	0.000	139.146	139.146	100.00	0.000	0.000
					B	0.000	139.146		100.00	0.000	0.000
					C	0.000	139.146		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	30	1	1	19.215	0.41	56.92	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	28	1	1	161.557	3.28	68.59	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	25	1	1	202.226	3.56	81.21	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	19	1	1	139.146	1.94	77.22	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	539.36 kip-ft	9.19		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	30	1	1	19.215	0.41	56.92	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	28	1	1	161.557	3.28	68.59	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L3	0.69	10.83	A	1	0.65	25	1	1	202.226	3.56	81.21	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	19	1	1	139.146	1.94	77.22	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	539.36 kip-ft	9.19		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	30	1	1	19.215	0.41	56.92	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	28	1	1	161.557	3.28	68.59	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	25	1	1	202.226	3.56	81.21	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	19	1	1	139.146	1.94	77.22	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	539.36 kip-ft	9.19		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	30	1	1	19.215	0.41	56.92	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	28	1	1	161.557	3.28	68.59	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	25	1	1	202.226	3.56	81.21	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	19	1	1	139.146	1.94	77.22	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	539.36	9.19		

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
									kip-ft			

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	1.11	A	1	1.2	8	1	1	21.288	0.23	30.94	C
125.00-117.72			B	1	1.2		1	1	21.288			
			C	1	1.2		1	1	21.288			
L2	0.72	12.22	A	1	1.2	8	1	1	175.191	1.75	36.48	C
117.72-69.84			B	1	1.2		1	1	175.191			
			C	1	1.2		1	1	175.191			
L3	0.69	15.55	A	1	1.2	7	1	1	214.359	1.85	42.23	C
69.84-26.06			B	1	1.2		1	1	214.359			
			C	1	1.2		1	1	214.359			
L4 26.06-1.00	0.39	12.89	A	1	1.2	5	1	1	145.644	0.99	39.65	C
			B	1	1.2		1	1	145.644			
			C	1	1.2		1	1	145.644			
Sum Weight:	1.83	41.77						OTM	285.06 kip-ft	4.81		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	1.11	A	1	1.2	8	1	1	21.288	0.23	30.94	C
125.00-117.72			B	1	1.2		1	1	21.288			
			C	1	1.2		1	1	21.288			
L2	0.72	12.22	A	1	1.2	8	1	1	175.191	1.75	36.48	C
117.72-69.84			B	1	1.2		1	1	175.191			
			C	1	1.2		1	1	175.191			
L3	0.69	15.55	A	1	1.2	7	1	1	214.359	1.85	42.23	C
69.84-26.06			B	1	1.2		1	1	214.359			
			C	1	1.2		1	1	214.359			
L4 26.06-1.00	0.39	12.89	A	1	1.2	5	1	1	145.644	0.99	39.65	C
			B	1	1.2		1	1	145.644			
			C	1	1.2		1	1	145.644			
Sum Weight:	1.83	41.77						OTM	285.06 kip-ft	4.81		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	1.11	A	1	1.2	8	1	1	21.288	0.23	30.94	C
125.00-117.72			B	1	1.2		1	1	21.288			
			C	1	1.2		1	1	21.288			
L2	0.72	12.22	A	1	1.2	8	1	1	175.191	1.75	36.48	C
117.72-69.84			B	1	1.2		1	1	175.191			
			C	1	1.2		1	1	175.191			
L3	0.69	15.55	A	1	1.2	7	1	1	214.359	1.85	42.23	C
69.84-26.06			B	1	1.2		1	1	214.359			
			C	1	1.2		1	1	214.359			
L4 26.06-1.00	0.39	12.89	A	1	1.2	5	1	1	145.644	0.99	39.65	C
			B	1	1.2		1	1	145.644			
			C	1	1.2		1	1	145.644			
Sum Weight:	1.83	41.77						OTM	285.06 kip-ft	4.81		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	1.11	A	1	1.2	8	1	1	21.288	0.23	30.94	C
125.00-117.72			B	1	1.2		1	1	21.288			
			C	1	1.2		1	1	21.288			
L2	0.72	12.22	A	1	1.2	8	1	1	175.191	1.75	36.48	C
117.72-69.84			B	1	1.2		1	1	175.191			
			C	1	1.2		1	1	175.191			
L3	0.69	15.55	A	1	1.2	7	1	1	214.359	1.85	42.23	C
69.84-26.06			B	1	1.2		1	1	214.359			
			C	1	1.2		1	1	214.359			
L4 26.06-1.00	0.39	12.89	A	1	1.2	5	1	1	145.644	0.99	39.65	C
			B	1	1.2		1	1	145.644			
			C	1	1.2		1	1	145.644			
Sum Weight:	1.83	41.77						OTM	285.06 kip-ft	4.81		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	10	1	1	19.215	0.14	19.49	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	10	1	1	161.557	1.12	23.48	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	8	1	1	202.226	1.22	27.80	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	7	1	1	139.146	0.66	26.43	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	184.64 kip-ft	3.15		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	10	1	1	19.215	0.14	19.49	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	10	1	1	161.557	1.12	23.48	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	8	1	1	202.226	1.22	27.80	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	7	1	1	139.146	0.66	26.43	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	184.64 kip-ft	3.15		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	10	1	1	19.215	0.14	19.49	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	10	1	1	161.557	1.12	23.48	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	8	1	1	202.226	1.22	27.80	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	7	1	1	139.146	0.66	26.43	C
			B	1	0.65		1	1	139.146			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	1.83	29.61	C	1	0.65		1	1 OTM	139.146 184.64 kip-ft	3.15		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	1	0.65	10	1	1	19.215	0.14	19.49	C
125.00-117.72			B	1	0.65		1	1	19.215			
			C	1	0.65		1	1	19.215			
L2	0.72	8.13	A	1	0.65	10	1	1	161.557	1.12	23.48	C
117.72-69.84			B	1	0.65		1	1	161.557			
			C	1	0.65		1	1	161.557			
L3	0.69	10.83	A	1	0.65	8	1	1	202.226	1.22	27.80	C
69.84-26.06			B	1	0.65		1	1	202.226			
			C	1	0.65		1	1	202.226			
L4 26.06-1.00	0.39	10.05	A	1	0.65	7	1	1	139.146	0.66	26.43	C
			B	1	0.65		1	1	139.146			
			C	1	0.65		1	1	139.146			
Sum Weight:	1.83	29.61						OTM	184.64 kip-ft	3.15		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	29.61					
Bracing Weight	0.00					
Total Member Self-Weight	29.61			0.23	0.00	
Total Weight	37.83			0.23	0.00	
Wind 0 deg - No Ice		0.00	-15.84	-1333.43	0.00	0.00
Wind 30 deg - No Ice		7.96	-13.72	-1154.75	-671.46	0.02
Wind 45 deg - No Ice		11.25	-11.20	-942.81	-949.59	0.03
Wind 60 deg - No Ice		13.78	-7.92	-666.60	-1163.01	0.04
Wind 90 deg - No Ice		15.92	0.00	0.23	-1342.93	0.05
Wind 120 deg - No Ice		13.78	7.92	667.05	-1163.01	0.04
Wind 135 deg - No Ice		11.25	11.20	943.26	-949.59	0.03
Wind 150 deg - No Ice		7.96	13.72	1155.20	-671.46	0.02
Wind 180 deg - No Ice		0.00	15.84	1333.88	0.00	0.00
Wind 210 deg - No Ice		-7.96	13.72	1155.20	671.46	-0.02
Wind 225 deg - No Ice		-11.25	11.20	943.26	949.59	-0.03
Wind 240 deg - No Ice		-13.78	7.92	667.05	1163.01	-0.04
Wind 270 deg - No Ice		-15.92	0.00	0.23	1342.93	-0.05
Wind 300 deg - No Ice		-13.78	-7.92	-666.60	1163.01	-0.04

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 315 deg - No Ice		-11.25	-11.20	-942.81	949.59	-0.03
Wind 330 deg - No Ice		-7.96	-13.72	-1154.75	671.46	-0.02
Member Ice	12.16					
Total Weight Ice	61.86			0.14	0.00	
Wind 0 deg - Ice		0.00	-7.37	-589.75	0.00	0.00
Wind 30 deg - Ice		3.69	-6.38	-510.72	-296.29	0.06
Wind 45 deg - Ice		5.22	-5.21	-416.98	-419.02	0.08
Wind 60 deg - Ice		6.40	-3.68	-294.81	-513.20	0.10
Wind 90 deg - Ice		7.39	0.00	0.14	-592.59	0.12
Wind 120 deg - Ice		6.40	3.68	295.08	-513.20	0.10
Wind 135 deg - Ice		5.22	5.21	417.25	-419.02	0.08
Wind 150 deg - Ice		3.69	6.38	511.00	-296.29	0.06
Wind 180 deg - Ice		0.00	7.37	590.03	0.00	0.00
Wind 210 deg - Ice		-3.69	6.38	511.00	296.29	-0.06
Wind 225 deg - Ice		-5.22	5.21	417.25	419.02	-0.08
Wind 240 deg - Ice		-6.40	3.68	295.08	513.20	-0.10
Wind 270 deg - Ice		-7.39	0.00	0.14	592.59	-0.12
Wind 300 deg - Ice		-6.40	-3.68	-294.81	513.20	-0.10
Wind 315 deg - Ice		-5.22	-5.21	-416.98	419.02	-0.08
Wind 330 deg - Ice		-3.69	-6.38	-510.72	296.29	-0.06
Total Weight	37.83			0.23	0.00	
Wind 0 deg - Service		0.00	-5.42	-456.33	0.00	0.00
Wind 30 deg - Service		2.72	-4.70	-395.17	-229.87	0.01
Wind 45 deg - Service		3.85	-3.83	-322.61	-325.08	0.01
Wind 60 deg - Service		4.72	-2.71	-228.05	-398.14	0.01
Wind 90 deg - Service		5.45	0.00	0.23	-459.73	0.02
Wind 120 deg - Service		4.72	2.71	228.51	-398.14	0.01
Wind 135 deg - Service		3.85	3.83	323.06	-325.08	0.01
Wind 150 deg - Service		2.72	4.70	395.62	-229.87	0.01
Wind 180 deg - Service		0.00	5.42	456.78	0.00	0.00
Wind 210 deg - Service		-2.72	4.70	395.62	229.87	-0.01
Wind 225 deg - Service		-3.85	3.83	323.06	325.08	-0.01
Wind 240 deg - Service		-4.72	2.71	228.51	398.14	-0.01
Wind 270 deg - Service		-5.45	0.00	0.23	459.73	-0.02
Wind 300 deg - Service		-4.72	-2.71	-228.05	398.14	-0.01
Wind 315 deg - Service		-3.85	-3.83	-322.61	325.08	-0.01
Wind 330 deg - Service		-2.72	-4.70	-395.17	229.87	-0.01

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice

Comb. No.	Description
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	125 - 117.72	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	34	-10.34	0.00	0.63
			Max. Mx	10	-3.77	-22.17	0.15
			Max. My	2	-3.78	0.00	21.89
			Max. Vy	10	6.18	-22.17	0.15
			Max. Vx	18	6.06	0.00	-21.58
			Max. Torque	26			-0.28
L2	117.72 - 69.84	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-33.68	0.00	-0.18
			Max. Mx	10	-17.22	-602.04	-0.27
			Max. My	18	-17.23	0.00	-596.40
			Max. Vy	10	16.12	-602.04	-0.27
			Max. Vx	18	16.00	0.00	-596.40
			Max. Torque	10			0.28
L3	69.84 - 26.06	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-51.60	0.00	-0.18
			Max. Mx	10	-30.16	-1390.29	-0.28
			Max. My	18	-30.17	0.00	-1379.55
			Max. Vy	10	21.42	-1390.29	-0.28
			Max. Vx	18	21.30	0.00	-1379.55
			Max. Torque	47			0.11
L4	26.06 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	34	-71.37	0.00	-0.18
			Max. Mx	10	-45.39	-2172.41	-0.28
			Max. My	18	-45.39	0.00	-2157.66
			Max. Vy	10	25.47	-2172.41	-0.28
			Max. Vx	18	25.35	0.00	-2157.66
			Max. Torque	39			-0.11

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	34	71.37	0.00	0.00
	Max. H_x	26	45.39	25.47	0.00
	Max. H_z	2	45.39	0.00	25.35
	Max. M_x	2	2157.11	0.00	25.35
	Max. M_z	10	2172.41	-25.47	0.00
	Max. Torsion	47	0.11	7.39	0.00
	Min. Vert	7	34.04	-18.01	17.92
	Min. H_x	10	45.39	-25.47	0.00
	Min. H_z	18	45.39	0.00	-25.35
	Min. M_x	18	-2157.66	0.00	-25.35
	Min. M_z	26	-2172.41	25.47	0.00
	Min. Torsion	39	-0.11	-7.39	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	37.83	0.00	0.00	0.23	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No	45.39	0.00	-25.35	-2157.11	0.00	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice 0.9 Dead+1.6 Wind 0 deg - No Ice	34.04	0.00	-25.35	-2151.20	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	45.39	12.73	-21.95	-1868.07	-1086.21	0.03
0.9 Dead+1.6 Wind 30 deg - No Ice	34.04	12.73	-21.95	-1862.96	-1083.19	0.04
1.2 Dead+1.6 Wind 45 deg - No Ice	45.39	18.01	-17.92	-1525.23	-1536.13	0.05
0.9 Dead+1.6 Wind 45 deg - No Ice	34.04	18.01	-17.92	-1521.06	-1531.86	0.05
1.2 Dead+1.6 Wind 60 deg - No Ice	45.39	22.05	-12.67	-1078.42	-1881.37	0.06
0.9 Dead+1.6 Wind 60 deg - No Ice	34.04	22.05	-12.67	-1075.49	-1876.14	0.06
1.2 Dead+1.6 Wind 90 deg - No Ice	45.39	25.47	0.00	0.28	-2172.41	0.07
0.9 Dead+1.6 Wind 90 deg - No Ice	34.04	25.47	0.00	0.21	-2166.38	0.07
1.2 Dead+1.6 Wind 120 deg - No Ice	45.39	22.05	12.67	1078.97	-1881.37	0.06
0.9 Dead+1.6 Wind 120 deg - No Ice	34.04	22.05	12.67	1075.91	-1876.14	0.06
1.2 Dead+1.6 Wind 135 deg - No Ice	45.39	18.01	17.92	1525.78	-1536.13	0.05
0.9 Dead+1.6 Wind 135 deg - No Ice	34.04	18.01	17.92	1521.48	-1531.86	0.05
1.2 Dead+1.6 Wind 150 deg - No Ice	45.39	12.73	21.95	1868.63	-1086.21	0.03
0.9 Dead+1.6 Wind 150 deg - No Ice	34.04	12.73	21.95	1863.38	-1083.19	0.04
1.2 Dead+1.6 Wind 180 deg - No Ice	45.39	0.00	25.35	2157.66	0.00	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	34.04	0.00	25.35	2151.61	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	45.39	-12.73	21.95	1868.63	1086.21	-0.03
0.9 Dead+1.6 Wind 210 deg - No Ice	34.04	-12.73	21.95	1863.38	1083.19	-0.04
1.2 Dead+1.6 Wind 225 deg - No Ice	45.39	-18.01	17.92	1525.78	1536.13	-0.05
0.9 Dead+1.6 Wind 225 deg - No Ice	34.04	-18.01	17.92	1521.48	1531.86	-0.05
1.2 Dead+1.6 Wind 240 deg - No Ice	45.39	-22.05	12.67	1078.97	1881.37	-0.06
0.9 Dead+1.6 Wind 240 deg - No Ice	34.04	-22.05	12.67	1075.91	1876.14	-0.06
1.2 Dead+1.6 Wind 270 deg - No Ice	45.39	-25.47	0.00	0.28	2172.41	-0.07
0.9 Dead+1.6 Wind 270 deg - No Ice	34.04	-25.47	0.00	0.21	2166.38	-0.07
1.2 Dead+1.6 Wind 300 deg - No Ice	45.39	-22.05	-12.67	-1078.42	1881.37	-0.06
0.9 Dead+1.6 Wind 300 deg - No Ice	34.04	-22.05	-12.67	-1075.49	1876.14	-0.06
1.2 Dead+1.6 Wind 315 deg - No Ice	45.39	-18.01	-17.92	-1525.23	1536.13	-0.05
0.9 Dead+1.6 Wind 315 deg - No Ice	34.04	-18.01	-17.92	-1521.06	1531.86	-0.05
1.2 Dead+1.6 Wind 330 deg - No Ice	45.39	-12.73	-21.95	-1868.07	1086.21	-0.03

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
0.9 Dead+1.6 Wind 330 deg - No Ice	34.04	-12.73	-21.95	-1862.96	1083.19	-0.04
1.2 Dead+1.0 Ice+1.0 Temp	71.37	0.00	0.00	0.18	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	71.37	0.00	-7.37	-602.11	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	71.37	3.69	-6.38	-521.42	-302.53	0.06
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	71.37	5.22	-5.21	-425.70	-427.85	0.08
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	71.37	6.40	-3.68	-300.96	-524.00	0.10
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	71.37	7.39	0.00	0.19	-605.07	0.11
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	71.37	6.40	3.68	301.34	-524.00	0.10
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	71.37	5.22	5.21	426.08	-427.85	0.08
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	71.37	3.69	6.38	521.80	-302.53	0.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	71.37	0.00	7.37	602.49	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	71.37	-3.69	6.38	521.80	302.53	-0.06
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	71.37	-5.22	5.21	426.08	427.85	-0.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	71.37	-6.40	3.68	301.34	524.00	-0.10
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	71.37	-7.39	0.00	0.19	605.07	-0.11
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	71.37	-6.40	-3.68	-300.96	524.00	-0.10
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	71.37	-5.22	-5.21	-425.70	427.85	-0.08
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	71.37	-3.69	-6.38	-521.42	302.53	-0.06
Dead+Wind 0 deg - Service	37.83	0.00	-5.42	-460.54	0.00	0.00
Dead+Wind 30 deg - Service	37.83	2.72	-4.70	-398.81	-231.99	0.01
Dead+Wind 45 deg - Service	37.83	3.85	-3.83	-325.58	-328.08	0.01
Dead+Wind 60 deg - Service	37.83	4.72	-2.71	-230.15	-401.81	0.01
Dead+Wind 90 deg - Service	37.83	5.45	0.00	0.23	-463.98	0.02
Dead+Wind 120 deg - Service	37.83	4.72	2.71	230.61	-401.81	0.01
Dead+Wind 135 deg - Service	37.83	3.85	3.83	326.04	-328.08	0.01
Dead+Wind 150 deg - Service	37.83	2.72	4.70	399.26	-231.99	0.01
Dead+Wind 180 deg - Service	37.83	0.00	5.42	461.00	0.00	0.00
Dead+Wind 210 deg - Service	37.83	-2.72	4.70	399.26	231.99	-0.01
Dead+Wind 225 deg - Service	37.83	-3.85	3.83	326.04	328.08	-0.01
Dead+Wind 240 deg - Service	37.83	-4.72	2.71	230.61	401.81	-0.01
Dead+Wind 270 deg - Service	37.83	-5.45	0.00	0.23	463.98	-0.02
Dead+Wind 300 deg - Service	37.83	-4.72	-2.71	-230.15	401.81	-0.01
Dead+Wind 315 deg - Service	37.83	-3.85	-3.83	-325.58	328.08	-0.01
Dead+Wind 330 deg - Service	37.83	-2.72	-4.70	-398.81	231.99	-0.01

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-37.83	0.00	0.00	37.83	0.00	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
2	0.00	-45.39	-25.35	0.00	45.39	25.35	0.000%
3	0.00	-34.04	-25.35	0.00	34.04	25.35	0.000%
4	12.73	-45.39	-21.95	-12.73	45.39	21.95	0.000%
5	12.73	-34.04	-21.95	-12.73	34.04	21.95	0.000%
6	18.01	-45.39	-17.92	-18.01	45.39	17.92	0.000%
7	18.01	-34.04	-17.92	-18.01	34.04	17.92	0.000%
8	22.05	-45.39	-12.67	-22.05	45.39	12.67	0.000%
9	22.05	-34.04	-12.67	-22.05	34.04	12.67	0.000%
10	25.47	-45.39	0.00	-25.47	45.39	0.00	0.000%
11	25.47	-34.04	0.00	-25.47	34.04	0.00	0.000%
12	22.05	-45.39	12.67	-22.05	45.39	-12.67	0.000%
13	22.05	-34.04	12.67	-22.05	34.04	-12.67	0.000%
14	18.01	-45.39	17.92	-18.01	45.39	-17.92	0.000%
15	18.01	-34.04	17.92	-18.01	34.04	-17.92	0.000%
16	12.73	-45.39	21.95	-12.73	45.39	-21.95	0.000%
17	12.73	-34.04	21.95	-12.73	34.04	-21.95	0.000%
18	0.00	-45.39	25.35	0.00	45.39	-25.35	0.000%
19	0.00	-34.04	25.35	0.00	34.04	-25.35	0.000%
20	-12.73	-45.39	21.95	12.73	45.39	-21.95	0.000%
21	-12.73	-34.04	21.95	12.73	34.04	-21.95	0.000%
22	-18.01	-45.39	17.92	18.01	45.39	-17.92	0.000%
23	-18.01	-34.04	17.92	18.01	34.04	-17.92	0.000%
24	-22.05	-45.39	12.67	22.05	45.39	-12.67	0.000%
25	-22.05	-34.04	12.67	22.05	34.04	-12.67	0.000%
26	-25.47	-45.39	0.00	25.47	45.39	0.00	0.000%
27	-25.47	-34.04	0.00	25.47	34.04	0.00	0.000%
28	-22.05	-45.39	-12.67	22.05	45.39	12.67	0.000%
29	-22.05	-34.04	-12.67	22.05	34.04	12.67	0.000%
30	-18.01	-45.39	-17.92	18.01	45.39	17.92	0.000%
31	-18.01	-34.04	-17.92	18.01	34.04	17.92	0.000%
32	-12.73	-45.39	-21.95	12.73	45.39	21.95	0.000%
33	-12.73	-34.04	-21.95	12.73	34.04	21.95	0.000%
34	0.00	-71.37	0.00	0.00	71.37	0.00	0.000%
35	0.00	-71.37	-7.37	0.00	71.37	7.37	0.000%
36	3.69	-71.37	-6.38	-3.69	71.37	6.38	0.000%
37	5.22	-71.37	-5.21	-5.22	71.37	5.21	0.000%
38	6.40	-71.37	-3.68	-6.40	71.37	3.68	0.000%
39	7.39	-71.37	0.00	-7.39	71.37	0.00	0.000%
40	6.40	-71.37	3.68	-6.40	71.37	-3.68	0.000%
41	5.22	-71.37	5.21	-5.22	71.37	-5.21	0.000%
42	3.69	-71.37	6.38	-3.69	71.37	-6.38	0.000%
43	0.00	-71.37	7.37	0.00	71.37	-7.37	0.000%
44	-3.69	-71.37	6.38	3.69	71.37	-6.38	0.000%
45	-5.22	-71.37	5.21	5.22	71.37	-5.21	0.000%
46	-6.40	-71.37	3.68	6.40	71.37	-3.68	0.000%
47	-7.39	-71.37	0.00	7.39	71.37	0.00	0.000%
48	-6.40	-71.37	-3.68	6.40	71.37	3.68	0.000%
49	-5.22	-71.37	-5.21	5.22	71.37	5.21	0.000%
50	-3.69	-71.37	-6.38	3.69	71.37	6.38	0.000%
51	0.00	-37.83	-5.42	0.00	37.83	5.42	0.000%
52	2.72	-37.83	-4.70	-2.72	37.83	4.70	0.000%
53	3.85	-37.83	-3.83	-3.85	37.83	3.83	0.000%
54	4.72	-37.83	-2.71	-4.72	37.83	2.71	0.000%
55	5.45	-37.83	0.00	-5.45	37.83	0.00	0.000%
56	4.72	-37.83	2.71	-4.72	37.83	-2.71	0.000%
57	3.85	-37.83	3.83	-3.85	37.83	-3.83	0.000%
58	2.72	-37.83	4.70	-2.72	37.83	-4.70	0.000%
59	0.00	-37.83	5.42	0.00	37.83	-5.42	0.000%
60	-2.72	-37.83	4.70	2.72	37.83	-4.70	0.000%
61	-3.85	-37.83	3.83	3.85	37.83	-3.83	0.000%
62	-4.72	-37.83	2.71	4.72	37.83	-2.71	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
63	-5.45	-37.83	0.00	5.45	37.83	0.00	0.000%
64	-4.72	-37.83	-2.71	4.72	37.83	2.71	0.000%
65	-3.85	-37.83	-3.83	3.85	37.83	3.83	0.000%
66	-2.72	-37.83	-4.70	2.72	37.83	4.70	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000826
3	Yes	4	0.00000001	0.00000419
4	Yes	4	0.00000001	0.00005068
5	Yes	4	0.00000001	0.00003303
6	Yes	4	0.00000001	0.00005810
7	Yes	4	0.00000001	0.00003785
8	Yes	4	0.00000001	0.00005050
9	Yes	4	0.00000001	0.00003288
10	Yes	4	0.00000001	0.00000833
11	Yes	4	0.00000001	0.00000423
12	Yes	4	0.00000001	0.00005102
13	Yes	4	0.00000001	0.00003323
14	Yes	4	0.00000001	0.00005818
15	Yes	4	0.00000001	0.00003789
16	Yes	4	0.00000001	0.00005049
17	Yes	4	0.00000001	0.00003288
18	Yes	4	0.00000001	0.00000826
19	Yes	4	0.00000001	0.00000419
20	Yes	4	0.00000001	0.00005049
21	Yes	4	0.00000001	0.00003288
22	Yes	4	0.00000001	0.00005818
23	Yes	4	0.00000001	0.00003789
24	Yes	4	0.00000001	0.00005102
25	Yes	4	0.00000001	0.00003323
26	Yes	4	0.00000001	0.00000833
27	Yes	4	0.00000001	0.00000423
28	Yes	4	0.00000001	0.00005050
29	Yes	4	0.00000001	0.00003288
30	Yes	4	0.00000001	0.00005810
31	Yes	4	0.00000001	0.00003785
32	Yes	4	0.00000001	0.00005068
33	Yes	4	0.00000001	0.00003303
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00017165
36	Yes	4	0.00000001	0.00017344
37	Yes	4	0.00000001	0.00017420
38	Yes	4	0.00000001	0.00017396
39	Yes	4	0.00000001	0.00017277
40	Yes	4	0.00000001	0.00017410
41	Yes	4	0.00000001	0.00017438
42	Yes	4	0.00000001	0.00017365
43	Yes	4	0.00000001	0.00017190
44	Yes	4	0.00000001	0.00017365
45	Yes	4	0.00000001	0.00017438
46	Yes	4	0.00000001	0.00017410
47	Yes	4	0.00000001	0.00017277

48	Yes	4	0.00000001	0.00017396
49	Yes	4	0.00000001	0.00017420
50	Yes	4	0.00000001	0.00017344
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 117.72	3.703	63	0.2576	0.0000
L2	121.36 - 69.84	3.507	63	0.2568	0.0000
L3	76.34 - 26.06	1.377	63	0.1770	0.0000
L4	34.31 - 1	0.261	55	0.0688	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	Lightning Rod 1"x10'	63	3.703	0.2576	0.0000	75127
125.00	LPA-80080-4CF	63	3.703	0.2576	0.0000	75127
117.00	SitePro 12' Handrail Kit HRK12	63	3.274	0.2544	0.0001	61279
115.00	AIR6449	55	3.169	0.2528	0.0001	56515

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 117.72	17.347	10	1.2070	0.0003
L2	121.36 - 69.84	16.428	10	1.2030	0.0003
L3	76.34 - 26.06	6.448	10	0.8291	0.0001
L4	34.31 - 1	1.221	10	0.3220	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130.00	Lightning Rod 1"x10'	10	17.347	1.2070	0.0003	16052
125.00	LPA-80080-4CF	10	17.347	1.2070	0.0003	16052
117.00	SitePro 12' Handrail Kit HRK12	10	15.339	1.1920	0.0003	13092
115.00	AIR6449	10	14.845	1.1845	0.0003	12073

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	125 - 117.72 (1)	TP32.46x30x0.25	7.28	124.00	135.3	24.5826	-10.33	303.38	0.034
L2	117.72 - 69.84 (2)	TP47.92x30.73x0.375	51.52	124.00	92.4	54.0091	-17.22	1429.93	0.012
L3	69.84 - 26.06 (3)	TP62.08x45.0012x0.375	50.28	124.00	71.2	70.1089	-30.16	2643.67	0.011
L4	26.06 - 1 (4)	TP70x58.5277x0.4375	33.31	124.00	60.3	96.5962	-45.39	4209.67	0.011

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	125 - 117.72 (1)	TP32.46x30x0.25	6.08	1093.65	0.006	0.00	1093.65	0.000
L2	117.72 - 69.84 (2)	TP47.92x30.73x0.375	602.04	3546.06	0.170	0.00	3546.06	0.000
L3	69.84 - 26.06 (3)	TP62.08x45.0012x0.375	1390.29	5415.07	0.257	0.00	5415.07	0.000
L4	26.06 - 1 (4)	TP70x58.5277x0.4375	2172.42	8762.17	0.248	0.00	8762.17	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	125 - 117.72 (1)	TP32.46x30x0.25	1.50	858.55	0.002	0.00	2192.65	0.000
L2	117.72 - 69.84	TP47.92x30.73x0.375	16.12	1900.95	0.008	0.07	7109.65	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L3	69.84 - 26.06 (2)	TP62.08x45.0012x0.375	21.42	2232.04	0.010	0.07	10853.83	0.000
L4	26.06 - 1 (3)	TP70x58.5277x0.4375	25.47	3057.98	0.008	0.07	17562.33	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	125 - 117.72 (1)	0.034	0.006	0.000	0.002	0.000	0.040 ✔	1.000	4.8.2 ✔
L2	117.72 - 69.84 (2)	0.012	0.170	0.000	0.008	0.000	0.182 ✔	1.000	4.8.2 ✔
L3	69.84 - 26.06 (3)	0.011	0.257	0.000	0.010	0.000	0.268 ✔	1.000	4.8.2 ✔
L4	26.06 - 1 (4)	0.011	0.248	0.000	0.008	0.000	0.259 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	125 - 117.72	Pole	TP32.46x30x0.25	1	-10.33	303.38	4.0	Pass
L2	117.72 - 69.84	Pole	TP47.92x30.73x0.375	2	-17.22	1429.93	18.2	Pass
L3	69.84 - 26.06	Pole	TP62.08x45.0012x0.375	3	-30.16	2643.67	26.8	Pass
L4	26.06 - 1	Pole	TP70x58.5277x0.4375	4	-45.39	4209.67	25.9	Pass
							Summary	
						Pole (L3)	26.8	Pass
						RATING =	**26.8**	**Pass**

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Anchor Bolt and Baseplate Analysis
Location:	125-FT EEI Monopole Meriden, CT
Rev. 0: 5/20/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21022.12

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	OM := 2172·ft·kips	(Input From tnxTower)
Shear Force =	Shear := 25·kips	(Input From tnxTower)
Axial Force =	Axial := 45·kips	(Input From tnxTower)

Anchor Bolt Data:

ASTMA615 Grade 75

Number of Anchor Bolts =	N := 12	(User Input)
Bolt "Column" Distance =	l := 3.0·in	(User Input)
Bolt Ultimate Strength =	F_u := 100·ksi	(User Input)
Bolt Yield Strength =	F_y := 75·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Anchor Bolts =	D := 2.25·in	(User Input)
Threads per Inch =	n := 4.5	(User Input)
Top of Concrete to Bot Leveling Nut =	l_{ar} := 2·in	(User Input)

Base Plate Data:

Use AST MA572 Grade 60

Plate Yield Strength =	Fy_{bp} := 60·ksi	(User Input)
Base Plate Thickness =	t_{bp} := 2.25·in	(User Input)
Base Plate Diameter =	D_{bp} := 86.5·in	(User Input)
Outer Pole Diameter =	D_{pole} := 70·in	(User Input)
	η := 0.5	per TIA-222-G Section 4.9.9

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Anchor Bolt and Baseplate Analysis

Location: 125-FT EEI Monopole
Meriden, CT

Rev. 0: 5/20/21

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21022.12

Geometric Layout Data:

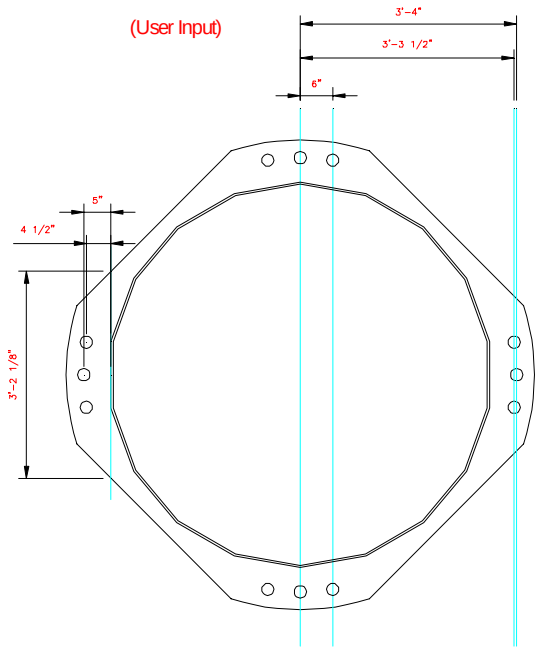
Distance from Bolts to Centroid of Pole:

$d_1 := 40in$ $d_2 := 39.5in$ $d_3 := 6in$ (User Input)

Critical Distances For Bending in Plate: (User Input)

$ma_1 := 5in$ $ma_2 := 4.5in$

Effective Width of Baseplate for Bending = $B_{eff} := 38.125in$ (User Input)



Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \left[\left(d_1\right)^2 \cdot 2 + \left(d_2\right)^2 \cdot 4 + \left(d_3\right)^2 \cdot 4\right] = 9585 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 3.976 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 3.248 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 2.033 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.508 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.826 \cdot in^3$

Tensile Root Diameter = $d_{rt} := D - \frac{0.9743 \cdot in}{n} = 2.033 \cdot in$

Plastic Section Modulus = $Z := \frac{d_{rt}^3}{6} = 1.401 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{d_1}{I_p} - \frac{Axial}{N} = 105 \cdot kips$

Maximum Compressive Force = $P_u := OM \cdot \frac{d_1}{I_p} + \frac{Axial}{N} = 112.5 \cdot kips$

Maximum Shear Force = $V_u := \frac{Shear}{N} = 2.1 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 259.815 \cdot k$

Bolt % of Capacity = $\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \cdot 100 = 44.9$

Condition1 = $Condition1 := if\left[\frac{\left(P_u + \frac{V_u}{\eta}\right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed"\right]$

Condition1 = "OK"

Base Plate Analysis:

Force from Bolts =

$$C_1 := \frac{OM \cdot d_1}{I_p} + \frac{Axial}{N} = 112.52 \cdot kips$$

$$C_2 := \frac{OM \cdot d_2}{I_p} + \frac{Axial}{N} = 111.16 \cdot kips$$

Applied Bending Stress in Plate =

$$f_{bp} := \frac{4 \cdot \left(C_1 \cdot ma_1 + 2C_2 \cdot ma_2\right)}{B_{eff} t_{bp}^{\ 2}} = 32.39 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 54 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 60.0 \cdot \%$$

Condition2= =

$$Condition2 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$$

Condition2 = "Ok"

Mat Foundation Analysis:

Input Data:

Monopole Base Reactions

Overturning Moment =	$OM_t := 2172 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 25 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 45 \cdot kip$	(User Input from tnxTower)	

Water Tank Base Reactions

Overturning Moment =	$OM_{wt} := 4825 \cdot ft \cdot kips$		
Shear Force =	$S_{wt} := 34 \cdot kip$		
Axial Force =	$WT_{wt} := 187 \cdot kip$		

Footing Data:

Overall Depth of Footing =	$D_f := 8 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2.5 \cdot ft$	(User Input)	
Length of Footing Side =	$a := 20.708 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 50 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 1.5 \cdot ft$	(User Input)	
Height of Monopole Pier =	$H_{mp} := 7 \cdot ft$	(User Input)	
Width of Monopole Pier =	$W_{mp} := 10 \cdot ft$	(User Input)	
Height of Water Tank Pier =	$H_{wtp} := 7 \cdot ft$	(User Input)	
Width of Water Tank Pier Top =	$W_{wtpt} := 3.67 \cdot ft$	(User Input)	
Length of Water Tank Pier Bot =	$L_{wtp} := 5 \cdot ft$	(User Input)	
Width of Water Tank Pier Bot =	$W_{wtp} := 6 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 5000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 1 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Stability of Footing:

Area of Concrete Pad = $A_{pad} := 2\cdot\left(1+\sqrt{2}\right)\cdot a^2 = 2071\cdot ft^3$

Weight of Concrete Pad = $WT_{pad} := 2\cdot\left(1+\sqrt{2}\right)\cdot a^2\cdot T_f\cdot\gamma_{conc} = 776.45\cdot kip$

Weight of Water Tank Piers = $WT_{pier.wt} := 4\cdot\left[\frac{1}{3}\cdot H_{wtp}\cdot\left[W_{wtpt}^2 + L_{wtp}\cdot W_{wtp} + \sqrt{W_{wtpt}^2\cdot\left(L_{wtp}\cdot W_{wtp}\right)}\right]\cdot\gamma_{conc}\right] = 88.998\cdot kip$

Weight of Monopole Pier = $WT_{pier.m} := H_{mp}\cdot W_{mp}^2\cdot\gamma_{conc} = 105\cdot kip$

Total Weight of Concrete = $WT_c := WT_{pad} + WT_{pier.wt} + WT_{pier.m} = 970\cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[A_{pad}\cdot\left(D_f - T_f\right) - \frac{\left(WT_{pier.wt} + WT_{pier.m}\right)}{\gamma_{conc}}\right]\cdot\gamma_{soil} = 1211\cdot kip$

Resisting Moment = $M_r := \left(0.9WT_c + 0.75WT_{s1} + 0.75WT_t + 0.75\cdot WT_{wt}\right)\cdot\frac{W_f}{2} = 48898\cdot kip\cdot ft$

Overturning Moment = $M_{ot} := OM_t + OM_{wt} + \left(S_t + S_{wt}\right)\cdot\left(H_{mp} + T_f\right) = 7557.5\cdot kip\cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 6.5$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := if\left(FS \geq FS_{req}, "Okay", "No\ Good"\right)$

$OverTurning\_Moment\_Check = "Okay"$

RAN Template:	A&L Template:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Section 1 - Site Information

Site ID: CT11603E
Status: Draft
Version: 5
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 4/30/2021 2:4:28 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

Site Name: CT603/Atlas Container WT
Site Class: Monopole
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Atlas Container LLC.

Latitude: 41.57320000
Longitude: -72.77920000
Address: 119 Empire Ave
City, State: Meriden, CT
Region: NORTHEAST

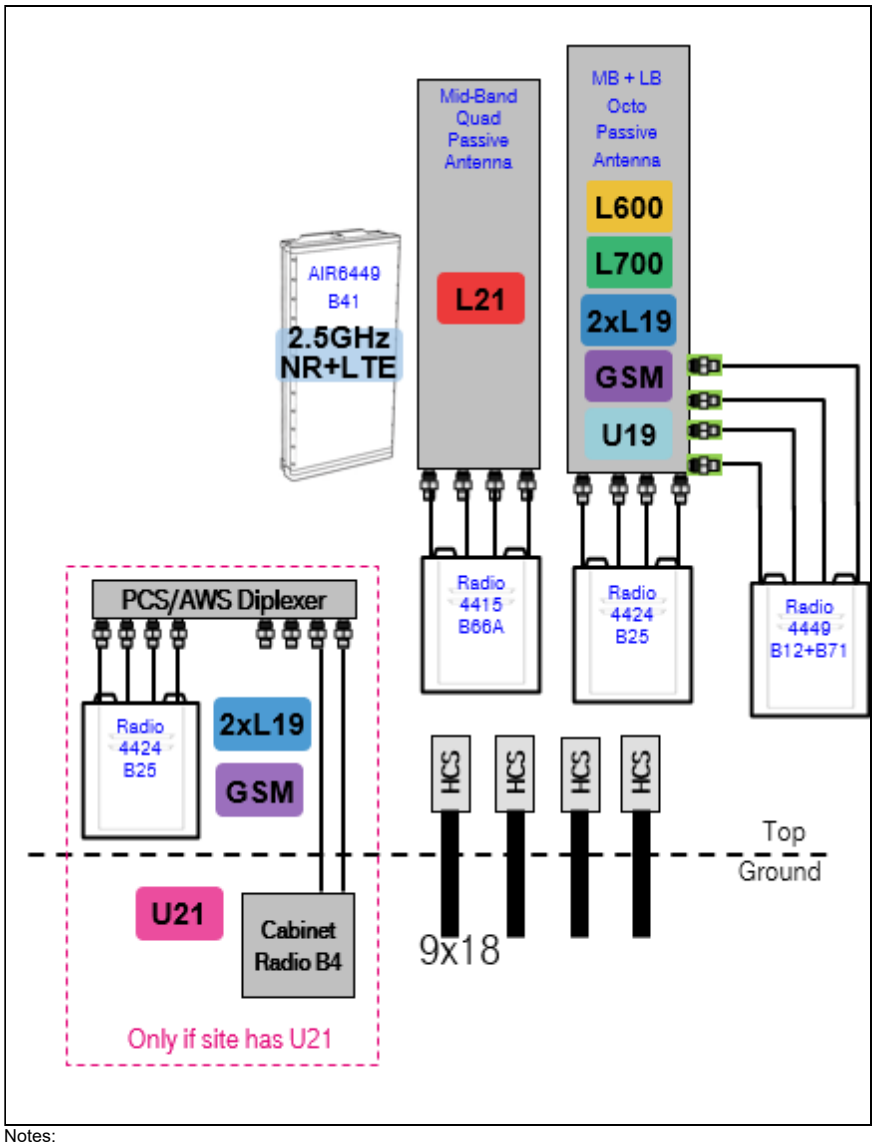
RAN Template: 67D5A998C Outdoor			AL Template: 67D5998C_1xAIR+1QP+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 6	**TMA Count:** 3	**RRU Count:** 9

Section 2 - Existing Template Images

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

Section 3 - Proposed Template Images

67D5998C_1xAIR+1QP+1OP.PNG



Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 702Cu Outdoor

Enclosure	1
Enclosure Type	RBS 6131
Baseband	DUW30 (U2100); DUW30 (U1900); DUG20 (G1900); BB 6630 (L700, L2100)
Hybrid Cable System	Ericsson 9x18 HCS *Select Length*
Radio	RU22 **(x 6)** (U2100)

Proposed RAN Equipment

Template: 67D5A998C Outdoor

Enclosure	1	2	3
Enclosure Type	RBS 6131	Enclosure 6160	B160
Baseband	DUW30 (U2100); DUG20 (G1900); BB 6630 (L2100, L1900); BB 6648 (L600, N600, L700)	BB 6648 (L2500, N2500)	
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 60m **(x 2)**	Ericsson Hybrid Trunk 6/24 4AWG 60m; PSU 4813	
Radio	RU22 **(x 6)** (U2100)		
Transport System		CSR IXRe V2 (Gen2)	

RAN Scope of Work:

Remove Nortel Cabinet.

U1900 will be decommissioned. Remove DUW30 for U1900 from existing RBS6131 Base Station Cabinet.

Add (1) BB6648 for L600, L700, and N600 (MMBB - Mixed Mode Baseband) to existing RBS6131 Base Station Cabinet.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6648 for L2500 and N2500 (MMBB - Mixed Mode Baseband) to new Enclosure 6160.

Add (1) PSU4813 Voltage Booster to new Enclosure 6160.

Keep (6) coaxial lines for U2100.

Add (3) 6X24 HCS as follows: (2) 6X24 HCS terminating at the RBS6131; (1) 6X24 HCS terminating at the Enclosure 6160 (Connect DC for the AIR6449 B41 to the PSU4813 Voltage Booster).

RAN Template:	A&L Template:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Section 6 - A&L Equipment

Existing Template: 702Cu
Proposed Template: 67D5998C_1xAIR+1QP+1OP (U21 Market)

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2	3	4	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Empty Antenna Mount (Empty mount)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	60		60		60	
M. Tilt	0		0		0	
Height	115		115		115	
Ports	P1	P2	P3		P4	P5
Active Tech.	U1900 G1900	U2100	L700		L2100	
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2		2	
Cables	Fiber Jumper - 15 ft. 1-5/8" Coax - 165 ft.	1-5/8" Coax - 165 ft.	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)				
Diplexers / Combiners						
Radio			RRUS11 B12 (At Antenna)			
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Sector 1 (Proposed) view from behind									
Coverage Type	A - Outdoor Macro								
Antenna	1		2				3	4	
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	60		60					60	
M. Tilt	0		0					0	
Height	115		115					115	
Ports	P1	P2	P3	P4	P5	P6		P7	P8
Active Tech.	L2500 N2500	L2500 N2500	L600 N600 L700	L600 N600 L700	G19 00 L190 0	U21 00 G19 00 L190 0		L2100	L2100
Dark Tech.									
Restricted Tech.									
Decomm. Tech.									
E. Tilt									
Cables	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)** 1-5/8" Coax - 165 ft. **(x2)**		Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper
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 4424 B25 (At Antenna)	SHARED Radio 4424 B25 (At Antenna)		Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B66A (At Antenna)

Sector Equipment

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 1.

Replace Low-Band Dual in Position 2 with (1) Low-Band/Mid-Band Octo.

Replace RRUS11 B12 with (1) Radio 4449 B71+B85 for L600, L700, and N600 in Position 2 at antenna, and connect its ports to the Low-Band ports of the Octo Antenna.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four common ports to the Mid-Band ports of the Octo Antenna.

Add (1) Radio 4424 B25 for L1900 (Both Carriers) and GSM to Position 2 near antenna, and connect its ports to the four PCS ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect to two AWS ports of the diplexer.

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

Replace AIR21 B2P/B4A with (1) Mid-Band Quad for L2100 in Position 4.

Add (1) Radio 4415 B66 for L2100 to Position 4 at antenna.

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:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2	3	4	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Empty Antenna Mount (Empty mount)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	180		180		180	
M. Tilt	0		0		0	
Height	115		115		115	
Ports	P1	P2	P3		P4	P5
Active Tech.	U1900 G1900	U2100	L700		L2100	
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2		2	
Cables	Fiber Jumper - 15 ft. 1-5/8" Coax - 165 ft.	1-5/8" Coax - 165 ft.	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)				
Diplexers / Combiners						
Radio			RRUS11 B12 (At Antenna)			
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Sector 2 (Proposed) view from behind									
Coverage Type	A - Outdoor Macro								
Antenna	1		2				3	4	
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	180		180					180	
M. Tilt	0		0					0	
Height	115		115					115	
Ports	P1	P2	P3	P4	P5	P6		P7	P8
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900 G1900	U2100 L1900 G1900		L2100	L2100
Dark Tech.									
Restricted Tech.									
Decomm. Tech.									
E. Tilt									
Cables	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)** 1-5/8" Coax - 165 ft. **(x2)**		Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper
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 4424 B25 (At Antenna)	SHARED Radio 4424 B25 (At Antenna)		Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B66A (At Antenna)

Sector Equipment

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 1.

Replace Low-Band Dual in Position 2 with (1) Low-Band/Mid-Band Octo.

Replace RRUS11 B12 with (1) Radio 4449 B71+B85 for L600, L700, and N600 in Position 2 at antenna, and connect its ports to the Low-Band ports of the Octo Antenna.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four common ports to the Mid-Band ports of the Octo Antenna.

Add (1) Radio 4424 B25 for L1900 (Both Carriers) and GSM to Position 2 near antenna, and connect its ports to the four PCS ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect to two AWS ports of the diplexer.

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

Replace AIR21 B2P/B4A with (1) Mid-Band Quad for L2100 in Position 4.

Add (1) Radio 4415 B66 for L2100 to Position 4 at antenna.

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:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2	3	4	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Empty Antenna Mount (Empty mount)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	290		290		290	
M. Tilt	0		0		0	
Height	115		115		115	
Ports	P1	P2	P3		P4	P5
Active Tech.	U1900 G1900	U2100	L700		L2100	
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2		2	
Cables	Fiber Jumper - 15 ft. 1-5/8" Coax - 165 ft.	1-5/8" Coax - 165 ft.	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)				
Diplexers / Combiners						
Radio			RRUS11 B12 (At Antenna)			
Sector Equipment						

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro								
Antenna	1		2				3	4	
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	290		290					290	
M. Tilt	0		0					0	
Height	115		115					115	
Ports	P1	P2	P3	P4	P5	P6		P7	P8
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900 G1900	U2100 L1900 G1900		L2100	L2100
Dark Tech.									
Restricted Tech.									
Decomm. Tech.									
E. Tilt									
Cables	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)** 1-5/8" Coax - 165 ft. **(x2)**		Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper
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 4424 B25 (At Antenna)	SHARED Radio 4424 B25 (At Antenna)		Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B66A (At Antenna)

Sector Equipment

Unconnected Equipment:

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 1.

Replace Low-Band Dual in Position 2 with (1) Low-Band/Mid-Band Octo.

Replace RRUS11 B12 with (1) Radio 4449 B71+B85 for L600, L700, and N600 in Position 2 at antenna, and connect its ports to the Low-Band ports of the Octo Antenna.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four common ports to the Mid-Band ports of the Octo Antenna.

Add (1) Radio 4424 B25 for L1900 (Both Carriers) and GSM to Position 2 near antenna, and connect its ports to the four PCS ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect to two AWS ports of the diplexer.

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

Replace AIR21 B2P/B4A with (1) Mid-Band Quad for L2100 in Position 4.

Add (1) Radio 4415 B66 for L2100 to Position 4 at antenna.

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:
67D5A998C Outdoor	67D5998C_1xAIR+1QP+1OP (U21 Market)

CT11603E_Anchor_5_draft

Print Name: Preliminary (Scoped_with_U2100)
PORs: Anchor_Phase 3
L600_5G POPs

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

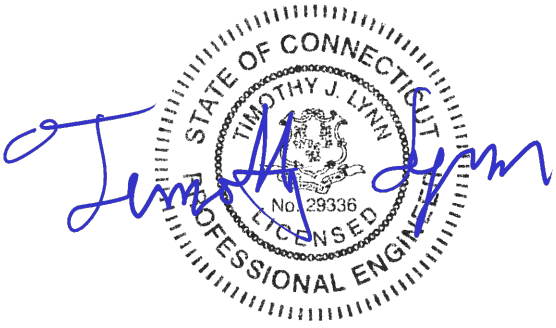
T-Mobile Site #: CT11603E

119 Empire Avenue
Meriden, CT

Centek Project No. 21022.12

Date: May 20, 2021

Max Stress Ratio = 73%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

May 20, 2021

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11603E
119 Empire Avenue
Meriden, CT 06450

Centek Project No. 21022.12

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 mount, consisting of one (1) low profile platform support the proposed equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  Low Profile Platform: Three (3) Ericsson AIR6449 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas, three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson 4449 remote radio heads, three (3) Ericsson 4415 remote radio heads, three (3) Ericsson 4424 remote radio heads and three (3) diplexers mounted on one (1) platform with a RAD center elevation of 115-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 of the 2018 Connecticut State Building Code.

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

Based on our review of the installation, it is our opinion that the subject antenna mount with the installation of one (1) handrail kit (SitePro p/n HRK-12) has 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

Section 2 - Calculations

CENTEK engineering
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Subject: TIA-222-G Loads

Location: Meriden, CT

Rev. 0: 5/20/21

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 21022.12

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

Wind Speeds

Basic Wind Speed: $V := 97$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice: $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = $Structure\_Type := Pole$ (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 = $z_{Ant} := 115$ 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)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 1.1$ (User Input)

Output

Wind Direction Probability Factor =

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

(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)

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

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.133$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.699$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.303$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 29.826$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.925$$

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 150$	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 =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 664$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 235$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 209$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.2$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 91$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 415$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 415$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6449		
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 =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 186$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 75$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 63$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 31$	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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4573$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 148$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 148$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPX16DWV-16DWVS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 46$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 212$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 51$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 75$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.7$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 30$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 46$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4079$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 132$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 132$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4449

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 = $T_{RRUS} := 10.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 74$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

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 = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 54$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 42$ 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 = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 22$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.8$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 18$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 74$ lbs

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2146$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 70$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 70$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4415

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 16.5$ in (User Input)

RRUS Width = $W_{RRUS} := 13.4$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.9$ in (User Input)

RRUS Weight = $WT_{RRUS} := 46$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.5$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 60$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.7$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 27$ lbs

Wind Load (with ice)

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

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.3$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 13$ lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1304$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1804$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 58$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 58$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4424

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 17.1$ in (User Input)

RRUS Width = $W_{RRUS} := 14.4$ in (User Input)

RRUS Thickness = $T_{RRUS} := 11.3$ in (User Input)

RRUS Weight = $WT_{RRUS} := 86$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.7$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 67$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.3$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 53$ 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 = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 27$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 22$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 86$ lbs

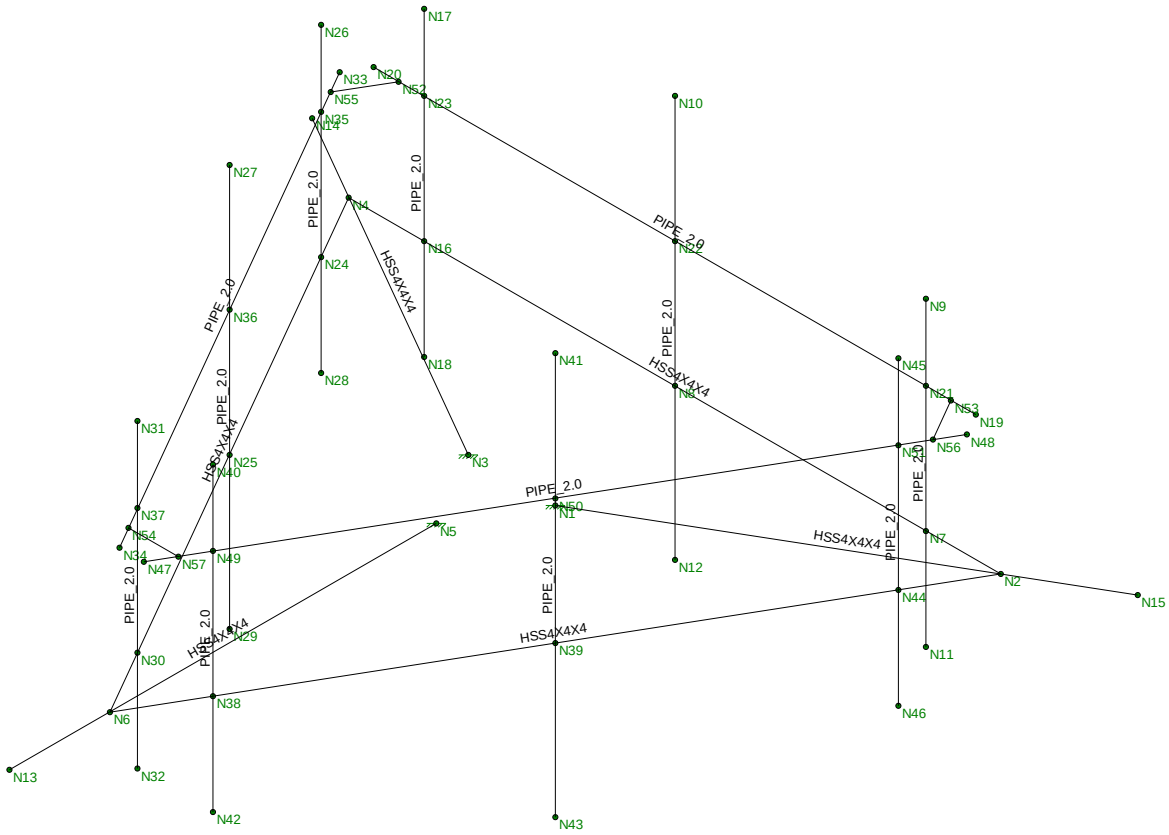
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2783$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2581$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 84$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 84$ lbs



Envelope Only Solution

Centek		
TJL	CT1029 - Mount	May 20, 2021 at 1:49 PM
16071.09	Member Framing	Mount_8.r3d

(Global) Model Settings

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

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

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4X4X4	Beam	Tube	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz	HSS4X4X4	Beam	Pipe	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
3	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Handrai	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Outrigger	8.5			Lbyy						Lateral
2	M2	Outrigger	8.5			Lbyy						Lateral
3	M3	Outrigger	8.5			Lbyy						Lateral
4	M4	Horz	12.99			Lbyy						Lateral
5	M5	Horz	12.99			Lbyy						Lateral
6	M6	Horz	12.99			Lbyy						Lateral
7	M9	Antenna Mast	8			Lbyy						Lateral
8	M16	Antenna Mast	6			Lbyy						Lateral
9	M18	Antenna Mast	6			Lbyy						Lateral
10	M13	Handrai	12			Lbyy						Lateral
11	M11	Antenna Mast	8			Lbyy						Lateral
12	M12	Antenna Mast	6			Lbyy						Lateral
13	M13A	Antenna Mast	6			Lbyy						Lateral
14	M14	Handrai	12			Lbyy						Lateral
15	M15	Antenna Mast	8			Lbyy						Lateral
16	M16A	Antenna Mast	6			Lbyy						Lateral
17	M17	Antenna Mast	6			Lbyy						Lateral
18	M18A	Handrai	12			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N15			Outrigger	Beam	Tube	A500 Gr.46	Typical
2	M2	N3	N14			Outrigger	Beam	Tube	A500 Gr.46	Typical
3	M3	N5	N13			Outrigger	Beam	Tube	A500 Gr.46	Typical
4	M4	N4	N2			Horz	Beam	Pipe	A500 Gr.46	Typical
5	M5	N6	N4			Horz	Beam	Pipe	A500 Gr.46	Typical
6	M6	N2	N6			Horz	Beam	Pipe	A500 Gr.46	Typical
7	M9	N12	N10			Antenna Mast	Column	Pipe	A53 Grade B	Typical
8	M16	N9	N11			Antenna Mast	Column	Pipe	A53 Grade B	Typical
9	M18	N17	N18			Antenna Mast	Column	Pipe	A53 Grade B	Typical
10	M13	N20	N19			Handrai	Beam	Pipe	A53 Grade B	Typical
11	M11	N29	N27			Antenna Mast	Column	Pipe	A53 Grade B	Typical
12	M12	N26	N28			Antenna Mast	Column	Pipe	A53 Grade B	Typical
13	M13A	N31	N32			Antenna Mast	Column	Pipe	A53 Grade B	Typical
14	M14	N34	N33			Handrai	Beam	Pipe	A53 Grade B	Typical
15	M15	N43	N41			Antenna Mast	Column	Pipe	A53 Grade B	Typical
16	M16A	N40	N42			Antenna Mast	Column	Pipe	A53 Grade B	Typical
17	M17	N45	N46			Antenna Mast	Column	Pipe	A53 Grade B	Typical
18	M18A	N48	N47			Handrai	Beam	Pipe	A53 Grade B	Typical
19	M19	N55	N52			RIGID	None	None	RIGID	Typical
20	M20	N53	N56			RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
21	M21	N54	N57			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
1	N1	0.866025	0	-.5	0	
2	N2	6.495191	0	-3.75	0	
3	N3	-0.866025	0	-.5	0	
4	N4	-6.495191	0	-3.75	0	
5	N5	0.	0	1	0	
6	N6	0.	0	7.5	0	
7	N7	5	0	-3.75	0	
8	N8	0	0	-3.75	0	
9	N9	5	4	-3.75	0	
10	N10	0	5	-3.75	0	
11	N11	5	-2	-3.75	0	
12	N12	0	-3	-3.75	0	
13	N13	0.	0	9.5	0	
14	N14	-8.227241	0	-4.75	0	
15	N15	8.227241	0	-4.75	0	
16	N16	-5	0	-3.75	0	
17	N17	-5	4	-3.75	0	
18	N18	-5	-2	-3.75	0	
19	N19	6	2.5	-3.75	0	
20	N20	-6	2.5	-3.75	0	
21	N21	5	2.5	-3.75	0	
22	N22	0	2.5	-3.75	0	
23	N23	-5	2.5	-3.75	0	
24	N24	-5.747595	0	-2.455127	0	
25	N25	-3.247595	0	1.875	0	
26	N26	-5.747595	4	-2.455127	0	
27	N27	-3.247595	5	1.875	0	
28	N28	-5.747595	-2	-2.455127	0	
29	N29	-3.247595	-3	1.875	0	
30	N30	-0.747595	0	6.205127	0	
31	N31	-0.747595	4	6.205127	0	
32	N32	-0.747595	-2	6.205127	0	
33	N33	-6.247595	2.5	-3.321152	0	
34	N34	-0.247595	2.5	7.071152	0	
35	N35	-5.747595	2.5	-2.455127	0	
36	N36	-3.247595	2.5	1.875	0	
37	N37	-0.747595	2.5	6.205127	0	
38	N38	0.747595	0	6.205127	0	
39	N39	3.247595	0	1.875	0	
40	N40	0.747595	4	6.205127	0	
41	N41	3.247595	5	1.875	0	
42	N42	0.747595	-2	6.205127	0	
43	N43	3.247595	-3	1.875	0	
44	N44	5.747595	0	-2.455127	0	
45	N45	5.747595	4	-2.455127	0	
46	N46	5.747595	-2	-2.455127	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diaphragm
47	N47	0.247595	2.5	7.071152	0	
48	N48	6.247595	2.5	-3.321152	0	
49	N49	0.747595	2.5	6.205127	0	
50	N50	3.247595	2.5	1.875	0	
51	N51	5.747595	2.5	-2.455127	0	
52	N52	-5.5	2.5	-3.75	0	
53	N53	5.5	2.5	-3.75	0	
54	N54	-0.497595	2.5	6.63814	0	
55	N55	-5.997595	2.5	-2.88814	0	
56	N56	5.997595	2.5	-2.88814	0	
57	N57	0.497595	2.5	6.63814	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N3	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N5	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Y	-.075	.5
2	M11	Y	-.075	.5
3	M15	Y	-.075	.5
4	M9	Y	-.075	7.5
5	M11	Y	-.075	7.5
6	M15	Y	-.075	7.5
7	M18	Y	-.052	.5
8	M13A	Y	-.052	.5
9	M17	Y	-.052	.5
10	M18	Y	-.052	3
11	M13A	Y	-.052	3
12	M17	Y	-.052	3
13	M16	Y	-.023	.5
14	M12	Y	-.023	.5
15	M16A	Y	-.023	.5
16	M16	Y	-.023	5.5
17	M12	Y	-.023	5.5
18	M16A	Y	-.023	5.5
19	M16	Y	-.046	%50
20	M12	Y	-.046	%50
21	M16A	Y	-.046	%50
22	M9	Y	-.074	6
23	M11	Y	-.074	6
24	M15	Y	-.074	6
25	M9	Y	-.086	%50
26	M11	Y	-.086	%50
27	M15	Y	-.086	%50

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Y	-.208	.5
2	M11	Y	-.208	.5
3	M15	Y	-.208	.5
4	M9	Y	-.208	7.5
5	M11	Y	-.208	7.5
6	M15	Y	-.208	7.5
7	M18	Y	-.074	.5
8	M13A	Y	-.074	.5
9	M17	Y	-.074	.5
10	M18	Y	-.074	3
11	M13A	Y	-.074	3
12	M17	Y	-.074	3
13	M16	Y	-.066	.5
14	M12	Y	-.066	.5
15	M16A	Y	-.066	.5
16	M16	Y	-.066	5.5
17	M12	Y	-.066	5.5
18	M16A	Y	-.066	5.5
19	M16	Y	-.058	%50
20	M12	Y	-.058	%50
21	M16A	Y	-.058	%50
22	M9	Y	-.07	6
23	M11	Y	-.07	6
24	M15	Y	-.07	6
25	M9	Y	-.084	%50
26	M11	Y	-.084	%50
27	M15	Y	-.084	%50

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	X	.046	.5
2	M9	X	.046	7.5
3	M11	X	.105	.5
4	M15	X	.105	.5
5	M11	X	.105	7.5
6	M15	X	.105	7.5
7	M18	X	.016	.5
8	M18	X	.016	3
9	M13A	X	.032	.5
10	M17	X	.032	.5
11	M13A	X	.032	3
12	M17	X	.032	3
13	M16	X	.015	.5
14	M16	X	.015	5.5
15	M12	X	.038	.5
16	M16A	X	.038	.5
17	M12	X	.038	5.5
18	M16A	X	.038	5.5
19	M16	X	.013	%50
20	M9	X	.018	6
21	M9	X	.022	%50

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	X	.118	.5
2	M9	X	.118	7.5
3	M11	X	.332	.5
4	M15	X	.332	.5
5	M11	X	.332	7.5
6	M15	X	.332	7.5
7	M18	X	.038	.5
8	M18	X	.038	3
9	M13A	X	.093	.5
10	M17	X	.093	.5
11	M13A	X	.093	3
12	M17	X	.093	3
13	M16	X	.026	.5
14	M16	X	.026	5.5
15	M12	X	.106	.5
16	M16A	X	.106	.5
17	M12	X	.106	5.5
18	M16A	X	.106	5.5
19	M16	X	.027	%50
20	M9	X	.042	6
21	M9	X	.053	%50

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Z	.105	.5
2	M9	Z	.105	7.5
3	M11	Z	.046	.5
4	M15	Z	.046	.5
5	M11	Z	.046	7.5
6	M15	Z	.046	7.5
7	M18	Z	.032	.5
8	M18	Z	.032	3
9	M13A	Z	.016	.5
10	M17	Z	.016	.5
11	M13A	Z	.016	3
12	M17	Z	.016	3
13	M16	Z	.038	.5
14	M16	Z	.038	5.5
15	M12	Z	.015	.5
16	M16A	Z	.015	.5
17	M12	Z	.015	5.5
18	M16A	Z	.015	5.5
19	M12	Z	.013	%50
20	M16A	Z	.013	%50
21	M11	Z	.018	6
22	M15	Z	.018	6
23	M11	Z	.022	%50
24	M15	Z	.022	%50

Member Point Loads (BLC 7 : Wind Z)

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

Member Point Loads (BLC 7 : Wind Z) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Z	.332	.5
2	M9	Z	.332	7.5
3	M11	Z	.118	.5
4	M15	Z	.118	.5
5	M11	Z	.118	7.5
6	M15	Z	.118	7.5
7	M18	Z	.093	.5
8	M18	Z	.093	3
9	M13A	Z	.038	.5
10	M17	Z	.038	.5
11	M13A	Z	.038	3
12	M17	Z	.038	3
13	M16	Z	.106	.5
14	M16	Z	.106	5.5
15	M12	Z	.026	.5
16	M16A	Z	.026	.5
17	M12	Z	.026	5.5
18	M16A	Z	.026	5.5
19	M12	Z	.027	%50
20	M16A	Z	.027	%50
21	M11	Z	.042	6
22	M15	Z	.042	6
23	M11	Z	.053	%50
24	M15	Z	.053	%50

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M14	X	.003	.003	0	0
2	M5	X	.003	.003	0	0
3	M18A	X	.003	.003	0	0
4	M6	X	.003	.003	0	0
5	M18	X	.003	.003	0	0
6	M9	X	.003	.003	0	0
7	M16	X	.003	.003	0	0
8	M3	X	.003	.003	0	0
9	M2	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M14	X	.01	.01	0	0
2	M5	X	.01	.01	0	0
3	M18A	X	.01	.01	0	0
4	M6	X	.01	.01	0	0
5	M18	X	.01	.01	0	0
6	M9	X	.01	.01	0	0
7	M16	X	.01	.01	0	0
8	M3	X	.01	.01	0	0
9	M2	X	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M13	Z	.003	.003	0	0
2	M4	Z	.003	.003	0	0
3	M17	Z	.003	.003	0	0
4	M15	Z	.003	.003	0	0
5	M13A	Z	.003	.003	0	0
6	M16A	Z	.003	.003	0	0
7	M11	Z	.003	.003	0	0
8	M12	Z	.003	.003	0	0
9	M2	Z	.003	.003	0	0
10	M1	Z	.003	.003	0	0
11	M18A	Z	.003	.003	0	0
12	M14	Z	.003	.003	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M13	Z	.01	.01	0	0
2	M4	Z	.01	.01	0	0
3	M17	Z	.01	.01	0	0
4	M15	Z	.01	.01	0	0
5	M13A	Z	.01	.01	0	0
6	M16A	Z	.01	.01	0	0
7	M11	Z	.01	.01	0	0
8	M12	Z	.01	.01	0	0
9	M2	Z	.01	.01	0	0
10	M1	Z	.01	.01	0	0
11	M18A	Z	.01	.01	0	0
12	M14	Z	.01	.01	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Equipment Weight	DL					27			
3	Ice Weight	LL					27			
4	Wind w/ Ice X	WLX					21	9		
5	Wind X	WLX					21	9		
6	Wind w/ Ice Z	WLZ					24	12		
7	Wind Z	WLZ					24	12		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dir...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dir...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	1.051	4	2.058	3	1.302	2	3.685	3	1.001	5	6.557	3
2		min	-2.299	2	.479	5	-1.143	4	.108	5	-.522	1	1.59	5
3	N3	max	-.272	6	1.878	6	-.264	6	3.318	3	-.051	3	-.094	2
4		min	-2.443	1	.253	2	-1.341	1	.071	5	-.895	5	-5.89	6
5	N5	max	.009	5	2.076	6	.053	3	-2.764	2	.044	4	.909	2
6		min	-.833	2	.774	2	-2.696	5	-7.608	6	-2.357	2	-.007	4
7	Totals:	max	0	5	5.833	6	0	2						
8		min	-5.568	1	2.331	5	-4.95	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
1	N1	max	0	6	0	6	0	6	0	6	0	6	0	6
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	.004	5	-.088	5	.01	4	4.138e-03	5	3.128e-03	2	-2.034e-03	5
4		min	-.056	1	-.638	3	-.102	2	-1.949e-03	3	4.575e-04	6	-6.76e-03	1
5	N3	max	0	6	0	6	0	6	0	6	0	6	0	6
6		min	0	1	0	1	0	1	0	1	0	1	0	1
7	N4	max	.001	4	.034	2	.102	1	4.366e-03	5	3.15e-03	2	3.63e-03	6
8		min	-.056	2	-.549	6	0	5	-2.087e-03	3	-2.256e-03	5	-3.126e-03	2
9	N5	max	0	6	0	6	0	6	0	6	0	6	0	6
10		min	0	1	0	1	0	1	0	1	0	1	0	1
11	N6	max	.126	2	-.23	2	.003	5	6.727e-03	4	-5.779e-06	6	4.316e-05	4
12		min	-.005	4	-.648	6	0	3	1.662e-03	2	-1.234e-03	2	-5.96e-03	2
13	N7	max	.004	5	-.058	5	.063	4	4.518e-03	5	3.447e-03	4	-9.382e-04	6
14		min	-.056	1	-.586	3	-.055	2	-1.558e-03	3	4.49e-04	3	-4.777e-03	1
15	N8	max	.003	4	-.045	5	.211	4	4.494e-03	5	2.974e-04	1	-1.38e-05	6
16		min	-.055	2	-.576	3	.002	2	-1.461e-03	3	-6.749e-05	4	-2.672e-03	2
17	N9	max	.255	2	-.058	5	.495	4	1.034e-02	4	6.589e-03	5	9.86e-04	4
18		min	-.015	4	-.586	3	-.012	2	5.325e-04	3	5.706e-04	3	-6.191e-03	2
19	N10	max	.433	2	-.045	5	1.696	5	3.582e-02	4	1.479e-05	6	-3.877e-06	6
20		min	0	6	-.577	3	-.024	3	-2.151e-04	3	-1.11e-03	1	-1.07e-02	2
21	N11	max	-.022	6	-.058	5	.034	6	2.628e-03	5	3.447e-03	4	-9.373e-04	6
22		min	-.158	1	-.586	3	-.05	2	-1.556e-03	3	4.49e-04	3	-4.101e-03	1
23	N12	max	.021	1	-.045	5	.486	4	-5.53e-04	2	2.974e-04	1	3.889e-03	1
24		min	0	6	-.577	3	.022	2	-1.212e-02	4	-6.749e-05	4	-3.251e-05	5
25	N13	max	.097	1	-.27	2	.003	5	6.741e-03	4	-5.779e-06	6	4.316e-05	4
26		min	-.007	4	-.773	4	0	3	1.673e-03	2	-1.217e-03	2	-5.96e-03	2
27	N14	max	.028	4	.085	2	.167	2	4.36e-03	5	3.142e-03	2	3.642e-03	6
28		min	-.093	2	-.635	6	-.046	5	-2.095e-03	3	-2.241e-03	5	-3.117e-03	2
29	N15	max	-.005	6	-.081	5	-.008	6	4.133e-03	5	3.128e-03	2	-2.044e-03	5
30		min	-.093	2	-.756	3	-.167	2	-1.956e-03	3	4.547e-04	6	-6.773e-03	1
31	N16	max	.002	4	-.029	2	.056	4	5.013e-03	5	2.09e-03	2	1.214e-03	4
32		min	-.056	2	-.511	6	.009	3	-1.738e-03	3	-3.536e-03	4	-3.732e-03	2
33	N17	max	.267	1	-.029	2	.488	4	1.008e-02	4	4.099e-03	1	-7.2e-04	6
34		min	.013	6	-.511	6	.009	3	-3.23e-05	2	-6.818e-03	5	-6.912e-03	1
35	N18	max	.031	4	-.029	2	.088	1	5.013e-03	5	2.09e-03	2	1.214e-03	4
36		min	-.141	2	-.511	6	-.065	5	-1.738e-03	3	-3.536e-03	4	-3.521e-03	2
37	N19	max	.145	2	-.046	5	.242	5	6.43e-03	4	5.986e-03	1	9.457e-04	4
38		min	0	6	-.596	3	-.088	2	-3.115e-04	2	1.098e-03	3	-6.556e-03	2

Envelope Joint Displacements (Continued)

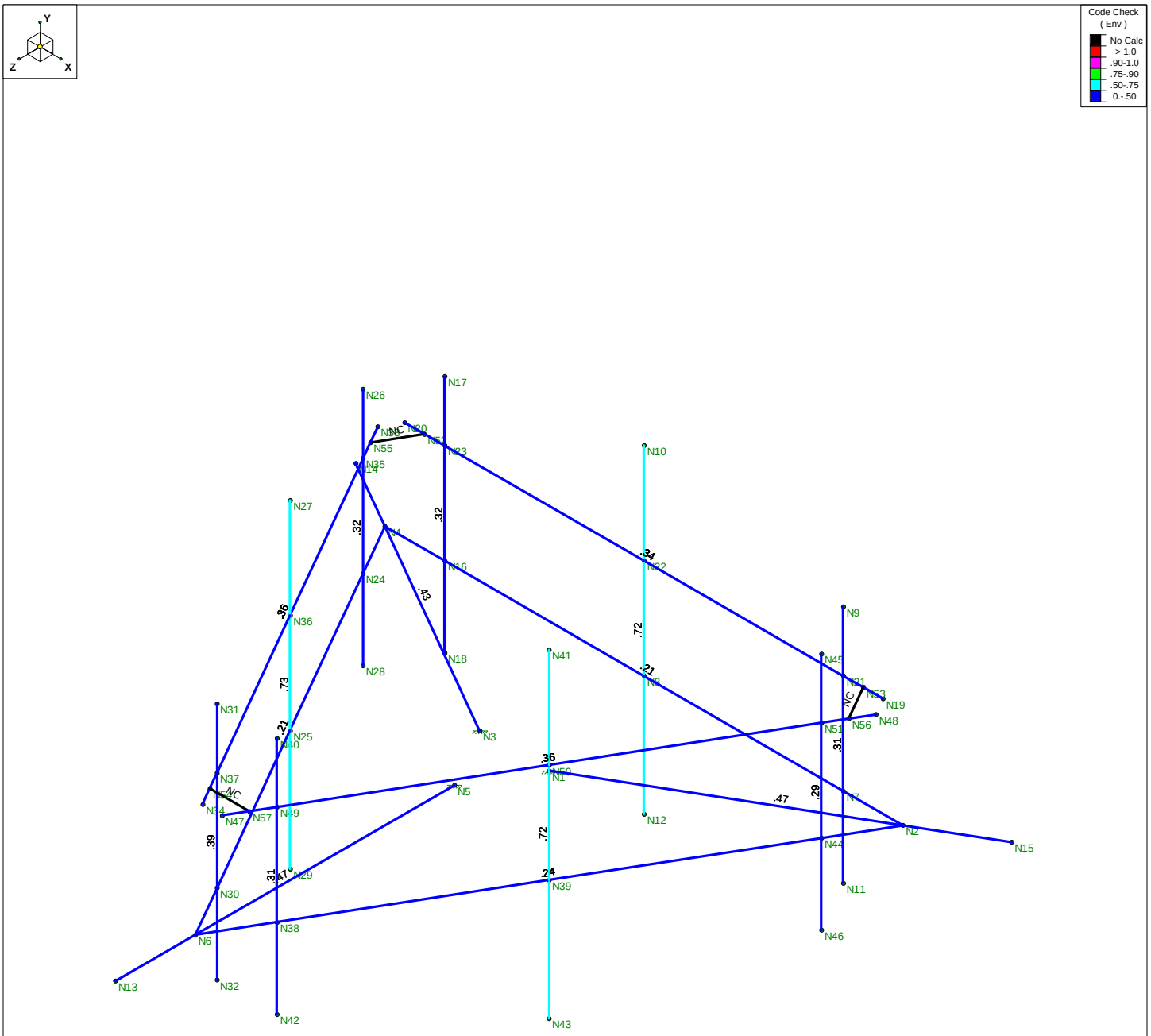
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
39	N20	max	.145	2	.054	2	.235	5	6.439e-03	4	5.727e-03	1	-7.489e-04	6
40		min	0	6	-.502	6	.013	3	5.127e-04	3	-5.893e-03	4	-7.274e-03	1
41	N21	max	.145	2	-.058	5	.312	5	9.495e-03	4	6.589e-03	5	9.859e-04	4
42		min	0	6	-.586	3	-.022	2	5.322e-04	3	5.706e-04	3	-5.895e-03	2
43	N22	max	.145	2	-.045	5	.705	5	2.521e-02	4	1.479e-05	6	-3.85e-06	6
44		min	0	6	-.577	3	-.018	3	-2.136e-04	3	-1.11e-03	1	-6.443e-03	2
45	N23	max	.145	2	-.029	2	.309	5	9.337e-03	4	4.099e-03	1	-7.194e-04	6
46		min	0	6	-.511	6	0	3	-3.229e-05	2	-6.818e-03	5	-6.52e-03	1
47	N24	max	.006	1	.02	2	.067	2	5.077e-03	5	4.441e-03	1	2.197e-03	4
48		min	-.033	5	-.53	6	.005	6	-8.748e-04	1	-1.979e-03	5	-3.735e-03	2
49	N25	max	.202	1	-.058	2	.042	5	4.041e-03	4	1.58e-03	2	2.541e-03	4
50		min	-.072	5	-.596	6	-.045	1	-1.235e-03	2	1.355e-04	6	-4.134e-03	2
51	N26	max	.415	1	.02	2	.377	4	7.054e-03	4	6.99e-03	2	1.162e-03	5
52		min	-.106	5	-.53	6	.013	3	-4.203e-04	2	-4.749e-03	4	-1.002e-02	1
53	N27	max	1.53	2	-.059	2	.675	4	1.355e-02	4	2.464e-03	1	4.896e-03	4
54		min	-.319	4	-.597	6	-.384	2	-7.28e-03	1	3.652e-04	6	-3.231e-02	1
55	N28	max	.043	6	.02	2	.088	1	4.401e-03	5	4.441e-03	1	2.196e-03	4
56		min	-.049	2	-.53	6	-.089	5	-8.745e-04	1	-1.979e-03	5	-1.845e-03	2
57	N29	max	.489	1	-.058	2	.073	5	4.02e-04	3	1.58e-03	2	1.246e-02	1
58		min	.013	5	-.596	6	-.028	3	-2.606e-03	5	1.355e-04	6	1.659e-03	6
59	N30	max	.155	1	-.159	2	.007	5	5.104e-03	4	8.522e-04	5	1.151e-03	6
60		min	-.012	5	-.599	6	-.017	1	3.656e-04	2	-2.155e-03	1	-6.055e-03	2
61	N31	max	.622	1	-.158	2	.325	5	6.627e-03	5	1.328e-03	4	4.814e-04	5
62		min	-.017	5	-.599	6	-.096	1	-2.453e-03	1	-5.656e-03	2	-9.944e-03	1
63	N32	max	.027	6	-.159	2	-.026	2	4.892e-03	4	8.522e-04	5	1.151e-03	6
64		min	.01	2	-.599	6	-.112	4	3.656e-04	2	-2.155e-03	1	-6.054e-03	2
65	N33	max	.174	2	.072	2	.218	5	6.439e-03	4	5.724e-03	1	-7.494e-04	6
66		min	-.027	4	-.508	6	.016	3	5.12e-04	3	-5.895e-03	4	-7.274e-03	1
67	N34	max	.387	2	-.192	2	.205	5	6.192e-03	5	6.957e-05	4	3.11e-05	4
68		min	-.004	4	-.607	6	-.017	2	-7.371e-04	3	-5.75e-03	1	-6.589e-03	2
69	N35	max	.237	2	.02	2	.251	5	6.758e-03	4	6.99e-03	2	1.162e-03	5
70		min	-.085	4	-.53	6	.01	3	-4.202e-04	2	-4.749e-03	4	-9.182e-03	1
71	N36	max	.644	2	-.059	2	.301	4	9.279e-03	4	2.464e-03	1	4.881e-03	4
72		min	-.172	4	-.596	6	-.166	2	-7.259e-03	1	3.652e-04	6	-2.171e-02	2
73	N37	max	.446	2	-.158	2	.207	5	6.235e-03	5	1.328e-03	4	4.812e-04	5
74		min	-.009	4	-.599	6	-.052	1	-2.452e-03	1	-5.656e-03	2	-9.204e-03	1
75	N38	max	.155	2	-.269	2	.017	2	5.032e-03	4	-1.28e-04	6	-8.922e-04	5
76		min	0	6	-.599	6	.001	6	9.602e-04	2	-2.11e-03	2	-6.687e-03	1
77	N39	max	.199	2	-.312	5	.047	5	3.972e-03	4	1.604e-03	2	-1.649e-03	6
78		min	.012	6	-.61	3	.008	6	1.065e-03	3	-6.986e-04	5	-5.477e-03	1
79	N40	max	.626	2	-.27	2	.321	5	6.455e-03	5	-4.342e-04	6	-9.25e-06	6
80		min	.002	6	-.599	6	.005	3	-3.254e-04	3	-5.85e-03	1	-1.011e-02	2
81	N41	max	1.559	1	-.313	5	.673	4	1.343e-02	4	2.386e-03	1	-1.276e-03	6
82		min	.089	6	-.611	3	.092	3	1.596e-03	3	-1.818e-03	4	-3.262e-02	1
83	N42	max	.032	2	-.269	2	-.006	2	4.356e-03	4	-1.28e-04	6	-8.919e-04	5
84		min	-.027	6	-.599	6	-.1	4	9.599e-04	2	-2.11e-03	2	-4.797e-03	1
85	N43	max	.438	2	-.312	5	.08	5	1.974e-03	1	1.604e-03	2	1.112e-02	2
86		min	-.048	6	-.61	3	-.03	3	-2.673e-03	5	-6.986e-04	5	-2.457e-03	4
87	N44	max	.036	5	-.143	5	.028	5	4.986e-03	5	4.348e-03	2	-1.911e-03	5
88		min	.001	3	-.596	3	-.068	1	3.374e-04	3	3.291e-04	6	-6.108e-03	1
89	N45	max	.402	2	-.144	5	.384	4	7.128e-03	4	7.365e-03	1	4.291e-04	6
90		min	.011	6	-.597	3	-.055	2	3.675e-04	3	1.12e-03	6	-9.047e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
91	N46	max	-.01	5	-.143	5	-.019	3	4.774e-03	5	4.348e-03	2	-1.911e-03	5
92		min	-.142	1	-.596	3	-.09	1	3.373e-04	3	3.291e-04	6	-6.107e-03	1
93	N47	max	.387	2	-.231	2	.204	5	6.192e-03	5	7.287e-05	4	3.194e-05	4
94		min	-.004	4	-.607	6	.004	3	-7.371e-04	3	-5.75e-03	1	-6.589e-03	2
95	N48	max	.176	2	-.076	5	.225	5	6.429e-03	4	5.984e-03	1	9.462e-04	4
96		min	.006	6	-.599	3	-.105	2	-3.121e-04	2	1.098e-03	3	-6.555e-03	2
97	N49	max	.447	1	-.27	2	.206	5	6.159e-03	5	-4.342e-04	6	-9.245e-06	6
98		min	-.001	5	-.599	6	.011	3	-3.252e-04	3	-5.85e-03	1	-9.269e-03	2
99	N50	max	.663	1	-.313	5	.302	4	9.163e-03	4	2.386e-03	1	-1.267e-03	6
100		min	.051	6	-.611	3	.045	3	1.585e-03	3	-1.818e-03	4	-2.201e-02	1
101	N51	max	.242	1	-.144	5	.257	5	6.735e-03	4	7.365e-03	1	4.288e-04	6
102		min	.018	6	-.597	3	-.067	2	3.672e-04	3	1.12e-03	6	-8.308e-03	2
103	N52	max	.145	2	.011	2	.271	5	6.439e-03	4	5.727e-03	1	-7.498e-04	6
104		min	0	6	-.506	6	.007	3	5.127e-04	3	-5.896e-03	4	-7.275e-03	1
105	N53	max	.145	2	-.051	5	.275	5	6.43e-03	4	5.986e-03	1	9.466e-04	4
106		min	0	6	-.591	3	-.052	2	-3.115e-04	2	1.098e-03	3	-6.555e-03	2
107	N54	max	.417	2	-.173	2	.205	5	6.192e-03	5	7.122e-05	4	3.152e-05	4
108		min	-.005	4	-.603	6	-.035	1	-7.378e-04	3	-5.752e-03	1	-6.589e-03	2
109	N55	max	.204	2	.046	2	.236	5	6.439e-03	4	5.727e-03	1	-7.498e-04	6
110		min	-.058	4	-.52	6	.013	3	5.127e-04	3	-5.896e-03	4	-7.275e-03	1
111	N56	max	.207	2	-.112	5	.242	5	6.43e-03	4	5.986e-03	1	9.466e-04	4
112		min	.012	6	-.598	3	-.088	2	-3.115e-04	2	1.098e-03	3	-6.555e-03	2
113	N57	max	.417	2	-.252	2	.204	5	6.192e-03	5	7.122e-05	4	3.152e-05	4
114		min	-.005	4	-.603	6	.007	3	-7.378e-04	3	-5.752e-03	1	-6.589e-03	2

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	Dir	...	phi*...	phi*...	phi*...	phi*...	Cb	Eqn
1	M11	PIPE_2.0	.730	3	1	.076	5.5		1	14.916	32.13	1.872	1.872	1.4..	H1-...
2	M15	PIPE_2.0	.724	3	1	.074	5.5		1	14.916	32.13	1.872	1.872	1.4..	H1-...
3	M9	PIPE_2.0	.722	3	4	.082	3		1	14.916	32.13	1.872	1.872	3.91	H1-...
4	M3	HSS4X4X4	.472	0	6	.093	0	y	1	103....	139....	16.181	16.181	1.9..	H1-...
5	M1	HSS4X4X4	.470	0	3	.071	0	y	1	103....	139....	16.181	16.181	1.9..	H1-...
6	M2	HSS4X4X4	.428	0	6	.073	0	y	4	103....	139....	16.181	16.181	1.8..	H1-...
7	M13A	PIPE_2.0	.389	4	1	.133	3....		1	20.867	32.13	1.872	1.872	2.4..	H1-...
8	M18A	PIPE_2.0	.364	11.5	1	.475	11		2	6.831	32.13	1.872	1.872	1.7..	H3-6
9	M14	PIPE_2.0	.364	.5	1	.470	.5		1	6.831	32.13	1.872	1.872	1.7..	H3-6
10	M13	PIPE_2.0	.337	11	5	.420	11.5		4	6.831	32.13	1.872	1.872	2.32	H3-6
11	M12	PIPE_2.0	.319	4	1	.105	4		4	20.867	32.13	1.872	1.872	1.9..	H1-...
12	M18	PIPE_2.0	.315	4	4	.113	3....		4	20.867	32.13	1.872	1.872	1.9..	H1-...
13	M16A	PIPE_2.0	.307	4	2	.122	1.5		1	20.867	32.13	1.872	1.872	1.8..	H1-...
14	M16	PIPE_2.0	.305	4	4	.100	1.5		4	20.867	32.13	1.872	1.872	1.8..	H1-...
15	M17	PIPE_2.0	.291	4	4	.103	4		4	20.867	32.13	1.872	1.872	1.6..	H1-...
16	M6	HSS4X4X4	.241	0	1	.042	12...	y	3	68.852	139....	16.181	16.181	2.6..	H1-...
17	M4	HSS4X4X4	.207	12...	6	.057	0	z	4	68.852	139....	16.181	16.181	2.3..	H1-...
18	M5	HSS4X4X4	.205	0	4	.061	0	z	1	68.852	139....	16.181	16.181	2.6..	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT1029 - Mount	May 20, 2021 at 1:49 PM
16071.09	Unity Check	Mount_8.r3d

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: CT11603E

CT603/Atlas Container WT
119 Empire Avenue
Meriden, Connecticut 06450

June 28, 2021

EBI Project Number: 6221003242

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**54.11%**

June 28, 2021

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

Emissions Analysis for Site: CT11603E - CT603/Atlas Container WT

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **119 Empire Avenue** 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 119 Empire Avenue 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 power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

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

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

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

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

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

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

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

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

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

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

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

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

13) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s) in Sector B, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 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.

14) The antenna mounting height centerline of the proposed antennas is 115 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	115 feet	Height (AGL):	115 feet	Height (AGL):	115 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A1 MPE %:	**11.00%**	Antenna B1 MPE %:	**11.00%**	Antenna C1 MPE %:	**11.00%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	115 feet	Height (AGL):	115 feet	Height (AGL):	115 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	**5.54%**	Antenna B2 MPE %:	**5.54%**	Antenna C2 MPE %:	**5.54%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	115 feet	Height (AGL):	115 feet	Height (AGL):	115 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A3 MPE %:	**1.41%**	Antenna B3 MPE %:	**1.41%**	Antenna C3 MPE %:	**1.41%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	17.95%
Nextel	3.2%
Cingular	6.63%
Sprint	5.19%
Verizon	20.96%
Clearwire	0.18%
Site Total MPE % :	54.11%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	17.95%
T-Mobile Sector B Total:	17.95%
T-Mobile Sector C Total:	17.95%
Site Total MPE % :	54.11%

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 1C & 2C Traffic	1	11044.63	115.0	33.42	2500 MHz LTE 1C & 2C Traffic	1000	3.34%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	115.0	3.25	2500 MHz LTE 1C & 2C Broadcast	1000	0.33%
T-Mobile 2500 MHz NR Traffic	1	22089.26	115.0	66.84	2500 MHz NR Traffic	1000	6.68%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	115.0	6.50	2500 MHz NR Broadcast	1000	0.65%
T-Mobile 600 MHz LTE	2	591.73	115.0	3.58	600 MHz LTE	400	0.90%
T-Mobile 600 MHz NR	1	1577.94	115.0	4.77	600 MHz NR	400	1.19%
T-Mobile 700 MHz LTE	2	695.22	115.0	4.21	700 MHz LTE	467	0.90%
T-Mobile 1900 MHz GSM	4	1052.26	115.0	12.74	1900 MHz GSM	1000	1.27%
T-Mobile 1900 MHz LTE	2	2104.51	115.0	12.74	1900 MHz LTE	1000	1.27%
T-Mobile 2100 MHz LTE	2	2334.27	115.0	14.13	2100 MHz LTE	1000	1.41%
						Total:	**17.95%**

• 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:	17.95%
Sector B:	17.95%
Sector C:	17.95%
T-Mobile Maximum MPE % (Sector A):	17.95%
Site Total:	54.11%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **54.11%** 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.