INDUSTRIAL AVE,
TE 3
AHWAH NJ 07430

ONE: 201.684.0055
X: 201.684.0066

Transcend Wireless

March 25, 2022

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

RE: Notice of Exempt Modification
27 Maynard Road, Salem, CT 06420
Latitude: 41.4630305600
Longitude: -72.2465972300
T-Mobile Site#: CT11451G - Anchor

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 82-foot level of the existing 100-foot lattice tower at 27 Maynard Road, Salem, CT. The 100-foot lattice tower and property are owned and operated by Salem Telecom LLC. T-Mobile now intends to remove and replace (3) antennas and add an additional (3) antennas to the 82-foot level of the tower. These antennas will support 5G services.

Planned Modifications:
Tower:
Install New:
(3) Ericsson AIR 6419 B41 Antennas
(3) Commscope VV-65A-R1 Antennas
(3) Radio 4460 B25 B66
(2) 6x24 Hybrid Cables

To Be Removed:
(3) APXV16DWV Antennas
(6) RRUS11
All existing coax cables

To Remain:
(3) RFS APXVAARR24 Antennas
(3) Radio 4449 B12 B71

Ground:
Install (1) 6160 Power Enclosure
Install (1) B160 Battery Cabinet
Relocate Existing Generator

This facility was approved by the Siting Council for T-Mobile use in TS-T-Mobile-121-160721 dated September 6, 2016. The proposed modification complies with the original approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman Ed Chmielewski, Elected Official, and Justin LaFountain, Town Planner, as well as the tower and property owner.

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

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

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

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

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

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

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

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

Sincerely,

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

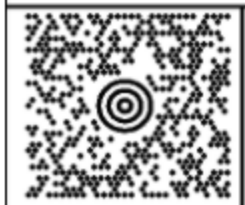
Attachments
cc: Ed Chmielewski - First Selectman of Salem
Justin LaFountain - Town Planner
Salem Telecom LLC - Property Owner

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS

1 OF 1

SHIP TO:
JUSTIN LAFOUNTAIN
270 HARTFORD ROAD
SALEM CT 06420



CT 063 0-01

UPS GROUND

TRACKING #: 1Z V25 742 03 9177 0562

BILLING: P/P

Reference #1: CT11451G

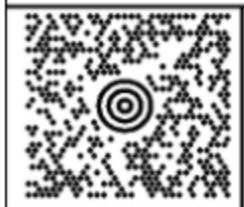
XOL 22.03.13 NV45 13.0A 03/2022*

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS

1 OF 1

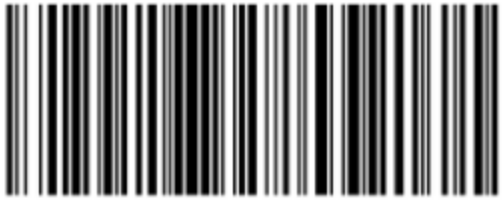
SHIP TO:
FIRST SELECTMAN ED CHMIELEWSKI
270 HARTFORD ROAD
SALEM CT 06420



CT 063 0-01

UPS GROUND

TRACKING #: 1Z V25 742 03 9394 4559



BILLING: P/P

Reference #1: CT11451G

XOL 22.03.13 NV45 13.0A 03/2022*

Hello, your package has been delivered.

Delivery Date: Wednesday, 03/23/2022

Delivery Time: 12:35 PM

Left At: OFFICE

Signed by: EISENBERG

TRANSCEND WIRELESS

Tracking Number:	1ZV257420393944559
Ship To:	FIRST SELECTMAN ED CHMIELEWSKI 270 HARTFORD ROAD SALEM, CT 06420 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11451G

Hello, your package has been delivered.

Delivery Date: Wednesday, 03/23/2022

Delivery Time: 12:35 PM

Left At: OFFICE

Signed by: EISENBERG

TRANSCEND WIRELESS

Tracking Number:	1ZV257420391770562
Ship To:	JUSTIN LAFOUNTAIN 270 HARTFORD ROAD SALEM, CT 06420 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11451G

Hello, your package has been delivered.

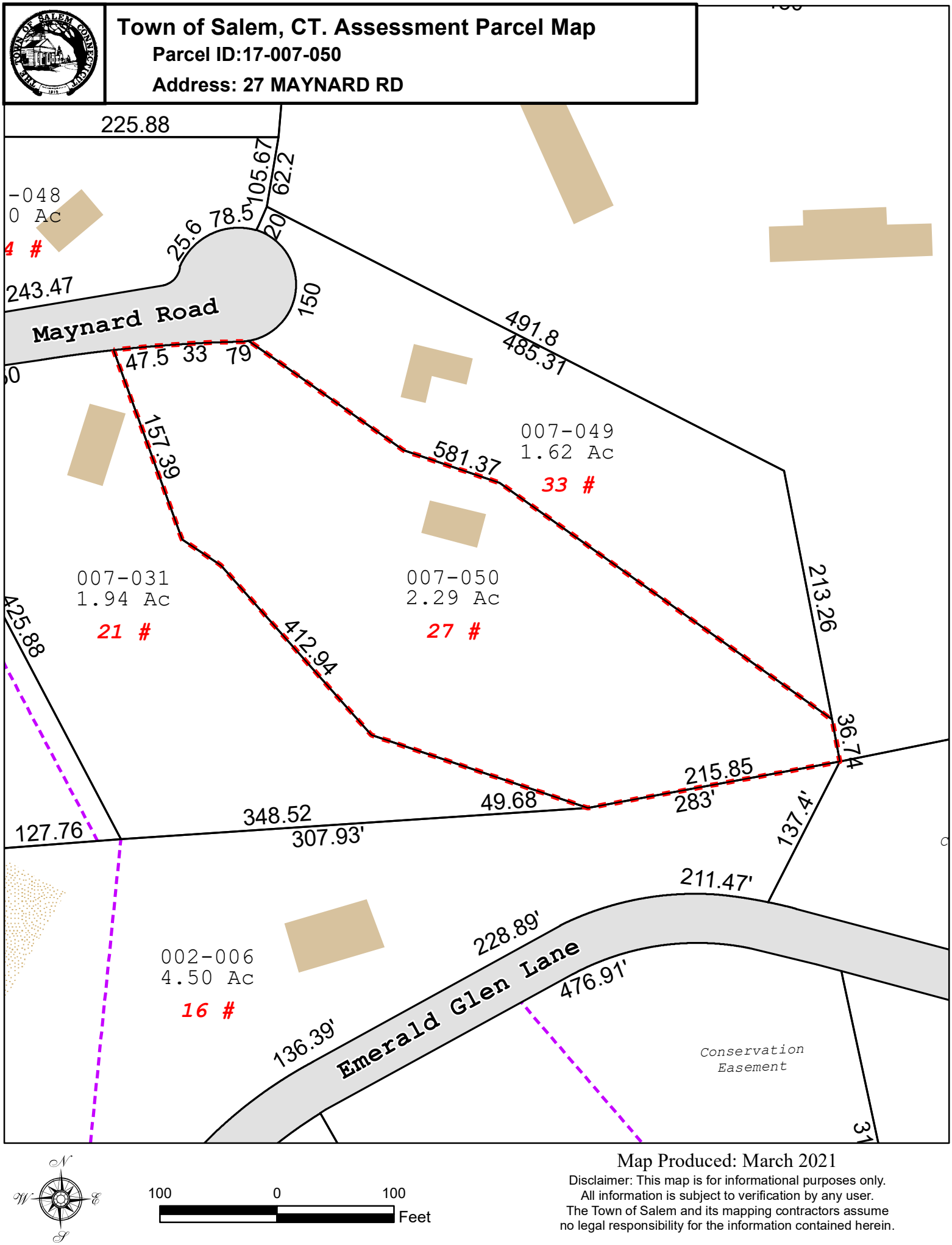
Delivery Date: Wednesday, 03/23/2022

Delivery Time: 2:11 PM

Left At: GARAGE

TRANSCEND WIRELESS

Tracking Number:	1ZV257420396867904
Ship To:	SALEM TELECOM 226 LAMBTOWN ROAD LEDYARD, CT 06339 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11451G



Map Produced: March 2021

Disclaimer: This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Salem and its mapping contractors assume
no legal responsibility for the information contained herein.

Town of Salem, CT

Property Listing Report

Map Block Lot	17-007-050	Building #	1	PID	559	Account	587

Property Information

Property Location	27 MAYNARD RD
Owner	SALEM TELECOM LLC
Co-Owner	na
Mailing Address	226 LAMBTOWN RD LEDYARD CT 06339-0000
Land Use	101 Single Family
Land Class	R
Zoning Code	RA
Census Tract	7151

Neighborhood	1105
Acreage	2.29
Utilities	UNKNOWN
Lot Setting/Desc	UNKNOWN UNKNOWN
Book / Page	0140/0183
Additional Info	

Photo

Sketch

Primary Construction Details

Year Built	2004
Building Desc.	Single Family
Building Style	Cape Cod
Building Grade	C+
Stories	1.5
Occupancy	1.00
Exterior Walls	Vinyl Siding
Exterior Walls 2	NA
Roof Style	Gable Or Hip
Roof Cover	Asphalt Shingl
Interior Walls	Drywall/Sheet
Interior Walls 2	NA
Interior Floors 1	Quarry Tile
Interior Floors 2	Carpet

Heating Fuel	Gas
Heating Type	Forced Air
AC Type	Heat Pump
Bedrooms	02
Full Bathrooms	2
Half Bathrooms	1
Extra Fixtures	0
Total Rooms	4
Bath Style	Modern
Kitchen Style	Modern
Rec Rm Area	NA
Rec Rm Quality	NA
Bsmt Gar	NA
Fireplaces	NA

(*Industrial / Commercial Details)

Building Use	Residential
Building Condition	G
Sprinkler %	NA
Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA
Foundation	NA

Report Created On 3/22/2022

Town of Salem, CT

Property Listing Report

Map Block Lot	17-007-050	Building #	1	PID	559	Account	587

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	172200	120500
Extras	2200	1500
Improvements		
Outbuildings	2200	1500
Land	280600	196400
Total	457200	319900

Outbuilding and Extra Features

Type	Description
Shed Frame	120 S.F.
Generator	1 UNITS
Gas Fireplace/Vent free	1 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	681	681
Attached Garage	624	0
Finished Half Story	1305	653
First Floor	681	681
Attached Garage	624	0
Finished Half Story	1305	653
Total Area	2610	1334

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
SALEM TELECOM LLC	0140/0183	2002-08-29	0
SPIEGEL JOHN M & NANCY	0066/0240	1990-06-08	75000

Report Created On 3/22/2022

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

September 6, 2016

Kyle Richers
Real Estate Consultant
Transcend Wireless
10 Industrial Avenue, Suite 3
Mahwah, NJ 07430

RE: **TS-T-MOBILE-121-160721** - T-Mobile Northeast LLC request for an order to approve tower sharing at an existing telecommunications facility located at 27 Maynard Road, Salem, Connecticut.

Dear Mr. Richers:

At a public meeting held on September 1, 2016, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the following conditions:

1. Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;
2. Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65;
3. Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;
4. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by T-Mobile Northeast LLC shall be removed within 60 days of the date the antenna ceased to function;
5. The validity of this action shall expire one year from the date of this letter; and
6. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and applies only to this request for tower sharing dated July 8, 2016. This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower. Any deviation from the approved tower sharing request is enforceable under the provisions of Connecticut General Statutes § 16-50u.

The proposed shared use is to be implemented as specified in your letter dated July 8, 2016, including the placement of all necessary equipment and shelters within the tower compound.

Please be advised that the validity of this action shall expire one year from the date of this letter.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein

Robert Stein
Chairman

RS/FOC/lm

c: The Honorable Kevin T. Lyden, First Selectman, Town of Salem
Richard Serra, Town Planner, Town of Salem
Salem Telecom LLC

SITE NAME: CT11451G
SITE ID: CT11451G
27 MAYNARD RD
SALEM, CT 06420

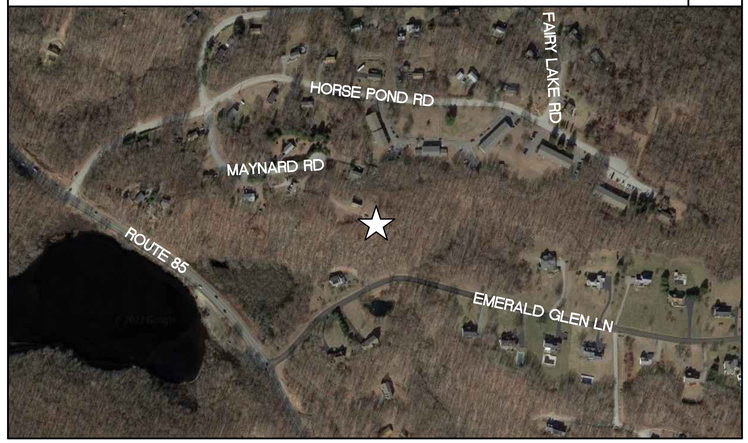
T-MOBILE A/L TEMPLATE (PROVIDED BY RFDS)
67D5998E_1xAIR+1OP+1QP

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67D5D998E MUAC

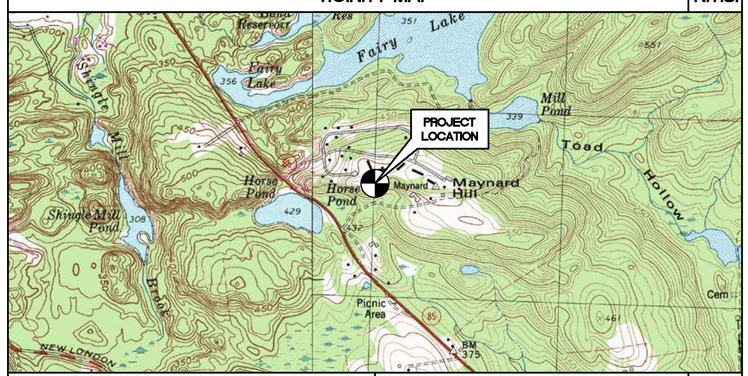
GENERAL NOTES

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. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
9. 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.
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

SITE LOCATION MAP — N.T.S.



VICINITY MAP — N.T.S.



COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH.

SITE COORDINATES: LATITUDE: 41° 47' 52.24" N
LONGITUDE: 72° 23' 12.56" W
GROUND ELEVATION: ±765' AMSL

NORTH

PROJECT SUMMARY

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

1. REMOVE EXISTING COAX CABLES
2. REMOVE EXISTING APX16DWV-16DWV-S-E-A20 ANTENNAS (1) PER SECTOR, TOTAL OF (3)
3. REMOVE EXISTING RRUS11 B2, TYP. (1) PER SECTOR. TOTAL OF (3)
4. REMOVE EXISTING RRUS11 B4, TYP. (1) PER SECTOR. TOTAL OF (3)
5. RELOCATE EXISTING APXVAARR24_43-U-NA20 ANTENNA, TYP. (1) PER SECTOR. TOTAL OF (3)
6. RELOCATE EXISTING RADIO 4449 B71+B12, TYP. (1) PER SECTOR. TOTAL OF (3)
7. RELOCATE EXISTING GENERATOR TO ACCOMMODATE THE PROPOSED (2) CABINETS
8. INSTALL (2) 6x24 HYBRID CABLES
9. INSTALL ERICSSON: AIR6419 B41 ANTENNA, TYP. (1) PER SECTOR. TOTAL OF (3)
10. INSTALL COMMSCOPE: VV-65A-R1 ANTENNA, TYP. (1) PER SECTOR. TOTAL OF (3)
11. INSTALL ERICSSON: RADIO 4460 B25+B66, TYP. (1) PER SECTOR. TOTAL OF (3)
12. INSTALL T-MOBILE 6160 POWER ENCLOSURE
13. INSTALL T-MOBILE B160 BATTERY CABINET
14. INSTALL NEW 100A CIRCUIT BREAKER TO SERVE NEW EQUIPMENT.
15. DOWNGRADE EXISTING 125A CIRCUIT BREAKER TO 100A CIRCUIT BREAKER TO SERVE EXISTING EQUIPMENT CABINET

PROJECT INFORMATION

SITE NAME:	CT11451G
SITE ID:	CT11451G
SITE ADDRESS:	27 MAYNARD RD SALEM, CT 06420
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 ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°-47'-52.24" N LONGITUDE: 72°-23'-12.56" W GROUND ELEVATION: 765'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHEET. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES AND SPECIFICATIONS, ANT. SCHEDULE	0
C-1	COMPOUND PLAN, EQUIPMENT PLANS AND ELEVATION	0
C-2	ANTENNA PLANS AND ELEVATIONS	0
C-3	TYPICAL EQUIPMENT DETAILS	0
E-1	ELECTRICAL DIAGRAM AND CONDUIT ROUTING	0
E-2	TYPICAL ELECTRICAL DETAILS	0
E-3	ELECTRICAL SPECIFICATIONS	0

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
0	03/21/22	JLD	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile
Transcend Wireless

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

T-MOBILE NORTHEAST LLC
SITE NAME: CT11451G
SITE ID: CT11451G
27 MAYNARD RD
SALEM, CT 06420

DATE: 02/22/22
SCALE: AS NOTED
JOB NO. 22022.01

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: 105 MPH (Vasd)
  (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

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

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
8. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
9. 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.
10. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
11. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
12. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
21. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
23. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
24. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

STRUCTURAL STEEL

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

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

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED HYBRID/COAX
A1	PROPOSED	ERICSSON (AIR 6419 B41)	33 x 16 x 9	82'	30°			(2) 6x24 HYBRID CABLE
A2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	82'	30°	(E) RADIO 4449 B71+B12 (1)		
A3	PROPOSED	COMMSCOPE (VV-65A-R1)	54.7 x 12.1 x 4.6	82'	30°	(P) RADIO 4460 B25+B66 (1)		
B1	PROPOSED	ERICSSON (AIR 6419 B41)	33 x 16 x 9	82'	150°			
B2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	82'	150°	(E) RADIO 4449 B71+B12 (1)		
B3	PROPOSED	COMMSCOPE (VV-65A-R1)	54.7 x 12.1 x 4.6	82'	150°	(P) RADIO 4460 B25+B66 (1)		
C1	PROPOSED	ERICSSON (AIR 6419 B41)	33 x 16 x 9	82'	270°			
C2	EXISTING	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	82'	270°	(E) RADIO 4449 B71+B12 (1)		
C3	PROPOSED	COMMSCOPE (VV-65A-R1)	54.7 x 12.1 x 4.6	82'	270°	(P) RADIO 4460 B25+B66 (1)		

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

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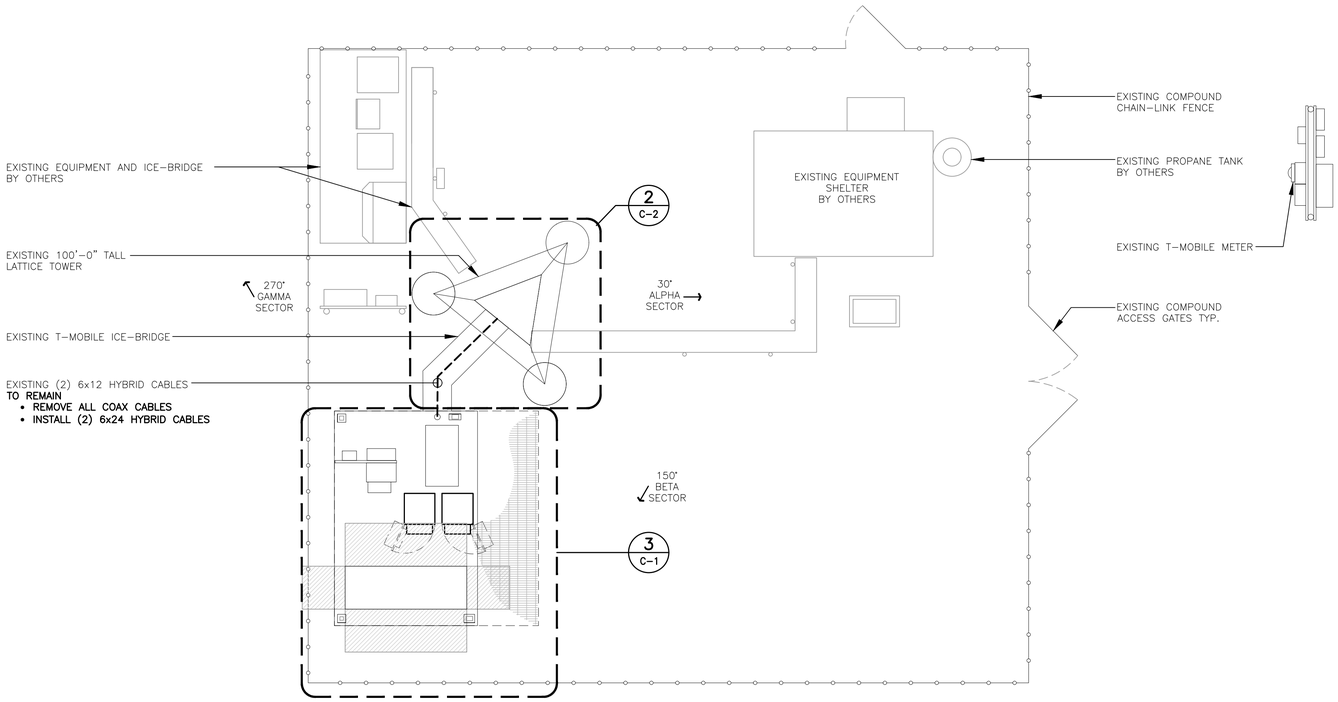
SITE ID: CT11451G
27 MAYNARD RD
SALEM, CT 06420

DATE: 02/22/22
SCALE: AS NOTED
JOB NO. 22022.01

NOTES AND SPECIFICATIONS, ANT. SCHEDULE

N-1

SHEET NO. 2 OF 8



1 C-1 **COMPOUND PLAN - PROPOSED**
SCALE: 1" = 5'
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 SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

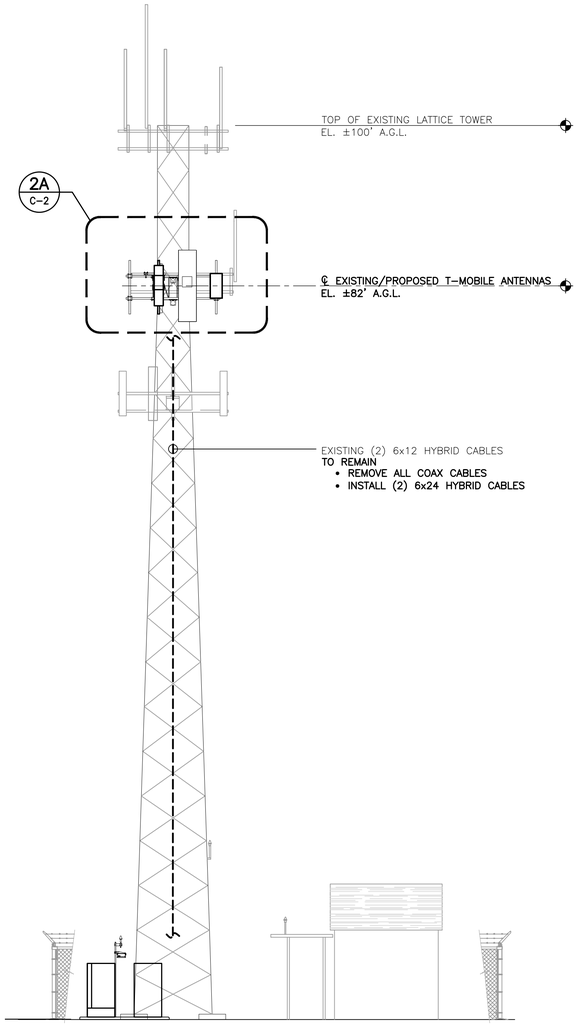
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22022.01) DATED 03/07/22 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

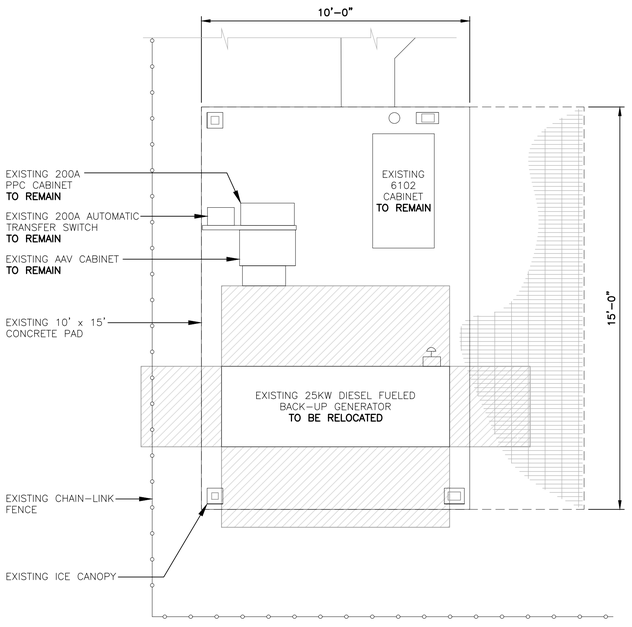
TOWER AND TOWER FOUNDATION

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.

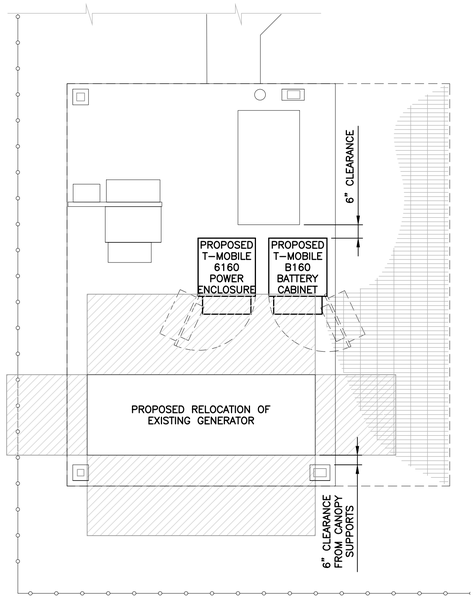
REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22022.01) DATED 03/07/22 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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-1 **EQUIPMENT PLAN - EXISTING**
SCALE: 3/8" = 1'
TRUE NORTH



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

4 C-1 **SOUTH WEST ELEVATION - PROPOSED**
SCALE: 1" = 8'

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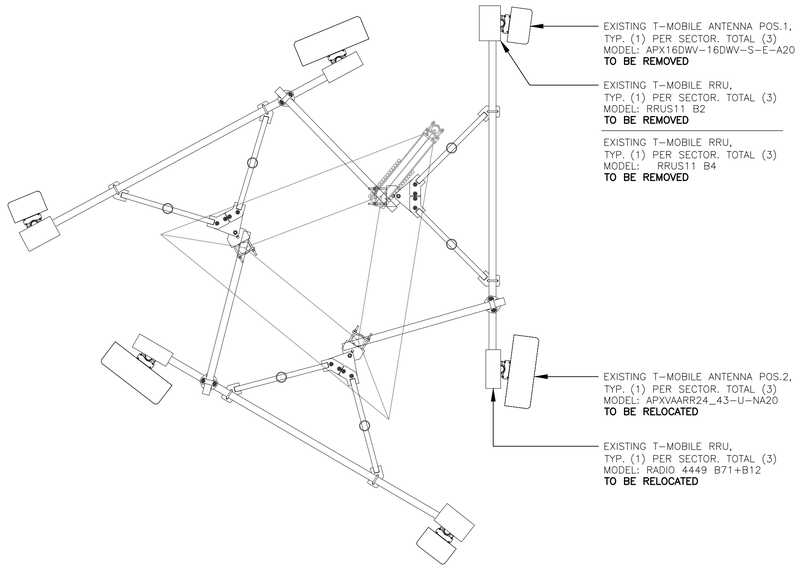
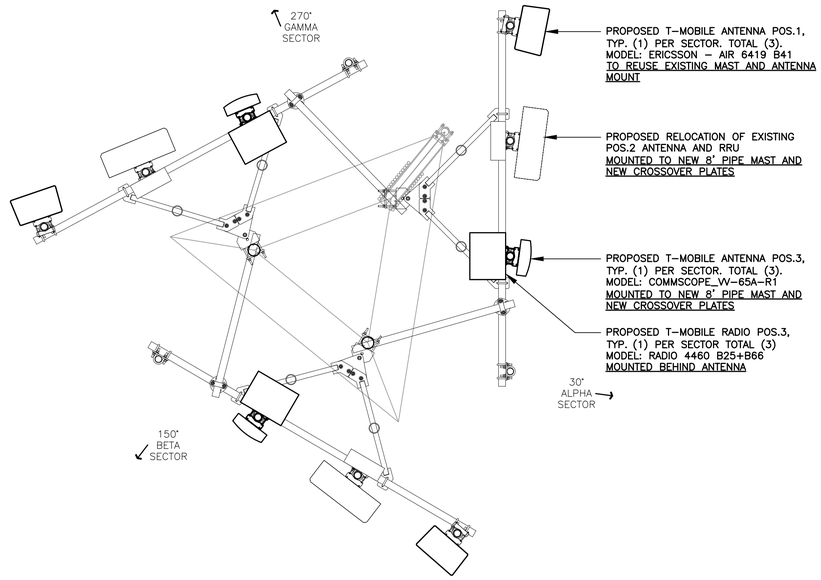
COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION

C-1

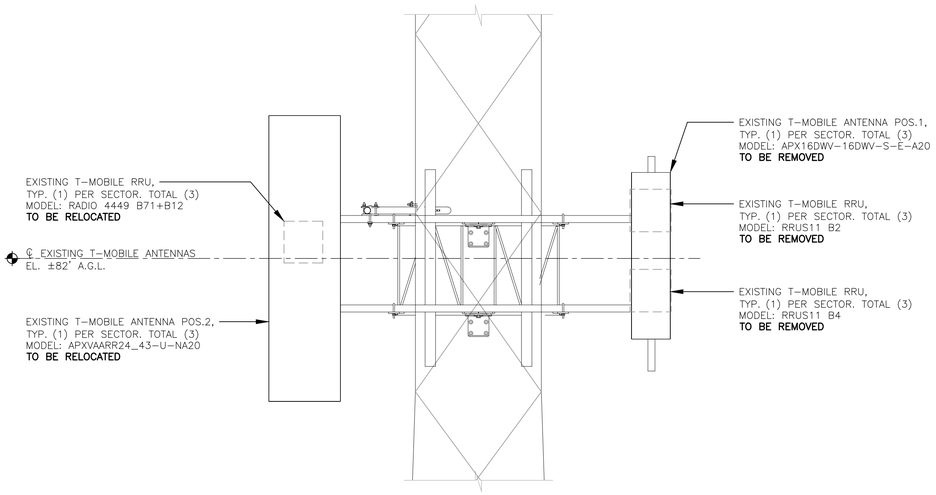
SHEET NO. 3 OF 8



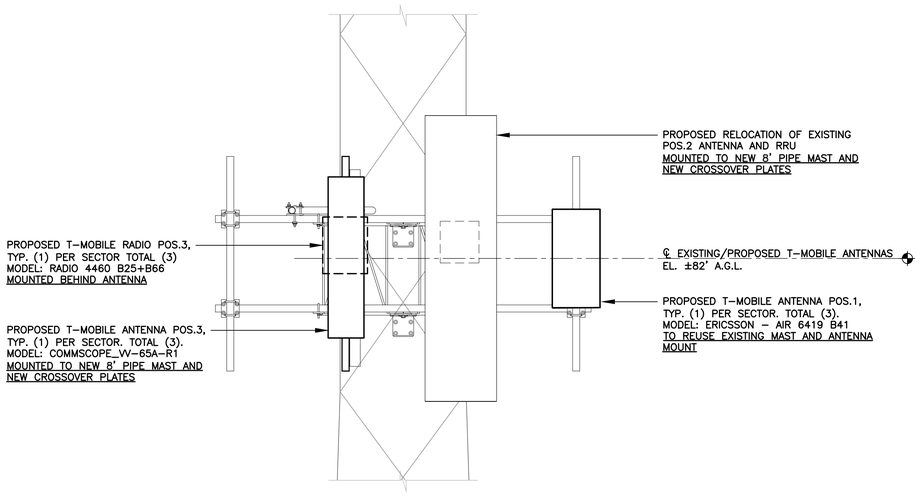
1 / C-2 **ANTENNA ELEVATION - EXISTING**
SCALE: 1/2" = 1'
TRUE NORTH



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



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



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

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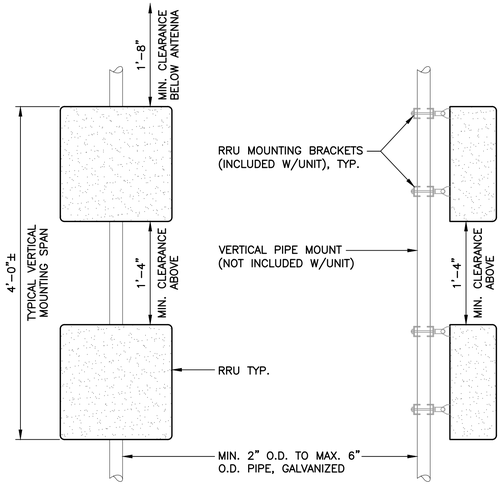
ANTENNA PLANS AND ELEVATIONS

C-2

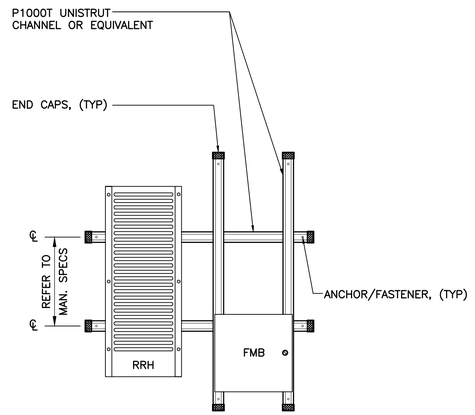
SHEET NO. 4 OF 8



FRONT ELEVATION SIDE ELEVATION

NOTES: (PIPE MOUNTING)

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



FRONT ELEVATION

NOTES: (UNISTRUT MOUNTING)

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

1 C–3 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE

AIR6419 B41

VV-65A-R1

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6419 B41	33"L x 16"W x 9"D	±41 LBS.
MAKE: COMMSCOPE MODEL: VV–65A–R1	54.7"L x 12.08"W x 4.6"D	±23 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 C–3 PROPOSED ANTENNA DETAIL

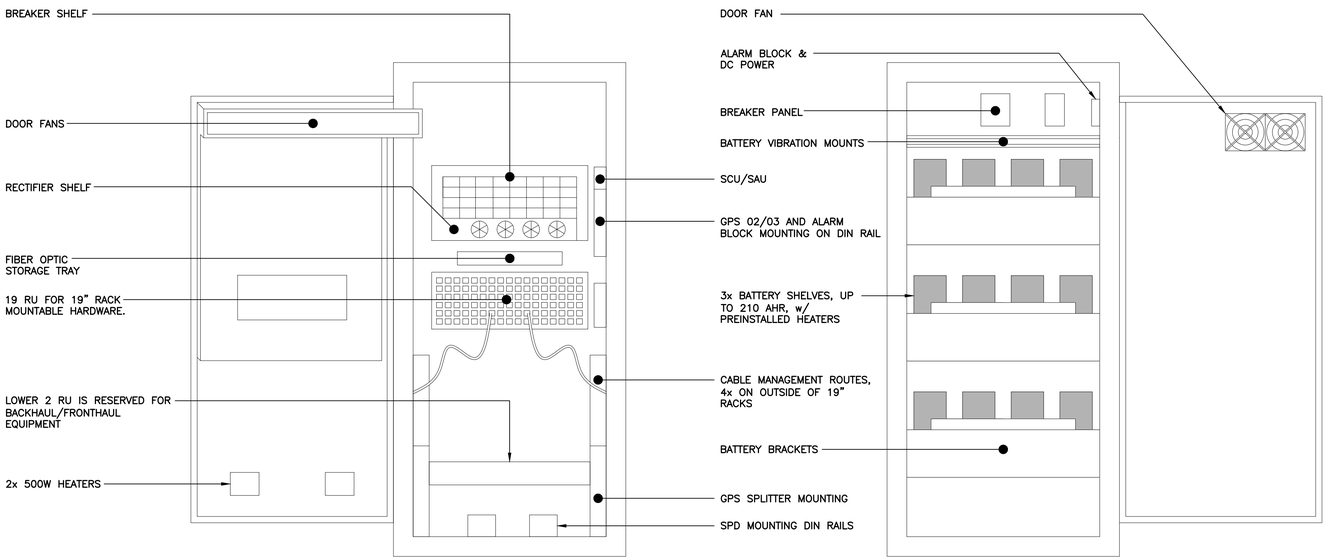
SCALE: NOT TO SCALE

RADIO 4460 B25+B66

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 C–3 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE



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–3 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–3 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

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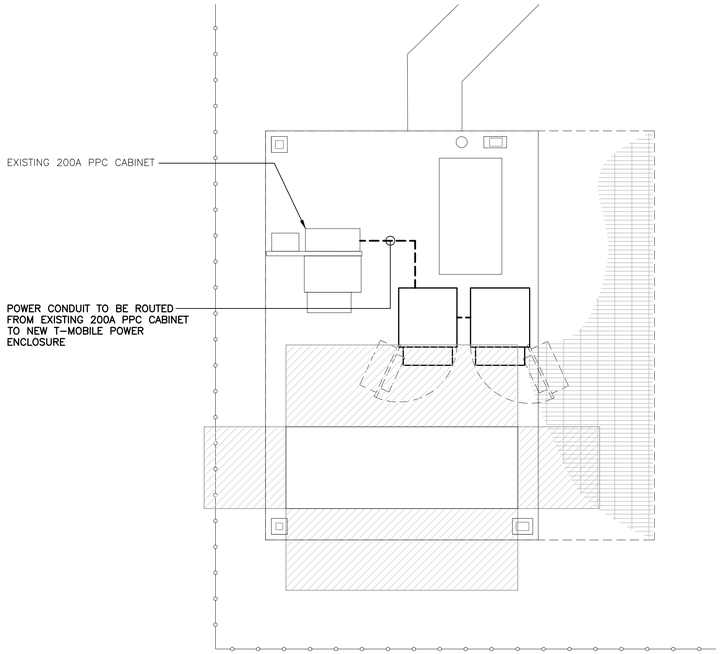
TYPICAL EQUIPMENT DETAILS

C-3

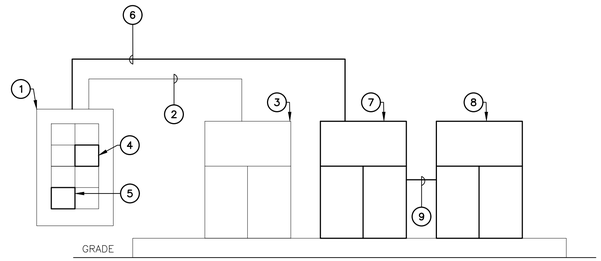
SHEET NO. 5 OF 8



1 / E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1/4" = 1'

RISER DIAGRAM NOTES

1. EXISTING 200A, 120/240V, SINGLE PHASE PPC CABINET TO REMAIN.
2. EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
3. EXISTING EQUIPMENT CABINET TO REMAIN.
4. EXISTING 125A/2P CIRCUIT BREAKER SERVING EXISTING EQUIPMENT CABINET TO BE REMOVED AND REPLACED WITH NEW 100A/2P CIRCUIT BREAKER. COORDINATE CABINET DOWNGRADE WITH CONSTRUCTION MANAGER.
5. NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
6. (3) #1 AWG, (1) #8 AWG GROUND, 1-1/2" CONDUIT.
7. NEW RADIO EQUIPMENT CABINET.
8. NEW BATTERY CABINET.
9. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



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

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T-MOBILE NORTHEAST LLC

SITE NAME: CT1145IG
SITE ID: CT1145IG
27 MAYNARD RD
SALEM, CT 06420

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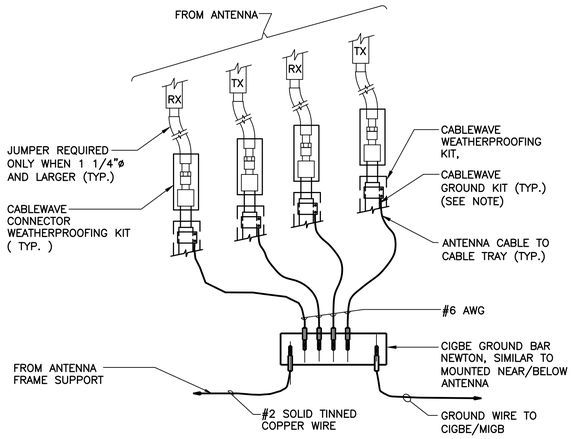
ELECTRICAL DIAGRAM AND CONDUIT ROUTING

E-1

SHEET NO. 6 OF 8

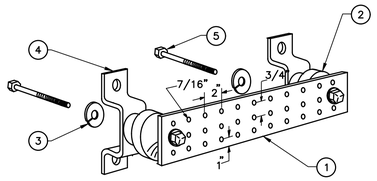


NOTES:

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

1 E-2 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

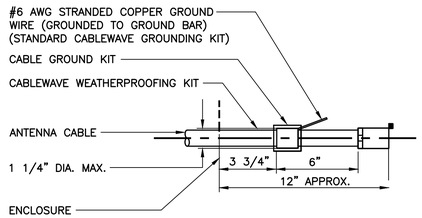


NOTES

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

2 E-2 GROUND BAR DETAIL

SCALE: NOT TO SCALE

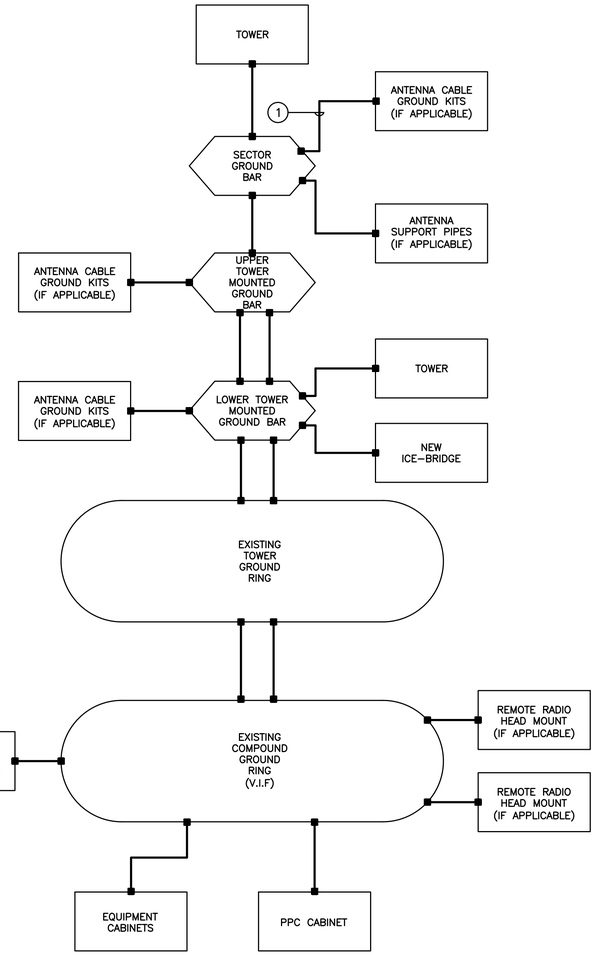


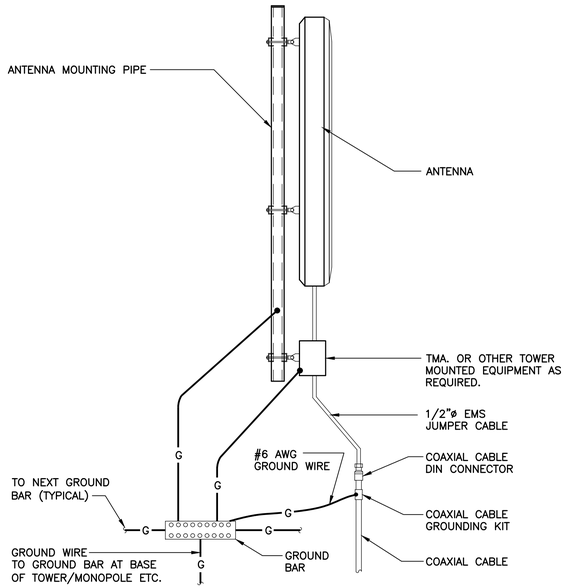
NOTES:

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

3 E-2 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE

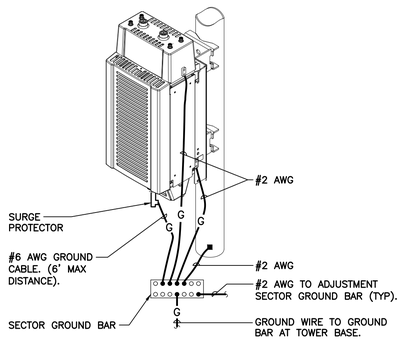




4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

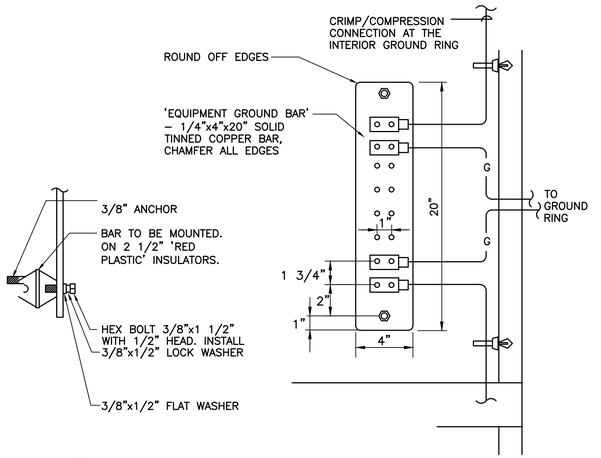
SCALE: NOT TO SCALE

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



5 E-2 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-2 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

#6 AWG

GENERAL NOTES:

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

7 E-2 ELECTRICAL SCHEMATIC DIAGRAM

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TYPICAL ELECTRICAL DETAILS

E-2

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

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

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

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

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

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

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

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

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

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

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

M. SHOP DRAWINGS:

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

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

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

SECTION 16111

1.01. CONDUITS

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

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

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

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

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

CONDUIT SCHEDULE SECTION 16111

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

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

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

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

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

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

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

SECTION 16130

1.01. BOXES

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

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

SECTION 16140

1.01. WIRING DEVICES

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

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

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

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

SECTION 16170

1.01. DISCONNECT SWITCHES

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

SECTION 16190

1.01. SEISMIC RESTRAINT

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

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

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

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

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

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

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

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

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

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

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

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

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

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

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

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

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

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

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

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

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

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

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

SECTION 16961

1.01. TESTS BY CONTRACTOR

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

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

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

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
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ELECTRICAL SPECIFICATIONS

E-3

SHEET NO. 8 OF 8

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

100' Existing Lattice Tower

Proposed T-Mobile
Antenna Upgrade

Site Ref: CT11451G

27 Maynard Road
Salem, CT

CENTEK Project No. 22022.01

Date: March 07, 2022

Max Stress Ratio = 90.6%

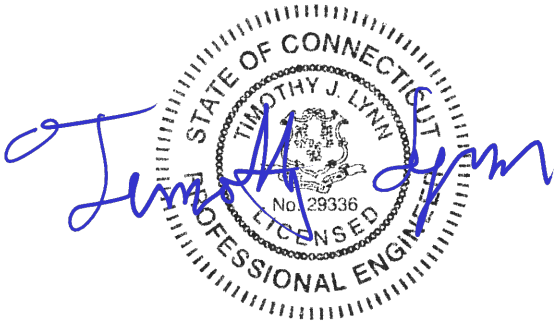

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Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna modification proposed by T-Mobile on the existing lattice tower located in Salem, Connecticut.

The host tower is a 100-ft, three-legged, lattice tower. The tower geometry, structure member sizes and foundation information were taken from a previous structural report prepared by Infinigy Engineering job no. 1106-A0001-B dated September 6, 2019.

Antenna and appurtenance inventory were taken from the aforementioned Infinigy Engineering structural report, a structural report prepared by Hudson Design Group job no. CT11451G dated May 21, 2019, a T-Mobile RF data sheet, and the Antenna Mount Analysis performed by Centek Engineering project no. 19027.19 dated April 30, 2019.

The tower consists of five (5) tapered vertical sections consisting of steel pipe legs conforming to ASTM A572 Gr. 50 and lateral bracing conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 5-ft at the top and 10-ft at the base.

Antenna and Appurtenance Summary

The existing tower supports several communication antennas. The existing and proposed loads considered in the analysis consist of the following:

Carrier: UNKNOWN (Existing)

Height	Quantity	Appurtenance	Mount Type	Coax & Lines
±100 ft.	1	Lightning Rod	-	-
	1	15’ Dipole Whip Antenna	Leg	(1) 7/8”
	1	10’ Whip Antenna	Leg	(1) 7/8”
	1	8’ Omni-directional Whip Antenna	Face	(1) 7/8”
	1	8’ Omni-directional Whip Antenna	Face	(1) 7/8”
±82 ft.	1	8’ Omni-directional Whip Antenna	Face	(1) 7/8”

Carrier: AT&T (Existing)

Height	Quantity	Appurtenance	Mount Type	Coax & Lines
±72 ft.	2	CCI DMP65R-BU4DA Antennas	Leg Mounted Sector Frames	(2) Fiber (6) DC
	2	CCI DMP65R-BU6DA Antennas		
	2	CCI DMP65R-BU4DA Antennas		
	3	Powerwave 7770 Antennas		
	3	Ericsson Radio 8843 B2/B66A		
	3	Ericsson Radio 4449 B5/B12		
	3	Ericsson RRUS 4478 B14		

	6	Powerwave LGP21401 TMA		
	3	Raycap DC6-48-60-18-8F	Leg Mounted	

Carrier: T-Mobile (To Be Removed)

Height	Quantity	Appurtenance	Mount Type	Coax & Lines
±82 ft.	3	RFS APX16DWV-16DWV Antennas	Leg Mounted Sector Frames	N.A.
	3	Ericsson RRUS11 B2		
	3	Ericsson RRUS11 B4		

Carrier: T-Mobile (To Remain)

Height	Quantity	Appurtenance	Mount Type	Coax & Lines
±82 ft.	3	RFS APXVAARR24_43-U Antennas	Leg Mounted Sector Frames	(2) 6X12 Hybrid Cables
	3	Ericsson Radio 4449 B71+B12		

Carrier: T-Mobile (Proposed)

Height	Quantity	Appurtenance	Mount Type	Coax & Lines
±82 ft.	3	**Ericsson Air 6419 B41**	Leg Mounted Sector Frames	(2) 6x24 Hybrid Cables
	3	**Commscope VV-65A-R1**		
	3	**Ericsson Radio 4460 B25+B66**		

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.
- 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 should be routed as specified in section 3 of 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:	*Salem*; V_{asd} = 108 mph (Nominal)	*[Appendix N of the 2018 CT Building Code]*
Load Cases 1:	108 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
Load Cases 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

- Calculated stresses were found to be within allowable limits. This tower was found to be at **90.6%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T5)	0'-0"-20'-0"	81.6%	**PASS**
Diagonal (T5)	0'-0"-20'-0"	90.6%	**PASS**
Bolt Checks (T5)	0'-0"-20'-0"	90.6%	**PASS**

Foundation and Anchors

The existing foundation consists of three (3) 3-ft ∅ x 4-ft long reinforced concrete piers on a 21-ft square x 2.5-ft thick reinforced concrete pad bearing directly on existing sub grade. The sub-grade conditions used in the analysis of the existing foundation were obtained from the aforementioned structural report prepared by Infinigy Engineering. Tower legs are connected to the foundation by means of (6) 1"∅, ASTM A36 anchor bolts per leg, embedded into the concrete foundation structure.

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

Reactions	Vector	Proposed Base Reactions
Base	Shear	**27 kips**
	Compression	**23 kips**
	Moment	**1509 kip-ft**
Leg	Shear	**15 kips**
	Uplift	**165 kips**
	Compression	**182 kips**

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	81.6%	**PASS**

- 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 Mat	OM(2)	1.0	2.17	**PASS**

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

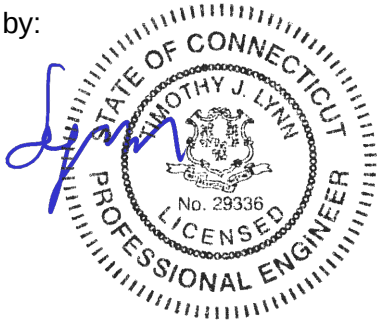
Conclusion

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

Prepared by:

Pablo Perez-Gomez
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:

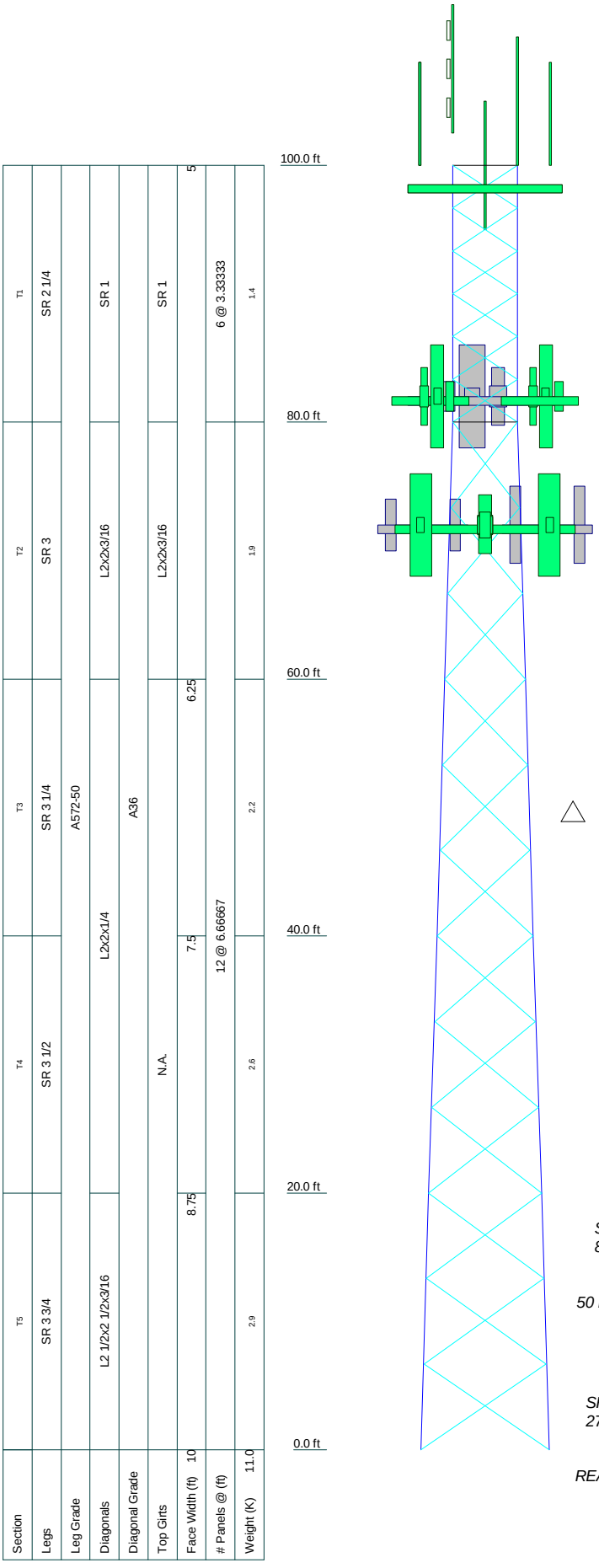
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or 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.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10-ft Lighting Rod	100	4460 B25+B66 (T-Mobile)	82
15-ft Single Dipole	100	(2) LGP21401 TMA (ATI)	72
10' x 3" Dia Omni	100	(2) LGP21401 TMA (ATI)	72
8' x 3" Dia Omni	100	(2) LGP21401 TMA (ATI)	72
8' x 3" Dia Omni	100	DC6-48-60-18-8F Surge Arrestor (ATI)	72
8' x 3" Dia Omni	100	DC6-48-60-18-8F Surge Arrestor (ATI)	72
PiROD 12' T-Frame	98.5	DC6-48-60-18-8F Surge Arrestor (ATI)	72
PiROD 12' T-Frame	98.5	PiROD 15' T-Frame (ATI)	72
PiROD 12' T-Frame (T-Mobile)	82	PiROD 15' T-Frame (ATI)	72
PiROD 12' T-Frame (T-Mobile)	82	PiROD 15' T-Frame (ATI)	72
PiROD 12' T-Frame (T-Mobile)	82	7770.00 w/ mount pipe (ATI)	72
AIR6419 (T-Mobile)	82	7770.00 w/ mount pipe (ATI)	72
AIR6419 (T-Mobile)	82	7770.00 w/ mount pipe (ATI)	72
AIR6419 (T-Mobile)	82	(2) DMP65R-BU4D (ATI)	72
APXVAARR24_43-U-NA20 (T-Mobile)	82	(2) DMP65R-BU6D (ATI)	72
APXVAARR24_43-U-NA20 (T-Mobile)	82	(2) DMP65R-BU8DA (ATI)	72
APXVAARR24_43-U-NA20 (T-Mobile)	82	8843 B2/B66A (ATI)	72
VV-65A-R1 (T-Mobile)	82	8843 B2/B66A (ATI)	72
VV-65A-R1 (T-Mobile)	82	8843 B2/B66A (ATI)	72
VV-65A-R1 (T-Mobile)	82	4449 B5/B12 (ATI)	72
4449 B12,B71 (T-Mobile)	82	4449 B5/B12 (ATI)	72
4449 B12,B71 (T-Mobile)	82	4449 B5/B12 (ATI)	72
4449 B12,B71 (T-Mobile)	82	4478 B14 (ATI)	72
4460 B25+B66 (T-Mobile)	82	4478 B14 (ATI)	72
4460 B25+B66 (T-Mobile)	82	4478 B14 (ATI)	72

MATERIAL STRENGTH

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

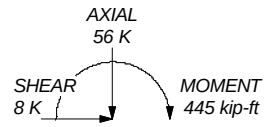
TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 108 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 3 with Crest Height of 160.00 ft
7. TOWER RATING: 90.6%

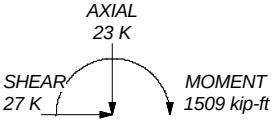
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 182 K
SHEAR: 15 K

UPLIFT: -165 K
SHEAR: 14 K



TORQUE 4 kip-ft
50 mph WIND - 0.7500 in ICE



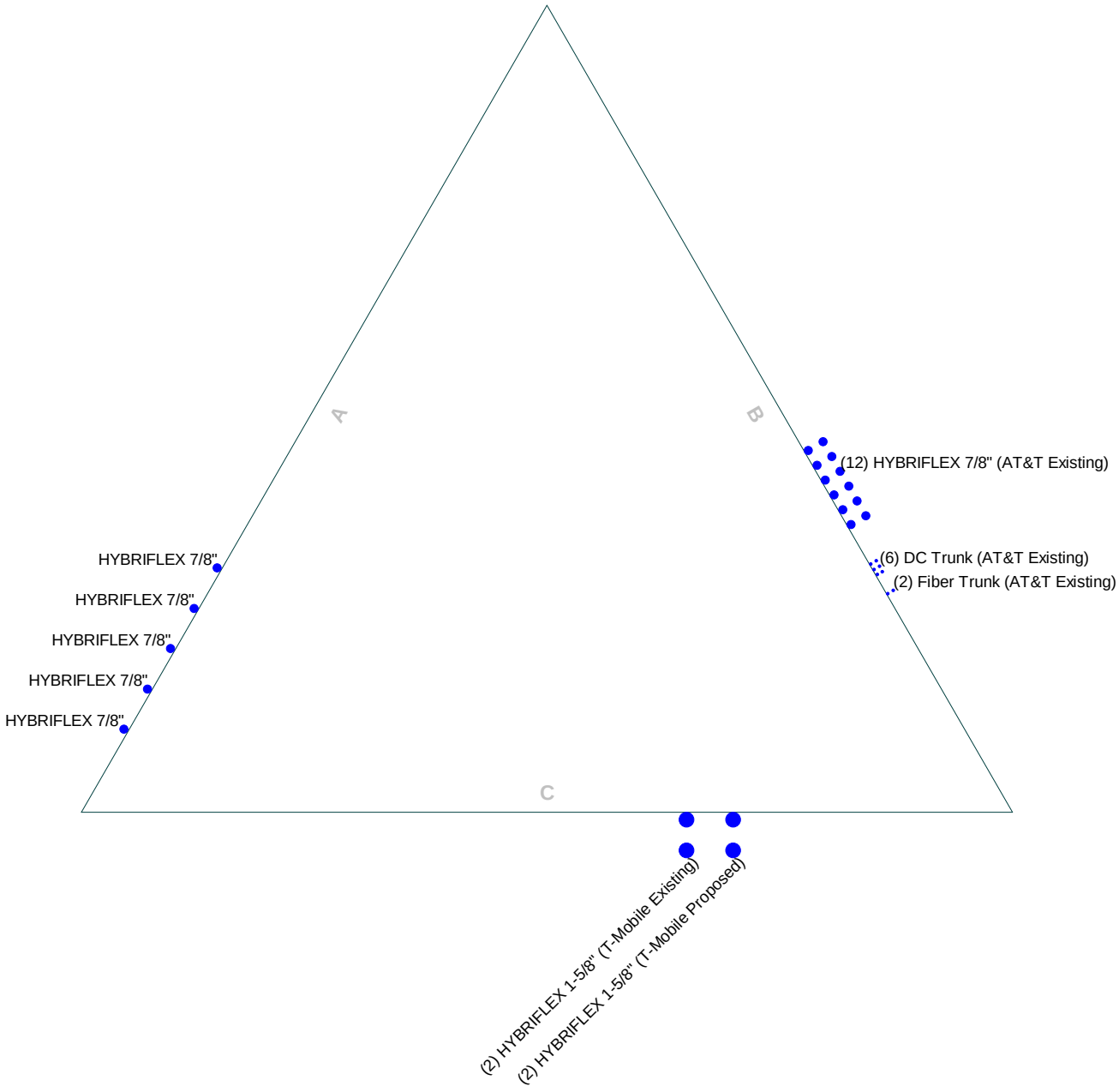
TORQUE 11 kip-ft
REACTIONS - 108 mph WIND

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

Job: 21022.01 - CT11451G		
Project: 100' Lattice Tower - 27 Maynard Rd., Salem, CT		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 03/07/22	Scale: NTS
Path: J:\Jobs\2202200.WI\01_CT11452G\05_Structural\02_Design\CALCS\Tower Analysis\100-ft Rohn Lattice Tower.eri		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



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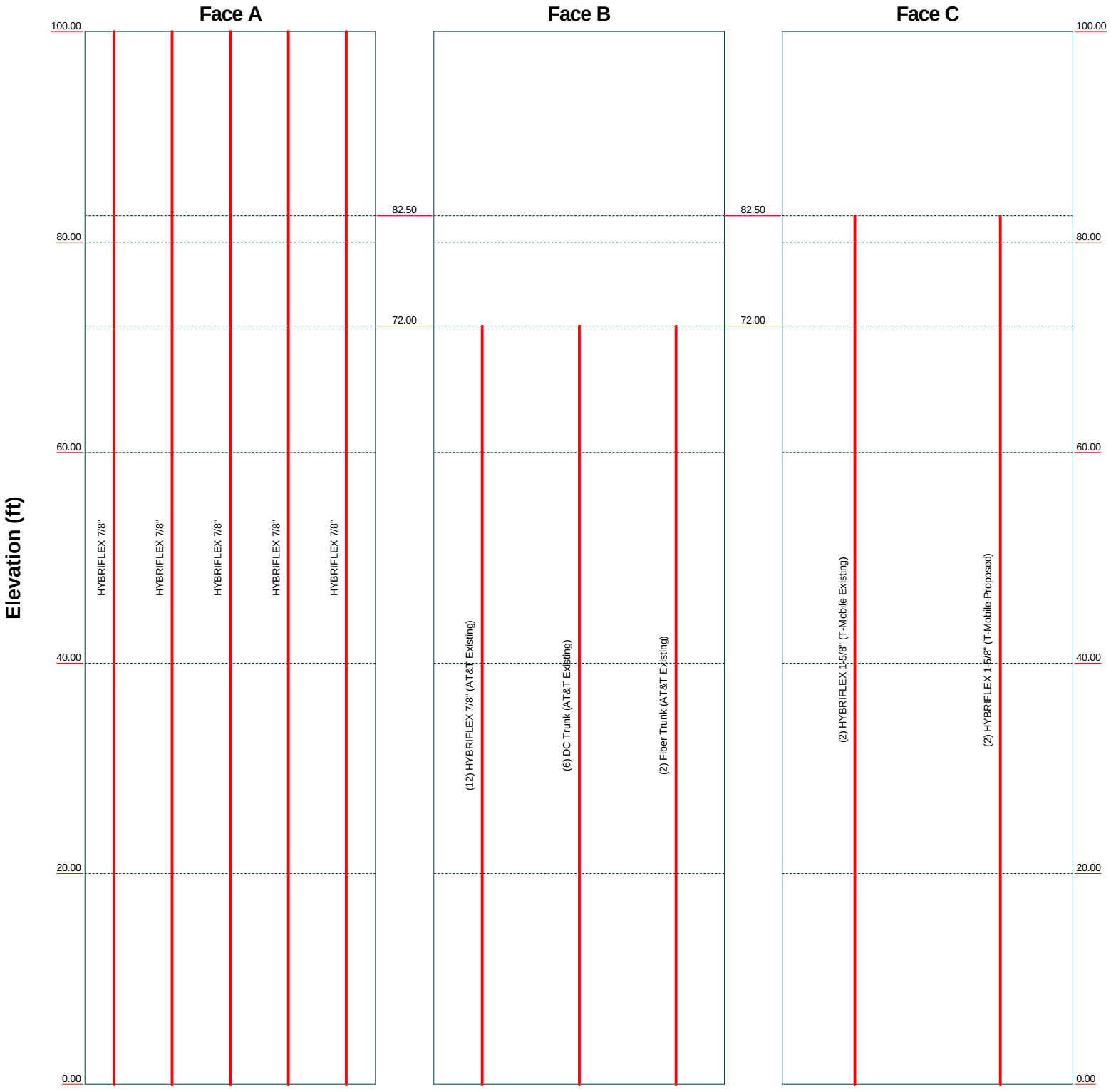
Job: ***21022.01 - CT11451G***		
Project: ***100' Lattice Tower - 27 Maynard Rd., Salem, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 03/07/22	Scale: NTS
Path: J:\Jobs\2202200.WI\01_CT11452G\05_Structural\02_Design\CALCS\Tower Analysis\100-ft Rohn Lattice Tower.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 100'

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



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Job: ***21022.01 - CT11451G***		
Project: ***100' Lattice Tower - 27 Maynard Rd., Salem, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 03/07/22	Scale: NTS
Path: J:\Jobs\2202200.W\01_CT11452G\05_Structural\02_Design\CALCS\Tower Analysis\100-ft Rohn Lattice Tower.eri		Dwg No. E-7

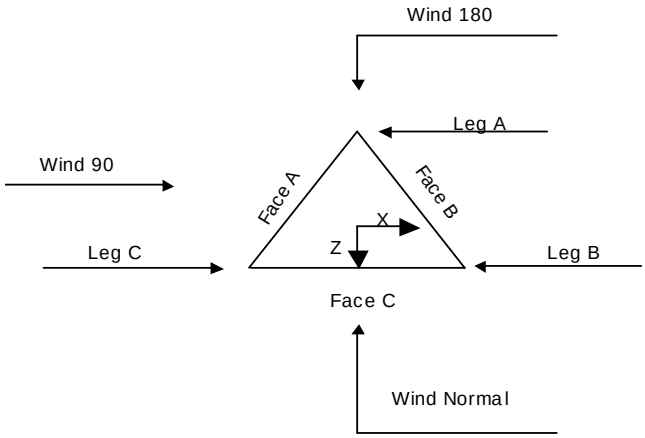
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 100.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 10.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 108 mph.
Structure Class II.
Exposure Category B.
Topographic Category 3.
Crest Height 160.00 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 tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	100.00-80.00			5.00	1	20.00
T2	80.00-60.00			5.00	1	20.00
T3	60.00-40.00			6.25	1	20.00
T4	40.00-20.00			7.50	1	20.00
T5	20.00-0.00			8.75	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	100.00-80.00	3.33	X Brace	No	No	0.0000	0.0000
T2	80.00-60.00	6.67	X Brace	No	No	0.0000	0.0000
T3	60.00-40.00	6.67	X Brace	No	No	0.0000	0.0000
T4	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T5	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 100.00-80.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T2 80.00-60.00	Solid Round	3	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 60.00-40.00	Solid Round	3 1/4	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T4 40.00-20.00	Solid Round	3 1/2	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T5 20.00-0.00	Solid Round	3 3/4	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 100.00-80.00	Solid Round	1	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 80.00-60.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 100.00-80.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T2 80.00-60.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T3 60.00-40.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T4 40.00-20.00	Single Angle		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 20.00-0.00	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
100.00-80.00 T2 80.00-60.00	0.00	0.0000	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T3 60.00-40.00	0.00	0.0000	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T4 40.00-20.00	0.00	0.0000	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
T5 20.00-0.00	0.00	0.0000	(36 ksi) A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T5 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 100.00-80.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 80.00-60.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 60.00-40.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 40.00-20.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 20.00-0.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 100.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 20.00-0.00	Flange	1.1250 A36	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
HYBRIFLEX 7/8"	A	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.4	1	1	0.8750	1.0900		0.53
HYBRIFLEX 7/8"	A	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.35	1	1	0.8750	1.0900		0.53
HYBRIFLEX 7/8"	A	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.3	1	1	0.8750	1.0900		0.53
HYBRIFLEX 7/8"	A	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.25	1	1	0.8750	1.0900		0.53
HYBRIFLEX 7/8"	A	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.2	1	1	0.8750	1.0900		0.53
HYBRIFLEX 1-5/8" (T-Mobile Existing)	C	No	No	Ar (CaAa)	82.50 - 0.00	0.0000	-0.15	2	1	1.9800	1.9800		1.90
HYBRIFLEX 7/8" (AT&T	B	No	No	Ar (CaAa)	72.00 - 0.00	0.0000	0.1	12	6	1.1100	1.0900		0.53

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Existing) DC Trunk (AT&T	B	No	No	Ar (CaAa)	72.00 - 0.00	0.0000	0.2	6	3	0.4000	0.4000		0.11
Existing) Fiber Trunk (AT&T	B	No	No	Ar (CaAa)	72.00 - 0.00	0.0000	0.23	2	1	0.4000	0.4000		1.00
Existing) HYBRIFLEX 1-5/8" (T-Mobile Proposed)	C	No	No	Ar (CaAa)	82.50 - 0.00	0.0000	-0.2	2	1	1.9800	1.9800		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
T1	100.00-80.00	A	0.000	0.000	10.900	0.000	0.05
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	1.980	0.000	0.02
T2	80.00-60.00	A	0.000	0.000	10.900	0.000	0.05
		B	0.000	0.000	19.536	0.000	0.11
		C	0.000	0.000	15.840	0.000	0.15
T3	60.00-40.00	A	0.000	0.000	10.900	0.000	0.05
		B	0.000	0.000	32.560	0.000	0.18
		C	0.000	0.000	15.840	0.000	0.15
T4	40.00-20.00	A	0.000	0.000	10.900	0.000	0.05
		B	0.000	0.000	32.560	0.000	0.18
		C	0.000	0.000	15.840	0.000	0.15
T5	20.00-0.00	A	0.000	0.000	10.900	0.000	0.05
		B	0.000	0.000	32.560	0.000	0.18
		C	0.000	0.000	15.840	0.000	0.15

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
T1	100.00-80.00	A	1.834	0.000	0.000	47.583	0.000	0.71
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	6.966	0.000	0.10
T2	80.00-60.00	A	1.836	0.000	0.000	47.621	0.000	0.71
		B		0.000	0.000	46.587	0.000	0.77
		C		0.000	0.000	55.754	0.000	0.84
T3	60.00-40.00	A	1.833	0.000	0.000	47.569	0.000	0.71
		B		0.000	0.000	77.592	0.000	1.29
		C		0.000	0.000	55.718	0.000	0.84
T4	40.00-20.00	A	1.812	0.000	0.000	47.140	0.000	0.70
		B		0.000	0.000	77.148	0.000	1.28
		C		0.000	0.000	55.424	0.000	0.82
T5	20.00-0.00	A	1.702	0.000	0.000	44.947	0.000	0.63
		B		0.000	0.000	74.881	0.000	1.20
		C		0.000	0.000	53.925	0.000	0.76

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	100.00-80.00	-4.9659	2.2759	-6.4944	2.7258
T2	80.00-60.00	2.9910	3.4394	1.7447	5.8535
T3	60.00-40.00	5.6452	3.1818	4.5064	5.9977
T4	40.00-20.00	6.2818	3.5493	5.1109	6.7626
T5	20.00-0.00	6.3860	3.6476	5.5990	7.2563

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	HYBRIFLEX 7/8"	80.00 - 100.00	0.6000	0.5576
T1	3	HYBRIFLEX 7/8"	80.00 - 100.00	0.6000	0.5576
T1	4	HYBRIFLEX 7/8"	80.00 - 100.00	0.6000	0.5576
T1	5	HYBRIFLEX 7/8"	80.00 - 100.00	0.6000	0.5576
T1	6	HYBRIFLEX 7/8"	80.00 - 100.00	0.6000	0.5576
T1	7	HYBRIFLEX 1-5/8"	80.00 - 82.50	0.6000	0.5576
T1	11	HYBRIFLEX 1-5/8"	80.00 - 82.50	0.6000	0.5576
T2	2	HYBRIFLEX 7/8"	60.00 - 80.00	0.6000	0.6000
T2	3	HYBRIFLEX 7/8"	60.00 - 80.00	0.6000	0.6000
T2	4	HYBRIFLEX 7/8"	60.00 - 80.00	0.6000	0.6000
T2	5	HYBRIFLEX 7/8"	60.00 - 80.00	0.6000	0.6000
T2	6	HYBRIFLEX 7/8"	60.00 - 80.00	0.6000	0.6000
T2	7	HYBRIFLEX 1-5/8"	60.00 - 80.00	0.6000	0.6000
T2	8	HYBRIFLEX 7/8"	60.00 - 72.00	0.6000	0.6000
T2	9	DC Trunk	60.00 - 72.00	0.6000	0.6000
T2	10	Fiber Trunk	60.00 - 72.00	0.6000	0.6000
T2	11	HYBRIFLEX 1-5/8"	60.00 - 80.00	0.6000	0.6000
T3	2	HYBRIFLEX 7/8"	40.00 - 60.00	0.6000	0.6000
T3	3	HYBRIFLEX 7/8"	40.00 - 60.00	0.6000	0.6000
T3	4	HYBRIFLEX 7/8"	40.00 - 60.00	0.6000	0.6000
T3	5	HYBRIFLEX 7/8"	40.00 - 60.00	0.6000	0.6000
T3	6	HYBRIFLEX 7/8"	40.00 - 60.00	0.6000	0.6000
T3	7	HYBRIFLEX 1-5/8"	40.00 - 60.00	0.6000	0.6000
T3	8	HYBRIFLEX 7/8"	40.00 - 60.00	0.6000	0.6000
T3	9	DC Trunk	40.00 - 60.00	0.6000	0.6000
T3	10	Fiber Trunk	40.00 - 60.00	0.6000	0.6000
T3	11	HYBRIFLEX 1-5/8"	40.00 - 60.00	0.6000	0.6000
T4	2	HYBRIFLEX 7/8"	20.00 - 40.00	0.6000	0.6000
T4	3	HYBRIFLEX 7/8"	20.00 - 40.00	0.6000	0.6000
T4	4	HYBRIFLEX 7/8"	20.00 - 40.00	0.6000	0.6000
T4	5	HYBRIFLEX 7/8"	20.00 - 40.00	0.6000	0.6000
T4	6	HYBRIFLEX 7/8"	20.00 - 40.00	0.6000	0.6000
T4	7	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T4	8	HYBRIFLEX 7/8"	20.00 - 40.00	0.6000	0.6000
T4	9	DC Trunk	20.00 - 40.00	0.6000	0.6000
T4	10	Fiber Trunk	20.00 - 40.00	0.6000	0.6000
T4	11	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T5	2	HYBRIFLEX 7/8"	0.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	3	HYBRIFLEX 7/8"	0.00 - 20.00	0.6000	0.6000
T5	4	HYBRIFLEX 7/8"	0.00 - 20.00	0.6000	0.6000
T5	5	HYBRIFLEX 7/8"	0.00 - 20.00	0.6000	0.6000
T5	6	HYBRIFLEX 7/8"	0.00 - 20.00	0.6000	0.6000
T5	7	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000
T5	8	HYBRIFLEX 7/8"	0.00 - 20.00	0.6000	0.6000
T5	9	DC Trunk	0.00 - 20.00	0.6000	0.6000
T5	10	Fiber Trunk	0.00 - 20.00	0.6000	0.6000
T5	11	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
10-ft Lighting Rod	A	None		0.0000	100.00	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
15-ft Single Dipole	C	From Leg	0.00 0.00 7.50	0.0000	100.00	No Ice 1/2" Ice 1" Ice	3.00 6.00 9.00	3.00 6.00 9.00	0.04 0.06 0.08
10' x 3" Dia Omni	B	From Leg	0.00 0.00 5.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	3.00 4.03 5.03	3.00 4.03 5.03	0.03 0.05 0.08
PiROD 12' T-Frame	C	From Face	1.50 0.00 0.00	0.0000	98.50	No Ice 1/2" Ice 1" Ice	12.20 17.60 23.00	12.20 17.60 23.00	0.36 0.49 0.62
8' x 3" Dia Omni	B	From Leg	3.00 0.00 4.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.40 3.19 3.67	2.40 3.19 3.67	0.03 0.04 0.07
8' x 3" Dia Omni	C	From Leg	3.00 0.00 4.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.40 3.19 3.67	2.40 3.19 3.67	0.03 0.04 0.07
PiROD 12' T-Frame	C	From Face	0.00 0.00 0.00	0.0000	98.50	No Ice 1/2" Ice 1" Ice	12.20 17.60 23.00	12.20 17.60 23.00	0.36 0.49 0.62
8' x 3" Dia Omni	C	From Leg	3.00 0.00 4.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.40 3.19 3.67	2.40 3.19 3.67	0.03 0.04 0.07
PiROD 15' T-Frame (AT&T)	A	From Face	4.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	15.00 20.60 26.20	15.00 20.60 26.20	0.50 0.65 0.80
PiROD 15' T-Frame (AT&T)	B	From Face	4.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	15.00 20.60 26.20	15.00 20.60 26.20	0.50 0.65 0.80
PiROD 15' T-Frame (AT&T)	C	From Face	4.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	15.00 20.60 26.20	15.00 20.60 26.20	0.50 0.65 0.80
7770.00 w/ mount pipe (AT&T)	A	From Face	4.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	5.62 6.00 6.40	4.26 4.91 5.57	0.06 0.11 0.17

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
7770.00 w/ mount pipe	B	From Face	4.00	0.0000	72.00	No Ice	5.62	4.26	0.06
(AT&T)			0.00			1/2" Ice	6.00	4.91	0.11
			0.00			1" Ice	6.40	5.57	0.17
7770.00 w/ mount pipe	C	From Face	4.00	0.0000	72.00	No Ice	5.62	4.26	0.06
(AT&T)			0.00			1/2" Ice	6.00	4.91	0.11
			0.00			1" Ice	6.40	5.57	0.17
(2) DMP65R-BU4D	A	From Face	4.00	0.0000	72.00	No Ice	8.00	3.51	0.07
(AT&T)			0.00			1/2" Ice	8.38	3.81	0.12
			0.00			1" Ice	8.77	4.12	0.17
(2) DMP65R-BU6D	B	From Face	4.00	0.0000	72.00	No Ice	12.71	5.62	0.10
(AT&T)			0.00			1/2" Ice	13.21	6.07	0.17
			0.00			1" Ice	13.71	6.53	0.25
(2) DMP65R-BU8DA	C	From Face	4.00	0.0000	72.00	No Ice	17.87	8.12	0.12
(AT&T)			0.00			1/2" Ice	18.50	8.72	0.22
			0.00			1" Ice	19.14	9.32	0.32
8843 B2/B66A	A	From Face	4.00	0.0000	72.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
8843 B2/B66A	B	From Face	4.00	0.0000	72.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
8843 B2/B66A	C	From Face	4.00	0.0000	72.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
4449 B5/B12	A	From Face	4.00	0.0000	72.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
4449 B5/B12	B	From Face	4.00	0.0000	72.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
4449 B5/B12	C	From Face	4.00	0.0000	72.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
4478 B14	A	From Face	4.00	0.0000	72.00	No Ice	1.84	1.06	0.06
(AT&T)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
4478 B14	B	From Face	4.00	0.0000	72.00	No Ice	1.84	1.06	0.06
(AT&T)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
4478 B14	C	From Face	4.00	0.0000	72.00	No Ice	1.84	1.06	0.06
(AT&T)			0.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
(2) LGP21401 TMA	A	From Face	4.00	0.0000	72.00	No Ice	0.82	0.35	0.02
(AT&T)			0.00			1/2" Ice	0.94	0.44	0.02
			0.00			1" Ice	1.06	0.54	0.03
(2) LGP21401 TMA	B	From Face	4.00	0.0000	72.00	No Ice	0.82	0.35	0.02
(AT&T)			0.00			1/2" Ice	0.94	0.44	0.02
			0.00			1" Ice	1.06	0.54	0.03
(2) LGP21401 TMA	C	From Face	4.00	0.0000	72.00	No Ice	0.82	0.35	0.02
(AT&T)			0.00			1/2" Ice	0.94	0.44	0.02
			0.00			1" Ice	1.06	0.54	0.03
DC6-48-60-18-8F Surge	A	From Face	4.00	0.0000	72.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	B	From Face	4.00	0.0000	72.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06

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
DC6-48-60-18-8F Surge	C	From Face	4.00	0.0000	72.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
PiROD 12' T-Frame	A	From Leg	2.00	0.0000	82.00	No Ice	12.20	12.20	0.36
(T-Mobile)			0.00			1/2" Ice	17.60	17.60	0.49
			0.00			1" Ice	23.00	23.00	0.62
PiROD 12' T-Frame	B	From Leg	2.00	0.0000	82.00	No Ice	12.20	12.20	0.36
(T-Mobile)			0.00			1/2" Ice	17.60	17.60	0.49
			0.00			1" Ice	23.00	23.00	0.62
PiROD 12' T-Frame	C	From Leg	2.00	0.0000	82.00	No Ice	12.20	12.20	0.36
(T-Mobile)			0.00			1/2" Ice	17.60	17.60	0.49
			0.00			1" Ice	23.00	23.00	0.62
AIR6419	A	From Leg	2.00	0.0000	82.00	No Ice	3.66	1.66	0.07
(T-Mobile)			-3.00			1/2" Ice	3.91	1.85	0.09
			0.00			1" Ice	4.16	2.05	0.12
AIR6419	B	From Leg	2.00	0.0000	82.00	No Ice	3.66	1.66	0.07
(T-Mobile)			-3.00			1/2" Ice	3.91	1.85	0.09
			0.00			1" Ice	4.16	2.05	0.12
AIR6419	C	From Leg	2.00	0.0000	82.00	No Ice	3.66	1.66	0.07
(T-Mobile)			-3.00			1/2" Ice	3.91	1.85	0.09
			0.00			1" Ice	4.16	2.05	0.12
APXVAARR24_43-U-NA20	A	From Leg	2.00	0.0000	82.00	No Ice	20.24	10.79	0.16
(T-Mobile)			-1.00			1/2" Ice	20.89	12.21	0.29
			0.00			1" Ice	21.55	13.49	0.44
APXVAARR24_43-U-NA20	B	From Leg	2.00	0.0000	82.00	No Ice	20.24	10.79	0.16
(T-Mobile)			-1.00			1/2" Ice	20.89	12.21	0.29
			0.00			1" Ice	21.55	13.49	0.44
APXVAARR24_43-U-NA20	C	From Leg	2.00	0.0000	82.00	No Ice	20.24	10.79	0.16
(T-Mobile)			-1.00			1/2" Ice	20.89	12.21	0.29
			0.00			1" Ice	21.55	13.49	0.44
VV-65A-R1	A	From Leg	2.00	0.0000	82.00	No Ice	5.93	2.76	0.03
(T-Mobile)			1.00			1/2" Ice	6.29	3.10	0.06
			0.00			1" Ice	6.66	3.45	0.10
VV-65A-R1	B	From Leg	2.00	0.0000	82.00	No Ice	5.93	2.76	0.03
(T-Mobile)			1.00			1/2" Ice	6.29	3.10	0.06
			0.00			1" Ice	6.66	3.45	0.10
VV-65A-R1	C	From Leg	2.00	0.0000	82.00	No Ice	5.93	2.76	0.03
(T-Mobile)			1.00			1/2" Ice	6.29	3.10	0.06
			0.00			1" Ice	6.66	3.45	0.10
4449 B12,B71	A	From Leg	2.00	0.0000	82.00	No Ice	1.65	1.16	0.08
(T-Mobile)			-1.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B12,B71	B	From Leg	2.00	0.0000	82.00	No Ice	1.65	1.16	0.08
(T-Mobile)			-1.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B12,B71	C	From Leg	2.00	0.0000	82.00	No Ice	1.65	1.16	0.08
(T-Mobile)			-1.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4460 B25+B66	A	From Leg	2.00	0.0000	82.00	No Ice	2.56	1.98	0.11
(T-Mobile)			1.00			1/2" Ice	2.76	2.16	0.13
			0.00			1" Ice	2.97	2.34	0.16
4460 B25+B66	B	From Leg	2.00	0.0000	82.00	No Ice	2.56	1.98	0.11
(T-Mobile)			1.00			1/2" Ice	2.76	2.16	0.13
			0.00			1" Ice	2.97	2.34	0.16
4460 B25+B66	C	From Leg	2.00	0.0000	82.00	No Ice	2.56	1.98	0.11
(T-Mobile)			1.00			1/2" Ice	2.76	2.16	0.13
			0.00			1" Ice	2.97	2.34	0.16

Tower Pressures - No Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 100.00-80.00	90.00	0.959	32	103.750	A	0.000	13.685	7.500	54.80	10.900	0.000
					B	0.000	13.685		54.80	0.000	0.000
					C	0.000	13.685		54.80	1.980	0.000
T2 80.00-60.00	70.00	0.892	33	117.502	A	9.130	10.007	10.007	52.29	10.900	0.000
					B	9.130	10.007		52.29	19.536	0.000
					C	9.130	10.007		52.29	15.840	0.000
T3 60.00-40.00	50.00	0.811	32	142.919	A	9.202	10.840	10.840	54.09	10.900	0.000
					B	9.202	10.840		54.09	32.560	0.000
					C	9.202	10.840		54.09	15.840	0.000
T4 40.00-20.00	30.00	0.701	31	168.336	A	10.135	11.674	11.674	53.53	10.900	0.000
					B	10.135	11.674		53.53	32.560	0.000
					C	10.135	11.674		53.53	15.840	0.000
T5 20.00-0.00	10.00	0.7	36	193.753	A	13.903	12.508	12.508	47.36	10.900	0.000
					B	13.903	12.508		47.36	32.560	0.000
					C	13.903	12.508		47.36	15.840	0.000

Tower Pressure - With Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 100.00-80.00	90.00	0.959	7	1.8341	109.864	A	0.000	48.601	19.728	40.59	47.583	0.000
						B	0.000	48.601		40.59	0.000	0.000
						C	0.000	48.601		40.59	6.966	0.000
T2 80.00-60.00	70.00	0.892	7	1.8360	123.626	A	9.130	39.019	22.255	46.22	47.621	0.000
						B	9.130	39.019		46.22	46.587	0.000
						C	9.130	39.019		46.22	55.754	0.000
T3 60.00-40.00	50.00	0.811	7	1.8334	149.034	A	9.202	39.943	23.071	46.94	47.569	0.000
						B	9.202	39.943		46.94	77.592	0.000
						C	9.202	39.943		46.94	55.718	0.000
T4 40.00-20.00	30.00	0.701	7	1.8120	174.379	A	10.135	42.127	23.762	45.47	47.140	0.000
						B	10.135	42.127		45.47	77.148	0.000
						C	10.135	42.127		45.47	55.424	0.000
T5 20.00-0.00	10.00	0.7	8	1.7023	199.430	A	13.903	42.798	23.864	42.09	44.947	0.000
						B	13.903	42.798		42.09	74.881	0.000
						C	13.903	42.798		42.09	53.925	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	90.00	0.959	10	103.750	A	0.000	13.685	7.500	54.80	10.900	0.000
100.00-80.00					B	0.000	13.685		54.80	0.000	0.000
					C	0.000	13.685		54.80	1.980	0.000
T2 80.00-60.00	70.00	0.892	10	117.502	A	9.130	10.007	10.007	52.29	10.900	0.000
					B	9.130	10.007		52.29	19.536	0.000
					C	9.130	10.007		52.29	15.840	0.000
T3 60.00-40.00	50.00	0.811	10	142.919	A	9.202	10.840	10.840	54.09	10.900	0.000
					B	9.202	10.840		54.09	32.560	0.000
					C	9.202	10.840		54.09	15.840	0.000
T4 40.00-20.00	30.00	0.701	10	168.336	A	10.135	11.674	11.674	53.53	10.900	0.000
					B	10.135	11.674		53.53	32.560	0.000
					C	10.135	11.674		53.53	15.840	0.000
T5 20.00-0.00	10.00	0.7	11	193.753	A	13.903	12.508	12.508	47.36	10.900	0.000
					B	13.903	12.508		47.36	32.560	0.000
					C	13.903	12.508		47.36	15.840	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
T1	0.07	1.43	A	0.132	2.839	32	1	1	7.745	0.82	41.00	C
100.00-80.00			B	0.132	2.839		1	1	7.745			
			C	0.132	2.839		1	1	7.745			
T2	0.31	1.86	A	0.163	2.725	33	1	1	14.824	1.89	94.30	C
80.00-60.00			B	0.163	2.725		1	1	14.824			
			C	0.163	2.725		1	1	14.824			
T3	0.39	2.25	A	0.14	2.808	32	1	1	15.290	2.16	108.19	C
60.00-40.00			B	0.14	2.808		1	1	15.290			
			C	0.14	2.808		1	1	15.290			
T4	0.39	2.57	A	0.13	2.848	31	1	1	16.568	2.21	110.28	C
40.00-20.00			B	0.13	2.848		1	1	16.568			
			C	0.13	2.848		1	1	16.568			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	36	1	1	20.496	2.85	142.44	C
			B	0.136	2.823		1	1	20.496			
			C	0.136	2.823		1	1	20.496			
Sum Weight:	1.54	11.00						OTM	408.67 kip-ft	9.92		

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
T1	0.07	1.43	A	0.132	2.839	32	0.825	1	7.745	0.82	41.00	C
100.00-80.00			B	0.132	2.839		0.825	1	7.745			

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
			C	0.132	2.839		0.825	1	7.745			
T2	0.31	1.86	A	0.163	2.725	33	0.825	1	13.226	1.77	88.28	C
80.00-60.00			B	0.163	2.725		0.825	1	13.226			
			C	0.163	2.725		0.825	1	13.226			
T3	0.39	2.25	A	0.14	2.808	32	0.825	1	13.679	2.04	101.96	C
60.00-40.00			B	0.14	2.808		0.825	1	13.679			
			C	0.14	2.808		0.825	1	13.679			
T4	0.39	2.57	A	0.13	2.848	31	0.825	1	14.794	2.07	103.55	C
40.00-20.00			B	0.13	2.848		0.825	1	14.794			
			C	0.13	2.848		0.825	1	14.794			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	36	0.825	1	18.063	2.64	131.97	C
			B	0.136	2.823		0.825	1	18.063			
			C	0.136	2.823		0.825	1	18.063			
Sum Weight:	1.54	11.00						OTM	387.87 kip-ft	9.34		

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
T1	0.07	1.43	A	0.132	2.839	32	0.8	1	7.745	0.82	41.00	C
100.00-80.00			B	0.132	2.839		0.8	1	7.745			
			C	0.132	2.839		0.8	1	7.745			
T2	0.31	1.86	A	0.163	2.725	33	0.8	1	12.998	1.75	87.42	C
80.00-60.00			B	0.163	2.725		0.8	1	12.998			
			C	0.163	2.725		0.8	1	12.998			
T3	0.39	2.25	A	0.14	2.808	32	0.8	1	13.449	2.02	101.07	C
60.00-40.00			B	0.14	2.808		0.8	1	13.449			
			C	0.14	2.808		0.8	1	13.449			
T4	0.39	2.57	A	0.13	2.848	31	0.8	1	14.541	2.05	102.59	C
40.00-20.00			B	0.13	2.848		0.8	1	14.541			
			C	0.13	2.848		0.8	1	14.541			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	36	0.8	1	17.715	2.61	130.48	C
			B	0.136	2.823		0.8	1	17.715			
			C	0.136	2.823		0.8	1	17.715			
Sum Weight:	1.54	11.00						OTM	384.90 kip-ft	9.25		

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
T1	0.07	1.43	A	0.132	2.839	32	0.85	1	7.745	0.82	41.00	C
100.00-80.00			B	0.132	2.839		0.85	1	7.745			
			C	0.132	2.839		0.85	1	7.745			

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
T2	0.31	1.86	A	0.163	2.725	33	0.85	1	13.454	1.78	89.14	C
80.00-60.00			B	0.163	2.725		0.85	1	13.454			
			C	0.163	2.725		0.85	1	13.454			
T3	0.39	2.25	A	0.14	2.808	32	0.85	1	13.910	2.06	102.85	C
60.00-40.00			B	0.14	2.808		0.85	1	13.910			
			C	0.14	2.808		0.85	1	13.910			
T4	0.39	2.57	A	0.13	2.848	31	0.85	1	15.047	2.09	104.51	C
40.00-20.00			B	0.13	2.848		0.85	1	15.047			
			C	0.13	2.848		0.85	1	15.047			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	36	0.85	1	18.410	2.67	133.47	C
			B	0.136	2.823		0.85	1	18.410			
			C	0.136	2.823		0.85	1	18.410			
Sum Weight:	1.54	11.00						OTM	390.84 kip-ft	9.42		

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
T1	0.81	3.45	A	0.442	1.986	7	1	1	31.862	0.55	27.71	C
100.00-80.00			B	0.442	1.986		1	1	31.862			
			C	0.442	1.986		1	1	31.862			
T2	2.32	4.31	A	0.389	2.085	7	1	1	33.780	0.95	47.57	C
80.00-60.00			B	0.389	2.085		1	1	33.780			
			C	0.389	2.085		1	1	33.780			
T3	2.83	4.73	A	0.33	2.22	7	1	1	33.518	1.08	54.03	C
60.00-40.00			B	0.33	2.22		1	1	33.518			
			C	0.33	2.22		1	1	33.518			
T4	2.79	5.22	A	0.3	2.297	7	1	1	35.362	1.08	53.99	C
40.00-20.00			B	0.3	2.297		1	1	35.362			
			C	0.3	2.297		1	1	35.362			
T5 20.00-0.00	2.60	5.83	A	0.284	2.339	8	1	1	39.334	1.28	64.12	C
			B	0.284	2.339		1	1	39.334			
			C	0.284	2.339		1	1	39.334			
Sum Weight:	11.36	23.54						OTM	215.72 kip-ft	4.95		

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
T1	0.81	3.45	A	0.442	1.986	7	0.825	1	31.862	0.55	27.71	C
100.00-80.00			B	0.442	1.986		0.825	1	31.862			
			C	0.442	1.986		0.825	1	31.862			
T2	2.32	4.31	A	0.389	2.085	7	0.825	1	32.183	0.93	46.59	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
80.00-60.00			B	0.389	2.085		0.825	1	32.183			
			C	0.389	2.085		0.825	1	32.183			
T3	2.83	4.73	A	0.33	2.22	7	0.825	1	31.907	1.06	52.97	C
60.00-40.00			B	0.33	2.22		0.825	1	31.907			
			C	0.33	2.22		0.825	1	31.907			
T4	2.79	5.22	A	0.3	2.297	7	0.825	1	33.588	1.06	52.83	C
40.00-20.00			B	0.3	2.297		0.825	1	33.588			
			C	0.3	2.297		0.825	1	33.588			
T5 20.00-0.00	2.60	5.83	A	0.284	2.339	8	0.825	1	36.901	1.25	62.27	C
			B	0.284	2.339		0.825	1	36.901			
			C	0.284	2.339		0.825	1	36.901			
Sum Weight:	11.36	23.54						OTM	212.21 kip-ft	4.85		

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
T1	0.81	3.45	A	0.442	1.986	7	0.8	1	31.862	0.55	27.71	C
100.00-80.00			B	0.442	1.986		0.8	1	31.862			
			C	0.442	1.986		0.8	1	31.862			
T2	2.32	4.31	A	0.389	2.085	7	0.8	1	31.954	0.93	46.44	C
80.00-60.00			B	0.389	2.085		0.8	1	31.954			
			C	0.389	2.085		0.8	1	31.954			
T3	2.83	4.73	A	0.33	2.22	7	0.8	1	31.677	1.06	52.82	C
60.00-40.00			B	0.33	2.22		0.8	1	31.677			
			C	0.33	2.22		0.8	1	31.677			
T4	2.79	5.22	A	0.3	2.297	7	0.8	1	33.335	1.05	52.66	C
40.00-20.00			B	0.3	2.297		0.8	1	33.335			
			C	0.3	2.297		0.8	1	33.335			
T5 20.00-0.00	2.60	5.83	A	0.284	2.339	8	0.8	1	36.553	1.24	62.00	C
			B	0.284	2.339		0.8	1	36.553			
			C	0.284	2.339		0.8	1	36.553			
Sum Weight:	11.36	23.54						OTM	211.71 kip-ft	4.83		

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
T1	0.81	3.45	A	0.442	1.986	7	0.85	1	31.862	0.55	27.71	C
100.00-80.00			B	0.442	1.986		0.85	1	31.862			
			C	0.442	1.986		0.85	1	31.862			
T2	2.32	4.31	A	0.389	2.085	7	0.85	1	32.411	0.93	46.73	C
80.00-60.00			B	0.389	2.085		0.85	1	32.411			

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
			C	0.389	2.085		0.85	1	32.411			
T3	2.83	4.73	A	0.33	2.22	7	0.85	1	32.137	1.06	53.12	C
60.00-40.00			B	0.33	2.22		0.85	1	32.137			
			C	0.33	2.22		0.85	1	32.137			
T4	2.79	5.22	A	0.3	2.297	7	0.85	1	33.842	1.06	52.99	C
40.00-20.00			B	0.3	2.297		0.85	1	33.842			
			C	0.3	2.297		0.85	1	33.842			
T5 20.00-0.00	2.60	5.83	A	0.284	2.339	8	0.85	1	37.248	1.25	62.53	C
			B	0.284	2.339		0.85	1	37.248			
			C	0.284	2.339		0.85	1	37.248			
Sum Weight:	11.36	23.54						OTM	212.71 kip-ft	4.86		

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
T1	0.07	1.43	A	0.132	2.839	10	1	1	7.745	0.25	12.65	C
100.00-80.00			B	0.132	2.839		1	1	7.745			
			C	0.132	2.839		1	1	7.745			
T2	0.31	1.86	A	0.163	2.725	10	1	1	14.824	0.58	29.11	C
80.00-60.00			B	0.163	2.725		1	1	14.824			
			C	0.163	2.725		1	1	14.824			
T3	0.39	2.25	A	0.14	2.808	10	1	1	15.345	0.67	33.46	C
60.00-40.00			B	0.14	2.808		1	1	15.345			
			C	0.14	2.808		1	1	15.345			
T4	0.39	2.57	A	0.13	2.848	10	1	1	16.740	0.68	34.24	C
40.00-20.00			B	0.13	2.848		1	1	16.740			
			C	0.13	2.848		1	1	16.740			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	11	1	1	20.986	0.89	44.61	C
			B	0.136	2.823		1	1	20.986			
			C	0.136	2.823		1	1	20.986			
Sum Weight:	1.54	11.00						OTM	126.45 kip-ft	3.08		

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
T1	0.07	1.43	A	0.132	2.839	10	0.825	1	7.745	0.25	12.65	C
100.00-80.00			B	0.132	2.839		0.825	1	7.745			
			C	0.132	2.839		0.825	1	7.745			
T2	0.31	1.86	A	0.163	2.725	10	0.825	1	13.226	0.54	27.25	C
80.00-60.00			B	0.163	2.725		0.825	1	13.226			
			C	0.163	2.725		0.825	1	13.226			

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
T3	0.39	2.25	A	0.14	2.808	10	0.825	1	13.734	0.63	31.53	C
60.00-40.00			B	0.14	2.808		0.825	1	13.734			
			C	0.14	2.808		0.825	1	13.734			
T4	0.39	2.57	A	0.13	2.848	10	0.825	1	14.967	0.64	32.16	C
40.00-20.00			B	0.13	2.848		0.825	1	14.967			
			C	0.13	2.848		0.825	1	14.967			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	11	0.825	1	18.553	0.83	41.38	C
			B	0.136	2.823		0.825	1	18.553			
			C	0.136	2.823		0.825	1	18.553			
Sum Weight:	1.54	11.00						OTM	120.03 kip-ft	2.90		

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
T1	0.07	1.43	A	0.132	2.839	10	0.8	1	7.745	0.25	12.65	C
100.00-80.00			B	0.132	2.839		0.8	1	7.745			
			C	0.132	2.839		0.8	1	7.745			
T2	0.31	1.86	A	0.163	2.725	10	0.8	1	12.998	0.54	26.98	C
80.00-60.00			B	0.163	2.725		0.8	1	12.998			
			C	0.163	2.725		0.8	1	12.998			
T3	0.39	2.25	A	0.14	2.808	10	0.8	1	13.504	0.63	31.26	C
60.00-40.00			B	0.14	2.808		0.8	1	13.504			
			C	0.14	2.808		0.8	1	13.504			
T4	0.39	2.57	A	0.13	2.848	10	0.8	1	14.713	0.64	31.87	C
40.00-20.00			B	0.13	2.848		0.8	1	14.713			
			C	0.13	2.848		0.8	1	14.713			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	11	0.8	1	18.206	0.82	40.92	C
			B	0.136	2.823		0.8	1	18.206			
			C	0.136	2.823		0.8	1	18.206			
Sum Weight:	1.54	11.00						OTM	119.11 kip-ft	2.87		

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
T1	0.07	1.43	A	0.132	2.839	10	0.85	1	7.745	0.25	12.65	C
100.00-80.00			B	0.132	2.839		0.85	1	7.745			
			C	0.132	2.839		0.85	1	7.745			
T2	0.31	1.86	A	0.163	2.725	10	0.85	1	13.454	0.55	27.51	C
80.00-60.00			B	0.163	2.725		0.85	1	13.454			
			C	0.163	2.725		0.85	1	13.454			
T3	0.39	2.25	A	0.14	2.808	10	0.85	1	13.964	0.64	31.81	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
60.00-40.00			B	0.14	2.808		0.85	1	13.964			
			C	0.14	2.808		0.85	1	13.964			
T4	0.39	2.57	A	0.13	2.848	10	0.85	1	15.220	0.65	32.46	C
40.00-20.00			B	0.13	2.848		0.85	1	15.220			
			C	0.13	2.848		0.85	1	15.220			
T5 20.00-0.00	0.39	2.89	A	0.136	2.823	11	0.85	1	18.901	0.84	41.84	C
			B	0.136	2.823		0.85	1	18.901			
			C	0.136	2.823		0.85	1	18.901			
Sum Weight:	1.54	11.00						OTM	120.95 kip-ft	2.93		

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	8.17					
Bracing Weight	2.83					
Total Member Self-Weight	11.00			3.87	-1.84	
Total Weight	18.93			3.87	-1.84	
Wind 0 deg - No Ice		0.05	-16.58	-939.50	-5.43	3.93
Wind 30 deg - No Ice		7.99	-13.95	-799.47	-461.42	6.32
Wind 45 deg - No Ice		11.22	-11.34	-651.03	-647.82	6.90
Wind 60 deg - No Ice		13.65	-8.00	-459.04	-789.12	7.01
Wind 90 deg - No Ice		15.90	-0.05	0.29	-914.78	5.82
Wind 120 deg - No Ice		14.18	8.25	472.45	-806.12	3.07
Wind 135 deg - No Ice		11.39	11.51	662.10	-651.15	1.33
Wind 150 deg - No Ice		7.91	13.90	803.63	-455.20	-0.50
Wind 180 deg - No Ice		-0.05	15.91	923.48	1.75	-3.93
Wind 210 deg - No Ice		-7.99	13.95	807.22	457.74	-6.32
Wind 225 deg - No Ice		-11.22	11.34	658.77	644.15	-6.90
Wind 240 deg - No Ice		-14.23	8.33	478.67	806.03	-7.01
Wind 270 deg - No Ice		-15.90	0.05	7.46	911.11	-5.82
Wind 300 deg - No Ice		-13.60	-7.91	-452.82	781.86	-3.07
Wind 315 deg - No Ice		-11.15	-11.27	-645.95	639.07	-1.33
Wind 330 deg - No Ice		-7.91	-13.90	-795.88	451.53	0.50
Member Ice	12.54					
Total Weight Ice	52.42			16.74	-6.90	
Wind 0 deg - Ice		0.01	-7.52	-410.57	-7.63	1.17
Wind 30 deg - Ice		3.71	-6.44	-351.09	-218.36	2.98
Wind 45 deg - Ice		5.23	-5.25	-283.45	-305.22	3.61
Wind 60 deg - Ice		6.38	-3.71	-195.55	-371.56	4.00
Wind 90 deg - Ice		7.39	-0.01	16.00	-428.55	3.94
Wind 120 deg - Ice		6.47	3.75	229.76	-374.30	2.83
Wind 135 deg - Ice		5.25	5.28	317.31	-305.60	1.96
Wind 150 deg - Ice		3.69	6.43	383.82	-217.09	0.96
Wind 180 deg - Ice		-0.01	7.40	440.03	-6.16	-1.17
Wind 210 deg - Ice		-3.71	6.44	384.56	204.57	-2.98
Wind 225 deg - Ice		-5.23	5.25	316.92	291.42	-3.61
Wind 240 deg - Ice		-6.48	3.77	231.02	361.24	-4.00
Wind 270 deg - Ice		-7.39	0.01	17.47	414.76	-3.94
Wind 300 deg - Ice		-6.37	-3.69	-194.28	357.04	-2.83
Wind 315 deg - Ice		-5.21	-5.24	-282.42	290.39	-1.96

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 330 deg - Ice		-3.69	-6.43	-350.35	203.30	-0.96
Total Weight	18.93			3.87	-1.84	
Wind 0 deg - Service		0.02	-5.14	-289.15	-1.22	1.21
Wind 30 deg - Service		2.48	-4.32	-245.88	-142.12	1.95
Wind 45 deg - Service		3.48	-3.51	-200.02	-199.72	2.13
Wind 60 deg - Service		4.23	-2.48	-140.70	-243.38	2.16
Wind 90 deg - Service		4.93	-0.02	1.23	-282.20	1.80
Wind 120 deg - Service		4.39	2.55	147.12	-248.62	0.95
Wind 135 deg - Service		3.53	3.57	205.72	-200.74	0.41
Wind 150 deg - Service		2.45	4.30	249.45	-140.20	-0.15
Wind 180 deg - Service		-0.02	4.93	286.48	1.00	-1.21
Wind 210 deg - Service		-2.48	4.32	250.56	141.89	-1.95
Wind 225 deg - Service		-3.48	3.51	204.69	199.49	-2.13
Wind 240 deg - Service		-4.41	2.58	149.04	249.50	-2.16
Wind 270 deg - Service		-4.93	0.02	3.44	281.98	-1.80
Wind 300 deg - Service		-4.21	-2.45	-138.78	242.04	-0.95
Wind 315 deg - Service		-3.45	-3.49	-198.45	197.92	-0.41
Wind 330 deg - Service		-2.45	-4.30	-244.78	139.97	0.15

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
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

Comb. No.	Description
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
T1	100 - 80	Leg	Max Tension	19	10.26	0.00	-0.42
			Max. Compression	24	-12.74	0.20	-0.11
			Max. Mx	10	-0.30	0.76	-0.00
			Max. My	2	4.05	-0.04	-0.76
			Max. Vy	10	-0.87	-0.40	0.03
			Max. Vx	18	-0.88	0.00	-0.42
		Diagonal	Max Tension	26	2.71	0.00	0.00
			Max. Compression	10	-2.75	0.00	0.00
			Max. Mx	47	0.85	-0.01	-0.00
			Max. My	10	-2.73	-0.00	0.00
			Max. Vy	47	0.02	-0.01	-0.00
			Max. Vx	10	-0.00	-0.00	0.00
		Top Girt	Max Tension	3	0.03	0.00	0.00
			Max. Compression	38	-0.06	0.00	0.00
			Max. Mx	34	-0.03	0.03	0.00
			Max. My	10	-0.01	0.00	0.00
			Max. Vy	34	0.02	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
T2	80 - 60	Leg	Max Tension	19	42.59	-0.47	0.02
			Max. Compression	24	-49.23	0.04	0.02

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	18	27.48	1.18	0.03
			Max. My	4	-2.49	-0.04	1.32
			Max. Vy	18	-1.45	-0.74	0.03
			Max. Vx	20	1.52	-0.02	0.69
		Diagonal	Max Tension	26	6.77	0.00	0.00
			Max. Compression	10	-6.82	0.00	0.00
			Max. Mx	40	1.04	0.03	-0.00
			Max. My	10	-6.39	0.00	-0.01
			Max. Vy	43	0.03	0.03	-0.00
			Max. Vx	10	0.00	0.00	0.00
		Top Girt	Max Tension	18	0.49	0.00	0.00
			Max. Compression	3	-0.46	0.00	0.00
			Max. Mx	34	0.02	-0.04	0.00
			Max. My	40	0.07	0.00	0.00
			Max. Vy	34	0.03	0.00	0.00
			Max. Vx	40	-0.00	0.00	0.00
T3	60 - 40	Leg	Max Tension	19	84.47	-0.13	0.02
			Max. Compression	24	-93.33	0.17	0.02
			Max. Mx	3	-92.02	0.17	-0.02
			Max. My	20	-5.41	-0.01	0.18
			Max. Vy	28	0.07	-0.16	-0.00
			Max. Vx	4	0.10	-0.00	-0.18
		Diagonal	Max Tension	26	6.50	0.00	0.00
			Max. Compression	26	-6.55	0.00	0.00
			Max. Mx	40	1.04	0.03	-0.00
			Max. My	10	-6.48	-0.00	-0.01
			Max. Vy	43	0.03	0.03	0.00
			Max. Vx	10	0.00	0.00	0.00
T4	40 - 20	Leg	Max Tension	19	122.56	-0.19	0.02
			Max. Compression	2	-134.68	0.17	-0.02
			Max. Mx	46	-52.14	0.34	0.01
			Max. My	20	-7.26	-0.02	0.31
			Max. Vy	48	-0.10	-0.26	0.00
			Max. Vx	20	-0.10	-0.02	0.31
		Diagonal	Max Tension	26	6.52	0.00	0.00
			Max. Compression	26	-6.60	0.00	0.00
			Max. Mx	43	1.10	0.05	0.00
			Max. My	8	-5.77	0.00	-0.01
			Max. Vy	43	0.04	0.05	0.00
			Max. Vx	38	0.00	0.00	0.00
T5	20 - 0	Leg	Max Tension	19	158.82	-0.24	0.03
			Max. Compression	2	-174.82	-0.00	0.00
			Max. Mx	43	29.30	-0.51	0.01
			Max. My	20	-8.23	-0.03	0.54
			Max. Vy	48	-0.15	-0.50	0.00
			Max. Vx	20	0.18	-0.03	0.54
		Diagonal	Max Tension	26	7.10	0.00	0.00
			Max. Compression	26	-7.26	0.00	0.00
			Max. Mx	43	0.87	0.07	0.00
			Max. My	10	-6.85	-0.00	-0.01
			Max. Vy	43	0.05	0.07	0.00
			Max. Vx	10	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	181.22	13.57	-7.11
	Max. H_x	24	181.22	13.57	-7.11
	Max. H_z	7	-158.48	-12.03	6.95
	Min. Vert	9	-163.36	-12.70	6.59
	Min. H_x	9	-163.36	-12.70	6.59
	Min. H_z	22	171.93	12.42	-7.17
Leg B	Max. Vert	12	180.51	-13.33	-7.38
	Max. H_x	29	-161.88	12.45	6.86
	Max. H_z	31	-156.87	11.69	7.35
	Min. Vert	29	-161.88	12.45	6.86
	Min. H_x	12	180.51	-13.33	-7.38
	Min. H_z	14	173.21	-12.32	-7.71
Leg A	Max. Vert	2	181.81	0.35	15.38
	Max. H_x	27	4.61	1.89	0.18
	Max. H_z	2	181.81	0.35	15.38
	Min. Vert	19	-164.98	-0.36	-14.39
	Min. H_x	13	-81.48	-1.91	-7.32
	Min. H_z	19	-164.98	-0.36	-14.39

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	18.93	0.00	0.00	3.87	-1.84	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	22.72	0.08	-26.53	-1508.91	-7.98	6.30
0.9 Dead+1.6 Wind 0 deg - No Ice	17.04	0.08	-26.53	-1509.03	-7.42	6.30
1.2 Dead+1.6 Wind 30 deg - No Ice	22.72	12.79	-22.31	-1284.25	-739.60	10.12
0.9 Dead+1.6 Wind 30 deg - No Ice	17.04	12.79	-22.31	-1284.52	-738.53	10.12
1.2 Dead+1.6 Wind 45 deg - No Ice	22.72	17.95	-18.15	-1046.08	-1038.68	11.06
0.9 Dead+1.6 Wind 45 deg - No Ice	17.04	17.95	-18.15	-1046.51	-1037.40	11.05
1.2 Dead+1.6 Wind 60 deg - No Ice	22.72	21.84	-12.79	-738.04	-1265.38	11.23
0.9 Dead+1.6 Wind 60 deg - No Ice	17.04	21.84	-12.79	-738.69	-1263.94	11.23
1.2 Dead+1.6 Wind 90 deg - No Ice	22.72	25.44	-0.08	-1.08	-1466.99	9.33
0.9 Dead+1.6 Wind 90 deg - No Ice	17.04	25.44	-0.08	-2.25	-1465.41	9.32
1.2 Dead+1.6 Wind 120 deg - No Ice	22.72	22.69	13.19	756.47	-1292.61	4.93
0.9 Dead+1.6 Wind 120 deg - No Ice	17.04	22.69	13.19	754.78	-1291.16	4.93
1.2 Dead+1.6 Wind 135 deg - No Ice	22.72	18.22	18.42	1060.75	-1043.99	2.14
0.9 Dead+1.6 Wind 135 deg - No Ice	17.04	18.22	18.42	1058.85	-1042.71	2.14
1.2 Dead+1.6 Wind 150 deg - No Ice	22.72	12.65	22.23	1287.83	-729.61	-0.79
0.9 Dead+1.6 Wind 150 deg - No Ice	17.04	12.65	22.23	1285.77	-728.55	-0.79

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
1.2 Dead+1.6 Wind 180 deg - No Ice	22.72	-0.08	25.45	1480.13	3.54	-6.30
0.9 Dead+1.6 Wind 180 deg - No Ice	17.04	-0.08	25.45	1477.93	4.09	-6.30
1.2 Dead+1.6 Wind 210 deg - No Ice	22.72	-12.79	22.31	1293.59	735.15	-10.12
0.9 Dead+1.6 Wind 210 deg - No Ice	17.04	-12.79	22.31	1291.53	735.19	-10.12
1.2 Dead+1.6 Wind 225 deg - No Ice	22.72	-17.95	18.15	1055.43	1034.23	-11.05
0.9 Dead+1.6 Wind 225 deg - No Ice	17.04	-17.95	18.15	1053.53	1034.07	-11.05
1.2 Dead+1.6 Wind 240 deg - No Ice	22.72	-22.77	13.33	766.45	1293.95	-11.23
0.9 Dead+1.6 Wind 240 deg - No Ice	17.04	-22.77	13.33	764.75	1293.60	-11.23
1.2 Dead+1.6 Wind 270 deg - No Ice	22.72	-25.44	0.08	10.44	1462.56	-9.33
0.9 Dead+1.6 Wind 270 deg - No Ice	17.04	-25.44	0.08	9.26	1462.10	-9.32
1.2 Dead+1.6 Wind 300 deg - No Ice	22.72	-21.76	-12.66	-728.07	1255.19	-4.93
0.9 Dead+1.6 Wind 300 deg - No Ice	17.04	-21.76	-12.66	-728.73	1254.87	-4.93
1.2 Dead+1.6 Wind 315 deg - No Ice	22.72	-17.84	-18.03	-1037.94	1026.10	-2.14
0.9 Dead+1.6 Wind 315 deg - No Ice	17.04	-17.84	-18.03	-1038.38	1025.94	-2.14
1.2 Dead+1.6 Wind 330 deg - No Ice	22.72	-12.65	-22.23	-1278.49	725.19	0.79
0.9 Dead+1.6 Wind 330 deg - No Ice	17.04	-12.65	-22.23	-1278.77	725.24	0.79
1.2 Dead+1.0 Ice+1.0 Temp	56.21	0.00	0.00	17.64	-7.30	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	56.21	0.01	-7.52	-412.50	-8.03	1.17
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	56.21	3.71	-6.44	-352.62	-220.18	3.00
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	56.21	5.23	-5.25	-284.55	-307.62	3.63
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	56.21	6.38	-3.71	-196.04	-374.42	4.02
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	56.21	7.39	-0.01	16.93	-431.78	3.96
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	56.21	6.47	3.75	232.10	-377.16	2.84
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	56.21	5.25	5.28	320.24	-308.00	1.97
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	56.21	3.69	6.43	387.21	-218.90	0.97
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	56.21	-0.01	7.40	443.80	-6.56	-1.17
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	56.21	-3.71	6.44	387.94	205.58	-3.00
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	56.21	-5.23	5.25	319.86	293.03	-3.63
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	56.21	-6.48	3.77	233.38	363.31	-4.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	56.21	-7.39	0.01	18.40	417.19	-3.96
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	56.21	-6.37	-3.69	-194.76	359.09	-2.84

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
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	56.21	-5.21	-5.24	-283.51	291.98	-1.97
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	56.21	-3.69	-6.43	-351.88	204.31	-0.97
Dead+Wind 0 deg - Service	18.93	0.02	-5.14	-288.27	-2.95	1.22
Dead+Wind 30 deg - Service	18.93	2.48	-4.32	-244.91	-144.18	1.95
Dead+Wind 45 deg - Service	18.93	3.48	-3.51	-198.94	-201.91	2.13
Dead+Wind 60 deg - Service	18.93	4.23	-2.48	-139.48	-245.67	2.17
Dead+Wind 90 deg - Service	18.93	4.93	-0.02	2.78	-284.58	1.80
Dead+Wind 120 deg - Service	18.93	4.39	2.55	149.00	-250.92	0.95
Dead+Wind 135 deg - Service	18.93	3.53	3.57	207.74	-202.94	0.41
Dead+Wind 150 deg - Service	18.93	2.45	4.30	251.57	-142.25	-0.15
Dead+Wind 180 deg - Service	18.93	-0.02	4.93	288.69	-0.73	-1.22
Dead+Wind 210 deg - Service	18.93	-2.48	4.32	252.68	140.49	-1.95
Dead+Wind 225 deg - Service	18.93	-3.48	3.51	206.71	198.22	-2.13
Dead+Wind 240 deg - Service	18.93	-4.41	2.58	150.93	248.35	-2.17
Dead+Wind 270 deg - Service	18.93	-4.93	0.02	5.00	280.90	-1.80
Dead+Wind 300 deg - Service	18.93	-4.21	-2.45	-137.55	240.88	-0.95
Dead+Wind 315 deg - Service	18.93	-3.45	-3.49	-197.37	196.66	-0.41
Dead+Wind 330 deg - Service	18.93	-2.45	-4.30	-243.80	138.57	0.15

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	-18.93	0.00	0.00	18.93	0.00	0.000%
2	0.08	-22.72	-26.53	-0.08	22.72	26.53	0.000%
3	0.08	-17.04	-26.53	-0.08	17.04	26.53	0.000%
4	12.79	-22.72	-22.31	-12.79	22.72	22.31	0.000%
5	12.79	-17.04	-22.31	-12.79	17.04	22.31	0.000%
6	17.95	-22.72	-18.15	-17.95	22.72	18.15	0.000%
7	17.95	-17.04	-18.15	-17.95	17.04	18.15	0.000%
8	21.84	-22.72	-12.79	-21.84	22.72	12.79	0.000%
9	21.84	-17.04	-12.79	-21.84	17.04	12.79	0.000%
10	25.44	-22.72	-0.08	-25.44	22.72	0.08	0.000%
11	25.44	-17.04	-0.08	-25.44	17.04	0.08	0.000%
12	22.69	-22.72	13.19	-22.69	22.72	-13.19	0.000%
13	22.69	-17.04	13.19	-22.69	17.04	-13.19	0.000%
14	18.22	-22.72	18.42	-18.22	22.72	-18.42	0.000%
15	18.22	-17.04	18.42	-18.22	17.04	-18.42	0.000%
16	12.65	-22.72	22.23	-12.65	22.72	-22.23	0.000%
17	12.65	-17.04	22.23	-12.65	17.04	-22.23	0.000%
18	-0.08	-22.72	25.45	0.08	22.72	-25.45	0.000%
19	-0.08	-17.04	25.45	0.08	17.04	-25.45	0.000%
20	-12.79	-22.72	22.31	12.79	22.72	-22.31	0.000%
21	-12.79	-17.04	22.31	12.79	17.04	-22.31	0.000%
22	-17.95	-22.72	18.15	17.95	22.72	-18.15	0.000%
23	-17.95	-17.04	18.15	17.95	17.04	-18.15	0.000%
24	-22.77	-22.72	13.33	22.77	22.72	-13.33	0.000%
25	-22.77	-17.04	13.33	22.77	17.04	-13.33	0.000%
26	-25.44	-22.72	0.08	25.44	22.72	-0.08	0.000%
27	-25.44	-17.04	0.08	25.44	17.04	-0.08	0.000%
28	-21.76	-22.72	-12.66	21.76	22.72	12.66	0.000%
29	-21.76	-17.04	-12.66	21.76	17.04	12.66	0.000%
30	-17.84	-22.72	-18.03	17.84	22.72	18.03	0.000%
31	-17.84	-17.04	-18.03	17.84	17.04	18.03	0.000%
32	-12.65	-22.72	-22.23	12.65	22.72	22.23	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
33	-12.65	-17.04	-22.23	12.65	17.04	22.23	0.000%
34	0.00	-56.21	0.00	0.00	56.21	0.00	0.000%
35	0.01	-56.21	-7.52	-0.01	56.21	7.52	0.000%
36	3.71	-56.21	-6.44	-3.71	56.21	6.44	0.000%
37	5.23	-56.21	-5.25	-5.23	56.21	5.25	0.000%
38	6.38	-56.21	-3.71	-6.38	56.21	3.71	0.000%
39	7.39	-56.21	-0.01	-7.39	56.21	0.01	0.000%
40	6.47	-56.21	3.75	-6.47	56.21	-3.75	0.000%
41	5.25	-56.21	5.28	-5.25	56.21	-5.28	0.000%
42	3.69	-56.21	6.43	-3.69	56.21	-6.43	0.000%
43	-0.01	-56.21	7.40	0.01	56.21	-7.40	0.000%
44	-3.71	-56.21	6.44	3.71	56.21	-6.44	0.000%
45	-5.23	-56.21	5.25	5.23	56.21	-5.25	0.000%
46	-6.48	-56.21	3.77	6.48	56.21	-3.77	0.000%
47	-7.39	-56.21	0.01	7.39	56.21	-0.01	0.000%
48	-6.37	-56.21	-3.69	6.37	56.21	3.69	0.000%
49	-5.21	-56.21	-5.24	5.21	56.21	5.24	0.000%
50	-3.69	-56.21	-6.43	3.69	56.21	6.43	0.000%
51	0.02	-18.93	-5.14	-0.02	18.93	5.14	0.000%
52	2.48	-18.93	-4.32	-2.48	18.93	4.32	0.000%
53	3.48	-18.93	-3.51	-3.48	18.93	3.51	0.000%
54	4.23	-18.93	-2.48	-4.23	18.93	2.48	0.000%
55	4.93	-18.93	-0.02	-4.93	18.93	0.02	0.000%
56	4.39	-18.93	2.55	-4.39	18.93	-2.55	0.000%
57	3.53	-18.93	3.57	-3.53	18.93	-3.57	0.000%
58	2.45	-18.93	4.30	-2.45	18.93	-4.30	0.000%
59	-0.02	-18.93	4.93	0.02	18.93	-4.93	0.000%
60	-2.48	-18.93	4.32	2.48	18.93	-4.32	0.000%
61	-3.48	-18.93	3.51	3.48	18.93	-3.51	0.000%
62	-4.41	-18.93	2.58	4.41	18.93	-2.58	0.000%
63	-4.93	-18.93	0.02	4.93	18.93	-0.02	0.000%
64	-4.21	-18.93	-2.45	4.21	18.93	2.45	0.000%
65	-3.45	-18.93	-3.49	3.45	18.93	3.49	0.000%
66	-2.45	-18.93	-4.30	2.45	18.93	4.30	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	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000168
5	Yes	4	0.00000001	0.00000163
6	Yes	4	0.00000001	0.00000183
7	Yes	4	0.00000001	0.00000172
8	Yes	4	0.00000001	0.00000182
9	Yes	4	0.00000001	0.00000169
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000160
17	Yes	4	0.00000001	0.00000001

18	Yes	4	0.00000001	0.00000182
19	Yes	4	0.00000001	0.00000168
20	Yes	4	0.00000001	0.00000171
21	Yes	4	0.00000001	0.00000165
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000174
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000172
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001
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 °
T1	100 - 80	0.978	59	0.0691	0.0339
T2	80 - 60	0.692	56	0.0641	0.0265
T3	60 - 40	0.419	56	0.0545	0.0163
T4	40 - 20	0.204	56	0.0378	0.0102
T5	20 - 0	0.064	62	0.0190	0.0050

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.00	10-ft Lighting Rod	59	0.978	0.0691	0.0339	Inf
98.50	PiROD 12' T-Frame	59	0.956	0.0688	0.0334	Inf
82.00	PiROD 12' T-Frame	59	0.720	0.0648	0.0275	358791
72.00	PiROD 15' T-Frame	56	0.579	0.0611	0.0222	166347

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	5.001	24	0.3445	0.1757
T2	80 - 60	3.567	3	0.3249	0.1377
T3	60 - 40	2.166	3	0.2790	0.0845
T4	40 - 20	1.058	2	0.1949	0.0531
T5	20 - 0	0.330	2	0.0980	0.0261

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.00	10-ft Lighting Rod	24	5.001	0.3445	0.1757	369681
98.50	PiROD 12' T-Frame	24	4.894	0.3433	0.1734	369681
82.00	PiROD 12' T-Frame	3	3.711	0.3276	0.1426	112864
72.00	PiROD 15' T-Frame	3	2.989	0.3110	0.1150	37408

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	100	Leg	A325N	0.7500	4	2.56	29.82	0.086 ✔	1	Bolt Tension
T2	80	Leg	A325N	1.0000	6	7.10	53.01	0.134 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6.77	7.83	0.865 ✔	1	Member Bearing
		Top Girt	A325N	0.6250	1	0.85	7.83	0.109 ✔	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T3	60	Leg	A325N	1.0000	6	14.08	53.01	0.266 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6.50	10.44	0.623 ✔	1	Member Bearing
T4	40	Leg	A325N	1.0000	6	20.43	53.01	0.385 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6.52	10.44	0.624 ✔	1	Member Bearing
T5	20	Leg	A36	1.1250	6	26.47	32.43	0.816 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7.10	7.83	0.906 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	2 1/4	20.00	3.33	71.1 K=1.00	3.9761	-12.74	123.62	0.103 [1] ✔
T2	80 - 60	3	20.01	6.67	106.7 K=1.00	7.0686	-49.23	138.29	0.356 [1] ✔
T3	60 - 40	3 1/4	20.01	6.67	98.5 K=1.00	8.2958	-93.33	183.58	0.508 [1] ✔
T4	40 - 20	3 1/2	20.01	6.67	91.5 K=1.00	9.6211	-134.68	234.78	0.574 [1] ✔
T5	20 - 0	3 3/4	20.01	6.67	85.4 K=1.00	11.0447	-174.82	291.63	0.599 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	1	6.01	2.89	124.9 K=0.90	0.7854	-2.75	11.19	0.246 [1] ✔
T2	80 - 60	L2x2x3/16	9.00	4.35	132.4 K=1.00	0.7150	-6.82	9.20	0.741 [1] ✔
T3	60 - 40	L2x2x1/4	9.88	4.78	146.6 K=1.00	0.9380	-6.51	9.85	0.661 [1] ✔
T4	40 - 20	L2x2x1/4	10.84	5.25	161.0 K=1.00	0.9380	-6.60	8.18	0.808 [1] ✔
T5	20 - 0	L2 1/2x2 1/2x3/16	11.85	5.74	139.2	0.9020	-7.26	10.52	0.690 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	1	5.00	4.81	161.7 K=0.70	0.7854	-0.06	6.79	0.009 [1] ✔
T2	80 - 60	L2x2x3/16	5.00	4.51	137.4 K=1.00	0.7150	-0.85	8.56	0.100 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	2 1/4	20.00	3.33	71.1	3.9761	10.26	178.92	0.057 [1] ✔
T2	80 - 60	3	20.01	6.67	106.7	7.0686	42.59	318.09	0.134 [1] ✔
T3	60 - 40	3 1/4	20.01	6.67	98.5	8.2958	84.47	373.31	0.226 [1] ✔
T4	40 - 20	3 1/2	20.01	6.67	91.5	9.6211	122.56	432.95	0.283 [1] ✔
T5	20 - 0	3 3/4	20.01	6.67	85.4	11.0447	158.82	497.01	0.320 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	1	6.01	2.89	138.8	0.7854	2.71	25.45	0.107 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	80 - 60	L2x2x3/16	9.00	4.35	86.9	0.7150	6.77	23.17	0.292 [1]
T3	60 - 40	L2x2x1/4	9.28	4.49	90.8	0.9380	6.50	30.39	0.214 [1]
T4	40 - 20	L2x2x1/4	10.84	5.25	105.7	0.9380	6.52	30.39	0.215 [1]
T5	20 - 0	L2 1/2x2 1/2x3/16	11.85	5.74	90.4	0.9020	7.10	29.22	0.243 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	100 - 80	1	5.00	4.81	231.0	0.7854	0.03	25.45	0.001 [1]
T2	80 - 60	L2x2x3/16	5.00	4.51	92.4	0.4308	0.85	18.74	0.046 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	100 - 80	Leg	2 1/4	1	-12.74	123.62	10.3	Pass
T2	80 - 60	Leg	3	43	-49.23	138.29	35.6	Pass
T3	60 - 40	Leg	3 1/4	67	-93.33	183.58	50.8	Pass
T4	40 - 20	Leg	3 1/2	90	-134.68	234.78	57.4	Pass
T5	20 - 0	Leg	3 3/4	111	-174.82	291.63	59.9	Pass
							81.6 (b)	
T1	100 - 80	Diagonal	1	8	-2.75	11.19	24.6	Pass
T2	80 - 60	Diagonal	L2x2x3/16	50	-6.82	9.20	74.1	Pass
							86.5 (b)	
T3	60 - 40	Diagonal	L2x2x1/4	70	-6.51	9.85	66.1	Pass
T4	40 - 20	Diagonal	L2x2x1/4	91	-6.60	8.18	80.8	Pass
T5	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	112	-7.26	10.52	69.0	Pass
							90.6 (b)	
T1	100 - 80	Top Girt	1	5	-0.06	6.79	0.9	Pass
T2	80 - 60	Top Girt	L2x2x3/16	48	-0.85	8.56	10.0	Pass
							10.9 (b)	
							Summary	
						Leg (T5)	81.6	Pass
						Diagonal (T5)	90.6	Pass
						Top Girt	10.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T2) Bolt Checks	90.6	Pass
						RATING =	**90.6**	**Pass**

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Subject: Foundation Analysis

Location: Salem, CT

Rev. 0: 03/07/22

Prepared by: PPG Checked by: TJL
Job No. 22022.01

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 1509 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 27 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 23\ kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 182 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 165 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 100 \cdot ft$	(User Input)	
Tower Width =	$W_t := 10 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 3.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 21.0 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcement Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 28 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 5000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 115 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Buoyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(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)	

Calculated Factors:

Coefficient of Lateral Soil Pressure = $K_p := \frac{1+\sin(\Phi_s)}{1-\sin(\Phi_s)} = 2.77$

Load Factor = $LF := 1$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := \text{if}(Bouyancy = 1, \gamma_{conc} - 62.4 \cdot pcf, \gamma_{conc}) = 150\ pcf$

Adjusted Soil Unit Weight = $\gamma_s := \text{if}(Bouyancy = 1, \gamma_{soil} - 62.4 \cdot pcf, \gamma_{soil}) = 115\ pcf$

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

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.115\ ksf$

$P_{top} := \text{if}(n < (D_f - T_f), P_{pt}, P_{pn}) = 1.115\ ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.911\ ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.513\ ksf$

$T_p := \text{if}(n < (D_f - T_f), T_f, (D_f - n)) = 2.5\ ft$

$A_p := W_f \cdot T_p = 52.5\ ft^2$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 79.433\ kip$

Weight of Concrete = $WT_c := \left(\left({W_f}^2 \cdot T_f \right) + (3) \cdot \left(\frac{{d_p}^2 \cdot \pi}{4} \cdot L_p \right) \right) \cdot \gamma_c = 178.098\ kip$

Weight of Soil Above Footing = $WT_{s1} := \left(\left({W_f}^2 - (3) \cdot \left(\frac{{d_p}^2 \cdot \pi}{4} \right) \right) \cdot \left(\left| L_p - L_{pag} - n \right| \right) \right) \cdot \gamma_s = 168.97\ kip$

Weight of Soil Wedge at Back Face = $WT_{s2} := \left(\frac{(D_f - n)^2 \cdot \tan(\Phi_s)}{2} \cdot W_f \right) \cdot \gamma_s = 23.113\ kip$

Foundation has undercut toe per Fred A. Nudd dwg 96-4992-1

Tower Offset = $X_{t1} := \left(\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2} \right) \quad X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := \text{if}(Pos_t = 1, X_{t1}, X_{t2}) = 7.613$

$X_{off1} := \frac{W_f}{2} - \left(\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t \right) = 0 \qquad X_{off2} := 0$

$X_{off} := \text{if}(Pos_t = 1, X_{off1}, X_{off2}) \qquad X_{off} = 0\ ft$

Total Weight = $WT_{tot} := 0.9 \cdot WT_c + 0.75 \cdot WT_{s1} = 287\ kip$

Resisting Moment =

$$M_r := \left(WT_{tot}\right) \cdot \frac{W_f}{2} + 0.9 \cdot WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75 \cdot \left(S_u \cdot \frac{T_p}{3}\right) + 0.75 \cdot WT_{s2} \cdot \left(W_f + \frac{\left(D_f - n\right) \cdot \tan\left(\Phi_s\right)}{3}\right) = 3663\ kip \cdot ft$$

Overturning Moment = $M_{ot} := OM + S_t \cdot \left(L_p + T_f\right) = 1684.5\ kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.17$

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

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

$OverTurning\_Moment\_Check = \text{“Okay”}$

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 208.59\ kips$

$Shear\_Check := \text{if}\left(S_p > S_t, \text{“Okay”}, \text{“No Good”}\right)$

$Shear\_Check = \text{“Okay”}$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 370\ kip$

Area of the Mat = $A_{mat} := {W_f}^2 = 441$

Section Modulus of Mat = $S := \frac{{W_f}^3}{6} = 1543.5\ ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.931\ ksf$

$Max\_Pressure\_Check := \text{if}\left(P_{max} < 0.75 \cdot q_s, \text{“Okay”}, \text{“No Good”}\right)$

$Max\_Pressure\_Check = \text{“Okay”}$

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.252\ ksf$

$Min\_Pressure\_Check := \text{if}\left(\left(P_{min} \geq 0\right) \cdot \left(P_{min} < 0.75 \cdot q_s\right), \text{“Okay”}, \text{“No Good”}\right)$

$Min\_Pressure\_Check = \text{“No Good”}$

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 6.191$

Distance to Kern = $X_k := \frac{W_f}{6} = 3.5$ Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 4.552$

Adjusted Soil Pressure =

$$P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 1.975\ ksf$$

$$q_{adj} := \text{if}\left(P_{min} < 0\ , P_a\ , P_{max}\right) = 1.975\ ksf$$

$$Pressure\_Check := \text{if}\left(q_{adj} < 0.75 \cdot q_s\ , \text{“Okay”}\ , \text{“No Good”}\right)$$

$Pressure\_Check = \text{“Okay”}$

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot {d_p}^2}{4} = \left(1.687 \cdot 10^3\right)\ kips$ (ACI-2008 10.14)

$$Bearing\_Check := \text{if}\left(P_b > LF \cdot C_t\ , \text{“Okay”}\ , \text{“No Good”}\right)$$

$Bearing\_Check = \text{“Okay”}$

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Structural Analysis Report

Antenna Mount Analysis

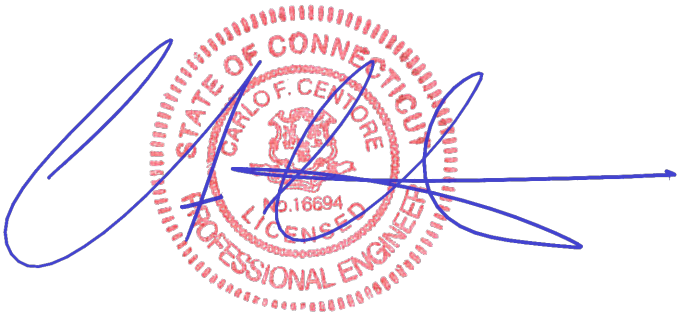
Proposed T-Mobile Antenna Upgrade

Site Ref: CT11451G

27 Maynard Road
Salem, CT

CENTEK Project No. 22022.01

Date: March 7, 2022



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

This structural analysis report (SAR) was prepared to address the structural viability of installing T-Mobile's proposed antenna configuration attached to the existing V-Frame sector mounts (SitePro P/N: VFA10-U). The antenna mounts are attached to the legs of a 100-ft self supporting, 3-legged, host lattice tower located at 27 maynard Road, Salem, Connecticut.

The antenna mount assembly consists of four pipe masts, the V-Frame sector Mount and a stiff arm for stability of the antenna mount assembly. This structural analysis report variffies the adequacy of aforementioned antenna mount assembly only.

The antenna mount assembly geometry and member information were gathered through a site visit to investigate the current conditions, performed by Centek personnel on 02/18/2022, and a structural analysis report prepared by Centek Engineering, Job No. 19027.19, dated May 17, 2016. Proposed/existing antenna and appurtenance information was taken from an RF data sheet dated 01/18/2022 provided by T-Mobile.

Primary Assumptions Used in the Analysis

- The host structure's theoretical capacity not including any assessment of the condition of the host structure.
- The existing elevated steel antenna frames carry the horizontal and vertical loads due to the weight of equipment, and wind and transfers into host structure.
- Structure is in plumb condition.
- Loading for equipment and enclosure as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All members are assumed to be as observed during roof framing mapping.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.

Antenna and Equipment Summary

Location	Appurtenance / Equipment	Rad Center Elevation (AGL)	Mount Type
Per Sector	**(1) Ericsson Air 6419 B41 Antenna** **(1) Commscope VV-65A-R1 Antenna** (1) RFS APXVAARR24_43-U_NA20 Antenna **(1) Ericsson 4460 B25+B66 Radio** (1) 4449 B71+B12 Radio	82-ft	V-Frame sector mounts attached to host lattice tower legs

Equipment – Indicates existing equipment to be relocated.
Equipment – Indicates proposed equipment to be installed.

Analysis

The antenna frames were analyzed using a comprehensive computer program titled Risa3D. The program examines the antenna mounts considering the worst-case code prescribed loading condition. The structures were considered to be loaded by concentric forces, and the model assumes that the members are subjected to bending, axial, and shear forces.

Design Loading

Loading was determined per the requirements of the 2006 ANSI TIA-222-G, 2015 International Building Code amended by the 2018 CSBC and ASCE 7-10 “Minimum Design Loads for Buildings and Other Structures”.

Basic Wind Speed:	V_{asd} = 105 mph	*Appendix N of the 2018 CT State Building Code*
Basic Wind Speed w/ Ice:	V_i = 50 mph	*Annex B of TIA-222-G*
Risk Category:	II	*2015 IBC; Table 1604.05*
Exposure Category:	Surface Roughness C	*ASCE 7-10; Section 26.7.2*
Dead Load	Equipment and framing self-weight	*Identified within SAR design calculations*

Reference Standards

2015 International Building Code:

1. AISC 360-10, *Specification for Structural Steel Buildings.*

Results

Member stresses and design reactions were calculated utilizing the structural analysis software RISA 3D.

The antenna mounting assembly and impacted host building components were found to be structurally acceptable as presented in the following table:

Sector	Component	Stress Ratio (percentage of capacity)	Result
All Sectors	Pipe 2.0 STD (Proposed Antenna Mast)	86%	**PASS**
	Pipe 2.0 STD (Existing V-Frame Horizontal)	50%	**PASS**
	Pipe 1.25 STD (Existing V-Frame Horizontal)	45%	**PASS**
	5/8" Solid Rod (Existing V-Frame Diagonal)	89%	**PASS**

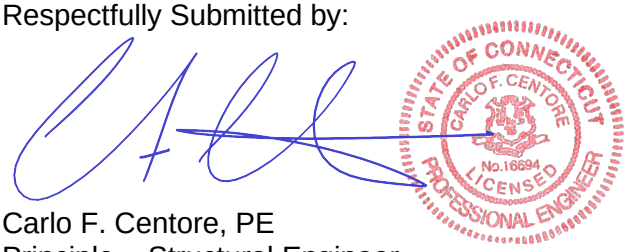
Conclusion

This analysis shows that the proposed subject antenna mount assemblies **STRUCTURALLY ADEQUETE** to support the proposed T-Mobile 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:



Carlo F. Centore, PE
Principle ~ Structural Engineer

Prepared by:

Pablo Perez-Gomez
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.

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Subject: Loads on Equipment

Location: Salem, CT

Rev. 0: 03/02/2022

Prepared by: PPG Checked by: TJL
Job No. 22022.01

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

Wind Speeds

Basic Wind Speed	$V := 105$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	$Structure\_Type := Lattice$		(User Input)
Structure Category =	$SC := II$		(User Input)
Exposure Category =	$Exp := C$		(User Input)
Structure Height =	$h := 100$	ft	(User Input)
Height to Center of Antennas =	$z := 82$	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 =	$G_H = 1.2$		(User Input)

Output

Wind Direction Probability Factor =

$$K_d := \left\| \begin{array}{l} \text{if } Structure\_Type = Pole \\ \quad \| \ 0.95 \\ \text{if } Structure\_Type = Lattice \\ \quad \| \ 0.85 \end{array} \right\| = 0.85$$

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

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

Importance Factors =

$$I_{Wind} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \ 0.87 \\ \text{if } SC = 2 \\ \quad \| \ 1.00 \\ \text{if } SC = 3 \\ \quad \| \ 1.15 \end{array} \right\| = 1$$

$$I_{Wind\_w\_Ice} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \ 0 \\ \text{if } SC = 2 \\ \quad \| \ 1.00 \\ \text{if } SC = 3 \\ \quad \| \ 1.00 \end{array} \right\| = 1$$

$$I_{ice} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \ 0 \\ \text{if } SC = 2 \\ \quad \| \ 1.00 \\ \text{if } SC = 3 \\ \quad \| \ 1.25 \end{array} \right\| = 1$$

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.095$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.643$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.214$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 29.12$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 6.603$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 19.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 133.4$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.31$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 13.1$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 598$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 264$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 15.8$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 164$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.3$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 85$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 353$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 353$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6419 B41		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33$	in	(User Input)
Antenna Width =	$W_{ant} := 16$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 2.1$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 3.7$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 154$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 0.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 30$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 4.9$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 46$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 1.6$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 15$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 41$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1663$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2841$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 92$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 92$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope VV-65A-R1		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 54.7$	in	(User Input)
Antenna Width =	$W_{ant} := 12.08$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 23$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.5$		
Antenna Force Coefficient =	$Ca_{ant} = 1.29$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.6$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 207$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 79$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.2$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 63$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.2$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 32$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 23$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3040$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 3987$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 129$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 129$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4449 B71+B12

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 = $N_{RRUS} := 1$

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$

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

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 57$ lbs

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

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 45$ lbs

Wind Load (with ice)

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

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.7$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 16$ 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 = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2058$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 67$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 67$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model = Ericsson 4460 B25+B66

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 19.7$ in (User Input)

RRUS Width = $W_{RRUS} := 15.7$ in (User Input)

RRUS Thickness = $T_{RRUS} := 12.1$ in (User Input)

RRUS Weight = $WT_{RRUS} := 109$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.3$

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

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 90$ lbs

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

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 69$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 29$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.5$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 23$ lbs

Gravity Load (without ice)

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

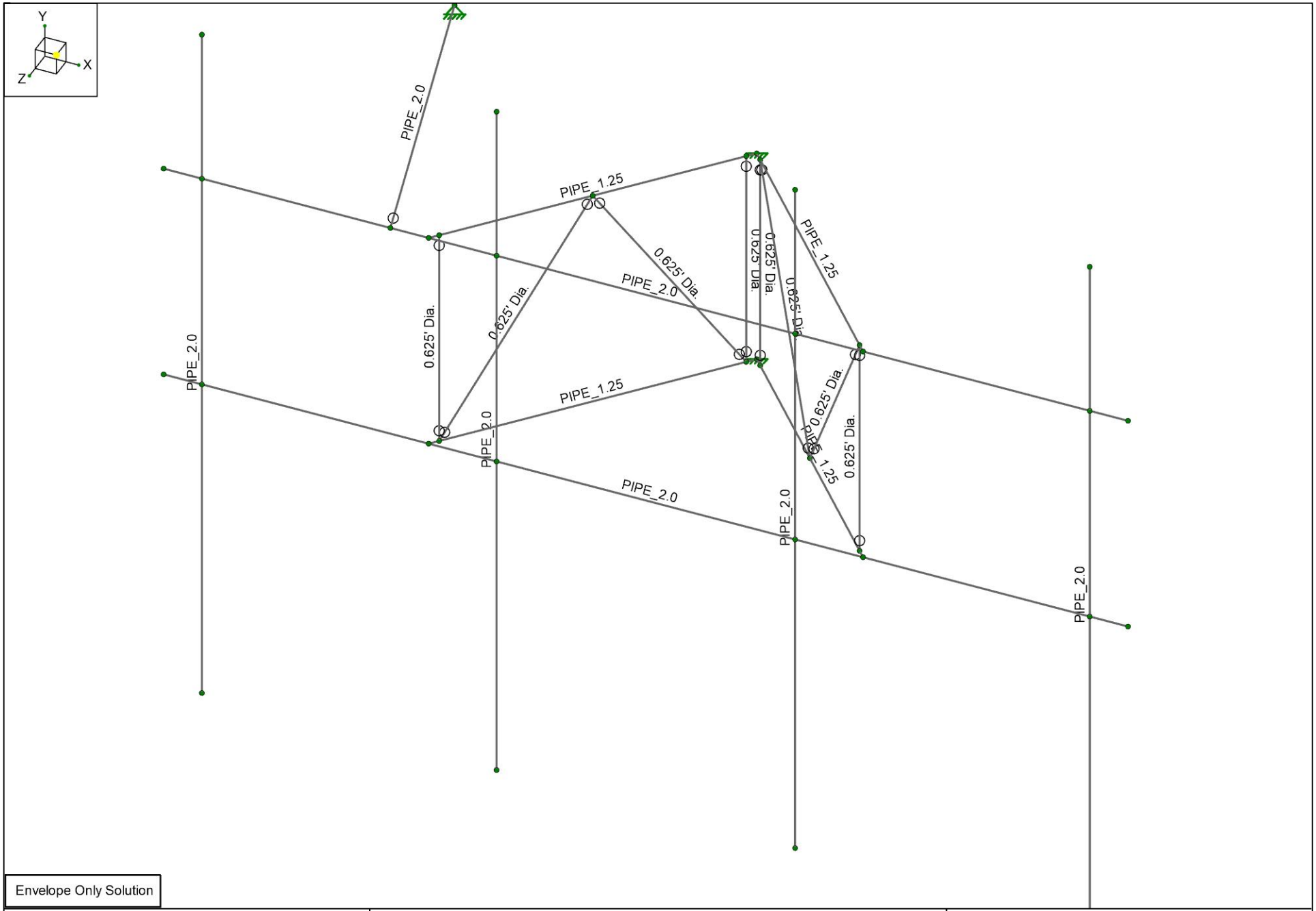
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3742$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2972$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 96$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 96$ lbs



Envelope Only Solution

Centek Engineering	CT11451G	SK-2
PPG		Mar 02, 2022
21022.01		CT11451G_AMA.r3d

Nodes

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Dia…
1	N1	-13.5	4.998	-2.		
2	N2	-71.5	4.998	30		
3	N3	14.875	4.998	30		
4	N4	-13.5	34.998	-2.		
5	N5	-71.5	34.998	30		
6	N6	14.875	34.998	30		
7	N7	-71.5	-40.002	30		
8	N8	44.5	-40.002	30		
9	N9	-71.5	55.998	30		
10	N10	44.5	55.998	30		
11	N12	-76.5	4.998	30		
12	N13	-76.5	34.998	30		
13	N14	49.5	4.998	30		
14	N15	49.5	34.998	30		
15	N22	0.6875	4.998	14.		
16	N23	-12.587748	4.998	-0.971204		
17	N24	-12.587748	34.998	-0.971204		
18	N25	13.962748	4.998	28.971204		
19	N26	13.962748	34.998	28.971204		
20	N27	-41.875	4.998	30		
21	N28	-41.875	34.998	30		
22	N29	-27.6875	34.998	14.		
23	N31	-14.412252	4.998	-0.971204		
24	N32	-14.412252	34.998	-0.971204		
25	N33	-40.962748	4.998	28.971204		
26	N34	-40.962748	34.998	28.971204		
27	N35	44.5	34.998	30		
28	N36	44.5	4.998	30		
29	N37	-33.	4.998	30		
30	N38	-33.	34.998	30		
31	N39	-33.	-40.002	30		
32	N40	-33.	55.998	30		
33	N45	-46.875	34.998	30		
34	N46	-58.875	34.998	-15		
35	N41	6.	-40.002	30		
36	N42	6.	55.998	30		
37	N43	6.	34.998	30		
38	N44	6.	4.998	30		

Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N4	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N23						
4	N24						
5	N31						
6	N32						
7	N46	Reaction	Reaction	Reaction			

Hot Rolled Steel Properties

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

General Section Sets

	Label	Shape	Type	Material	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+06	1e+06	1e+06	1e+06

Hot Rolled Member Properties

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp t…	Lcomp…	L-Torqu…	K y-y	K z-z	Cb	Function
1	M1	(E) Ante…	96			Lbyy						Lateral
2	M2	(E) Ante…	96			Lbyy						Lateral
3	M3	(E) Pipe…	42.768			Lbyy						Lateral
4	M4	(E) Pipe…	42.768			Lbyy						Lateral
5	M6	(E) Hori…	126			Lbyy						Lateral
6	M7	(E) Hori…	126			Lbyy						Lateral
7	M9	(E) SR5/8	30			Lbyy						Lateral
8	M10	(E) SR5/8	36.061			Lbyy						Lateral
9	M11	(E) SR5/8	36.061			Lbyy						Lateral
10	M12	(E) SR5/8	30			Lbyy						Lateral
11	M13	(E) Pipe…	42.768			Lbyy						Lateral
12	M14	(E) Pipe…	42.768			Lbyy						Lateral
13	M15	(E) SR5/8	30			Lbyy						Lateral
14	M16	(E) SR5/8	36.061			Lbyy						Lateral
15	M17	(E) SR5/8	36.061			Lbyy						Lateral
16	M18	(E) SR5/8	30			Lbyy						Lateral
17	M19	(E) Ante…	96			Lbyy						Lateral
18	M21	(E) Hori…	46.573			Lbyy						Lateral
19	M20	(E) Ante…	96			Lbyy						Lateral

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
1	M20	Y	-0.074	48	Active
2	M20	Y	-0.067	6	Active
3	M20	Y	-0.067	90	Active
4	M2	Y	-0.022	63	Active
5	M2	Y	-0.022	33	Active
6	M19	Y	-0.012	70	Active
7	M19	Y	-0.012	26	Active
8	M19	Y	-0.109	48	Active

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
1	M20	Y	-0.177	90	Active
2	M20	Y	-0.067	48	Active
3	M20	Y	-0.177	6	Active
4	M2	Y	-0.046	33	Active
5	M2	Y	-0.046	63	Active
6	M19	Y	-0.065	26	Active
7	M19	Y	-0.065	70	Active
8	M19	Y	-0.096	48	Active

Member Point Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
1	M20	X	0.016	48	Active
2	M20	X	0.043	6	Active
3	M20	X	0.043	90	Active
4	M2	X	0.008	63	Active
5	M2	X	0.008	33	Active
6	M19	X	0.016	70	Active
7	M19	X	0.016	26	Active

Member Point Loads (BLC 4 : Wind with Ice X) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
8	M19	X	0.023	48	Active

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
1	M20	X	0.132	6	Active
2	M20	X	0.045	48	Active
3	M20	X	0.132	90	Active
4	M2	X	0.015	33	Active
5	M2	X	0.015	63	Active
6	M19	X	0.04	26	Active
7	M19	X	0.04	70	Active
8	M19	X	0.069	48	Active

Member Point Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
1	M20	Z	0.02	48	Active
2	M20	Z	0.082	6	Active
3	M20	Z	0.082	90	Active
4	M2	Z	0.023	63	Active
5	M2	Z	0.023	33	Active
6	M19	Z	0.032	70	Active
7	M19	Z	0.032	26	Active
8	M19	Z	0.029	48	Active

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]	Inactive [(k, k-ft), (in,…
1	M20	Z	0.299	6	Active
2	M20	Z	0.057	48	Active
3	M20	Z	0.299	90	Active
4	M2	Z	0.077	33	Active
5	M2	Z	0.077	63	Active
6	M19	Z	0.104	26	Active
7	M19	Z	0.104	70	Active
8	M19	Z	0.09	48	Active

Member Distributed Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […]	End Location [(…	Inactive [(k, k-f…
1	M3	X	0.0009	0.0009	0	%100	Active
2	M4	X	0.0009	0.0009	0	%100	Active
3	M13	X	0.0009	0.0009	0	%100	Active
4	M14	X	0.0009	0.0009	0	%100	Active
5	M9	X	0.0003	0.0003	0	%100	Active
6	M10	X	0.0003	0.0003	0	%100	Active
7	M11	X	0.0003	0.0003	0	%100	Active
8	M12	X	0.0003	0.0003	0	%100	Active
9	M15	X	0.0003	0.0003	0	%100	Active
10	M16	X	0.0003	0.0003	0	%100	Active
11	M17	X	0.0003	0.0003	0	%100	Active
12	M18	X	0.0003	0.0003	0	%100	Active
13	M20	X	0.001	0.001	0	%100	Active
14	M2	X	0.001	0.001	0	%100	Active
15	M19	X	0.001	0.001	0	%100	Active
16	M1	X	0.001	0.001	0	%100	Active
17	M21	X	0.001	0.001	0	%100	Active

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	M3	X	0.004	0.004	0	%100	Active
2	M4	X	0.004	0.004	0	%100	Active
3	M13	X	0.004	0.004	0	%100	Active
4	M14	X	0.004	0.004	0	%100	Active
5	M9	X	0.002	0.002	0	%100	Active
6	M10	X	0.002	0.002	0	%100	Active
7	M11	X	0.002	0.002	0	%100	Active
8	M12	X	0.002	0.002	0	%100	Active
9	M15	X	0.002	0.002	0	%100	Active
10	M16	X	0.002	0.002	0	%100	Active
11	M17	X	0.002	0.002	0	%100	Active
12	M18	X	0.002	0.002	0	%100	Active
13	M20	X	0.006	0.006	0	%100	Active
14	M2	X	0.006	0.006	0	%100	Active
15	M19	X	0.006	0.006	0	%100	Active
16	M1	X	0.006	0.006	0	%100	Active
17	M21	X	0.006	0.006	0	%100	Active

Member Distributed Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	M6	Z	0.001	0.001	0	%100	Active
2	M7	Z	0.001	0.001	0	%100	Active
3	M3	Z	0.0009	0.0009	0	%100	Active
4	M4	Z	0.0009	0.0009	0	%100	Active
5	M13	Z	0.0009	0.0009	0	%100	Active
6	M14	Z	0.0009	0.0009	0	%100	Active
7	M9	Z	0.0003	0.0003	0	%100	Active
8	M10	Z	0.0003	0.0003	0	%100	Active
9	M11	Z	0.0003	0.0003	0	%100	Active
10	M12	Z	0.0003	0.0003	0	%100	Active
11	M15	Z	0.0003	0.0003	0	%100	Active
12	M16	Z	0.0003	0.0003	0	%100	Active
13	M17	Z	0.0003	0.0003	0	%100	Active
14	M18	Z	0.0003	0.0003	0	%100	Active
15	M2	Z	0.001	0.001	0	30	Active
16	M2	Z	0.001	0.001	66	96	Active
17	M20	Z	0.001	0.001	90	96	Active
18	M20	Z	0.001	0.001	0	6	Active
19	M19	Z	0.001	0.001	0	26	Active
20	M19	Z	0.001	0.001	70	96	Active
21	M1	Z	0.001	0.001	0	%100	Active
22	M21	Z	0.001	0.001	0	%100	Active

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
1	M6	Z	0.006	0.006	0	%100	Active
2	M7	Z	0.006	0.006	0	%100	Active
3	M3	Z	0.004	0.004	0	%100	Active
4	M4	Z	0.004	0.004	0	%100	Active
5	M13	Z	0.004	0.004	0	%100	Active
6	M14	Z	0.004	0.004	0	%100	Active
7	M9	Z	0.002	0.002	0	%100	Active
8	M10	Z	0.002	0.002	0	%100	Active
9	M11	Z	0.002	0.002	0	%100	Active
10	M12	Z	0.002	0.002	0	%100	Active
11	M15	Z	0.002	0.002	0	%100	Active
12	M16	Z	0.002	0.002	0	%100	Active

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

	Member Label	Direction	Start Magnitud…	End Magnitude…	Start Location […	End Location [(…	Inactive [(k, k-f…
13	M17	Z	0.002	0.002	0	%100	Active
14	M18	Z	0.002	0.002	0	%100	Active
15	M20	Z	0.006	0.006	0	6	Active
16	M2	Z	0.006	0.006	66	%100	Active
17	M2	Z	0.006	0.006	0	30	Active
18	M20	Z	0.006	0.006	90	96	Active
19	M19	Z	0.006	0.006	70	96	Active
20	M19	Z	0.006	0.006	0	26	Active
21	M1	Z	0.006	0.006	0	%100	Active
22	M21	Z	0.006	0.006	0	%100	Active

Basic Load Cases

	BLC Desc…	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me…	Surface(P…
1	Self Weight	DL		-1						
2	Dead Load	None					8			
3	Ice Load	None					8			
4	Wind with…	None					8	17		
5	Wind X	None					8	17		
6	Wind with…	None					8	22		
7	Wind Z	None					8	22		

Load Combinations

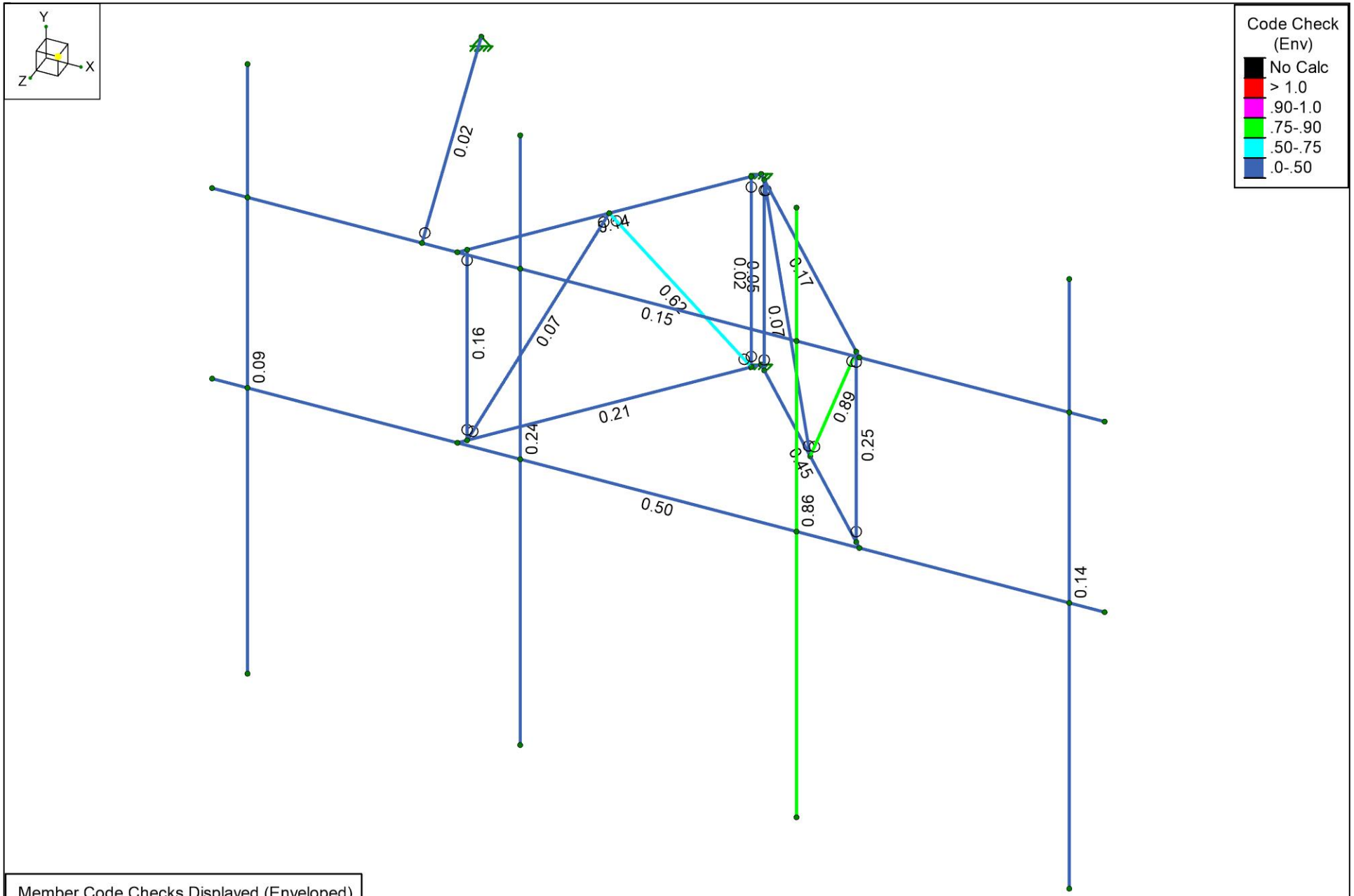
	De…	So…	PD…	SR…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…	BLC	Fa…
1	1.2…	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9…	Yes	Y		1	0.9	2	0.9	5	1.6														
3	1.2…	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2…	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9…	Yes	Y		1	0.9	2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

Node Reactions

	Node…		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0.434	6	0.623	3	1.49	3	0.029	5	0.111	4	0.004	5
2		min	-0.895	2	0.012	5	-1.351	5	-0.078	3	-0.196	2	-0.07	1
3	N4	max	-0.136	2	0.963	6	0.274	2	-0.007	2	0.012	4	0.063	6
4		min	-0.458	6	0.043	2	-1.644	4	-0.099	6	-0.056	1	-0.038	2
5	N46	max	0.133	5	0.008	1	0.481	5	0	6	0	6	0	6
6		min	-0.24	1	0.006	5	-0.829	1	0	1	0	1	0	1
7	Totals:	max	0	6	1.501	6	0	2						
8		min	-1.27	1	0.571	2	-2.33	4						

Material Take-Off

	Material	Size	Pieces	Length [in]	Weight [k]
1	Hot Rolled Steel				
2	A36 Gr.36	0.625' Dia.	8	264.2	0.023
3	A53 Grade B	PIPE_1.25	4	171.1	0.03
4	A53 Grade B	PIPE_2.0	7	682.6	0.197
5	Total HR Steel		19	1117.9	0.251



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering	CT11451G	SK-1
PPG		Mar 02, 2022
21022.01		CT11451G_AMA.r3d

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

Subject: Connection to Lattice Tower

Location: Salem, CT

Date: 03/02/2022

Prepared by: PPG; Checked by: CFC
Job No. 22022.01

Antenna Mast to Silo Connection:

Anchor Data

1/2" Dia. X 6-1/2" Long Grade 5 Hex Thru Bolt

Number of Bolts =	$N := 2$	(User Input)
Spacing Between Bolts=	$S := 6\ in$	(User Input)
Design Tension Strength =	$\Phi F_{nt} := 17.7\ kip$	(User Input)
Design Shear Strength=	$\Phi F_{nv} := 10.3\ kip$	(User Input)

Design Reactions:

Node 1 - Envelope

Force X =	$Shear_x := 0.895 \cdot kip$	(User Input)
Force Y=	$Vertical := 0.623\ kip$	(User Input)
Force Z=	$Shear_z := 1.49 \cdot kip$	(User Input)
Moment X=	$M_X := 0.078 \cdot kip \cdot ft$	(User Input)
Moment Y=	$M_Y := 0.196 \cdot kip \cdot ft$	(User Input)
Moment Z=	$M_Z := 0.07\ kip \cdot ft$	(User Input)

Anchor Check:

Max Tension Force =

$$T_{Max} := \frac{Shear_z}{N} + \frac{M_Y + M_X}{S \cdot \frac{N}{2}} = 1.29\ kip$$

Max Shear Force =

$$V_{Max} := \frac{Shear_x + Vertical}{N} + \frac{M_Z}{S \cdot \frac{N}{2}} = 0.9\ kip$$

Condition 1 =

$$Condition1 := \text{if}\left(\frac{T_{Max}}{\Phi F_{nt}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

Condition 2 =

$$Condition2 := \text{if}\left(\frac{V_{Max}}{\Phi F_{nv}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

Condition 3 =

$$Condition3 := \text{if}\left(\frac{T_{Max}}{\Phi F_{nt}} + \frac{V_{Max}}{\Phi F_{nv}} \le 1.0\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

% of Capacity =

$$\max\left(\frac{T_{Max}}{\Phi F_{nt}}, \frac{V_{Max}}{\Phi F_{nv}}, \left(\frac{T_{Max}}{\Phi F_{nt}}\right) + \left(\frac{V_{Max}}{\Phi F_{nv}}\right)\right) = 16.03\%$$

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: CT11451G

27 Maynard Road
Salem, Connecticut 06420

March 23, 2022

EBI Project Number: 6222002091

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**56.01%**

March 23, 2022

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

Emissions Analysis for Site: CT11451G

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **27 Maynard Road** in **Salem, 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 27 Maynard Road in Salem, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

4) 2 UMTS 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 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6419 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Commscope VV-65A-R1 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all

calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

14) The antenna mounting height centerline of the proposed antennas is 82 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 6419	Make / Model:	Ericsson AIR 6419	Make / Model:	Ericsson AIR 6419
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:	22.05 dBd / 17.3 dBd / 22.05 dBd / 17.3 dBd	Gain:	22.05 dBd / 17.3 dBd / 22.05 dBd / 17.3 dBd	Gain:	22.05 dBd / 17.3 dBd / 22.05 dBd / 17.3 dBd
Height (AGL):	82 feet	Height (AGL):	82 feet	Height (AGL):	82 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts	Total TX Power (W):	240.00 Watts
ERP (W):	32,080.61	ERP (W):	32,080.61	ERP (W):	32,080.61
Antenna A1 MPE %:	**19.97%**	Antenna B1 MPE %:	**19.97%**	Antenna C1 MPE %:	**19.97%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd
Height (AGL):	82 feet	Height (AGL):	82 feet	Height (AGL):	82 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200.00 Watts	Total TX Power (W):	200.00 Watts	Total TX Power (W):	200.00 Watts
ERP (W):	4,059.02	ERP (W):	4,059.02	ERP (W):	4,059.02
Antenna A2 MPE %:	**6.03%**	Antenna B2 MPE %:	**6.03%**	Antenna C2 MPE %:	**6.03%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope VV-65A-R1	Make / Model:	Commscope VV-65A-R1	Make / Model:	Commscope VV-65A-R1
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.55 dBd / 15.55 dBd / 16.05 dBd	Gain:	15.55 dBd / 15.55 dBd / 16.05 dBd	Gain:	15.55 dBd / 15.55 dBd / 16.05 dBd
Height (AGL):	82 feet	Height (AGL):	82 feet	Height (AGL):	82 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	300.00 Watts	Total TX Power (W):	300.00 Watts	Total TX Power (W):	300.00 Watts
ERP (W):	11,293.20	ERP (W):	11,293.20	ERP (W):	11,293.20
Antenna A3 MPE %:	**7.03%**	Antenna B3 MPE %:	**7.03%**	Antenna C3 MPE %:	**7.03%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	33.02%
AT&T	20.88%
Antenna Systems 2-8	2.11%
Site Total MPE % :	56.01%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	33.02%
T-Mobile Sector B Total:	33.02%
T-Mobile Sector C Total:	33.02%
Site Total MPE % :	56.01%

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	9619.47	82.0	59.87	2500 MHz LTE 1C & 2C Traffic	1000	5.99%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	82.0	6.69	2500 MHz LTE 1C & 2C Broadcast	1000	0.67%
T-Mobile 2500 MHz NR Traffic	1	19238.94	82.0	119.75	2500 MHz NR Traffic	1000	11.97%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	82.0	13.37	2500 MHz NR Broadcast	1000	1.34%
T-Mobile 600 MHz LTE	2	591.73	82.0	7.37	600 MHz LTE	400	1.84%
T-Mobile 600 MHz NR	1	1577.94	82.0	9.82	600 MHz NR	400	2.46%
T-Mobile 700 MHz LTE	2	648.82	82.0	8.08	700 MHz LTE	467	1.73%
T-Mobile 1900 MHz UMTS	2	1076.77	82.0	13.40	1900 MHz UMTS	1000	1.34%
T-Mobile 1900 MHz LTE	2	2153.53	82.0	26.81	1900 MHz LTE	1000	2.68%
T-Mobile 2100 MHz LTE	2	2416.30	82.0	30.08	2100 MHz LTE	1000	3.01%
						Total:	**33.02%**

• 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:	33.02%
Sector B:	33.02%
Sector C:	33.02%
T-Mobile Maximum MPE % (Sector A):	33.02%
Site Total:	56.01%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **56.01%** 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.

RAN Template:	A&L Template:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Section 1 - Site Information

Site ID: CT11451G
Status: Final
Version: 3
Project Type: Anchor
Approved: 1/18/2022 2:54:22 PM
Approved By: Pratik.Patil30@T-Mobile.com
Last Modified: 1/18/2022 2:54:22 PM
Last Modified By: Pratik.Patil30@T-Mobile.com

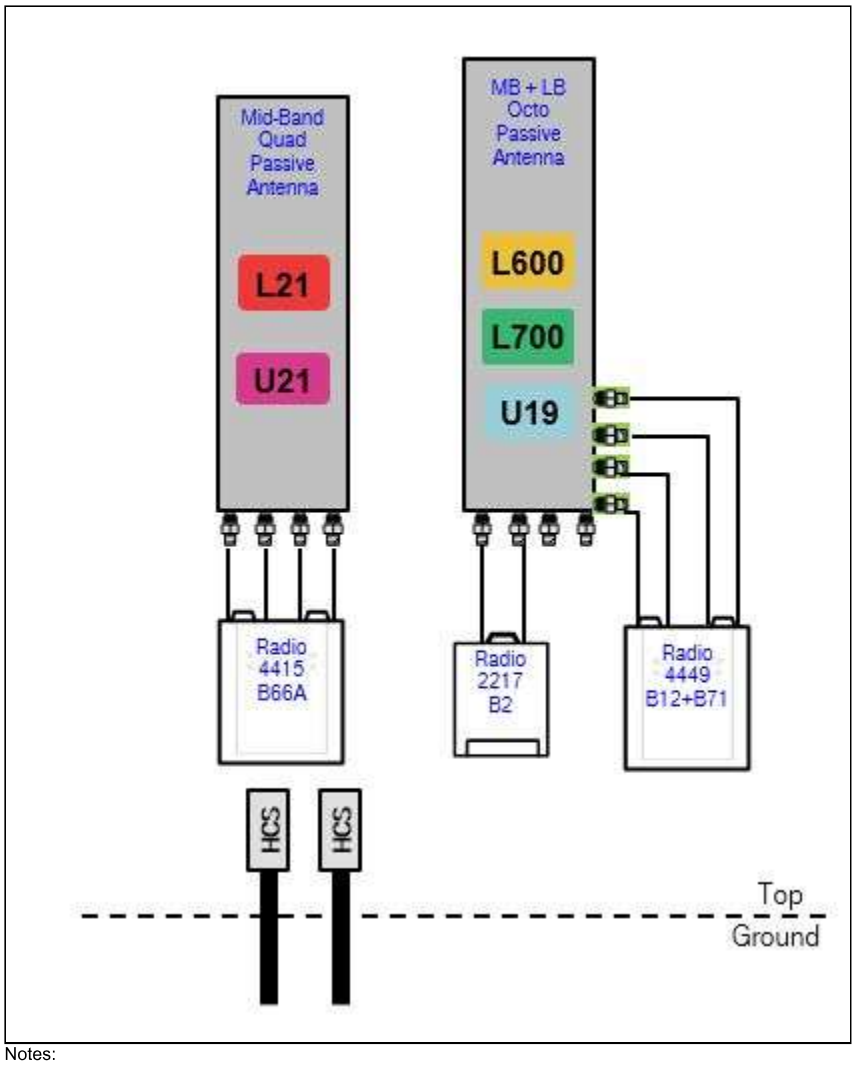
Site Name: CT11451G
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2022
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Salem Telecom LLC

Latitude: 41.46303056
Longitude: -72.24659723
Address: 27 Maynard Rd
City, State: Salem, CT
Region: NORTHEAST

RAN Template: 67D5D998E MUAC			AL Template: 67D5998E_1xAIR+1OP+1QP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

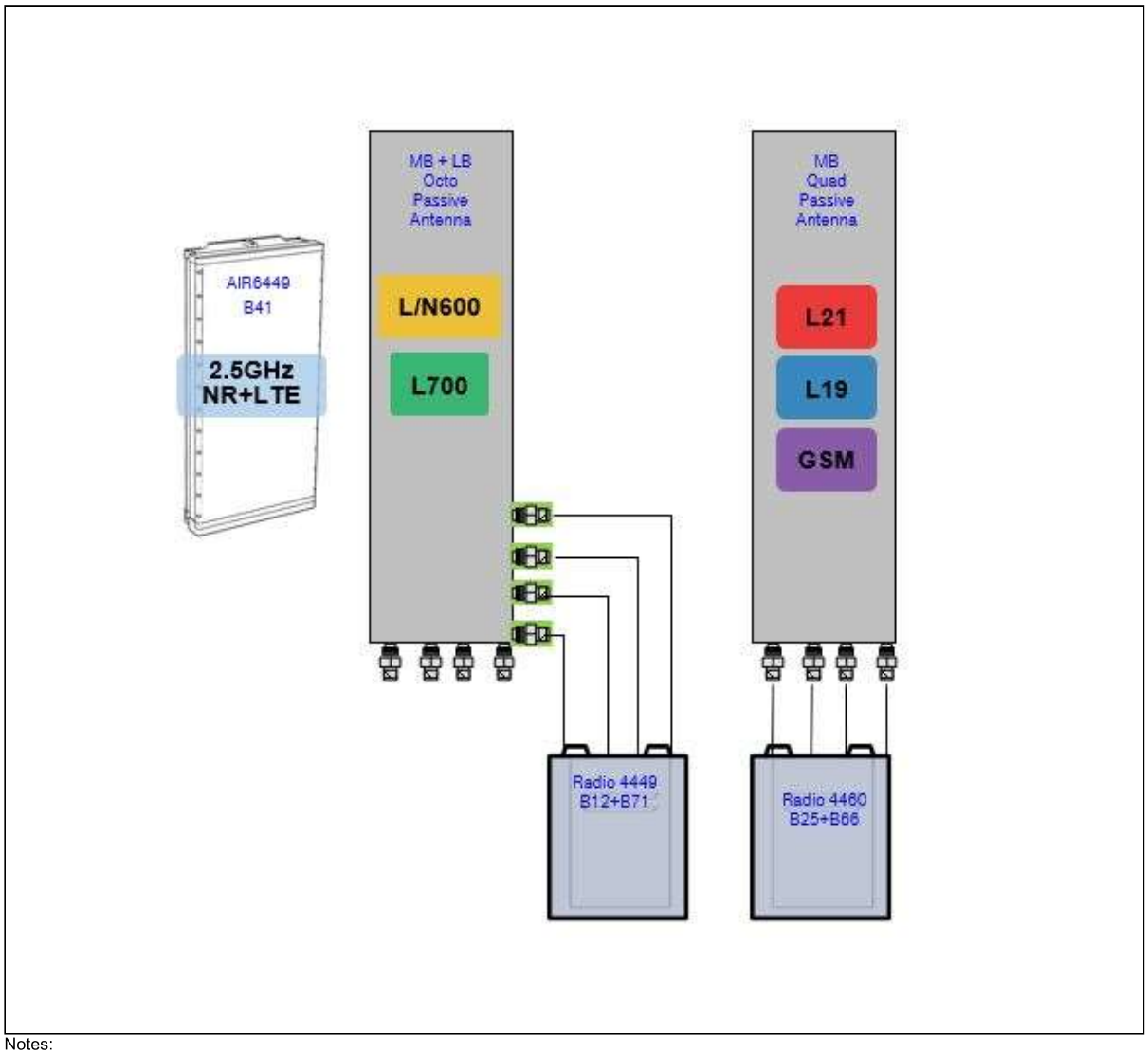
67D07C.JPG



Notes:

Section 3 - Proposed Template Images

67D5998E_1xAIR+1OP+1QP.JPG



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 67D07C 6102 MUAC

Enclosure	1
Enclosure Type	RBS 6102 MU AC
Baseband	DUW30 (U1900); BB 6630 (L700, L600, N600); BB 6630 (L2100)
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG* **(x 2)**

Proposed RAN Equipment

Template: 67D5D998E MUAC

Enclosure	1	2	3	4
Enclosure Type	Ancillary Equipment (Ericsson)	RBS 6102 MU AC	Enclosure 6160 AC V1	B160
Baseband		DUW30 (U1900); BB 6630 (L700, L600, N600); BB 6630 (L2100, L1900)	RP 6651 (N2500); RP 6651 (L2500)	
Hybrid Cable System		Ericsson 6x12 HCS *Select Length & AWG* **(x 2)**	PSU 4813 vR4A (Kit); Ericsson Hybrid Trunk 6/24 4AWG 100m **(x 2)**	
Transport System			CSR IXRe V2 (Gen2)	

RAN Scope of Work:

Remove and return all cabinet radios from existing base station cabinet.

Add (1) Enclosure 6160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) RP 6651 for L2500 to new Enclosure 6160.

Add (1) RP 6651 for N2500 to new Enclosure 6160.

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

Add (1) Battery Cabinet B160.

Existing : (2) 6x12

Remove all Coax

Add (2) 6X24 HCS terminating at the Enclosure 6160 and Connect DC for the AIR6449 B41 to the PSU4813 Voltage Booster.

RAN Template:	A&L Template:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Section 6 - A&L Equipment

Existing Template: 67D07C_1QP+1OP
Proposed Template: 67D5998E_1xAIR+1OP+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	30		30			
M. Tilt	0		0			
Height	82		82			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	U1900	L2100	L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2		
Cables			Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Swap (1) LB Dual antenna with (1) LB/MB Octa 8' antenna.
Swap (1) RRUS11 B12 with (1) Radio 4449.

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

RAN Template:	A&L Template:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	AIR 6419 B41 (Active Antenna - Massive MIMO)		RFS - APXVAARR24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	30		30				30	
M. Tilt	0		0				0	
Height	82		82				82	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	N2500 L2500	N2500 L2500	L700 L600 N600	L700 L600 N600			L2100 L1900 U1900	L2100 L1900 U1900
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2			2	2
Cables	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper
TMAs								
Diplexers / Combiners								
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment								

Unconnected Equipment:

Scope of Work:

There will be Three antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove RRUS11 B2 and RRUS11 B4 from Position 1.

Replace APX16DWV from Position 1 with (1) AIR 6419 for L2500 and N2500.

Install (1) mid-band Quad VV-65A-R1 in Position 3 .

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), and U1900 to Position 3 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:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	150		150			
M. Tilt	0		0			
Height	82		82			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	U1900	L2100	L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2		
Cables			Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Swap (1) LB Dual antenna with (1) LB/MB Octa 8' antenna.
Swap (1) RRUS11 B12 with (1) Radio 4449.

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

RAN Template:	A&L Template:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	AIR 6419 B41 (Active Antenna - Massive MIMO)		RFS - APXVAARR24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	150		150				150	
M. Tilt	0		0				0	
Height	82		82				82	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	N2500 L2500	N2500 L2500	L700 L600 N600	L700 L600 N600			L2100 L1900 U1900	L2100 L1900 U1900
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2			2	2
Cables	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper
TMAs								
Diplexers / Combiners								
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment								

Unconnected Equipment:

Scope of Work:

There will be Three antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove RRUS11 B2 and RRUS11 B4 from Position 1.

Replace APX16DWV from Position 1 with (1) AIR 6419 for L2500 and N2500.

Install (1) mid-band Quad VV-65A-R1 in Position 3 .

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), and U1900 to Position 3 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:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	270		270			
M. Tilt	0		0			
Height	82		82			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	U1900	L2100	L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2		
Cables			Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	RRUS11 B2 (At Antenna)	RRUS11 B4 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Swap (1) LB Dual antenna with (1) LB/MB Octa 8' antenna.
Swap (1) RRUS11 B12 with (1) Radio 4449.

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

RAN Template:	A&L Template:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	AIR 6419 B41 (Active Antenna - Massive MIMO)		RFS - APXVAARR24_43-U-NA20 (Octo)				Commscope_VV-65A-R1 (Quad)	
Azimuth	270		270				270	
M. Tilt	0		0				0	
Height	82		82				82	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	N2500 L2500	N2500 L2500	L700 L600 N600	L700 L600 N600			L2100 L1900 U1900	L2100 L1900 U1900
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2	2	2	2			2	2
Cables	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper
TMAs								
Diplexers / Combiners								
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment								

Unconnected Equipment:

Scope of Work:

There will be Three antennae per sector.

Remove all TMAs.

Remove all Coaxial Lines.

Remove RRUS11 B2 and RRUS11 B4 from Position 1.

Replace APX16DWV from Position 1 with (1) AIR 6419 for L2500 and N2500.

Install (1) mid-band Quad VV-65A-R1 in Position 3 .

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both carriers), and U1900 to Position 3 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:
67D5D998E MUAC	67D5998E_1xAIR+1OP+1QP

CT11451G_Anchor_3

Print Name: Preliminary (RFDS_For_Scoping)
PORs: Anchor_Phase 3

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
----- This section is intentionally blank. -----

	Proposed Power Systems Equipment
Enclosure	1
Enclosure Type	Enclosure 6160 AC V1