

INDUSTRIAL AVE,
STATE 3
MIDHWAH NJ 07430
PHONE: 201.684.0055
FAX: 201.684.0066



December 17, 2021

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

RE: Notice of Exempt Modification
156 Bokum Road / Middlesex Turnpike, Old Saybrook, CT 06475
Latitude: 41.194130
Longitude: -72.231965
T-Mobile Site#: CT11335B - Anchor

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 155' level and three (3) antennas at the 167' level of the 200' guyed tower located at 156 Bokum Road/Middlesex Turnpike in Old Saybrook, CT. The guyed tower and property are owned by Crossroads Communications of Old Saybrook. T-Mobile now intends to replace three (3) of its existing antennas with three (3) L2500/N2500 antennas. The new antennas would be installed at the 155' level of the tower. The new antennas support 5G services.

Planned Modifications:

Tower:

Install New:

- (3) RFS APXVAAL24 Antennas
- (3) Radio 4480 B71/B85
- (3) Radio 4460 B25 / B66
- (3) 6x12 Hybrid Cables

To Be Removed:

- (3) Placement Holder Antennas
- All Existing Coax Cables

Existing to Remain:

- (3) APX16DWV Antennas

This tower was approved by the Town of Old Saybrook with no existing conditions given. There are no dockets or petitions on the Connecticut Siting Council website that approved this site. After visiting the jurisdiction there were no original permits or approval letters for the tower on file. This modification will not break any conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to First Selectwoman Carl Fortuna Jr., Elected Official, and Christina Costa, Town Planner of Old Saybrook, as well as the property and tower 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: Carl Fortuna Jr. - First Selectman of Old Saybrook

Christina Costa - Town Planner

Crossroads Communications of Old Saybrook - Property Owner

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
CHRISTINA COSTA
302 MAIN STREET
OLD SAYBROOK CT 06475



CT 063 5-02



UPS GROUND

TRACKING #: 1Z V25 742 03 9467 1799



BILLING: P/P

Reference #1: CT11335B

XOL 21.11.24 NV45 51.0A.12/2021*



TM

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
CARL FORTUNA JR
302 MAIN STREET
OLD SAYBROOK CT 06475



CT 063 5-02



UPS GROUND

TRACKING #: 1Z V25 742 03 9530 6940



BILLING: P/P

Reference #1: CT11335B

XOL 21.11.24 NV45 51.0A.12/2021*



TM

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
CROSSROADS COMM OF OLD SAYBROOK
157 NORTH SEIR HILL ROAD
NORWALK CT 06850



CT 069 9-04



UPS GROUND

TRACKING #: 1Z V25 742 03 9339 3805



BILLING: P/P

Reference #1: CT11335B

XOL 21.11.24 NV45 51.0A 12/2021*



TM

Hello, your package has been delivered.

Delivery Date: Wednesday, 12/15/2021

Delivery Time: 12:19 PM

Left At: SIDE DOOR

Experience UPS My Choice® Premium Today

Be in total control of how, when and where your packages are delivered.

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[Set Delivery Instructions](#)

[Manage Preferences](#)

[View My Pack](#)

TRANSCEND WIRELESS

Tracking Number:	1ZV257420393393805
Ship To:	CROSSROADS COMM OF OLD SAYBROOK 157 NORTH SEIR HILL ROAD NORWALK, CT 06850 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11335B

Hello, your package has been delivered.

Delivery Date: Wednesday, 12/15/2021

Delivery Time: 12:59 PM

Left At: OFFICE

Signed by: COSTA

TRANSCEND WIRELESS

Tracking Number: [1ZV257420394671799](#)

Ship To: CHRISTINA COSTA
302 MAIN STREET
OLD SAYBROOK, CT 06475
US

Number of Packages: 1

UPS Service: UPS Ground

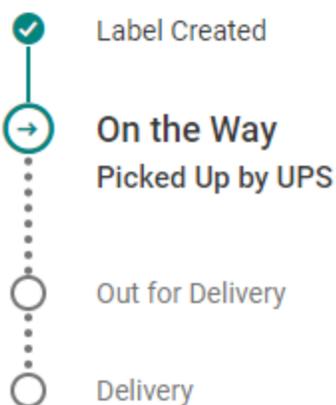
Package Weight: 1.0 LBS

Reference Number: CT11335B

Your shipment
1ZV257420395306940

Estimated delivery

The delivery date will be provided as soon as possible.



Ship To
OLD SAYBROOK, CT US



Year Built:

0

Living Area:

Building Attributes	
Field	Description
Style	Vacant Land
Model	
Grade:	
Stories:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	

Building Photo



Building Layout

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

Bath Style:	
Kitchen Style:	
Num Kitchens	
Cndtn	
Usrflid 103	
Usrflid 104	
Usrflid 105	
Usrflid 106	
Usrflid 107	
Num Park	
Fireplaces	
Usrflid 108	
Usrflid 101	
Usrflid 102	
Usrflid 100	
Usrflid 300	
Usrflid 301	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 1300
Description RES ACLNDV MDL-00 ⓘ
Zone AAA

Land Line Valuation

Size (Acres) 13.69
Depth 0
Assessed Value \$208,700
Appraised Value \$298,100

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CELL	CELL TOWER			180.00 UNITS	\$56,700	1
CELL	CELL TOWER			180.00 UNITS	\$56,700	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2020	\$113,400	\$298,100	\$411,500
2018	\$113,400	\$298,100	\$411,500
2016	\$94,600	\$298,100	\$392,700

Assessment			
Valuation Year	Improvements	Land	Total
2020	\$79,400	\$208,700	\$288,100
2018	\$79,400	\$208,700	\$288,100
2016	\$66,200	\$208,700	\$274,900

T-Mobile

ROUTE 9 MIDDLESEX TURNPIKE

SITE ID: CT11335B

156 BOKUM RD

OLD SAYBROOK, CT 06475

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

67E998E_10P+1QP

RAN TEMPLATE (PROVIDED BY RFDS)

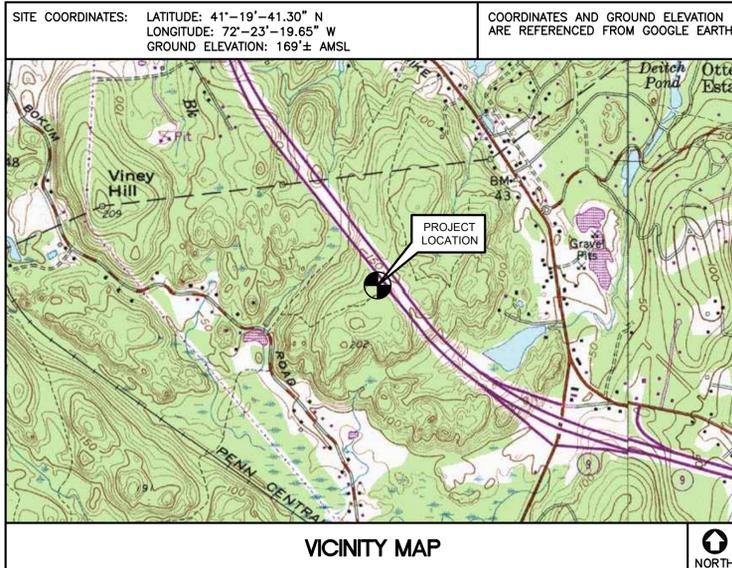
67E998E 6160

GENERAL NOTES

- 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.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
- 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.
- 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.
- 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.
- ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	TO: 156 BOKUM RD OLD SAYBROOK, CT 06475
1. START OUT GOING NORTH ON GRIFFIN RD TOWARD HARTMAN RD	0.30 MI.
2. TURN RIGHT ONTO DAY HILL RD.	0.41 MI.
3. TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.84 MI.
4. STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	2.74 MI.
5. TURN LEFT ONTO E WINTONBURY AVE/CT-178. CONTINUE TO FOLLOW CT-178.	1.77 MI.
6. MERGE ONTO I-91 S TOWARD HARTFORD.	15.56 MI.
7. MERGE ONTO CT-9 S VIA EXIT 225 ON THE LEFT TOWARD MIDDLETOWN/OLD SAYBROOK.	25.55 MI.
8. TAKE THE CT-154 EXIT, EXIT 3, TOWARD ESSEX/WESTBROOK/CT-153	0.26 MI.
9. GO STRAIGHT TOWARD WESTBROOK.	0.12 MI.
10. TURN RIGHT ONTO PLAINS RD/CT-153.	0.84 MI.
11. TURN LEFT ONTO BOKUM RD.	1.33 MI.
12. 156 BOKUM RD, OLD SAYBROOK, CT 06475-1247, 156 BOKUM RD.	



PROJECT SUMMARY

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

- INSTALL (1) 7' PIPE MAST PER SECTOR. TOTAL (3)
- INSTALL (1) 11' PIPE MAST PER SECTOR. TOTAL (3)
- INSTALL (1) APXVALL24_U-NA20 ANTENNA PER SECTOR. TOTAL (3)
- INSTALL (1) METER CENTER
- INSTALL 200A MINI PPC CABINET
- INSTALL (1) T-MOBILE POWER ENCLOSURE 6160
- INSTALL (1) T-MOBILE BATTERY CABINET B160
- INSTALL (3) RRU5 4460 B25+B66 AND (3) RRU54480 B71+B85
- INSTALL 100A BREAKER
- REMOVE ALL EXISTING COAX, INSTALL (3) 6x12 HYBRIDS

PROJECT INFORMATION

SITE NAME:	ROUTE 9 MIDDLESEX TURNPIKE
SITE ID:	CT11335B
SITE ADDRESS:	156 BOKUM RD OLD SAYBROOK, CT 06475
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:	CEN TEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
	CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-19'-41.30" N LONGITUDE: 72°-23'-19.65" W GROUND ELEVATION: 169'± AMSL
	COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	GENERAL NOTES AND SPECIFICATIONS	0
C-1	SITE LOCATION PLAN	0
C-2	SITE, COMPOUND, EQUIPMENT PLAN AND ELEVATION	0
C-3	ANTENNA PLANS AND ELEVATIONS	0
C-4	TYPICAL EQUIPMENT DETAILS	0
C-5	TYPICAL EQUIPMENT DETAILS	0
E-1	ELECTRICAL RISER DIAGRAM AND CONDUIT ROUTING	0
E-2	TYPICAL ELECTRICAL DETAILS	0
E-3	TYPICAL ELECTRICAL DETAILS	0

PROFESSIONAL ENGINEER SEAL

T-MOBILE
TRANSCEND WIRELESS

CEN TEK 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
ROUTE 9 MIDDLESEX TURNPIKE
SITE ID: CT11335B
156 BOKUM RD
OLD SAYBROOK, CT 06475

DATE: 11/01/21
SCALE: AS NOTED
JOB NO. 21022.34

TITLE SHEET

T-1

Sheet No. 1 of 10

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
DRAWN BY: TJR
DATE: 12/01/21
REV. 0

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

- DESIGN CRITERIA:
 - RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
 - NOMINAL DESIGN SPEED: 105 MPH (Vasd) (EXPOSURE C/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

- THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
- 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.
- THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
- 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.
- IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

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- CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
- THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
- THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

STRUCTURAL STEEL

- ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
 - STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
 - STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
 - STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
 - STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
 - PIPE---ASTM A53 (FY = 35 KSI)
 - U-BOLTS---ASTM A36
 - ANCHOR RODS---ASTM F 1554
 - WELDING ELECTRODE---ASTM E 70XX
- 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.
- STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
- PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
- FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
- INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
- AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
- 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.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
- 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.
- CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
- 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.
- LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
- SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
- MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
- FABRICATE BEAMS WITH MILL CAMBER UP.
- 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.
- COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
- INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
- FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

REV.	DATE	BY	DESCRIPTION
0	12/01/21	TJR	ISSUED FOR CONSTRUCTION



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T-MOBILE NORTHEAST LLC
ROUTE 9 MIDDLESEX TURNPIKE
SITE ID: CT11335B
156 BOKUM RD
OLD SAYBROOK, CT 06475

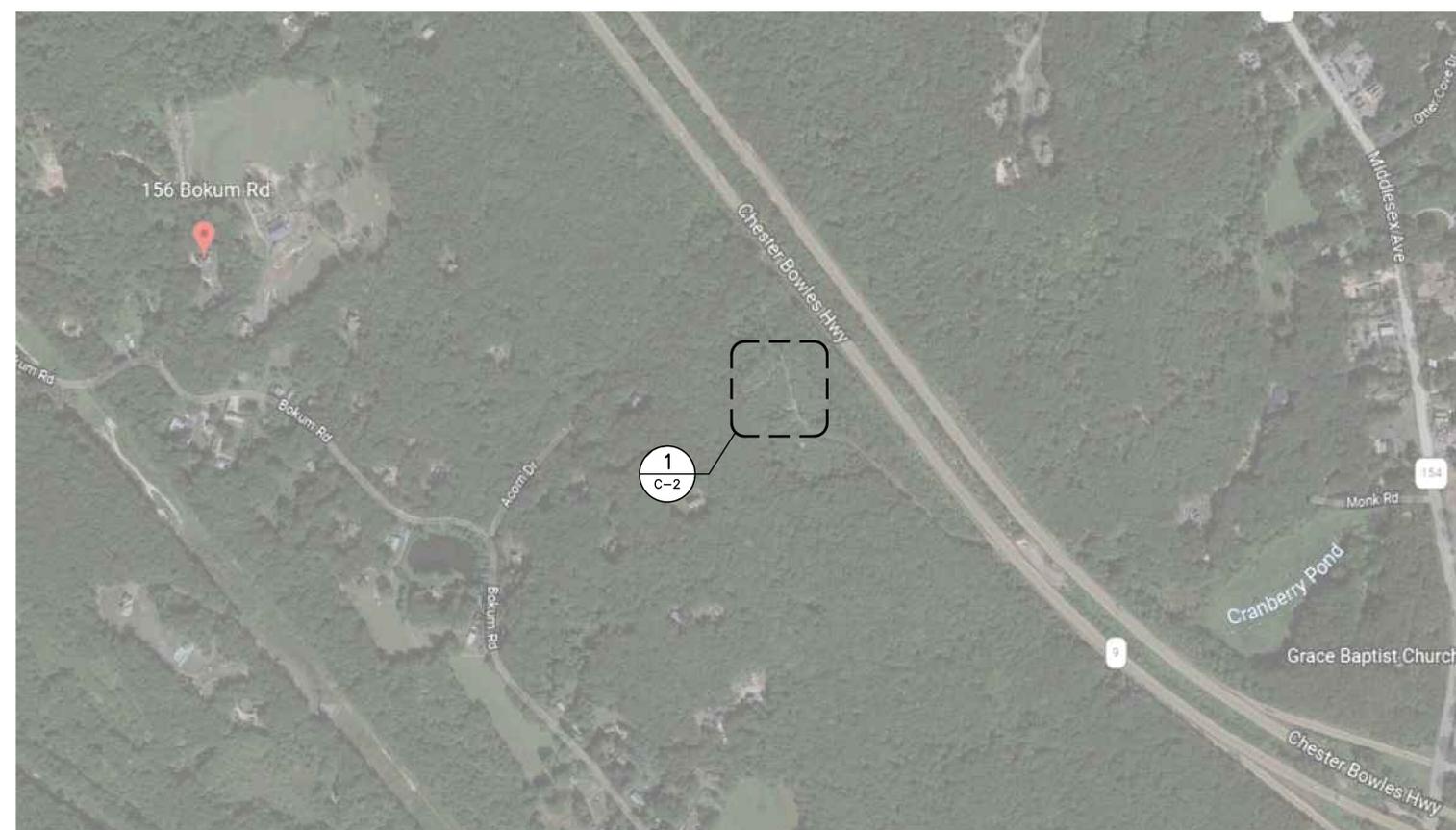
DATE: 11/01/21
 SCALE: AS NOTED
 JOB NO. 21022.34

GENERAL NOTES AND SPECIFICATIONS

N-1
 Sheet No. 2 of 10

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

ANTENNA SCHEDULE							
SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ϕ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	155'	50°	(P) RADIO 4480 B71+B85 (1)	(1) 6/24 4AWG
A2	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	167'	50°	(P) RADIO 4460 B25+B66 (1)	
B1	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	155'	160°	(P) RADIO 4480 B71+B85 (1)	(1) 6/24 4AWG
B2	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	167'	160°	(P) RADIO 4460 B25+B66 (1)	
C1	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	155'	320°	(P) RADIO 4480 B71+B85 (1)	(1) 6/24 4AWG
C2	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	167'	320°	(P) RADIO 4460 B25+B66 (1)	

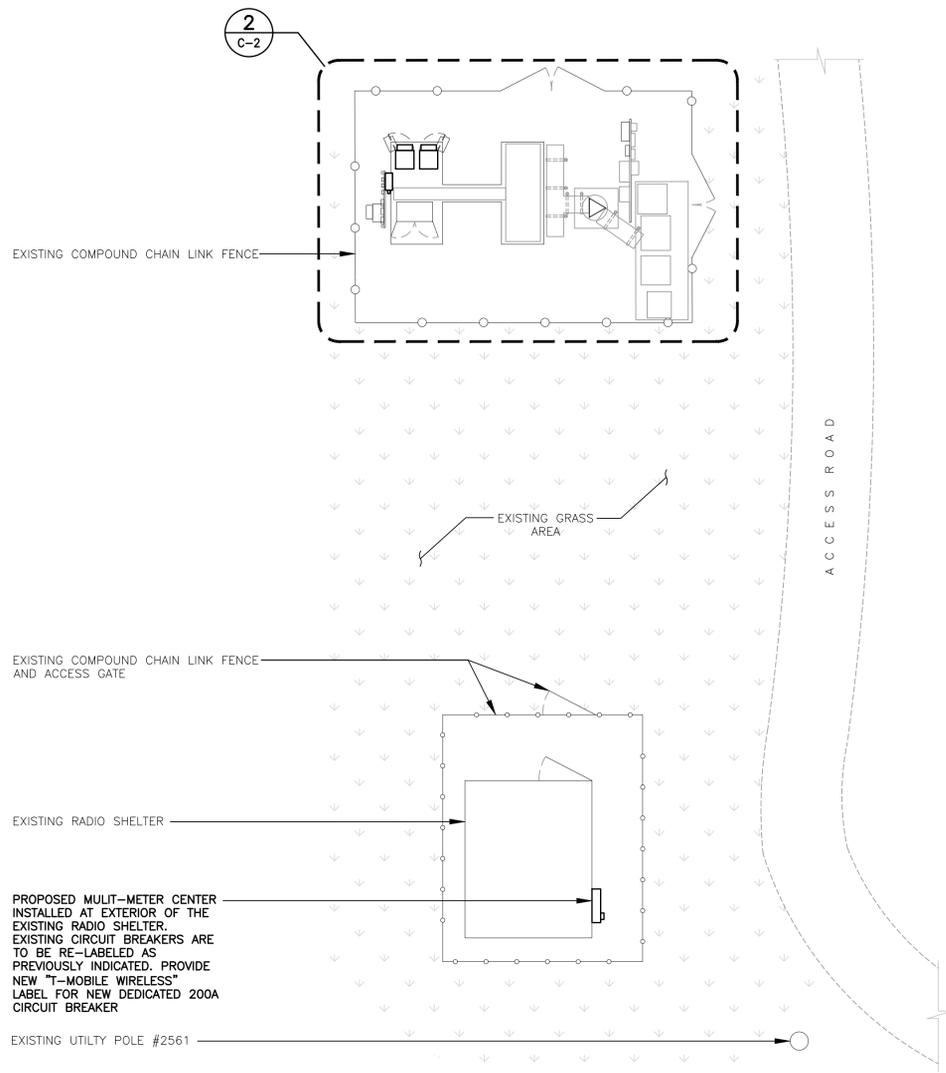


1
C-1 **SITE LOCATION PLAN**
SCALE: NOT TO SCALE

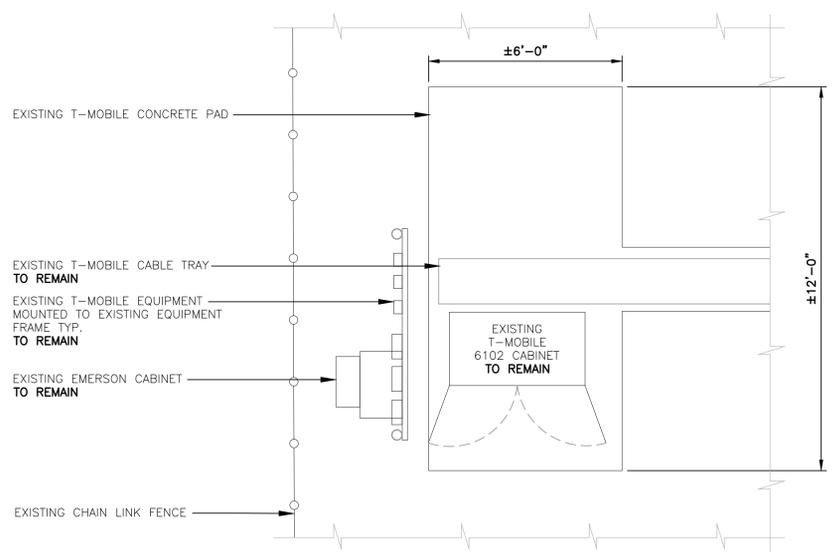


T-MOBILE NORTHEAST LLC ROUTE 9 MIDDLESEX TURNPIKE SITE ID: CT11335B 156 BOKUM RD OLD SAYBROOK, CT 06475	
DATE:	11/01/21
SCALE:	AS NOTED
JOB NO.	21022.34
SITE LOCATION PLAN	
C-1	
Sheet No. 3 of 10	

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1
C-2 **SITE PLAN - PROPOSED**
SCALE: 1" = 10'
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..

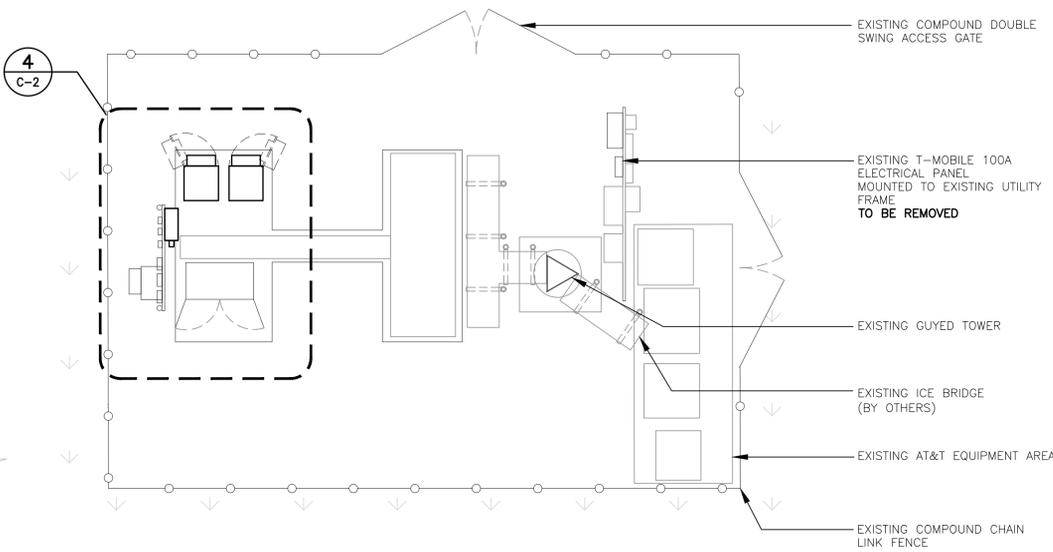
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.34) DATED 11/29/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

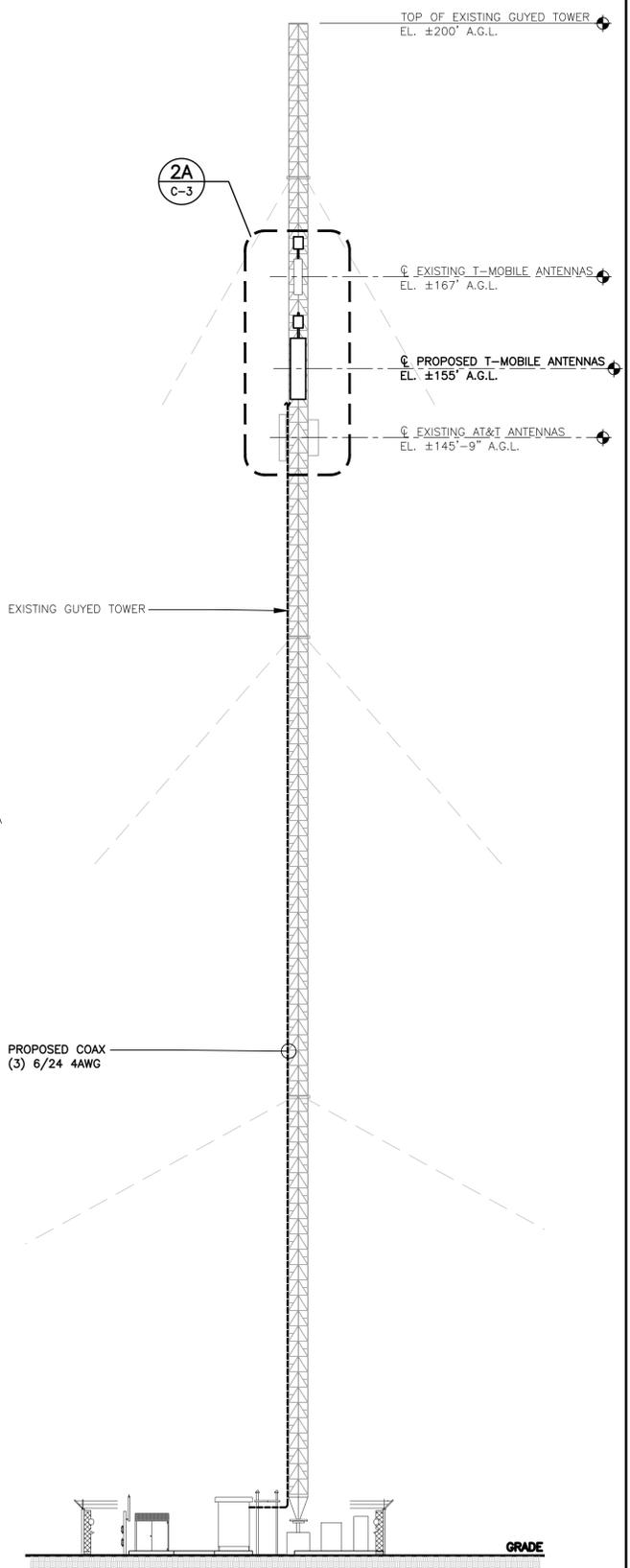
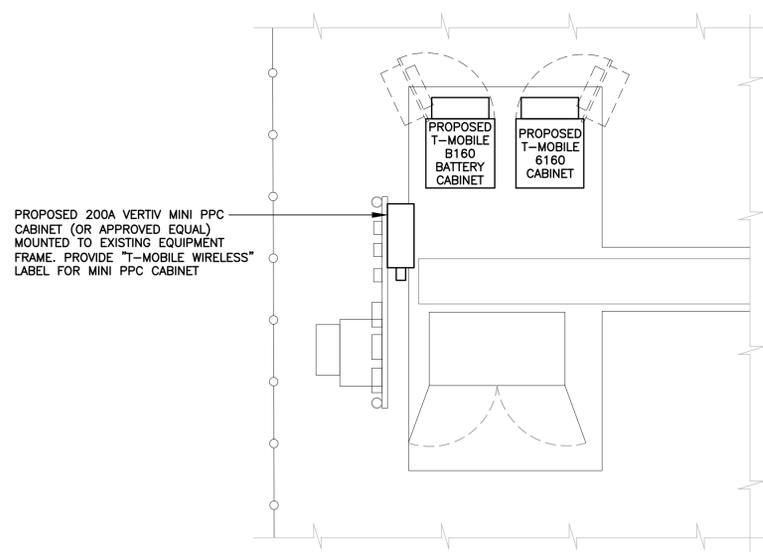
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.34) DATED 11/29/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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



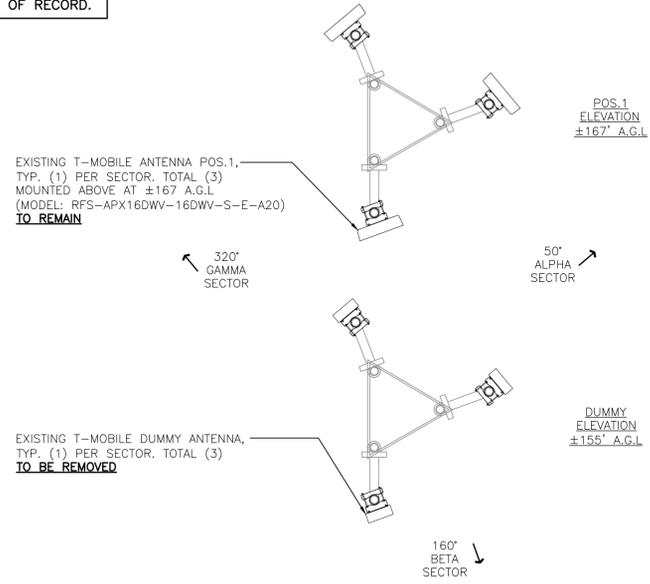
2
C-2 **COMPOUND PLAN - PROPOSED**
SCALE: 3/16" = 1'
TRUE NORTH



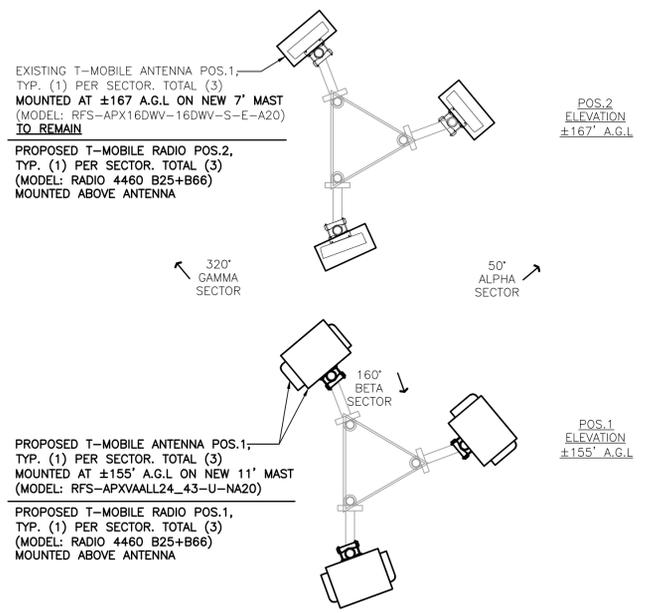
5
C-2 **TOWER ELEVATION - PROPOSED**
SCALE: 3/32" = 1'

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	RIS
	DATE
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T-MOBILE NORTHEAST LLC ROUTE 9 MIDDLESEX TURNPIKE SITE ID: CT11335B 156 BOKUM RD OLD SAYBROOK, CT 06475	REV.
DATE: 11/01/21 SCALE: AS NOTED JOB NO. 21022.34	DESCRIPTION
SITE, COMPOUND, EQUIPMENT PLAN, AND ELEVATION	
C-2	
Sheet No. 4 of 10	

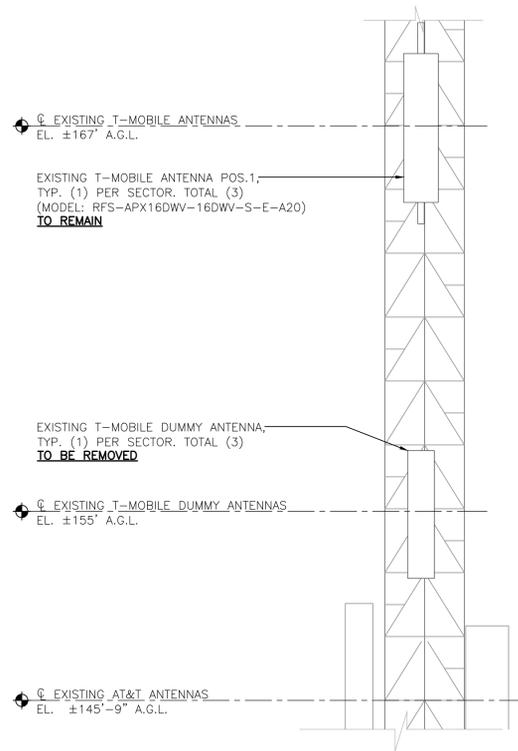
EQUIPMENT GROUNDING NOTE:
 ALL (E/P) EQUIPMENT IS TO BE BONDED TO THE EXISTING GROUNDING SYSTEM. IF AN EXISTING GROUNDING SYSTEM IS NOT PRESENT OR IS NOT OPERATIONAL, THE CONTRACTOR IS TO CONTACT THE ENGINEER OF RECORD.



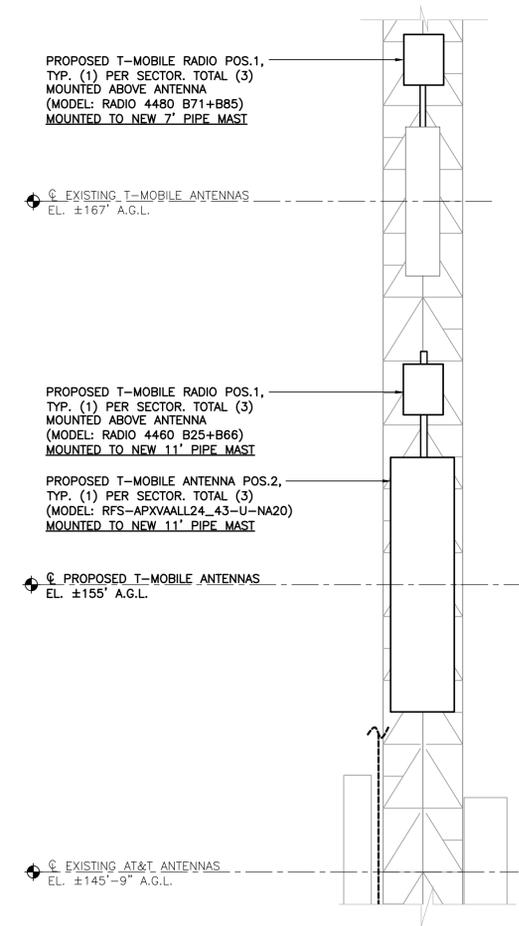
1 ANTENNA PLAN - EXISTING
 C-3 SCALE: 3/4" = 1' TRUE NORTH



2 ANTENNA PLAN - 155' PROPOSED
 C-3 SCALE: 3/4" = 1' TRUE NORTH

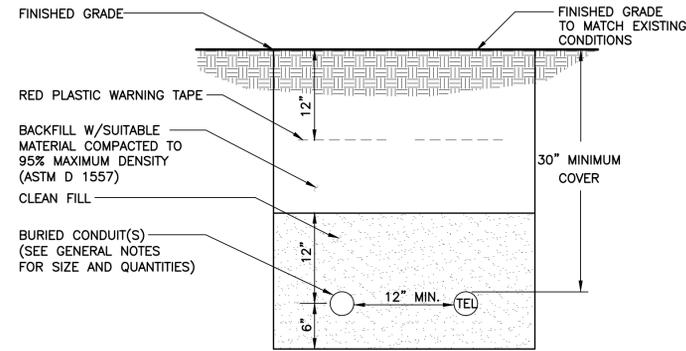


1A ANTENNA ELEVATION - EXISTING
 C-3 SCALE: 1/2" = 1'



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

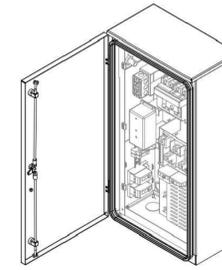
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	DATE: 12/01/21
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T-MOBILE NORTHEAST LLC ROUTE 9 MIDDLESEX TURNPIKE SITE ID: CT11335B 156 BOKUM RD OLD SAYBROOK, CT 06475	SCALE: AS NOTED
	JOB NO. 21022.34
	ANTENNA PLANS AND ELEVATIONS
	C-3
Sheet No. 5 of 10	



NOTES:

1. THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

1 TYPICAL ELECTRICAL/TEL TRENCH DETAIL
SCALE: NOT TO SCALE



MINI PPC CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: VERTIV MODEL: F1011209	39"L x 20"W x 10.5"D	±75 LBS.

NOTES:

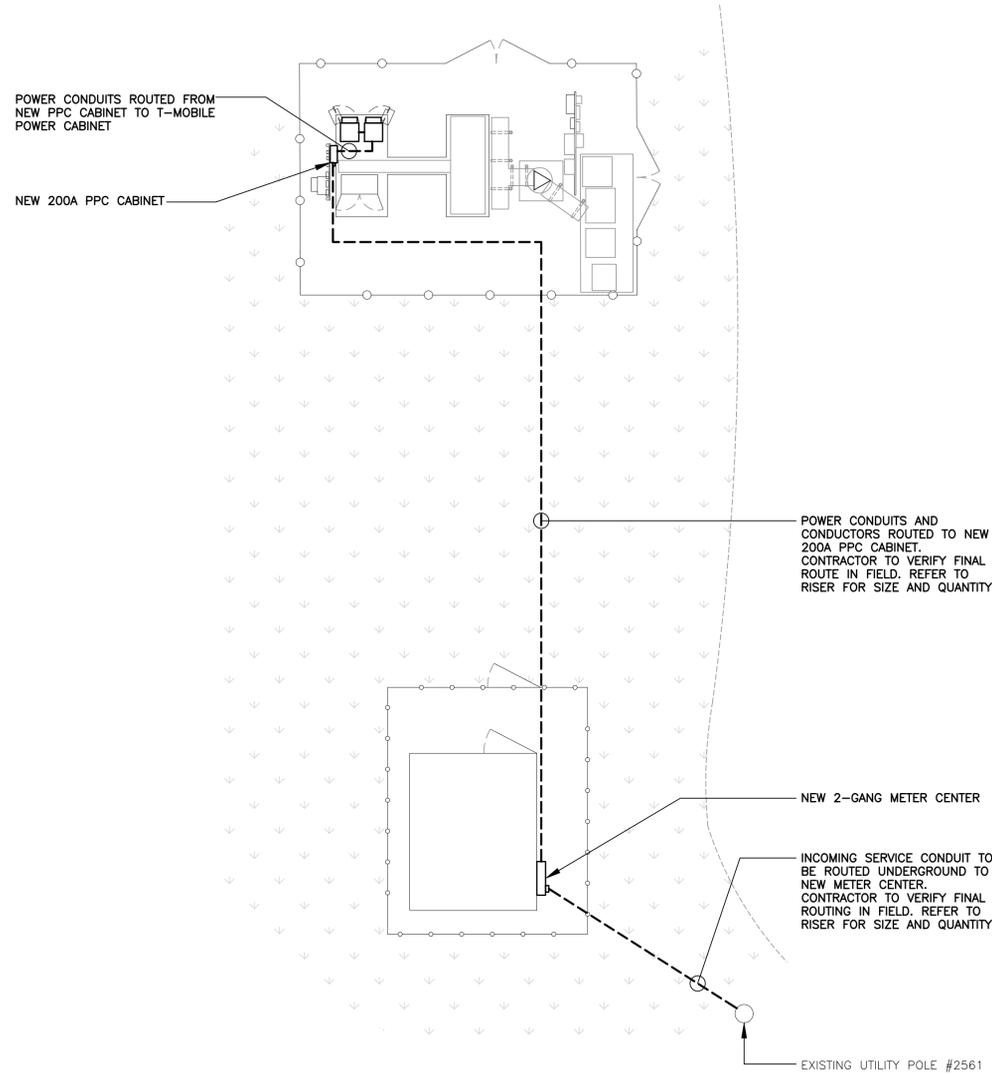
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. PROVIDE LABEL STATING "T-MOBILE WIRELESS"

2 MINI PPC CABINET DETAIL
SCALE: NOT TO SCALE

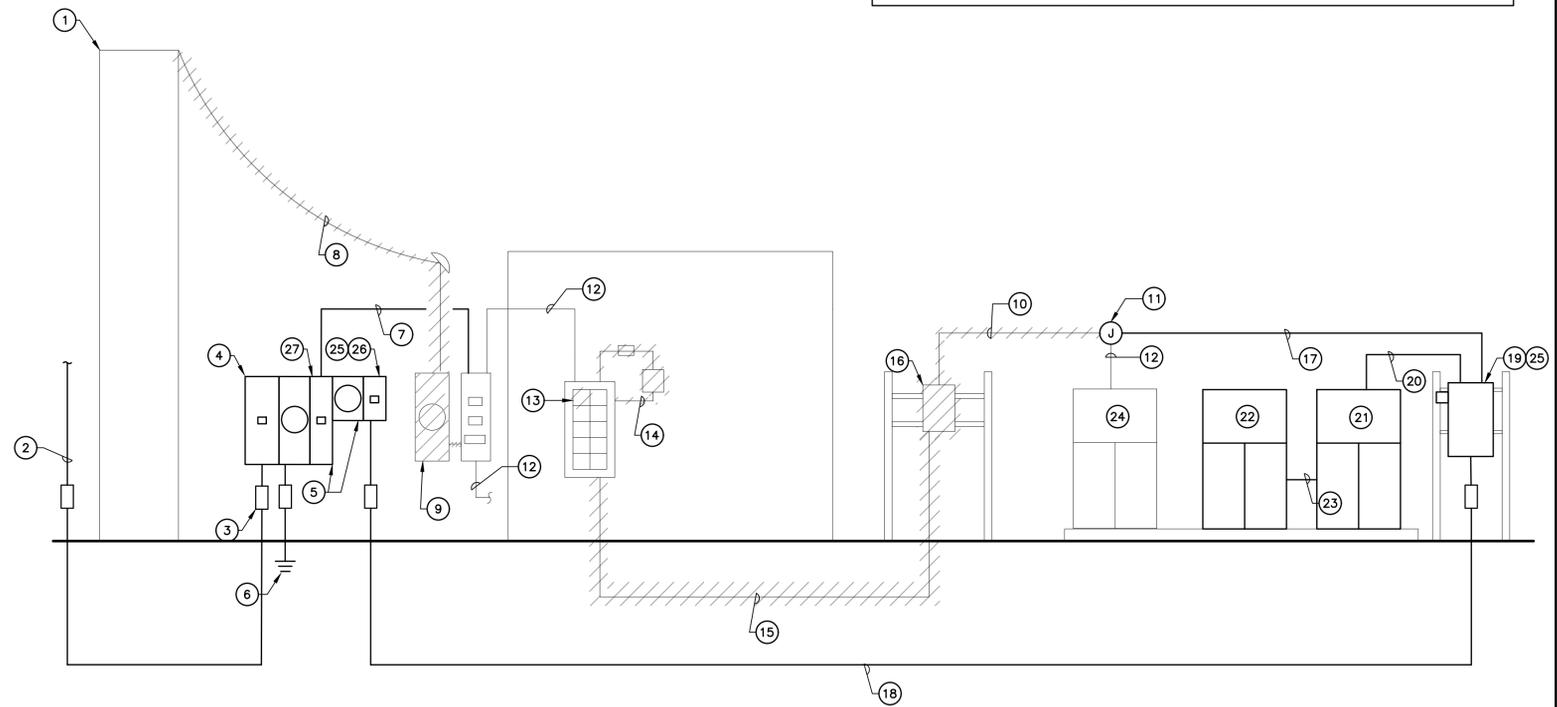
PROFESSIONAL ENGINEER SEAL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
	TJR
DATE	12/01/21
REV.	0
DATE	12/01/21
REV.	0
	<p>www.CentekEng.com</p> <p>63-2 North Branford Road Branford, CT 06405</p> <p>Fax: (203) 488-8587 Phone: (203) 488-0580</p>
<p>T-MOBILE NORTHEAST LLC</p> <p>ROUTE 9 MIDDLESEX TURNPIKE</p> <p>SITE ID: CT11335B</p> <p>156 BOKUM RD</p> <p>OLD SAYBROOK, CT 06475</p>	
DATE:	11/01/21
SCALE:	AS NOTED
JOB NO.	21022.34
TYPICAL EQUIPMENT DETAILS	
C-5	
Sheet No. <u>7</u> of <u>10</u>	

EQUIPMENT GROUNDING NOTE:

ALL (E/P) EQUIPMENT IS TO BE BONDED TO THE EXISTING GROUNDING SYSTEM. IF AN EXISTING GROUNDING SYSTEM IS NOT PRESENT OR IS NOT OPERATIONAL, THE CONTRACTOR IS TO CONTACT THE ENGINEER OF RECORD.



1 ELECTRICAL CONDUIT ROUTING PLAN
E-1 SCALE: 3/4" = 1"

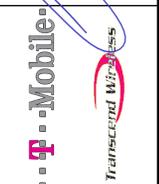


2 ELECTRICAL POWER RISER DIAGRAM
E-1 SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

- 1 EXISTING UTILITY POLE #2561
- 2 (2) SETS OF (3) 350 KCML, 3" CONDUIT
- 3 EXPANSION COUPLING TYP.
- 4 600A, 240/120V, 1P, 65 KAIC RATED, NEMA-3R, MAIN CIRCUIT BREAKER MODULE WITH 600A/2P MAIN CIRCUIT BREAKER. (SQUARE-D: EZM1600CBU OR APPROVED EQUIVALENT.) MUST BE UTILITY COMPANY APPROVED.
- 5 TWO SINGLE GANG MULTI-METER BRANCH DEVICES. (1) 240V, 1P, 3W, 225A RATED METER SOCKET (SQUARE-D: EZML111225 OR APPROVED EQUIVALENT) AND (1) 240V, 1P, 3W, 400A RATED METER SOCKET (SQUARE-D: EZML111400 OR APPROVED EQUIVALENT). MUST BE UTILITY COMPANY APPROVED.
- 6 #2/0 AWG MAIN SERVICE GROUNDING CONDUCTOR IN 3/4" PVC CONDUIT. BOND TO EXISTING EXTERIOR GROUNDING SYSTEM
- 7 (3) #500 KCML, (1) #3 AWG GROUND, 3" CONDUIT TO BACK FEED EXISTING DISTRIBUTION EQUIPMENT.
- 8 EXISTING OVERHEAD CONDUITS AND CONDUCTORS TO BE REMOVED.
- 9 EXISTING UTILITY METER TO BE REMOVED AND REPLACED BY NEW 400A RATED UTILITY METER IN NEW METER CENTER.
- 10 SECTION OF CONDUITS AND CONDUCTORS TO BE REMOVED
- 11 JUNCTION BOX SIZED PER NEC
- 12 EXISTING CONDUITS AND CONDUCTORS TO REMAIN
- 13 EXISTING 100A/2P T-MOBILE CIRCUIT BREAKER TO BE REMOVED
- 14 EXISTING T-MOBILE SUB-METER TO BE REMOVED
- 15 EXISTING CONDUITS AND CONDUCTORS TO BE REMOVED
- 16 EXISTING 100A T-MOBILE ELECTRICAL PANEL TO BE REMOVED
- 17 EXTEND EXISTING CONDUITS AND CONDUCTORS TO NEW PPC CABINET. CONTRACTOR TO VERIFY FINAL ROUTING IN FIELD
- 18 (3) 3/0 AWG, (1) #6 AWG GROUND, 2" CONDUIT.
- 19 NEW 200A, 120/240V, SINGLE PHASE PPC CABINET
- 20 (3) #1 AWG, (1) #8 AWG GROUND, 1-1/2" CONDUIT.
- 21 NEW T-MOBILE POWER ENCLOSURE
- 22 NEW T-MOBILE BATTERY CABINET
- 23 DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS
- 24 EXISTING CABINET TO REMAIN
- 25 PROVIDE SIGN STATING "T-MOBILE WIRELESS"
- 26 200A RATED, 240V, SINGLE PHASE, 3 WIRE UTILITY METER AND ASSOCIATED 200A/2P CIRCUIT BREAKER TO SERVE T-MOBILE. ALL EQUIPMENT MUST BE UTILITY COMPANY APPROVED.
- 27 400A RATED, 240V, SINGLE PHASE, 3 WIRE UTILITY METER AND ASSOCIATED 400A/2P CIRCUIT BREAKER TO BACK FEED EXISTING DISTRIBUTION EQUIPMENT. ALL EQUIPMENT MUST BE UTILITY COMPANY APPROVED.

REV.	DATE	BY	DESCRIPTION
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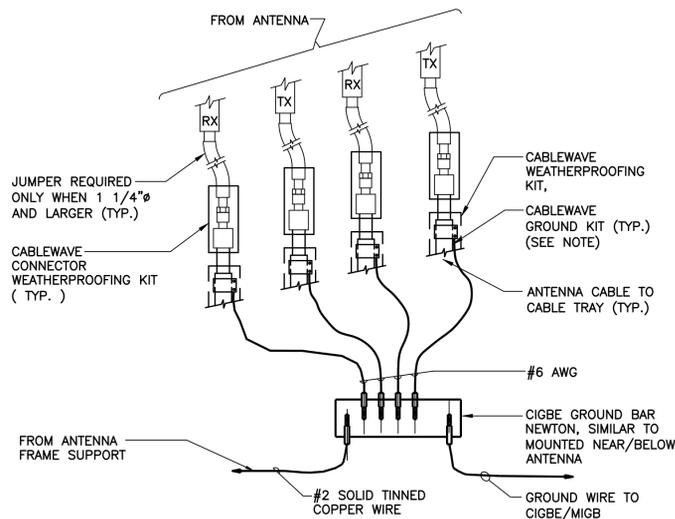
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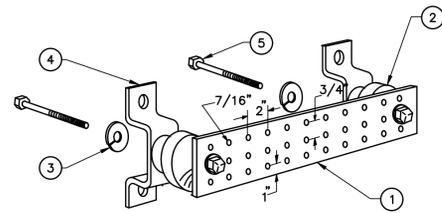
ELECTRICAL RISER
DIAGRAM AND
CONDUIT ROUTING

E-1
Sheet No. 8 of 10



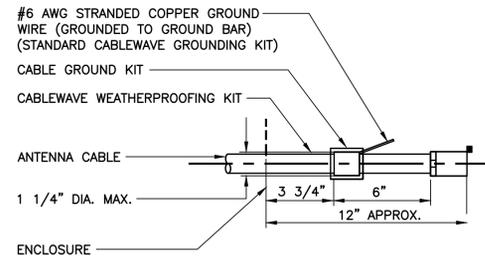
NOTES:

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



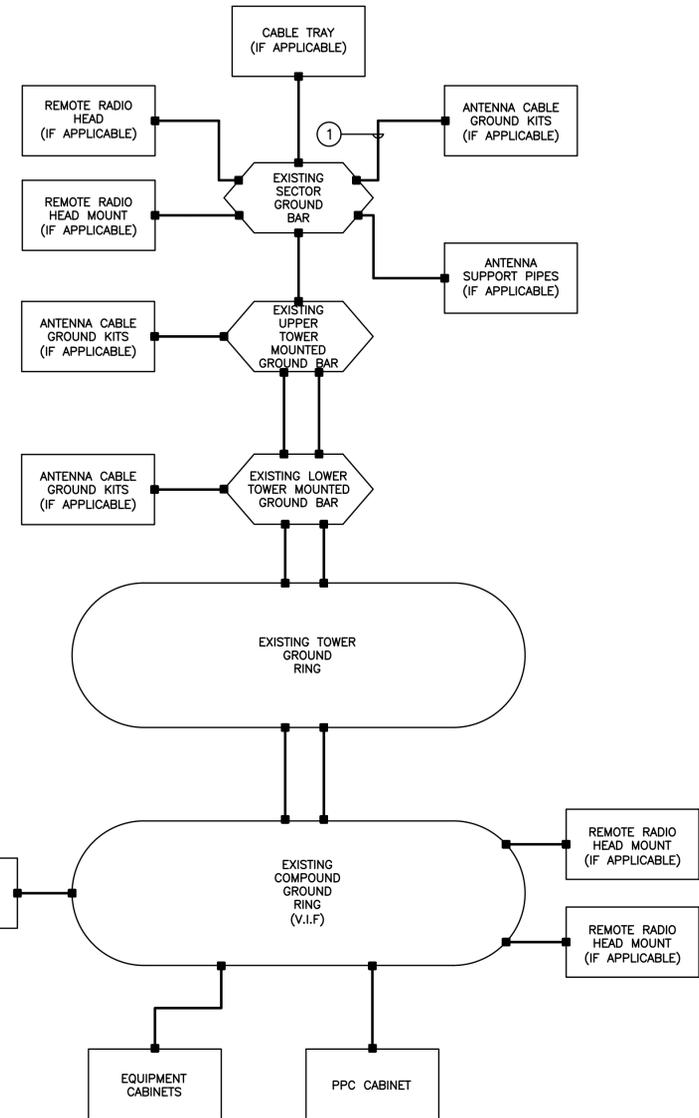
NOTES

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



NOTES:

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



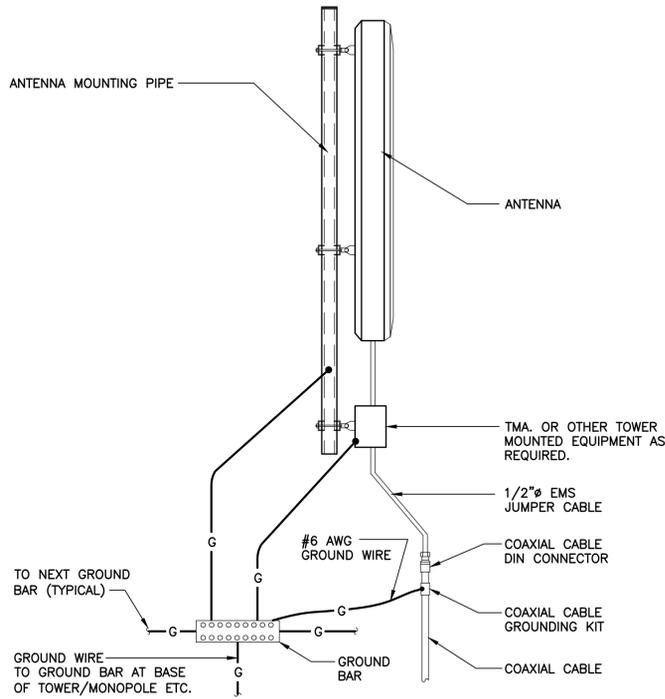
GROUNDING SCHEMATIC NOTES

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

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

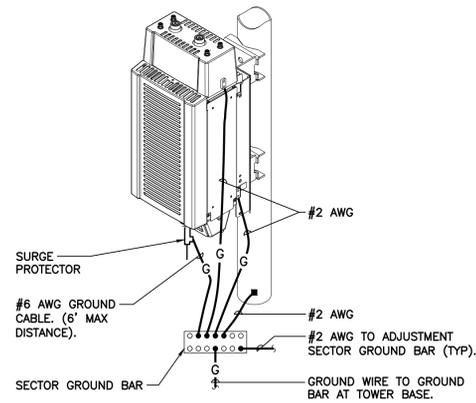
2 GROUND BAR DETAIL
E-2 SCALE: NOT TO SCALE

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

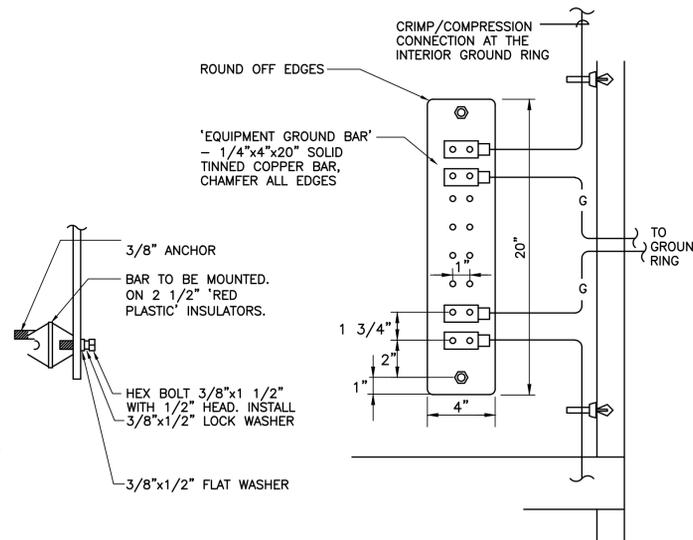


4 TYPICAL ANTENNA GROUNDING DETAIL
E-2 SCALE: NOT TO SCALE

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



5 RRH POLE MOUNT GROUNDING
E-2 SCALE: NOT TO SCALE



6 EQUIPMENT GROUND BAR DETAIL
E-2 SCALE: NOT TO SCALE

PROFESSIONAL ENGINEER SEAL

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DATE: 11/01/21
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TYPICAL ELECTRICAL DETAILS

E-2

Sheet No. 9 of 10

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
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DRAWN BY/CHK'D BY

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.1. SCOPE OF WORK

- A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
- INSTALL NEW 2-GANG MULTI METER CENTER, 600A, 240/120V, 1P, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 200A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
 - FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, LIGHTING FIXTURES, ETC. AS INDICATED OR NOTED ON PLANS.
 - CELLULAR GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, GROUND BARS, ETC.
 - COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.
- B. LOCAL UTILITY COMPANIES SHALL PROVIDE THE FOLLOWING:
- SHUTDOWN OF SERVICE (COORDINATE WITH OWNER).
- C. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.
- D. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

1.02. GENERAL REQUIREMENTS

- A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
- B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
- C. 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:
- 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.
 - 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
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:
- | | | |
|------|------------------|--------------------------|
| LINE | 120/208/240V | 277/480V |
| 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.
- 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)
 - DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE
 - SINGLE POLE SWITCH – P&S #CSB20AC2 (20A–120V HARD USE) SPECIFICATION GRADE
 - 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:
- 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.
 - 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:
- EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
 - THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
 - 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:

- GROUND BARS
 - EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
 - 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:
- TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
 - CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
 - 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.

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	TJR	RIS	12/01/21	DATE
DRAWN BY	REV.	0		
PROFESSIONAL ENGINEER SEAL				
				
T-MOBILE NORTHEAST LLC ROUTE 9 MIDDLESEX TURNPIKE SITE ID: CT11335B 156 BOKUM RD OLD SAYBROOK, CT 06475	(203) 488-0380 (203) 488-8587 Fax 63-2 North Branford Road Branford, CT 06405 www.CentekEng.com			
DATE:	11/01/21			
SCALE:	AS NOTED			
JOB NO.	21022.34			
TYPICAL ELECTRICAL DETAILS				
E-3				
Sheet No. 10 of 10				

Structural Analysis Report

Antenna Mount Analysis

*Proposed T-Mobile
Equipment Upgrade*

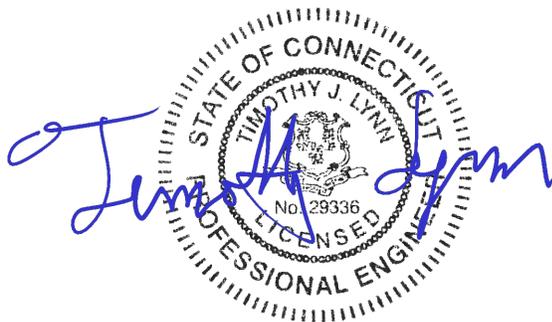
T-Mobile Site #: CT11335B

*156 Bokum Road
Old Saybrook, CT*

Centek Project No. 21022.34

Date: November 29, 2021

Max Stress Ratio = 57.1%



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

Table of Contents

SECTION 1 – REPORT

- ANTENNA AND APPURTENANCE SUMMARY
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SECTION 3 – REFERENCE MATERIALS (NOT INCLUDED WITHIN REPORT)

- RF DATA SHEET, DATED 09/1/2021

November 29, 2021

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

Re: *Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11335B
156 Bokum Road
Old Saybrook, CT 06475*

Centek Project No. 21022.34

Dear Mr. Reid,

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

The loads considered in this analysis consist of the following:

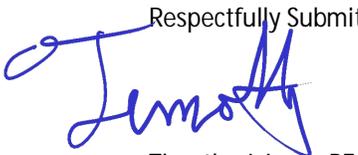
- T-Mobile:
Antenna Masts: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) RFS APX16DWV-16DWV-S-E-A20 panel antennas, three (3) Ericsson 4480 B71+B85 remote radio heads and three (3) Ericsson 4460 B25+B66 remote radio heads on the proposed mount with RAD center elevations of 155-ft & 167-ft +/- AGL.

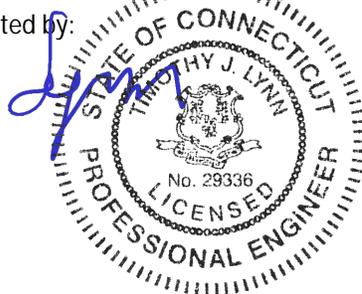
The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 105 mph for Old Saybrook as required in Appendix N of the 2018 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:


Timothy J. Lynn, PE
Structural Engineer



Prepared by:


Fernando J. Palacios
Engineer

CEN TEK Engineering, Inc.
Structural Analysis – Mount Analysis
T-Mobile Antenna Equipment Upgrade – CT11335B
Old Saybrook, CT
November 29, 2021

Section 2 - Calculations

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24_43-U-NA20	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 95.9$	in (User Input)
Antenna Width =	$W_{ant} := 24.0$	in (User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in (User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs (User Input)
Number of Antennas =	$N_{ant} := 1$	(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$	
Antenna Force Coefficient =	$Ca_{ant} = 1.27$	

Wind Load (without ice)

Surface Area for One Antenna = $SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$ sf

Total Antenna Wind Force Front = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 611$ lbs

Surface Area for One Antenna = $SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$ sf

Total Antenna Wind Force Side = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 216$ lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19$ sf

Total Antenna Wind Force w/ Ice Front = $F_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 165$ 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 = $F_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 72$ lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 433$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 433$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS - APX16DWV-16DWV-S-E-A20	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 55.9$	in (User Input)
Antenna Width =	$W_{ant} := 13.0$	in (User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in (User Input)
Antenna Weight =	$WT_{ant} := 40.7$	lbs (User Input)
Number of Antennas =	$N_{ant} := 1$	(User Input)
Antenna Aspect Ratio =	$AR_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$	

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

Wind Load (without ice)

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

Total Antenna Wind Force Front = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 195$ lbs

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

Total Antenna Wind Force Side = $F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 47$ lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.8$ sf

Total Antenna Wind Force w/ Ice Front = $F_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 60$ lbs

Surface Area for One Antenna w/ Ice = $SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.8$ sf

Total Antenna Wind Force w/ Ice Side = $F_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 24$ lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4270$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot I_d = 138$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 138$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4480 B71+B85	
RRUS Shape =	Flat	(User Input)
RRUS Height =	$L_{RRUS} := 21.8$	in (User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in (User Input)
RRUS Thickness =	$T_{RRUS} := 7.5$	in (User Input)
RRUS Weight =	$WT_{RRUS} := 84$	lbs (User Input)
Number of RRUS's =	$N_{RRUS} := 1$	
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.4$	
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$	

Wind Load (without ice)

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

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 86$ lbs

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

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 41$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.4$ sf

Total RRUS Wind Force w/ Ice = $F_{IRRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 28$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.9$ sf

Total RRUS Wind Force w/ Ice = $F_{IRRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 16$ lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2567$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2804$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 91$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 91$ lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

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

Wind Load (without ice)

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

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 77$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 60$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.1$ sf

Total RRUS Wind Force w/ Ice = $F_{IRRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 25$ lbs

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

Total RRUS Wind Force w/ Ice = $F_{IRRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 21$ lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3227$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 105$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 105$ lbs



Envelope Only Solution

Centek Engineering
FJP
21022.34

CT11335B - Mount Member Framing

Nov 22, 2021 at 10:24 PM
CT11335B_AMA.R3D



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering	CT11335B - Mount Member Unity Check	
FJP		Nov 22, 2021 at 10:23 PM
21022.34		CT11335B_AMA.R3D

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 1 - Site Information

Site ID: CT11335B
Status: Draft
Version: 6
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 9/10/2021 2:40:32 PM
Last Modified By: Richard.Kane@sprint.com

Site Name: Old Saybrook/RT 9
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2022
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: <undefined>

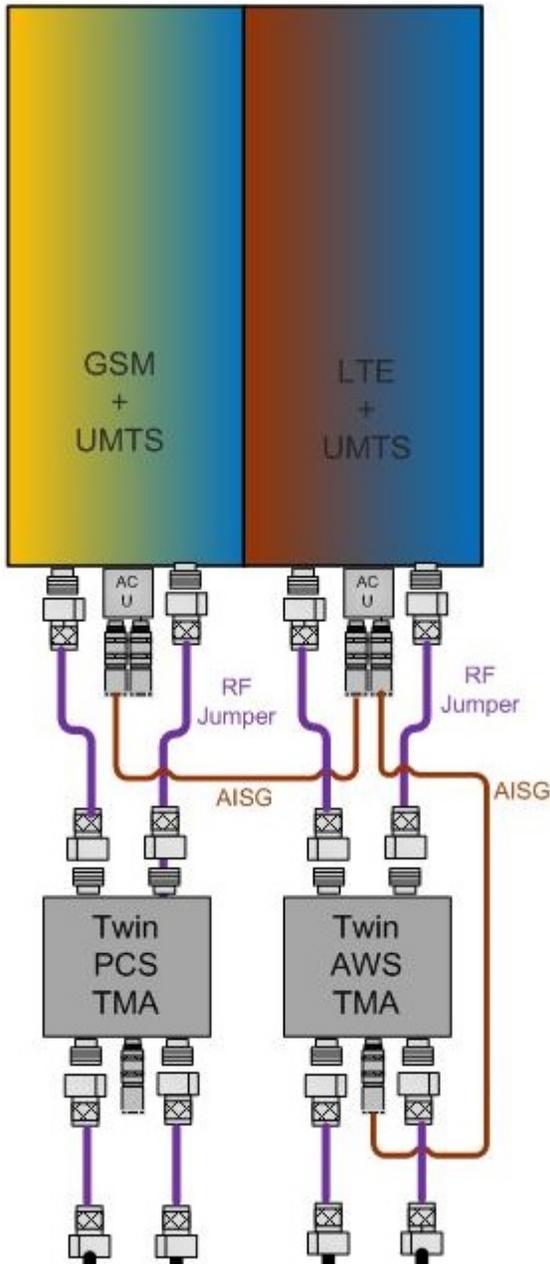
Latitude: 41.32810900
Longitude: -72.38876800
Address: 156 Bokum Road
City, State: Old Saybrook, CT
Region: NORTHEAST

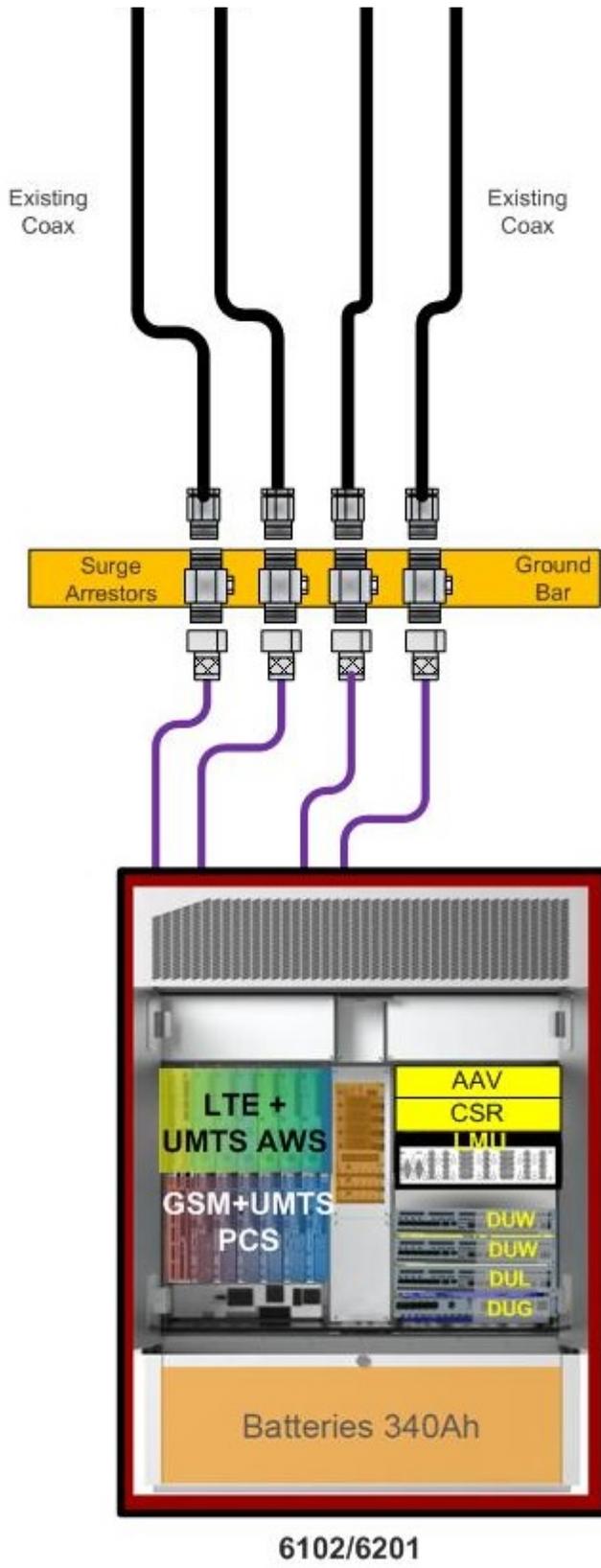
RAN Template: 67E998E 6160		AL Template: 67E998E_10P+1QP		
Sector Count: 3	Antenna Count: 6	Coax Line Count: 0	TMA Count: 0	RRU Count: 6

Section 2 - Existing Template Images

4B_1QP.jpg

Site Configuration 4B_1Q – with 6102/6201

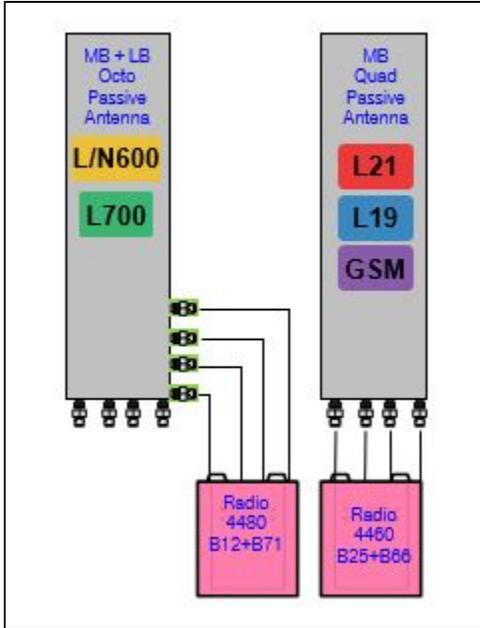




Notes:

Section 3 - Proposed Template Images

67E998E.JPG



DRAFT

Notes:

Section 4 - Siteplan Images

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

DRAFT

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 5 - RAN Equipment

Existing RAN Equipment

Template: 94E

Enclosure	1			
Enclosure Type	RBS 6102			
Baseband	DUW30 U2100	DUG20 G1900	BB 5216 L1900 L2100	
Radio	RUS01 B2 (x 3) L1900	RUS01 B2 (x 3) L1900 G1900	RUS01 B4 (x 3) U2100	RUS01 B4 (x 3) L2100

Proposed RAN Equipment

Template: 67E998E 6160

	1	2	3
Enclosure	1	2	3
Enclosure Type	Enclosure 6160	B160	RBS 6601
Baseband	BB 6648 L700 L600 N600 BB 6648 L2100 L1900		DUG20 G1900
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m (x 3)		
Transport System	CSR IXRe V2 (Gen2)		

RAN Scope of Work:

upgrade 200A
No Generator

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 6 - A&L Equipment

Existing Template: 94E_1QP
Proposed Template: 67E998E_10P+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	50	
M. Tilt		
Height	167	
Ports	P1	P2
Active Tech.	L1900 G1900	U2100 L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	7/8" Coax - 200 ft. (x2)	7/8" Coax - 200 ft. (x2)
TMA's	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1			2		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			RFS - APX16DWW-16DWW-S-E-A20 (Quad)		
Azimuth	50			50		
M. Tilt						
Height	155			167		
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600			L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5			2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)			Coax Jumper (x2)	Coax Jumper (x2)
TMA's						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						
Unconnected Equipment:						
Scope of Work:						

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

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 2 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	160	
M. Tilt		
Height	167	
Ports	P1	P2
Active Tech.	L1900 G1900	U2100 L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	7/8" Coax - 200 ft. (x2)	7/8" Coax - 200 ft. (x2)
TMA's	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 2 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1			2		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			RFS - APX16DWW-16DWW-S-E-A20 (Quad)		
Azimuth	160			160		
M. Tilt						
Height	155			167		
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600			L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5			2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)			Coax Jumper (x2)	Coax Jumper (x2)
TMA's						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						
Unconnected Equipment:						
Scope of Work:						

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

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 3 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	320	
M. Tilt		
Height	167	
Ports	P1	P2
Active Tech.	L1900 G1900	U2100 L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	7/8" Coax - 200 ft. (x2)	7/8" Coax - 200 ft. (x2)
TMA's	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 3 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1			2		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			RFS - APX16DWW-16DWW-S-E-A20 (Quad)		
Azimuth	320			320		
M. Tilt						
Height	155			167		
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600			L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5			2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)			Coax Jumper (x2)	Coax Jumper (x2)
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						
Unconnected Equipment:						
Scope of Work:						

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

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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Proposed Power Systems Equipment

Enclosure

1

Enclosure Type

Enclosure 6160

Structural Analysis Report

200-ft Existing Guyed Lattice Tower

*Proposed T-Mobile
Antenna Upgrade*

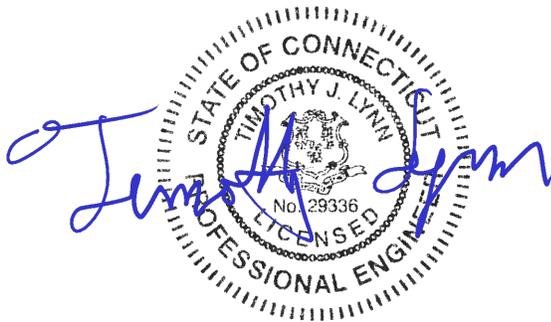
T-Mobile Site Ref: CT11335B

*156 Bokum Road
Old Saybrook, CT*

Centek Project No. 21022.34

Date: November 29, 2021

Max Stress Ratio = 99.5%



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

Table of Contents

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- INTRODUCTION
- ANTENNA AND APPURTENANCE SUMMARY
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- TOWER LOADING
- TOWER CAPACITY
- FOUNDATION AND ANCHORS
- CONCLUSION

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- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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- GUY ANCHOR FOUNDATION ANALYSIS

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Introduction

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

The tower is a 200-ft, three legged, tapered lattice tower. The tower geometry, structure member sizes and foundation information were taken from a previous structural analysis report prepared by Hudson Design Group dated April 17, 2013. All previous reinforcements are assumed to be installed. See Primary Assumptions Section below for detailed reinforcement reference reports.

Antenna and appurtenance information were obtained from the aforementioned structural analysis report and a T-Mobile RF sheet.

The tower is made up of straight vertical sections consisting of solid round legs conforming to ASTM A572 Gr. 50, steel angle lateral bracing conforming to ASTM A36 and one (1) tapered base vertical section consisting of solid round legs steel grade of ASTM A572-50. The vertical tower sections are connected by bolted sleeves with the diagonal and horizontal bracing to legs consisting of welded connections. The width of the tower face is 1.50-ft throughout its length.

Antenna and Appurtenance Summary

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

- **AT&T (Existing):**
Antennas: One (1) Commscope SBNHH-1D4545A panel antenna, one (1) Powerwave P65-17-XLH-RR panel antenna, one (1) KMW AM-X-CD-17-6500T-RET panel antenna and three (3) CCI DTMABP7819VG12A TMAs mounted on three (3) pipes with an elevation of 145-ft above the existing tower base.
Coax Cables: Twelve (12) 7/8" coax cables running on the outside of the existing tower.
- **T-MOBILE (EXISTING TO REMOVE):**
Antennas: Three (3) Commscope RR90-17-02DPL2 panel antennas and three (3) TMA's with a RAD center elevation of +/- 145-ft AGL.
Cables: Twelve (12) 7/8" \emptyset cables routed along the exterior of the tower.
- **T-MOBILE (EXISTING TO REMAIN):**
Antennas: Three (3) RFS APX16DWV-16DWV-S-E-A20 panel antennas mounted on antenna masts with a RAD center elevation of +/-167-ft AGL.
- **T-MOBILE (PROPOSED):**
Antennas: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson 4460 remote radio units and three (3) Ericsson 4480 remote radio units mounted on antenna masts with a RAD center elevation of +/- 155-ft AGL.
Cables: Three (3) 6x24 fiber cables routed along the exterior of the tower.

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.
- **All previous reinforcements per the below listed structural analysis and modification report are assumed to be installed.**
 - **Structural report prepared by Hudson Design Group dated 04/17/2013.**

A n a l y s i s

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 CSBC¹ and the wind speed data available in the TIA-222-G-2005 Standard.

T o w e r L o a d i n g

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:	Old Saybrook; $v = 105$ mph (Nominal)	[Appendix N of the 2018 CT Building Code]
Load Cases:	<u>Load Case 1</u> ; 105 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	[Appendix N of the 2018 CT Building Code]
	<u>Load Case 2</u> ; 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.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T5)	160'-0" - 152'-5"	99.5%	PASS
Diagonal (T8)	140'-0" - 120'-0"	65.0%	PASS
Guy A @ 179.67-ft radius (T2)	179.67-ft	57.6%	PASS

Foundation and Anchors

The tower base foundation consists of a 3.0-ft diameter x 3.0-ft long reinforced concrete pier on a 4.5-ft square x 2.0-ft thick reinforced concrete pad bearing directly on the existing sub grade. Additionally, guy wire loading is transferred to three (3) concrete support blocks. The foundation information and sub-grade conditions used as the basis for the foundation analysis were derived from the aforementioned structural report

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

Tower Guy Reactions	
Vector	Inner
Horizontal (In Plane of GW)	17 kips
Horizontal (Out of Plane of GW)	1 kips
Vertical	15 kips
Resultant Force at end of Guy Wire	23 kips
Tower Base Reactions	
Vector	Proposed Reaction
Horizontal Shear	1.0 kips
Axial Compression	67.0 kips

Foundation	Design Limit	FS ⁽¹⁾	Proposed Loading (FS) ⁽¹⁾	Result
Reinf. Conc. Anchor Block	Uplift	1.86	4.1	PASS
	Sliding	1.40	11.6	PASS
		Ultimate Bearing	Proposed	
Base Foundation	Bearing	8.0 ksf	3.94 ksf	PASS

| Note 1: FS denotes 'Factor of Safety'.

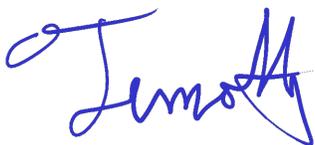
Conclusion

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

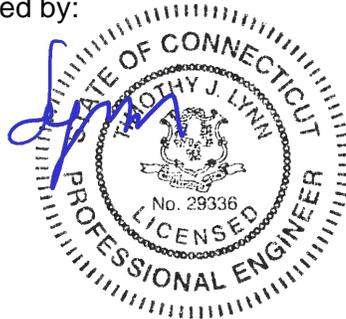
The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
 Structural Engineer



Prepared by:



Fernando J. Palacios
 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.

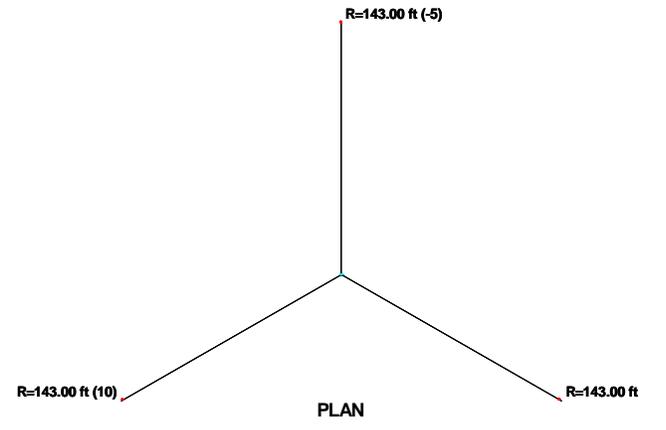
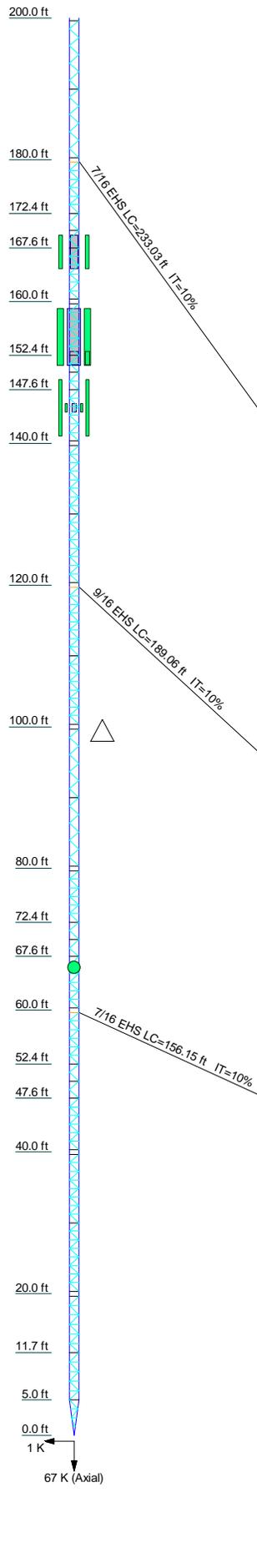
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

tnxTower Features:

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

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20
Legs	Pipe 1-1/4" dia. w 1-1/2" x 1/4"																			
Leg Grade	A572-50																			
Diagonals	SR 5/8																			
Diagonal Grade	A572-50																			
Top Girts	SR 7/8																			
Mid Girts	N.A.																			
Bottom Girts	SR 7/8																			
Horizontals	L1 3/4x1 3/4x3/16																			
Top Guy Pull-Offs	N.A.																			
Face Width (ft)	2x1/4																			
# Panels @ (ft)	D 5 @ 1.33278					17 @ 1.20833					6 @ 1.20778					C 6 @ 1.20778				
Weight (K)	5.0					0.1					0.2					0.1				



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APX16DWV-16DWVS-E-A20 (T-Mobile)	167	4480 b71+b85 (T-Mobile)	155
APX16DWV-16DWVS-E-A20 (T-Mobile)	167	4480 b71+b85 (T-Mobile)	155
APX16DWV-16DWVS-E-A20 (T-Mobile)	167	Pipe 2.0 STD X 11-FT (T-Mobile)	155
Pipe 2.0 STD X 7-FT (ATI)	167	Pipe 2.0 STD X 11-FT (T-Mobile)	155
Pipe 2.0 STD X 7-FT (ATI)	167	Pipe 2.0 STD X 11-FT (T-Mobile)	155
Pipe 2.0 STD X 7-FT (ATI)	167	SBNH-1D4545A (ATI)	145
APXVAARR24_43-U-NA20 (T-Mobile)	155	P65-17-XLH-RR (ATI)	145
APXVAARR24_43-U-NA20 (T-Mobile)	155	AM-X-CD-17-65-00T-RET (ATI)	145
APXVAARR24_43-U-NA20 (T-Mobile)	155	DTMA1819VG12A (ATI)	145
APXVAARR24_43-U-NA20 (T-Mobile)	155	DTMA1819VG12A (ATI)	145
APXVAARR24_43-U-NA20 (T-Mobile)	155	DTMA1819VG12A (ATI)	145
4460 B25+B60 (T-Mobile)	155	2" Std. x 7.5" Pipe (ATI)	145
4460 B25+B60 (T-Mobile)	155	2" Std. x 7.5" Pipe (ATI)	145
4460 B25+B60 (T-Mobile)	155	2" Std. x 7.5" Pipe (ATI)	145
4480 b71+b85 (T-Mobile)	155	2" Dish	66

SYMBOL LIST

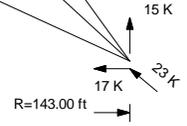
MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x3/16	C	4 @ 1.21
B	SR 7/8	D	4 @ 1.25

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 99.5%

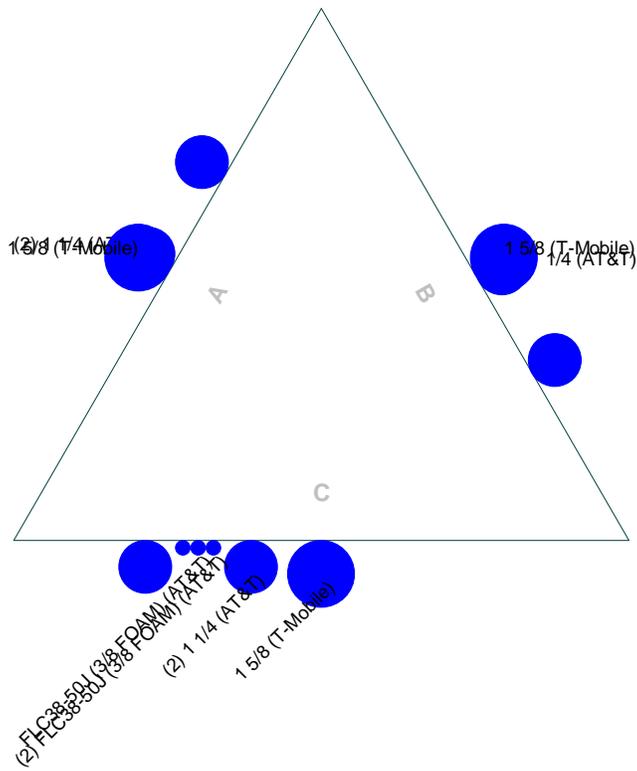


ALL REACTIONS ARE FACTORED

Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: 21022.34 CT11335B Bokum Road		
	Project: 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT		
	Client: T-Mobile	Drawn by: T.JL	App'd:
	Code: TIA-222-G	Date: 11/29/21	Scale: NTS
	Path: J:\Jobs\210220\21022.34 CT11335B\5 - Structural Tower Analysis\Backup Documents\21022.34 Guyed Tow Old Saybrook CT.dwg	Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face



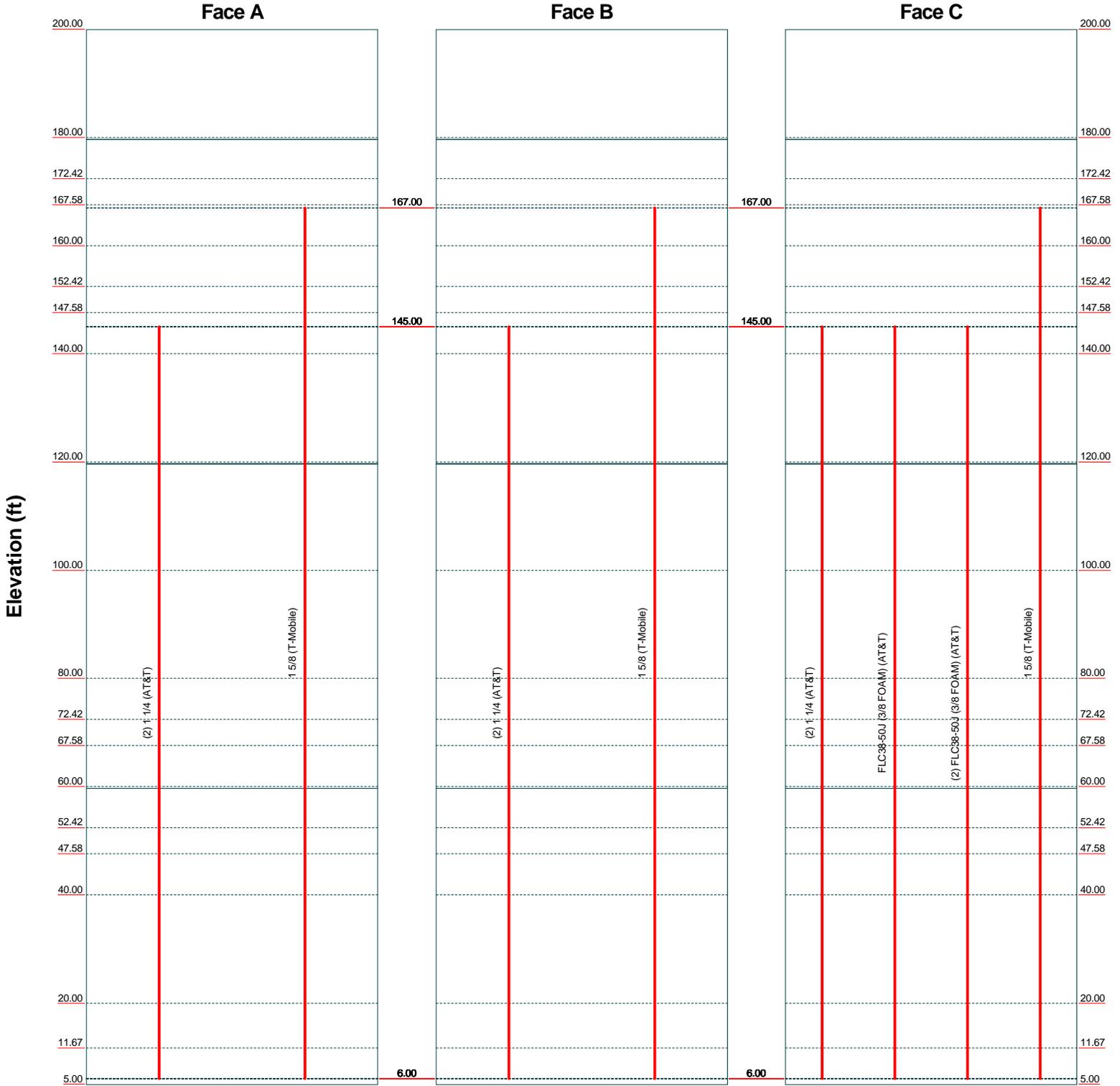
Centek Engineering 63-2 N Branford Rd Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: 21022.34 CT11335B Bokum Road		
	Project: 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT		
	Client: T-Mobile	Drawn by: FJP	App'd:
	Code: TIA-222-G	Date: 11/22/21	Scale: NTS
	Path:	Dwg No. E-7	

J:\Jobs\210220\11334 CT11335B\5-Structural\Tower Analysis\Backup Documentation\ER200_Guyed_Twr_Old Saybrook_CT.dwg

Feed Line Distribution Chart

5' - 200'

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



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	Client: T-Mobile	Drawn by: FJP	App'd:
	Code: TIA-222-G	Date: 11/22/21	Scale: NTS
	Path:	Dwg No. E-7	

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 1 of 69
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	Client T-Mobile	Designed by TJJ

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 200.00 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 1.50 ft at the top and tapered at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Middlesex County, Connecticut.

Basic wind speed of 105 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.750 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.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

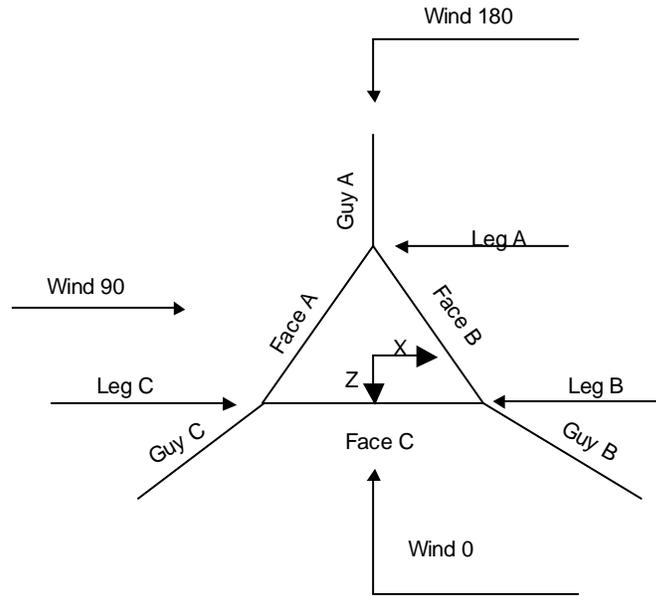
Safety factor used in guy design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

<ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) √ SR Members Have Cut Ends SR Members Are Concentric 	<ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned Assume Rigid Index Plate Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas Add IBC .6D+W Combination √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs 	<ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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Corner & Starmount Guyed Tower

Tower Section Geometry

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	200.00-180.00			1.50	1	20.00
T2	180.00-172.42			1.50	1	7.58
T3	172.42-167.58			1.50	1	4.84
T4	167.58-160.00			1.50	1	7.58
T5	160.00-152.42			1.50	1	7.58
T6	152.42-147.58			1.50	1	4.84
T7	147.58-140.00			1.50	1	7.58
T8	140.00-120.00			1.50	1	20.00
T9	120.00-100.00			1.50	1	20.00
T10	100.00-80.00			1.50	1	20.00
T11	80.00-72.42			1.50	1	7.58
T12	72.42-67.58			1.50	1	4.84
T13	67.58-60.00			1.50	1	7.58
T14	60.00-52.42			1.50	1	7.58
T15	52.42-47.58			1.50	1	4.84
T16	47.58-40.00			1.50	1	7.58
T17	40.00-20.00			1.50	1	20.00
T18	20.00-11.67			1.50	1	8.33
T19	11.67-5.00			1.50	1	6.67
T20	5.00-0.00			1.50	1	5.00

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 3 of 69
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	Client T-Mobile	Designed by TJL

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	200.00-180.00	1.21	K Brace Right	No	No	4.000	4.000
T2	180.00-172.42	1.21	K Brace Right	No	Yes	4.000	0.000
T3	172.42-167.58	1.21	K Brace Right	No	No	0.000	0.000
T4	167.58-160.00	1.21	K Brace Right	No	Yes	0.000	4.000
T5	160.00-152.42	1.21	K Brace Right	No	Yes	4.000	0.000
T6	152.42-147.58	1.21	K Brace Right	No	Yes	0.000	0.000
T7	147.58-140.00	1.21	K Brace Right	No	Yes	0.000	4.000
T8	140.00-120.00	1.21	K Brace Right	No	Yes	4.000	4.000
T9	120.00-100.00	1.21	K Brace Right	No	Yes	4.000	4.000
T10	100.00-80.00	1.21	K Brace Right	No	No	4.000	4.000
T11	80.00-72.42	1.21	K Brace Right	No	Yes	4.000	0.000
T12	72.42-67.58	1.21	K Brace Right	No	No	0.000	0.000
T13	67.58-60.00	1.21	K Brace Right	No	Yes	0.000	4.000
T14	60.00-52.42	1.21	K Brace Right	No	Yes	4.000	0.000
T15	52.42-47.58	1.21	K Brace Right	No	No	0.000	0.000
T16	47.58-40.00	1.21	K Brace Right	No	Yes	0.000	4.000
T17	40.00-20.00	1.21	K Brace Right	No	Yes	4.000	4.000
T18	20.00-11.67	1.33	K Brace Right	No	Yes	4.000	0.000
T19	11.67-5.00	1.33	K Brace Left	No	Yes	0.000	0.000
T20	5.00-0.00	1.25	K Brace Left	No	Yes	0.000	0.000

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 200.00-180.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T2 180.00-172.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T3 172.42-167.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T4 167.58-160.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T5 160.00-152.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T6 152.42-147.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T7 147.58-140.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T8 140.00-120.00	Arbitrary Shape	Pipe 1-1/4"dia. w 1-1/2"x1/4"	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T9 120.00-100.00	Arbitrary Shape	Pipe 1-1/4"dia. w 1-1/2"x1/4"	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T10 100.00-80.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T11 80.00-72.42	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T12 72.42-67.58	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T13 67.58-60.00	Solid Round	1 1/4	A572-50	Solid Round	5/8	A572-50

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Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T14 60.00-52.42	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50
T15 52.42-47.58	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50
T16 47.58-40.00	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50
T17 40.00-20.00	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50
T18 20.00-11.67	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50
T19 11.67-5.00	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50
T20 5.00-0.00	Solid Round	1 1/4	(50 ksi) A572-50	Solid Round	5/8	(50 ksi) A572-50

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 200.00-180.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 180.00-172.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 167.58-160.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 160.00-152.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T7 147.58-140.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T8 140.00-120.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 120.00-100.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 100.00-80.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T11 80.00-72.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T13 67.58-60.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 60.00-52.42	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T16 47.58-40.00	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 40.00-20.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T18 20.00-11.67	Solid Round	7/8	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)
T19 11.67-5.00	Solid Round	7/8	A572-50 (50 ksi)	Flat Bar		A36 (36 ksi)
T20 5.00-0.00	Solid Round	7/8	A572-50 (50 ksi)	Flat Bar	3x1/4	A36 (36 ksi)

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Tower Section Geometry (cont'd)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 200.00-180.00	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)
T2 180.00-172.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 172.42-167.58	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)
T4 167.58-160.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 160.00-152.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T6 152.42-147.58	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T7 147.58-140.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 140.00-120.00	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T9 120.00-100.00	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T10 100.00-80.00	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)
T11 80.00-72.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T12 72.42-67.58	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)
T13 67.58-60.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T14 60.00-52.42	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T15 52.42-47.58	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)
T16 47.58-40.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T17 40.00-20.00	1	Solid Round	7/8	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T18 20.00-11.67	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T19 11.67-5.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T20 5.00-0.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 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
200.00-180.00	0.00	0.000	A36 (36 ksi)	1	1	1.05	36.000	36.000	36.000
T2	0.00	0.000	A36	1	1	1.05	36.000	36.000	36.000

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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
T10 100.00-80.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 80.00-72.42	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T12 72.42-67.58	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 67.58-60.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 60.00-52.42	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T15 52.42-47.58	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T16 47.58-40.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T17 40.00-20.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T18 20.00-11.67	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T19 11.67-5.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T20 5.00-0.00	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Guy Data

Guy Elevation ft	Guy Grade	Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L _u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %	
179.667	EHS	A	7/16	2.08	10%	21000	0.399	232.84	143.00	0.0000	-5.00	100%
		B	7/16	2.08	10%	21000	0.399	228.90	143.00	0.0000	0.00	100%
		C	7/16	2.08	10%	21000	0.399	221.15	143.00	0.0000	10.00	100%
119.667	EHS	A	9/16	3.50	10%	21000	0.671	188.90	143.00	0.0000	-5.00	100%
		B	9/16	3.50	10%	21000	0.671	185.65	143.00	0.0000	0.00	100%
		C	9/16	3.50	10%	21000	0.671	179.37	143.00	0.0000	10.00	100%
59.6667	EHS	A	7/16	2.08	10%	21000	0.399	156.02	143.00	0.0000	-5.00	100%
		B	7/16	2.08	10%	21000	0.399	154.02	143.00	0.0000	0.00	100%
		C	7/16	2.08	10%	21000	0.399	150.44	143.00	0.0000	10.00	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
179.667	Corner						
119.667	Corner						
59.6667	Corner						

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Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
179.67	A36 (36 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	2x1/4
119.67	A36 (36 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	2x1/4
59.67	A36 (36 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	2x1/4

Guy Data (cont'd)

Guy Elevation ft	Cable Weight			Tower Intercept		Tower Intercept		
	A K	B K	C K	D K	A ft	B ft	C ft	D ft
179.667	0.09	0.09	0.09		5.11	4.94	4.62	
119.667	0.13	0.12	0.12		3.9 sec/pulse	3.8 sec/pulse	3.7 sec/pulse	
59.6667	0.06	0.06	0.06		3.38	3.27	3.05	
					3.2 sec/pulse	3.1 sec/pulse	3.0 sec/pulse	
					2.32	2.26	2.16	
					2.6 sec/pulse	2.6 sec/pulse	2.5 sec/pulse	

Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K _x	K _y	K _x	K _y	K _x	K _y
179.667	Yes	Yes			1	1	1	1
119.667	No	No			1	1	1	1
59.6667	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
179.667	0.000	0	0.000	1	0.625	0	0.000	0.75	0.625	0	0.000	0.75
119.667	A325N				A325N				A325N			
59.6667	0.000	0	0.000	1	0.625	0	0.000	0.75	0.625	0	0.000	0.75
	A325N				A325N				A325N			
	0.000	0	0.000	1	0.625	0	0.000	0.75	0.625	0	0.000	0.75
	A325N				A325N				A325N			

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Guy Pressures

Guy Elevation ft	Guy Location	z ft	q _z psf	q _z Ice psf	Ice Thickness in
179.667	A	87.33	23	5	1.653
	B	89.83	23	5	1.658
	C	94.83	23	5	1.667
119.667	A	57.33	20	5	1.585
	B	59.83	20	5	1.592
	C	64.83	21	5	1.605
59.6667	A	27.33	17	4	1.472
	B	29.83	17	4	1.485
	C	34.83	18	4	1.508

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F _x K	F _y K	F _z K	M _x kip-ft	M _y kip-ft	M _z kip-ft
179.667	A	52.4153	2.15 2.08	0.00	1.72	-1.29	-1.49	0.00	0.00
	B	51.6525	2.15 2.08	1.14	1.70	0.66	0.74	0.00	-1.28
	C	50.0463	2.15 2.08	-1.18	1.66	0.68	0.72	0.00	1.25
119.667	A	41.2542	Sum: 3.58 3.50	-0.04 0.00	5.09 2.40	0.04 -2.66	-0.03 -2.08	0.00 0.00	-0.03 0.00
	B	40.0950	3.58 3.50	2.34	2.34	1.35	1.01	0.00	-1.76
	C	37.6528	3.57 3.50	-2.42	2.22	1.40	0.96	0.00	1.67
59.6667	A	24.4641	Sum: 2.11 2.08	-0.08 0.00	6.96 0.90	0.09 -1.90	-0.10 -0.78	0.00 0.00	-0.09 0.00
	B	22.7723	2.10 2.08	1.67	0.84	0.96	0.36	0.00	-0.63
	C	19.2612	2.10 2.08	-1.71	0.72	0.99	0.31	0.00	0.54
			Sum:	-0.04	2.46	0.05	-0.10	0.00	-0.09

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F _x K	F _y K	F _z K	M _x kip-ft	M _y kip-ft	M _z kip-ft
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Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F _x	F _y	F _z	M _x	M _y	M _z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
179.667	A	52.4153	5.20 4.34	0.00	4.32	-2.90	-3.74	0.00	0.00
	B	51.6525	5.20 4.36	2.56	4.28	1.48	1.85	0.00	-3.21
	C	50.0463	5.20 4.40	-2.66	4.20	1.53	1.82	0.00	3.15
119.667	A	41.2542	Sum: 6.89 6.29	-0.10 0.00	12.79 4.80	0.11 -4.95	-0.07 -4.16	0.00 0.00	-0.06 0.00
	B	40.0950	6.90 6.32	4.37	4.70	2.52	2.04	0.00	-3.53
	C	37.6528	6.90 6.36	-4.54	4.49	2.62	1.94	0.00	3.37
59.6667	A	24.4641	Sum: 4.50 4.25	-0.17 0.00	14.00 2.11	0.19 -3.97	-0.18 -1.83	0.00 0.00	-0.16 0.00
	B	22.7723	4.52 4.28	3.51	2.00	2.02	0.87	0.00	-1.50
	C	19.2612	4.54 4.34	-3.62	1.76	2.09	0.76	0.00	1.32
			Sum:	-0.12	5.88	0.14	-0.20	0.00	-0.18

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F _x	F _y	F _z	M _x	M _y	M _z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
179.667	A	52.4153	2.15 2.08	0.00	1.72	-1.29	-1.49	0.00	0.00
	B	51.6525	2.15 2.08	1.14	1.70	0.66	0.74	0.00	-1.28
	C	50.0463	2.15 2.08	-1.18	1.66	0.68	0.72	0.00	1.25
119.667	A	41.2542	Sum: 3.58 3.50	-0.04 0.00	5.09 2.40	0.04 -2.66	-0.03 -2.08	0.00 0.00	-0.03 0.00
	B	40.0950	3.58 3.50	2.34	2.34	1.35	1.01	0.00	-1.76
	C	37.6528	3.57 3.50	-2.42	2.22	1.40	0.96	0.00	1.67
59.6667	A	24.4641	Sum: 2.11 2.08	-0.08 0.00	6.96 0.90	0.09 -1.90	-0.10 -0.78	0.00 0.00	-0.09 0.00
	B	22.7723	2.10 2.08	1.67	0.84	0.96	0.36	0.00	-0.63
	C	19.2612	2.10 2.08	-1.71	0.72	0.99	0.31	0.00	0.54
			Sum:	-0.04	2.46	0.05	-0.10	0.00	-0.09

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Guy-Tensioning Information

Temperature At Time Of Tensioning																	
Guy Elevation ft	H ft	V ft	0 F		20 F		40 F		60 F		80 F		100 F		120 F		
			Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	Initial Tension K	Intercept ft	
			179.667	A	142.13	184.67	2.414	4.41	2.302	4.63	2.191	4.86	2.080	5.11	1.971	5.39	1.862
	B	142.13	179.67	2.426	4.25	2.310	4.46	2.194	4.69	2.080	4.94	1.967	5.23	1.855	5.54	1.745	5.88
	C	142.13	169.67	2.451	3.93	2.326	4.14	2.203	4.37	2.080	4.62	1.960	4.90	1.840	5.21	1.723	5.56
119.667	A	142.13	124.67	4.357	2.72	4.069	2.91	3.783	3.13	3.500	3.38	3.222	3.67	2.950	4.01	2.685	4.40
	B	142.13	119.67	4.388	2.61	4.089	2.80	3.793	3.02	3.500	3.27	3.212	3.56	2.931	3.90	2.657	4.29
	C	142.13	109.67	4.452	2.41	4.131	2.59	3.814	2.81	3.500	3.05	3.192	3.35	2.891	3.69	2.601	4.10
59.667	A	142.13	64.67	2.831	1.71	2.578	1.88	2.327	2.08	2.080	2.32	1.839	2.63	1.606	3.00	1.386	3.48
	B	142.13	59.67	2.851	1.65	2.591	1.82	2.333	2.02	2.080	2.26	1.833	2.57	1.594	2.95	1.370	3.43
	C	142.13	49.67	2.889	1.56	2.616	1.72	2.346	1.92	2.080	2.16	1.821	2.47	1.572	2.86	1.339	3.35

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)	# Row	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 1/4 (AT&T)	A	No	No	Ar (CaAa)	145.00 - 6.00	0.000	0.1	2	2	1.550	1.550		0.66
1 1/4 (AT&T)	B	No	No	Ar (CaAa)	145.00 - 6.00	0.000	0.1	2	2	1.550	1.550		0.66
1 1/4 (AT&T)	C	No	No	Ar (CaAa)	145.00 - 6.00	0.000	0.2	2	2	1.550	1.550		0.66
FLC38-50J (3/8 FOAM) (AT&T)	C	No	No	Ar (CaAa)	145.00 - 6.00	0.000	0.2	1	1	0.440	0.440		0.08
FLC38-50J (3/8 FOAM) (AT&T)	C	No	No	Ar (CaAa)	145.00 - 6.00	0.000	0.2	2	2	0.440	0.440		0.08
1 5/8 (T-Mobile)	A	No	No	Ar (CaAa)	160.00 - 6.00	0.000	0	1	1	1.980	1.980		1.04
1 5/8 (T-Mobile)	B	No	No	Ar (CaAa)	160.00 - 6.00	0.000	0	1	1	1.980	1.980		1.04
1 5/8 (T-Mobile)	C	No	No	Ar (CaAa)	160.00 - 6.00	0.000	0	1	1	1.980	1.980		1.04

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AAA} In Face ft ²	C _{AAA} Out Face ft ²	Weight K
T1	200.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	180.00-172.42	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T3	172.42-167.58	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T4	167.58-160.00	A	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T5	160.00-152.42	A	0.000	0.000	1.501	0.000	0.01
		B	0.000	0.000	1.501	0.000	0.01
		C	0.000	0.000	1.501	0.000	0.01
T6	152.42-147.58	A	0.000	0.000	0.958	0.000	0.01
		B	0.000	0.000	0.958	0.000	0.01
		C	0.000	0.000	0.958	0.000	0.01
T7	147.58-140.00	A	0.000	0.000	3.051	0.000	0.01
		B	0.000	0.000	3.051	0.000	0.01
		C	0.000	0.000	3.711	0.000	0.02
T8	140.00-120.00	A	0.000	0.000	10.160	0.000	0.05
		B	0.000	0.000	10.160	0.000	0.05
		C	0.000	0.000	12.800	0.000	0.05
T9	120.00-100.00	A	0.000	0.000	10.160	0.000	0.05
		B	0.000	0.000	10.160	0.000	0.05
		C	0.000	0.000	12.800	0.000	0.05
T10	100.00-80.00	A	0.000	0.000	10.160	0.000	0.05
		B	0.000	0.000	10.160	0.000	0.05
		C	0.000	0.000	12.800	0.000	0.05
T11	80.00-72.42	A	0.000	0.000	3.851	0.000	0.02
		B	0.000	0.000	3.851	0.000	0.02
		C	0.000	0.000	4.851	0.000	0.02
T12	72.42-67.58	A	0.000	0.000	2.459	0.000	0.01
		B	0.000	0.000	2.459	0.000	0.01
		C	0.000	0.000	3.098	0.000	0.01
T13	67.58-60.00	A	0.000	0.000	3.851	0.000	0.02
		B	0.000	0.000	3.851	0.000	0.02
		C	0.000	0.000	4.851	0.000	0.02
T14	60.00-52.42	A	0.000	0.000	3.851	0.000	0.02
		B	0.000	0.000	3.851	0.000	0.02
		C	0.000	0.000	4.851	0.000	0.02
T15	52.42-47.58	A	0.000	0.000	2.459	0.000	0.01
		B	0.000	0.000	2.459	0.000	0.01
		C	0.000	0.000	3.098	0.000	0.01
T16	47.58-40.00	A	0.000	0.000	3.851	0.000	0.02
		B	0.000	0.000	3.851	0.000	0.02
		C	0.000	0.000	4.851	0.000	0.02
T17	40.00-20.00	A	0.000	0.000	10.160	0.000	0.05
		B	0.000	0.000	10.160	0.000	0.05
		C	0.000	0.000	12.800	0.000	0.05
T18	20.00-11.67	A	0.000	0.000	4.232	0.000	0.02
		B	0.000	0.000	4.232	0.000	0.02
		C	0.000	0.000	5.331	0.000	0.02
T19	11.67-5.00	A	0.000	0.000	2.880	0.000	0.01
		B	0.000	0.000	2.880	0.000	0.01
		C	0.000	0.000	3.629	0.000	0.01
T20	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
T1	200.00-180.00	A	1.787	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
T2	180.00-172.42	C	1.774	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
T3	172.42-167.58	C	1.767	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
T4	167.58-160.00	C	1.761	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
T5	160.00-152.42	C	1.752	0.000	0.000	4.157	0.000	0.07
		A		0.000	0.000	4.157	0.000	0.07
		B		0.000	0.000	4.157	0.000	0.07
T6	152.42-147.58	C	1.745	0.000	0.000	2.648	0.000	0.04
		A		0.000	0.000	2.648	0.000	0.04
		B		0.000	0.000	2.648	0.000	0.04
T7	147.58-140.00	C	1.738	0.000	0.000	10.107	0.000	0.14
		A		0.000	0.000	10.107	0.000	0.14
		B		0.000	0.000	15.934	0.000	0.19
T8	140.00-120.00	C	1.720	0.000	0.000	34.607	0.000	0.45
		A		0.000	0.000	34.607	0.000	0.45
		B		0.000	0.000	57.725	0.000	0.66
T9	120.00-100.00	C	1.692	0.000	0.000	34.297	0.000	0.44
		A		0.000	0.000	34.297	0.000	0.44
		B		0.000	0.000	57.100	0.000	0.64
T10	100.00-80.00	C	1.658	0.000	0.000	33.932	0.000	0.43
		A		0.000	0.000	33.932	0.000	0.43
		B		0.000	0.000	56.364	0.000	0.63
T11	80.00-72.42	C	1.631	0.000	0.000	12.747	0.000	0.16
		A		0.000	0.000	12.747	0.000	0.16
		B		0.000	0.000	21.135	0.000	0.23
T12	72.42-67.58	C	1.617	0.000	0.000	8.103	0.000	0.10
		A		0.000	0.000	8.103	0.000	0.10
		B		0.000	0.000	13.422	0.000	0.15
T13	67.58-60.00	C	1.602	0.000	0.000	12.629	0.000	0.16
		A		0.000	0.000	12.629	0.000	0.16
		B		0.000	0.000	20.896	0.000	0.23
T14	60.00-52.42	C	1.582	0.000	0.000	12.546	0.000	0.15
		A		0.000	0.000	12.546	0.000	0.15
		B		0.000	0.000	20.729	0.000	0.22
T15	52.42-47.58	C	1.564	0.000	0.000	7.963	0.000	0.10
		A		0.000	0.000	7.963	0.000	0.10
		B		0.000	0.000	13.138	0.000	0.14
T16	47.58-40.00	C	1.543	0.000	0.000	12.385	0.000	0.15
		A		0.000	0.000	12.385	0.000	0.15
		B		0.000	0.000	20.405	0.000	0.22
T17	40.00-20.00	C	1.486	0.000	0.000	32.058	0.000	0.38
		A		0.000	0.000	32.058	0.000	0.38
		B		0.000	0.000	52.587	0.000	0.54
T18	20.00-11.67	C	1.394	0.000	0.000	12.937	0.000	0.15
		A		0.000	0.000	12.937	0.000	0.15
		B		0.000	0.000	21.065	0.000	0.21
T19	11.67-5.00	C	1.307	0.000	0.000	8.540	0.000	0.09
		A		0.000	0.000	8.540	0.000	0.09
		B		0.000	0.000	13.801	0.000	0.13
T20	5.00-0.00	C	1.159	0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 16 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Feed Line Center of Pressure

Section	Elevation ft	CP _x	CP _z	CP _x Ice	CP _z Ice
		in	in	in	in
T1	200.00-180.00	0.000	0.000	0.000	0.000
T2	180.00-172.42	0.000	0.000	0.000	0.000
T3	172.42-167.58	0.000	0.000	0.000	0.000
T4	167.58-160.00	0.000	0.000	0.000	0.000
T5	160.00-152.42	0.000	0.000	0.000	0.000
T6	152.42-147.58	0.000	0.000	0.000	0.000
T7	147.58-140.00	-0.257	0.185	0.000	0.000
T8	140.00-120.00	-0.274	0.205	-0.122	0.130
T9	120.00-100.00	-0.272	0.204	-0.127	0.135
T10	100.00-80.00	-0.427	0.295	-0.467	0.463
T11	80.00-72.42	-0.343	0.245	-0.055	0.055
T12	72.42-67.58	-0.424	0.293	-0.444	0.438
T13	67.58-60.00	-0.343	0.245	-0.070	0.070
T14	60.00-52.42	-0.334	0.240	-0.065	0.065
T15	52.42-47.58	-0.424	0.293	-0.461	0.453
T16	47.58-40.00	-0.343	0.245	-0.102	0.101
T17	40.00-20.00	-0.349	0.249	-0.168	0.166
T18	20.00-11.67	-0.359	0.256	-0.301	0.295
T19	11.67-5.00	-0.333	0.238	-0.281	0.273
T20	5.00-0.00	0.000	0.000	0.000	0.000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T5	6	1 5/8	152.42 - 160.00	0.6000	0.0000
T5	7	1 5/8	152.42 - 160.00	0.6000	0.0000
T5	8	1 5/8	152.42 - 160.00	0.6000	0.0000
T6	6	1 5/8	147.58 - 152.42	0.6000	0.0925
T6	7	1 5/8	147.58 - 152.42	0.6000	0.0925
T6	8	1 5/8	147.58 - 152.42	0.6000	0.0925
T7	1	1 1/4	140.00 - 145.00	0.6000	0.0000
T7	2	1 1/4	140.00 - 145.00	0.6000	0.0000
T7	3	1 1/4	140.00 - 145.00	0.6000	0.0000
T7	4	FLC38-50J (3/8 FOAM)	140.00 - 145.00	0.6000	0.0000
T7	5	FLC38-50J (3/8 FOAM)	140.00 - 145.00	0.6000	0.0000
T7	6	1 5/8	140.00 - 147.58	0.6000	0.0000
T7	7	1 5/8	140.00 - 147.58	0.6000	0.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	8	1 5/8	140.00 - 147.58	0.6000	0.0000
T8	1	1 1/4	120.00 - 140.00	0.6000	0.0780
T8	2	1 1/4	120.00 - 140.00	0.6000	0.0780
T8	3	1 1/4	120.00 - 140.00	0.6000	0.0780
T8	4	FLC38-50J (3/8 FOAM)	120.00 - 140.00	0.6000	0.0780
T8	5	FLC38-50J (3/8 FOAM)	120.00 - 140.00	0.6000	0.0780
T8	6	1 5/8	120.00 - 140.00	0.6000	0.0780
T8	7	1 5/8	120.00 - 140.00	0.6000	0.0780
T8	8	1 5/8	120.00 - 140.00	0.6000	0.0780
T9	1	1 1/4	100.00 - 120.00	0.6000	0.0822
T9	2	1 1/4	100.00 - 120.00	0.6000	0.0822
T9	3	1 1/4	100.00 - 120.00	0.6000	0.0822
T9	4	FLC38-50J (3/8 FOAM)	100.00 - 120.00	0.6000	0.0822
T9	5	FLC38-50J (3/8 FOAM)	100.00 - 120.00	0.6000	0.0822
T9	6	1 5/8	100.00 - 120.00	0.6000	0.0822
T9	7	1 5/8	100.00 - 120.00	0.6000	0.0822
T9	8	1 5/8	100.00 - 120.00	0.6000	0.0822
T10	1	1 1/4	80.00 - 100.00	0.6000	0.2843
T10	2	1 1/4	80.00 - 100.00	0.6000	0.2843
T10	3	1 1/4	80.00 - 100.00	0.6000	0.2843
T10	4	FLC38-50J (3/8 FOAM)	80.00 - 100.00	0.6000	0.2843
T10	5	FLC38-50J (3/8 FOAM)	80.00 - 100.00	0.6000	0.2843
T10	6	1 5/8	80.00 - 100.00	0.6000	0.2843
T10	7	1 5/8	80.00 - 100.00	0.6000	0.2843
T10	8	1 5/8	80.00 - 100.00	0.6000	0.2843
T11	1	1 1/4	72.42 - 80.00	0.6000	0.0352
T11	2	1 1/4	72.42 - 80.00	0.6000	0.0352
T11	3	1 1/4	72.42 - 80.00	0.6000	0.0352
T11	4	FLC38-50J (3/8 FOAM)	72.42 - 80.00	0.6000	0.0352
T11	5	FLC38-50J (3/8 FOAM)	72.42 - 80.00	0.6000	0.0352
T11	6	1 5/8	72.42 - 80.00	0.6000	0.0352
T11	7	1 5/8	72.42 - 80.00	0.6000	0.0352
T11	8	1 5/8	72.42 - 80.00	0.6000	0.0352
T12	1	1 1/4	67.58 - 72.42	0.6000	0.2711
T12	2	1 1/4	67.58 - 72.42	0.6000	0.2711
T12	3	1 1/4	67.58 - 72.42	0.6000	0.2711
T12	4	FLC38-50J (3/8 FOAM)	67.58 - 72.42	0.6000	0.2711
T12	5	FLC38-50J (3/8 FOAM)	67.58 - 72.42	0.6000	0.2711
T12	6	1 5/8	67.58 - 72.42	0.6000	0.2711
T12	7	1 5/8	67.58 - 72.42	0.6000	0.2711
T12	8	1 5/8	67.58 - 72.42	0.6000	0.2711
T13	1	1 1/4	60.00 - 67.58	0.6000	0.0454
T13	2	1 1/4	60.00 - 67.58	0.6000	0.0454
T13	3	1 1/4	60.00 - 67.58	0.6000	0.0454
T13	4	FLC38-50J (3/8 FOAM)	60.00 - 67.58	0.6000	0.0454

Job	21022.34 CT11335B Bokum Road	Page	18 of 69
Project	200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date	13:15:20 11/29/21
Client	T-Mobile	Designed by	TJL

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	5	FLC38-50J (3/8 FOAM)	60.00 - 67.58	0.6000	0.0454
T13	6	1 5/8	60.00 - 67.58	0.6000	0.0454
T13	7	1 5/8	60.00 - 67.58	0.6000	0.0454
T13	8	1 5/8	60.00 - 67.58	0.6000	0.0454
T14	1	1 1/4	52.42 - 60.00	0.6000	0.0425
T14	2	1 1/4	52.42 - 60.00	0.6000	0.0425
T14	3	1 1/4	52.42 - 60.00	0.6000	0.0425
T14	4	FLC38-50J (3/8 FOAM)	52.42 - 60.00	0.6000	0.0425
T14	5	FLC38-50J (3/8 FOAM)	52.42 - 60.00	0.6000	0.0425
T14	6	1 5/8	52.42 - 60.00	0.6000	0.0425
T14	7	1 5/8	52.42 - 60.00	0.6000	0.0425
T14	8	1 5/8	52.42 - 60.00	0.6000	0.0425
T15	1	1 1/4	47.58 - 52.42	0.6000	0.2863
T15	2	1 1/4	47.58 - 52.42	0.6000	0.2863
T15	3	1 1/4	47.58 - 52.42	0.6000	0.2863
T15	4	FLC38-50J (3/8 FOAM)	47.58 - 52.42	0.6000	0.2863
T15	5	FLC38-50J (3/8 FOAM)	47.58 - 52.42	0.6000	0.2863
T15	6	1 5/8	47.58 - 52.42	0.6000	0.2863
T15	7	1 5/8	47.58 - 52.42	0.6000	0.2863
T15	8	1 5/8	47.58 - 52.42	0.6000	0.2863
T16	1	1 1/4	40.00 - 47.58	0.6000	0.0663
T16	2	1 1/4	40.00 - 47.58	0.6000	0.0663
T16	3	1 1/4	40.00 - 47.58	0.6000	0.0663
T16	4	FLC38-50J (3/8 FOAM)	40.00 - 47.58	0.6000	0.0663
T16	5	FLC38-50J (3/8 FOAM)	40.00 - 47.58	0.6000	0.0663
T16	6	1 5/8	40.00 - 47.58	0.6000	0.0663
T16	7	1 5/8	40.00 - 47.58	0.6000	0.0663
T16	8	1 5/8	40.00 - 47.58	0.6000	0.0663
T17	1	1 1/4	20.00 - 40.00	0.6000	0.1086
T17	2	1 1/4	20.00 - 40.00	0.6000	0.1086
T17	3	1 1/4	20.00 - 40.00	0.6000	0.1086
T17	4	FLC38-50J (3/8 FOAM)	20.00 - 40.00	0.6000	0.1086
T17	5	FLC38-50J (3/8 FOAM)	20.00 - 40.00	0.6000	0.1086
T17	6	1 5/8	20.00 - 40.00	0.6000	0.1086
T17	7	1 5/8	20.00 - 40.00	0.6000	0.1086
T17	8	1 5/8	20.00 - 40.00	0.6000	0.1086
T18	1	1 1/4	11.67 - 20.00	0.6000	0.1944
T18	2	1 1/4	11.67 - 20.00	0.6000	0.1944
T18	3	1 1/4	11.67 - 20.00	0.6000	0.1944
T18	4	FLC38-50J (3/8 FOAM)	11.67 - 20.00	0.6000	0.1944
T18	5	FLC38-50J (3/8 FOAM)	11.67 - 20.00	0.6000	0.1944
T18	6	1 5/8	11.67 - 20.00	0.6000	0.1944
T18	7	1 5/8	11.67 - 20.00	0.6000	0.1944
T18	8	1 5/8	11.67 - 20.00	0.6000	0.1944
T19	1	1 1/4	6.00 - 11.67	0.6000	0.2081
T19	2	1 1/4	6.00 - 11.67	0.6000	0.2081
T19	3	1 1/4	6.00 - 11.67	0.6000	0.2081
T19	4	FLC38-50J (3/8 FOAM)	6.00 - 11.67	0.6000	0.2081
T19	5	FLC38-50J (3/8 FOAM)	6.00 - 11.67	0.6000	0.2081
T19	6	1 5/8	6.00 - 11.67	0.6000	0.2081
T19	7	1 5/8	6.00 - 11.67	0.6000	0.2081
T19	8	1 5/8	6.00 - 11.67	0.6000	0.2081

Discrete Tower Loads

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job		21022.34 CT11335B Bokum Road		Page		19 of 69	
	Project		200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT		Date		13:15:20 11/29/21	
	Client		T-Mobile		Designed by		TJL	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
SBNH-1D4545A (AT&T)	A	From Leg	1.50	0.0000	145.00	No Ice	8.28	5.47	0.06
			0.00			1/2" Ice	8.80	6.37	0.13
			0.00			1" Ice	9.29	7.12	0.20
P65-17-XLH-RR (AT&T)	B	From Leg	1.50	0.0000	145.00	No Ice	11.47	6.80	0.06
			0.00			1/2" Ice	12.08	7.38	0.12
			0.00			1" Ice	12.71	7.98	0.19
AM-X-CD-17-65-00T-RET (AT&T)	C	From Leg	1.50	0.0000	145.00	No Ice	11.31	6.80	0.06
			0.00			1/2" Ice	11.93	7.38	0.12
			0.00			1" Ice	12.55	7.98	0.19
DTMA1819VG12A (AT&T)	A	From Leg	0.50	0.0000	145.00	No Ice	0.99	0.41	0.00
			0.00			1/2" Ice	1.12	0.51	0.01
			0.00			1" Ice	1.26	0.61	0.02
DTMA1819VG12A (AT&T)	B	From Leg	0.50	0.0000	145.00	No Ice	0.99	0.41	0.00
			0.00			1/2" Ice	1.12	0.51	0.01
			0.00			1" Ice	1.26	0.61	0.02
DTMA1819VG12A (AT&T)	C	From Leg	0.50	0.0000	145.00	No Ice	0.99	0.41	0.00
			0.00			1/2" Ice	1.12	0.51	0.01
			0.00			1" Ice	1.26	0.61	0.02
2" Std. x 7.5' Pipe (AT&T)	A	From Leg	0.00	0.0000	145.00	No Ice	0.00	1.78	0.03
			0.00			1/2" Ice	0.00	2.56	0.04
			0.00			1" Ice	0.00	3.11	0.06
2" Std. x 7.5' Pipe (AT&T)	B	From Leg	0.00	0.0000	145.00	No Ice	0.00	1.78	0.03
			0.00			1/2" Ice	0.00	2.56	0.04
			0.00			1" Ice	0.00	3.11	0.06
2" Std. x 7.5' Pipe (AT&T)	C	From Leg	0.00	0.0000	145.00	No Ice	0.00	1.78	0.03
			0.00			1/2" Ice	0.00	2.56	0.04
			0.00			1" Ice	0.00	3.11	0.06
APX16DWV-16DWVS-E-A 20 (T-Mobile)	A	From Leg	1.50	0.0000	167.00	No Ice	6.46	2.15	0.04
			0.00			1/2" Ice	6.83	2.49	0.07
			0.00			1" Ice	7.21	2.84	0.11
APX16DWV-16DWVS-E-A 20 (T-Mobile)	B	From Leg	1.50	0.0000	167.00	No Ice	6.46	2.15	0.04
			0.00			1/2" Ice	6.83	2.49	0.07
			0.00			1" Ice	7.21	2.84	0.11
APX16DWV-16DWVS-E-A 20 (T-Mobile)	C	From Leg	1.50	0.0000	167.00	No Ice	6.46	2.15	0.04
			0.00			1/2" Ice	6.83	2.49	0.07
			0.00			1" Ice	7.21	2.84	0.11
Pipe 2.0 STD X 7-FT (AT&T)	A	From Leg	0.00	0.0000	167.00	No Ice	0.00	1.66	0.03
			0.00			1/2" Ice	0.00	2.39	0.04
			0.00			1" Ice	0.00	2.83	0.06
Pipe 2.0 STD X 7-FT (AT&T)	B	From Leg	0.00	0.0000	167.00	No Ice	0.00	1.66	0.03
			0.00			1/2" Ice	0.00	2.39	0.04
			0.00			1" Ice	0.00	2.83	0.06
Pipe 2.0 STD X 7-FT (AT&T)	C	From Leg	0.00	0.0000	167.00	No Ice	0.00	1.66	0.03
			0.00			1/2" Ice	0.00	2.39	0.04
			0.00			1" Ice	0.00	2.83	0.06
APXVAARR24_43-U-NA20 (T-Mobile)	A	From Leg	1.50	0.0000	155.00	No Ice	20.24	10.79	0.16
			0.00			1/2" Ice	20.89	12.21	0.29
			0.00			1" Ice	21.55	13.49	0.44
APXVAARR24_43-U-NA20 (T-Mobile)	B	From Leg	1.50	0.0000	155.00	No Ice	20.24	10.79	0.16
			0.00			1/2" Ice	20.89	12.21	0.29
			0.00			1" Ice	21.55	13.49	0.44
APXVAARR24_43-U-NA20 (T-Mobile)	C	From Leg	1.50	0.0000	155.00	No Ice	20.24	10.79	0.16
			0.00			1/2" Ice	20.89	12.21	0.29
			0.00			1" Ice	21.55	13.49	0.44
4460 B25+B60 (T-Mobile)	A	From Leg	1.50	0.0000	155.00	No Ice	2.56	1.98	0.11
			0.00			1/2" Ice	2.76	2.16	0.13
			-3.00			1" Ice	2.97	2.34	0.16

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job	21022.34 CT11335B Bokum Road	Page	20 of 69
	Project	200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date	13:15:20 11/29/21
	Client	T-Mobile	Designed by	TJL

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz Lateral	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	K
4460 B25+B60 (T-Mobile)	B	From Leg	1.50	0.0000	155.00	No Ice	2.56	1.98	0.11
			0.00			1/2" Ice	2.76	2.16	0.13
			-3.00			1" Ice	2.97	2.34	0.16
4460 B25+B60 (T-Mobile)	C	From Leg	1.50	0.0000	155.00	No Ice	2.56	1.98	0.11
			0.00			1/2" Ice	2.76	2.16	0.13
			-3.00			1" Ice	2.97	2.34	0.16
4480 b71+b85 (T-Mobile)	A	From Leg	1.50	0.0000	155.00	No Ice	2.85	1.38	0.08
			0.00			1/2" Ice	3.06	1.54	0.11
			-3.00			1" Ice	3.28	1.71	0.13
4480 b71+b85 (T-Mobile)	B	From Leg	1.50	0.0000	155.00	No Ice	2.85	1.38	0.08
			0.00			1/2" Ice	3.06	1.54	0.11
			-3.00			1" Ice	3.28	1.71	0.13
4480 b71+b85 (T-Mobile)	C	From Leg	1.50	0.0000	155.00	No Ice	2.85	1.38	0.08
			0.00			1/2" Ice	3.06	1.54	0.11
			-3.00			1" Ice	3.28	1.71	0.13
Pipe 2.0 STD X 11-FT (T-Mobile)	A	From Leg	0.00	0.0000	155.00	No Ice	0.00	2.61	0.04
			0.00			1/2" Ice	0.00	3.74	0.06
			0.00			1" Ice	0.00	4.89	0.09
Pipe 2.0 STD X 11-FT (T-Mobile)	B	From Leg	0.00	0.0000	155.00	No Ice	0.00	2.61	0.04
			0.00			1/2" Ice	0.00	3.74	0.06
			0.00			1" Ice	0.00	4.89	0.09
Pipe 2.0 STD X 11-FT (T-Mobile)	C	From Leg	0.00	0.0000	155.00	No Ice	0.00	2.61	0.04
			0.00			1/2" Ice	0.00	3.74	0.06
			0.00			1" Ice	0.00	4.89	0.09

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							
			ft	ft	°	°	ft	ft	ft ²	K		
2' Dish		Paraboloid w/Radome	None		Worst			66.00	2.00	No Ice	28.27	0.05
										1/2" Ice	29.07	0.10
										1" Ice	29.87	0.12

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation	z	K _Z	q _z	A _G	F _a	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	ft ²	c	ft ²	ft ²	ft ²		ft ²	ft ²
T1	190.00	1.187	28	32.083	A	0.000	6.100	4.167	68.31	0.000	0.000
200.00-180.00					B	0.000	6.100		68.31	0.000	0.000
					C	0.000	6.100		68.31	0.000	0.000

Job	21022.34 CT11335B Bokum Road	Page	21 of 69
Project	200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date	13:15:20 11/29/21
Client	T-Mobile	Designed by	TJL

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
T2 180.00-172.42	176.21	1.162	28	12.160	A	1.563	2.181	1.579	42.18	0.000	0.000
					B	1.563	2.181		42.18	0.000	0.000
					C	1.563	2.181		42.18	0.000	0.000
T3 172.42-167.58	170.00	1.15	28	7.764	A	0.000	1.519	1.008	66.37	0.000	0.000
					B	0.000	1.519		66.37	0.000	0.000
					C	0.000	1.519		66.37	0.000	0.000
T4 167.58-160.00	163.79	1.138	27	12.160	A	1.313	2.290	1.579	43.83	0.000	0.000
					B	1.313	2.290		43.83	0.000	0.000
					C	1.313	2.290		43.83	0.000	0.000
T5 160.00-152.42	156.21	1.123	27	12.160	A	1.313	2.290	1.579	43.83	1.501	0.000
					B	1.313	2.290		43.83	1.501	0.000
					C	1.313	2.290		43.83	1.501	0.000
T6 152.42-147.58	150.00	1.11	27	7.764	A	0.438	1.519	1.008	51.53	0.958	0.000
					B	0.438	1.519		51.53	0.958	0.000
					C	0.438	1.519		51.53	0.958	0.000
T7 147.58-140.00	143.79	1.096	26	12.160	A	1.313	2.290	1.579	43.83	3.051	0.000
					B	1.313	2.290		43.83	3.051	0.000
					C	1.313	2.290		43.83	3.711	0.000
T8 140.00-120.00	130.00	1.065	26	33.858	A	10.778	1.933	7.715	60.70	10.160	0.000
					B	10.778	1.933		60.70	10.160	0.000
					C	10.778	1.933		60.70	12.800	0.000
T9 120.00-100.00	110.00	1.016	24	33.858	A	11.028	1.824	7.715	60.03	10.160	0.000
					B	11.028	1.824		60.03	10.160	0.000
					C	11.028	1.824		60.03	12.800	0.000
T10 100.00-80.00	90.00	0.959	23	32.083	A	0.000	6.100	4.167	68.31	10.160	0.000
					B	0.000	6.100		68.31	10.160	0.000
					C	0.000	6.100		68.31	12.800	0.000
T11 80.00-72.42	76.21	0.914	22	12.160	A	1.313	2.290	1.579	43.83	3.851	0.000
					B	1.313	2.290		43.83	3.851	0.000
					C	1.313	2.290		43.83	4.851	0.000
T12 72.42-67.58	70.00	0.892	21	7.764	A	0.000	1.519	1.008	66.37	2.459	0.000
					B	0.000	1.519		66.37	2.459	0.000
					C	0.000	1.519		66.37	3.098	0.000
T13 67.58-60.00	63.79	0.869	21	12.160	A	1.313	2.290	1.579	43.83	3.851	0.000
					B	1.313	2.290		43.83	3.851	0.000
					C	1.313	2.290		43.83	4.851	0.000
T14 60.00-52.42	56.21	0.838	20	12.160	A	1.563	2.181	1.579	42.18	3.851	0.000
					B	1.563	2.181		42.18	3.851	0.000
					C	1.563	2.181		42.18	4.851	0.000
T15 52.42-47.58	50.00	0.811	19	7.764	A	0.000	1.519	1.008	66.37	2.459	0.000
					B	0.000	1.519		66.37	2.459	0.000
					C	0.000	1.519		66.37	3.098	0.000
T16 47.58-40.00	43.79	0.781	19	12.160	A	1.313	2.290	1.579	43.83	3.851	0.000
					B	1.313	2.290		43.83	3.851	0.000
					C	1.313	2.290		43.83	4.851	0.000
T17 40.00-20.00	30.00	0.701	17	32.083	A	3.063	6.100	4.167	45.48	10.160	0.000
					B	3.063	6.100		45.48	10.160	0.000
					C	3.063	6.100		45.48	12.800	0.000
T18 20.00-11.67	15.84	0.7	17	13.363	A	1.094	2.472	1.735	48.67	4.232	0.000
					B	1.094	2.472		48.67	4.232	0.000
					C	1.094	2.472		48.67	5.331	0.000
T19 11.67-5.00	8.34	0.7	17	10.700	A	0.875	2.022	1.390	47.97	2.880	0.000
					B	0.875	2.022		47.97	2.880	0.000
					C	0.875	2.022		47.97	3.629	0.000
T20 5.00-0.00	2.50	0.7	17	4.277	A	0.000	1.578	1.057	66.98	0.000	0.000
					B	0.000	1.578		66.98	0.000	0.000
					C	0.000	1.578		66.98	0.000	0.000

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 22 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} In Face	C _{AA} Out Face
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
T1 200.00-180.00	190.00	1.187	6	1.787	38.040	A	0.000	28.532	16.080	56.36	0.000	0.000
						B	0.000	28.532		56.36	0.000	0.000
						C	0.000	28.532		56.36	0.000	0.000
T2 180.00-172.42	176.21	1.162	6	1.774	14.400	A	1.563	13.181	6.060	41.10	0.000	0.000
						B	1.563	13.181		41.10	0.000	0.000
						C	1.563	13.181		41.10	0.000	0.000
T3 172.42-167.58	170.00	1.15	6	1.767	9.190	A	0.000	7.083	3.859	54.49	0.000	0.000
						B	0.000	7.083		54.49	0.000	0.000
						C	0.000	7.083		54.49	0.000	0.000
T4 167.58-160.00	163.79	1.138	6	1.761	14.384	A	1.313	13.211	6.028	41.50	0.000	0.000
						B	1.313	13.211		41.50	0.000	0.000
						C	1.313	13.211		41.50	0.000	0.000
T5 160.00-152.42	156.21	1.123	6	1.752	14.373	A	1.313	13.159	6.007	41.51	4.157	0.000
						B	1.313	13.159		41.51	4.157	0.000
						C	1.313	13.159		41.51	4.157	0.000
T6 152.42-147.58	150.00	1.11	6	1.745	9.172	A	0.438	7.886	3.824	45.94	2.648	0.000
						B	0.438	7.886		45.94	2.648	0.000
						C	0.438	7.886		45.94	2.648	0.000
T7 147.58-140.00	143.79	1.096	6	1.738	14.355	A	1.313	13.069	5.970	41.51	10.107	0.000
						B	1.313	13.069		41.51	10.107	0.000
						C	1.313	13.069		41.51	15.934	0.000
T8 140.00-120.00	130.00	1.065	6	1.720	39.592	A	18.424	18.082	15.362	42.08	34.607	0.000
						B	18.424	18.082		42.08	34.607	0.000
						C	18.424	18.082		42.08	57.725	0.000
T9 120.00-100.00	110.00	1.016	6	1.692	39.497	A	18.547	17.705	15.235	42.02	34.297	0.000
						B	18.547	17.705		42.02	34.297	0.000
						C	18.547	17.705		42.02	57.100	0.000
T10 100.00-80.00	90.00	0.959	5	1.658	37.611	A	0.000	26.917	15.222	56.55	33.932	0.000
						B	0.000	26.917		56.55	33.932	0.000
						C	0.000	26.917		56.55	56.364	0.000
T11 80.00-72.42	76.21	0.914	5	1.631	14.220	A	1.313	12.406	5.700	41.55	12.747	0.000
						B	1.313	12.406		41.55	12.747	0.000
						C	1.313	12.406		41.55	21.135	0.000
T12 72.42-67.58	70.00	0.892	5	1.617	9.069	A	0.000	6.610	3.617	54.72	8.103	0.000
						B	0.000	6.610		54.72	8.103	0.000
						C	0.000	6.610		54.72	13.422	0.000
T13 67.58-60.00	63.79	0.869	5	1.602	14.184	A	1.313	12.228	5.627	41.56	12.629	0.000
						B	1.313	12.228		41.56	12.629	0.000
						C	1.313	12.228		41.56	20.896	0.000
T14 60.00-52.42	56.21	0.838	5	1.582	14.158	A	1.563	11.994	5.576	41.14	12.546	0.000
						B	1.563	11.994		41.14	12.546	0.000
						C	1.563	11.994		41.14	20.729	0.000
T15 52.42-47.58	50.00	0.811	4	1.564	9.026	A	0.000	6.442	3.531	54.81	7.963	0.000
						B	0.000	6.442		54.81	7.963	0.000
						C	0.000	6.442		54.81	13.138	0.000
T16 47.58-40.00	43.79	0.781	4	1.543	14.109	A	1.313	11.861	5.478	41.58	12.385	0.000
						B	1.313	11.861		41.58	12.385	0.000
						C	1.313	11.861		41.58	20.405	0.000
T17 40.00-20.00	30.00	0.701	4	1.486	37.036	A	3.063	29.951	14.072	42.62	32.058	0.000
						B	3.063	29.951		42.62	32.058	0.000
						C	3.063	29.951		42.62	52.587	0.000
T18 20.00-11.67	15.84	0.7	4	1.394	15.298	A	1.094	11.229	5.606	45.49	12.937	0.000
						B	1.094	11.229		45.49	12.937	0.000
						C	1.094	11.229		45.49	21.065	0.000

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 23 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg % ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
T19 11.67-5.00	8.34	0.7	4	1.307	12.153	A B C	0.875 0.875 0.875	8.749 8.749 8.749	4.296	44.64 44.64 44.64	8.540 8.540 13.801	0.000 0.000 0.000
T20 5.00-0.00	2.50	0.7	4	1.159	5.253	A B C	0.000 0.000 0.000	5.182 5.182 5.182	3.017	58.23 58.23 58.23	0.000 0.000 0.000	0.000 0.000 0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg % ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
T1 200.00-180.00	190.00	1.187	9	32.083	A B C	0.000 0.000 0.000	6.100 6.100 6.100	4.167	68.31 68.31 68.31	0.000 0.000 0.000	0.000 0.000 0.000
T2 180.00-172.42	176.21	1.162	9	12.160	A B C	1.563 1.563 1.563	2.181 2.181 2.181	1.579	42.18 42.18 42.18	0.000 0.000 0.000	0.000 0.000 0.000
T3 172.42-167.58	170.00	1.15	9	7.764	A B C	0.000 0.000 0.000	1.519 1.519 1.519	1.008	66.37 66.37 66.37	0.000 0.000 0.000	0.000 0.000 0.000
T4 167.58-160.00	163.79	1.138	9	12.160	A B C	1.313 1.313 1.313	2.290 2.290 2.290	1.579	43.83 43.83 43.83	0.000 0.000 0.000	0.000 0.000 0.000
T5 160.00-152.42	156.21	1.123	9	12.160	A B C	1.313 1.313 1.313	2.290 2.290 2.290	1.579	43.83 43.83 43.83	1.501 1.501 1.501	0.000 0.000 0.000
T6 152.42-147.58	150.00	1.11	9	7.764	A B C	0.438 0.438 0.438	1.519 1.519 1.519	1.008	51.53 51.53 51.53	0.958 0.958 0.958	0.000 0.000 0.000
T7 147.58-140.00	143.79	1.096	9	12.160	A B C	1.313 1.313 1.313	2.290 2.290 2.290	1.579	43.83 43.83 43.83	3.051 3.051 3.711	0.000 0.000 0.000
T8 140.00-120.00	130.00	1.065	8	33.858	A B C	10.778 10.778 10.778	1.933 1.933 1.933	7.715	60.70 60.70 60.70	10.160 10.160 12.800	0.000 0.000 0.000
T9 120.00-100.00	110.00	1.016	8	33.858	A B C	11.028 11.028 11.028	1.824 1.824 1.824	7.715	60.03 60.03 60.03	10.160 10.160 12.800	0.000 0.000 0.000
T10 100.00-80.00	90.00	0.959	8	32.083	A B C	0.000 0.000 0.000	6.100 6.100 6.100	4.167	68.31 68.31 68.31	10.160 10.160 12.800	0.000 0.000 0.000
T11 80.00-72.42	76.21	0.914	7	12.160	A B C	1.313 1.313 1.313	2.290 2.290 2.290	1.579	43.83 43.83 43.83	3.851 3.851 4.851	0.000 0.000 0.000
T12 72.42-67.58	70.00	0.892	7	7.764	A B C	0.000 0.000 0.000	1.519 1.519 1.519	1.008	66.37 66.37 66.37	2.459 2.459 3.098	0.000 0.000 0.000
T13 67.58-60.00	63.79	0.869	7	12.160	A B C	1.313 1.313 1.313	2.290 2.290 2.290	1.579	43.83 43.83 43.83	3.851 3.851 4.851	0.000 0.000 0.000
T14	56.21	0.838	7	12.160	A	1.563	2.181	1.579	42.18	3.851	0.000

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 24 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F _{a c e} ft ²	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
60.00-52.42					B	1.563	2.181		42.18	3.851	0.000
					C	1.563	2.181		42.18	4.851	0.000
T15 52.42-47.58	50.00	0.811	6	7.764	A	0.000	1.519	1.008	66.37	2.459	0.000
					B	0.000	1.519		66.37	2.459	0.000
					C	0.000	1.519		66.37	3.098	0.000
T16 47.58-40.00	43.79	0.781	6	12.160	A	1.313	2.290	1.579	43.83	3.851	0.000
					B	1.313	2.290		43.83	3.851	0.000
					C	1.313	2.290		43.83	4.851	0.000
T17 40.00-20.00	30.00	0.701	5	32.083	A	3.063	6.100	4.167	45.48	10.160	0.000
					B	3.063	6.100		45.48	10.160	0.000
					C	3.063	6.100		45.48	12.800	0.000
T18 20.00-11.67	15.84	0.7	5	13.363	A	1.094	2.472	1.735	48.67	4.232	0.000
					B	1.094	2.472		48.67	4.232	0.000
					C	1.094	2.472		48.67	5.331	0.000
T19 11.67-5.00	8.34	0.7	5	10.700	A	0.875	2.022	1.390	47.97	2.880	0.000
					B	0.875	2.022		47.97	2.880	0.000
					C	0.875	2.022		47.97	3.629	0.000
T20 5.00-0.00	2.50	0.7	5	4.277	A	0.000	1.578	1.057	66.98	0.000	0.000
					B	0.000	1.578		66.98	0.000	0.000
					C	0.000	1.578		66.98	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F _{a c e}	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	0.39	A	0.19	2.629	28	1	1	3.494	0.22	11.12	C
			B	0.19	2.629		1	1	3.494			
			C	0.19	2.629		1	1	3.494			
T2 180.00-172.42	0.00	0.21	A	0.308	2.275	28	1	1	2.874	0.15	20.44	C
			B	0.308	2.275		1	1	2.874			
			C	0.308	2.275		1	1	2.874			
T3 172.42-167.58	0.00	0.10	A	0.196	2.611	28	1	1	0.872	0.05	11.02	C
			B	0.196	2.611		1	1	0.872			
			C	0.196	2.611		1	1	0.872			
T4 167.58-160.00	0.00	0.21	A	0.296	2.306	27	1	1	2.682	0.14	18.93	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T5 160.00-152.42	0.02	0.21	A	0.296	2.306	27	1	1	2.682	0.20	26.83	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T6 152.42-147.58	0.02	0.12	A	0.252	2.431	27	1	1	1.327	0.11	23.15	C
			B	0.252	2.431		1	1	1.327			
			C	0.252	2.431		1	1	1.327			
T7 147.58-140.00	0.04	0.21	A	0.296	2.306	26	1	1	2.682	0.27	35.60	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T8 140.00-120.00	0.15	0.57	A	0.375	2.115	26	1	1	11.988	0.98	49.11	C
			B	0.375	2.115		1	1	11.988			
			C	0.375	2.115		1	1	11.988			
T9 120.00-100.00	0.15	0.57	A	0.38	2.106	24	1	1	12.173	0.94	47.12	C
			B	0.38	2.106		1	1	12.173			
			C	0.38	2.106		1	1	12.173			
T10 100.00-80.00	0.15	0.39	A	0.19	2.629	23	1	1	3.494	0.57	28.41	C
			B	0.19	2.629		1	1	3.494			
			C	0.19	2.629		1	1	3.494			

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 25 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T11 80.00-72.42	0.06	0.21	A	0.296	2.306	22	1	1	2.682	0.26	33.74	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T12 72.42-67.58	0.04	0.10	A	0.196	2.611	21	1	1	0.872	0.13	26.64	C
			B	0.196	2.611		1	1	0.872			
			C	0.196	2.611		1	1	0.872			
T13 67.58-60.00	0.06	0.21	A	0.296	2.306	21	1	1	2.682	0.24	32.07	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T14 60.00-52.42	0.06	0.21	A	0.308	2.275	20	1	1	2.874	0.24	31.73	C
			B	0.308	2.275		1	1	2.874			
			C	0.308	2.275		1	1	2.874			
T15 52.42-47.58	0.04	0.10	A	0.196	2.611	19	1	1	0.872	0.12	24.20	C
			B	0.196	2.611		1	1	0.872			
			C	0.196	2.611		1	1	0.872			
T16 47.58-40.00	0.06	0.21	A	0.296	2.306	19	1	1	2.682	0.22	28.80	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T17 40.00-20.00	0.15	0.53	A	0.286	2.335	17	1	1	6.689	0.51	25.35	C
			B	0.286	2.335		1	1	6.689			
			C	0.286	2.335		1	1	6.689			
T18 20.00-11.67	0.06	0.21	A	0.267	2.388	17	1	1	2.550	0.21	24.62	C
			B	0.267	2.388		1	1	2.550			
			C	0.267	2.388		1	1	2.550			
T19 11.67-5.00	0.04	0.17	A	0.271	2.377	17	1	1	2.069	0.15	22.58	C
			B	0.271	2.377		1	1	2.069			
			C	0.271	2.377		1	1	2.069			
T20 5.00-0.00	0.00	0.11	A	0.369	2.129	17	1	1	0.984	0.03	5.98	C
			B	0.369	2.129		1	1	0.984			
			C	0.369	2.129		1	1	0.984			
Sum Weight:	1.06	5.02								5.75		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	0.39	A	0.19	2.629	28	0.825	1	3.494	0.22	11.12	C
			B	0.19	2.629		0.825	1	3.494			
			C	0.19	2.629		0.825	1	3.494			
T2 180.00-172.42	0.00	0.21	A	0.308	2.275	28	0.825	1	2.601	0.14	18.50	C
			B	0.308	2.275		0.825	1	2.601			
			C	0.308	2.275		0.825	1	2.601			
T3 172.42-167.58	0.00	0.10	A	0.196	2.611	28	0.825	1	0.872	0.05	11.02	C
			B	0.196	2.611		0.825	1	0.872			
			C	0.196	2.611		0.825	1	0.872			
T4 167.58-160.00	0.00	0.21	A	0.296	2.306	27	0.825	1	2.452	0.13	17.31	C
			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T5 160.00-152.42	0.02	0.21	A	0.296	2.306	27	0.825	1	2.452	0.19	25.23	C
			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T6	0.02	0.12	A	0.252	2.431	27	0.825	1	1.250	0.11	22.28	C

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
152.42-147.58			B	0.252	2.431		0.825	1	1.250			
			C	0.252	2.431		0.825	1	1.250			
T7	0.04	0.21	A	0.296	2.306	26	0.825	1	2.452	0.26	34.04	C
147.58-140.00			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T8	0.15	0.57	A	0.375	2.115	26	0.825	1	10.102	0.90	44.78	C
140.00-120.00			B	0.375	2.115		0.825	1	10.102			
			C	0.375	2.115		0.825	1	10.102			
T9	0.15	0.57	A	0.38	2.106	24	0.825	1	10.243	0.86	42.91	C
120.00-100.00			B	0.38	2.106		0.825	1	10.243			
			C	0.38	2.106		0.825	1	10.243			
T10	0.15	0.39	A	0.19	2.629	23	0.825	1	3.494	0.57	28.41	C
100.00-80.00			B	0.19	2.629		0.825	1	3.494			
			C	0.19	2.629		0.825	1	3.494			
T11	0.06	0.21	A	0.296	2.306	22	0.825	1	2.452	0.25	32.44	C
80.00-72.42			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T12	0.04	0.10	A	0.196	2.611	21	0.825	1	0.872	0.13	26.64	C
72.42-67.58			B	0.196	2.611		0.825	1	0.872			
			C	0.196	2.611		0.825	1	0.872			
T13	0.06	0.21	A	0.296	2.306	21	0.825	1	2.452	0.23	30.83	C
67.58-60.00			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T14	0.06	0.21	A	0.308	2.275	20	0.825	1	2.601	0.23	30.33	C
60.00-52.42			B	0.308	2.275		0.825	1	2.601			
			C	0.308	2.275		0.825	1	2.601			
T15	0.04	0.10	A	0.196	2.611	19	0.825	1	0.872	0.12	24.20	C
52.42-47.58			B	0.196	2.611		0.825	1	0.872			
			C	0.196	2.611		0.825	1	0.872			
T16	0.06	0.21	A	0.296	2.306	19	0.825	1	2.452	0.21	27.69	C
47.58-40.00			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T17	0.15	0.53	A	0.286	2.335	17	0.825	1	6.153	0.49	24.46	C
40.00-20.00			B	0.286	2.335		0.825	1	6.153			
			C	0.286	2.335		0.825	1	6.153			
T18	0.06	0.21	A	0.267	2.388	17	0.825	1	2.359	0.20	23.84	C
20.00-11.67			B	0.267	2.388		0.825	1	2.359			
			C	0.267	2.388		0.825	1	2.359			
T19	0.04	0.17	A	0.271	2.377	17	0.825	1	1.915	0.15	21.80	C
11.67-5.00			B	0.271	2.377		0.825	1	1.915			
			C	0.271	2.377		0.825	1	1.915			
T20 5.00-0.00	0.00	0.11	A	0.369	2.129	17	0.825	1	0.984	0.03	5.98	C
			B	0.369	2.129		0.825	1	0.984			
			C	0.369	2.129		0.825	1	0.984			
Sum Weight:	1.06	5.02								5.45		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1	0.00	0.39	A	0.19	2.629	28	0.8	1	3.494	0.22	11.12	C
200.00-180.00			B	0.19	2.629		0.8	1	3.494			

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T2 180.00-172.42	0.00	0.21	C	0.19	2.629		0.8	1	3.494			
			A	0.308	2.275	28	0.8	1	2.562	0.14	18.22	C
			B	0.308	2.275		0.8	1	2.562			
T3 172.42-167.58	0.00	0.10	C	0.308	2.275		0.8	1	2.562			
			A	0.196	2.611	28	0.8	1	0.872	0.05	11.02	C
			B	0.196	2.611		0.8	1	0.872			
T4 167.58-160.00	0.00	0.21	C	0.196	2.611		0.8	1	0.872			
			A	0.296	2.306	27	0.8	1	2.419	0.13	17.08	C
			B	0.296	2.306		0.8	1	2.419			
T5 160.00-152.42	0.02	0.21	C	0.296	2.306		0.8	1	2.419			
			A	0.296	2.306	27	0.8	1	2.419	0.19	25.00	C
			B	0.296	2.306		0.8	1	2.419			
T6 152.42-147.58	0.02	0.12	C	0.296	2.306		0.8	1	2.419			
			A	0.252	2.431	27	0.8	1	1.239	0.11	22.15	C
			B	0.252	2.431		0.8	1	1.239			
T7 147.58-140.00	0.04	0.21	C	0.252	2.431		0.8	1	1.239			
			A	0.296	2.306	26	0.8	1	2.419	0.26	33.82	C
			B	0.296	2.306		0.8	1	2.419			
T8 140.00-120.00	0.15	0.57	C	0.296	2.306		0.8	1	2.419			
			A	0.375	2.115	26	0.8	1	9.832	0.88	44.16	C
			B	0.375	2.115		0.8	1	9.832			
T9 120.00-100.00	0.15	0.57	C	0.375	2.115		0.8	1	9.832			
			A	0.38	2.106	24	0.8	1	9.967	0.85	42.31	C
			B	0.38	2.106		0.8	1	9.967			
T10 100.00-80.00	0.15	0.39	C	0.38	2.106		0.8	1	9.967			
			A	0.19	2.629	23	0.8	1	3.494	0.57	28.41	C
			B	0.19	2.629		0.8	1	3.494			
T11 80.00-72.42	0.06	0.21	C	0.19	2.629		0.8	1	3.494			
			A	0.296	2.306	22	0.8	1	2.419	0.24	32.25	C
			B	0.296	2.306		0.8	1	2.419			
T12 72.42-67.58	0.04	0.10	C	0.296	2.306		0.8	1	2.419			
			A	0.196	2.611	21	0.8	1	0.872	0.13	26.64	C
			B	0.196	2.611		0.8	1	0.872			
T13 67.58-60.00	0.06	0.21	C	0.196	2.611		0.8	1	0.872			
			A	0.296	2.306	21	0.8	1	2.419	0.23	30.65	C
			B	0.296	2.306		0.8	1	2.419			
T14 60.00-52.42	0.06	0.21	C	0.296	2.306		0.8	1	2.419			
			A	0.308	2.275	20	0.8	1	2.562	0.23	30.13	C
			B	0.308	2.275		0.8	1	2.562			
T15 52.42-47.58	0.04	0.10	C	0.308	2.275		0.8	1	2.562			
			A	0.196	2.611	19	0.8	1	0.872	0.12	24.20	C
			B	0.196	2.611		0.8	1	0.872			
T16 47.58-40.00	0.06	0.21	C	0.196	2.611		0.8	1	0.872			
			A	0.296	2.306	19	0.8	1	2.419	0.21	27.53	C
			B	0.296	2.306		0.8	1	2.419			
T17 40.00-20.00	0.15	0.53	C	0.296	2.306		0.8	1	2.419			
			A	0.286	2.335	17	0.8	1	6.077	0.49	24.33	C
			B	0.286	2.335		0.8	1	6.077			
T18 20.00-11.67	0.06	0.21	C	0.286	2.335		0.8	1	6.077			
			A	0.267	2.388	17	0.8	1	2.332	0.20	23.72	C
			B	0.267	2.388		0.8	1	2.332			
T19 11.67-5.00	0.04	0.17	C	0.267	2.388		0.8	1	2.332			
			A	0.271	2.377	17	0.8	1	1.894	0.14	21.69	C
			B	0.271	2.377		0.8	1	1.894			
T20 5.00-0.00	0.00	0.11	C	0.271	2.377		0.8	1	1.894			
			A	0.369	2.129	17	0.8	1	0.984	0.03	5.98	C
			B	0.369	2.129		0.8	1	0.984			
Sum Weight:	1.06	5.02								5.41		

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	0.39	A	0.19	2.629	28	0.85	1	3.494	0.22	11.12	C
			B	0.19	2.629		0.85	1	3.494			
			C	0.19	2.629		0.85	1	3.494			
T2 180.00-172.42	0.00	0.21	A	0.308	2.275	28	0.85	1	2.640	0.14	18.77	C
			B	0.308	2.275		0.85	1	2.640			
			C	0.308	2.275		0.85	1	2.640			
T3 172.42-167.58	0.00	0.10	A	0.196	2.611	28	0.85	1	0.872	0.05	11.02	C
			B	0.196	2.611		0.85	1	0.872			
			C	0.196	2.611		0.85	1	0.872			
T4 167.58-160.00	0.00	0.21	A	0.296	2.306	27	0.85	1	2.485	0.13	17.54	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T5 160.00-152.42	0.02	0.21	A	0.296	2.306	27	0.85	1	2.485	0.19	25.46	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T6 152.42-147.58	0.02	0.12	A	0.252	2.431	27	0.85	1	1.261	0.11	22.40	C
			B	0.252	2.431		0.85	1	1.261			
			C	0.252	2.431		0.85	1	1.261			
T7 147.58-140.00	0.04	0.21	A	0.296	2.306	26	0.85	1	2.485	0.26	34.26	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T8 140.00-120.00	0.15	0.57	A	0.375	2.115	26	0.85	1	10.371	0.91	45.40	C
			B	0.375	2.115		0.85	1	10.371			
			C	0.375	2.115		0.85	1	10.371			
T9 120.00-100.00	0.15	0.57	A	0.38	2.106	24	0.85	1	10.518	0.87	43.51	C
			B	0.38	2.106		0.85	1	10.518			
			C	0.38	2.106		0.85	1	10.518			
T10 100.00-80.00	0.15	0.39	A	0.19	2.629	23	0.85	1	3.494	0.57	28.41	C
			B	0.19	2.629		0.85	1	3.494			
			C	0.19	2.629		0.85	1	3.494			
T11 80.00-72.42	0.06	0.21	A	0.296	2.306	22	0.85	1	2.485	0.25	32.62	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T12 72.42-67.58	0.04	0.10	A	0.196	2.611	21	0.85	1	0.872	0.13	26.64	C
			B	0.196	2.611		0.85	1	0.872			
			C	0.196	2.611		0.85	1	0.872			
T13 67.58-60.00	0.06	0.21	A	0.296	2.306	21	0.85	1	2.485	0.24	31.01	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T14 60.00-52.42	0.06	0.21	A	0.308	2.275	20	0.85	1	2.640	0.23	30.53	C
			B	0.308	2.275		0.85	1	2.640			
			C	0.308	2.275		0.85	1	2.640			
T15 52.42-47.58	0.04	0.10	A	0.196	2.611	19	0.85	1	0.872	0.12	24.20	C
			B	0.196	2.611		0.85	1	0.872			
			C	0.196	2.611		0.85	1	0.872			
T16 47.58-40.00	0.06	0.21	A	0.296	2.306	19	0.85	1	2.485	0.21	27.85	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T17 40.00-20.00	0.15	0.53	A	0.286	2.335	17	0.85	1	6.230	0.49	24.59	C
			B	0.286	2.335		0.85	1	6.230			
			C	0.286	2.335		0.85	1	6.230			
T18	0.06	0.21	A	0.267	2.388	17	0.85	1	2.386	0.20	23.95	C

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 29 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
20.00-11.67			B	0.267	2.388		0.85	1	2.386			
			C	0.267	2.388		0.85	1	2.386			
T19 11.67-5.00	0.04	0.17	A	0.271	2.377	17	0.85	1	1.937	0.15	21.91	C
			B	0.271	2.377		0.85	1	1.937			
			C	0.271	2.377		0.85	1	1.937			
T20 5.00-0.00	0.00	0.11	A	0.369	2.129	17	0.85	1	0.984	0.03	5.98	C
			B	0.369	2.129		0.85	1	0.984			
			C	0.369	2.129		0.85	1	0.984			
Sum Weight:	1.06	5.02								5.50		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	1.36	A	0.75	1.788	6	1	1	24.182	0.24	11.86	C
			B	0.75	1.788		1	1	24.182			
			C	0.75	1.788		1	1	24.182			
T2 180.00-172.42	0.00	0.82	A	1	2.1	6	1	1	14.744	0.16*	21.43	C
			B	1	2.1		1	1	14.744			
			C	1	2.1		1	1	14.744			
T3 172.42-167.58	0.00	0.34	A	0.771	1.797	6	1	1	6.113	0.06	12.07	C
			B	0.771	1.797		1	1	6.113			
			C	0.771	1.797		1	1	6.113			
T4 167.58-160.00	0.00	0.80	A	1	2.1	6	1	1	14.523	0.16*	20.97	C
			B	1	2.1		1	1	14.523			
			C	1	2.1		1	1	14.523			
T5 160.00-152.42	0.21	0.80	A	1	2.1	6	1	1	14.472	0.16*	20.67	C
			B	1	2.1		1	1	14.472			
			C	1	2.1		1	1	14.472			
T6 152.42-147.58	0.13	0.43	A	0.907	1.935	6	1	1	8.101	0.08	17.40	C
			B	0.907	1.935		1	1	8.101			
			C	0.907	1.935		1	1	8.101			
T7 147.58-140.00	0.46	0.79	A	1	2.1	6	1	1	14.382	0.15*	20.16	C
			B	1	2.1		1	1	14.382			
			C	1	2.1		1	1	14.382			
T8 140.00-120.00	1.55	2.32	A	0.922	1.957	6	1	1	36.215	0.40	19.89	C
			B	0.922	1.957		1	1	36.215			
			C	0.922	1.957		1	1	36.215			
T9 120.00-100.00	1.52	2.29	A	0.918	1.95	6	1	1	35.906	0.38	18.87	C
			B	0.918	1.95		1	1	35.906			
			C	0.918	1.95		1	1	35.906			
T10 100.00-80.00	1.48	1.24	A	0.716	1.778	5	1	1	22.134	0.33	16.55	C
			B	0.716	1.778		1	1	22.134			
			C	0.716	1.778		1	1	22.134			
T11 80.00-72.42	0.55	0.74	A	0.965	2.03	5	1	1	13.719	0.12	16.45	C
			B	0.965	2.03		1	1	13.719			
			C	0.965	2.03		1	1	13.719			
T12 72.42-67.58	0.35	0.31	A	0.729	1.781	5	1	1	5.499	0.07	15.20	C
			B	0.729	1.781		1	1	5.499			
			C	0.729	1.781		1	1	5.499			
T13 67.58-60.00	0.54	0.72	A	0.955	2.012	5	1	1	13.540	0.12	15.55	C
			B	0.955	2.012		1	1	13.540			

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 30 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T14 60.00-52.42	0.53	0.72	C	0.955	2.012	5	1	1	13.540	0.11	14.98	C
			A	0.957	2.017		1	1	13.556			
			B	0.957	2.017		1	1	13.556			
T15 52.42-47.58	0.33	0.29	C	0.957	2.017	4	1	1	13.556	0.07	13.72	C
			A	0.714	1.777		1	1	5.288			
			B	0.714	1.777		1	1	5.288			
T16 47.58-40.00	0.51	0.69	C	0.714	1.777	4	1	1	5.288	0.10	13.75	C
			A	0.934	1.976		1	1	13.098			
			B	0.934	1.976		1	1	13.098			
T17 40.00-20.00	1.30	1.70	C	0.934	1.976	4	1	1	13.098	0.24	11.89	C
			A	0.891	1.912		1	1	31.772			
			B	0.891	1.912		1	1	31.772			
T18 20.00-11.67	0.50	0.61	C	0.891	1.912	4	1	1	31.772	0.09	11.39	C
			A	0.806	1.82		1	1	11.086			
			B	0.806	1.82		1	1	11.086			
T19 11.67-5.00	0.32	0.47	C	0.806	1.82	4	1	1	11.086	0.07	10.64	C
			A	0.792	1.81		1	1	8.567			
			B	0.792	1.81		1	1	8.567			
T20 5.00-0.00	0.00	0.23	C	0.792	1.81	4	1	1	8.567	0.03	6.95	C
			A	0.986	2.072		1	1	5.182			
			B	0.986	2.072		1	1	5.182			
Sum Weight:	10.28	17.68	C	0.986	2.072		1	1	5.182	3.16		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	1.36	A	0.75	1.788	6	0.825	1	24.182	0.24	11.86	C
			B	0.75	1.788		0.825	1	24.182			
			C	0.75	1.788		0.825	1	24.182			
T2 180.00-172.42	0.00	0.82	A	1	2.1	6	0.825	1	14.470	0.16*	21.43	C
			B	1	2.1		0.825	1	14.470			
			C	1	2.1		0.825	1	14.470			
T3 172.42-167.58	0.00	0.34	A	0.771	1.797	6	0.825	1	6.113	0.06	12.07	C
			B	0.771	1.797		0.825	1	6.113			
			C	0.771	1.797		0.825	1	6.113			
T4 167.58-160.00	0.00	0.80	A	1	2.1	6	0.825	1	14.293	0.16	20.83	C
			B	1	2.1		0.825	1	14.293			
			C	1	2.1		0.825	1	14.293			
T5 160.00-152.42	0.21	0.80	A	1	2.1	6	0.825	1	14.242	0.16	20.48	C
			B	1	2.1		0.825	1	14.242			
			C	1	2.1		0.825	1	14.242			
T6 152.42-147.58	0.13	0.43	A	0.907	1.935	6	0.825	1	8.025	0.08	17.24	C
			B	0.907	1.935		0.825	1	8.025			
			C	0.907	1.935		0.825	1	8.025			
T7 147.58-140.00	0.46	0.79	A	1	2.1	6	0.825	1	14.152	0.15	19.88	C
			B	1	2.1		0.825	1	14.152			
			C	1	2.1		0.825	1	14.152			
T8 140.00-120.00	1.55	2.32	A	0.922	1.957	6	0.825	1	32.991	0.37	18.34	C
			B	0.922	1.957		0.825	1	32.991			

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T9 120.00-100.00	1.52	2.29	C	0.922	1.957	6	0.825	1	32.991	0.35	17.38	C
			A	0.918	1.95		0.825	1	32.660			
			B	0.918	1.95		0.825	1	32.660			
T10 100.00-80.00	1.48	1.24	C	0.918	1.95	5	0.825	1	22.134	0.33	16.55	C
			A	0.716	1.778		0.825	1	22.134			
			B	0.716	1.778		0.825	1	22.134			
T11 80.00-72.42	0.55	0.74	C	0.716	1.778	5	0.825	1	13.489	0.12	16.19	C
			A	0.965	2.03		0.825	1	13.489			
			B	0.965	2.03		0.825	1	13.489			
T12 72.42-67.58	0.35	0.31	C	0.965	2.03	5	0.825	1	5.499	0.07	15.20	C
			A	0.729	1.781		0.825	1	5.499			
			B	0.729	1.781		0.825	1	5.499			
T13 67.58-60.00	0.54	0.72	C	0.729	1.781	5	0.825	1	13.311	0.12	15.31	C
			A	0.955	2.012		0.825	1	13.311			
			B	0.955	2.012		0.825	1	13.311			
T14 60.00-52.42	0.53	0.72	C	0.955	2.012	5	0.825	1	13.283	0.11	14.70	C
			A	0.957	2.017		0.825	1	13.283			
			B	0.957	2.017		0.825	1	13.283			
T15 52.42-47.58	0.33	0.29	C	0.957	2.017	4	0.825	1	5.288	0.07	13.72	C
			A	0.714	1.777		0.825	1	5.288			
			B	0.714	1.777		0.825	1	5.288			
T16 47.58-40.00	0.51	0.69	C	0.714	1.777	4	0.825	1	12.869	0.10	13.53	C
			A	0.934	1.976		0.825	1	12.869			
			B	0.934	1.976		0.825	1	12.869			
T17 40.00-20.00	1.30	1.70	C	0.934	1.976	4	0.825	1	31.236	0.23	11.73	C
			A	0.891	1.912		0.825	1	31.236			
			B	0.891	1.912		0.825	1	31.236			
T18 20.00-11.67	0.50	0.61	C	0.891	1.912	4	0.825	1	10.895	0.09	11.25	C
			A	0.806	1.82		0.825	1	10.895			
			B	0.806	1.82		0.825	1	10.895			
T19 11.67-5.00	0.32	0.47	C	0.806	1.82	4	0.825	1	8.414	0.07	10.51	C
			A	0.792	1.81		0.825	1	8.414			
			B	0.792	1.81		0.825	1	8.414			
T20 5.00-0.00	0.00	0.23	C	0.792	1.81	4	0.825	1	5.182	0.03	6.95	C
			A	0.986	2.072		0.825	1	5.182			
			B	0.986	2.072		0.825	1	5.182			
Sum Weight:	10.28	17.68								3.08		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	1.36	A	0.75	1.788	6	0.8	1	24.182	0.24	11.86	C
			B	0.75	1.788		0.8	1	24.182			
			C	0.75	1.788		0.8	1	24.182			
T2 180.00-172.42	0.00	0.82	A	1	2.1	6	0.8	1	14.431	0.16*	21.43	C
			B	1	2.1		0.8	1	14.431			
			C	1	2.1		0.8	1	14.431			
T3 172.42-167.58	0.00	0.34	A	0.771	1.797	6	0.8	1	6.113	0.06	12.07	C
			B	0.771	1.797		0.8	1	6.113			

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T4 167.58-160.00	0.00	0.80	C	0.771	1.797		0.8	1	6.113			
			A	1	2.1	6	0.8	1	14.261	0.16	20.79	C
			B	1	2.1		0.8	1	14.261			
T5 160.00-152.42	0.21	0.80	C	1	2.1		0.8	1	14.261			
			A	1	2.1	6	0.8	1	14.209	0.15	20.43	C
			B	1	2.1		0.8	1	14.209			
T6 152.42-147.58	0.13	0.43	C	1	2.1		0.8	1	14.209			
			A	0.907	1.935	6	0.8	1	8.014	0.08	17.22	C
			B	0.907	1.935		0.8	1	8.014			
T7 147.58-140.00	0.46	0.79	C	0.907	1.935		0.8	1	8.014			
			A	1	2.1	6	0.8	1	14.119	0.15	19.83	C
			B	1	2.1		0.8	1	14.119			
T8 140.00-120.00	1.55	2.32	C	1	2.1		0.8	1	14.119			
			A	0.922	1.957	6	0.8	1	32.530	0.36	18.11	C
			B	0.922	1.957		0.8	1	32.530			
T9 120.00-100.00	1.52	2.29	C	0.922	1.957		0.8	1	32.530			
			A	0.918	1.95	6	0.8	1	32.196	0.34	17.17	C
			B	0.918	1.95		0.8	1	32.196			
T10 100.00-80.00	1.48	1.24	C	0.918	1.95		0.8	1	32.196			
			A	0.716	1.778	5	0.8	1	22.134	0.33	16.55	C
			B	0.716	1.778		0.8	1	22.134			
T11 80.00-72.42	0.55	0.74	C	0.716	1.778		0.8	1	22.134			
			A	0.965	2.03	5	0.8	1	13.456	0.12	16.16	C
			B	0.965	2.03		0.8	1	13.456			
T12 72.42-67.58	0.35	0.31	C	0.965	2.03		0.8	1	13.456			
			A	0.729	1.781	5	0.8	1	5.499	0.07	15.20	C
			B	0.729	1.781		0.8	1	5.499			
T13 67.58-60.00	0.54	0.72	C	0.729	1.781		0.8	1	5.499			
			A	0.955	2.012	5	0.8	1	13.278	0.12	15.27	C
			B	0.955	2.012		0.8	1	13.278			
T14 60.00-52.42	0.53	0.72	C	0.955	2.012		0.8	1	13.278			
			A	0.957	2.017	5	0.8	1	13.244	0.11	14.65	C
			B	0.957	2.017		0.8	1	13.244			
T15 52.42-47.58	0.33	0.29	C	0.957	2.017		0.8	1	13.244			
			A	0.714	1.777	4	0.8	1	5.288	0.07	13.72	C
			B	0.714	1.777		0.8	1	5.288			
T16 47.58-40.00	0.51	0.69	C	0.714	1.777		0.8	1	5.288			
			A	0.934	1.976	4	0.8	1	12.836	0.10	13.50	C
			B	0.934	1.976		0.8	1	12.836			
T17 40.00-20.00	1.30	1.70	C	0.934	1.976		0.8	1	12.836			
			A	0.891	1.912	4	0.8	1	31.160	0.23	11.70	C
			B	0.891	1.912		0.8	1	31.160			
T18 20.00-11.67	0.50	0.61	C	0.891	1.912		0.8	1	31.160			
			A	0.806	1.82	4	0.8	1	10.867	0.09	11.23	C
			B	0.806	1.82		0.8	1	10.867			
T19 11.67-5.00	0.32	0.47	C	0.806	1.82		0.8	1	10.867			
			A	0.792	1.81	4	0.8	1	8.392	0.07	10.49	C
			B	0.792	1.81		0.8	1	8.392			
T20 5.00-0.00	0.00	0.23	C	0.792	1.81		0.8	1	8.392			
			A	0.986	2.072	4	0.8	1	5.182	0.03	6.95	C
			B	0.986	2.072		0.8	1	5.182			
Sum Weight:	10.28	17.68	C	0.986	2.072		0.8	1	5.182	3.06		

*2.1A_g limit

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	1.36	A	0.75	1.788	6	0.85	1	24.182	0.24	11.86	C
			B	0.75	1.788		0.85	1	24.182			
			C	0.75	1.788		0.85	1	24.182			
T2 180.00-172.42	0.00	0.82	A	1	2.1	6	0.85	1	14.509	0.16*	21.43	C
			B	1	2.1		0.85	1	14.509			
			C	1	2.1		0.85	1	14.509			
T3 172.42-167.58	0.00	0.34	A	0.771	1.797	6	0.85	1	6.113	0.06	12.07	C
			B	0.771	1.797		0.85	1	6.113			
			C	0.771	1.797		0.85	1	6.113			
T4 167.58-160.00	0.00	0.80	A	1	2.1	6	0.85	1	14.326	0.16	20.88	C
			B	1	2.1		0.85	1	14.326			
			C	1	2.1		0.85	1	14.326			
T5 160.00-152.42	0.21	0.80	A	1	2.1	6	0.85	1	14.275	0.16	20.53	C
			B	1	2.1		0.85	1	14.275			
			C	1	2.1		0.85	1	14.275			
T6 152.42-147.58	0.13	0.43	A	0.907	1.935	6	0.85	1	8.036	0.08	17.26	C
			B	0.907	1.935		0.85	1	8.036			
			C	0.907	1.935		0.85	1	8.036			
T7 147.58-140.00	0.46	0.79	A	1	2.1	6	0.85	1	14.185	0.15	19.92	C
			B	1	2.1		0.85	1	14.185			
			C	1	2.1		0.85	1	14.185			
T8 140.00-120.00	1.55	2.32	A	0.922	1.957	6	0.85	1	33.452	0.37	18.56	C
			B	0.922	1.957		0.85	1	33.452			
			C	0.922	1.957		0.85	1	33.452			
T9 120.00-100.00	1.52	2.29	A	0.918	1.95	6	0.85	1	33.124	0.35	17.59	C
			B	0.918	1.95		0.85	1	33.124			
			C	0.918	1.95		0.85	1	33.124			
T10 100.00-80.00	1.48	1.24	A	0.716	1.778	5	0.85	1	22.134	0.33	16.55	C
			B	0.716	1.778		0.85	1	22.134			
			C	0.716	1.778		0.85	1	22.134			
T11 80.00-72.42	0.55	0.74	A	0.965	2.03	5	0.85	1	13.522	0.12	16.23	C
			B	0.965	2.03		0.85	1	13.522			
			C	0.965	2.03		0.85	1	13.522			
T12 72.42-67.58	0.35	0.31	A	0.729	1.781	5	0.85	1	5.499	0.07	15.20	C
			B	0.729	1.781		0.85	1	5.499			
			C	0.729	1.781		0.85	1	5.499			
T13 67.58-60.00	0.54	0.72	A	0.955	2.012	5	0.85	1	13.344	0.12	15.34	C
			B	0.955	2.012		0.85	1	13.344			
			C	0.955	2.012		0.85	1	13.344			
T14 60.00-52.42	0.53	0.72	A	0.957	2.017	5	0.85	1	13.322	0.11	14.74	C
			B	0.957	2.017		0.85	1	13.322			
			C	0.957	2.017		0.85	1	13.322			
T15 52.42-47.58	0.33	0.29	A	0.714	1.777	4	0.85	1	5.288	0.07	13.72	C
			B	0.714	1.777		0.85	1	5.288			
			C	0.714	1.777		0.85	1	5.288			
T16 47.58-40.00	0.51	0.69	A	0.934	1.976	4	0.85	1	12.902	0.10	13.56	C
			B	0.934	1.976		0.85	1	12.902			
			C	0.934	1.976		0.85	1	12.902			
T17 40.00-20.00	1.30	1.70	A	0.891	1.912	4	0.85	1	31.313	0.24	11.75	C
			B	0.891	1.912		0.85	1	31.313			
			C	0.891	1.912		0.85	1	31.313			
T18 20.00-11.67	0.50	0.61	A	0.806	1.82	4	0.85	1	10.922	0.09	11.27	C
			B	0.806	1.82		0.85	1	10.922			
			C	0.806	1.82		0.85	1	10.922			
T19 11.67-5.00	0.32	0.47	A	0.792	1.81	4	0.85	1	8.436	0.07	10.53	C
			B	0.792	1.81		0.85	1	8.436			
			C	0.792	1.81		0.85	1	8.436			

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 34 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T20 5.00-0.00	0.00	0.23	A	0.986	2.072	4	0.85	1	5.182	0.03	6.95	C
			B	0.986	2.072		0.85	1	5.182			
			C	0.986	2.072		0.85	1	5.182			
Sum Weight:	10.28	17.68			*2.1A _g limit					3.09		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	0.39	A	0.19	2.629	9	1	1	3.494	0.07	3.63	C
			B	0.19	2.629		1	1	3.494			
			C	0.19	2.629		1	1	3.494			
T2 180.00-172.42	0.00	0.21	A	0.308	2.275	9	1	1	2.874	0.05	6.67	C
			B	0.308	2.275		1	1	2.874			
			C	0.308	2.275		1	1	2.874			
T3 172.42-167.58	0.00	0.10	A	0.196	2.611	9	1	1	0.872	0.02	3.60	C
			B	0.196	2.611		1	1	0.872			
			C	0.196	2.611		1	1	0.872			
T4 167.58-160.00	0.00	0.21	A	0.296	2.306	9	1	1	2.682	0.05	6.18	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T5 160.00-152.42	0.02	0.21	A	0.296	2.306	9	1	1	2.682	0.07	8.76	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T6 152.42-147.58	0.02	0.12	A	0.252	2.431	9	1	1	1.327	0.04	7.56	C
			B	0.252	2.431		1	1	1.327			
			C	0.252	2.431		1	1	1.327			
T7 147.58-140.00	0.04	0.21	A	0.296	2.306	9	1	1	2.682	0.09	11.62	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T8 140.00-120.00	0.15	0.57	A	0.375	2.115	8	1	1	11.988	0.32	16.04	C
			B	0.375	2.115		1	1	11.988			
			C	0.375	2.115		1	1	11.988			
T9 120.00-100.00	0.15	0.57	A	0.38	2.106	8	1	1	12.173	0.31	15.39	C
			B	0.38	2.106		1	1	12.173			
			C	0.38	2.106		1	1	12.173			
T10 100.00-80.00	0.15	0.39	A	0.19	2.629	8	1	1	3.494	0.19	9.28	C
			B	0.19	2.629		1	1	3.494			
			C	0.19	2.629		1	1	3.494			
T11 80.00-72.42	0.06	0.21	A	0.296	2.306	7	1	1	2.682	0.08	11.02	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T12 72.42-67.58	0.04	0.10	A	0.196	2.611	7	1	1	0.872	0.04	8.70	C
			B	0.196	2.611		1	1	0.872			
			C	0.196	2.611		1	1	0.872			
T13 67.58-60.00	0.06	0.21	A	0.296	2.306	7	1	1	2.682	0.08	10.47	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T14 60.00-52.42	0.06	0.21	A	0.308	2.275	7	1	1	2.874	0.08	10.36	C
			B	0.308	2.275		1	1	2.874			
			C	0.308	2.275		1	1	2.874			

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 35 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T15 52.42-47.58	0.04	0.10	A	0.196	2.611	6	1	1	0.872	0.04	7.90	C
			B	0.196	2.611		1	1	0.872			
			C	0.196	2.611		1	1	0.872			
T16 47.58-40.00	0.06	0.21	A	0.296	2.306	6	1	1	2.682	0.07	9.40	C
			B	0.296	2.306		1	1	2.682			
			C	0.296	2.306		1	1	2.682			
T17 40.00-20.00	0.15	0.53	A	0.286	2.335	5	1	1	6.689	0.17	8.28	C
			B	0.286	2.335		1	1	6.689			
			C	0.286	2.335		1	1	6.689			
T18 20.00-11.67	0.06	0.21	A	0.267	2.388	5	1	1	2.550	0.07	8.04	C
			B	0.267	2.388		1	1	2.550			
			C	0.267	2.388		1	1	2.550			
T19 11.67-5.00	0.04	0.17	A	0.271	2.377	5	1	1	2.069	0.05	7.37	C
			B	0.271	2.377		1	1	2.069			
			C	0.271	2.377		1	1	2.069			
T20 5.00-0.00	0.00	0.11	A	0.369	2.129	5	1	1	0.984	0.01	1.95	C
			B	0.369	2.129		1	1	0.984			
			C	0.369	2.129		1	1	0.984			
Sum Weight:	1.06	5.02								1.88		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 200.00-180.00	0.00	0.39	A	0.19	2.629	9	0.825	1	3.494	0.07	3.63	C
			B	0.19	2.629		0.825	1	3.494			
			C	0.19	2.629		0.825	1	3.494			
T2 180.00-172.42	0.00	0.21	A	0.308	2.275	9	0.825	1	2.601	0.05	6.04	C
			B	0.308	2.275		0.825	1	2.601			
			C	0.308	2.275		0.825	1	2.601			
T3 172.42-167.58	0.00	0.10	A	0.196	2.611	9	0.825	1	0.872	0.02	3.60	C
			B	0.196	2.611		0.825	1	0.872			
			C	0.196	2.611		0.825	1	0.872			
T4 167.58-160.00	0.00	0.21	A	0.296	2.306	9	0.825	1	2.452	0.04	5.65	C
			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T5 160.00-152.42	0.02	0.21	A	0.296	2.306	9	0.825	1	2.452	0.06	8.24	C
			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T6 152.42-147.58	0.02	0.12	A	0.252	2.431	9	0.825	1	1.250	0.04	7.27	C
			B	0.252	2.431		0.825	1	1.250			
			C	0.252	2.431		0.825	1	1.250			
T7 147.58-140.00	0.04	0.21	A	0.296	2.306	9	0.825	1	2.452	0.08	11.11	C
			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T8 140.00-120.00	0.15	0.57	A	0.375	2.115	8	0.825	1	10.102	0.29	14.62	C
			B	0.375	2.115		0.825	1	10.102			
			C	0.375	2.115		0.825	1	10.102			
T9 120.00-100.00	0.15	0.57	A	0.38	2.106	8	0.825	1	10.243	0.28	14.01	C
			B	0.38	2.106		0.825	1	10.243			
			C	0.38	2.106		0.825	1	10.243			
T10	0.15	0.39	A	0.19	2.629	8	0.825	1	3.494	0.19	9.28	C

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 36 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
100.00-80.00			B	0.19	2.629		0.825	1	3.494			
			C	0.19	2.629		0.825	1	3.494			
T11	0.06	0.21	A	0.296	2.306	7	0.825	1	2.452	0.08	10.59	C
80.00-72.42			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T12	0.04	0.10	A	0.196	2.611	7	0.825	1	0.872	0.04	8.70	C
72.42-67.58			B	0.196	2.611		0.825	1	0.872			
			C	0.196	2.611		0.825	1	0.872			
T13	0.06	0.21	A	0.296	2.306	7	0.825	1	2.452	0.08	10.07	C
67.58-60.00			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T14	0.06	0.21	A	0.308	2.275	7	0.825	1	2.601	0.08	9.90	C
60.00-52.42			B	0.308	2.275		0.825	1	2.601			
			C	0.308	2.275		0.825	1	2.601			
T15	0.04	0.10	A	0.196	2.611	6	0.825	1	0.872	0.04	7.90	C
52.42-47.58			B	0.196	2.611		0.825	1	0.872			
			C	0.196	2.611		0.825	1	0.872			
T16	0.06	0.21	A	0.296	2.306	6	0.825	1	2.452	0.07	9.04	C
47.58-40.00			B	0.296	2.306		0.825	1	2.452			
			C	0.296	2.306		0.825	1	2.452			
T17	0.15	0.53	A	0.286	2.335	5	0.825	1	6.153	0.16	7.99	C
40.00-20.00			B	0.286	2.335		0.825	1	6.153			
			C	0.286	2.335		0.825	1	6.153			
T18	0.06	0.21	A	0.267	2.388	5	0.825	1	2.359	0.06	7.78	C
20.00-11.67			B	0.267	2.388		0.825	1	2.359			
			C	0.267	2.388		0.825	1	2.359			
T19	0.04	0.17	A	0.271	2.377	5	0.825	1	1.915	0.05	7.12	C
11.67-5.00			B	0.271	2.377		0.825	1	1.915			
			C	0.271	2.377		0.825	1	1.915			
T20	0.00	0.11	A	0.369	2.129	5	0.825	1	0.984	0.01	1.95	C
5.00-0.00			B	0.369	2.129		0.825	1	0.984			
			C	0.369	2.129		0.825	1	0.984			
Sum Weight:	1.06	5.02								1.78		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1	0.00	0.39	A	0.19	2.629	9	0.8	1	3.494	0.07	3.63	C
200.00-180.00			B	0.19	2.629		0.8	1	3.494			
			C	0.19	2.629		0.8	1	3.494			
T2	0.00	0.21	A	0.308	2.275	9	0.8	1	2.562	0.05	5.95	C
180.00-172.42			B	0.308	2.275		0.8	1	2.562			
			C	0.308	2.275		0.8	1	2.562			
T3	0.00	0.10	A	0.196	2.611	9	0.8	1	0.872	0.02	3.60	C
172.42-167.58			B	0.196	2.611		0.8	1	0.872			
			C	0.196	2.611		0.8	1	0.872			
T4	0.00	0.21	A	0.296	2.306	9	0.8	1	2.419	0.04	5.58	C
167.58-160.00			B	0.296	2.306		0.8	1	2.419			
			C	0.296	2.306		0.8	1	2.419			
T5	0.02	0.21	A	0.296	2.306	9	0.8	1	2.419	0.06	8.16	C
160.00-152.42			B	0.296	2.306		0.8	1	2.419			

tnxTower Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 37 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T6 152.42-147.58	0.02	0.12	C	0.296	2.306		0.8	1	2.419			
			A	0.252	2.431	9	0.8	1	1.239	0.04	7.23	C
			B	0.252	2.431		0.8	1	1.239			
T7 147.58-140.00	0.04	0.21	C	0.252	2.431		0.8	1	1.239			
			A	0.296	2.306	9	0.8	1	2.419	0.08	11.04	C
			B	0.296	2.306		0.8	1	2.419			
T8 140.00-120.00	0.15	0.57	C	0.296	2.306		0.8	1	2.419			
			A	0.375	2.115	8	0.8	1	9.832	0.29	14.42	C
			B	0.375	2.115		0.8	1	9.832			
T9 120.00-100.00	0.15	0.57	C	0.375	2.115		0.8	1	9.832			
			A	0.38	2.106	8	0.8	1	9.967	0.28	13.81	C
			B	0.38	2.106		0.8	1	9.967			
T10 100.00-80.00	0.15	0.39	C	0.38	2.106		0.8	1	9.967			
			A	0.19	2.629	8	0.8	1	3.494	0.19	9.28	C
			B	0.19	2.629		0.8	1	3.494			
T11 80.00-72.42	0.06	0.21	C	0.19	2.629		0.8	1	3.494			
			A	0.296	2.306	7	0.8	1	2.419	0.08	10.53	C
			B	0.296	2.306		0.8	1	2.419			
T12 72.42-67.58	0.04	0.10	C	0.296	2.306		0.8	1	2.419			
			A	0.196	2.611	7	0.8	1	0.872	0.04	8.70	C
			B	0.196	2.611		0.8	1	0.872			
T13 67.58-60.00	0.06	0.21	C	0.196	2.611		0.8	1	0.872			
			A	0.296	2.306	7	0.8	1	2.419	0.08	10.01	C
			B	0.296	2.306		0.8	1	2.419			
T14 60.00-52.42	0.06	0.21	C	0.296	2.306		0.8	1	2.419			
			A	0.308	2.275	7	0.8	1	2.562	0.07	9.84	C
			B	0.308	2.275		0.8	1	2.562			
T15 52.42-47.58	0.04	0.10	C	0.308	2.275		0.8	1	2.562			
			A	0.196	2.611	6	0.8	1	0.872	0.04	7.90	C
			B	0.196	2.611		0.8	1	0.872			
T16 47.58-40.00	0.06	0.21	C	0.196	2.611		0.8	1	0.872			
			A	0.296	2.306	6	0.8	1	2.419	0.07	8.99	C
			B	0.296	2.306		0.8	1	2.419			
T17 40.00-20.00	0.15	0.53	C	0.296	2.306		0.8	1	2.419			
			A	0.286	2.335	5	0.8	1	6.077	0.16	7.94	C
			B	0.286	2.335		0.8	1	6.077			
T18 20.00-11.67	0.06	0.21	C	0.286	2.335		0.8	1	6.077			
			A	0.267	2.388	5	0.8	1	2.332	0.06	7.75	C
			B	0.267	2.388		0.8	1	2.332			
T19 11.67-5.00	0.04	0.17	C	0.267	2.388		0.8	1	2.332			
			A	0.271	2.377	5	0.8	1	1.894	0.05	7.08	C
			B	0.271	2.377		0.8	1	1.894			
T20 5.00-0.00	0.00	0.11	C	0.271	2.377		0.8	1	1.894			
			A	0.369	2.129	5	0.8	1	0.984	0.01	1.95	C
			B	0.369	2.129		0.8	1	0.984			
Sum Weight:	1.06	5.02								1.77		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
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Project	200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date	13:15:20 11/29/21
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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
T1 200.00-180.00	0.00	0.39	A	0.19	2.629	9	0.85	1	3.494	0.07	3.63	C
			B	0.19	2.629		0.85	1	3.494			
			C	0.19	2.629		0.85	1	3.494			
T2 180.00-172.42	0.00	0.21	A	0.308	2.275	9	0.85	1	2.640	0.05	6.13	C
			B	0.308	2.275		0.85	1	2.640			
			C	0.308	2.275		0.85	1	2.640			
T3 172.42-167.58	0.00	0.10	A	0.196	2.611	9	0.85	1	0.872	0.02	3.60	C
			B	0.196	2.611		0.85	1	0.872			
			C	0.196	2.611		0.85	1	0.872			
T4 167.58-160.00	0.00	0.21	A	0.296	2.306	9	0.85	1	2.485	0.04	5.73	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T5 160.00-152.42	0.02	0.21	A	0.296	2.306	9	0.85	1	2.485	0.06	8.31	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T6 152.42-147.58	0.02	0.12	A	0.252	2.431	9	0.85	1	1.261	0.04	7.32	C
			B	0.252	2.431		0.85	1	1.261			
			C	0.252	2.431		0.85	1	1.261			
T7 147.58-140.00	0.04	0.21	A	0.296	2.306	9	0.85	1	2.485	0.08	11.19	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T8 140.00-120.00	0.15	0.57	A	0.375	2.115	8	0.85	1	10.371	0.30	14.82	C
			B	0.375	2.115		0.85	1	10.371			
			C	0.375	2.115		0.85	1	10.371			
T9 120.00-100.00	0.15	0.57	A	0.38	2.106	8	0.85	1	10.518	0.28	14.21	C
			B	0.38	2.106		0.85	1	10.518			
			C	0.38	2.106		0.85	1	10.518			
T10 100.00-80.00	0.15	0.39	A	0.19	2.629	8	0.85	1	3.494	0.19	9.28	C
			B	0.19	2.629		0.85	1	3.494			
			C	0.19	2.629		0.85	1	3.494			
T11 80.00-72.42	0.06	0.21	A	0.296	2.306	7	0.85	1	2.485	0.08	10.65	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T12 72.42-67.58	0.04	0.10	A	0.196	2.611	7	0.85	1	0.872	0.04	8.70	C
			B	0.196	2.611		0.85	1	0.872			
			C	0.196	2.611		0.85	1	0.872			
T13 67.58-60.00	0.06	0.21	A	0.296	2.306	7	0.85	1	2.485	0.08	10.12	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T14 60.00-52.42	0.06	0.21	A	0.308	2.275	7	0.85	1	2.640	0.08	9.97	C
			B	0.308	2.275		0.85	1	2.640			
			C	0.308	2.275		0.85	1	2.640			
T15 52.42-47.58	0.04	0.10	A	0.196	2.611	6	0.85	1	0.872	0.04	7.90	C
			B	0.196	2.611		0.85	1	0.872			
			C	0.196	2.611		0.85	1	0.872			
T16 47.58-40.00	0.06	0.21	A	0.296	2.306	6	0.85	1	2.485	0.07	9.09	C
			B	0.296	2.306		0.85	1	2.485			
			C	0.296	2.306		0.85	1	2.485			
T17 40.00-20.00	0.15	0.53	A	0.286	2.335	5	0.85	1	6.230	0.16	8.03	C
			B	0.286	2.335		0.85	1	6.230			
			C	0.286	2.335		0.85	1	6.230			
T18 20.00-11.67	0.06	0.21	A	0.267	2.388	5	0.85	1	2.386	0.07	7.82	C
			B	0.267	2.388		0.85	1	2.386			
			C	0.267	2.388		0.85	1	2.386			
T19 11.67-5.00	0.04	0.17	A	0.271	2.377	5	0.85	1	1.937	0.05	7.15	C
			B	0.271	2.377		0.85	1	1.937			
			C	0.271	2.377		0.85	1	1.937			
T20 5.00-0.00	0.00	0.11	A	0.369	2.129	5	0.85	1	0.984	0.01	1.95	C
			B	0.369	2.129		0.85	1	0.984			
			C	0.369	2.129		0.85	1	0.984			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
Sum Weight:	1.06	5.02								1.79		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	2.71			
Bracing Weight	2.31			
Total Member Self-Weight	5.02			
Guy Weight	0.83			
Total Weight	8.61			
Wind 0 deg - No Ice		-0.00	-8.65	-0.13
Wind 30 deg - No Ice		4.22	-7.27	-0.03
Wind 45 deg - No Ice		5.93	-5.90	0.02
Wind 60 deg - No Ice		7.23	-4.15	0.07
Wind 90 deg - No Ice		8.43	0.00	0.16
Wind 120 deg - No Ice		7.52	4.32	0.20
Wind 135 deg - No Ice		6.05	6.03	0.21
Wind 150 deg - No Ice		4.22	7.27	0.19
Wind 180 deg - No Ice		0.00	8.31	0.13
Wind 210 deg - No Ice		-4.22	7.27	0.03
Wind 225 deg - No Ice		-5.93	5.90	-0.02
Wind 240 deg - No Ice		-7.52	4.32	-0.07
Wind 270 deg - No Ice		-8.43	-0.00	-0.16
Wind 300 deg - No Ice		-7.23	-4.16	-0.20
Wind 315 deg - No Ice		-5.93	-5.91	-0.21
Wind 330 deg - No Ice		-4.22	-7.27	-0.19
Member Ice	12.66			
Guy Ice	6.84			
Total Weight Ice	41.58			
Wind 0 deg - Ice		-0.00	-4.01	-0.04
Wind 30 deg - Ice		1.98	-3.41	-0.01
Wind 45 deg - Ice		2.79	-2.78	0.00
Wind 60 deg - Ice		3.41	-1.96	0.02
Wind 90 deg - Ice		3.96	0.00	0.04
Wind 120 deg - Ice		3.49	2.01	0.06
Wind 135 deg - Ice		2.82	2.81	0.06
Wind 150 deg - Ice		1.98	3.42	0.05
Wind 180 deg - Ice		0.00	3.92	0.04
Wind 210 deg - Ice		-1.98	3.41	0.01
Wind 225 deg - Ice		-2.79	2.78	-0.00
Wind 240 deg - Ice		-3.49	2.00	-0.02
Wind 270 deg - Ice		-3.96	-0.00	-0.04
Wind 300 deg - Ice		-3.41	-1.96	-0.06
Wind 315 deg - Ice		-2.79	-2.78	-0.06
Wind 330 deg - Ice		-1.98	-3.42	-0.05
Total Weight	8.61			
Wind 0 deg - Service		-0.00	-2.82	-0.04
Wind 30 deg - Service		1.38	-2.37	-0.01
Wind 45 deg - Service		1.94	-1.93	0.01
Wind 60 deg - Service		2.36	-1.36	0.02
Wind 90 deg - Service		2.75	0.00	0.05

<p>tnxTower</p> <p>Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587</p>	<p>Job</p> <p>21022.34 CT11335B Bokum Road</p>	<p>Page</p> <p>40 of 69</p>
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	<p>Client</p> <p>T-Mobile</p>	<p>Designed by</p> <p>TJL</p>

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Wind 120 deg - Service		2.46	1.41	0.07
Wind 135 deg - Service		1.98	1.97	0.07
Wind 150 deg - Service		1.38	2.37	0.06
Wind 180 deg - Service		0.00	2.71	0.04
Wind 210 deg - Service		-1.38	2.37	0.01
Wind 225 deg - Service		-1.94	1.93	-0.01
Wind 240 deg - Service		-2.46	1.41	-0.02
Wind 270 deg - Service		-2.75	-0.00	-0.05
Wind 300 deg - Service		-2.36	-1.36	-0.07
Wind 315 deg - Service		-1.94	-1.93	-0.07
Wind 330 deg - Service		-1.38	-2.37	-0.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 45 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 135 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 225 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
14	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
15	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
16	1.2 Dead+1.6 Wind 315 deg - No Ice+1.0 Guy
17	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
18	1.2 Dead+1.0 Ice+1.0 Temp+Guy
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
28	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
29	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp+1.0 Guy
30	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
31	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
32	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
33	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp+1.0 Guy
34	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy

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Comb. No.	Description
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	Dead+Wind 330 deg - Service+Guy

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	200 - 180	Leg	Max Tension	5	2.67	0.04	-0.01		
			Max. Compression	2	-2.57	-0.00	0.01		
			Max. Mx	6	2.06	0.04	-0.00		
			Max. My	10	2.57	-0.01	0.04		
			Max. Vy	6	0.16	-0.02	0.00		
		Diagonal	Max. Vx	10	0.16	-0.00	-0.02		
			Max Tension	3	0.31	0.00	0.00		
			Max. Compression	17	-0.33	0.00	0.00		
			Max. Mx	19	-0.16	0.00	0.00		
			Max. My	34	-0.08	0.00	0.00		
		Top Girt	Max. Vy	19	-0.00	0.00	0.00		
			Max. Vx	34	-0.00	0.00	0.00		
			Max Tension	15	0.01	0.00	0.00		
			Max. Compression	5	-0.00	0.00	0.00		
			Max. Mx	22	-0.00	0.00	0.00		
		Bottom Girt	Max. My	16	-0.00	0.00	0.00		
			Max. Vy	22	-0.01	0.00	0.00		
			Max. Vx	16	-0.00	0.00	0.00		
			Max Tension	12	0.19	0.00	0.00		
			Max. Compression	5	-0.17	0.00	0.00		
		Mid Girt	Max. Mx	22	0.06	0.00	0.00		
			Max. My	16	0.17	0.00	0.00		
			Max. Vy	22	-0.01	0.00	0.00		
			Max. Vx	16	-0.00	0.00	0.00		
			Max Tension	15	0.01	0.00	0.00		
		T2	180 - 172.42	Leg	Max. Compression	2	-0.00	0.00	0.00
					Max. Mx	22	-0.00	0.00	0.00
					Max. My	16	-0.00	0.00	0.00
Max. Vy	22				-0.01	0.00	0.00		
Max. Vx	16				-0.00	0.00	0.00		
Diagonal	Max Tension			13	11.26	-0.01	0.01		
	Max. Compression			10	-16.68	-0.02	0.02		
	Max. Mx			6	2.05	-0.07	0.01		
	Max. My			10	2.57	0.01	-0.07		
	Max. Vy			6	0.16	-0.07	0.01		
	Max. Vx			10	0.16	0.01	-0.07		
	Max Tension			6	2.44	0.00	0.00		
Max. Compression	14	-2.52	0.00	0.00					
Max. Mx	19	0.58	0.00	0.00					
Max. My	34	0.31	0.00	0.00					
Max. Vy	19	-0.00	0.00	0.00					

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
			Max. Vx	34	-0.00	0.00	0.00	
		Horizontal	Max Tension	13	0.10	0.00	0.00	
			Max. Compression	5	-0.02	0.00	0.00	
			Max. Mx	22	0.04	-0.00	0.00	
			Max. My	16	-0.02	0.00	-0.00	
			Max. Vy	22	-0.01	0.00	0.00	
			Max. Vx	16	-0.00	0.00	0.00	
		Bottom Girt	Max Tension	13	0.11	0.00	0.00	
			Max. Compression	10	-0.04	0.00	0.00	
			Max. Mx	25	0.07	-0.00	0.00	
			Max. My	16	0.04	0.00	-0.00	
			Max. Vy	25	-0.01	0.00	0.00	
			Max. Vx	16	-0.00	0.00	0.00	
		Guy A	Bottom Tension	10	7.12			
			Top Tension	10	7.19			
			Top Cable Vert	10	5.76			
			Top Cable Norm	10	4.30			
			Top Cable Tan	10	0.00			
			Bot Cable Vert	10	-5.55			
			Bot Cable Norm	10	4.46			
			Bot Cable Tan	10	0.00			
			Guy B	Bottom Tension	16	7.08		
				Top Tension	16	7.15		
		Top Cable Vert		16	5.67			
		Top Cable Norm		16	4.35			
		Top Cable Tan		16	0.02			
		Bot Cable Vert		16	-5.46			
		Guy C	Bot Cable Norm	16	4.50			
			Bot Cable Tan	16	0.04			
			Bottom Tension	5	6.94			
			Top Tension	5	7.00			
			Top Cable Vert	5	5.43			
			Top Cable Norm	5	4.42			
		Top Guy Pull-Off	Top Cable Tan	5	0.00			
			Bot Cable Vert	5	-5.23			
			Bot Cable Norm	5	4.56			
			Bot Cable Tan	5	0.00			
			Max Tension	9	2.50	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
		Leg	Max. Mx	22	1.16	0.00	0.00	
			Max. My	16	2.31	0.00	0.00	
			Max. Vy	22	0.01	0.00	0.00	
			Max. Vx	16	-0.00	0.00	0.00	
			Max Tension	13	20.97	-0.01	0.00	
			Max. Compression	15	-26.04	-0.00	-0.03	
			Max. Mx	17	-2.30	-0.04	-0.01	
			Max. My	11	-2.86	0.01	0.04	
			Max. Vy	17	-0.06	0.03	-0.01	
			Max. Vx	13	0.06	-0.02	-0.03	
		Diagonal	Max Tension	14	2.25	0.00	0.00	
			Max. Compression	6	-2.30	0.00	0.00	
			Max. Mx	19	0.54	0.00	0.00	
			Max. My	34	0.27	0.00	0.00	
			Max. Vy	19	-0.00	0.00	0.00	
			Max. Vx	34	-0.00	0.00	0.00	
		Mid Girt	Max Tension	13	0.12	0.00	0.00	
			Max. Compression	14	-0.06	0.00	0.00	
			Max. Mx	22	0.01	0.00	0.00	
			Max. My	16	0.01	0.00	0.00	
			Max. Vy	22	0.01	0.00	0.00	
T3	172.42 - 167.58							

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T4	167.58 - 160	Leg	Max. Vx	16	-0.00	0.00	0.00
			Max Tension	13	32.84	0.13	-0.09
			Max. Compression	15	-37.85	-0.01	-0.04
			Max. Mx	14	-34.12	0.18	-0.04
			Max. My	2	-20.40	0.02	0.18
			Max. Vy	14	0.61	0.18	-0.04
		Diagonal	Max. Vx	2	0.60	0.02	0.18
			Max Tension	6	1.97	0.00	0.00
			Max. Compression	14	-2.04	0.00	0.00
			Max. Mx	19	0.42	0.00	0.00
			Max. My	34	0.17	0.00	0.00
			Max. Vy	19	-0.00	0.00	0.00
		Horizontal	Max. Vx	34	0.00	0.00	0.00
			Max Tension	14	0.30	0.00	0.00
			Max. Compression	6	-0.29	0.00	0.00
			Max. Mx	32	0.02	-0.00	0.00
			Max. My	16	0.14	0.00	-0.00
			Max. Vy	32	-0.01	0.00	0.00
		Top Girt	Max. Vx	16	-0.00	0.00	0.00
			Max Tension	11	0.23	0.00	0.00
			Max. Compression	8	-0.17	0.00	0.00
			Max. Mx	26	0.07	-0.00	0.00
			Max. My	16	-0.05	0.00	-0.00
			Max. Vy	26	-0.01	0.00	0.00
		Bottom Girt	Max. Vx	16	-0.00	0.00	0.00
			Max Tension	15	0.92	0.00	0.00
			Max. Compression	7	-0.80	0.00	0.00
			Max. Mx	22	0.22	0.00	0.00
Max. My	15		0.92	0.00	-0.00		
Max. Vy	22		-0.01	0.00	0.00		
T5	160 - 152.42	Leg	Max. Vx	15	0.00	0.00	0.00
			Max Tension	13	38.76	-0.02	-0.03
			Max. Compression	15	-44.59	-0.07	0.04
			Max. Mx	6	27.50	0.23	0.01
			Max. My	2	32.44	0.01	-0.22
			Max. Vy	6	0.70	-0.02	0.05
		Diagonal	Max. Vx	2	-0.71	0.06	0.02
			Max Tension	14	1.92	0.00	0.00
			Max. Compression	6	-1.97	0.00	0.00
			Max. Mx	27	0.07	0.00	0.00
			Max. My	34	-0.15	0.00	0.00
			Max. Vy	27	0.00	0.00	0.00
		Horizontal	Max. Vx	34	0.00	0.00	0.00
			Max Tension	16	0.89	0.00	0.00
			Max. Compression	7	-0.85	0.00	0.00
			Max. Mx	29	0.09	-0.00	0.00
			Max. My	17	-0.11	0.00	0.00
			Max. Vy	29	0.01	0.00	0.00
		Top Girt	Max. Vx	17	0.00	0.00	0.00
			Max Tension	7	0.76	0.00	0.00
			Max. Compression	15	-0.90	0.00	0.00
			Max. Mx	28	0.18	0.00	0.00
			Max. My	15	-0.90	0.00	-0.00
			Max. Vy	28	0.01	0.00	0.00
		Bottom Girt	Max. Vx	15	0.00	0.00	0.00
			Max Tension	13	0.23	0.00	0.00
			Max. Compression	12	-0.14	0.00	0.00
			Max. Mx	21	0.06	-0.00	0.00
Max. My	9		-0.06	0.00	0.00		
Max. Vy	21		0.01	0.00	0.00		
		Max. Vx	9	0.00	0.00	0.00	

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	Client T-Mobile	Designed by TJL

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T6	152.42 - 147.58	Leg	Max Tension	7	36.73	0.01	0.04
			Max. Compression	15	-42.56	-0.06	0.04
			Max. Mx	11	-38.31	-0.07	0.00
			Max. My	7	-24.70	0.01	0.07
			Max. Vy	10	-0.10	0.06	0.03
		Diagonal	Max. Vx	14	-0.10	-0.02	-0.06
			Max Tension	8	1.15	0.00	0.00
			Max. Compression	16	-1.27	0.00	0.00
			Max. Mx	27	0.16	0.00	0.00
			Max. My	34	-0.21	0.00	0.00
			Max. Vy	27	0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Horizontal	Max Tension	13	0.22	0.00	0.00
			Max. Compression	8	-0.14	0.00	0.00
			Max. Mx	22	0.06	-0.00	0.00
			Max. My	17	-0.05	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
		Mid Girt	Max. Vx	17	0.00	0.00	0.00
			Max Tension	13	0.22	0.00	0.00
			Max. Compression	12	-0.13	0.00	0.00
Max. Mx	33		0.06	0.00	0.00		
Max. My	17		0.05	0.00	-0.00		
T7	147.58 - 140	Leg	Max. Vy	33	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	7	31.98	0.01	0.03
			Max. Compression	15	-37.86	-0.05	0.04
			Max. Mx	6	15.47	0.25	0.01
		Diagonal	Max. My	10	8.22	-0.03	0.23
			Max. Vy	14	-1.12	0.13	-0.03
			Max. Vx	10	1.05	-0.04	-0.12
			Max Tension	14	3.05	0.00	0.00
			Max. Compression	6	-3.16	0.00	0.00
			Max. Mx	31	0.71	0.00	0.00
			Max. My	34	-0.38	0.00	0.00
		Horizontal	Max. Vy	31	-0.00	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
			Max Tension	16	0.50	0.00	0.00
			Max. Compression	7	-0.42	0.00	0.00
			Max. Mx	22	0.07	-0.00	0.00
		Top Girt	Max. My	16	0.34	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
Max Tension	13		0.22	0.00	0.00		
Max. Compression	6		-0.11	0.00	0.00		
Bottom Girt	Max. Mx	22	0.06	-0.00	0.00		
	Max. My	17	0.05	0.00	0.00		
	Max. Vy	22	-0.01	0.00	0.00		
	Max. Vx	17	0.00	0.00	0.00		
	Max Tension	7	1.24	0.00	0.00		
T8	140 - 120	Leg	Max. Compression	15	-1.28	0.00	0.00
			Max. Mx	18	0.04	0.00	0.00
			Max. My	16	0.83	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
			Max Tension	15	31.06	0.42	-0.07
			Max. Compression	13	-39.80	0.16	0.09
			Max. Mx	15	-23.14	-0.48	0.08
			Max. My	12	-10.57	-0.14	0.44
			Max. Vy	15	1.77	-0.17	-0.03
			Max. Vx	9	1.29	0.04	-0.13

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	Client T-Mobile	Designed by TJL

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T9	120 - 100	Diagonal	Max Tension	14	4.73	0.00	0.00
			Max. Compression	6	-4.95	0.00	0.00
			Max. Mx	28	0.54	0.00	0.00
			Max. My	33	-0.50	0.00	0.00
			Max. Vy	28	-0.00	0.00	0.00
			Max. Vx	33	0.00	0.00	0.00
		Horizontal	Max Tension	14	0.74	0.00	0.00
			Max. Compression	14	-0.60	0.00	0.00
			Max. Mx	22	0.33	-0.00	0.00
			Max. My	17	0.14	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Top Girt	Max Tension	15	1.64	0.00	0.00
			Max. Compression	7	-1.53	0.00	0.00
			Max. Mx	18	0.07	0.00	0.00
			Max. My	16	-0.95	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
		Bottom Girt	Max. Vx	16	0.00	0.00	0.00
			Max Tension	7	2.17	0.00	0.00
			Max. Compression	15	-1.72	0.00	0.00
			Max. Mx	22	0.45	0.00	0.00
			Max. My	17	1.80	0.00	-0.00
		Mid Girt	Max. Vy	22	0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	28	0.26	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.25	0.00	0.00
		Leg	Max. My	17	0.07	0.00	-0.00
			Max. Vy	22	0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	15	31.06	-0.17	-0.03
			Max. Compression	13	-39.80	0.69	0.07
			Max. Mx	15	23.64	-0.77	-0.00
			Max. My	17	-5.88	-0.13	0.60
			Max. Vy	15	1.80	-0.77	-0.00
			Max. Vx	9	1.29	0.01	-0.56
			Diagonal	Max Tension	6	1.67	0.00
		Max. Compression		2	-2.17	0.00	0.00
		Max. Mx		28	-0.33	0.00	0.00
		Max. My		34	-0.31	0.00	0.00
		Max. Vy		28	-0.00	0.00	0.00
		Horizontal	Max. Vx	34	-0.00	0.00	0.00
Max Tension	13		0.89	0.00	0.00		
Max. Compression	5		-0.50	0.00	0.00		
Max. Mx	18		0.30	-0.00	0.00		
Max. My	17		-0.34	0.00	0.00		
Bottom Girt	Max. Vy	18	0.01	0.00	0.00		
	Max. Vx	17	0.00	0.00	0.00		
	Max Tension	5	0.60	0.00	0.00		
	Max. Compression	12	-0.46	0.00	0.00		
	Max. Mx	22	0.02	0.00	0.00		
Mid Girt	Max. My	8	0.42	0.00	-0.00		
	Max. Vy	22	0.01	0.00	0.00		
	Max. Vx	8	0.00	0.00	0.00		
	Max Tension	28	0.45	0.00	0.00		
	Max. Compression	1	0.00	0.00	0.00		
Guy A	Max. Mx	18	0.39	0.00	0.00		
	Max. My	9	0.32	0.00	-0.00		
	Max. Vy	18	0.01	0.00	0.00		
	Max. Vx	9	0.00	0.00	0.00		
		Bottom Tension	9	10.97			

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Tension	9	11.06		
			Top Cable Vert	9	7.36		
			Top Cable Norm	9	8.25		
			Top Cable Tan	9	0.03		
			Bot Cable Vert	9	-7.14		
			Bot Cable Norm	9	8.33		
			Bot Cable Tan	9	0.08		
		Guy B	Bottom Tension	16	10.93		
			Top Tension	16	11.01		
			Top Cable Vert	16	7.16		
			Top Cable Norm	16	8.36		
			Top Cable Tan	16	0.01		
			Bot Cable Vert	16	-6.94		
			Bot Cable Norm	16	8.44		
			Bot Cable Tan	16	0.04		
		Guy C	Bottom Tension	4	10.62		
			Top Tension	4	10.69		
			Top Cable Vert	4	6.60		
			Top Cable Norm	4	8.41		
			Top Cable Tan	4	0.01		
			Bot Cable Vert	4	-6.39		
			Bot Cable Norm	4	8.48		
			Bot Cable Tan	4	0.04		
		Top Guy Pull-Off	Max Tension	7	4.94	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	2.00	0.00	0.00
			Max. My	17	2.38	0.00	-0.00
			Max. Vy	22	0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
T10	100 - 80	Leg	Max Tension	5	1.89	-0.05	0.05
			Max. Compression	13	-19.02	-0.02	0.02
			Max. Mx	6	-8.38	-0.08	-0.01
			Max. My	2	-4.23	-0.00	0.08
			Max. Vy	6	-0.35	-0.05	0.01
			Max. Vx	10	-0.37	-0.01	-0.06
		Diagonal	Max Tension	3	0.87	0.00	0.00
			Max. Compression	11	-0.90	0.00	0.00
			Max. Mx	27	-0.30	0.00	0.00
			Max. My	34	0.11	0.00	0.00
			Max. Vy	27	0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Top Girt	Max Tension	12	0.44	0.00	0.00
			Max. Compression	5	-0.41	0.00	0.00
			Max. Mx	22	0.10	0.00	0.00
			Max. My	8	-0.26	0.00	-0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	0.11	0.00	0.00
			Max. Compression	15	-0.02	0.00	0.00
			Max. Mx	18	0.06	0.00	0.00
			Max. My	8	0.05	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
		Mid Girt	Max Tension	19	0.06	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.06	0.00	0.00
			Max. My	8	0.04	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
T11	80 - 72.42	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-17.54	0.04	0.02

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T12	72.42 - 67.58	Diagonal	Max. Mx	32	-16.77	0.07	-0.00
			Max. My	25	-17.00	0.03	-0.06
			Max. Vy	32	0.12	0.07	-0.00
			Max. Vx	21	0.10	-0.03	0.06
			Max Tension	14	0.16	0.00	0.00
			Max. Compression	7	-0.38	0.00	0.00
			Max. Mx	22	-0.26	0.00	0.00
			Max. My	34	-0.12	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
			Max Tension	31	0.22	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
		Horizontal	Max. Mx	22	0.21	-0.00	0.00
			Max. My	8	0.14	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
			Max Tension	16	0.06	0.00	0.00
			Max. Compression	5	-0.05	0.00	0.00
			Max. Mx	22	0.03	0.00	0.00
			Max. My	8	0.01	0.00	-0.00
		Bottom Girt	Max. Vy	22	0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
			Max Tension	31	0.16	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.16	-0.00	0.00
			Max. My	8	0.11	0.00	0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
		Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-18.43	0.04	0.02
			Max. Mx	28	-17.81	0.04	-0.02
			Max. My	24	-18.31	-0.00	-0.05
			Max. Vy	26	0.07	-0.04	0.01
			Max. Vx	32	0.07	-0.01	0.05
			Max Tension	6	0.39	0.00	0.00
			Max. Compression	6	-0.52	0.00	0.00
			Max. Mx	22	-0.23	0.00	0.00
			Max. My	34	-0.01	0.00	0.00
			Max. Vy	22	-0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
Mid Girt	Max Tension	32	0.11	0.00	0.00		
	Max. Compression	1	0.00	0.00	0.00		
	Max. Mx	22	0.11	0.00	0.00		
	Max. My	8	0.07	0.00	-0.00		
	Max. Vy	22	0.01	0.00	0.00		
	Max. Vx	8	0.00	0.00	0.00		
	Max Tension	10	2.06	-0.01	0.17		
	Max. Compression	13	-22.65	0.03	0.02		
Leg	Max. Mx	6	-0.15	0.18	0.01		
	Max. My	2	-2.93	-0.01	-0.18		
	Max. Vy	14	-0.59	0.03	-0.01		
	Max. Vx	10	0.58	-0.01	-0.02		
	Max Tension	14	1.70	0.00	0.00		
	Max. Compression	6	-1.91	0.00	0.00		
	Max. Mx	23	-0.63	0.00	0.00		
	Max. My	34	0.06	0.00	0.00		
	Max. Vy	23	-0.00	0.00	0.00		
	Max. Vx	34	0.00	0.00	0.00		
	Horizontal	Max Tension	10	0.35	0.00	0.00	
		Max. Compression	2	-0.17	0.00	0.00	
Max. Mx		22	0.23	-0.00	0.00		

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T14	60 - 52.42	Top Girt	Max. My	8	-0.13	0.00	0.00
			Max. Vy	22	0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
			Max Tension	28	0.16	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.16	-0.00	0.00
		Bottom Girt	Max. My	8	0.09	0.00	0.00
			Max. Vy	22	0.01	0.00	0.00
			Max. Vx	8	0.00	0.00	0.00
			Max Tension	7	0.89	0.00	0.00
			Max. Compression	15	-0.70	0.00	0.00
			Max. Mx	22	0.20	0.00	0.00
		Leg	Max. Vy	22	0.01	0.00	0.00
			Max. Vx	9	-0.00	0.00	0.00
			Max Tension	10	2.06	-0.01	-0.02
			Max. Compression	13	-22.66	0.20	-0.08
			Max. Mx	14	0.47	0.23	-0.01
			Max. My	2	-5.17	-0.01	0.23
			Max. Vy	14	-0.59	0.23	-0.01
			Max. Vx	10	0.58	-0.01	-0.22
			Max Tension	11	1.32	0.00	0.00
			Max. Compression	3	-1.63	0.00	0.00
			Max. Mx	23	0.24	0.00	0.00
			Max. My	34	-0.03	0.00	0.00
		Diagonal	Max. Vy	23	-0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
			Max Tension	13	0.38	0.00	0.00
			Max. Compression	10	-0.15	0.00	0.00
			Max. Mx	22	0.22	-0.00	0.00
			Max. My	34	0.19	0.00	-0.00
		Horizontal	Max. Vy	22	0.01	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
			Max Tension	28	0.19	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.18	-0.00	0.00
			Max. Vy	22	0.01	0.00	0.00
		Bottom Girt	Max. Vx	34	0.00	0.00	0.00
			Max Tension	27	5.04	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	22	0.18	-0.00	0.00
			Max. Vy	22	0.01	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
Guy A	Bottom Tension	27	5.04	0.00	0.00		
	Top Tension	27	5.28	0.00	0.00		
	Top Cable Vert	27	2.45	0.00	0.00		
	Top Cable Norm	27	4.68	0.00	0.00		
	Top Cable Tan	27	0.00	0.00	0.00		
	Bot Cable Vert	27	-1.82	0.00	0.00		
	Bot Cable Norm	27	4.70	0.00	0.00		
	Bot Cable Tan	27	0.00	0.00	0.00		
	Bottom Tension	32	4.97	0.00	0.00		
	Top Tension	32	5.20	0.00	0.00		
	Top Cable Vert	32	2.28	0.00	0.00		
	Top Cable Norm	32	4.68	0.00	0.00		
Guy B	Top Cable Tan	32	0.00	0.00	0.00		
	Bot Cable Vert	32	-1.66	0.00	0.00		
	Bot Cable Norm	32	4.69	0.00	0.00		
	Bot Cable Tan	32	0.00	0.00	0.00		
	Bottom Tension	22	4.86	0.00	0.00		
	Top Tension	22	5.06	0.00	0.00		
	Top Cable Vert	22	1.94	0.00	0.00		
	Top Cable Norm	22	4.67	0.00	0.00		
	Top Cable Tan	22	0.00	0.00	0.00		
	Bot Cable Vert	22	-1.33	0.00	0.00		
	Bot Cable Norm	22	4.68	0.00	0.00		
	Bot Cable Tan	22	0.00	0.00	0.00		

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	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft	
T15	52.42 - 47.58	Top Guy Pull-Off	Max Tension	25	2.76	0.00	0.00	
			Max. Compression	1	0.00	0.00	0.00	
			Max. Mx	22	1.98	0.00	0.00	
		Leg	Max. Vy	22	0.01	0.00	0.00	
			Max. Vx	34	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	27	-21.79	-0.05	0.03	
			Max. Mx	34	-19.45	-0.05	0.01	
			Max. My	31	-21.32	-0.00	-0.06	
			Max. Vy	34	0.08	0.05	-0.01	
			Max. Vx	29	0.08	0.01	-0.05	
			Diagonal	Max Tension	11	1.06	0.00	0.00
				Max. Compression	11	-1.19	0.00	0.00
				Max. Mx	20	0.33	0.00	0.00
				Max. My	34	0.11	0.00	0.00
Mid Girt	Max. Vy	20	0.00	0.00	0.00			
	Max. Vx	34	-0.00	0.00	0.00			
	Max Tension	28	0.14	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	22	0.12	0.00	0.00			
	Max. Vy	22	0.01	0.00	0.00			
T16	47.58 - 40	Leg	Max. Vx	15	0.00	0.00	0.00	
			Max Tension	1	0.00	0.00	0.00	
			Max. Compression	27	-24.81	-0.05	0.00	
		Diagonal	Max. Mx	7	-14.19	-0.11	-0.05	
			Max. My	2	-14.08	0.01	0.11	
			Max. Vy	14	0.28	0.10	-0.03	
			Max. Vx	2	0.29	-0.02	0.09	
			Max Tension	3	0.83	0.00	0.00	
			Max. Compression	9	-1.09	0.00	0.00	
			Max. Mx	20	0.18	0.00	0.00	
			Max. My	34	-0.02	0.00	0.00	
			Max. Vy	20	-0.00	0.00	0.00	
			Max. Vx	34	-0.00	0.00	0.00	
			Horizontal	Max Tension	28	0.28	0.00	0.00
				Max. Compression	1	0.00	0.00	0.00
Max. Mx	25	0.18		-0.00	0.00			
Top Girt	Max. Vy	25	-0.01	0.00	0.00			
	Max. Vx	34	-0.00	0.00	0.00			
	Max Tension	28	0.20	0.00	0.00			
	Max. Compression	1	0.00	0.00	0.00			
	Max. Mx	22	0.17	-0.00	0.00			
	Max. Vy	22	-0.01	0.00	0.00			
Bottom Girt	Max. Vx	15	-0.00	0.00	0.00			
	Max Tension	10	0.43	0.00	0.00			
	Max. Compression	13	-0.36	0.00	0.00			
T17	40 - 20	Leg	Max. Mx	25	0.14	0.00	0.00	
			Max. Vy	25	-0.01	0.00	0.00	
			Max Tension	2	0.54	-0.03	-0.01	
		Diagonal	Max. Compression	27	-27.07	-0.06	0.01	
			Max. Mx	14	-9.14	-0.12	-0.01	
			Max. My	2	-14.09	0.02	-0.12	
			Max. Vy	14	0.28	0.01	-0.03	
			Max. Vx	2	0.29	0.02	0.02	
			Max Tension	9	0.77	0.00	0.00	
			Max. Compression	17	-1.00	0.00	0.00	
			Max. Mx	31	-0.10	0.00	0.00	
			Max. My	34	-0.33	0.00	0.00	
			Max. Vy	31	0.00	0.00	0.00	
			Max. Vx	34	-0.00	0.00	0.00	
			Horizontal	Max Tension	29	0.29	0.00	0.00

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	Client T-Mobile	Designed by TJL

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T18	20 - 11.67	Top Girt	Max. Compression	7	-0.05	0.00	0.00
			Max. Mx	21	0.24	-0.00	0.00
			Max. My	17	0.16	0.00	0.00
			Max. Vy	21	0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	13	0.43	0.00	0.00
			Max. Compression	4	-0.31	0.00	0.00
			Max. Mx	31	0.21	0.00	0.00
			Max. Vy	31	0.01	0.00	0.00
			Max Tension	7	0.18	0.00	0.00
			Max. Compression	15	-0.11	0.00	0.00
			Max. Mx	30	0.07	0.00	0.00
		Bottom Girt	Max. My	17	0.11	0.00	-0.00
			Max. Vy	30	0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	29	0.29	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	0.24	0.00	0.00
			Max. My	9	0.14	0.00	-0.00
			Max. Vy	21	0.01	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-27.08	-0.05	-0.02
			Max. Mx	29	-24.91	-0.10	-0.00
		Mid Girt	Max. My	30	-23.94	-0.05	0.09
			Max. Vy	27	-0.15	0.10	0.00
			Max. Vx	31	-0.13	0.04	-0.09
			Max Tension	14	0.40	0.00	0.00
			Max. Compression	6	-0.77	0.00	0.00
			Max. Mx	31	-0.07	0.00	0.00
			Max. My	34	-0.44	0.00	0.00
			Max. Vy	31	0.00	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
			Max Tension	29	0.27	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	0.19	-0.00	0.00
		Leg	Max. My	17	0.14	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	15	0.23	0.00	0.00
Max. Compression	7		-0.12	0.00	0.00		
Max. Mx	30		0.12	0.00	0.00		
Max. My	17		-0.04	0.00	-0.00		
Max. Vy	30		-0.00	0.00	0.00		
Max. Vx	17		0.00	0.00	0.00		
Max Tension	1		0.00	0.00	0.00		
Max. Compression	27		-25.44	0.10	0.00		
Max. Mx	29		-24.52	-0.10	-0.00		
Diagonal	Max. My	34	-23.65	-0.04	0.09		
	Max. Vy	28	-0.15	0.10	0.00		
	Max. Vx	34	-0.14	-0.04	0.09		
	Max Tension	6	0.73	0.00	0.00		
	Max. Compression	15	-1.05	0.00	0.00		
	Max. Mx	28	0.08	0.00	0.00		
	Max. My	34	-0.51	0.00	0.00		
	Max. Vy	28	-0.00	0.00	0.00		
	Max. Vx	34	-0.00	0.00	0.00		
	Max Tension	34	0.27	0.00	0.00		
	Max. Compression	1	0.00	0.00	0.00		
	Max. Mx	30	0.27	-0.00	0.00		
Horizontal	Max. My	17	0.15	0.00	0.00		

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	Client T-Mobile	Designed by TJL

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T20	5 - 0	Top Girt	Max. Vy	30	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	29	0.27	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	30	0.27	0.00	0.00
			Max. My	17	0.12	0.00	-0.00
		Leg	Max. Vy	30	0.00	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-24.47	-0.01	0.12
			Max. Mx	13	-7.93	0.03	-0.07
			Max. My	25	-21.51	0.00	-0.16
		Diagonal	Max. Vy	13	0.03	-0.00	0.04
			Max. Vx	25	0.25	-0.00	0.16
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-1.55	0.00	0.00
			Max. Mx	31	-0.51	0.00	0.00
			Max. My	34	-0.52	0.00	0.00
		Horizontal	Max. Vy	31	-0.00	0.00	0.00
			Max. Vx	33	-0.00	0.00	0.00
			Max Tension	26	0.42	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	30	0.36	0.00	0.00
			Max. My	17	0.24	0.00	-0.00
		Top Girt	Max. Vy	30	-0.00	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
			Max Tension	33	2.65	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	2.44	0.00	0.00
			Max. My	17	0.99	0.00	-0.00
			Max. Vy	18	-0.00	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K	
Mast	Max. Vert	30	66.82	0.12	-0.06	
	Max. H _x	14	32.85	0.65	0.03	
	Max. H _z	2	33.83	-0.01	0.65	
	Max. M _x	1	0.00	-0.00	0.00	
	Max. M _z	1	0.00	-0.00	0.00	
	Max. Torsion	16	0.07	0.50	0.46	
	Min. Vert	1	22.29	-0.00	0.00	
	Min. H _x	6	32.09	-0.67	0.03	
	Min. H _z	10	30.44	0.00	-0.68	
	Min. M _x	1	0.00	-0.00	0.00	
	Min. M _z	1	0.00	-0.00	0.00	
	Min. Torsion	9	-0.08	-0.30	-0.57	
	Guy C @ 143 ft Elev 10 ft Azimuth 240 deg	Max. Vert	13	-0.46	-0.43	0.25
		Max. H _x	13	-0.46	-0.43	0.25
		Max. H _z	4	-13.10	-15.07	8.80
Min. Vert		5	-13.11	-15.13	8.74	
Min. H _x		5	-13.11	-15.13	8.74	

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Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy B @ 143 ft Elev 0 ft Azimuth 120 deg	Min. H _z	13	-0.46	-0.43	0.25
	Max. Vert	7	-0.58	0.47	0.27
	Max. H _x	16	-14.22	15.00	8.77
	Max. H _z	16	-14.22	15.00	8.77
	Min. Vert	16	-14.22	15.00	8.77
Guy A @ 143 ft Elev -5 ft Azimuth 0 deg	Min. H _x	7	-0.58	0.47	0.27
	Min. H _z	7	-0.58	0.47	0.27
	Max. Vert	2	-0.65	0.00	-0.57
	Max. H _x	14	-7.77	0.42	-9.02
	Max. H _z	2	-0.65	0.00	-0.57
	Min. Vert	10	-14.60	0.00	-17.17
	Min. H _x	6	-7.89	-0.42	-9.14
	Min. H _z	10	-14.60	0.00	-17.17

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	22.29	0.00	-0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	33.83	0.01	-0.65	0.00	0.00	-0.04
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	31.86	0.36	-0.57	0.00	0.00	0.00
1.2 Dead+1.6 Wind 45 deg - No Ice+1.0 Guy	30.48	0.51	-0.47	0.00	0.00	0.02
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	29.79	0.61	-0.35	0.00	0.00	0.03
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	32.09	0.67	-0.03	0.00	0.00	0.04
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	34.28	0.56	0.31	0.00	0.00	0.07
1.2 Dead+1.6 Wind 135 deg - No Ice+1.0 Guy	33.86	0.44	0.46	0.00	0.00	0.08
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	32.71	0.30	0.57	0.00	0.00	0.08
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	30.44	-0.00	0.68	0.00	0.00	0.06
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	33.03	-0.30	0.57	0.00	0.00	0.01
1.2 Dead+1.6 Wind 225 deg - No Ice+1.0 Guy	34.06	-0.43	0.45	0.00	0.00	-0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	35.01	-0.55	0.31	0.00	0.00	-0.01
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	32.85	-0.65	-0.03	0.00	0.00	-0.03
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	30.26	-0.60	-0.34	0.00	0.00	-0.07
1.2 Dead+1.6 Wind 315 deg - No Ice+1.0 Guy	30.99	-0.50	-0.46	0.00	0.00	-0.07
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	32.31	-0.35	-0.56	0.00	0.00	-0.07
1.2 Dead+1.0 Ice+1.0	65.71	0.01	-0.02	0.00	0.00	0.01

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587</p>	<p>Job</p> <p style="text-align: center;">21022.34 CT11335B Bokum Road</p>	<p>Page</p> <p style="text-align: center;">53 of 69</p>
	<p>Project</p> <p style="text-align: center;">200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT</p>	<p>Date</p> <p style="text-align: center;">13:15:20 11/29/21</p>
	<p>Client</p> <p style="text-align: center;">T-Mobile</p>	<p>Designed by</p> <p style="text-align: center;">TJL</p>

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
Temp+Guy						
1.2 Dead+1.0 Wind 0 deg+1.0	66.37	0.01	-0.17	0.00	0.00	0.01
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 30 deg+1.0	66.17	0.09	-0.15	0.00	0.00	0.02
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 45 deg+1.0	66.07	0.13	-0.13	0.00	0.00	0.02
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 60 deg+1.0	66.05	0.15	-0.10	0.00	0.00	0.02
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 90 deg+1.0	66.25	0.17	-0.02	0.00	0.00	0.01
Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 120	66.52	0.15	0.06	0.00	0.00	0.02
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 135	66.51	0.12	0.10	0.00	0.00	0.03
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 150	66.43	0.09	0.12	0.00	0.00	0.04
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 180	66.39	0.01	0.15	0.00	0.00	0.02
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 210	66.61	-0.07	0.12	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 225	66.75	-0.10	0.10	0.00	0.00	0.01
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 240	66.82	-0.12	0.06	0.00	0.00	0.01
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 270	66.55	-0.15	-0.02	0.00	0.00	0.02
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 300	66.28	-0.13	-0.10	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 315	66.26	-0.10	-0.13	0.00	0.00	-0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy						
1.2 Dead+1.0 Wind 330	66.29	-0.07	-0.15	0.00	0.00	-0.01
deg+1.0 Ice+1.0 Temp+1.0 Guy						
Dead+Wind 0 deg -	22.42	0.00	-0.15	0.00	0.00	-0.01
Service+Guy						
Dead+Wind 30 deg -	22.42	0.08	-0.13	0.00	0.00	0.00
Service+Guy						
Dead+Wind 45 deg -	22.42	0.11	-0.11	0.00	0.00	0.01
Service+Guy						
Dead+Wind 60 deg -	22.42	0.13	-0.07	0.00	0.00	0.01
Service+Guy						
Dead+Wind 90 deg -	22.42	0.15	-0.00	0.00	0.00	0.02
Service+Guy						
Dead+Wind 120 deg -	22.42	0.13	0.08	0.00	0.00	0.02
Service+Guy						
Dead+Wind 135 deg -	22.42	0.11	0.11	0.00	0.00	0.03
Service+Guy						
Dead+Wind 150 deg -	22.41	0.08	0.13	0.00	0.00	0.03
Service+Guy						
Dead+Wind 180 deg -	22.42	0.00	0.15	0.00	0.00	0.02
Service+Guy						
Dead+Wind 210 deg -	22.42	-0.07	0.13	0.00	0.00	0.00
Service+Guy						
Dead+Wind 225 deg -	22.43	-0.11	0.11	0.00	0.00	-0.00
Service+Guy						
Dead+Wind 240 deg -	22.43	-0.13	0.08	0.00	0.00	-0.00
Service+Guy						
Dead+Wind 270 deg -	22.43	-0.15	-0.00	0.00	0.00	-0.01
Service+Guy						
Dead+Wind 300 deg -	22.42	-0.13	-0.07	0.00	0.00	-0.02
Service+Guy						

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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+Wind 315 deg - Service+Guy	22.42	-0.11	-0.11	0.00	0.00	-0.02
Dead+Wind 330 deg - Service+Guy	22.42	-0.08	-0.13	0.00	0.00	-0.02

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-8.61	0.00	-0.00	8.61	0.00	0.025%
2	-0.01	-10.25	-15.28	0.01	10.25	15.22	0.354%
3	7.46	-10.15	-12.87	-7.46	10.15	12.82	0.311%
4	10.50	-10.09	-10.46	-10.52	10.08	10.41	0.284%
5	12.81	-10.06	-7.36	-12.81	10.06	7.38	0.123%
6	14.92	-10.16	0.01	-14.87	10.16	0.03	0.325%
7	13.28	-10.26	7.65	-13.22	10.26	-7.61	0.372%
8	10.71	-10.24	10.67	-10.65	10.23	-10.63	0.371%
9	7.47	-10.18	12.89	-7.42	10.17	-12.86	0.346%
10	0.01	-10.09	14.74	-0.03	10.09	-14.73	0.112%
11	-7.46	-10.19	12.87	7.40	10.19	-12.85	0.340%
12	-10.50	-10.25	10.46	10.45	10.25	-10.43	0.362%
13	-13.27	-10.28	7.63	13.21	10.28	-7.60	0.392%
14	-14.92	-10.18	-0.01	14.87	10.18	0.04	0.335%
15	-12.81	-10.08	-7.38	12.80	10.08	7.40	0.148%
16	-10.52	-10.10	-10.48	10.53	10.10	10.43	0.299%
17	-7.47	-10.16	-12.89	7.48	10.16	12.83	0.327%
18	0.00	-43.14	0.00	-0.01	43.14	0.01	0.026%
19	-0.01	-43.22	-5.61	0.01	43.22	5.59	0.034%
20	2.76	-43.12	-4.78	-2.75	43.12	4.77	0.036%
21	3.90	-43.05	-3.89	-3.89	43.05	3.88	0.040%
22	4.76	-43.02	-2.75	-4.75	43.02	2.74	0.039%
23	5.52	-43.13	0.01	-5.51	43.13	-0.00	0.039%
24	4.85	-43.23	2.81	-4.84	43.23	-2.80	0.038%
25	3.95	-43.21	3.95	-3.93	43.21	-3.93	0.042%
26	2.78	-43.14	4.80	-2.77	43.14	-4.78	0.046%
27	0.01	-43.05	5.51	-0.02	43.05	-5.49	0.051%
28	-2.76	-43.15	4.78	2.74	43.15	-4.77	0.047%
29	-3.90	-43.23	3.89	3.89	43.23	-3.88	0.044%
30	-4.84	-43.26	2.79	4.83	43.25	-2.78	0.041%
31	-5.52	-43.15	-0.01	5.50	43.15	0.01	0.042%
32	-4.77	-43.04	-2.77	4.75	43.04	2.76	0.047%
33	-3.91	-43.07	-3.91	3.90	43.07	3.90	0.044%
34	-2.78	-43.13	-4.80	2.77	43.13	4.79	0.043%
35	-0.00	-8.63	-3.12	0.00	8.63	3.11	0.042%
36	1.52	-8.61	-2.63	-1.52	8.61	2.62	0.090%
37	2.14	-8.60	-2.13	-2.14	8.60	2.13	0.062%
38	2.61	-8.59	-1.50	-2.61	8.59	1.50	0.048%
39	3.04	-8.61	0.00	-3.04	8.61	0.00	0.046%
40	2.71	-8.63	1.56	-2.71	8.63	-1.56	0.037%
41	2.19	-8.63	2.18	-2.18	8.63	-2.18	0.029%
42	1.53	-8.61	2.63	-1.52	8.61	-2.63	0.026%
43	0.00	-8.60	3.01	-0.00	8.60	-3.00	0.049%
44	-1.52	-8.62	2.63	1.52	8.62	-2.62	0.092%
45	-2.14	-8.63	2.13	2.14	8.63	-2.13	0.068%
46	-2.71	-8.64	1.56	2.70	8.64	-1.55	0.074%
47	-3.04	-8.62	-0.00	3.04	8.62	0.00	0.043%
48	-2.62	-8.59	-1.51	2.61	8.59	1.51	0.023%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
49	-2.15	-8.60	-2.14	2.15	8.60	2.14	0.019%
50	-1.53	-8.61	-2.63	1.52	8.61	2.63	0.021%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	14	0.00000001	0.00007788
2	Yes	61	0.00094825	0.00041562
3	Yes	58	0.00096652	0.00035995
4	Yes	51	0.00099202	0.00030391
5	Yes	20	0.00078888	0.00090480
6	Yes	60	0.00099936	0.00036970
7	Yes	63	0.00097296	0.00042937
8	Yes	62	0.00098324	0.00042854
9	Yes	60	0.00098034	0.00039530
10	Yes	21	0.00048189	0.00082405
11	Yes	65	0.00096407	0.00038302
12	Yes	67	0.00095599	0.00041182
13	Yes	67	0.00099225	0.00044302
14	Yes	65	0.00097374	0.00037537
15	Yes	21	0.00073669	0.00086402
16	Yes	52	0.00096727	0.00031781
17	Yes	58	0.00095735	0.00037724
18	Yes	23	0.00097124	0.00008538
19	Yes	42	0.00094771	0.00013749
20	Yes	38	0.00094073	0.00017481
21	Yes	35	0.00096285	0.00023101
22	Yes	35	0.00092193	0.00023416
23	Yes	39	0.00099707	0.00017538
24	Yes	43	0.00097332	0.00014624
25	Yes	41	0.00098706	0.00016964
26	Yes	38	0.00099159	0.00021343
27	Yes	36	0.00099334	0.00026661
28	Yes	41	0.00098393	0.00019174
29	Yes	44	0.00099259	0.00016640
30	Yes	46	0.00095124	0.00014948
31	Yes	42	0.00094539	0.00017186
32	Yes	36	0.00097016	0.00024954
33	Yes	36	0.00093416	0.00023735
34	Yes	37	0.00097669	0.00020968
35	Yes	20	0.00093849	0.00029017
36	Yes	15	0.00093308	0.00080366
37	Yes	16	0.00091989	0.00064385
38	Yes	17	0.00086812	0.00051514
39	Yes	19	0.00083570	0.00034080
40	Yes	21	0.00096471	0.00024848
41	Yes	22	0.00091707	0.00020894
42	Yes	22	0.00089740	0.00020616
43	Yes	18	0.00095490	0.00042523
44	Yes	16	0.00086930	0.00066795
45	Yes	18	0.00084848	0.00044234
46	Yes	18	0.00097171	0.00045792
47	Yes	20	0.00084031	0.00028459
48	Yes	22	0.00090004	0.00019897
49	Yes	23	0.00086675	0.00017180

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50 Yes 23 0.00088821 0.00017415

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	200 - 180	0.643	43	0.2236	0.2584
T2	180 - 172.42	1.475	43	0.2303	0.2582
T3	172.42 - 167.58	1.797	43	0.2090	0.2565
T4	167.58 - 160	1.972	43	0.1726	0.2583
T5	160 - 152.42	2.154	43	0.0863	0.2609
T6	152.42 - 147.58	2.178	43	0.0439	0.2654
T7	147.58 - 140	2.096	43	0.1103	0.2670
T8	140 - 120	1.840	43	0.1909	0.2657
T9	120 - 100	0.943	43	0.1581	0.2576
T10	100 - 80	0.599	43	0.0389	0.2464
T11	80 - 72.42	0.509	43	0.0169	0.2439
T12	72.42 - 67.58	0.483	43	0.0153	0.2468
T13	67.58 - 60	0.468	43	0.0114	0.2450
T14	60 - 52.42	0.454	43	0.0117	0.2376
T15	52.42 - 47.58	0.481	43	0.0284	0.2303
T16	47.58 - 40	0.507	43	0.0281	0.2298
T17	40 - 20	0.539	46	0.0144	0.2251
T18	20 - 11.67	0.427	46	0.0685	0.2169
T19	11.67 - 5	0.278	46	0.0983	0.2162
T20	5 - 0	0.126	46	0.1131	0.2333

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.67	Guy	43	1.489	0.2299	0.2580	46761
167.00	APX16DWV-16DWVS-E-A20	43	1.991	0.1672	0.2585	6038
155.00	APXVAARR24_43-U-NA20	43	2.190	0.0342	0.2639	3627
145.00	SBNH-1D4545A	43	2.024	0.1451	0.2669	4585
119.67	Guy	43	0.932	0.1560	0.2575	5512
66.00	2' Dish	43	0.464	0.0096	0.2438	54172
59.67	Guy	43	0.454	0.0124	0.2372	13199

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	200 - 180	10.964	13	0.8879	0.7442
T2	180 - 172.42	14.431	13	0.9200	0.7448
T3	172.42 - 167.58	15.773	13	0.8236	0.7528
T4	167.58 - 160	16.468	13	0.6493	0.7628
T5	160 - 152.42	17.067	13	0.2333	0.7823

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	152.42 - 147.58	16.832	13	0.4595	0.8057
T7	147.58 - 140	16.170	13	0.8130	0.8161
T8	140 - 120	14.446	13	1.2500	0.8162
T9	120 - 100	8.609	13	1.1220	0.7860
T10	100 - 80	5.552	13	0.4886	0.7895
T11	80 - 72.42	4.034	13	0.2930	0.7889
T12	72.42 - 67.58	3.599	13	0.2494	0.7892
T13	67.58 - 60	3.361	13	0.2087	0.7836
T14	60 - 52.42	3.073	13	0.0866	0.7644
T15	52.42 - 47.58	3.053	13	0.1358	0.7546
T16	47.58 - 40	3.105	13	0.1311	0.7534
T17	40 - 20	3.162	13	0.0552	0.7434
T18	20 - 11.67	2.374	13	0.3966	0.7134
T19	11.67 - 5	1.531	13	0.5483	0.6998
T20	5 - 0	0.693	13	0.6239	0.7115

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.67	Guy	13	14.491	0.9182	0.7450	15278
167.00	APX16DWV-16DWVS-E-A20	13	16.537	0.6185	0.7641	1184
155.00	APXVAARR24_43-U-NA20	13	17.019	0.2749	0.7980	712
145.00	SBNH-1D4545A	13	15.665	0.9865	0.8181	898
119.67	Guy	13	8.529	1.1109	0.7857	1081
66.00	2' Dish	13	3.287	0.1868	0.7801	6050
59.67	Guy	13	3.066	0.0817	0.7636	2260

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T2	179.67 (A) (939)	7/16 EHS	2.08	20.80	7.19	12.48	1.000	1.735 ✓
	179.67 (B) (938)	7/16 EHS	2.08	20.80	7.15	12.48	1.000	1.746 ✓
	179.67 (C) (937)	7/16 EHS	2.08	20.80	7.00	12.48	1.000	1.782 ✓
T9	119.67 (A) (942)	9/16 EHS	3.50	35.00	11.06	21.00	1.000	1.899 ✓
	119.67 (B) (941)	9/16 EHS	3.50	35.00	11.01	21.00	1.000	1.907 ✓
	119.67 (C) (940)	9/16 EHS	3.50	35.00	10.69	21.00	1.000	1.964 ✓
T14	59.67 (A) (945)	7/16 EHS	2.08	20.80	5.28	12.48	1.000	2.362 ✓
	59.67 (B) (944)	7/16 EHS	2.08	20.80	5.20	12.48	1.000	2.398 ✓
	59.67 (C) (943)	7/16 EHS	2.08	20.80	5.06	12.48	1.000	2.466 ✓

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Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	Mast Stability Index	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	1 1/4	20.00	1.21	92.8 K=2.00	1.227	1.00	-2.57	29.42	0.087 ¹
T2	180 - 172.42	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.90	-16.68	42.55	0.392 ¹
T3	172.42 - 167.58	1 1/4	4.84	1.21	92.9 K=2.00	1.227	0.99	-26.04	29.08	0.896 ¹
T4	167.58 - 160	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.95	-37.85	44.87	0.844 ¹
T5	160 - 152.42	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.95	-44.59	44.82	0.995 ¹
T6	152.42 - 147.58	1 1/4	4.84	1.21	46.5 K=1.00	1.227	0.95	-42.56	44.67	0.953 ¹
T7	147.58 - 140	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.94	-37.86	44.35	0.854 ¹
T8	140 - 120	Pipe 1-1/4"dia. w 1-1/2"x1/4"	20.00	1.21	28.0 K=1.00	1.415	0.92	-39.80	55.18	0.721 ¹
T9	120 - 100	Pipe 1-1/4"dia. w 1-1/2"x1/4"	20.00	1.21	28.0 K=1.00	1.415	0.87	-39.56	52.03	0.760 ¹
T10	100 - 80	1 1/4	20.00	1.21	92.8 K=2.00	1.227	0.96	-19.02	28.30	0.672 ¹
T11	80 - 72.42	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.58	-17.54	27.28	0.643 ¹
T12	72.42 - 67.58	1 1/4	4.84	1.21	92.9 K=2.00	1.227	0.91	-18.43	26.68	0.690 ¹
T13	67.58 - 60	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.61	-21.03	28.76	0.731 ¹
T14	60 - 52.42	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.60	-22.48	28.46	0.790 ¹
T15	52.42 - 47.58	1 1/4	4.84	1.21	92.9 K=2.00	1.227	0.91	-21.79	26.86	0.811 ¹
T16	47.58 - 40	1 1/4	7.58	1.21	46.4 K=1.00	1.227	0.61	-24.81	28.89	0.859 ¹
T17	40 - 20	1 1/4	20.00	1.21	46.4 K=1.00	1.227	0.62	-27.07	29.35	0.923 ¹
T18	20 - 11.67	1 1/4	8.33	1.33	51.2 K=1.00	1.227	0.64	-27.08	29.21	0.927 ¹
T19	11.67 - 5	1 1/4	6.67	1.33	51.2 K=1.00	1.227	0.62	-25.44	28.48	0.893 ¹
T20	5 - 0	1 1/4	5.07	1.27	48.7 K=1.00	1.227	0.60	-24.47	27.69	0.884 ¹

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¹ $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	5/8	1.93	1.79	96.4 K=0.70	0.307	-0.33	7.00	0.046 ¹
T2	180 - 172.42	5/8	1.93	1.79	96.3 K=0.70	0.307	-2.52	7.00	0.360 ¹
T3	172.42 - 167.58	5/8	1.93	1.79	96.4 K=0.70	0.307	-2.30	7.00	0.329 ¹
T4	167.58 - 160	5/8	1.93	1.79	96.3 K=0.70	0.307	-2.04	7.00	0.291 ¹
T5	160 - 152.42	5/8	1.93	1.79	96.3 K=0.70	0.307	-1.97	7.00	0.281 ¹
T6	152.42 - 147.58	5/8	1.93	1.79	96.4 K=0.70	0.307	-1.27	7.00	0.182 ¹
T7	147.58 - 140	5/8	1.93	1.79	96.3 K=0.70	0.307	-3.16	7.00	0.451 ¹
T8	140 - 120	5/8	1.93	1.68	90.2 K=0.70	0.307	-4.95	7.61	0.650 ¹
T9	120 - 100	5/8	1.93	1.68	90.2 K=0.70	0.307	-2.17	7.61	0.285 ¹
T10	100 - 80	5/8	1.93	1.79	96.4 K=0.70	0.307	-0.90	7.00	0.128 ¹
T11	80 - 72.42	5/8	1.93	1.79	96.3 K=0.70	0.307	-0.38	7.00	0.055 ¹
T12	72.42 - 67.58	5/8	1.93	1.79	96.4 K=0.70	0.307	-0.52	7.00	0.074 ¹
T13	67.58 - 60	5/8	1.93	1.79	96.3 K=0.70	0.307	-1.91	7.00	0.273 ¹
T14	60 - 52.42	5/8	1.93	1.79	96.3 K=0.70	0.307	-1.63	7.00	0.232 ¹
T15	52.42 - 47.58	5/8	1.93	1.79	96.4 K=0.70	0.307	-1.19	7.00	0.170 ¹
T16	47.58 - 40	5/8	1.93	1.79	96.3 K=0.70	0.307	-1.09	7.00	0.155 ¹
T17	40 - 20	5/8	1.93	1.79	96.4 K=0.70	0.307	-1.00	7.00	0.143 ¹
T18	20 - 11.67	5/8	2.01	1.87	100.4 K=0.70	0.307	-0.77	6.61	0.117 ¹
T19	11.67 - 5	5/8	2.01	1.87	100.4 K=0.70	0.307	-1.05	6.60	0.159 ¹
T20	5 - 0	5/8	1.38	1.12	82.3 K=0.95	0.307	-1.55	8.42	0.185 ¹

¹ $P_u / \phi P_n$ controls

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Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 172.42	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.02	13.83	0.001 ¹ ✓
T4	167.58 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.29	13.83	0.021 ¹ ✓
T5	160 - 152.42	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.85	13.83	0.061 ¹ ✓
T6	152.42 - 147.58	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.14	13.83	0.010 ¹ ✓
T7	147.58 - 140	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.42	13.83	0.031 ¹ ✓
T8	140 - 120	L1 3/4x1 3/4x3/16	1.50	1.31	82.8 K=1.81	0.621	-0.60	14.02	0.043 ¹ ✓
T9	120 - 100	L1 3/4x1 3/4x3/16	1.50	1.31	82.8 K=1.81	0.621	-0.50	14.02	0.036 ¹ ✓
T13	67.58 - 60	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.17	13.83	0.012 ¹ ✓
T14	60 - 52.42	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.15	13.83	0.011 ¹ ✓
T17	40 - 20	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.05	13.83	0.004 ¹ ✓

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.00	17.63	0.000 ¹ ✓
T4	167.58 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.17	13.83	0.012 ¹ ✓
T5	160 - 152.42	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.90	17.63	0.051 ¹ ✓
T7	147.58 - 140	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.11	13.83	0.008 ¹ ✓
T8	140 - 120	7/8	1.50	1.31	71.7 K=1.00	0.601	-1.53	18.58	0.082 ¹ ✓
T10	100 - 80	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.41	17.63	0.023 ¹ ✓
T11	80 - 72.42	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.05	17.63	0.003 ¹ ✓
T17	40 - 20	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.31	17.63	0.018 ¹ ✓
T18	20 - 11.67	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.12	17.63	0.007 ¹ ✓

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¹ $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.17	17.63	0.009 ¹ ✓
T2	180 - 172.42	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.04	13.83	0.003 ¹ ✓
T4	167.58 - 160	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.80	17.63	0.046 ¹ ✓
T5	160 - 152.42	L1 3/4x1 3/4x3/16	1.50	1.40	84.4 K=1.73	0.621	-0.14	13.83	0.010 ¹ ✓
T7	147.58 - 140	7/8	1.50	1.40	76.6 K=1.00	0.601	-1.28	17.63	0.073 ¹ ✓
T8	140 - 120	7/8	1.50	1.31	71.7 K=1.00	0.601	-1.72	18.58	0.093 ¹ ✓
T9	120 - 100	7/8	1.50	1.31	71.7 K=1.00	0.601	-0.46	18.58	0.025 ¹ ✓
T10	100 - 80	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.02	17.63	0.001 ¹ ✓
T13	67.58 - 60	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.70	17.63	0.040 ¹ ✓
T16	47.58 - 40	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.36	17.63	0.021 ¹ ✓
T17	40 - 20	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.11	17.63	0.006 ¹ ✓

¹ $P_u / \phi P_n$ controls

Mid 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	200 - 180	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.00	17.63	0.000 ¹ ✓
T3	172.42 - 167.58	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.06	17.63	0.004 ¹ ✓
T6	152.42 - 147.58	7/8	1.50	1.40	76.6 K=1.00	0.601	-0.13	17.63	0.007 ¹ ✓

¹ $P_u / \phi P_n$ controls

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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	200 - 180	1 1/4	20.00	1.21	46.4	1.227	2.67	55.22	0.048 ¹
T2	180 - 172.42	1 1/4	7.58	1.21	46.4	1.227	11.26	55.22	0.204 ¹
T3	172.42 - 167.58	1 1/4	4.84	1.21	46.5	1.227	20.97	55.22	0.380 ¹
T4	167.58 - 160	1 1/4	7.58	1.21	46.4	1.227	32.84	55.22	0.595 ¹
T5	160 - 152.42	1 1/4	7.58	1.21	46.4	1.227	38.76	55.22	0.702 ¹
T6	152.42 - 147.58	1 1/4	4.84	1.21	46.5	1.227	36.73	55.22	0.665 ¹
T7	147.58 - 140	1 1/4	7.58	1.21	46.4	1.227	31.98	55.22	0.579 ¹
T8	140 - 120	Pipe 1-1/4" dia. w 1-1/2"x1/4"	20.00	1.21	28.0	1.415	31.06	63.65	0.488 ¹
T9	120 - 100	Pipe 1-1/4" dia. w 1-1/2"x1/4"	20.00	1.21	28.0	1.415	31.06	63.65	0.488 ¹
T10	100 - 80	1 1/4	20.00	1.21	46.4	1.227	1.89	55.22	0.034 ¹
T13	67.58 - 60	1 1/4	7.58	1.21	46.4	1.227	2.06	55.22	0.037 ¹
T14	60 - 52.42	1 1/4	7.58	1.21	46.4	1.227	2.06	55.22	0.037 ¹
T17	40 - 20	1 1/4	20.00	1.21	46.4	1.227	0.54	55.22	0.010 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	200 - 180	5/8	1.93	1.79	137.7	0.307	0.31	13.81	0.023 ¹
T2	180 - 172.42	5/8	1.93	1.79	137.6	0.307	2.44	13.81	0.177 ¹
T3	172.42 - 167.58	5/8	1.93	1.79	137.7	0.307	2.25	13.81	0.163 ¹
T4	167.58 - 160	5/8	1.93	1.79	137.6	0.307	1.97	13.81	0.143 ¹
T5	160 - 152.42	5/8	1.93	1.79	137.6	0.307	1.92	13.81	0.139 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T6	152.42 - 147.58	5/8	1.93	1.79	137.7	0.307	1.15	13.81	0.083 ¹
T7	147.58 - 140	5/8	1.93	1.79	137.6	0.307	3.05	13.81	0.221 ¹
T8	140 - 120	5/8	1.93	1.68	128.9	0.307	4.73	13.81	0.343 ¹
T9	120 - 100	5/8	1.93	1.68	128.9	0.307	1.67	13.81	0.121 ¹
T10	100 - 80	5/8	1.93	1.79	137.7	0.307	0.87	13.81	0.063 ¹
T11	80 - 72.42	5/8	1.93	1.79	137.6	0.307	0.16	13.81	0.012 ¹
T12	72.42 - 67.58	5/8	1.93	1.79	137.7	0.307	0.39	13.81	0.028 ¹
T13	67.58 - 60	5/8	1.93	1.79	137.6	0.307	1.70	13.81	0.123 ¹
T14	60 - 52.42	5/8	1.93	1.79	137.6	0.307	1.32	13.81	0.095 ¹
T15	52.42 - 47.58	5/8	1.93	1.79	137.7	0.307	1.06	13.81	0.077 ¹
T16	47.58 - 40	5/8	1.93	1.79	137.6	0.307	0.83	13.81	0.060 ¹
T17	40 - 20	5/8	1.93	1.79	137.7	0.307	0.77	13.81	0.056 ¹
T18	20 - 11.67	5/8	2.01	1.87	143.4	0.307	0.40	13.81	0.029 ¹
T19	11.67 - 5	5/8	2.01	1.87	143.5	0.307	0.73	13.81	0.053 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 172.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.10	20.12	0.005 ¹
T4	167.58 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.30	20.12	0.015 ¹
T5	160 - 152.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.89	20.12	0.044 ¹
T6	152.42 - 147.58	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.22	20.12	0.011 ¹
T7	147.58 - 140	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.50	20.12	0.025 ¹
T8	140 - 120	L1 3/4x1 3/4x3/16	1.50	1.31	29.2	0.621	0.74	20.12	0.037 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T9	120 - 100	L1 3/4x1 3/4x3/16	1.50	1.31	29.2	0.621	0.89	20.12	0.044 ¹
T11	80 - 72.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.22	20.12	0.011 ¹
T13	67.58 - 60	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.35	20.12	0.017 ¹
T14	60 - 52.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.38	20.12	0.019 ¹
T16	47.58 - 40	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.28	20.12	0.014 ¹
T17	40 - 20	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.29	20.12	0.015 ¹
T18	20 - 11.67	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.27	20.12	0.014 ¹
T19	11.67 - 5	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.27	20.12	0.013 ¹
T20	5 - 0	7/8	0.38	0.27	14.9	0.601	0.42	27.06	0.015 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	200 - 180	7/8	1.50	1.40	76.6	0.601	0.01	27.06	0.000 ¹
T4	167.58 - 160	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.23	20.12	0.012 ¹
T5	160 - 152.42	7/8	1.50	1.40	76.6	0.601	0.76	27.06	0.028 ¹
T7	147.58 - 140	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.22	20.12	0.011 ¹
T8	140 - 120	7/8	1.50	1.31	71.7	0.601	1.64	27.06	0.061 ¹
T10	100 - 80	7/8	1.50	1.40	76.6	0.601	0.44	27.06	0.016 ¹
T11	80 - 72.42	7/8	1.50	1.40	76.6	0.601	0.06	27.06	0.002 ¹
T13	67.58 - 60	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.16	20.12	0.008 ¹
T16	47.58 - 40	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.20	20.12	0.010 ¹
T17	40 - 20	7/8	1.50	1.40	76.6	0.601	0.43	27.06	0.016 ¹
T18	20 - 11.67	7/8	1.50	1.40	76.6	0.601	0.23	27.06	0.008 ¹
T19	11.67 - 5	7/8	1.50	1.40	76.6	0.601	0.27	27.06	0.010 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T20	5 - 0	7/8	1.50	1.40	76.6	0.601	2.65	27.06	0.098 ¹ ✓ ✓

¹ P_u / φP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	200 - 180	7/8	1.50	1.40	76.6	0.601	0.19	27.06	0.007 ¹ ✓
T2	180 - 172.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.11	20.12	0.006 ¹ ✓
T4	167.58 - 160	7/8	1.50	1.40	76.6	0.601	0.92	27.06	0.034 ¹ ✓
T5	160 - 152.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.23	20.12	0.012 ¹ ✓
T7	147.58 - 140	7/8	1.50	1.40	76.6	0.601	1.24	27.06	0.046 ¹ ✓
T8	140 - 120	7/8	1.50	1.31	71.7	0.601	2.17	27.06	0.080 ¹ ✓
T9	120 - 100	7/8	1.50	1.31	71.7	0.601	0.60	27.06	0.022 ¹ ✓
T10	100 - 80	7/8	1.50	1.40	76.6	0.601	0.11	27.06	0.004 ¹ ✓
T11	80 - 72.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.16	20.12	0.008 ¹ ✓
T13	67.58 - 60	7/8	1.50	1.40	76.6	0.601	0.89	27.06	0.033 ¹ ✓
T14	60 - 52.42	L1 3/4x1 3/4x3/16	1.50	1.40	31.2	0.621	0.19	20.12	0.010 ¹ ✓
T16	47.58 - 40	7/8	1.50	1.40	76.6	0.601	0.43	27.06	0.016 ¹ ✓
T17	40 - 20	7/8	1.50	1.40	76.6	0.601	0.18	27.06	0.007 ¹ ✓

¹ P_u / φP_n controls

Mid 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	200 - 180	7/8	1.50	1.40	76.6	0.601	0.01	27.06	0.000 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T3	172.42 - 167.58	7/8	1.50	1.40	76.6	0.601	0.12	27.06	0.004 ¹ ✓
T6	152.42 - 147.58	7/8	1.50	1.40	76.6	0.601	0.22	27.06	0.008 ¹ ✓
T8	140 - 120	7/8	1.50	1.31	71.7	0.601	0.26	27.06	0.010 ¹ ✓
T9	120 - 100	7/8	1.50	1.31	71.7	0.601	0.45	27.06	0.017 ¹ ✓
T10	100 - 80	7/8	1.50	1.40	76.6	0.601	0.06	27.06	0.002 ¹ ✓
T12	72.42 - 67.58	7/8	1.50	1.40	76.6	0.601	0.11	27.06	0.004 ¹ ✓
T15	52.42 - 47.58	7/8	1.50	1.40	76.6	0.601	0.14	27.06	0.005 ¹ ✓
T17	40 - 20	7/8	1.50	1.40	76.6	0.601	0.29	27.06	0.011 ¹ ✓

¹ P_u / φP_n controls

Top Guy Pull-Off 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 $\frac{P_u}{\phi P_n}$
T2	180 - 172.42	2x1/4	1.50	1.40	232.1	0.500	2.50	16.20	0.154 ¹ ✓
T9	120 - 100	2x1/4	1.50	1.31	217.3	0.500	4.94	16.20	0.305 ¹ ✓
T14	60 - 52.42	2x1/4	1.50	1.40	232.1	0.500	2.76	16.20	0.170 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	200 - 180	Leg	1 1/4	3	-2.57	29.42	8.7	Pass
T2	180 - 172.42	Leg	1 1/4	63	-16.68	42.55	39.2	Pass
T3	172.42 - 167.58	Leg	1 1/4	105	-26.04	29.08	89.6	Pass
T4	167.58 - 160	Leg	1 1/4	122	-37.85	44.87	84.4	Pass
T5	160 - 152.42	Leg	1 1/4	164	-44.59	44.82	99.5	Pass
T6	152.42 - 147.58	Leg	1 1/4	206	-42.56	44.67	95.3	Pass
T7	147.58 - 140	Leg	1 1/4	230	-37.86	44.35	85.4	Pass
T8	140 - 120	Leg	Pipe 1-1/4"dia. w 1-1/2"x1/4"	271	-39.80	55.18	72.1	Pass
T9	120 - 100	Leg	Pipe 1-1/4"dia. w 1-1/2"x1/4"	374	-39.56	52.03	76.0	Pass
T10	100 - 80	Leg	1 1/4	475	-19.02	28.30	67.2	Pass

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Client	T-Mobile	Designed by	TJL

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T11	80 - 72.42	Leg	1 1/4	535	-17.54	27.28	64.3	Pass
T12	72.42 - 67.58	Leg	1 1/4	577	-18.43	26.68	69.0	Pass
T13	67.58 - 60	Leg	1 1/4	595	-21.03	28.76	73.1	Pass
T14	60 - 52.42	Leg	1 1/4	639	-22.48	28.46	79.0	Pass
T15	52.42 - 47.58	Leg	1 1/4	681	-21.79	26.86	81.1	Pass
T16	47.58 - 40	Leg	1 1/4	699	-24.81	28.89	85.9	Pass
T17	40 - 20	Leg	1 1/4	741	-27.07	29.35	92.3	Pass
T18	20 - 11.67	Leg	1 1/4	843	-27.08	29.21	92.7	Pass
T19	11.67 - 5	Leg	1 1/4	882	-25.44	28.48	89.3	Pass
T20	5 - 0	Leg	1 1/4	915	-24.47	27.69	88.4	Pass
T1	200 - 180	Diagonal	5/8	14	-0.33	7.00	4.6	Pass
T2	180 - 172.42	Diagonal	5/8	94	-2.52	7.00	36.0	Pass
T3	172.42 - 167.58	Diagonal	5/8	118	-2.30	7.00	32.9	Pass
T4	167.58 - 160	Diagonal	5/8	130	-2.04	7.00	29.1	Pass
T5	160 - 152.42	Diagonal	5/8	202	-1.97	7.00	28.1	Pass
T6	152.42 - 147.58	Diagonal	5/8	212	-1.27	7.00	18.2	Pass
T7	147.58 - 140	Diagonal	5/8	238	-3.16	7.00	45.1	Pass
T8	140 - 120	Diagonal	5/8	283	-4.95	7.61	65.0	Pass
T9	120 - 100	Diagonal	5/8	468	-2.17	7.61	28.5	Pass
T10	100 - 80	Diagonal	5/8	534	-0.90	7.00	12.8	Pass
T11	80 - 72.42	Diagonal	5/8	544	-0.38	7.00	5.5	Pass
T12	72.42 - 67.58	Diagonal	5/8	583	-0.52	7.00	7.4	Pass
T13	67.58 - 60	Diagonal	5/8	604	-1.91	7.00	27.3	Pass
T14	60 - 52.42	Diagonal	5/8	672	-1.63	7.00	23.2	Pass
T15	52.42 - 47.58	Diagonal	5/8	696	-1.19	7.00	17.0	Pass
T16	47.58 - 40	Diagonal	5/8	707	-1.09	7.00	15.5	Pass
T17	40 - 20	Diagonal	5/8	839	-1.00	7.00	14.3	Pass
T18	20 - 11.67	Diagonal	5/8	847	-0.77	6.61	11.7	Pass
T19	11.67 - 5	Diagonal	5/8	886	-1.05	6.60	15.9	Pass
T20	5 - 0	Diagonal	5/8	924	-1.55	8.42	18.5	Pass
T2	180 - 172.42	Horizontal	L1 3/4x1 3/4x3/16	80	0.10	20.12	0.5	Pass
T4	167.58 - 160	Horizontal	L1 3/4x1 3/4x3/16	133	-0.29	13.83	2.1	Pass
T5	160 - 152.42	Horizontal	L1 3/4x1 3/4x3/16	181	-0.85	13.83	6.1	Pass
T6	152.42 - 147.58	Horizontal	L1 3/4x1 3/4x3/16	224	0.22	20.12	1.1	Pass
T7	147.58 - 140	Horizontal	L1 3/4x1 3/4x3/16	259	-0.42	13.83	3.1	Pass
T8	140 - 120	Horizontal	L1 3/4x1 3/4x3/16	286	-0.60	14.02	4.3	Pass
T9	120 - 100	Horizontal	L1 3/4x1 3/4x3/16	469	0.89	20.12	4.4	Pass
T11	80 - 72.42	Horizontal	L1 3/4x1 3/4x3/16	553	0.22	20.12	1.1	Pass
T13	67.58 - 60	Horizontal	L1 3/4x1 3/4x3/16	609	0.35	20.12	1.7	Pass
T14	60 - 52.42	Horizontal	L1 3/4x1 3/4x3/16	673	0.38	20.12	1.9	Pass
T16	47.58 - 40	Horizontal	L1 3/4x1 3/4x3/16	716	0.28	20.12	1.4	Pass
T17	40 - 20	Horizontal	L1 3/4x1 3/4x3/16	773	0.29	20.12	1.5	Pass
T18	20 - 11.67	Horizontal	L1 3/4x1 3/4x3/16	857	0.27	20.12	1.4	Pass
T19	11.67 - 5	Horizontal	L1 3/4x1 3/4x3/16	889	0.27	20.12	1.3	Pass
T20	5 - 0	Horizontal	7/8	921	0.42	27.06	1.5	Pass
T1	200 - 180	Top Girt	7/8	6	0.01	27.06	0.0	Pass
T4	167.58 - 160	Top Girt	L1 3/4x1 3/4x3/16	124	-0.17	13.83	1.2	Pass
T5	160 - 152.42	Top Girt	7/8	166	-0.90	17.63	5.1	Pass
T7	147.58 - 140	Top Girt	L1 3/4x1 3/4x3/16	233	0.22	20.12	1.1	Pass
T8	140 - 120	Top Girt	7/8	274	-1.53	18.58	8.2	Pass
T10	100 - 80	Top Girt	7/8	480	-0.41	17.63	2.3	Pass
T11	80 - 72.42	Top Girt	7/8	540	-0.05	17.63	0.3	Pass
T13	67.58 - 60	Top Girt	L1 3/4x1 3/4x3/16	598	0.16	20.12	0.8	Pass
T16	47.58 - 40	Top Girt	L1 3/4x1 3/4x3/16	701	0.20	20.12	1.0	Pass
T17	40 - 20	Top Girt	7/8	744	-0.31	17.63	1.8	Pass
T18	20 - 11.67	Top Girt	7/8	844	0.23	27.06	0.8	Pass
T19	11.67 - 5	Top Girt	7/8	884	0.27	27.06	1.0	Pass
T20	5 - 0	Top Girt	7/8	916	2.65	27.06	9.8	Pass
T1	200 - 180	Bottom Girt	7/8	9	-0.17	17.63	0.9	Pass
T2	180 - 172.42	Bottom Girt	L1 3/4x1 3/4x3/16	68	0.11	20.12	0.6	Pass
T4	167.58 - 160	Bottom Girt	7/8	127	-0.80	17.63	4.6	Pass

<p style="text-align: center;">tnxTower</p> <p style="text-align: center;">Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587</p>	<p>Job</p> <p style="text-align: center;">21022.34 CT11335B Bokum Road</p>	<p>Page</p> <p style="text-align: center;">68 of 69</p>
	<p>Project</p> <p style="text-align: center;">200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT</p>	<p>Date</p> <p style="text-align: center;">13:15:20 11/29/21</p>
	<p>Client</p> <p style="text-align: center;">T-Mobile</p>	<p>Designed by</p> <p style="text-align: center;">TJL</p>

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
T5	160 - 152.42	Bottom Girt	L1 3/4x1 3/4x3/16	170	0.23	20.12	1.2	Pass	
T7	147.58 - 140	Bottom Girt	7/8	235	-1.28	17.63	7.3	Pass	
T8	140 - 120	Bottom Girt	7/8	277	-1.72	18.58	9.3	Pass	
T9	120 - 100	Bottom Girt	7/8	381	-0.46	18.58	2.5	Pass	
T10	100 - 80	Bottom Girt	7/8	483	0.11	27.06	0.4	Pass	
T11	80 - 72.42	Bottom Girt	L1 3/4x1 3/4x3/16	541	0.16	20.12	0.8	Pass	
T13	67.58 - 60	Bottom Girt	7/8	601	-0.70	17.63	4.0	Pass	
T14	60 - 52.42	Bottom Girt	L1 3/4x1 3/4x3/16	644	0.19	20.12	1.0	Pass	
T16	47.58 - 40	Bottom Girt	7/8	705	-0.36	17.63	2.1	Pass	
T17	40 - 20	Bottom Girt	7/8	745	0.18	27.06	0.7	Pass	
T1	200 - 180	Mid Girt	7/8	12	-0.00	17.63	0.0	Pass	
T3	172.42 - 167.58	Mid Girt	7/8	107	0.12	27.06	0.4	Pass	
T6	152.42 - 147.58	Mid Girt	7/8	209	0.22	27.06	0.8	Pass	
T8	140 - 120	Mid Girt	7/8	280	0.26	27.06	1.0	Pass	
T9	120 - 100	Mid Girt	7/8	382	0.45	27.06	1.7	Pass	
T10	100 - 80	Mid Girt	7/8	484	0.06	27.06	0.2	Pass	
T12	72.42 - 67.58	Mid Girt	7/8	580	0.11	27.06	0.4	Pass	
T15	52.42 - 47.58	Mid Girt	7/8	683	0.14	27.06	0.5	Pass	
T17	40 - 20	Mid Girt	7/8	749	0.29	27.06	1.1	Pass	
T2	180 - 172.42	Guy A@179.667	7/16	939	7.19	12.48	57.6	Pass	
T9	120 - 100	Guy A@119.667	9/16	942	11.06	21.00	52.6	Pass	
T14	60 - 52.42	Guy A@59.6667	7/16	945	5.28	12.48	42.3	Pass	
T2	180 - 172.42	Guy B@179.667	7/16	938	7.15	12.48	57.3	Pass	
T9	120 - 100	Guy B@119.667	9/16	941	11.01	21.00	52.4	Pass	
T14	60 - 52.42	Guy B@59.6667	7/16	944	5.20	12.48	41.7	Pass	
T2	180 - 172.42	Guy C@179.667	7/16	937	7.00	12.48	56.1	Pass	
T9	120 - 100	Guy C@119.667	9/16	940	10.69	21.00	50.9	Pass	
T14	60 - 52.42	Guy C@59.6667	7/16	943	5.06	12.48	40.6	Pass	
T2	180 - 172.42	Top Guy	2x1/4	66	2.50	16.20	15.4	Pass	
		Pull-Off@179.667							
T9	120 - 100	Top Guy	2x1/4	378	4.94	16.20	30.5	Pass	
		Pull-Off@119.667							
T14	60 - 52.42	Top Guy	2x1/4	642	2.76	16.20	17.0	Pass	
		Pull-Off@59.6667							
							Summary		
							Leg (T5)	99.5	Pass
							Diagonal (T8)	65.0	Pass
							Horizontal (T5)	6.1	Pass
							Top Girt (T20)	9.8	Pass
							Bottom Girt (T8)	9.3	Pass
							Mid Girt (T9)	1.7	Pass
							Guy A (T2)	57.6	Pass
							Guy B (T2)	57.3	Pass
							Guy C (T2)	56.1	Pass
							Top Guy	30.5	Pass
							Pull-Off (T9)		
							RATING =	99.5	Pass

<i>tnxTower</i> <i>Centek Engineering Inc.</i> <i>63 2 North Branford Rd.</i> Saybrook_Ct Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job 21022.34 CT11335B Bokum Road	Page 69 of 69
	Project 200-ft Guyed Tower -156 Bokum Street - Old Saybrook, CT	Date 13:15:20 11/29/21
	Client T-Mobile	Designed by TJL

Guyed Tower Base Foundation:

Input Data:

Tower Data

Shear Force = Shear := 1-kip (User Input from tnxTower)
 Axial Force = Axial := 67-kip (User Input from tnxTower)
 Tower Height = $H_t := 200\text{-ft}$ (User Input)

Footing Data:

Overall Depth of Footing = $D_f := 3.5\text{-ft}$ (User Input)
 Length of Pier = $L_p := 5\text{-ft}$ (User Input)
 Extension of Pier Above Grade = $L_{pag} := 1.5\text{-ft}$ (User Input)
 Width of Pier = $W_p := 3.0\text{-ft}$ (User Input)
 Thickness of Footing = $T_f := 2\text{-ft}$ (User Input)
 Width of Footing = $W_{f1} := 4.5\text{-ft}$ (User Input)
 Length of Footing = $W_{f2} := 4.5\text{-ft}$ (User Input)

Material Properties:

Concrete Compressive Strength = $f_c := 3000\text{-psi}$ (User Input)
 Steel Reinforcement Yield Strength = $f_y := 60000\text{-psi}$ (User Input)
 Internal Friction Angle of Soil = $\Phi_s := 30\text{-deg}$ (User Input)
 Ultimate Soil Bearing Capacity = $q_s := 8000\text{-psf}$ (User Input)
 Unit Weight of Soil = $\gamma_{soil} := 110\text{-pcf}$ (User Input)
 Unit Weight of Concrete = $\gamma_{conc} := 150\text{-pcf}$ (User Input)
 Foundation Bouyancy = Bouyancy := 0 (User Input) (Yes=1 / No=0)
 Depth to Neglect = $n := 0\text{-ft}$ (User Input)
 Cohesion of Clay Type Soil = $c := 0\text{-ksf}$ (User Input) (Use 0 for Sandy Soil)
 Seismic Zone Factor = $Z := 2$ (User Input)
 Coefficient of Friction Between Concrete = $\mu := 0.45$ (User Input)

Calculated Factors:

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Load Factor = $LF := \begin{cases} 1.333 & \text{if } H_t \leq 700\text{-ft} \\ 1.7 & \text{if } H_t \geq 1200\text{-ft} \\ 1.333 + \left(\frac{H_t - 700\text{ft}}{1200\text{ft} - 700\text{ft}} \right) \cdot 0.4 & \text{otherwise} \end{cases} = 1.333$

Stability of Footing:

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

Adjusted Soil Unit Weight = $\gamma_s := \text{if}(\text{Bouyancy} = 1, \gamma_{\text{soil}} - 62.4\text{pcf}, \gamma_{\text{soil}}) = 110\text{-pcf}$

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

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 0.495\text{-ksf}$

$P_{top} := \text{if}[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.495\text{-ksf}$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.155\text{-ksf}$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.825\text{-ksf}$

$T_p := \text{if}[n < (D_f - T_f), T_f, (D_f - n)] = 2$

$A_p := W_{f1} \cdot T_p = 9$

Soil Shear Resistance = $Sl_1 := P_{ave} \cdot A_p = 7.43\text{-kip}$

Weight of Concrete = $WT_c := [(W_{f1} \cdot W_{f2} \cdot T_f) + W_p^2 \cdot L_p] \cdot \gamma_c = 12.82\text{-kip}$

Total Weight = $WT_{tot} := WT_c + \text{Axial} = 79.83\text{-kip}$

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 35.92\text{-kips}$

Total Sliding Resistance = $Sl_{tot} := Sl_1 + Sl_2 = 43.35\text{-kips}$

Sliding Resistance Ratio = $\text{Sliding_Resistance_ratio} := \frac{0.75Sl_{tot}}{\text{Shear}} = 32.51$

$\text{Sliding_Resistance_Check} := \text{if}\left[\left(\frac{\text{Shear}}{0.75Sl_{tot}} < 1.0\right), \text{"Okay"}, \text{"No Good"}\right]$

Sliding_Resistance_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_{f1} \cdot W_{f2} = 20.25$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} = 3.94\text{-ksf}$

$\text{Max_Pressure_Check} := \text{if}(P_{max} < 0.6q_s, \text{"Okay"}, \text{"No Good"})$

Max_Pressure_Check = "Okay"

Job : T-Mobile - CT11335B: 200-ft Guyed Lattice Tower
 Address: 156 Bokum Road Old Saybrook, CT
 Description: Guy Anchor Evaluation

Project No. 21022.34
 Computed by TJL
 Checked by CFC

Sheet 1 of 2
 Date 11/29/21
 Date

CHECK UPLIFT RESISTANCE

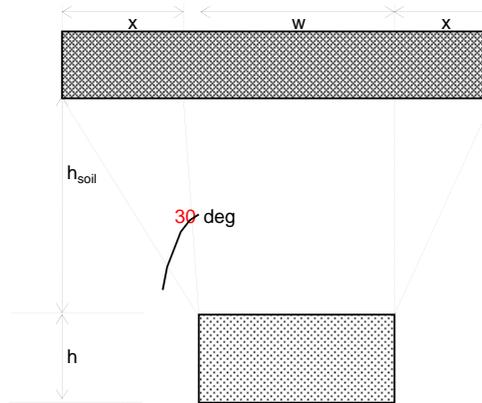
ANCHOR LOCATION 1

RESULTS FROM COMPUTER ANALYSIS:

Uplift = 15 kips
 Sliding = 17 kips
 Wdepth = 10 ft

CONCRETE PARAMETERS:

$\gamma_{conc} = 150$ pcf
 $\gamma_{conc.sub} = 87.6$ pcf
 $w = 5$ ft
 $h = 2.5$ ft
 $d = 9$ ft
 Vol. = 112.50 ft³
 Vol.sub = 0.00 ft³
 $Wc = 16.88$ kips
 $\emptyset = 0.90$
 15.19



Foundation Section

SOIL PARAMETERS:

$\gamma_{soil} = 100$ pcf
 $\gamma_{soil.sub} = 37.6$ pcf
 $h_{soil} = 2.5$ ft
 $x = 1.44$ ft

Soil Weight (Wr):

B1 = 45.00
 B2 = 45.00
 B3 = 93.75

W.soil = 16.97 kips
 W.soil.sub = 0.00 kips
 Total = 16.97 kips
 $\emptyset = 0.75$
 12.73

SF AGAINST UPLIFT

1.86 > 1 OK

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

Job : T-Mobile - CT11335B: 200-ft Guyed Lattice Tower
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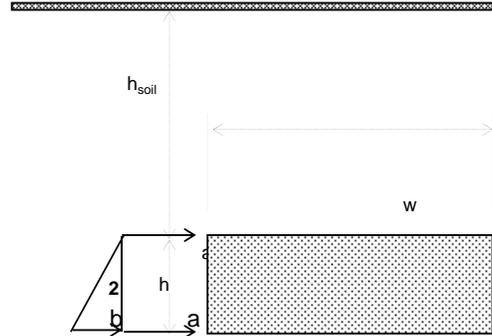
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma_{soil} = 100$ pcf
 $\gamma_{soil} = 37.6$ pcf
 $h_{soil} = 2.5$ ft
 $h = 2.5$ ft
 $\phi = 30$ degrees

ANCHOR PARAMETERS

$w = 5.0$ ft
 $h = 2.5$ ft
 $d = 9.0$ ft



Foundation Elevation View

$K_p = 3.00$

HORIZONTAL FORCES

RESIST TO SLIDING =

0.75 ksf
 1.50 ksf
 25.31 k

SOIL & CONCRETE WEIGHT =
UPLIFT REACTIONS =
SUM =

$W_r + W_c = 27.92$ k
 -15 k

 12.92 k

COEF. OF FRICTION, (0.45) =
RESIST TO SLIDING =
SUM =

5.81 k
 25.31 k

 31.13 k

SF AGAINST SLIDING

$SF = 1.8 > 1$ **OK**

GUY ANCHORS AGAINST SLIDING NEED REINFORCEMENT

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 Address: 156 Bokum Road Old Saybrook, CT
 Description: Guy Anchor Evaluation

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CHECK UPLIFT RESISTANCE

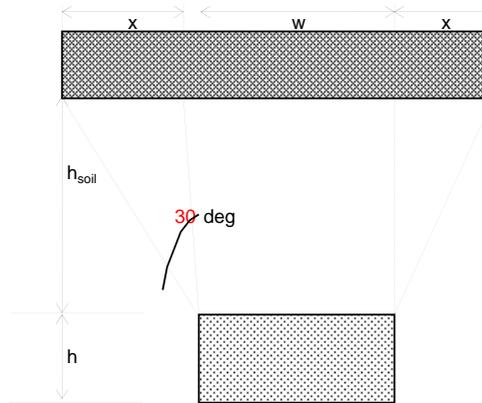
ANCHOR LOCATION 2

RESULTS FROM COMPUTER ANALYSIS:

Uplift = 15 kips
 Sliding = 17 kips
 Wdepth = 10 ft

CONCRETE PARAMETERS:

$\gamma_{conc} = 150$ pcf
 $\gamma_{conc.sub} = 87.6$ pcf
 $w = 6$ ft
 $h = 1.25$ ft
 $d = 12$ ft
 Vol. = 90.00 ft³
 Vol.sub = 0.00 ft³
 $Wc = 13.50$ kips
 $\emptyset = 0.90$
 12.15



Foundation Section

SOIL PARAMETERS:

$\gamma_{soil} = 100$ pcf
 $\gamma_{soil.sub} = 37.6$ pcf
 $h_{soil} = 2.75$ ft
 $x = 1.59$ ft

Soil Weight (Wr):

B1 = 72.00
 B2 = 72.00
 B3 = 139.24

W.soil = 28.54 kips
 W.soil.sub = 0.00 kips
 Total = 28.54 kips
 $\emptyset = 0.75$
 21.41

SF AGAINST UPLIFT

2.24 > 1 OK

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

Job : T-Mobile - CT11335B: 200-ft Guyed Lattice Tower
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 Description: Guy Anchor Evaluation

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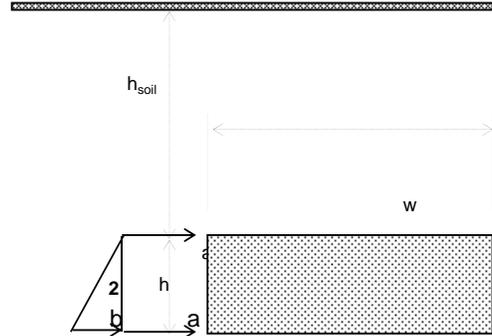
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma_{soil} = 100$ pcf
 $\gamma_{soil} = 37.6$ pcf
 $h_{soil} = 2.75$ ft
 $h = 1.25$ ft
 $\phi = 30$ degrees

ANCHOR PARAMETERS

$w = 6.0$ ft
 $h = 1.3$ ft
 $d = 12.0$ ft



Foundation Elevation View

$K_p = 3.00$

HORIZONTAL FORCES

RESIST TO SLIDING =

0.83 ksf
 1.20 ksf
 15.19 k

SOIL & CONCRETE WEIGHT =
UPLIFT REACTIONS =
SUM =

$W_r + W_c = 33.56$ k
 -15 k
18.56 k

COEF. OF FRICTION, (0.45) =
RESIST TO SLIDING =
SUM =

8.35 k
 15.19 k
23.54 k

SF AGAINST SLIDING

SF = 1.4 > 1 OK

GUY ANCHORS AGAINST SLIDING NEED REINFORCEMENT

Job : T-Mobile - CT11335B: 200-ft Guyed Lattice Tower
 Address: 156 Bokum Road Old Saybrook, CT
 Description: Guy Anchor Evaluation

Project No. 21022.34
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CHECK UPLIFT RESISTANCE

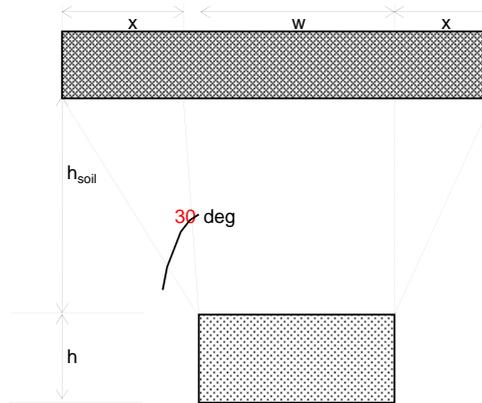
ANCHOR LOCATION 3

RESULTS FROM COMPUTER ANALYSIS:

Uplift = 15 kips
 Sliding = 17 kips
 Wdepth = 10 ft

CONCRETE PARAMETERS:

$\gamma_{conc} = 150$ pcf
 $\gamma_{conc.sub} = 87.6$ pcf
 $w = 6$ ft
 $h = 3.5$ ft
 $d = 10$ ft
 Vol. = 210.00 ft³
 Vol.sub = 0.00 ft³
 $Wc = 31.50$ kips
 $\emptyset = 0.90$
 28.35



Foundation Section

SOIL PARAMETERS:

$\gamma_{soil} = 100$ pcf
 $\gamma_{soil.sub} = 37.6$ pcf
 $h_{soil} = 0.25$ ft
 $x = 0.14$ ft

Soil Weight (Wr):

B1 = 60.00
 B2 = 60.00
 B3 = 64.70

W.soil = 1.56 kips
 W.soil.sub = 0.00 kips
 Total = 1.56 kips
 $\emptyset = 0.75$
 1.17

SF AGAINST UPLIFT

1.97 > 1 OK

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

Job : T-Mobile - CT11335B: 200-ft Guyed Lattice Tower
 Address: 156 Bokum Road Old Saybrook, CT
 Description: Guy Anchor Evaluation

Project No. 21022.34
 Computed by TJL
 Checked by CFC

Sheet 2 of 2
 Date 11/29/21
 Date

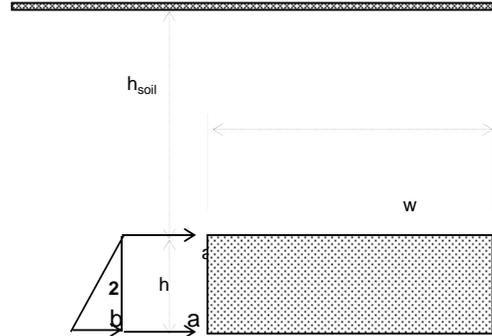
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma_{soil} = 100$ pcf
 $\gamma_{soil} = 37.6$ pcf
 $h_{soil} = 0.25$ ft
 $h = 3.5$ ft
 $\phi = 30$ degrees

ANCHOR PARAMETERS

$w = 6.0$ ft
 $h = 3.5$ ft
 $d = 10.0$ ft



Foundation Elevation View

$K_p = 3.00$

HORIZONTAL FORCES

RESIST TO SLIDING =

0.08 ksf
 1.13 ksf
 21.00 k

SOIL & CONCRETE WEIGHT =
UPLIFT REACTIONS =
SUM =

$W_r + W_c = 29.52$ k
 -15 k
14.52 k

COEF. OF FRICTION, (0.45) =
RESIST TO SLIDING =
SUM =

6.53 k
 21.00 k
27.53 k

SF AGAINST SLIDING

$SF = 1.6 > 1$ **OK**

GUY ANCHORS AGAINST SLIDING NEED REINFORCEMENT

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 1 - Site Information

Site ID: CT11335B
Status: Draft
Version: 6
Project Type: L600
Approved: Not Approved
Approved By: Not Approved
Last Modified: 9/10/2021 2:40:32 PM
Last Modified By: Richard.Kane@sprint.com

Site Name: Old Saybrook/RT 9
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2022
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: <undefined>

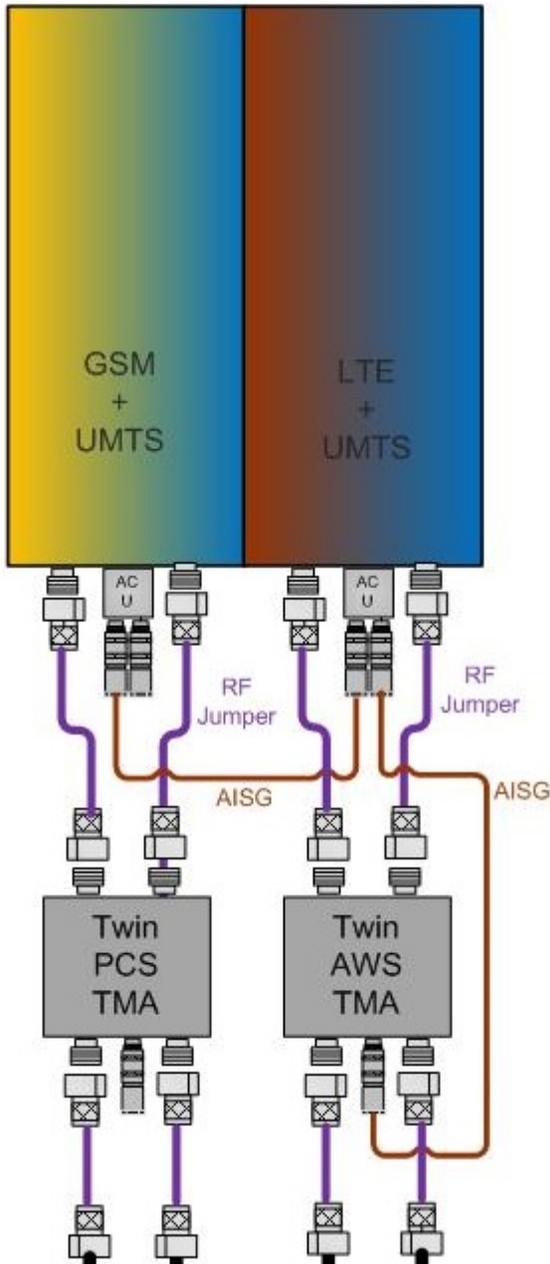
Latitude: 41.32810900
Longitude: -72.38876800
Address: 156 Bokum Road
City, State: Old Saybrook, CT
Region: NORTHEAST

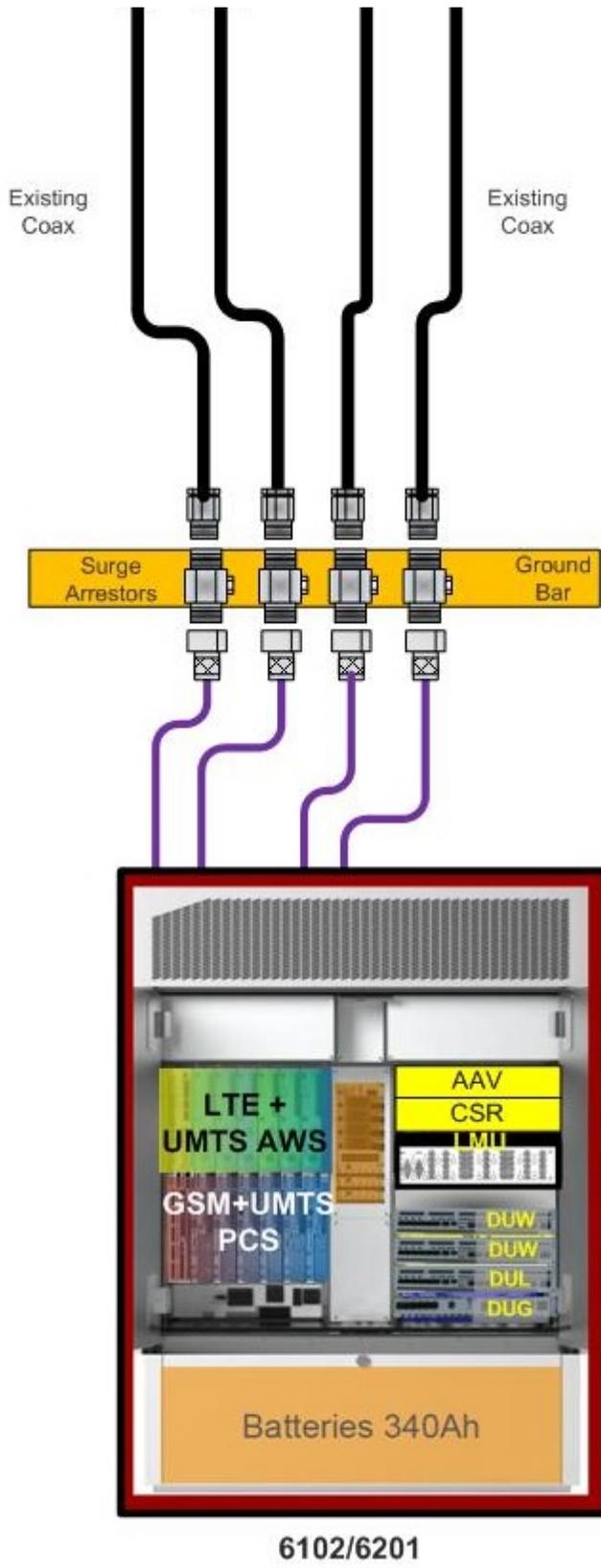
RAN Template: 67E998E 6160		AL Template: 67E998E_10P+1QP		
Sector Count: 3	Antenna Count: 6	Coax Line Count: 0	TMA Count: 0	RRU Count: 6

Section 2 - Existing Template Images

4B_1QP.jpg

Site Configuration 4B_1Q – with 6102/6201

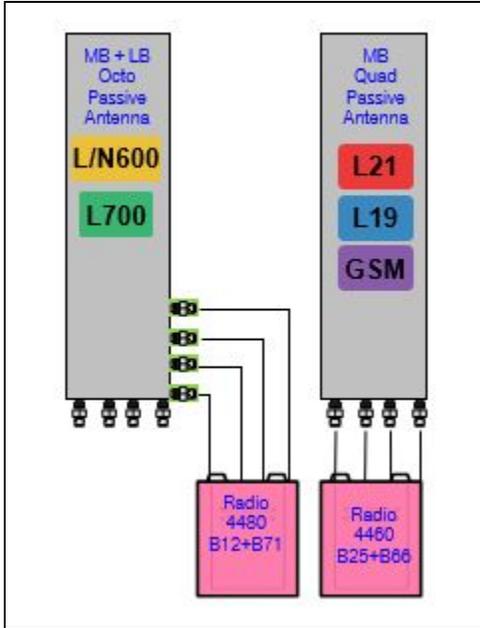




Notes:

Section 3 - Proposed Template Images

67E998E.JPG



DRAFT

Notes:

Section 4 - Siteplan Images

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

DRAFT

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 5 - RAN Equipment

Existing RAN Equipment

Template: 94E

Enclosure	1			
Enclosure Type	RBS 6102			
Baseband	DUW30 U2100	DUG20 G1900	BB 5216 L1900 L2100	
Radio	RUS01 B2 (x 3) L1900	RUS01 B2 (x 3) L1900 G1900	RUS01 B4 (x 3) U2100	RUS01 B4 (x 3) L2100

Proposed RAN Equipment

Template: 67E998E 6160

	1	2	3
Enclosure	1	2	3
Enclosure Type	Enclosure 6160	B160	RBS 6601
Baseband	BB 6648 L700 L600 N600 BB 6648 L2100 L1900		DUG20 G1900
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m (x 3)		
Transport System	CSR IXRe V2 (Gen2)		

RAN Scope of Work:

upgrade 200A
No Generator

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 6 - A&L Equipment

Existing Template: 94E_1QP
Proposed Template: 67E998E_10P+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	50	
M. Tilt		
Height	167	
Ports	P1	P2
Active Tech.	L1900 G1900	U2100 L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	7/8" Coax - 200 ft. (x2)	7/8" Coax - 200 ft. (x2)
TMA's	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		

Unconnected Equipment:

Scope of Work:

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1			2		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			RFS - APX16DWW-16DWW-S-E-A20 (Quad)		
Azimuth	50			50		
M. Tilt						
Height	155			167		
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600			L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5			2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)			Coax Jumper (x2)	Coax Jumper (x2)
TMA's						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						

Unconnected Equipment:

Scope of Work:

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

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 2 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	160	
M. Tilt		
Height	167	
Ports	P1	P2
Active Tech.	L1900 G1900	U2100 L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	7/8" Coax - 200 ft. (x2)	7/8" Coax - 200 ft. (x2)
TMA's	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 2 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1			2		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			RFS - APX16DWW-16DWW-S-E-A20 (Quad)		
Azimuth	160			160		
M. Tilt						
Height	155			167		
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600			L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5			2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)			Coax Jumper (x2)	Coax Jumper (x2)
TMA's						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						
Unconnected Equipment:						
Scope of Work:						

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

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 3 (Existing) view from behind		
Coverage Type	A - Outdoor Macro	
Antenna	1	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)	
Azimuth	320	
M. Tilt		
Height	167	
Ports	P1	P2
Active Tech.	L1900 G1900	U2100 L2100
Dark Tech.		
Restricted Tech.		
Decomm. Tech.		
E. Tilt	2	2
Cables	7/8" Coax - 200 ft. (x2)	7/8" Coax - 200 ft. (x2)
TMAs	Generic Twin Style 1A - PCS (AtAntenna)	Generic Twin Style 1B - AWS (AtAntenna)
Diplexers / Combiners		
Radio		
Sector Equipment		
Unconnected Equipment:		
Scope of Work:		

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Sector 3 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1			2		
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)			RFS - APX16DWV-16DWV-S-E-A20 (Quad)		
Azimuth	320			320		
M. Tilt						
Height	155			167		
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600			L2100 L1900 G1900	L2100 L1900 G1900
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5			2	2
Cables	Coax Jumper (x2)	Coax Jumper (x2)			Coax Jumper (x2)	Coax Jumper (x2)
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)			Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)
Sector Equipment						
Unconnected Equipment:						
Scope of Work:						

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

RAN Template: 67E998E 6160	A&L Template: 67E998E_10P+1QP
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Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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Proposed Power Systems Equipment

Enclosure

1

Enclosure Type

Enclosure 6160

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

T-Mobile Existing Facility

Site ID: CT11335B

Old Saybrook/RT 9
156 Bokum Road
Old Saybrook, Connecticut 06475

December 16, 2021

EBI Project Number: 6221007676

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	6.28%

December 16, 2021

T-Mobile

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

Emissions Analysis for Site: CT11335B - Old Saybrook/RT 9

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **156 Bokum Road in Old Saybrook, 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ 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 ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is $1000 \mu\text{W}/\text{cm}^2$. 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 156 Bokum Road in Old Saybrook, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 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) 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.
- 8) 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.
- 9) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 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.
- 10) The antenna mounting height centerlines of the proposed antennas are 167 and 155 feet above ground level (AGL).
- 11) 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.
- 12) All calculations were done with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	155 feet	Height (AGL):	155 feet	Height (AGL):	155 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A1 MPE %:	1.60%	Antenna B1 MPE %:	1.60%	Antenna C1 MPE %:	1.60%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APX16DWWV-16DWWV-S-E-A20	Make / Model:	RFS APX16DWWV-16DWWV-S-E-A20	Make / Model:	RFS APX16DWWV-16DWWV-S-E-A20
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd
Height (AGL):	167 feet	Height (AGL):	167 feet	Height (AGL):	167 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	14,005.63	ERP (W):	14,005.63	ERP (W):	14,005.63
Antenna A2 MPE %:	1.94%	Antenna B2 MPE %:	1.94%	Antenna C2 MPE %:	1.94%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	3.54%
Verizon	0.9%
AT&T	1.84%
Site Total MPE % :	6.28%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	3.54%
T-Mobile Sector B Total:	3.54%
T-Mobile Sector C Total:	3.54%
Site Total MPE % :	6.28%

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 ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 600 MHz LTE	2	591.73	155.0	1.92	600 MHz LTE	400	0.48%
T-Mobile 600 MHz NR	1	1577.94	155.0	2.56	600 MHz NR	400	0.64%
T-Mobile 700 MHz LTE	2	695.22	155.0	2.25	700 MHz LTE	467	0.48%
T-Mobile 1900 MHz GSM	4	1167.14	167.0	6.48	1900 MHz GSM	1000	0.65%
T-Mobile 1900 MHz LTE	2	2334.27	167.0	6.48	1900 MHz LTE	1000	0.65%
T-Mobile 2100 MHz LTE	2	2334.27	167.0	6.48	2100 MHz LTE	1000	0.65%
						Total:	3.54%

• 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:	3.54%
Sector B:	3.54%
Sector C:	3.54%
T-Mobile Maximum MPE % (Sector A):	3.54%
Site Total:	6.28%
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **6.28%** 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.