10 Industrial Avenue,
Suite 3
Mahwah, NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 14, 2020

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
818 Providence Pike, Killingly, CT
Latitude: 41.791417
Longitude: -72.822361
T-Mobile Site#: CT11156A/ Anchor

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 140-foot level of the existing 190-foot guyed-lattice tower at 818 Providence Pike, Killingly, CT. The 190-foot guyed-lattice tower and underlying property is owned by Quinebaug Valley Emergency Communications Inc. T-Mobile now intends to add three (3) new 2500 MHz antennas. The new antennas would be installed at the 140-foot level of the tower.

Planned Modifications:

Remove:
TMAs:
(3) Generic Twin 1A TMAs
Coax Cables:
(6) 1-5/8" coax cables

Install New:
Antennas:
(3) Air6449 B41- 2500 MHz / 2500 MHz
RRUs:
(3) Radio 4425 B66A , (3) Radio 4424 B25
Coax Cables:
(3) 6x12 Hybrid cable

Existing to Remain:
Antennas:
(3) RFS APX16DWV-16DWVS- 1900 MHz / 1900 MHz
(3) RFS APXVAARR24-4-U-NA20 - 600 MHz / 700 MHz antenna
RRUs:
(3) Radio 4449 B71+ B12

Ground:
Add (1) Battery cabinet, (1) enclosure to contain (3) BB6630 for L2500 and (1) BB6648 for N2500 on new slab

This facility was approved by the Killingly Planning and Zoning Commission, however, after corresponding with the Town Planner, the Planner has not been able to find records of the approval on file in her department. Subsequent exempt modifications have been approved by the Siting Council to this facility, with no record of conditions that would restrict exempt modifications. Therefore, this modification complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Jonathan Cesolini, Chairman, Councilor at Large for the Town of Killingly as well as Ann-Marie Aubrey, Director, Planning and Development for the Town of Killingly and Quinebaug Valley Emergency Communications Inc., tower and property owner

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

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

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

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

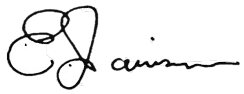
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

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

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

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

Sincerely,



Elizabeth Jamieson
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey 07430
860-605-7808
EJamieson@TranscendWireless.com

Cc:
Jonathan Cesolini, Chairman, Town of Killingly
Ann-Marie Aubrey, Director, Planning and Development, Town of Killingly
Quinebaug Valley Emergency Communications Inc, as tower and property owner.

Exhibit A

Original Facility Approval

ORIGINAL FACILITY APPROVAL WAS NOT ABLE TO BE OBTAINED.

AFTER CORRESPONDING WITH THE PLANNER IT APPEARS THERE WAS NO ACTUAL APPROVAL ON RECORD WITH THE DEPARTMENT

Exhibit B

Property card

tyler clt division

COMMERCIAL PROPERTY RECORD CARD 2018

TOWN OF KILLINGLY

Situs : 812 PROVIDENCE PIKE | **Map ID: 001389** | **Class: Charitable Organizations under :** | Card: 1 of 1 | Printed: December 5, 2018

CURRENT OWNER

QUINEBAUG VALLEY EMERGENCY
COMMUNICATIONS INC
1249 HARTFORD PIKE
KILLINGLY CT 06239

GENERAL INFORMATION

Living Units	
Neighborhood	112
Alternate Id	212-27
Vol / Pg	652/315
District	7
Zoning	RURAL DEVELOPMENT
Class	EXEMPT

Property Notes

COMMUNICATION TOWER 20X40 BLDG
& 1 SHELTER FOR QVEC THE OTHER
VERIZON - NOT EXEMPT 7200

Land Information

Type		Size	Influence Factors	Influence %	Value
Primary	AC	1.0000	Traffic	-10	16,200

Total Acres: 1
Spot: Location:

Assessment Information

	Assessed	Appraised	Cost	Income	Market
Land	11,340	16,200	16,200	0	0
Building	129,430	184,900	184,900	0	0
Total	140,770	201,100	201,100	0	0

Manual Override Reason
Base Date of Value 10/01/2018
Value Flag COST APPROACH **Effective Date of Value** 10/01/2018
TOWER ON SLAB 20000

Entrance Information

Date	ID	Entry Code	Source
06/19/12	DB	Complete	Other

Permit Information

Date Issued	Number	Price	Purpose		% Complete
01/24/18	25795	15,000	97 BPP	Repl 6 Antenna Panels W/New Mo	995
03/03/17	25119	500	BLDG	Nvc Set 1000g A/G Lp Tank & U/G	997
02/28/17	25111	21,000	81 CELE	Supply & Install 1 New Propane Ge	997
05/15/15	23589	3,000	BLDG	Nvc Install 1000 Gal A/G Lp Tank &	997
05/07/15	23567	15,000	72 CREN	Modification Of Existing Telecomm	997

Sales/Ownership History

Transfer Date	Price	Type	Validity	Deed Reference	Deed Type	Grantee
04/01/96	15,000	Land Only				

Inspection Witnessed By _____

tyler
clt division

COMMERCIAL PROPERTY RECORD CARD 2018

TOWN OF KILLINGLY

Situs : 812 PROVIDENCE PIKE	Parcel Id: 001389	Class: Charitable Organizations under :	Card: 1 of 1	Printed: December 5, 2018

Building Information

Year Built/Eff Year	/
Building #	
Structure Type	
Identical Units	
Total Units	
Grade	
# Covered Parking	
# Uncovered Parking	
DBA	

Building Other Features

Line	Type	+/-	Meas1	Meas2	# Stops	Ident Units	Line	Type	+/-	Meas1	Meas2	# Stops	Ident Units

Interior/Exterior Information

Line	Level From - To	Int Fin	Area	Perim	Use Type	Wall Height	Ext Walls	Construction	Partitions	Heating	Cooling	Plumbing	Physical	Functional

Interior/Exterior Valuation Detail

Line	Area	Use Type	% Good	% Complete	Use Value/RCNLD

Outbuilding Data

Line	Type	Yr Blt	Meas1	Meas2	Qty	Area	Grade	Phy	Fun	Value
1	Mas Garage	2000	20	40	1	800	D	A		14,280
2	Fence Chai	2000	1	4,000	1	4,000	C	3	3	5,280
3	Tow er Cell	2014	1	160	1	160	C	3	3	124,800
4	Gar-1s Stg	2015	12	25	1	300	C	3	3	9,870
5	Gar-1s Stg	2015	12	27	1	324	C	3	3	10,660

tyler clt division

COMMERCIAL PROPERTY RECORD CARD 2018

TOWN OF KILLINGLY

Situs : 812 PROVIDENCE PIKE	Parcel Id: 001389	Class: Charitable Organizations under :	Card: 1 of 1	Printed: December 5, 2018

Addtional Property Photos

tyler clt division

COMMERCIAL PROPERTY RECORD CARD 2018

TOWN OF KILLINGLY

Situs : 812 PROVIDENCE PIKE	Parcel Id: 001389	Class: Charitable Organizations under :	Card: 1 of 1	Printed: December 5, 2018

Income Detail (Includes all Buildings on Parcel)

Use Grp	Mod Type	Inc Mod	Model Description	Units	Net Area	Income Rate	Econ Adjust	Potential Gross Income	Vac Model	Vac Adj	Additional Income	Effective Gross Income	Expense Model %	Expense Adj %	Expense Adj	Other Expenses	Total Expenses	Net Operating Income

Apartment Detail - Building 1 of 1

Line	Use Type	Per Bldg	Beds	Baths	Units	Rent	Income

Building Cost Detail - Building 1 of 1

Total Gross Building Area	
Replace, Cost New Less Depr	
Percent Complete	100
Number of Identical Units	
Economic Condition Factor	
Final Building Value	
Value per SF	0.00

Notes - Building 1 of 1

Income Summary (Includes all Building on Parcel)

Total Gross Rent Area	
Total Gross Building Area	

812 Providence Pike

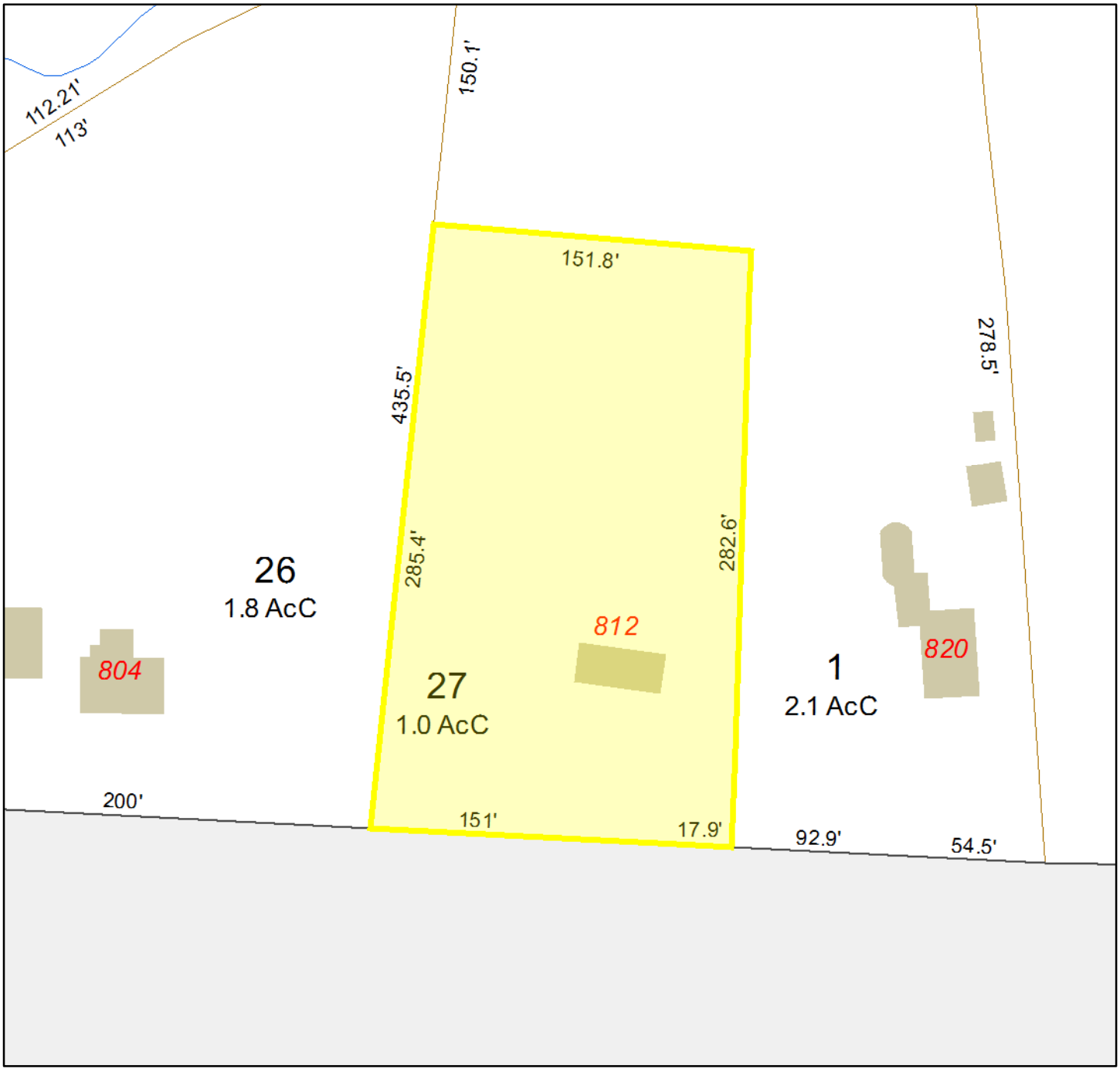
Killingly, CT

June 17, 2019

1 inch = 67 Feet

0 67 134 201

www.cai-tech.com



PROPERTYLINE
Right of Ways
ROAD
WATER
Buildings

Exhibit C

Construction Drawings

T-Mobile

WIRELESS COMMUNICATIONS FACILITY

KILLINGLY/MARGARET HENR1

SITE ID: CT11156A

818 PROVIDENCE PIKE

KILLINGLY, CT 06239

T-MOBILE RF CONFIGURATION

67D5998C_1xAIR+1QP+1OP

GENERAL NOTES

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

SITE DIRECTIONS

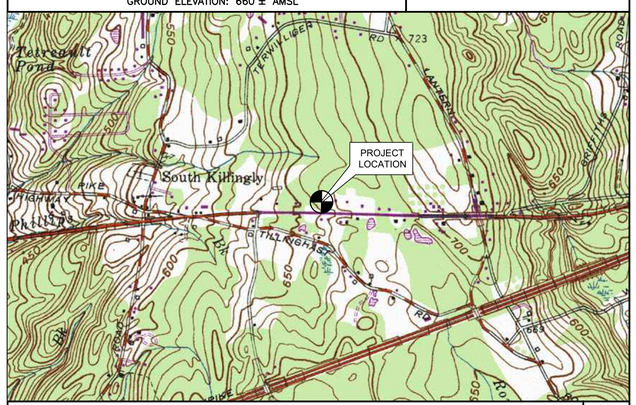
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 818 PROVIDENCE PIKE
KILLINGLY, CT 06239

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	TAKE THE 1ST RIGHT ONTO BLUE HILLS AVENUE EXT/CT-187. CONTINUE TO FOLLOW CT-187.	0.64 MI.
4.	STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	1.24 MI.
5.	TURN LEFT ONTO OLD WINDSOR RD/CT-305. CONTINUE TO FOLLOW CT-305.	2.33 MI.
6.	MERGE ONTO I-91 S TOWARD HARTFORD.	2.37 MI.
7.	MERGE ONTO I-291 E VIA EXIT 35A TOWARD MANCHESTER.	6.18 MI.
8.	MERGE ONTO I-84 E VIA THE EXIT ON THE LEFT TOWARD BOSTON.	15.35 MI.
9.	TAKE THE CT-74 EXIT, EXIT 69, TOWARD WILLINGTON/US-44.	0.32 MI.
10.	TURN RIGHT ONTO TOLLAND STAGE RD/CT-74. CONTINUE TO FOLLOW CT-74.	7.54 MI.
11.	TURN LEFT ONTO POMPEY HOLLOW RD/US-44 E. CONTINUE TO FOLLOW US-44 E.	11.89 MI.
12.	STAY STRAIGHT TO GO ONTO MASHAMOQUET RD/CT-101. CONTINUE TO FOLLOW CT-101.	4.83 MI.
13.	MERGE ONTO I-395 S TOWARD NORWICH.	3.57 MI.
14.	MERGE ONTO PROVIDENCE PIKE/US-6 E VIA EXIT 37A TOWARD PROVIDENCE.	3.22 MI.
15.	818 PROVIDENCE PIKE, DANIELSON, CT 06239-3901, 818 PROVIDENCE PIKE IS ON THE LEFT.	

SITE COORDINATES: LATITUDE: 41°-47'-29.14" N
LONGITUDE: 71°-49'-20.48" W
GROUND ELEVATION: 660'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

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

A. AT EQUIPMENT PAD

1. ADD (1) ENCLOSURE 6160
2. ADD (1) iXRE ROUTER
3. ADD (3) BB6630 FOR L2500
4. ADD (1) BB6648 FOR N2500
5. ADD (1) BATTERY CABINET B160
6. ADD 125A/2P BREAKER
7. INSTALL CONCRETE PAD AND ICE CANOPY FOR PROPOSED EQUIPMENT CABINETS.

B. AT EXISTING ANTENNA SECTORS

8. ADD (3) RADIO 4415 B66A
9. ADD (3) RADIO 4424 B25
10. REMOVE TMA'S
11. REMOVE ALL EXISTING COAX,
12. INSTALL (3) 6x12 HYBRIDS

PROJECT INFORMATION

SITE NAME:	KILLINGLY/MARGARET HENR1
SITE ID:	CT11156A
SITE ADDRESS:	818 PROVIDENCE PIKE KILLINGLY, CT 06239
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-47'-29.14" N LONGITUDE: 71°-49'-20.48" W GROUND ELEVATION: 660'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/01/20	RYS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless

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

T-MOBILE NORTHEAST LLC
WIRELESS COMMUNICATIONS FACILITY
KILLINGLY/MARGARET HENRI
SITE ID: CT11156A
818 PROVIDENCE PIKE
KILLINGLY, CT 06239

DATE: 05/20/20
SCALE: AS NOTED
JOB NO. 20074.28

TITLE SHEET

T-1

Sheet No. 1 of 8

NOTES AND SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

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

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
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18. THE CONTRACTOR SHALL CONTACT "DIG SAFE" (DIAL 811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
20. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
21. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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KILLINGLY/MARGARET HENRI

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818 PROVIDENCE PIKE
KILLINGLY, CT 06239

DATE:	05/20/20
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JOB NO.	20074.28

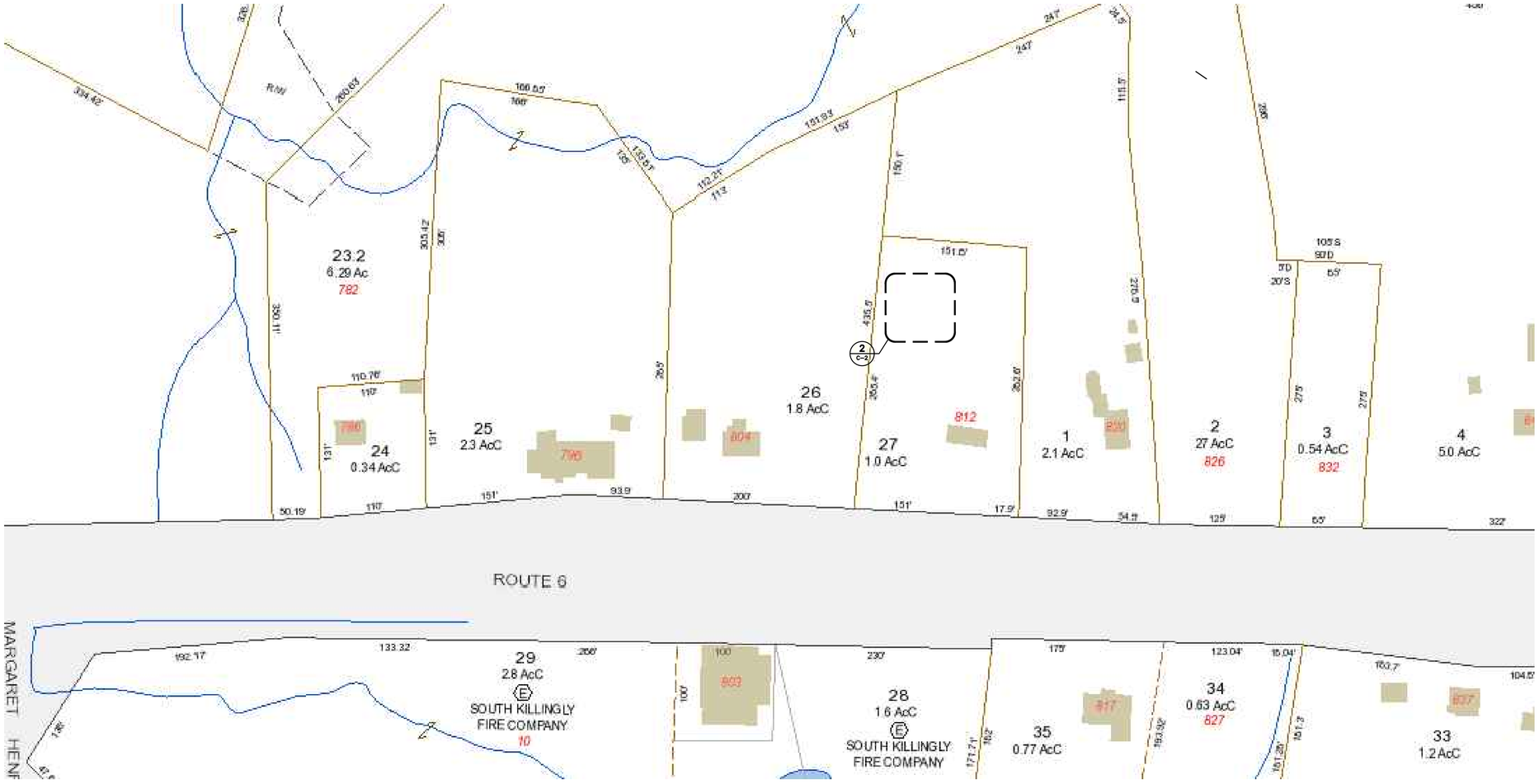
GENERAL NOTES AND SPECIFICATIONS

N-1

Sheet No. 2 of 8

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13.0 x 3.15	145'	90°	(P) RADIO 4424 B25 (1)		(1) 6x12 HCS (±165')
A2	EXISTING	RFS (APXVAARR24-43-U-NA20)	95.9 x 24.0 x 8.7	145'	90°	(P) RADIO 4415 B66A (1), (E) RADIO 4449 B71+B85 (1)		
A3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.5 x 8.3	145'	90°			
B1	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13.0 x 3.15	145'	200°	(P) RADIO 4424 B25 (1)		(1) 6x12 HCS (±165')
B2	EXISTING	RFS (APXVAARR24-43-U-NA20)	95.9 x 24.0 x 8.7	145'	200°	(P) RADIO 4415 B66A (1), (E) RADIO 4449 B71+B85 (1)		
B3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.5 x 8.3	145'	200°			
C1	EXISTING	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13.0 x 3.15	145'	315°	(P) RADIO 4424 B25 (1)		(1) 6x12 HCS (±165')
C2	EXISTING	RFS (APXVAARR24-43-U-NA20)	95.9 x 24.0 x 8.7	145'	315°	(P) RADIO 4415 B66A (1), (E) RADIO 4449 B71+B85 (1)		
C3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.5 x 8.3	145'	315°			



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

TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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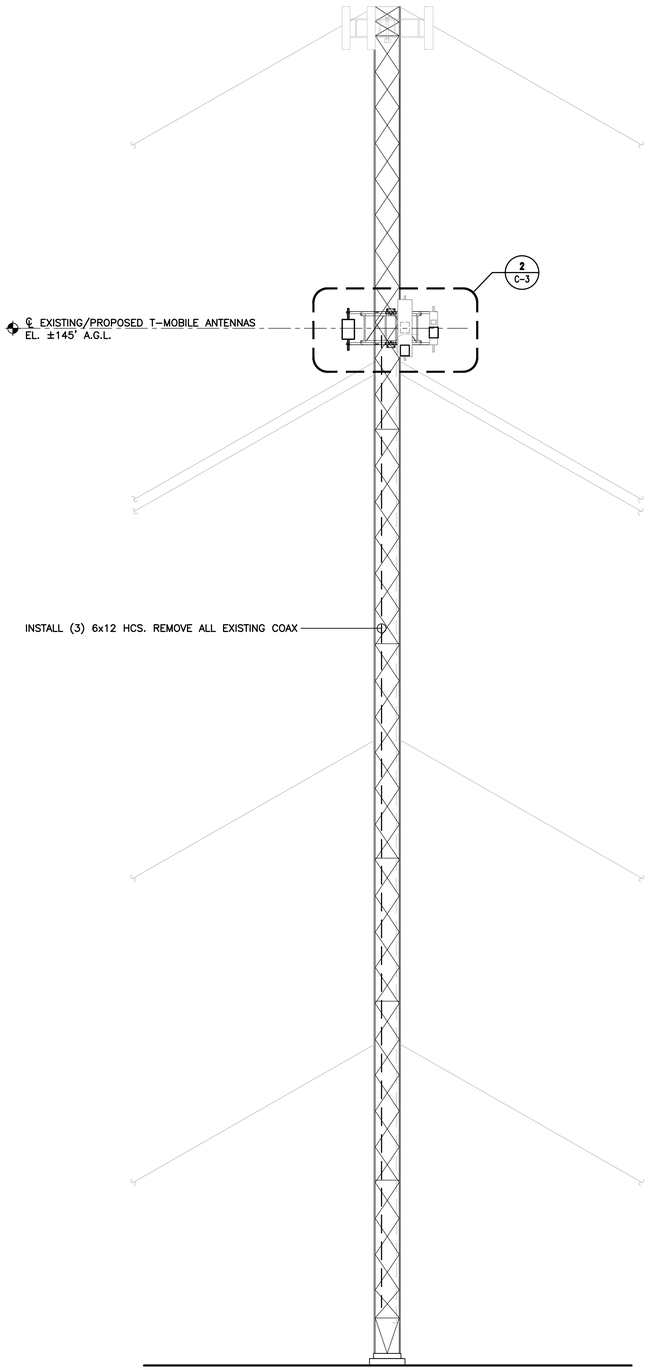
SITE LOCATION PLAN

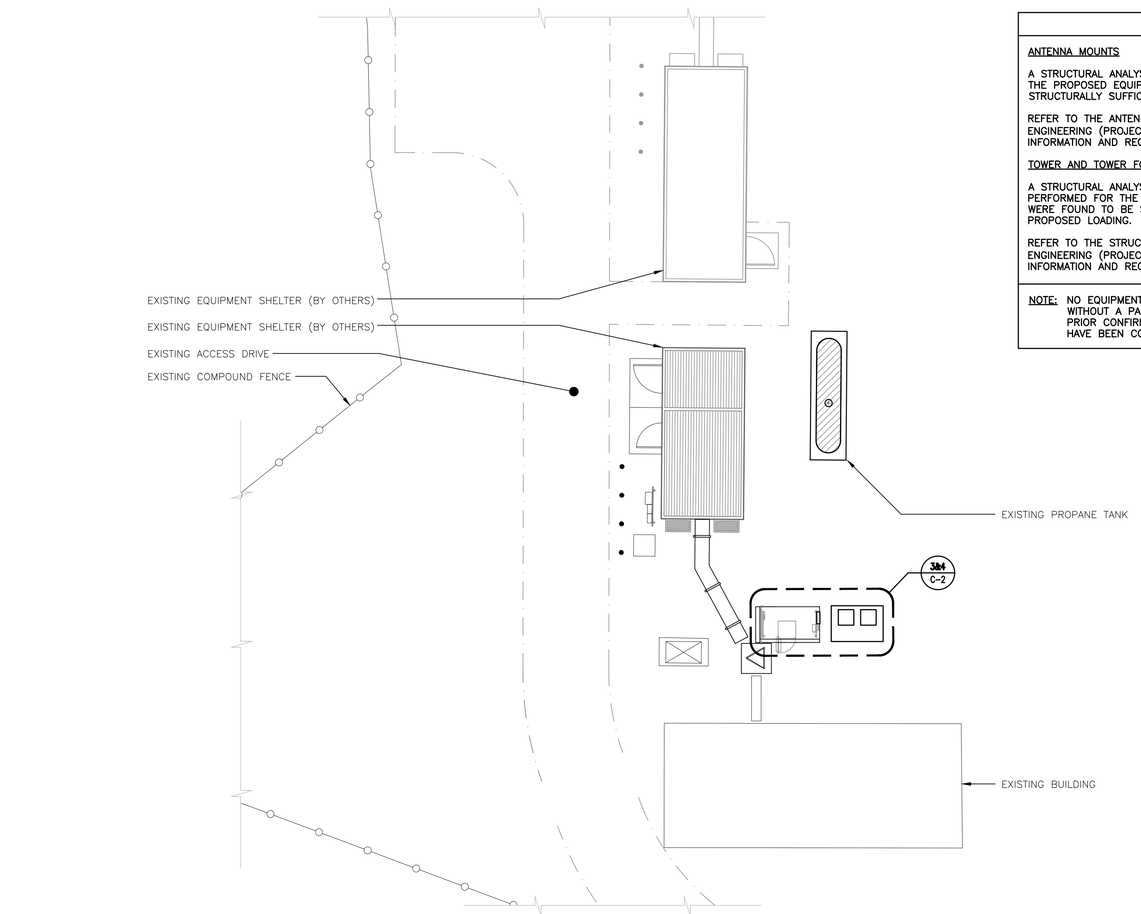
C-1

Sheet No. 3 of 8



1 C-2 **SOUTH ELEVATION - PROPOSED**
SCALE: 1" = 10'

GRAPHIC SCALE
10 0 5 10 20 40
1" = 10'-0"



2 C-2 **PATIAL COMPOUND PLAN - PROPOSED**
SCALE: 1" = 10'

APPROXIMATE 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.

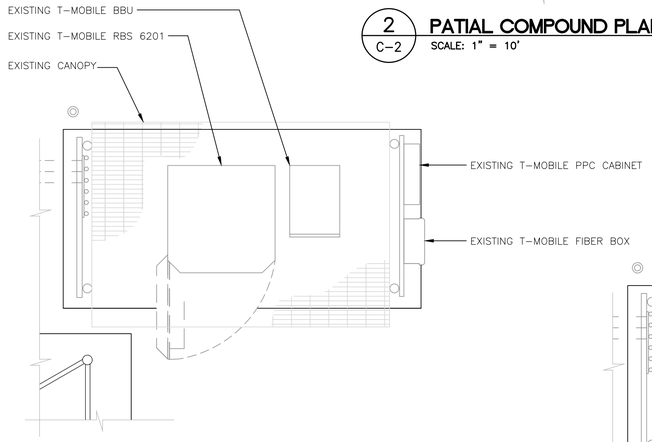
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.28) DATED 05/27/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

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

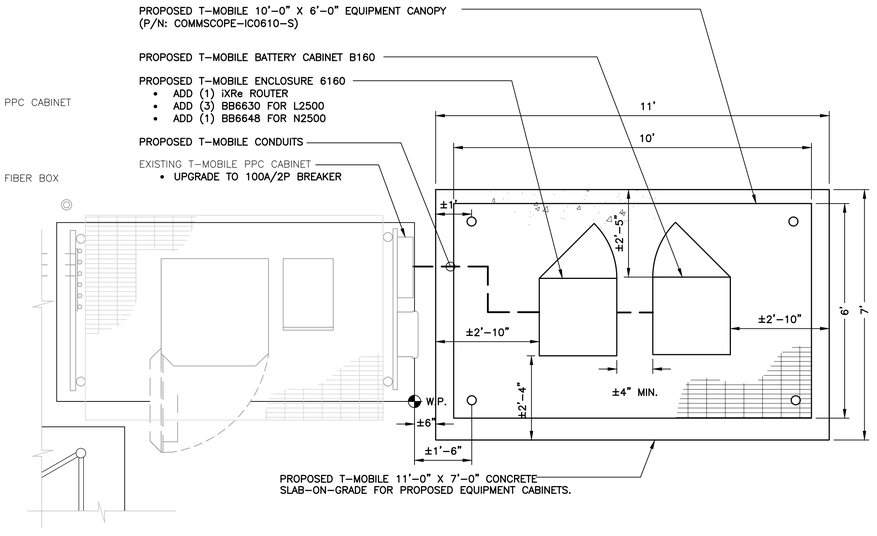
REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.28) DATED 05/27/20 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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



LEGEND

W.P. DENOTES WORKING POINT.



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

APPROXIMATE NORTH

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

APPROXIMATE NORTH

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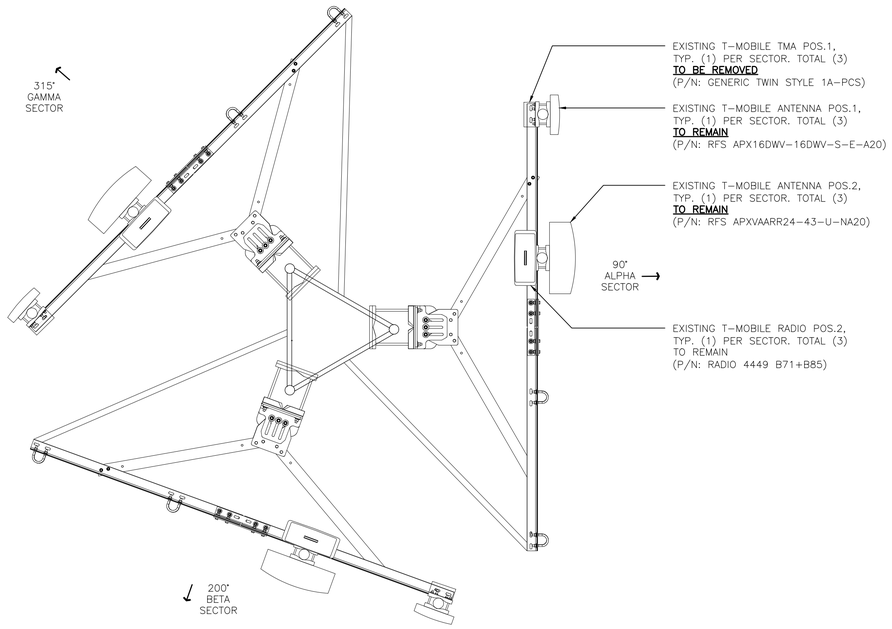
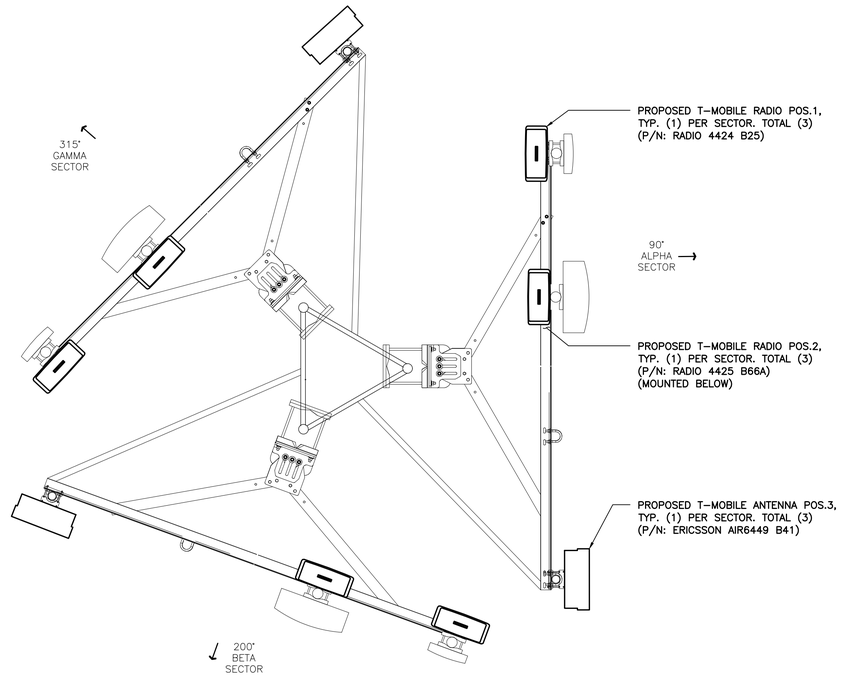
COMPOUND PLAN, EQUIPMENT PLAN, AND ELEVATION

C-2

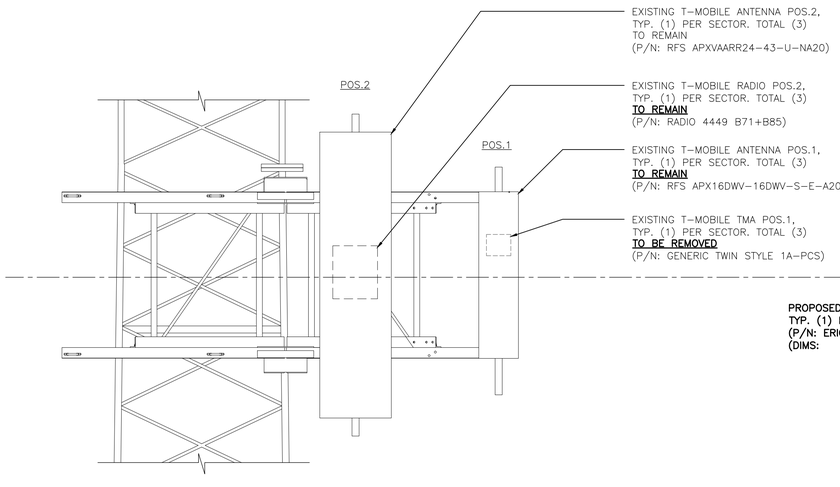
Sheet No. 4 of 8



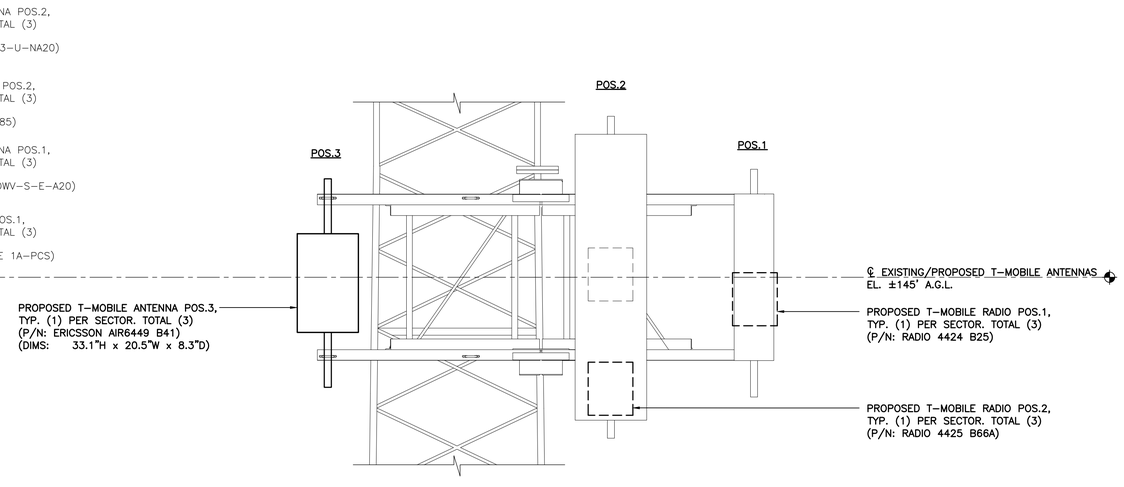
1 C-3 **EQUIPMENT AND ANTENNA PLAN - EXISTING**
SCALE: 1/2" = 1'



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



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



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

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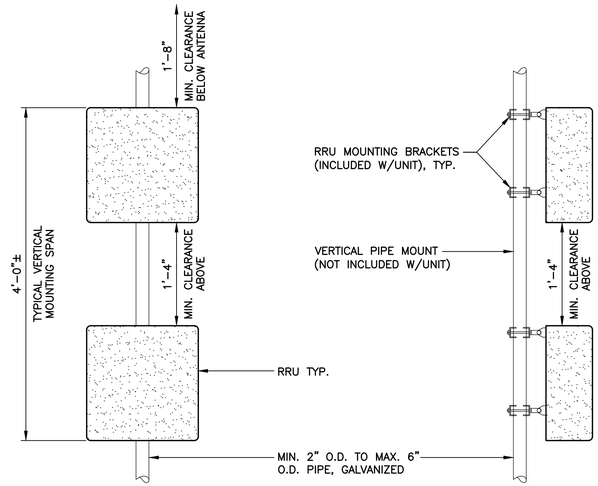
ANTENNA PLANS

C-3

Sheet No. 5 of 8

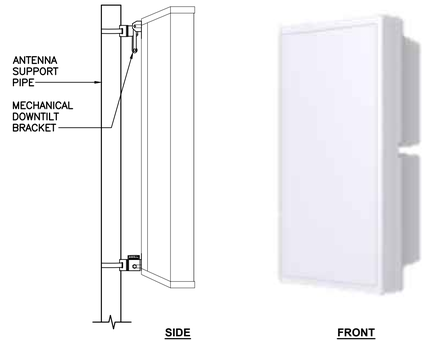


FRONT ELEVATION SIDE ELEVATION

NOTES:

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

1 / C–4 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NOT TO SCALE

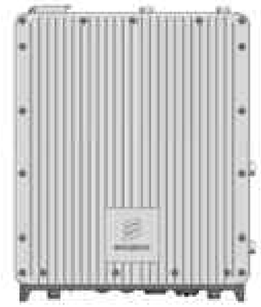


SIDE FRONT

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 / C–4 **PROPOSED ANTENNA DETAIL**
SCALE: NOT TO SCALE

ISOMETRIC VIEW



FRONT VIEW

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4424 B25	16.5"L x 13.5"W x 9.6"D	88 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4415 B66A	16.5"L x 13.4"W x 5.9"D	46 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

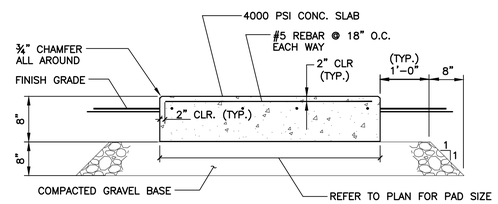
3 / C–4 **PROPOSED RRU DETAIL**
SCALE: NOT TO SCALE

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

4 / C–4 **ENCLOSURE 6160 (OUTDOOR)**
SCALE: NOT TO SCALE

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

5 / C–4 **BATTERY CABINET DETAIL**
NOT TO SCALE



6 / C–4 **TYPICAL CONCRETE PAD DETAIL**
NOT TO SCALE

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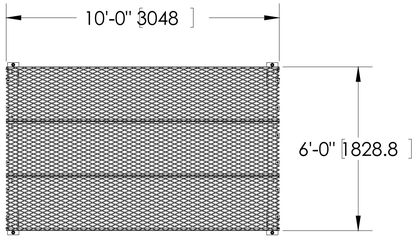
TYPICAL EQUIPMENT DETAILS

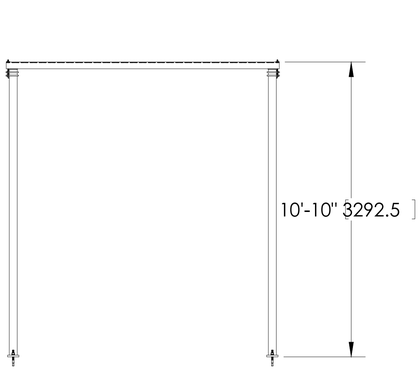
C-4

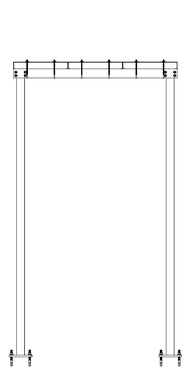
Sheet No. 6 of 8

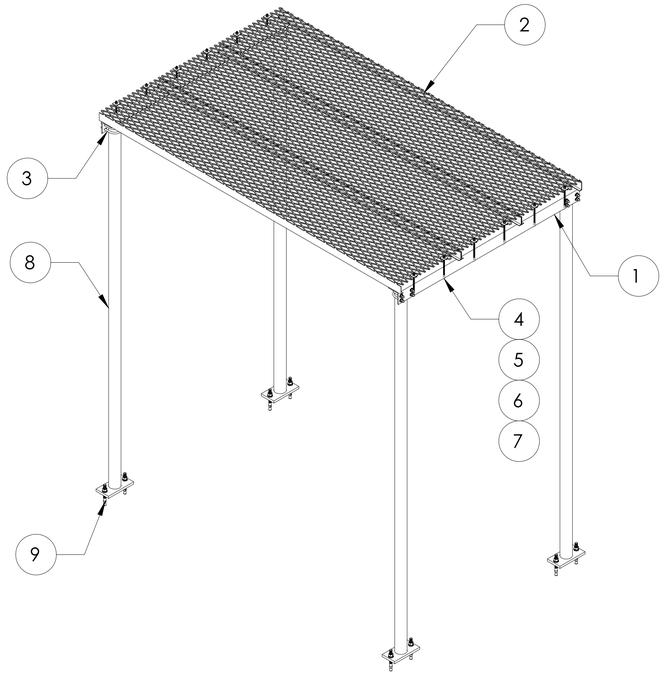
ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	IC0601	6' ICE SHIELD SUPPORT BRACKET	2	38.89 LBS
2	WB-CY210	SAFETY GRATING 24" X 10'	3	111.00 LBS
3	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	8	0.57 LBS
4	GJB0380	8" GALV J-BOLT KIT	12	0.25 LBS
5	MT-387	SQUARE WASHER, 1-1/2" X 1-5/8" W/ 7/16" HOLE	12	0.12 LBS
6	GWL-03	3/8" GALV LOCK WASHER	12	0.01 LBS
7	GN-03	3/8" GALV HEX NUT	12	0.04 LBS
8	MF126.01	BASE SHOE	4	69.59 LBS
9	MT-287	3/4" x 7" WEDGE ANCHOR	8	0.72 LBS

REVISIONS				
REV.	ZONE	DESCRIPTION	BY	DATE
A		INITIAL RELEASE	ACG	03/29/07









NOTES:
1. ALL METRIC DIMENSIONS ARE IN BRACKETS.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:
.X = ± .06 ANGLES ±2°
.XX = ± .03 FRACTIONS ±1/32
.XXX= ± .010
REMOVE BURRS AND BREAK EDGES .005
DO NOT SCALE THIS PRINT

DRAWN BY: ACG	SHEET: 1 of 1	PART NUMBER: IC-0610-S	
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 6' X 10' ICE CANOPY w/ BASE SHOE LEGS	
DATE: 03/29/07	MATERIAL: A36, A53, A568	DRAWING TYPE: ASSEMBLY DRAWING	
REVISION: A	FINISH: GALV A123	ANDREW® ORLAND PARK, IL. 60462 U.S.A.	
	WEIGHT: 708.46 LBS		

1 / C-5 **EQUIPMENT CANOPY DETAIL**
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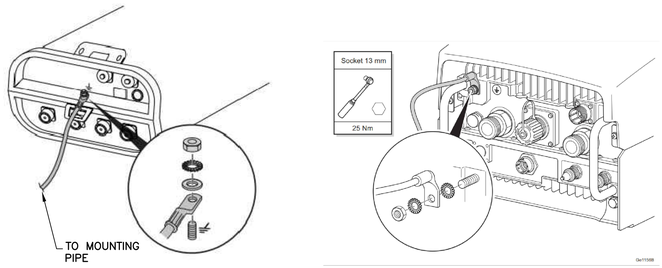
EQUIPMENT CANOPY DETAIL

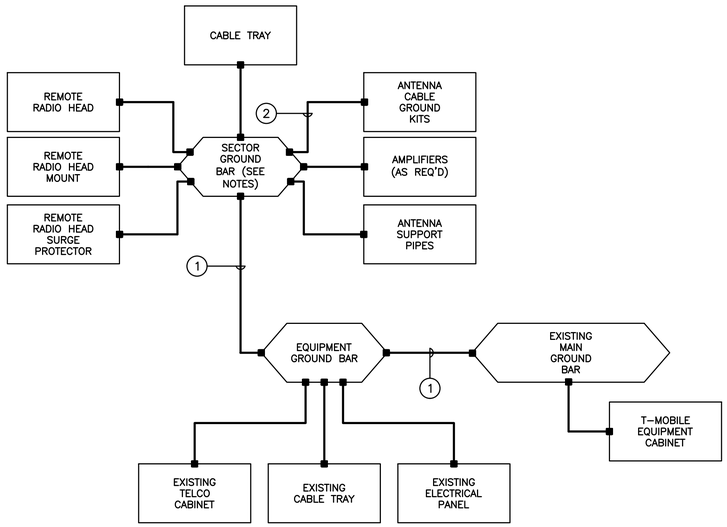
C-5

Sheet No. 7 of 8



1 E-1 TYPICAL ANTENNA/RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

(1) #2 AWG

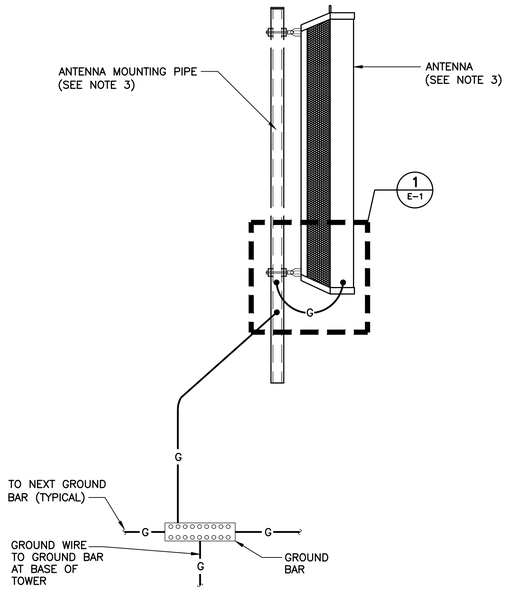
(2) #6 AWG

GENERAL NOTES:

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

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE



NOTES:

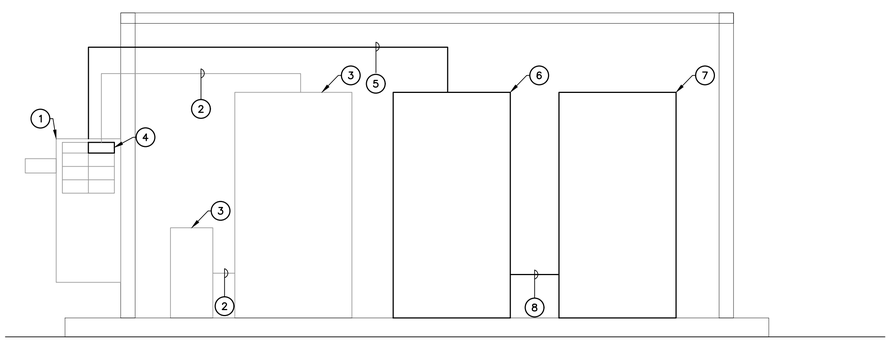
1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

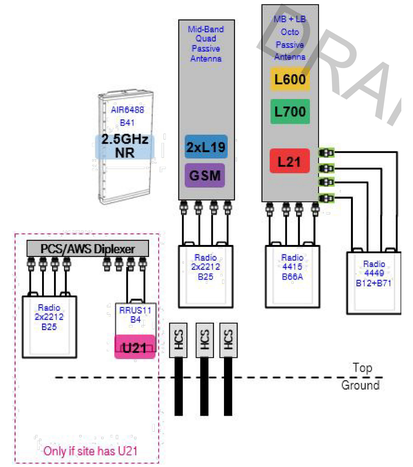
RISER DIAGRAM NOTES

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



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE



3 E-1 PROPOSED PLUMBING DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/01/20	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless

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

T-MOBILE NORTHEAST LLC

WIRELESS COMMUNICATIONS FACILITY

KILLINGLY/MARGARET HENRI

SITE ID: CT11156A

818 PROVIDENCE PIKE
KILLINGLY, CT 06239

DATE:	05/20/20
SCALE:	AS NOTED
JOB NO.	20074.28

TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 8 of 8

Exhibit D

Structural Analysis Report

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

190-ft Existing ROHN Guyed Lattice Tower

Proposed T-Mobile
Antenna Upgrade

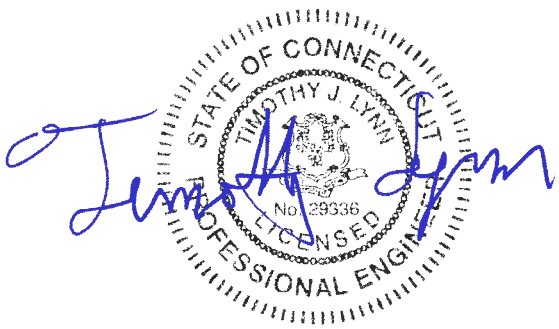
T-Mobile Site Ref: CT11156A

812 Providence Pike
Danielson, CT

Centek Project No. 20074.28

Date: May 27, 2020

Max Stress Ratio = 73.5%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

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

The host tower is a 190-ft tall, eleven-section, Rohn model 80 guyed lattice tower. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes and foundation system information were obtained from a previous structural analysis report prepared by Centek; job no; 19027.60 dated May 21, 2019.

Antenna and appurtenance information were obtained from the aforementioned Centek structural report and an RF data sheet.

The tower consists of eleven (11) vertical sections constructed of steel pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of steel pipe construction conforming to ASTM A53-B-42. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 3.42-ft throughout its length with the exception of a 5'-0" high tapered base section.

Antenna and Appurtenance Summary

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

- VERIZON (Existing):
  Antennas: Three (3) Antel BXA-70063-6CF panel antennas, six (6) Commscope JAHH-65B-r3B panel antennas, three (3) Alcatel-Lucent RRH2x90-AWS remote radio heads, three (3) Alcatel-Lucent RRH2x60-07-U remote radio heads, three (3) Alcatel-Lucent RRH4x40-850 remote radio heads and two (2) main distribution boxes mounted on three (3) Valmont 13-ft lightweight T-Frames with a RAD center elevation of 187-ft above the existing tower base.
  Cables: Two (2) 1-5/8" dia. Hybriflex Fiber feeder cables running on the exterior of the existing tower.
- T-MOBILE (Existing to Remain):
  Antennas: Three (3) RFS APX16DWV-16DWVS panel antennas, three (3) RFS APXVAARR24_43 panel antennas and three (3) Ericsson 4449 B71 B12 remote radio units mounted three (3) V-Frames with a RAD center elevation of 140-ft above the existing tower base.
  Coax Cables: One (1) 6x12 fiber cable running on the exterior of the existing tower.
- T-MOBILE (Existing to Remove):
  Antennas: Three (3) TMAs mounted on three (3) V-Frames with a RAD center elevation of 140-ft above the existing tower base.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the exterior of the existing tower.

- **T-MOBILE (Proposed):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4415 remote radio units and three (3) Ericsson 4424 remote radio units mounted three (3) V-Frames with a RAD center elevation of 140-ft above the existing tower base.
  Coax Cables: Three (3) 6x12 fiber cables running on the exterior of the existing 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 or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All existing coax cables to be installed as indicated in this report.

Analysis

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

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

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

Tower Loading

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

Basic Wind Speed:	Danielson; v = 101 mph (3 second gust)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 101 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

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

Tower Capacity

- Calculated stresses were found to be within allowable limits. This tower was found to be at **73.5%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T6)	80.01' - 100.01'	73.5%	**PASS**
Diagonal (T1)	175.35' - 190.6'	54.1%	**PASS**
Bottom Girt (T10)	4.58' - 20.01'	70.7%	**PASS**
Guy C @ 189.98' radius (T1)	175.35' - 190.6'	66.3%	**PASS**

Foundations and Anchorage

The existing tower base foundation consists of a 2.0-ft square x 3.75-ft long reinforced concrete pedestal with a 4.0-ft square x 1.75-ft thick reinforced concrete pad bearing directly on the existing sub grade. Additionally, guy wire loading is transferred to six (6) existing 7-ft x 4-ft x 2-ft reinforced concrete anchor support blocks. The foundation information was obtained from the original design documents prepared by ROHN dated September 27, 1979.

- The worst case tower base and guy anchor reactions developed from the governing Load Case were used in the verification of the anchorage foundations:

Tower Guy Reactions		
Vector	**Inner**	**Outer**
Horizontal (In Plane of GW)	6 kips	15 kips
Horizontal (Out of Plane of GW)	0 kips	0 kips
Vertical	6 kips	24 kips
Resultant Force at end of Guy Wire	9 kips	29 kips

Tower Base Reactions	
Vector	**Proposed Reaction**
Horizontal Shear	1.0 kips
Axial Compression	93.0 kips

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinf. Conc. Anchor Block (C) at 99-ft radius.	Uplift	1.0	2.06	**PASS**
	Sliding	1.0	1.50	**PASS**
		Ultimate Bearing	**Proposed**	
Base Foundation	Bearing	12.0 ksf	6.0 ksf	**PASS**

Note 1: FS denotes 'Factor of Safety'.

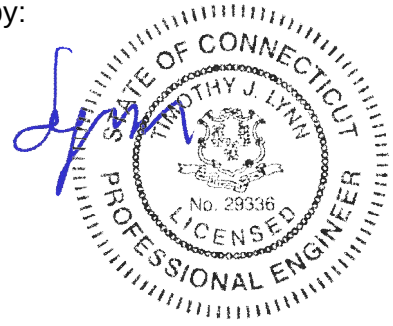
C o n c l u s i o n

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

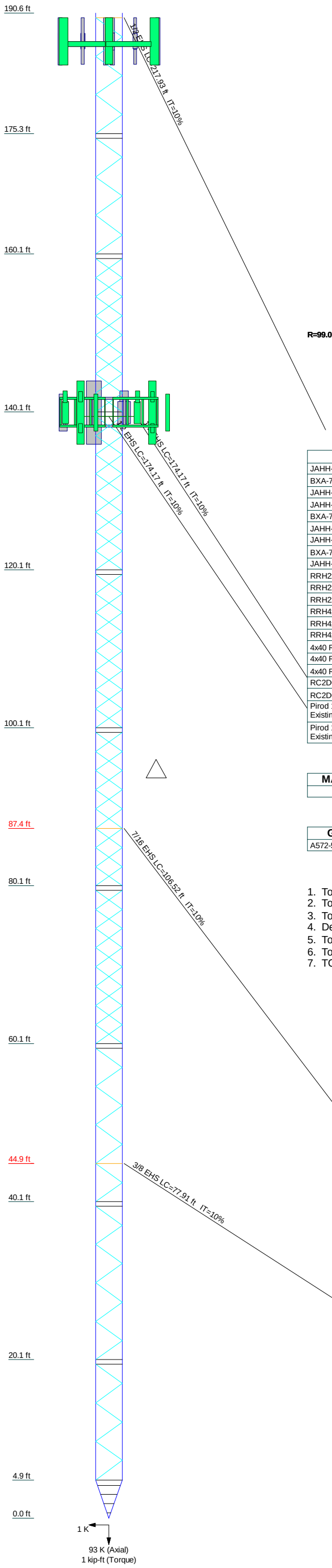
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

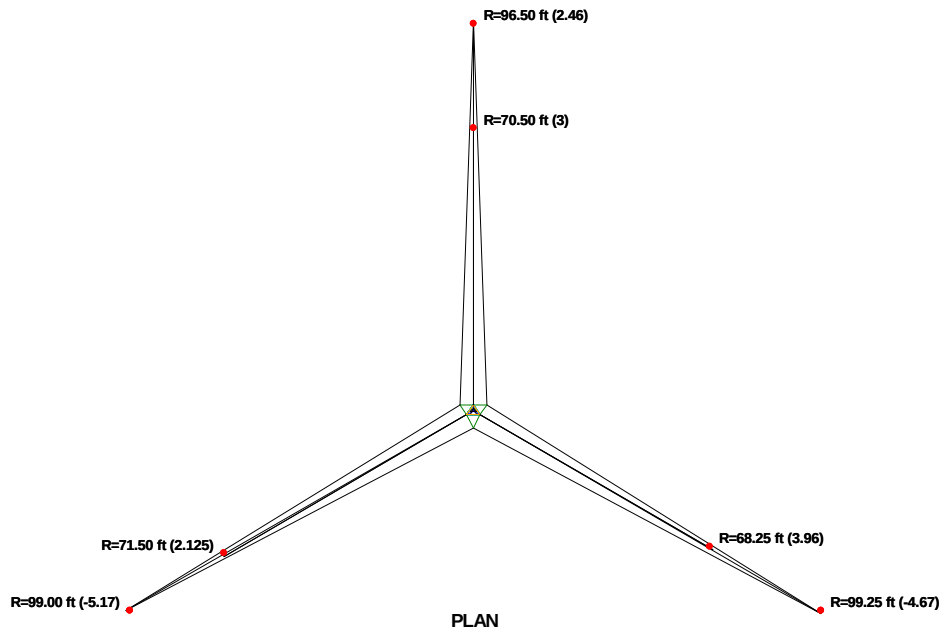
TnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, TnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

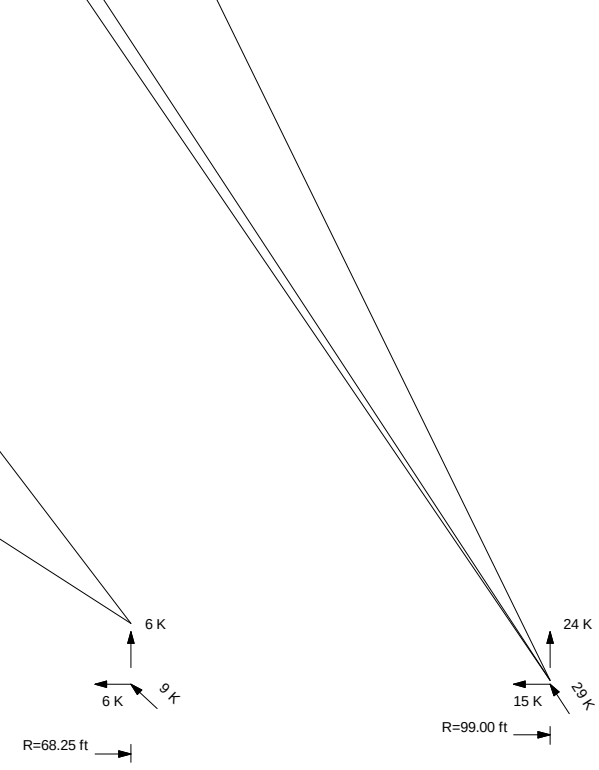
TnxTower Features:

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

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs	ROHN 2.5 X-STR			ROHN 2 STD			ROHN 2 EH		ROHN 2.5 STD		A
Leg Grade		A572-50									
Diagonals	N.A.										N.A.
Diagonal Grade		ROHN TS1.5x16 ga									N.A.
Top Girts		A53-B-42									14x3/16
Mid Girts		ROHN TS1.5x16 ga									14x3/16
Bottom Girts		N.A.									14x3/16
Top Guy Pull-Offs		ROHN TS1.5x16 ga				C4x5.4	N.A.	C4x5.4	N.A.		
Face Width (ft)	3.458			4 1/2x3/8							
# Panels @ (ft)	12 @ 2.43924				56 @ 2.42318					6 @ 2.43857	B
Weight (K)	0.5	0.4	0.4	0.7	0.4	0.5	0.5	0.5	0.5	0.4	0.3







DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
JAHH-65B-R3B (Verizon - Existing)	187	Pirod 12' T-Frame Sector Mount (1) (Verizon - Existing)	187
BXA-70063/6CF (Verizon - Existing)	187		
JAHH-65B-R3B (Verizon - Existing)	187	APX16DWV-16DWVS-E-A20 (T-Mobile - Existing)	140
JAHH-65B-R3B (Verizon - Existing)	187	APXVAARR24-43 (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Existing)	187	AIR6449 (T-Mobile - Proposed)	140
JAHH-65B-R3B (Verizon - Existing)	187	APX16DWV-16DWVS-E-A20 (T-Mobile - Existing)	140
JAHH-65B-R3B (Verizon - Existing)	187	APXVAARR24-43 (T-Mobile - Existing)	140
BXA-70063/6CF (Verizon - Existing)	187	AIR6449 (T-Mobile - Proposed)	140
JAHH-65B-R3B (Verizon - Existing)	187	APX16DWV-16DWVS-E-A20 (T-Mobile - Existing)	140
RRH2x60-07-U (Verizon - Existing)	187	APXVAARR24-43 (T-Mobile - Existing)	140
RRH2x60-07-U (Verizon - Existing)	187	AIR6449 (T-Mobile - Proposed)	140
RRH2x60-07-U (Verizon - Existing)	187	Radio 4449 B71 B12 (T-Mobile - Existing)	140
RRH4x45/2x90-AWS (Verizon - Existing)	187	Radio 4449 B71 B12 (T-Mobile - Existing)	140
RRH4x45/2x90-AWS (Verizon - Existing)	187	Radio 4449 B71 B12 (T-Mobile - Existing)	140
RRH4x45/2x90-AWS (Verizon - Existing)	187	4415 B25 (T-Mobile - Proposed)	140
4x40 RRH 850 (Verizon - Existing)	187	4415 B25 (T-Mobile - Proposed)	140
4x40 RRH 850 (Verizon - Existing)	187	4415 B25 (T-Mobile - Proposed)	140
4x40 RRH 850 (Verizon - Existing)	187	4424 B25 (T-Mobile - Proposed)	140
RC2DC-3315-PF-48 (Verizon - Existing)	187	4424 B25 (T-Mobile - Proposed)	140
RC2DC-3315-PF-48 (Verizon - Existing)	187	4424 B25 (T-Mobile - Proposed)	140
Pirod 12' T-Frame Sector Mount (1) (Verizon - Existing)	187	12' V-Frame (T-Mobile - Existing)	140
Pirod 12' T-Frame Sector Mount (1) (Verizon - Existing)	187	12' V-Frame (T-Mobile - Existing)	140
		12' V-Frame (T-Mobile - Existing)	140

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 X-STR	B	4 @ 1.17356

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 73.5%

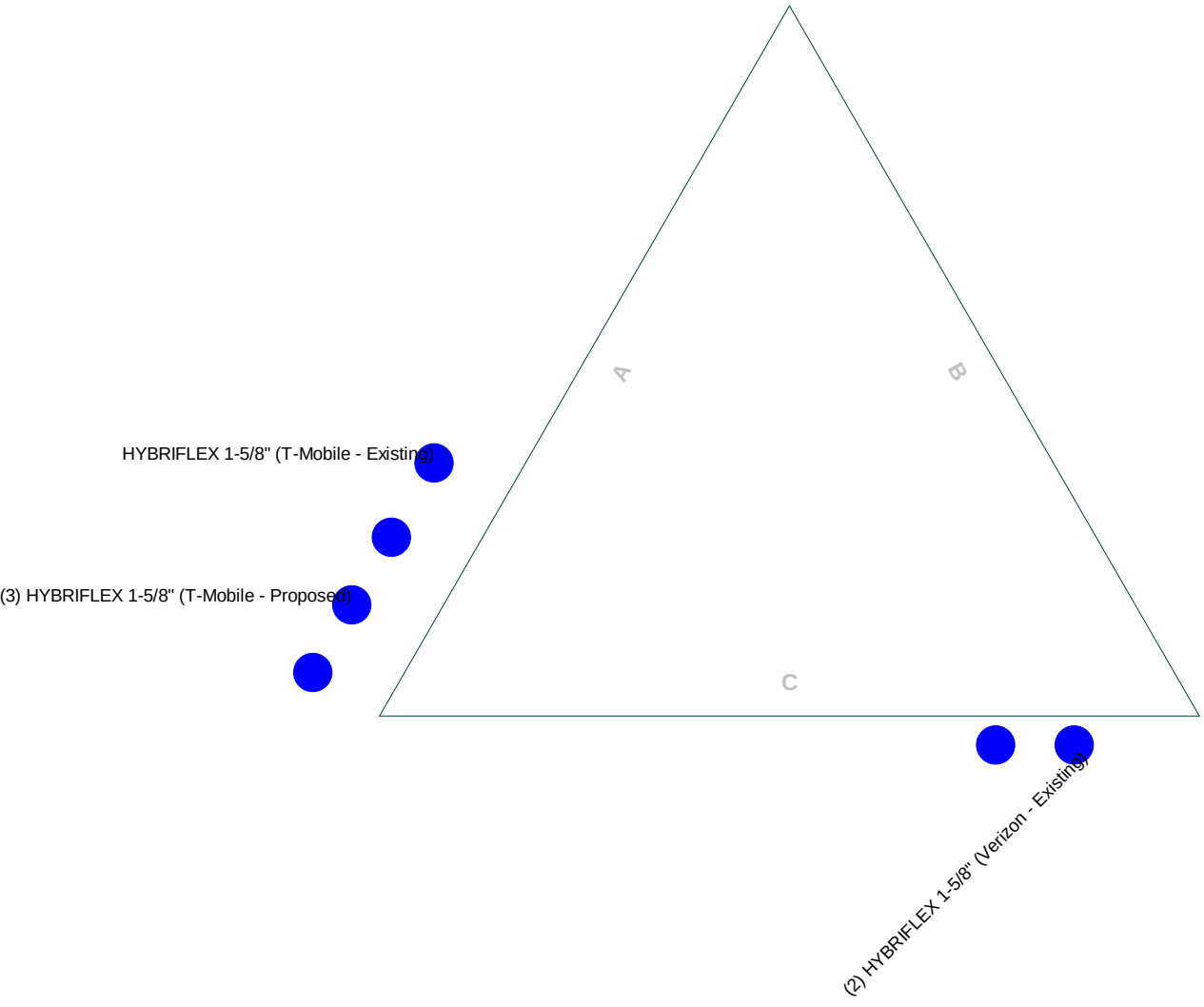
ALL REACTIONS ARE FACTORED

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

Job: ***20074.28 - CT11156A***		
Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 05/27/20	Scale: NTS
Path:		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



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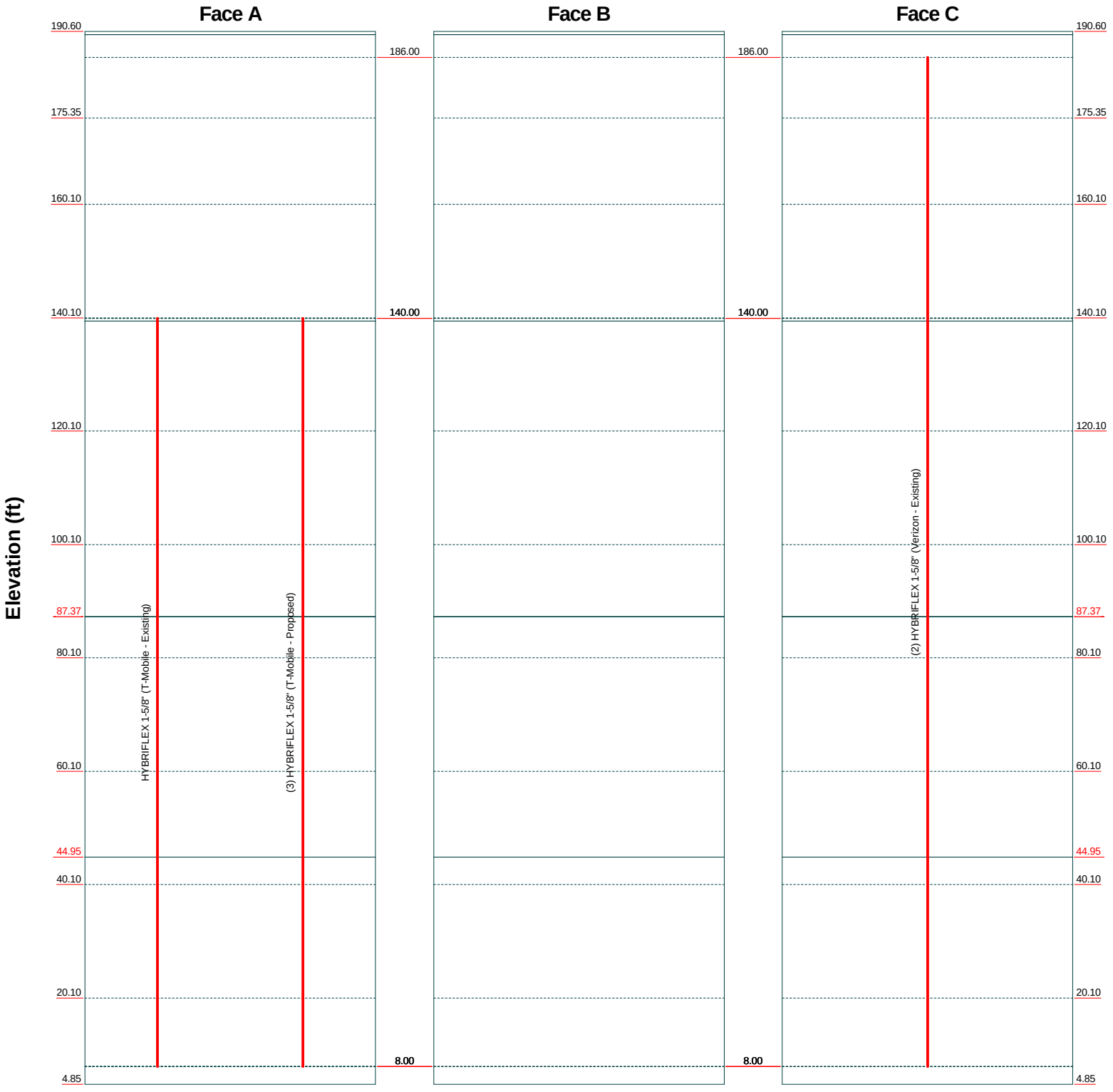
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-7	

Feed Line Distribution Chart
4'10-3/16" - 190'7-3/16"

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



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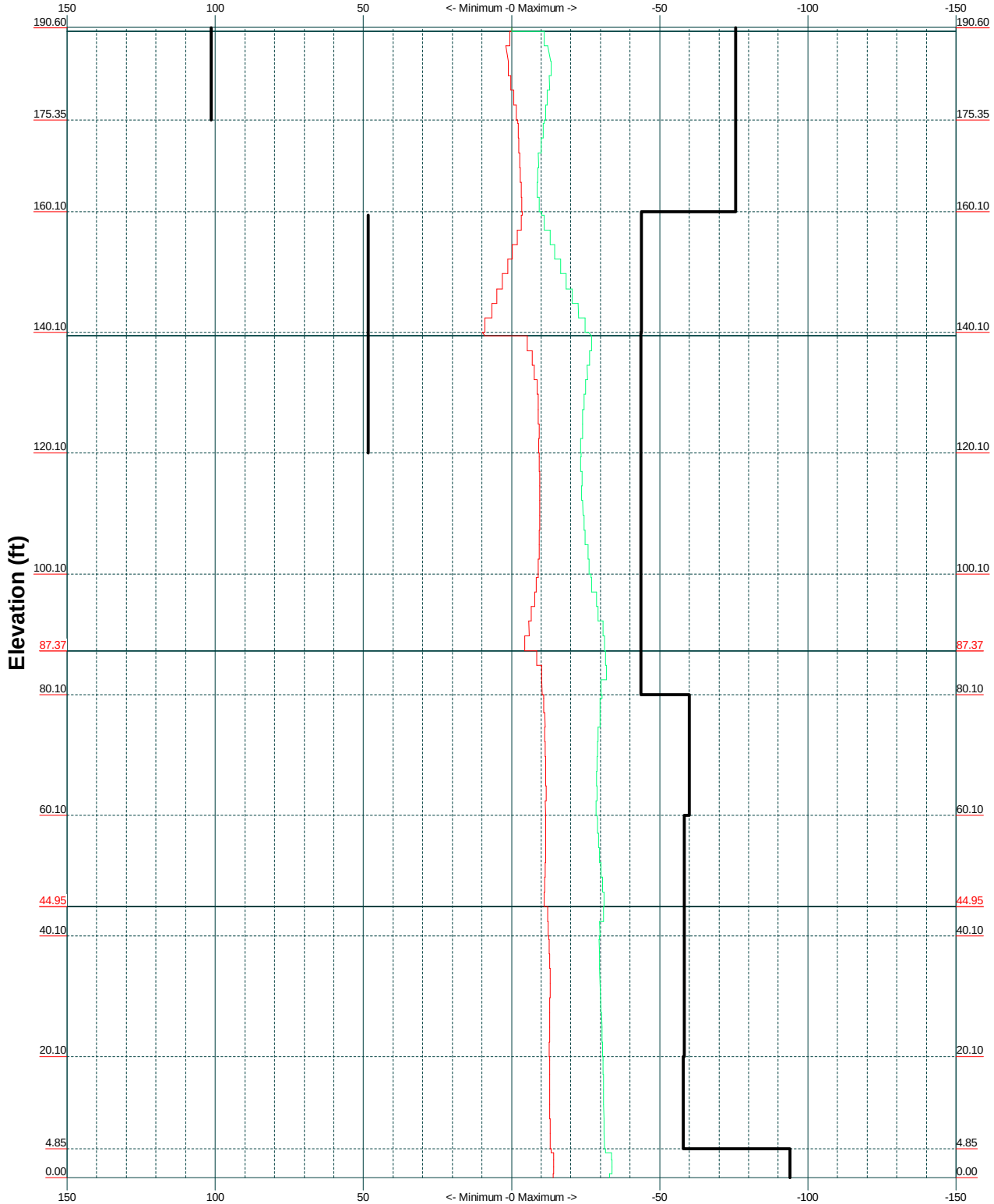
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-7	

TIA-222-G - 101 mph/50 mph 0.7500 in Ice Exposure B

Leg Capacity ——— **Leg Compression (K)**



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Job: ***20074.28 - CT11156A***			
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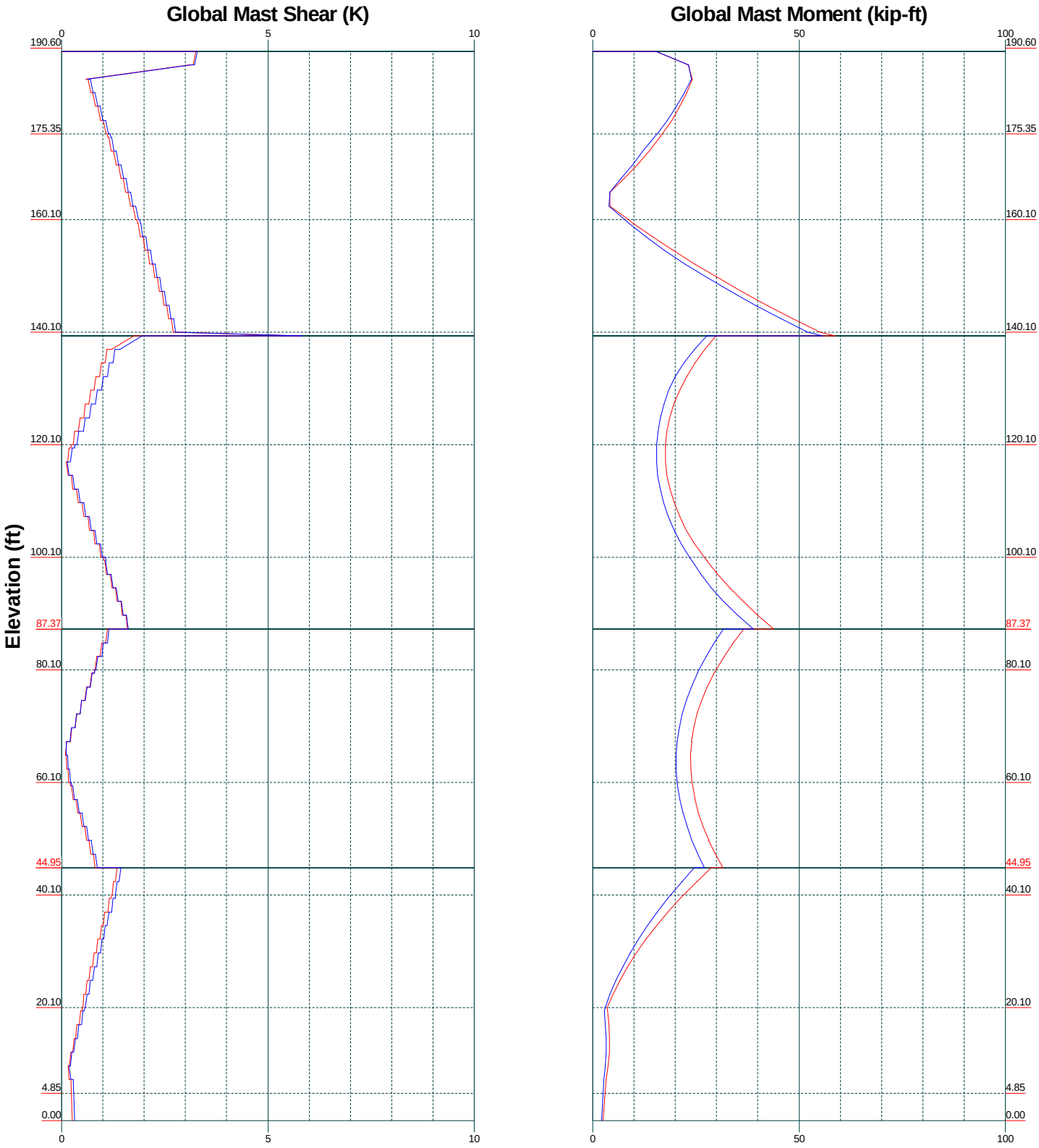
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-3	

TIA-222-G - 101 mph/50 mph 0.7500 in Ice Exposure B

Vx Vz

Maximum Values

Mx Mz



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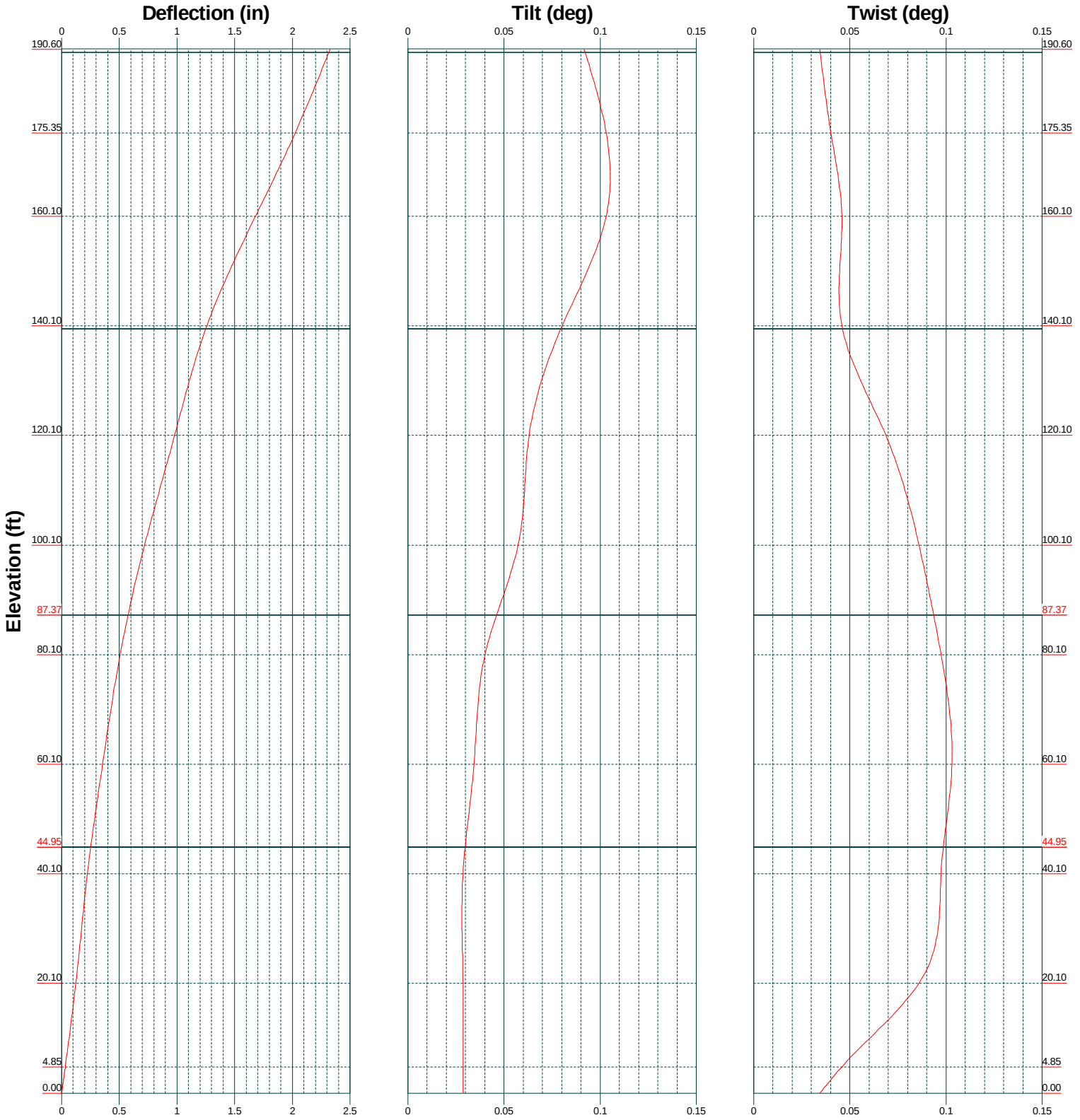
Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



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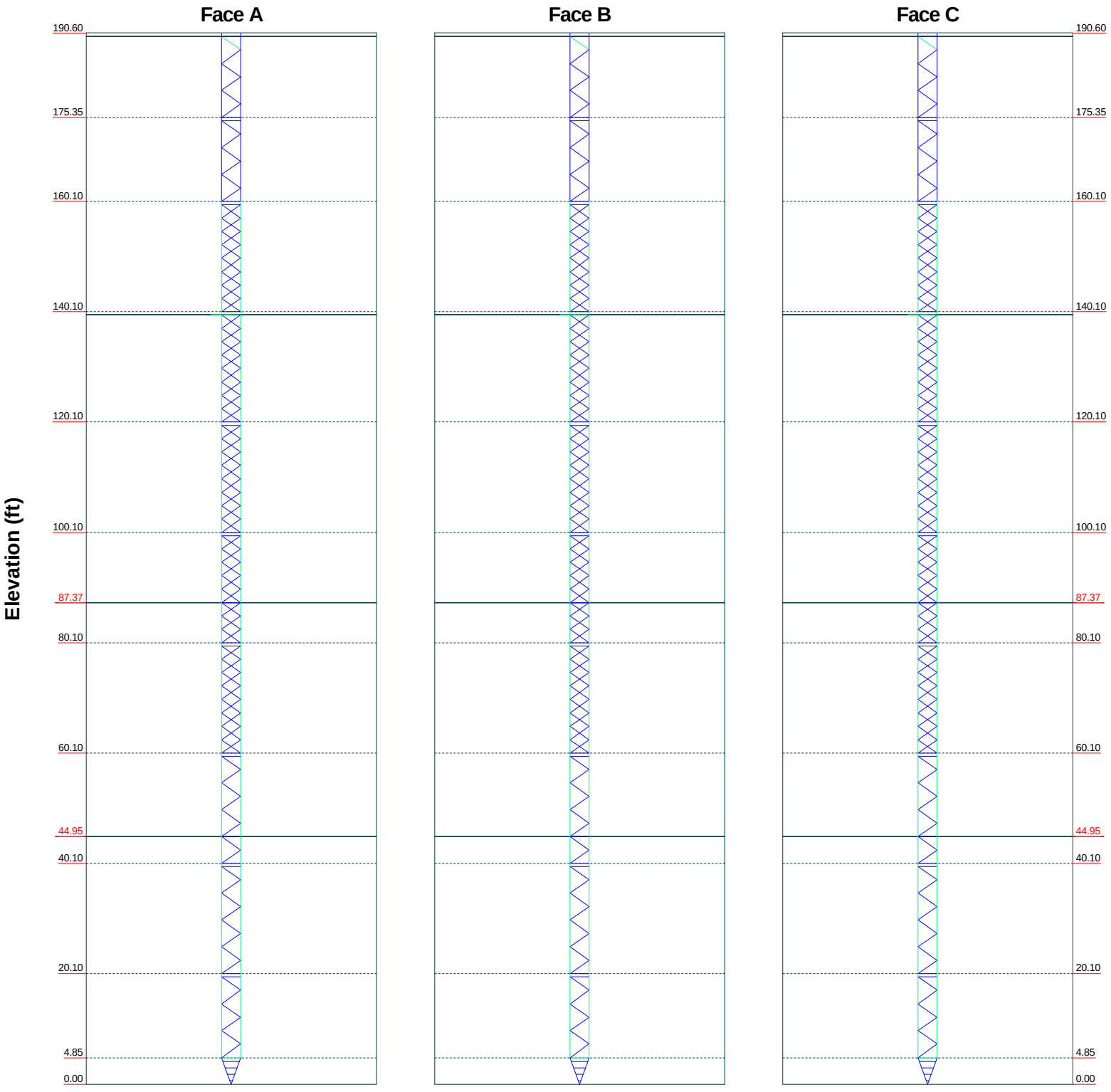
FAX: (203) 488-8587

Job: ***20074.28 - CT11156A***			
Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-5	

Stress Distribution Chart
0' - 190'7-3/16"

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



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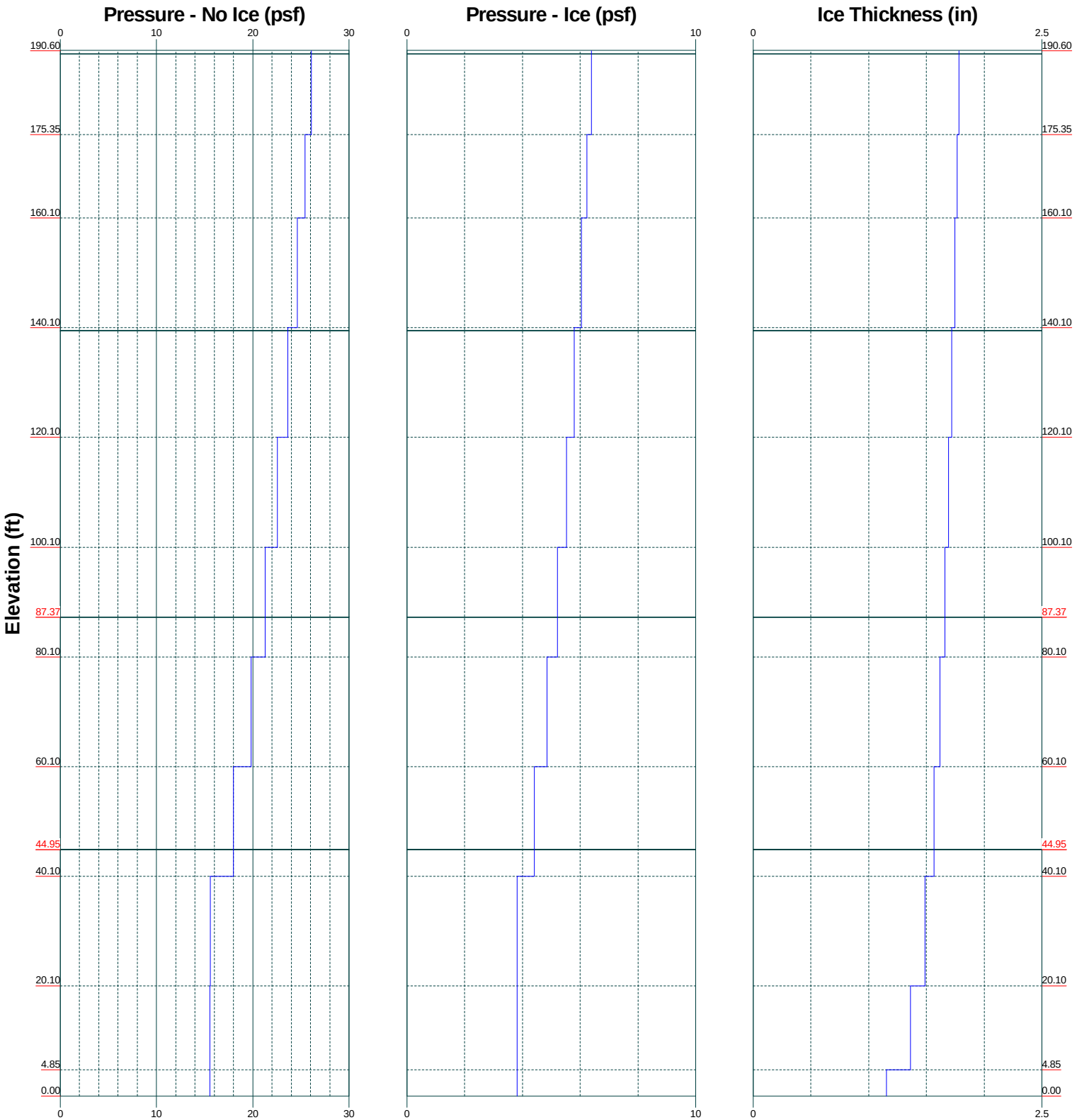
Job: ***20074.28 - CT11156A***			
Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-8	

Wind Pressures and Ice Thickness

TIA-222-G - 101 mph/50 mph 0.7500 in Ice Exposure B



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Job: ***20074.28 - CT11156A***			
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Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 05/27/20	Scale: NTS	
Path:		Dwg No. E-9	

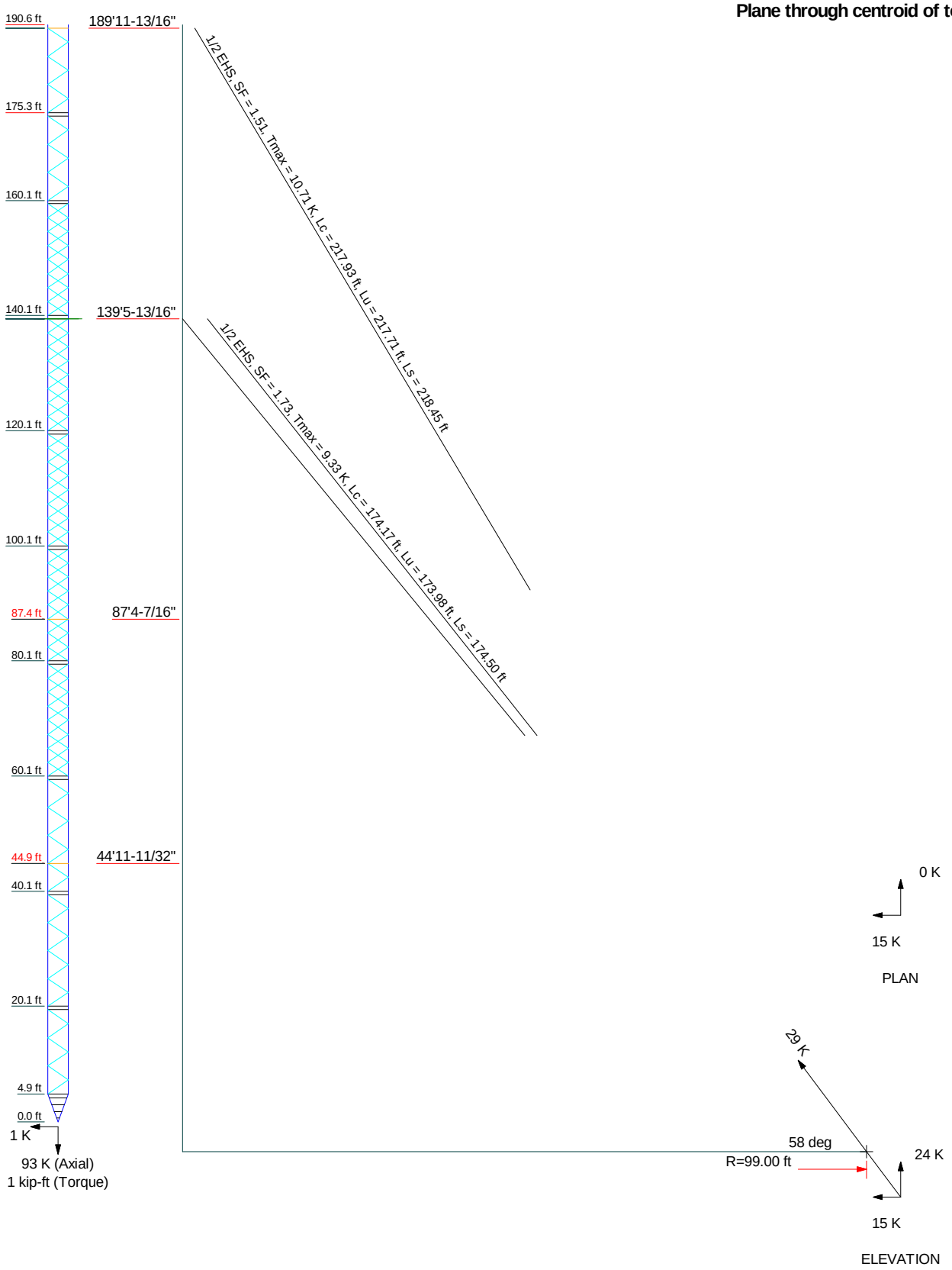
Guy Tensions and Tower Reactions

TIA-222-G - 101 mph/50 mph 0.7500 in Ice Exposure B

Maximum Values

Anchor 'C'@99 ft Azimuth 240 deg Elev -5.17 ft

Plane through centroid of tower



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***20074.28 - CT11156A***		
	Project: ***190-ft Guyed Tower - 812 Providence Pike, Danielson, CT***		
	Client: T-Mobile	Drawn by: TJL	App'd:
	Code: TIA-222-G	Date: 05/27/20	Scale: NTS
	Path:		Dwg No. E-6

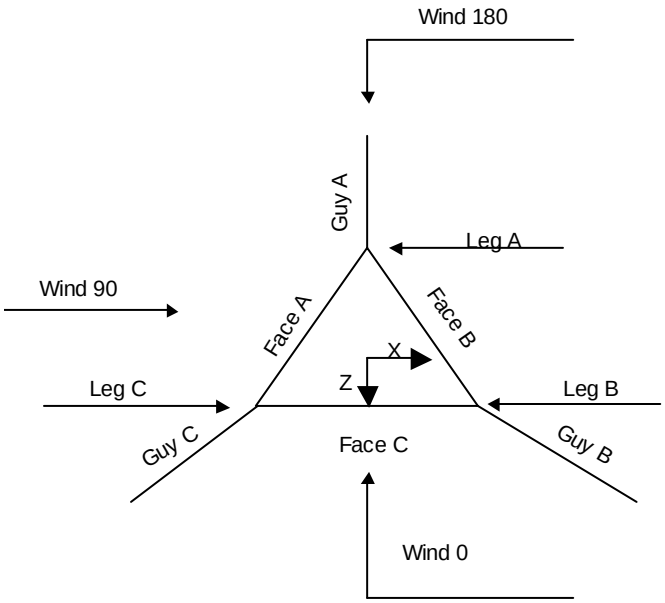
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 190.60 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.46 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

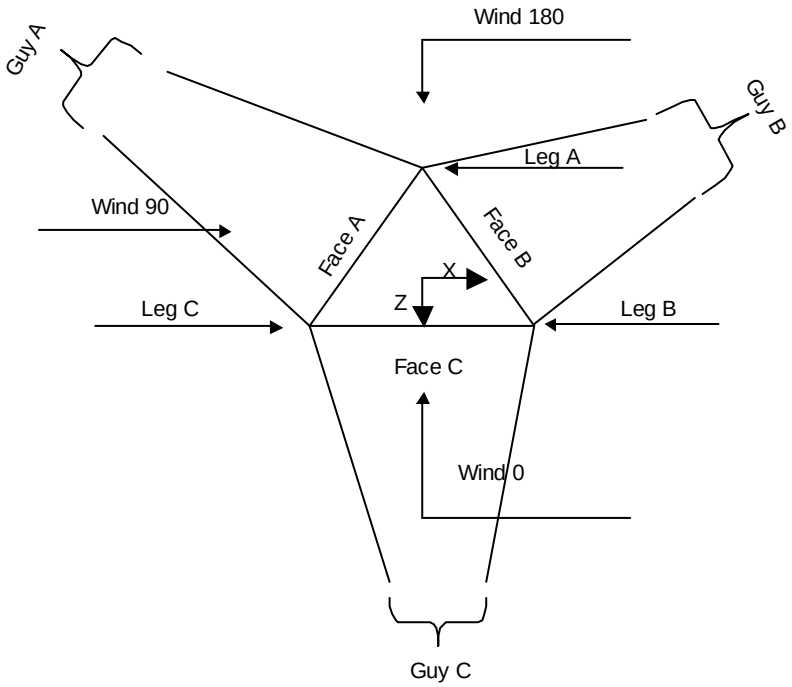
Basic wind speed of 101 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	190.60-175.35			3.46	1	15.25
T2	175.35-160.10			3.46	1	15.25
T3	160.10-140.10			3.46	1	20.00
T4	140.10-120.10			3.46	1	20.00
T5	120.10-100.10			3.46	1	20.00
T6	100.10-80.10			3.46	1	20.00
T7	80.10-60.10			3.46	1	20.00
T8	60.10-40.10			3.46	1	20.00
T9	40.10-20.10			3.46	1	20.00
T10	20.10-4.85			3.46	1	15.25
T11	4.85-0.00			3.46	1	4.85

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	190.60-175.35	2.44	K Brace Left	No	Yes	7.3750	0.0000
T2	175.35-160.10	2.44	K Brace Left	No	Yes	7.3750	0.0000
T3	160.10-140.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T4	140.10-120.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T5	120.10-100.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T6	100.10-80.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T7	80.10-60.10	2.42	CX Brace	No	Yes	7.3750	0.0000
T8	60.10-40.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T9	40.10-20.10	2.42	K Brace Left	No	Yes	7.3750	0.0000
T10	20.10-4.85	2.44	K Brace Left	No	Yes	7.3750	0.0000
T11	4.85-0.00	1.17	X Brace	No	Yes	8.0000	8.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 190.60-175.35	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T2 175.35-160.10	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T3 160.10-140.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 140.10-120.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T5 120.10-100.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T6 100.10-80.10	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.10-60.10	Pipe	ROHN 2 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 60.10-40.10	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 40.10-20.10	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.10-4.85	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T11 4.85-0.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A53-B-42 (42 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 190.60-175.35	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T2 175.35-160.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 160.10-140.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 140.10-120.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T5 120.10-100.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T6 100.10-80.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.10-60.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 60.10-40.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 40.10-20.10	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.10-4.85	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T11 4.85-0.00	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar	14x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 4.85-0.00	2	Flat Bar	14x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 190.60-175.35	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 175.35-160.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 160.10-140.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 140.10-120.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 120.10-100.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 100.10-80.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 80.10-60.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 60.10-40.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T9 40.10-20.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 20.10-4.85	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 4.85-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
190.60-175.35				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
175.35-160.10				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
160.10-140.10				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
140.10-120.10				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
120.10-100.10				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
100.10-80.10				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
80.10-60.10				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
60.10-40.10				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.10-20.10				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.10-4.85				1	1	1	1	1	1	1
T11 4.85-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 190.60-175.35	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T2 175.35-160.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.10-140.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.10-120.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 120.10-100.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 100.10-80.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.10-60.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 60.10-40.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.10-20.10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.10-4.85	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 4.85-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 190.60-175.35	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T2 175.35-160.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T3 160.10-140.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T4 140.10-120.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T5 120.10-100.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T6 100.10-80.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T7 80.10-60.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T8 60.10-40.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T9 40.10-20.10	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T10 20.10-4.85	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000
T11 4.85-0.00	0.0000	0.0000	0.0000	0.0000	3.2500	0.0000	3.2500	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
190.60-175.35		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
175.35-160.10		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
160.10-140.10		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
140.10-120.10		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
120.10-100.10		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
100.10-80.10		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7 80.10-60.10	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8 60.10-40.10	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9 40.10-20.10	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10 20.10-4.85	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T11 4.85-0.00	Flange	0.7500	0	0.0000	0	0.0000	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
189.985	EHS	A	1/2	2.69	10%	21000	0.517	209.81	96.50	0.0000	2.46	100%
		B	1/2	2.69	10%	21000	0.517	217.41	99.25	0.0000	-4.67	100%
		C	1/2	2.69	10%	21000	0.517	217.75	99.00	0.0000	-5.17	100%
139.485	EHS	A	1/2	2.69	10%	21000	0.517	166.31	96.50	0.0000	2.46	100%
		B	1/2	2.69	10%	21000	0.517	173.74	99.25	0.0000	-4.67	100%
		C	1/2	2.69	10%	21000	0.517	174.02	99.00	0.0000	-5.17	100%
87.3695	EHS	A	7/16	2.08	10%	21000	0.399	108.59	70.50	0.0000	3.00	100%
		B	7/16	2.08	10%	21000	0.399	106.43	68.25	0.0000	3.96	100%
		C	7/16	2.08	10%	21000	0.399	109.89	71.50	0.0000	2.13	100%
44.9464	EHS	A	3/8	1.54	10%	21000	0.273	80.25	70.50	0.0000	3.00	100%
		B	3/8	1.54	10%	21000	0.273	77.83	68.25	0.0000	3.96	100%
		C	3/8	1.54	10%	21000	0.273	81.56	71.50	0.0000	2.13	100%

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
189.985	Corner						
139.485	Torque Arm	7.17	0.0000	Channel	A36	Channel	C10x15.3

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
					(36 ksi)		
87.3695	Corner						
44.9464	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
189.99	A53-B-42 (42 ksi)	Pipe			No	A36 (36 ksi)	Flat Bar	4 1/2x3/8
139.49	A53-B-42 (42 ksi)	Pipe				A36 (36 ksi)	Flat Bar	
87.37	A53-B-42 (42 ksi)	Pipe			No	A36 (36 ksi)	Channel	C4x5.4
44.95	A53-B-42 (42 ksi)	Pipe			Yes	A36 (36 ksi)	Channel	C4x5.4

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
189.985	0.11	0.11	0.11		4.16 3.5 sec/pulse	4.46 3.6 sec/pulse	4.48 3.7 sec/pulse	
139.485	0.09	0.09	0.09		2.63 2.8 sec/pulse	2.86 2.9 sec/pulse	2.87 2.9 sec/pulse	
87.3695	0.04	0.04	0.04		1.12 1.8 sec/pulse	1.08 1.8 sec/pulse	1.15 1.9 sec/pulse	
44.9464	0.02	0.02	0.02		0.57 1.3 sec/pulse	0.54 1.3 sec/pulse	0.59 1.3 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
189.985	Yes	No			1	1	1	1
139.485	Yes	No	1	1	1	1	1	1
87.3695	Yes	No			1	1	1	1
44.9464	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
189.985	0.6250 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
139.485	0.6250 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
87.3695	0.6250 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
44.9464	0.0000 A325N	0	0.0000	1	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
189.985	A	96.22	22	5	1.6694
	B	92.66	21	5	1.6631
	C	92.41	21	5	1.6627
139.485	A	70.97	20	5	1.6194
	B	67.41	20	5	1.6111
	C	67.16	20	5	1.6105
87.3695	A	45.18	17	4	1.5479
	B	45.66	18	4	1.5495
	C	44.75	17	4	1.5464
44.9464	A	23.97	16	4	1.4528
	B	24.45	16	4	1.4557
	C	23.54	16	4	1.4501

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
189.985	A	63.2542	2.79 2.69	0.00	2.50	-1.23	-4.99	0.00	0.00
	B	63.4524	2.79 2.69	1.06	2.51	0.61	2.50	0.00	-4.34
	C	63.5700	2.79 2.69	-1.06	2.51	0.61	2.51	0.00	4.34
			Sum:	**0.00**	7.52	**-0.01**	**0.02**	0.00	**0.00**
139.485	A	55.4083	2.76 2.69	-0.06	2.29	-1.55	-4.73	5.66	-8.20
	A	55.4083	2.76 2.69	0.06	2.29	-1.55	-4.73	-5.66	8.20
	B	55.9967	2.76 2.69	1.35	2.31	0.71	9.54	5.58	0.00
	B	55.9967	2.76 2.69	1.29	2.31	0.81	-4.77	-5.58	-8.27

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
	C	56.1568	2.76 2.69	-1.29	2.31	0.81	-4.78	5.56	8.28
	C	56.1568	2.76 2.69	-1.34	2.31	0.71	9.56	-5.56	0.00
			Sum:	**0.01**	13.80	**-0.05**	**0.09**	0.00	**0.02**
87.3695	A	50.9253	2.11 2.08	0.00	1.65	-1.32	-3.29	0.00	0.00
	B	51.5393	2.11 2.08	1.13	1.66	0.65	1.66	0.00	-2.88
	C	50.8082	2.11 2.08	-1.15	1.65	0.66	1.64	0.00	2.85
			Sum:	**-0.02**	4.96	**-0.01**	**0.01**	0.00	**-0.03**
44.9464	A	31.4801	1.55 1.54	0.00	0.82	-1.32	-1.63	0.00	0.00
	B	31.7421	1.55 1.54	1.14	0.82	0.66	0.82	0.00	-1.42
	C	31.6374	1.55 1.54	-1.14	0.82	0.66	0.82	0.00	1.42
			Sum:	**-0.00**	2.46	**-0.00**	**0.01**	0.00	**-0.00**

Guy-Mast Forces (Excluding Wind) - Ice

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
189.985	A	63.2542	5.38 4.45	0.00	4.90	-2.20	-9.79	0.00	0.00
	B	63.4524	5.43 4.47	1.91	4.96	1.10	4.95	0.00	-8.58
	C	63.5700	5.42 4.47	-1.90	4.96	1.10	4.95	0.00	8.58
			Sum:	**0.01**	14.83	**-0.00**	**0.11**	0.00	**0.00**
139.485	A	55.4083	5.15 4.51	-0.10	4.36	-2.73	-9.03	10.01	-15.65
	A	55.4083	5.15 4.51	0.10	4.36	-2.73	-9.03	-10.01	15.65
	B	55.9967	5.20 4.52	2.40	4.43	1.27	18.35	9.92	0.00
	B	55.9967	5.20 4.52	2.30	4.43	1.44	-9.18	-9.92	-15.89
	C	56.1568	5.19 4.52	-2.28	4.44	1.43	-9.18	9.87	15.91
	C	56.1568	5.19 4.52	-2.38	4.44	1.26	18.37	-9.87	0.00
			Sum:	**0.02**	26.47	**-0.06**	**0.29**	0.00	**0.01**
87.3695	A	50.9253	3.70 3.35	0.00	2.96	-2.22	-5.92	0.00	0.00
	B	51.5393	3.67 3.33	1.88	2.96	1.09	2.96	0.00	-5.12
	C	50.8082	3.72 3.36	-1.93	2.97	1.12	2.97	0.00	5.14
			Sum:	**-0.05**	8.90	**-0.02**	**0.00**	0.00	**0.02**

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
44.9464	A	31.4801	2.73 2.58	0.00	1.53	-2.26	-3.05	0.00	0.00
	B	31.7421	2.70 2.56	1.93	1.52	1.12	1.52	0.00	-2.63
	C	31.6374	2.74 2.59	-1.96	1.54	1.13	1.54	0.00	2.66
			Sum:	**-0.03**	4.58	**-0.01**	**0.01**	0.00	**0.03**

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
189.985	A	63.2542	2.79 2.69	0.00	2.50	-1.23	-4.99	0.00	0.00
	B	63.4524	2.79 2.69	1.06	2.51	0.61	2.50	0.00	-4.34
	C	63.5700	2.79 2.69	-1.06	2.51	0.61	2.51	0.00	4.34
			Sum:	**0.00**	7.52	**-0.01**	**0.02**	0.00	**0.00**
139.485	A	55.4083	2.76 2.69	-0.06	2.29	-1.55	-4.73	5.66	-8.20
	A	55.4083	2.76 2.69	0.06	2.29	-1.55	-4.73	-5.66	8.20
	B	55.9967	2.76 2.69	1.35	2.31	0.71	9.54	5.58	0.00
	B	55.9967	2.76 2.69	1.29	2.31	0.81	-4.77	-5.58	-8.27
	C	56.1568	2.76 2.69	-1.29	2.31	0.81	-4.78	5.56	8.28
	C	56.1568	2.76 2.69	-1.34	2.31	0.71	9.56	-5.56	0.00
			Sum:	**0.01**	13.80	**-0.05**	**0.09**	0.00	**0.02**
87.3695	A	50.9253	2.11 2.08	0.00	1.65	-1.32	-3.29	0.00	0.00
	B	51.5393	2.11 2.08	1.13	1.66	0.65	1.66	0.00	-2.88
	C	50.8082	2.11 2.08	-1.15	1.65	0.66	1.64	0.00	2.85
			Sum:	**-0.02**	4.96	**-0.01**	**0.01**	0.00	**-0.03**
44.9464	A	31.4801	1.55 1.54	0.00	0.82	-1.32	-1.63	0.00	0.00
	B	31.7421	1.55 1.54	1.14	0.82	0.66	0.82	0.00	-1.42
	C	31.6374	1.55 1.54	-1.14	0.82	0.66	0.82	0.00	1.42
			Sum:	**-0.00**	2.46	**-0.00**	**0.01**	0.00	**-0.00**

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension K	0 F Intercept ft	20 F Initial Tension K	20 F Intercept ft	40 F Initial Tension K	40 F Intercept ft	60 F Initial Tension K	60 F Intercept ft	80 F Initial Tension K	80 F Intercept ft	100 F Initial Tension K	100 F Intercept ft	120 F Initial Tension K	120 F Intercept ft
189.985	A	94.50	187.53	2.932	3.82	2.851	3.93	2.771	4.04	2.690	4.16	2.610	4.29	2.530	4.42	2.450	4.56
	B	97.25	194.66	2.929	4.10	2.849	4.22	2.769	4.34	2.690	4.46	2.611	4.60	2.532	4.74	2.454	4.89
	C	97.00	195.16	2.927	4.12	2.848	4.23	2.769	4.35	2.690	4.48	2.612	4.61	2.533	4.75	2.456	4.90
139.485	A	94.50	137.03	3.076	2.30	2.947	2.40	2.818	2.51	2.690	2.63	2.562	2.76	2.435	2.90	2.310	3.05
	B	97.25	144.16	3.064	2.52	2.939	2.62	2.814	2.74	2.690	2.86	2.566	3.00	2.443	3.15	2.321	3.31
	C	97.00	144.66	3.061	2.53	2.937	2.63	2.813	2.75	2.690	2.87	2.567	3.01	2.445	3.16	2.324	3.32
87.3695	A	68.50	84.37	2.452	0.95	2.328	1.00	2.204	1.06	2.080	1.12	1.957	1.19	1.834	1.27	1.712	1.36
	B	66.25	83.41	2.442	0.92	2.321	0.97	2.201	1.02	2.080	1.08	1.960	1.14	1.840	1.22	1.721	1.30
	C	69.50	85.24	2.454	0.98	2.329	1.03	2.204	1.09	2.080	1.15	1.956	1.22	1.833	1.30	1.710	1.40
44.9464	A	68.50	41.95	2.008	0.44	1.852	0.47	1.696	0.52	1.540	0.57	1.385	0.63	1.231	0.71	1.078	0.81
	B	66.25	40.99	2.006	0.41	1.850	0.45	1.695	0.49	1.540	0.54	1.386	0.60	1.232	0.67	1.080	0.76
	C	69.50	42.82	2.007	0.45	1.851	0.49	1.695	0.53	1.540	0.59	1.386	0.65	1.232	0.73	1.080	0.84

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
HYBRIFLEX 1-5/8" (Verizon - Existing)	C	No	No	Ar (CaAa)	186.00 - 8.00	0.5000	-0.3	2	2	1.9800	1.9800		1.90
HYBRIFLEX 1-5/8" (T-Mobile - Existing)	A	No	No	Ar (CaAa)	140.00 - 8.00	3.0000	-0.2	1	1	1.9800	1.9800		1.90
HYBRIFLEX 1-5/8" (T-Mobile - Proposed)	A	No	No	Ar (CaAa)	140.00 - 8.00	3.0000	-0.4	3	3	1.9800	1.9800		1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	190.60-175.35	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	4.217	0.000	0.04
T2	175.35-160.10	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	6.039	0.000	0.06
T3	160.10-140.10	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	7.920	0.000	0.08
T4	140.10-120.10	A	0.000	0.000	15.761	0.000	0.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.920	0.000	0.08
T5	120.10-100.10	A	0.000	0.000	15.840	0.000	0.15
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	7.920	0.000	0.08
T6	100.10-80.10	A	0.000	0.000	15.840	0.000	0.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.920	0.000	0.08
T7	80.10-60.10	A	0.000	0.000	15.840	0.000	0.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.920	0.000	0.08
T8	60.10-40.10	A	0.000	0.000	15.840	0.000	0.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.920	0.000	0.08
T9	40.10-20.10	A	0.000	0.000	15.840	0.000	0.15
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.920	0.000	0.08
T10	20.10-4.85	A	0.000	0.000	9.583	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	4.792	0.000	0.05
T11	4.85-0.00	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_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	190.60-175.35	A	1.780	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	14.641	0.000	0.21
T2	175.35-160.10	A	1.765	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	20.885	0.000	0.29
T3	160.10-140.10	A	1.745	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	27.256	0.000	0.38
T4	140.10-120.10	A	1.721	0.000	0.000	46.609	0.000	0.75
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	27.087	0.000	0.37
T5	120.10-100.10	A	1.692	0.000	0.000	46.544	0.000	0.74
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	26.893	0.000	0.37
T6	100.10-80.10	A	1.658	0.000	0.000	46.191	0.000	0.73
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	26.663	0.000	0.36
T7	80.10-60.10	A	1.617	0.000	0.000	45.760	0.000	0.71
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	26.383	0.000	0.35
T8	60.10-40.10	A	1.564	0.000	0.000	45.199	0.000	0.69
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	26.019	0.000	0.34
T9	40.10-20.10	A	1.486	0.000	0.000	44.386	0.000	0.66
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	25.490	0.000	0.33
T10	20.10-4.85	A	1.361	0.000	0.000	26.062	0.000	0.37
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	14.907	0.000	0.19
T11	4.85-0.00	A	1.155	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 Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	190.60-175.35	1.4745	1.6307	1.9776	2.1555
T2	175.35-160.10	2.2344	2.4175	2.8165	3.0473
T3	160.10-140.10	2.0400	2.2072	1.6967	1.8358
T4	140.10-120.10	-3.6483	2.7940	-2.6830	2.4174
T5	120.10-100.10	-3.6698	2.7962	-2.7461	2.4586
T6	100.10-80.10	-3.4576	2.6606	-2.5609	2.2981
T7	80.10-60.10	-3.6680	2.7948	-2.8635	2.5593
T8	60.10-40.10	-3.6990	2.8493	-3.9446	3.5340
T9	40.10-20.10	-3.9529	3.0119	-4.2637	3.7989
T10	20.10-4.85	-3.3941	2.5861	-3.8130	3.3866
T11	4.85-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	HYBRIFLEX 1-5/8"	175.35 - 186.00	0.6000	0.5101
T2	2	HYBRIFLEX 1-5/8"	160.10 - 175.35	0.6000	0.5256
T3	2	HYBRIFLEX 1-5/8"	140.10 - 160.10	0.6000	0.3824
T4	2	HYBRIFLEX 1-5/8"	120.10 - 140.10	0.6000	0.3875
T4	3	HYBRIFLEX 1-5/8"	120.10 - 140.00	0.6000	0.3875
T4	4	HYBRIFLEX 1-5/8"	120.10 - 140.00	0.6000	0.3875
T5	2	HYBRIFLEX 1-5/8"	100.10 - 120.10	0.6000	0.3934
T5	3	HYBRIFLEX 1-5/8"	100.10 - 120.10	0.6000	0.3934
T5	4	HYBRIFLEX 1-5/8"	100.10 - 120.10	0.6000	0.3934
T6	2	HYBRIFLEX 1-5/8"	80.10 - 100.10	0.6000	0.3751
T6	3	HYBRIFLEX 1-5/8"	80.10 - 100.10	0.6000	0.3751
T6	4	HYBRIFLEX 1-5/8"	80.10 - 100.10	0.6000	0.3751
T7	2	HYBRIFLEX 1-5/8"	60.10 - 80.10	0.6000	0.4088
T7	3	HYBRIFLEX 1-5/8"	60.10 - 80.10	0.6000	0.4088
T7	4	HYBRIFLEX 1-5/8"	60.10 - 80.10	0.6000	0.4088
T8	2	HYBRIFLEX 1-5/8"	40.10 - 60.10	0.6000	0.5386
T8	3	HYBRIFLEX 1-5/8"	40.10 - 60.10	0.6000	0.5386
T8	4	HYBRIFLEX 1-5/8"	40.10 - 60.10	0.6000	0.5386
T9	2	HYBRIFLEX 1-5/8"	20.10 - 40.10	0.6000	0.5741
T9	3	HYBRIFLEX 1-5/8"	20.10 - 40.10	0.6000	0.5741
T9	4	HYBRIFLEX 1-5/8"	20.10 - 40.10	0.6000	0.5741
T10	2	HYBRIFLEX 1-5/8"	8.00 - 20.10	0.6000	0.5855
T10	3	HYBRIFLEX 1-5/8"	8.00 - 20.10	0.6000	0.5855

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	4	HYBRIFLEX 1-5/8"	8.00 - 20.10	0.6000	0.5855

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
JAHH-65B-R3B	A	From Face	3.00	0.0000	187.00	No Ice	9.11	5.98	0.06
(Verizon - Existing)			-6.00			1/2" Ice	9.58	6.44	0.12
			0.00			1" Ice	10.05	6.91	0.19
BXA-70063/6CF	A	From Face	3.00	0.0000	187.00	No Ice	7.57	4.16	0.01
(Verizon - Existing)			0.00			1/2" Ice	8.02	4.60	0.05
			0.00			1" Ice	8.47	5.04	0.10
JAHH-65B-R3B	A	From Face	3.00	0.0000	187.00	No Ice	9.11	5.98	0.06
(Verizon - Existing)			6.00			1/2" Ice	9.58	6.44	0.12
			0.00			1" Ice	10.05	6.91	0.19
JAHH-65B-R3B	B	From Face	3.00	0.0000	187.00	No Ice	9.11	5.98	0.06
(Verizon - Existing)			-6.00			1/2" Ice	9.58	6.44	0.12
			0.00			1" Ice	10.05	6.91	0.19
BXA-70063/6CF	B	From Face	3.00	0.0000	187.00	No Ice	7.57	4.16	0.01
(Verizon - Existing)			0.00			1/2" Ice	8.02	4.60	0.05
			0.00			1" Ice	8.47	5.04	0.10
JAHH-65B-R3B	B	From Face	3.00	0.0000	187.00	No Ice	9.11	5.98	0.06
(Verizon - Existing)			6.00			1/2" Ice	9.58	6.44	0.12
			0.00			1" Ice	10.05	6.91	0.19
JAHH-65B-R3B	C	From Face	3.00	0.0000	187.00	No Ice	9.11	5.98	0.06
(Verizon - Existing)			-6.00			1/2" Ice	9.58	6.44	0.12
			0.00			1" Ice	10.05	6.91	0.19
BXA-70063/6CF	C	From Face	3.00	0.0000	187.00	No Ice	7.57	4.16	0.01
(Verizon - Existing)			0.00			1/2" Ice	8.02	4.60	0.05
			0.00			1" Ice	8.47	5.04	0.10
JAHH-65B-R3B	C	From Face	3.00	0.0000	187.00	No Ice	9.11	5.98	0.06
(Verizon - Existing)			6.00			1/2" Ice	9.58	6.44	0.12
			0.00			1" Ice	10.05	6.91	0.19
RRH2x60-07-U	A	From Face	3.00	0.0000	187.00	No Ice	2.10	1.41	0.05
(Verizon - Existing)			0.00			1/2" Ice	2.29	1.56	0.07
			0.00			1" Ice	2.48	1.74	0.09
RRH2x60-07-U	B	From Face	3.00	0.0000	187.00	No Ice	2.10	1.41	0.05
(Verizon - Existing)			0.00			1/2" Ice	2.29	1.56	0.07
			0.00			1" Ice	2.48	1.74	0.09
RRH2x60-07-U	C	From Face	3.00	0.0000	187.00	No Ice	2.10	1.41	0.05
(Verizon - Existing)			0.00			1/2" Ice	2.29	1.56	0.07
			0.00			1" Ice	2.48	1.74	0.09
RRH4x45/2x90-AWS	A	From Face	3.00	0.0000	187.00	No Ice	2.58	1.69	0.08
(Verizon - Existing)			-6.00			1/2" Ice	2.79	1.87	0.10
			0.00			1" Ice	3.01	2.06	0.12
RRH4x45/2x90-AWS	B	From Face	3.00	0.0000	187.00	No Ice	2.58	1.69	0.08
(Verizon - Existing)			-6.00			1/2" Ice	2.79	1.87	0.10
			0.00			1" Ice	3.01	2.06	0.12
RRH4x45/2x90-AWS	C	From Face	3.00	0.0000	187.00	No Ice	2.58	1.69	0.08
(Verizon - Existing)			-6.00			1/2" Ice	2.79	1.87	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	3.01	2.06	0.12
4x40 RRH 850	A	From Face	3.00	0.0000	187.00	No Ice	2.00	2.00	0.06
(Verizon - Existing)			0.00			1/2" Ice	2.19	2.19	0.08
			0.00			1" Ice	2.39	2.39	0.10
4x40 RRH 850	B	From Face	3.00	0.0000	187.00	No Ice	2.00	2.00	0.06
(Verizon - Existing)			0.00			1/2" Ice	2.19	2.19	0.08
			0.00			1" Ice	2.39	2.39	0.10
4x40 RRH 850	C	From Face	3.00	0.0000	187.00	No Ice	2.00	2.00	0.06
(Verizon - Existing)			0.00			1/2" Ice	2.19	2.19	0.08
			0.00			1" Ice	2.39	2.39	0.10
RC2DC-3315-PF-48	A	From Face	3.00	0.0000	187.00	No Ice	3.01	1.96	0.03
(Verizon - Existing)			0.00			1/2" Ice	3.23	2.15	0.05
			0.00			1" Ice	3.46	2.35	0.08
RC2DC-3315-PF-48	B	From Face	3.00	0.0000	187.00	No Ice	3.01	1.96	0.03
(Verizon - Existing)			0.00			1/2" Ice	3.23	2.15	0.05
			0.00			1" Ice	3.46	2.35	0.08
Pirod 12' T-Frame Sector	A	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - Existing)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	B	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - Existing)			0.00			1" Ice	23.20	23.20	0.73
Pirod 12' T-Frame Sector	C	From Leg	1.00	0.0000	187.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon - Existing)			0.00			1" Ice	23.20	23.20	0.73
APX16DWV-16DWVS-E-A	A	From Leg	3.50	0.0000	140.00	No Ice	6.46	2.15	0.04
20			-6.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile - Existing)			0.00			1" Ice	7.21	2.84	0.11
APXVAARR24-43	A	From Leg	3.50	0.0000	140.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			-2.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
AIR6449	A	From Leg	3.50	0.0000	140.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			2.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APX16DWV-16DWVS-E-A	B	From Leg	3.50	0.0000	140.00	No Ice	6.46	2.15	0.04
20			-6.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile - Existing)			0.00			1" Ice	7.21	2.84	0.11
APXVAARR24-43	B	From Leg	3.50	0.0000	140.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			-2.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
AIR6449	B	From Leg	3.50	0.0000	140.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			2.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
APX16DWV-16DWVS-E-A	C	From Leg	3.50	0.0000	140.00	No Ice	6.46	2.15	0.04
20			-6.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile - Existing)			0.00			1" Ice	7.21	2.84	0.11
APXVAARR24-43	C	From Leg	3.50	0.0000	140.00	No Ice	20.24	8.89	0.15
(T-Mobile - Existing)			-2.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
AIR6449	C	From Leg	3.50	0.0000	140.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			2.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
Radio 4449 B71 B12	A	From Leg	3.50	0.0000	140.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			-2.00			1/2" Ice	1.80	1.44	0.09
			-2.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	B	From Leg	3.50	0.0000	140.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			-2.00			1/2" Ice	1.80	1.44	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			1" Ice	1.97	1.59	0.11
Radio 4449 B71 B12	C	From Leg	3.50	0.0000	140.00	No Ice	1.64	1.29	0.07
(T-Mobile - Existing)			-2.00			1/2" Ice	1.80	1.44	0.09
			-2.00			1" Ice	1.97	1.59	0.11
4415 B25	A	From Leg	3.50	0.0000	140.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			-2.00			1/2" Ice	2.01	0.94	0.06
			2.00			1" Ice	2.19	1.07	0.08
4415 B25	B	From Leg	3.50	0.0000	140.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			-2.00			1/2" Ice	2.01	0.94	0.06
			2.00			1" Ice	2.19	1.07	0.08
4415 B25	C	From Leg	3.50	0.0000	140.00	No Ice	1.84	0.82	0.05
(T-Mobile - Proposed)			-2.00			1/2" Ice	2.01	0.94	0.06
			2.00			1" Ice	2.19	1.07	0.08
4424 B25	A	From Leg	3.50	0.0000	140.00	No Ice	2.05	1.61	0.09
(T-Mobile - Proposed)			2.00			1/2" Ice	2.23	1.77	0.11
			2.00			1" Ice	2.42	1.94	0.13
4424 B25	B	From Leg	3.50	0.0000	140.00	No Ice	2.05	1.61	0.09
(T-Mobile - Proposed)			2.00			1/2" Ice	2.23	1.77	0.11
			2.00			1" Ice	2.42	1.94	0.13
4424 B25	C	From Leg	3.50	0.0000	140.00	No Ice	2.05	1.61	0.09
(T-Mobile - Proposed)			2.00			1/2" Ice	2.23	1.77	0.11
			2.00			1" Ice	2.42	1.94	0.13
12' V-Frame	A	From Leg	2.00	0.0000	140.00	No Ice	9.22	12.97	0.30
(T-Mobile - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00			1" Ice	9.22	12.97	0.50
12' V-Frame	B	From Leg	2.00	0.0000	140.00	No Ice	9.22	12.97	0.30
(T-Mobile - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00			1" Ice	9.22	12.97	0.50
12' V-Frame	C	From Leg	2.00	0.0000	140.00	No Ice	9.22	12.97	0.30
(T-Mobile - Existing)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00			1" Ice	9.22	12.97	0.50

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	182.98	1.174	26	56.388	A	1.207	10.664	7.307	61.56	0.000	0.000
190.60-175.35					B	1.207	10.664		61.56	0.000	0.000
					C	1.207	10.664		61.56	4.217	0.000
T2	167.73	1.146	25	56.388	A	0.000	11.066	7.307	66.03	0.000	0.000
175.35-160.10					B	0.000	11.066		66.03	0.000	0.000
					C	0.000	11.066		66.03	6.039	0.000
T3	150.10	1.11	25	73.118	A	0.000	16.693	7.917	47.42	0.000	0.000
160.10-140.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	16.693		47.42	7.920	0.000
T4	130.10	1.065	24	73.118	A	0.000	16.693	7.917	47.42	15.761	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
140.10-120.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	16.693		47.42	7.920	0.000
T5	110.10	1.016	23	73.118	A	0.000	16.693	7.917	47.42	15.840	0.000
120.10-100.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	16.693		47.42	7.920	0.000
T6	90.10	0.959	21	73.118	A	1.087	16.693	7.917	44.53	15.840	0.000
100.10-80.10					B	1.087	16.693		44.53	0.000	0.000
					C	1.087	16.693		44.53	7.920	0.000
T7 80.10-60.10	70.10	0.893	20	73.127	A	0.000	16.709	7.933	47.48	15.840	0.000
					B	0.000	16.709		47.48	0.000	0.000
					C	0.000	16.709		47.48	7.920	0.000
T8 60.10-40.10	50.10	0.811	18	73.952	A	1.073	14.318	9.583	62.27	15.840	0.000
					B	1.073	14.318		62.27	0.000	0.000
					C	1.073	14.318		62.27	7.920	0.000
T9 40.10-20.10	30.10	0.701	16	73.952	A	0.000	14.318	9.583	66.93	15.840	0.000
					B	0.000	14.318		66.93	0.000	0.000
					C	0.000	14.318		66.93	7.920	0.000
T10 20.10-4.85	12.48	0.7	16	56.373	A	0.000	11.064	7.305	66.03	9.583	0.000
					B	0.000	11.064		66.03	0.000	0.000
					C	0.000	11.064		66.03	4.792	0.000
T11 4.85-0.00	2.43	0.7	16	9.627	A	6.951	2.515	2.515	26.57	0.000	0.000
					B	6.951	2.515		26.57	0.000	0.000
					C	6.951	2.515		26.57	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	182.98	1.174	6	1.7802	60.913	A	1.207	28.634	16.357	54.81	0.000	0.000
190.60-175.35						B	1.207	28.634		54.81	0.000	0.000
						C	1.207	28.634		54.81	14.641	0.000
T2	167.73	1.146	6	1.7648	60.874	A	0.000	28.881	16.278	56.36	0.000	0.000
175.35-160.10						B	0.000	28.881		56.36	0.000	0.000
						C	0.000	28.881		56.36	20.885	0.000
T3	150.10	1.11	6	1.7453	78.936	A	0.000	48.753	19.552	40.10	0.000	0.000
160.10-140.10						B	0.000	48.753		40.10	0.000	0.000
						C	0.000	48.753		40.10	27.256	0.000
T4	130.10	1.065	6	1.7206	78.854	A	0.000	48.298	19.387	40.14	46.609	0.000
140.10-120.10						B	0.000	48.298		40.14	0.000	0.000
						C	0.000	48.298		40.14	27.087	0.000
T5	110.10	1.016	6	1.6921	78.759	A	0.000	47.775	19.197	40.18	46.544	0.000
120.10-100.10						B	0.000	47.775		40.18	0.000	0.000
						C	0.000	47.775		40.18	26.893	0.000
T6 100.10-80.10	90.10	0.959	5	1.6585	78.647	A	1.087	48.059	18.973	38.61	46.191	0.000
						B	1.087	48.059		38.61	0.000	0.000
						C	1.087	48.059		38.61	26.663	0.000
T7 80.10-60.10	70.10	0.893	5	1.6174	78.518	A	0.000	46.416	18.716	40.32	45.760	0.000
						B	0.000	46.416		40.32	0.000	0.000
						C	0.000	46.416		40.32	26.383	0.000
T8 60.10-40.10	50.10	0.811	4	1.5640	79.165	A	1.073	35.456	20.010	54.78	45.199	0.000
						B	1.073	35.456		54.78	0.000	0.000
						C	1.073	35.456		54.78	26.019	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T9 40.10-20.10	30.10	0.701	4	1.4863	78.906	A	0.000	33.609	19.492	58.00	44.386	0.000
						B	0.000	33.609		58.00	0.000	0.000
						C	0.000	33.609		58.00	25.490	0.000
T10 20.10-4.85	12.48	0.7	4	1.3610	59.832	A	0.000	24.800	14.222	57.35	26.062	0.000
						B	0.000	24.800		57.35	0.000	0.000
						C	0.000	24.800		57.35	14.907	0.000
T11 4.85-0.00	2.43	0.7	4	1.1554	10.619	A	6.951	5.684	4.536	35.91	0.000	0.000
						B	6.951	5.684		35.91	0.000	0.000
						C	6.951	5.684		35.91	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	182.98	1.174	9	56.388	A	1.207	10.664	7.307	61.56	0.000	0.000
190.60-175.35					B	1.207	10.664		61.56	0.000	0.000
					C	1.207	10.664		61.56	4.217	0.000
T2	167.73	1.146	9	56.388	A	0.000	11.066	7.307	66.03	0.000	0.000
175.35-160.10					B	0.000	11.066		66.03	0.000	0.000
					C	0.000	11.066		66.03	6.039	0.000
T3	150.10	1.11	9	73.118	A	0.000	16.693	7.917	47.42	0.000	0.000
160.10-140.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	16.693		47.42	7.920	0.000
T4	130.10	1.065	8	73.118	A	0.000	16.693	7.917	47.42	15.761	0.000
140.10-120.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	16.693		47.42	7.920	0.000
T5	110.10	1.016	8	73.118	A	0.000	16.693	7.917	47.42	15.840	0.000
120.10-100.10					B	0.000	16.693		47.42	0.000	0.000
					C	0.000	16.693		47.42	7.920	0.000
T6	90.10	0.959	8	73.118	A	1.087	16.693	7.917	44.53	15.840	0.000
100.10-80.10					B	1.087	16.693		44.53	0.000	0.000
					C	1.087	16.693		44.53	7.920	0.000
T7 80.10-60.10	70.10	0.893	7	73.127	A	0.000	16.709	7.933	47.48	15.840	0.000
					B	0.000	16.709		47.48	0.000	0.000
					C	0.000	16.709		47.48	7.920	0.000
T8 60.10-40.10	50.10	0.811	6	73.952	A	1.073	14.318	9.583	62.27	15.840	0.000
					B	1.073	14.318		62.27	0.000	0.000
					C	1.073	14.318		62.27	7.920	0.000
T9 40.10-20.10	30.10	0.701	5	73.952	A	0.000	14.318	9.583	66.93	15.840	0.000
					B	0.000	14.318		66.93	0.000	0.000
					C	0.000	14.318		66.93	7.920	0.000
T10 20.10-4.85	12.48	0.7	5	56.373	A	0.000	11.064	7.305	66.03	9.583	0.000
					B	0.000	11.064		66.03	0.000	0.000
					C	0.000	11.064		66.03	4.792	0.000
T11 4.85-0.00	2.43	0.7	5	9.627	A	6.951	2.515	2.515	26.57	0.000	0.000
					B	6.951	2.515		26.57	0.000	0.000
					C	6.951	2.515		26.57	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	26	1	1	7.353	0.47	31.04	C
190.60-175.35			B	0.211	2.561		1	1	7.353			
			C	0.211	2.561		1	1	7.353			
T2	0.06	0.44	A	0.196	2.609	25	1	1	6.350	0.44	28.61	C
175.35-160.10			B	0.196	2.609		1	1	6.350			
			C	0.196	2.609		1	1	6.350			
T3	0.08	0.42	A	0.228	2.504	25	1	1	9.682	0.61	30.36	C
160.10-140.10			B	0.228	2.504		1	1	9.682			
			C	0.228	2.504		1	1	9.682			
T4	0.23	0.42	A	0.228	2.504	24	1	1	9.682	0.77	38.65	C
140.10-120.10		TA 0.33	B	0.228	2.504		1	1	9.682			
			C	0.228	2.504		1	1	9.682			
T5	0.23	0.42	A	0.228	2.504	23	1	1	9.682	0.74	36.90	C
120.10-100.10			B	0.228	2.504		1	1	9.682			
			C	0.228	2.504		1	1	9.682			
T6	0.23	0.48	A	0.243	2.458	21	1	1	10.825	0.74	36.98	C
100.10-80.10			B	0.243	2.458		1	1	10.825			
			C	0.243	2.458		1	1	10.825			
T7	0.23	0.50	A	0.228	2.504	20	1	1	9.692	0.65	32.45	C
80.10-60.10			B	0.228	2.504		1	1	9.692			
			C	0.228	2.504		1	1	9.692			
T8	0.23	0.51	A	0.208	2.569	18	1	1	9.319	0.58	29.23	C
60.10-40.10			B	0.208	2.569		1	1	9.319			
			C	0.208	2.569		1	1	9.319			
T9	0.23	0.46	A	0.194	2.617	16	1	1	8.210	0.47	23.65	C
40.10-20.10			B	0.194	2.617		1	1	8.210			
			C	0.194	2.617		1	1	8.210			
T10	0.14	0.35	A	0.196	2.609	16	1	1	6.349	0.33	21.82	C
20.10-4.85			B	0.196	2.609		1	1	6.349			
			C	0.196	2.609		1	1	6.349			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	16	1	1	9.466	0.26	53.20	C
			B	0.983	2.066		1	1	9.466			
			C	0.983	2.066		1	1	9.466			
Sum Weight:	1.68	5.12								6.06		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	26	0.8	1	7.112	0.46	30.14	C
190.60-175.35			B	0.211	2.561		0.8	1	7.112			
			C	0.211	2.561		0.8	1	7.112			
T2	0.06	0.44	A	0.196	2.609	25	0.8	1	6.350	0.44	28.61	C
175.35-160.10			B	0.196	2.609		0.8	1	6.350			
			C	0.196	2.609		0.8	1	6.350			
T3	0.08	0.42	A	0.228	2.504	25	0.8	1	9.682	0.61	30.36	C
160.10-140.10			B	0.228	2.504		0.8	1	9.682			
			C	0.228	2.504		0.8	1	9.682			
T4	0.23	0.42	A	0.228	2.504	24	0.8	1	9.682	0.77	38.65	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
140.10-120.10		TA 0.33	B	0.228	2.504		0.8	1	9.682			
			C	0.228	2.504		0.8	1	9.682			
T5	0.23	0.42	A	0.228	2.504	23	0.8	1	9.682	0.74	36.90	C
120.10-100.10			B	0.228	2.504		0.8	1	9.682			
			C	0.228	2.504		0.8	1	9.682			
T6	0.23	0.48	A	0.243	2.458	21	0.8	1	10.608	0.73	36.50	C
100.10-80.10			B	0.243	2.458		0.8	1	10.608			
			C	0.243	2.458		0.8	1	10.608			
T7	0.23	0.50	A	0.228	2.504	20	0.8	1	9.692	0.65	32.45	C
80.10-60.10			B	0.228	2.504		0.8	1	9.692			
			C	0.228	2.504		0.8	1	9.692			
T8	0.23	0.51	A	0.208	2.569	18	0.8	1	9.105	0.58	28.81	C
60.10-40.10			B	0.208	2.569		0.8	1	9.105			
			C	0.208	2.569		0.8	1	9.105			
T9	0.23	0.46	A	0.194	2.617	16	0.8	1	8.210	0.47	23.65	C
40.10-20.10			B	0.194	2.617		0.8	1	8.210			
			C	0.194	2.617		0.8	1	8.210			
T10	0.14	0.35	A	0.196	2.609	16	0.8	1	6.349	0.33	21.82	C
20.10-4.85			B	0.196	2.609		0.8	1	6.349			
			C	0.196	2.609		0.8	1	6.349			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	16	0.8	1	8.075	0.22	45.39	C
			B	0.983	2.066		0.8	1	8.075			
			C	0.983	2.066		0.8	1	8.075			
Sum Weight:	1.68	5.12								6.00		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	26	0.85	1	7.172	0.46	30.37	C
190.60-175.35			B	0.211	2.561		0.85	1	7.172			
			C	0.211	2.561		0.85	1	7.172			
T2	0.06	0.44	A	0.196	2.609	25	0.85	1	6.350	0.44	28.61	C
175.35-160.10			B	0.196	2.609		0.85	1	6.350			
			C	0.196	2.609		0.85	1	6.350			
T3	0.08	0.42	A	0.228	2.504	25	0.85	1	9.682	0.61	30.36	C
160.10-140.10			B	0.228	2.504		0.85	1	9.682			
			C	0.228	2.504		0.85	1	9.682			
T4	0.23	0.42	A	0.228	2.504	24	0.85	1	9.682	0.77	38.65	C
140.10-120.10		TA 0.33	B	0.228	2.504		0.85	1	9.682			
			C	0.228	2.504		0.85	1	9.682			
T5	0.23	0.42	A	0.228	2.504	23	0.85	1	9.682	0.74	36.90	C
120.10-100.10			B	0.228	2.504		0.85	1	9.682			
			C	0.228	2.504		0.85	1	9.682			
T6	0.23	0.48	A	0.243	2.458	21	0.85	1	10.662	0.73	36.62	C
100.10-80.10			B	0.243	2.458		0.85	1	10.662			
			C	0.243	2.458		0.85	1	10.662			
T7	0.23	0.50	A	0.228	2.504	20	0.85	1	9.692	0.65	32.45	C
80.10-60.10			B	0.228	2.504		0.85	1	9.692			
			C	0.228	2.504		0.85	1	9.692			
T8	0.23	0.51	A	0.208	2.569	18	0.85	1	9.158	0.58	28.91	C
60.10-40.10			B	0.208	2.569		0.85	1	9.158			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			C	0.208	2.569		0.85	1	9.158			
T9	0.23	0.46	A	0.194	2.617	16	0.85	1	8.210	0.47	23.65	C
40.10-20.10			B	0.194	2.617		0.85	1	8.210			
			C	0.194	2.617		0.85	1	8.210			
T10	0.14	0.35	A	0.196	2.609	16	0.85	1	6.349	0.33	21.82	C
20.10-4.85			B	0.196	2.609		0.85	1	6.349			
			C	0.196	2.609		0.85	1	6.349			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	16	0.85	1	8.423	0.23	47.34	C
			B	0.983	2.066		0.85	1	8.423			
			C	0.983	2.066		0.85	1	8.423			
Sum Weight:	1.68	5.12								6.01		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.21	1.71	A	0.49	1.913	6	1	1	20.667	0.26	16.74	C
190.60-175.35			B	0.49	1.913		1	1	20.667			
			C	0.49	1.913		1	1	20.667			
T2	0.29	1.58	A	0.474	1.935	6	1	1	19.395	0.26	16.85	C
175.35-160.10			B	0.474	1.935		1	1	19.395			
			C	0.474	1.935		1	1	19.395			
T3	0.38	2.49	A	0.618	1.794	6	1	1	36.811	0.39	19.62	C
160.10-140.10			B	0.618	1.794		1	1	36.811			
			C	0.618	1.794		1	1	36.811			
T4	1.12	2.45	A	0.613	1.797	6	1	1	36.307	0.46	23.10	C
140.10-120.10		TA 0.87	B	0.613	1.797		1	1	36.307			
			C	0.613	1.797		1	1	36.307			
T5	1.11	2.40	A	0.607	1.8	6	1	1	35.733	0.44	21.89	C
120.10-100.10			B	0.607	1.8		1	1	35.733			
			C	0.607	1.8		1	1	35.733			
T6	1.09	2.52	A	0.625	1.791	5	1	1	37.601	0.42	20.99	C
100.10-80.10			B	0.625	1.791		1	1	37.601			
			C	0.625	1.791		1	1	37.601			
T7	1.06	2.35	A	0.591	1.81	5	1	1	34.264	0.38	18.89	C
80.10-60.10			B	0.591	1.81		1	1	34.264			
			C	0.591	1.81		1	1	34.264			
T8	1.03	1.85	A	0.461	1.955	4	1	1	24.648	0.32	16.23	C
60.10-40.10			B	0.461	1.955		1	1	24.648			
			C	0.461	1.955		1	1	24.648			
T9	0.99	1.59	A	0.426	2.015	4	1	1	21.773	0.27	13.62	C
40.10-20.10			B	0.426	2.015		1	1	21.773			
			C	0.426	2.015		1	1	21.773			
T10	0.56	1.14	A	0.414	2.036	4	1	1	15.937	0.18	11.98	C
20.10-4.85			B	0.414	2.036		1	1	15.937			
			C	0.414	2.036		1	1	15.937			
T11 4.85-0.00	0.00	0.84	A	1	2.1	4	1	1	12.634	0.07*	14.87	C
			B	1	2.1		1	1	12.634			
			C	1	2.1		1	1	12.634			
Sum Weight:	7.84	21.80			*2.1A_g limit					3.45		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.21	1.71	A	0.49	1.913	6	0.8	1	20.425	0.25	16.58	C
190.60-175.35			B	0.49	1.913		0.8	1	20.425			
			C	0.49	1.913		0.8	1	20.425			
T2	0.29	1.58	A	0.474	1.935	6	0.8	1	19.395	0.26	16.85	C
175.35-160.10			B	0.474	1.935		0.8	1	19.395			
			C	0.474	1.935		0.8	1	19.395			
T3	0.38	2.49	A	0.618	1.794	6	0.8	1	36.811	0.39	19.62	C
160.10-140.10			B	0.618	1.794		0.8	1	36.811			
			C	0.618	1.794		0.8	1	36.811			
T4	1.12	2.45	A	0.613	1.797	6	0.8	1	36.307	0.46	23.10	C
140.10-120.10		TA 0.87	B	0.613	1.797		0.8	1	36.307			
			C	0.613	1.797		0.8	1	36.307			
T5	1.11	2.40	A	0.607	1.8	6	0.8	1	35.733	0.44	21.89	C
120.10-100.10			B	0.607	1.8		0.8	1	35.733			
			C	0.607	1.8		0.8	1	35.733			
T6	1.09	2.52	A	0.625	1.791	5	0.8	1	37.383	0.42	20.91	C
100.10-80.10			B	0.625	1.791		0.8	1	37.383			
			C	0.625	1.791		0.8	1	37.383			
T7	1.06	2.35	A	0.591	1.81	5	0.8	1	34.264	0.38	18.89	C
80.10-60.10			B	0.591	1.81		0.8	1	34.264			
			C	0.591	1.81		0.8	1	34.264			
T8	1.03	1.85	A	0.461	1.955	4	0.8	1	24.434	0.32	16.15	C
60.10-40.10			B	0.461	1.955		0.8	1	24.434			
			C	0.461	1.955		0.8	1	24.434			
T9	0.99	1.59	A	0.426	2.015	4	0.8	1	21.773	0.27	13.62	C
40.10-20.10			B	0.426	2.015		0.8	1	21.773			
			C	0.426	2.015		0.8	1	21.773			
T10	0.56	1.14	A	0.414	2.036	4	0.8	1	15.937	0.18	11.98	C
20.10-4.85			B	0.414	2.036		0.8	1	15.937			
			C	0.414	2.036		0.8	1	15.937			
T11 4.85-0.00	0.00	0.84	A	1	2.1	4	0.8	1	11.244	0.07*	14.87	C
			B	1	2.1		0.8	1	11.244			
			C	1	2.1		0.8	1	11.244			
Sum Weight:	7.84	21.80			*2.1A_g limit					3.45		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.21	1.71	A	0.49	1.913	6	0.85	1	20.486	0.25	16.62	C
190.60-175.35			B	0.49	1.913		0.85	1	20.486			
			C	0.49	1.913		0.85	1	20.486			
T2	0.29	1.58	A	0.474	1.935	6	0.85	1	19.395	0.26	16.85	C
175.35-160.10			B	0.474	1.935		0.85	1	19.395			
			C	0.474	1.935		0.85	1	19.395			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T3	0.38	2.49	A	0.618	1.794	6	0.85	1	36.811	0.39	19.62	C
160.10-140.10			B	0.618	1.794		0.85	1	36.811			
			C	0.618	1.794		0.85	1	36.811			
T4	1.12	2.45	A	0.613	1.797	6	0.85	1	36.307	0.46	23.10	C
140.10-120.10		TA 0.87	B	0.613	1.797		0.85	1	36.307			
			C	0.613	1.797		0.85	1	36.307			
T5	1.11	2.40	A	0.607	1.8	6	0.85	1	35.733	0.44	21.89	C
120.10-100.10			B	0.607	1.8		0.85	1	35.733			
			C	0.607	1.8		0.85	1	35.733			
T6	1.09	2.52	A	0.625	1.791	5	0.85	1	37.438	0.42	20.93	C
100.10-80.10			B	0.625	1.791		0.85	1	37.438			
			C	0.625	1.791		0.85	1	37.438			
T7	1.06	2.35	A	0.591	1.81	5	0.85	1	34.264	0.38	18.89	C
80.10-60.10			B	0.591	1.81		0.85	1	34.264			
			C	0.591	1.81		0.85	1	34.264			
T8	1.03	1.85	A	0.461	1.955	4	0.85	1	24.488	0.32	16.17	C
60.10-40.10			B	0.461	1.955		0.85	1	24.488			
			C	0.461	1.955		0.85	1	24.488			
T9	0.99	1.59	A	0.426	2.015	4	0.85	1	21.773	0.27	13.62	C
40.10-20.10			B	0.426	2.015		0.85	1	21.773			
			C	0.426	2.015		0.85	1	21.773			
T10	0.56	1.14	A	0.414	2.036	4	0.85	1	15.937	0.18	11.98	C
20.10-4.85			B	0.414	2.036		0.85	1	15.937			
			C	0.414	2.036		0.85	1	15.937			
T11 4.85-0.00	0.00	0.84	A	1	2.1	4	0.85	1	11.592	0.07*	14.87	C
			B	1	2.1		0.85	1	11.592			
			C	1	2.1		0.85	1	11.592			
Sum Weight:	7.84	21.80			*2.1A_g limit					3.45		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	9	1	1	7.353	0.17	10.96	C
190.60-175.35			B	0.211	2.561		1	1	7.353			
			C	0.211	2.561		1	1	7.353			
T2	0.06	0.44	A	0.196	2.609	9	1	1	6.350	0.15	10.10	C
175.35-160.10			B	0.196	2.609		1	1	6.350			
			C	0.196	2.609		1	1	6.350			
T3	0.08	0.42	A	0.228	2.504	9	1	1	9.682	0.21	10.71	C
160.10-140.10			B	0.228	2.504		1	1	9.682			
			C	0.228	2.504		1	1	9.682			
T4	0.23	0.42	A	0.228	2.504	8	1	1	9.682	0.27	13.64	C
140.10-120.10		TA 0.33	B	0.228	2.504		1	1	9.682			
			C	0.228	2.504		1	1	9.682			
T5	0.23	0.42	A	0.228	2.504	8	1	1	9.682	0.26	13.02	C
120.10-100.10			B	0.228	2.504		1	1	9.682			
			C	0.228	2.504		1	1	9.682			
T6	0.23	0.48	A	0.243	2.458	8	1	1	10.825	0.26	13.05	C
100.10-80.10			B	0.243	2.458		1	1	10.825			
			C	0.243	2.458		1	1	10.825			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T7	0.23	0.50	A	0.228	2.504	7	1	1	9.692	0.23	11.45	C
80.10-60.10			B	0.228	2.504		1	1	9.692			
			C	0.228	2.504		1	1	9.692			
T8	0.23	0.51	A	0.208	2.569	6	1	1	9.319	0.21	10.32	C
60.10-40.10			B	0.208	2.569		1	1	9.319			
			C	0.208	2.569		1	1	9.319			
T9	0.23	0.46	A	0.194	2.617	5	1	1	8.210	0.17	8.35	C
40.10-20.10			B	0.194	2.617		1	1	8.210			
			C	0.194	2.617		1	1	8.210			
T10	0.14	0.35	A	0.196	2.609	5	1	1	6.349	0.12	7.70	C
20.10-4.85			B	0.196	2.609		1	1	6.349			
			C	0.196	2.609		1	1	6.349			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	5	1	1	9.466	0.09	18.78	C
			B	0.983	2.066		1	1	9.466			
			C	0.983	2.066		1	1	9.466			
Sum Weight:	1.68	5.12								2.14		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	9	0.8	1	7.112	0.16	10.64	C
190.60-175.35			B	0.211	2.561		0.8	1	7.112			
			C	0.211	2.561		0.8	1	7.112			
T2	0.06	0.44	A	0.196	2.609	9	0.8	1	6.350	0.15	10.10	C
175.35-160.10			B	0.196	2.609		0.8	1	6.350			
			C	0.196	2.609		0.8	1	6.350			
T3	0.08	0.42	A	0.228	2.504	9	0.8	1	9.682	0.21	10.71	C
160.10-140.10			B	0.228	2.504		0.8	1	9.682			
			C	0.228	2.504		0.8	1	9.682			
T4	0.23	0.42	A	0.228	2.504	8	0.8	1	9.682	0.27	13.64	C
140.10-120.10		TA 0.33	B	0.228	2.504		0.8	1	9.682			
			C	0.228	2.504		0.8	1	9.682			
T5	0.23	0.42	A	0.228	2.504	8	0.8	1	9.682	0.26	13.02	C
120.10-100.10			B	0.228	2.504		0.8	1	9.682			
			C	0.228	2.504		0.8	1	9.682			
T6	0.23	0.48	A	0.243	2.458	8	0.8	1	10.608	0.26	12.88	C
100.10-80.10			B	0.243	2.458		0.8	1	10.608			
			C	0.243	2.458		0.8	1	10.608			
T7	0.23	0.50	A	0.228	2.504	7	0.8	1	9.692	0.23	11.45	C
80.10-60.10			B	0.228	2.504		0.8	1	9.692			
			C	0.228	2.504		0.8	1	9.692			
T8	0.23	0.51	A	0.208	2.569	6	0.8	1	9.105	0.20	10.17	C
60.10-40.10			B	0.208	2.569		0.8	1	9.105			
			C	0.208	2.569		0.8	1	9.105			
T9	0.23	0.46	A	0.194	2.617	5	0.8	1	8.210	0.17	8.35	C
40.10-20.10			B	0.194	2.617		0.8	1	8.210			
			C	0.194	2.617		0.8	1	8.210			
T10	0.14	0.35	A	0.196	2.609	5	0.8	1	6.349	0.12	7.70	C
20.10-4.85			B	0.196	2.609		0.8	1	6.349			
			C	0.196	2.609		0.8	1	6.349			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	5	0.8	1	8.075	0.08	16.02	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
			B	0.983	2.066		0.8	1	8.075			
			C	0.983	2.066		0.8	1	8.075			
Sum Weight:	1.68	5.12								2.12		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	0.49	A	0.211	2.561	9	0.85	1	7.172	0.16	10.72	C
190.60-175.35			B	0.211	2.561		0.85	1	7.172			
			C	0.211	2.561		0.85	1	7.172			
T2	0.06	0.44	A	0.196	2.609	9	0.85	1	6.350	0.15	10.10	C
175.35-160.10			B	0.196	2.609		0.85	1	6.350			
			C	0.196	2.609		0.85	1	6.350			
T3	0.08	0.42	A	0.228	2.504	9	0.85	1	9.682	0.21	10.71	C
160.10-140.10			B	0.228	2.504		0.85	1	9.682			
			C	0.228	2.504		0.85	1	9.682			
T4	0.23	0.42	A	0.228	2.504	8	0.85	1	9.682	0.27	13.64	C
140.10-120.10		TA 0.33	B	0.228	2.504		0.85	1	9.682			
			C	0.228	2.504		0.85	1	9.682			
T5	0.23	0.42	A	0.228	2.504	8	0.85	1	9.682	0.26	13.02	C
120.10-100.10			B	0.228	2.504		0.85	1	9.682			
			C	0.228	2.504		0.85	1	9.682			
T6	0.23	0.48	A	0.243	2.458	8	0.85	1	10.662	0.26	12.92	C
100.10-80.10			B	0.243	2.458		0.85	1	10.662			
			C	0.243	2.458		0.85	1	10.662			
T7	0.23	0.50	A	0.228	2.504	7	0.85	1	9.692	0.23	11.45	C
80.10-60.10			B	0.228	2.504		0.85	1	9.692			
			C	0.228	2.504		0.85	1	9.692			
T8	0.23	0.51	A	0.208	2.569	6	0.85	1	9.158	0.20	10.20	C
60.10-40.10			B	0.208	2.569		0.85	1	9.158			
			C	0.208	2.569		0.85	1	9.158			
T9	0.23	0.46	A	0.194	2.617	5	0.85	1	8.210	0.17	8.35	C
40.10-20.10			B	0.194	2.617		0.85	1	8.210			
			C	0.194	2.617		0.85	1	8.210			
T10	0.14	0.35	A	0.196	2.609	5	0.85	1	6.349	0.12	7.70	C
20.10-4.85			B	0.196	2.609		0.85	1	6.349			
			C	0.196	2.609		0.85	1	6.349			
T11 4.85-0.00	0.00	0.31	A	0.983	2.066	5	0.85	1	8.423	0.08	16.71	C
			B	0.983	2.066		0.85	1	8.423			
			C	0.983	2.066		0.85	1	8.423			
Sum Weight:	1.68	5.12								2.12		

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	2.96			
Bracing Weight	2.15			
Total Member Self-Weight	5.12			
Guy Weight	1.06			
Total Weight	12.67			
Wind 0 deg - No Ice		0.00	-10.44	-1.06
Wind 30 deg - No Ice		5.20	-9.00	-0.36
Wind 60 deg - No Ice		9.00	-5.19	0.44
Wind 90 deg - No Ice		10.41	0.00	1.12
Wind 120 deg - No Ice		9.06	5.22	1.50
Wind 150 deg - No Ice		5.20	9.00	1.48
Wind 180 deg - No Ice		0.00	10.37	1.06
Wind 210 deg - No Ice		-5.20	9.00	0.36
Wind 240 deg - No Ice		-9.06	5.22	-0.44
Wind 270 deg - No Ice		-10.41	0.00	-1.12
Wind 300 deg - No Ice		-9.00	-5.19	-1.50
Wind 330 deg - No Ice		-5.20	-9.00	-1.48
Member Ice	16.68			
Guy Ice	9.12			
Total Weight Ice	52.92			
Wind 0 deg - Ice		0.00	-4.93	-0.49
Wind 30 deg - Ice		2.46	-4.26	-0.07
Wind 60 deg - Ice		4.27	-2.46	0.36
Wind 90 deg - Ice		4.93	0.00	0.70
Wind 120 deg - Ice		4.27	2.46	0.85
Wind 150 deg - Ice		2.46	4.26	0.77
Wind 180 deg - Ice		0.00	4.92	0.49
Wind 210 deg - Ice		-2.46	4.26	0.07
Wind 240 deg - Ice		-4.27	2.46	-0.36
Wind 270 deg - Ice		-4.93	0.00	-0.70
Wind 300 deg - Ice		-4.27	-2.46	-0.85
Wind 330 deg - Ice		-2.46	-4.26	-0.77
Total Weight	12.67			
Wind 0 deg - Service		0.00	-3.68	-0.37
Wind 30 deg - Service		1.84	-3.18	-0.13
Wind 60 deg - Service		3.18	-1.83	0.15
Wind 90 deg - Service		3.67	0.00	0.39
Wind 120 deg - Service		3.20	1.84	0.53
Wind 150 deg - Service		1.84	3.18	0.52
Wind 180 deg - Service		0.00	3.66	0.37
Wind 210 deg - Service		-1.84	3.18	0.13
Wind 240 deg - Service		-3.20	1.84	-0.15
Wind 270 deg - Service		-3.67	0.00	-0.39
Wind 300 deg - Service		-3.18	-1.83	-0.53
Wind 330 deg - Service		-1.84	-3.18	-0.52

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy

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

Maximum 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	190.6 - 175.35	Leg	Max Tension	6	1.99	-0.05	0.48
			Max. Compression	4	-13.41	-0.06	-0.08
			Max. Mx	6	-9.48	1.07	0.25
			Max. My	2	-9.45	-0.28	-1.19
			Max. Vy	10	1.12	0.34	0.50
			Max. Vx	2	1.06	-0.62	0.04
		Diagonal	Max Tension	5	2.26	0.00	0.00
			Max. Compression	11	-2.26	0.00	0.00
			Max. Mx	17	0.18	0.02	0.00
			Max. My	25	0.01	0.00	0.00
			Max. Vy	17	-0.01	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00
		Bottom Girt	Max Tension	7	0.27	0.00	0.00
			Max. Compression	13	-0.23	0.00	0.00
			Max. Mx	19	0.03	0.01	0.00
			Max. My	6	-0.17	0.00	0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	10.45		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Tension	7	10.55		
			Top Cable Vert	7	9.45		
			Top Cable Norm	7	4.67		
			Top Cable Tan	7	0.01		
			Bot Cable Vert	7	-9.25		
			Bot Cable Norm	7	4.87		
			Bot Cable Tan	7	0.13		
		Guy B	Bottom Tension	11	10.57		
			Top Tension	11	10.67		
			Top Cable Vert	11	9.58		
			Top Cable Norm	11	4.69		
			Top Cable Tan	11	0.02		
			Bot Cable Vert	11	-9.37		
			Bot Cable Norm	11	4.90		
			Bot Cable Tan	11	0.13		
		Guy C	Bottom Tension	5	10.61		
			Top Tension	5	10.71		
			Top Cable Vert	5	9.63		
			Top Cable Norm	5	4.69		
			Top Cable Tan	5	0.02		
			Bot Cable Vert	5	-9.41		
			Bot Cable Norm	5	4.90		
			Bot Cable Tan	5	0.13		
		Top Guy Pull-Off	Max Tension	13	2.91	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	0.90	0.03	0.00
			Max. My	6	0.13	0.00	0.00
			Max. Vy	26	0.04	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
T2	175.35 - 160.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	11	-11.00	0.04	0.05
			Max. Mx	5	-5.87	0.25	-0.05
			Max. My	8	-4.85	0.00	0.26
			Max. Vy	11	-0.52	0.17	-0.02
			Max. Vx	2	-0.50	-0.04	0.16
		Diagonal	Max Tension	13	1.67	0.00	0.00
			Max. Compression	7	-1.70	0.00	0.00
			Max. Mx	17	0.45	0.01	0.00
			Max. My	25	-0.01	0.00	0.00
			Max. Vy	17	-0.01	0.00	0.00
			Max. Vx	25	0.00	0.00	0.00
		Top Girt	Max Tension	12	0.30	0.00	0.00
			Max. Compression	6	-0.30	0.00	0.00
			Max. Mx	19	0.04	0.01	0.00
			Max. My	6	0.17	0.00	0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Bottom Girt	Max Tension	7	0.65	0.00	0.00
			Max. Compression	13	-0.60	0.00	0.00
			Max. Mx	16	-0.05	0.01	0.00
			Max. My	13	-0.60	0.00	-0.00
			Max. Vy	16	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
T3	160.1 - 140.1	Leg	Max Tension	8	8.94	-0.00	-0.06
			Max. Compression	6	-24.76	-0.08	-0.03
			Max. Mx	5	-4.98	0.25	-0.05
			Max. My	8	-4.18	0.00	0.26
			Max. Vy	11	-0.77	0.24	-0.05
			Max. Vx	2	-0.81	-0.01	0.25
		Diagonal	Max Tension	7	1.13	0.00	0.00
			Max. Compression	7	-1.23	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	17	0.18	0.01	0.00
			Max. My	25	0.08	0.00	0.00
			Max. Vy	17	-0.01	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00
		Top Girt	Max Tension	9	0.27	0.00	0.00
			Max. Compression	3	-0.12	0.00	0.00
			Max. Mx	16	0.04	0.01	0.00
			Max. My	13	-0.03	0.00	-0.00
			Max. Vy	16	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	2.06	0.00	0.00
			Max. Compression	6	-1.31	0.00	0.00
			Max. Mx	26	0.87	0.01	0.00
			Max. My	13	0.46	0.00	-0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
T4	140.1 - 120.1	Leg	Max Tension	8	9.92	0.00	-0.01
			Max. Compression	6	-26.98	-0.07	-0.04
			Max. Mx	11	-5.82	1.65	-0.38
			Max. My	3	-5.99	-0.52	1.67
			Max. Vy	11	-2.95	1.65	-0.38
			Max. Vx	3	-2.96	-0.52	1.67
		Diagonal	Max Tension	12	0.92	0.00	0.00
			Max. Compression	12	-1.14	0.00	0.00
			Max. Mx	17	-0.53	0.01	0.00
			Max. My	25	-0.18	0.00	0.00
			Max. Vy	17	0.01	0.00	0.00
			Max. Vx	25	-0.00	0.00	0.00
		Top Girt	Max Tension	8	2.14	0.00	0.00
			Max. Compression	10	-2.17	0.00	0.00
			Max. Mx	26	0.59	0.01	0.00
			Max. My	13	-0.11	0.00	-0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	0.28	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	16	0.23	0.01	0.00
			Max. My	13	0.22	0.00	-0.00
			Max. Vy	16	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Guy A	Bottom Tension	7	9.38		
			Top Tension	7	9.44		
			Top Cable Vert	7	7.81		
			Top Cable Norm	7	5.31		
			Top Cable Tan	7	0.02		
			Bot Cable Vert	7	-7.65		
			Bot Cable Norm	7	5.42		
			Bot Cable Tan	7	0.09		
		Guy B	Bottom Tension	13	9.41		
			Top Tension	13	9.49		
			Top Cable Vert	13	7.90		
			Top Cable Norm	13	5.25		
			Top Cable Tan	13	0.02		
			Bot Cable Vert	13	-7.73		
			Bot Cable Norm	13	5.37		
			Bot Cable Tan	13	0.09		
		Guy C	Bottom Tension	3	9.26		
			Top Tension	3	9.33		
			Top Cable Vert	3	7.79		
			Top Cable Norm	3	5.14		
			Top Cable Tan	3	0.02		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Vert	3	-7.62		
			Bot Cable Norm	3	5.26		
			Bot Cable Tan	3	0.09		
		Torque Arm Top	Max Tension	11	5.65	0.00	0.00
			Max. Compression	11	-2.73	0.00	0.00
			Max. Mx	5	0.10	-27.74	-0.00
			Max. My	6	-2.20	-22.11	0.00
			Max. Vy	5	7.77	-27.74	-0.00
			Max. Vx	6	0.00	-22.11	0.00
T5	120.1 - 100.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-26.09	-0.03	-0.04
			Max. Mx	5	-11.19	0.15	-0.06
			Max. My	2	-13.21	-0.05	-0.15
			Max. Vy	7	0.18	0.06	0.02
			Max. Vx	7	-0.23	0.03	-0.10
		Diagonal	Max Tension	13	0.59	0.00	0.00
			Max. Compression	13	-0.83	0.00	0.00
			Max. Mx	17	0.19	0.01	0.00
			Max. My	25	-0.23	0.00	0.00
			Max. Vy	17	0.01	0.00	0.00
			Max. Vx	25	0.00	0.00	0.00
		Top Girt	Max Tension	21	0.27	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	16	0.25	0.01	0.00
			Max. My	13	0.19	0.00	-0.00
			Max. Vy	16	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	0.35	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	0.24	0.01	0.00
			Max. My	13	0.23	0.00	-0.00
			Max. Vy	23	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
T6	100.1 - 80.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-32.09	0.00	-0.02
			Max. Mx	10	-26.62	0.18	-0.10
			Max. My	2	-26.87	0.03	0.22
			Max. Vy	5	0.38	-0.08	0.01
			Max. Vx	2	-0.42	0.03	0.22
		Diagonal	Max Tension	13	0.89	0.00	0.00
			Max. Compression	13	-1.00	0.00	0.00
			Max. Mx	25	0.35	0.01	0.00
			Max. My	26	-0.45	0.00	0.00
			Max. Vy	25	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	15	0.33	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	0.32	0.01	0.00
			Max. My	13	0.22	0.00	-0.00
			Max. Vy	23	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	0.44	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	0.40	0.01	0.00
			Max. My	13	0.33	0.00	-0.00
			Max. Vy	17	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Guy A	Bottom Tension	9	5.52		
			Top Tension	9	5.55		
			Top Cable Vert	9	4.33		
			Top Cable Norm	9	3.47		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Tan	9	0.01		
			Bot Cable Vert	9	-4.25		
			Bot Cable Norm	9	3.52		
			Bot Cable Tan	9	0.04		
		Guy B	Bottom Tension	11	5.69		
			Top Tension	11	5.73		
			Top Cable Vert	11	4.51		
			Top Cable Norm	11	3.54		
			Top Cable Tan	11	0.01		
			Bot Cable Vert	11	-4.42		
			Bot Cable Norm	11	3.59		
			Bot Cable Tan	11	0.04		
		Guy C	Bottom Tension	5	5.64		
			Top Tension	5	5.67		
			Top Cable Vert	5	4.42		
			Top Cable Norm	5	3.56		
			Top Cable Tan	5	0.01		
			Bot Cable Vert	5	-4.33		
			Bot Cable Norm	5	3.61		
			Bot Cable Tan	5	0.04		
		Top Guy Pull-Off	Max Tension	2	2.13	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.84	0.03	0.00
			Max. My	13	1.71	0.00	-0.00
			Max. Vy	14	-0.03	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
T7	80.1 - 60.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-30.50	0.02	0.01
			Max. Mx	11	-13.38	-0.15	-0.04
			Max. My	8	-11.81	-0.01	0.16
			Max. Vy	11	0.36	0.07	-0.01
			Max. Vx	8	-0.38	0.01	-0.07
		Diagonal	Max Tension	3	0.38	0.00	0.00
			Max. Compression	2	-0.60	0.00	0.00
			Max. Mx	24	0.18	0.01	0.00
			Max. My	26	-0.34	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	5	0.34	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	0.33	0.01	0.00
			Max. My	13	0.24	0.00	-0.00
			Max. Vy	17	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Bottom Girt	Max Tension	16	0.28	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	0.23	0.01	0.00
			Max. My	13	0.22	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
T8	60.1 - 40.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-31.15	0.14	0.26
			Max. Mx	6	-30.46	-0.29	0.01
			Max. My	2	-29.79	0.04	0.31
			Max. Vy	6	-0.21	-0.29	0.01
			Max. Vx	2	-0.20	0.04	0.31
		Diagonal	Max Tension	7	1.17	0.00	0.00
			Max. Compression	13	-1.41	0.00	0.00
			Max. Mx	24	0.22	0.01	0.00
			Max. My	26	-0.35	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	17	0.14	0.00	0.00
			Max. Compression	12	-0.02	0.00	0.00
			Max. Mx	19	0.09	0.01	0.00
			Max. My	13	0.10	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
		Bottom Girt	Max Tension	13	0.50	0.00	0.00
			Max. Compression	7	-0.27	0.00	0.00
			Max. Mx	19	0.17	0.01	0.00
			Max. My	26	0.28	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Guy A	Bottom Tension	8	3.31		
			Top Tension	8	3.32		
			Top Cable Vert	8	1.75		
			Top Cable Norm	8	2.83		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-1.71		
			Bot Cable Norm	8	2.84		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	12	3.36		
			Top Tension	12	3.37		
			Top Cable Vert	12	1.79		
			Top Cable Norm	12	2.86		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-1.75		
			Bot Cable Norm	12	2.87		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	4	3.29		
			Top Tension	4	3.30		
			Top Cable Vert	4	1.75		
			Top Cable Norm	4	2.80		
			Top Cable Tan	4	0.00		
			Bot Cable Vert	4	-1.71		
			Bot Cable Norm	4	2.81		
			Bot Cable Tan	4	0.00		
		Top Guy Pull-Off	Max Tension	25	1.76	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	1.68	0.03	0.00
			Max. My	13	0.44	0.00	-0.00
			Max. Vy	19	-0.03	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00
T9	40.1 - 20.1	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-30.76	0.05	-0.13
			Max. Mx	6	-29.01	-0.28	-0.16
			Max. My	2	-29.36	0.04	0.31
			Max. Vy	10	0.59	0.26	-0.18
			Max. Vx	2	0.59	0.04	0.31
		Diagonal	Max Tension	13	1.11	0.00	0.00
			Max. Compression	7	-1.29	0.00	0.00
			Max. Mx	24	-0.07	0.01	0.00
			Max. My	26	-0.23	0.00	0.00
			Max. Vy	24	-0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.43	0.00	0.00
			Max. Compression	13	-0.29	0.00	0.00
			Max. Mx	19	0.06	0.01	0.00
			Max. My	13	-0.29	0.00	-0.00
			Max. Vy	19	0.01	0.00	0.00
			Max. Vx	13	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bottom Girt	Max Tension	13	0.27	0.00	0.00
			Max. Compression	6	-0.19	0.00	0.00
			Max. Mx	19	0.05	0.01	0.00
			Max. My	26	0.12	0.00	-0.00
			Max. Vy	19	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T10	20.1 - 4.854	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-31.34	-0.58	0.51
			Max. Mx	20	-30.47	0.73	0.21
			Max. My	21	-31.26	-0.17	-0.76
			Max. Vy	20	-0.35	-0.12	0.13
			Max. Vx	21	0.33	-0.17	-0.76
		Diagonal	Max Tension	7	0.84	0.00	0.00
			Max. Compression	6	-0.80	0.00	0.00
			Max. Mx	26	0.24	0.01	0.00
			Max. My	26	0.30	0.00	0.00
			Max. Vy	26	-0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.29	0.00	0.00
			Max. Compression	13	-0.15	0.00	0.00
			Max. Mx	19	0.11	0.01	0.00
			Max. My	26	0.02	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	25	4.18	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	4.14	0.01	0.00
			Max. Vy	25	-0.01	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
T11	4.854 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-33.89	0.06	0.01
			Max. Mx	26	-31.35	-2.67	-0.14
			Max. My	12	-19.06	-0.37	-0.66
			Max. Vy	25	4.74	-2.67	-0.11
			Max. Vx	12	1.39	-0.37	-0.66
		Top Girt	Max Tension	25	2.97	-1.32	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	2.97	-1.82	-0.01
			Max. My	13	1.98	-1.43	-0.01
			Max. Vy	13	0.29	-1.50	-0.01
			Max. Vx	26	0.01	-1.81	-0.01
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-0.96	-0.85	-0.01
			Max. Mx	13	-0.65	-1.16	-0.01
			Max. My	13	-0.61	-1.12	-0.01
			Max. Vy	12	3.54	-1.14	-0.01
			Max. Vx	13	0.05	-1.12	-0.01
		Mid Girt	Max Tension	19	0.08	0.00	0.00
			Max. Compression	21	-0.17	0.00	0.00
			Max. Mx	23	0.07	0.02	0.00
			Max. My	25	0.07	0.00	0.00
			Max. Vy	23	0.03	0.00	0.00
			Max. Vx	25	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	21	93.15	-0.04	-0.10
	Max. H_x	12	54.87	0.44	0.28
	Max. H_z	4	54.73	-0.47	0.28
	Max. M_x	1	0.00	-0.01	0.00
	Max. M_z	1	0.00	-0.01	0.00
	Max. Torsion	12	0.90	0.44	0.28
	Min. Vert	1	40.35	-0.01	0.00
	Min. H_x	4	54.73	-0.47	0.28
	Min. H_z	8	54.93	-0.01	-0.55
	Min. M_x	1	0.00	-0.01	0.00
	Min. M_z	1	0.00	-0.01	0.00
	Min. Torsion	7	-0.97	-0.03	-0.38
Guy C @ 99 ft Elev -5.17 ft Azimuth 240 deg	Max. Vert	10	-1.31	-0.45	0.26
	Max. H_x	10	-1.31	-0.45	0.26
	Max. H_z	3	-24.27	-12.99	7.83
	Min. Vert	5	-24.41	-13.35	7.37
	Min. H_x	5	-24.41	-13.35	7.37
	Min. H_z	10	-1.31	-0.45	0.26
Guy B @ 99.25 ft Elev -4.67 ft Azimuth 120 deg	Max. Vert	6	-1.30	0.45	0.26
	Max. H_x	11	-24.32	13.38	7.39
	Max. H_z	13	-24.16	13.01	7.84
	Min. Vert	11	-24.32	13.38	7.39
	Min. H_x	6	-1.30	0.45	0.26
	Min. H_z	6	-1.30	0.45	0.26
Guy A @ 96.5 ft Elev 2.46 ft Azimuth 0 deg	Max. Vert	2	-1.20	-0.00	-0.48
	Max. H_x	10	-20.62	0.46	-13.10
	Max. H_z	2	-1.20	-0.00	-0.48
	Min. Vert	9	-23.97	0.29	-15.31
	Min. H_x	5	-12.81	-0.46	-8.03
	Min. H_z	9	-23.97	0.29	-15.31
Guy C @ 71.5 ft Elev 2.125 ft Azimuth 240 deg	Max. Vert	10	-0.16	-0.09	0.05
	Max. H_x	10	-0.16	-0.09	0.05
	Max. H_z	3	-6.00	-5.48	3.22
	Min. Vert	3	-6.00	-5.48	3.22
	Min. H_x	4	-6.00	-5.53	3.19
	Min. H_z	10	-0.16	-0.09	0.05
Guy B @ 68.25 ft Elev 3.96 ft Azimuth 120 deg	Max. Vert	6	-0.16	0.09	0.05
	Max. H_x	12	-6.13	5.56	3.21
	Max. H_z	13	-6.11	5.49	3.22
	Min. Vert	12	-6.13	5.56	3.21
	Min. H_x	6	-0.16	0.09	0.05
	Min. H_z	6	-0.16	0.09	0.05
Guy A @ 70.5 ft Elev 3 ft Azimuth 0 deg	Max. Vert	2	-0.15	-0.00	-0.10
	Max. H_x	24	-3.21	0.11	-3.97
	Max. H_z	2	-0.15	-0.00	-0.10
	Min. Vert	8	-5.94	0.00	-6.34
	Min. H_x	18	-3.19	-0.11	-3.94
	Min. H_z	8	-5.94	0.00	-6.34

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	40.35	0.01	-0.00	0.00	0.00	0.03
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	68.28	0.01	-0.21	0.00	0.00	-0.64
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	63.37	0.32	-0.19	0.00	0.00	-0.24
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	54.73	0.47	-0.28	0.00	0.00	0.25
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	63.47	0.33	-0.17	0.00	0.00	0.65
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	68.17	0.20	0.12	0.00	0.00	0.92
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	63.25	0.03	0.38	0.00	0.00	0.97
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	54.93	0.01	0.55	0.00	0.00	0.78
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	63.35	-0.01	0.38	0.00	0.00	0.35
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	68.22	-0.17	0.12	0.00	0.00	-0.11
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	63.58	-0.30	-0.16	0.00	0.00	-0.54
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	54.87	-0.44	-0.28	0.00	0.00	-0.90
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	63.38	-0.29	-0.19	0.00	0.00	-0.87
1.2 Dead+1.0 Ice+1.0 Temp+Guy	91.30	0.04	-0.03	0.00	0.00	0.08
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.56	0.05	-0.18	0.00	0.00	-0.15
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.80	0.10	-0.16	0.00	0.00	0.05
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	93.02	0.15	-0.09	0.00	0.00	0.19
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.74	0.18	-0.01	0.00	0.00	0.29
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.48	0.17	0.05	0.00	0.00	0.41
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.84	0.13	0.09	0.00	0.00	0.45
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	93.15	0.04	0.10	0.00	0.00	0.31
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.89	-0.04	0.09	0.00	0.00	0.11
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.57	-0.08	0.05	0.00	0.00	-0.02
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.85	-0.09	-0.01	0.00	0.00	-0.13
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	93.11	-0.06	-0.09	0.00	0.00	-0.25
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	92.86	-0.01	-0.15	0.00	0.00	-0.29
Dead+Wind 0 deg - Service+Guy	40.40	0.01	-0.17	0.00	0.00	-0.11
Dead+Wind 30 deg - Service+Guy	40.45	0.08	-0.14	0.00	0.00	-0.02

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 60 deg - Service+Guy	40.52	0.13	-0.08	0.00	0.00	0.07
Dead+Wind 90 deg - Service+Guy	40.52	0.16	-0.00	0.00	0.00	0.16
Dead+Wind 120 deg - Service+Guy	40.53	0.15	0.08	0.00	0.00	0.22
Dead+Wind 150 deg - Service+Guy	40.63	0.08	0.13	0.00	0.00	0.23
Dead+Wind 180 deg - Service+Guy	40.70	0.01	0.14	0.00	0.00	0.18
Dead+Wind 210 deg - Service+Guy	40.65	-0.07	0.13	0.00	0.00	0.10
Dead+Wind 240 deg - Service+Guy	40.57	-0.13	0.08	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	40.57	-0.14	-0.00	0.00	0.00	-0.08
Dead+Wind 300 deg - Service+Guy	40.56	-0.11	-0.08	0.00	0.00	-0.15
Dead+Wind 330 deg - Service+Guy	40.48	-0.06	-0.13	0.00	0.00	-0.16

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-12.67	0.00	0.00	12.67	-0.00	0.006%
2	-0.00	-15.06	-18.93	0.00	15.06	18.93	0.005%
3	9.44	-15.00	-16.32	-9.44	15.00	16.32	0.004%
4	16.33	-14.94	-9.41	-16.33	14.94	9.41	0.004%
5	18.88	-15.00	0.00	-18.88	15.00	-0.00	0.005%
6	16.42	-15.05	9.47	-16.42	15.05	-9.47	0.004%
7	9.44	-14.99	16.32	-9.44	14.99	-16.32	0.005%
8	0.00	-14.93	18.82	-0.00	14.93	-18.82	0.006%
9	-9.44	-14.99	16.32	9.44	14.99	-16.32	0.005%
10	-16.42	-15.05	9.47	16.42	15.05	-9.46	0.004%
11	-18.88	-14.99	-0.00	18.88	14.99	0.00	0.005%
12	-16.33	-14.94	-9.41	16.33	14.94	9.41	0.003%
13	-9.44	-15.00	-16.32	9.44	15.00	16.32	0.004%
14	0.00	-55.24	0.00	-0.00	55.24	-0.00	0.001%
15	-0.00	-55.32	-7.54	0.00	55.32	7.54	0.002%
16	3.77	-55.25	-6.52	-3.77	55.25	6.52	0.002%
17	6.53	-55.18	-3.77	-6.53	55.18	3.76	0.002%
18	7.54	-55.25	0.00	-7.54	55.25	-0.00	0.001%
19	6.54	-55.31	3.77	-6.54	55.31	-3.77	0.002%
20	3.77	-55.24	6.53	-3.77	55.24	-6.53	0.002%
21	0.00	-55.17	7.53	-0.00	55.17	-7.53	0.001%
22	-3.77	-55.24	6.52	3.77	55.24	-6.52	0.002%
23	-6.53	-55.31	3.77	6.53	55.31	-3.77	0.002%
24	-7.54	-55.24	-0.00	7.54	55.24	0.00	0.001%
25	-6.53	-55.18	-3.77	6.53	55.18	3.77	0.002%
26	-3.77	-55.25	-6.53	3.77	55.25	6.52	0.002%
27	-0.00	-12.69	-4.18	0.00	12.69	4.17	0.010%
28	2.08	-12.67	-3.60	-2.08	12.67	3.60	0.005%
29	3.60	-12.66	-2.08	-3.60	12.66	2.08	0.007%
30	4.16	-12.67	0.00	-4.16	12.67	-0.00	0.006%
31	3.62	-12.68	2.09	-3.62	12.68	-2.09	0.004%
32	2.08	-12.67	3.60	-2.08	12.67	-3.60	0.005%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
33	0.00	-12.66	4.15	-0.00	12.66	-4.15	0.006%
34	-2.08	-12.67	3.60	2.08	12.67	-3.60	0.005%
35	-3.62	-12.68	2.09	3.62	12.68	-2.09	0.004%
36	-4.16	-12.67	-0.00	4.16	12.67	0.00	0.006%
37	-3.60	-12.66	-2.08	3.60	12.66	2.08	0.007%
38	-2.08	-12.67	-3.60	2.08	12.67	3.60	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	10	0.00000001	0.00006959
2	Yes	22	0.00006801	0.00007636
3	Yes	22	0.00000001	0.00005594
4	Yes	15	0.00009547	0.00005771
5	Yes	21	0.00007838	0.00008107
6	Yes	22	0.00000001	0.00006033
7	Yes	21	0.00007817	0.00007774
8	Yes	13	0.00000001	0.00009868
9	Yes	21	0.00007505	0.00007490
10	Yes	22	0.00000001	0.00005787
11	Yes	21	0.00007521	0.00007764
12	Yes	16	0.00000001	0.00003635
13	Yes	22	0.00000001	0.00005563
14	Yes	10	0.00000001	0.00005404
15	Yes	15	0.00000001	0.00002947
16	Yes	15	0.00000001	0.00003930
17	Yes	15	0.00000001	0.00004098
18	Yes	16	0.00000001	0.00002464
19	Yes	15	0.00000001	0.00003628
20	Yes	15	0.00000001	0.00004170
21	Yes	15	0.00000001	0.00003106
22	Yes	15	0.00000001	0.00003840
23	Yes	15	0.00000001	0.00003302
24	Yes	16	0.00000001	0.00002281
25	Yes	15	0.00000001	0.00003884
26	Yes	15	0.00000001	0.00003869
27	Yes	9	0.00000001	0.00009574
28	Yes	10	0.00000001	0.00006217
29	Yes	10	0.00000001	0.00007893
30	Yes	10	0.00000001	0.00006713
31	Yes	10	0.00000001	0.00004622
32	Yes	10	0.00000001	0.00006021
33	Yes	10	0.00000001	0.00006769
34	Yes	10	0.00000001	0.00005906
35	Yes	10	0.00000001	0.00004492
36	Yes	10	0.00000001	0.00006431
37	Yes	10	0.00000001	0.00007539
38	Yes	10	0.00000001	0.00006031

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190.6 - 175.35	2.327	29	0.0907	0.0346
T2	175.35 - 160.1	2.026	29	0.1011	0.0397
T3	160.1 - 140.1	1.680	29	0.1059	0.0436
T4	140.1 - 120.1	1.258	29	0.0792	0.0456
T5	120.1 - 100.1	0.979	37	0.0653	0.0677
T6	100.1 - 80.1	0.719	37	0.0599	0.0860
T7	80.1 - 60.1	0.507	37	0.0399	0.0973
T8	60.1 - 40.1	0.355	37	0.0345	0.1020
T9	40.1 - 20.1	0.223	27	0.0269	0.0967
T10	20.1 - 4.854	0.123	27	0.0269	0.0840
T11	4.854 - 0	0.031	27	0.0299	0.0479

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.99	Guy	29	2.315	0.0911	0.0348	118215
187.00	JAHH-65B-R3B	29	2.259	0.0931	0.0357	118215
140.00	APX16DWV-16DWVS-E-A20	29	1.257	0.0791	0.0456	24481
139.49	Guy	29	1.248	0.0784	0.0460	24672
87.37	Guy	37	0.576	0.0466	0.0938	61242
44.95	Guy	27	0.251	0.0285	0.0981	107685

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190.6 - 175.35	24.127	2	1.0425	0.2697
T2	175.35 - 160.1	20.742	2	1.0852	0.2901
T3	160.1 - 140.1	17.177	2	1.0937	0.3109
T4	140.1 - 120.1	12.811	2	0.9078	0.3198
T5	120.1 - 100.1	9.364	2	0.7667	0.3942
T6	100.1 - 80.1	6.385	2	0.6410	0.4497
T7	80.1 - 60.1	4.112	2	0.4322	0.4768
T8	60.1 - 40.1	2.559	2	0.3192	0.4786
T9	40.1 - 20.1	1.434	2	0.2166	0.4279
T10	20.1 - 4.854	0.703	2	0.1721	0.3413
T11	4.854 - 0	0.174	2	0.1706	0.2151

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
189.99	Guy	2	23.993	1.0442	0.2704	26783
187.00	JAHH-65B-R3B	2	23.340	1.0524	0.2741	26783
140.00	APX16DWV-16DWVS-E-A20	2	12.792	0.9068	0.3200	3995

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.49	Guy	2	12.692	0.9018	0.3211	4011
87.37	Guy	2	4.845	0.5049	0.4691	5964
44.95	Guy	2	1.666	0.2389	0.4431	10010

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	190.6	Leg	A325N	0.7500	4	0.96	29.82	0.032 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2.26	4.17	0.541 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.27	5.92	0.046 ✓	1	Member Bearing
T2	175.35	Leg	A325N	0.7500	4	0.78	29.82	0.026 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1.67	4.17	0.401 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.30	4.17	0.072 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.65	5.92	0.109 ✓	1	Member Bearing
T3	160.1	Leg	A325N	0.7500	4	2.24	29.82	0.075 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1.13	4.17	0.271 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.27	4.17	0.065 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	2.06	5.92	0.348 ✓	1	Member Bearing
T4	140.1	Leg	A325N	0.7500	4	1.94	29.82	0.065 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	0.92	4.17	0.220 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	2.14	4.17	0.514 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.28	5.92	0.047 ✓	1	Member Bearing
T5	120.1	Leg	A325N	0.7500	4	2.17	29.82	0.073 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	0.59	4.17	0.141 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.27	4.17	0.064 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.35	5.92	0.059 ✓	1	Member Bearing
T6	100.1	Leg	A325N	0.7500	4	2.52	29.82	0.085 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	0.89	4.17	0.213 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.33	4.17	0.080 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.44	5.92	0.075 ✓	1	Member Bearing
T7	80.1	Leg	A325N	0.7500	4	2.38	29.82	0.080 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	0.38	4.17	0.092 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.34	4.17	0.082 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.28	5.92	0.047 ✓	1	Member Bearing
T8	60.1	Leg	A325N	0.7500	4	2.48	29.82	0.083 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1.17	4.17	0.280 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.14	4.17	0.034 ✓	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.50	5.92	0.084 ✓	1	Member Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T9	40.1	Leg	A325N	0.7500	4	2.56	29.82	0.086 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1.11	4.17	0.266 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.43	4.17	0.103 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.27	5.92	0.045 ✔	1	Member Bearing
T10	20.1	Leg	A325N	0.7500	4	2.61	29.82	0.088 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	1	0.84	4.17	0.202 ✔	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.29	4.17	0.069 ✔	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	4.18	5.92	0.707 ✔	1	Member Bearing

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T1	189.99 (A) (450)	1/2 EHS	2.69	26.90	10.55	16.14	1.000	1.531 ✔
	189.99 (B) (449)	1/2 EHS	2.69	26.90	10.67	16.14	1.000	1.513 ✔
	189.99 (C) (448)	1/2 EHS	2.69	26.90	10.71	16.14	1.000	1.507 ✔
T4	139.49 (A) (459)	1/2 EHS	2.69	26.90	9.29	16.14	1.000	1.737 ✔
	139.49 (A) (460)	1/2 EHS	2.69	26.90	9.44	16.14	1.000	1.709 ✔
	139.49 (B) (455)	1/2 EHS	2.69	26.90	9.49	16.14	1.000	1.701 ✔
	139.49 (B) (456)	1/2 EHS	2.69	26.90	9.28	16.14	1.000	1.740 ✔
	139.49 (C) (451)	1/2 EHS	2.69	26.90	9.30	16.14	1.000	1.735 ✔
	139.49 (C) (452)	1/2 EHS	2.69	26.90	9.33	16.14	1.000	1.730 ✔
T6	87.37 (A) (468)	7/16 EHS	2.08	20.80	5.55	12.48	1.000	2.248 ✔
	87.37 (B) (467)	7/16 EHS	2.08	20.80	5.73	12.48	1.000	2.179 ✔
	87.37 (C) (463)	7/16 EHS	2.08	20.80	5.67	12.48	1.000	2.200 ✔
T8	44.95 (A) (474)	3/8 EHS	1.54	15.40	3.32	9.24	1.000	2.780 ✔
	44.95 (B) (473)	3/8 EHS	1.54	15.40	3.37	9.24	1.000	2.740 ✔
	44.95 (C) (469)	3/8 EHS	1.54	15.40	3.30	9.24	1.000	2.798 ✔

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	190.6 - 175.35	ROHN 2.5 X-STR	15.25	2.44	63.4 K=2.00	2.2535	1.00	-13.41	75.62	0.177 [1] ✔
T2	175.35 - 160.1	ROHN 2.5 X-STR	15.25	2.44	63.4 K=2.00	2.2535	1.00	-11.00	75.62	0.145 [1] ✔
T3	160.1 - 140.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.0745	1.00	-24.76	43.76	0.566 [1] ✔
T4	140.1 - 120.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.0745	1.00	-26.98	43.67	0.618 [1] ✔
T5	120.1 - 100.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.0745	1.00	-26.09	43.67	0.598 [1] ✔
T6	100.1 - 80.1	ROHN 2 STD	20.00	2.42	36.9 K=1.00	1.0745	1.00	-32.09	43.67	0.735 [1] ✔
T7	80.1 - 60.1	ROHN 2 EH	20.00	2.42	37.8 K=1.00	1.4807	1.00	-30.50	60.00	0.508 [1] ✔
T8	60.1 - 40.1	ROHN 2.5 STD	20.00	2.42	61.4 K=2.00	1.7040	1.00	-31.15	58.22	0.535 [1] ✔
T9	40.1 - 20.1	ROHN 2.5 STD	20.00	2.42	61.4 K=2.00	1.7040	1.00	-30.76	58.22	0.528 [1] ✔
T10	20.1 - 4.854	ROHN 2.5 STD	15.25	2.44	61.8 K=2.00	1.7040	1.00	-31.34	58.01	0.540 [1] ✔
T11	4.854 - 0	ROHN 2.5 X-STR	5.25	1.27	16.5 K=1.00	2.2535	0.95	-33.89	93.97	0.361 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190.6 - 175.35	ROHN TS1.5x16 ga	4.23	3.94	92.6 K=1.00	0.2627	-2.26	5.86	0.386 [1] ✔
T2	175.35 - 160.1	ROHN TS1.5x16 ga	4.23	3.94	92.6 K=1.00	0.2627	-1.70	5.86	0.290 [1] ✔
T3	160.1 - 140.1	ROHN TS1.5x16 ga	4.22	3.98	93.6 K=1.00	0.2627	-1.23	5.80	0.213 [1] ✔
T4	140.1 - 120.1	ROHN TS1.5x16 ga	4.22	3.98	93.6 K=1.00	0.2627	-1.14	5.80	0.196 [1] ✔
T5	120.1 - 100.1	ROHN TS1.5x16 ga	4.22	3.98	93.6 K=1.00	0.2627	-0.83	5.80	0.143 [1] ✔
T6	100.1 - 80.1	ROHN TS1.5x16 ga	4.22	3.98	93.6 K=1.00	0.2627	-1.00	5.80	0.172 [1] ✔
T7	80.1 - 60.1	ROHN TS1.5x16 ga	4.22	3.98	93.6 K=1.00	0.2627	-0.60	5.80	0.104 [1] ✔
T8	60.1 - 40.1	ROHN TS1.5x16 ga	4.22	3.93	92.4 K=1.00	0.2627	-1.41	5.88	0.240 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40.1 - 20.1	ROHN TS1.5x16 ga	4.22	3.93	92.4 K=1.00	0.2627	-1.29	5.88	0.220 [1] ✔
T10	20.1 - 4.854	ROHN TS1.5x16 ga	4.23	3.94	92.6 K=1.00	0.2627	-0.80	5.86	0.137 [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 $\frac{P_u}{\phi P_n}$
T2	175.35 - 160.1	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.30	6.99	0.043 [1] ✔
T3	160.1 - 140.1	ROHN TS1.5x16 ga	3.46	3.26	76.7 K=1.00	0.2627	-0.12	6.92	0.017 [1] ✔
T4	140.1 - 120.1	ROHN TS1.5x16 ga	3.46	3.26	76.7 K=1.00	0.2627	-2.17	6.92	0.314 [1] ✔
T8	60.1 - 40.1	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.02	6.99	0.003 [1] ✔
T9	40.1 - 20.1	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.29	6.99	0.042 [1] ✔
T10	20.1 - 4.854	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.15	6.99	0.021 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190.6 - 175.35	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.23	6.99	0.033 [1] ✔
T2	175.35 - 160.1	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.60	6.99	0.086 [1] ✔
T3	160.1 - 140.1	ROHN TS1.5x16 ga	3.46	3.26	76.7 K=1.00	0.2627	-1.31	6.92	0.189 [1] ✔
T8	60.1 - 40.1	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.27	6.99	0.039 [1] ✔
T9	40.1 - 20.1	ROHN TS1.5x16 ga	3.46	3.22	75.7 K=1.00	0.2627	-0.19	6.99	0.027 [1] ✔
T11	4.854 - 0	14x3/16	0.47	0.24	52.2 K=1.00	2.6250	-0.96	73.69	0.013 [1] ✔

[1] P_u / ϕP_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 $\frac{P_u}{\phi P_n}$
T11	4.854 - 0	14x3/16	1.31	1.07	237.5 K=1.00	2.6250	-0.17	10.51	0.016 [1] ✔
		KL/R > 200 (C) - 444							

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	140.1 - 120.1 (453)	C10x15.3	3.59	3.49	58.7 K=1.00	4.4900	-2.69	121.35	0.022
T4	140.1 - 120.1 (454)	C10x15.3	3.59	3.49	58.7 K=1.00	4.4900	-0.23	121.35	0.002
T4	140.1 - 120.1 (457)	C10x15.3	3.59	3.49	58.7 K=1.00	4.4900	-0.02	121.35	0.000
T4	140.1 - 120.1 (458)	C10x15.3	3.59	3.49	58.7 K=1.00	4.4900	-2.73	121.35	0.023
T4	140.1 - 120.1 (461)	C10x15.3	3.59	3.49	58.7 K=1.00	4.4900	-2.60	121.35	0.021
T4	140.1 - 120.1 (462)	C10x15.3	3.59	3.49	58.7 K=1.00	4.4900	-0.04	121.35	0.000

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T4	140.1 - 120.1 (453)	C10x15.3	-26.40	41.58	0.635	-0.00	4.70	0.000
T4	140.1 - 120.1 (454)	C10x15.3	-26.58	41.58	0.639	-0.00	4.70	0.000
T4	140.1 - 120.1 (457)	C10x15.3	-27.35	41.58	0.658	0.00	4.70	0.000
T4	140.1 - 120.1 (458)	C10x15.3	-26.68	41.58	0.642	-0.00	4.70	0.000
T4	140.1 - 120.1 (461)	C10x15.3	-25.78	41.58	0.620	-0.00	4.70	0.000
T4	140.1 - 120.1 (462)	C10x15.3	-26.94	41.58	0.648	-0.00	4.70	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	140.1 - 120.1 (453)	C10x15.3	0.022	0.635	0.000	0.646 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (454)	C10x15.3	0.002	0.639	0.000	0.640 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (457)	C10x15.3	0.000	0.658	0.000	0.658 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (458)	C10x15.3	0.023	0.642	0.000	0.653 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (461)	C10x15.3	0.021	0.620	0.000	0.631 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (462)	C10x15.3	0.000	0.648	0.000	0.648 ✔	1.000	4.8.1 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190.6 - 175.35	ROHN 2.5 X-STR	15.25	2.44	31.7	2.2535	1.99	101.41	0.020 [1] ✔
T3	160.1 - 140.1	ROHN 2 STD	20.00	2.42	36.9	1.0745	8.94	48.35	0.185 [1] ✔
T4	140.1 - 120.1	ROHN 2 STD	20.00	2.42	36.9	1.0745	9.92	48.35	0.205 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	190.6 - 175.35	ROHN TS1.5x16 ga	4.23	3.94	92.6	0.2627	2.26	9.93	0.227 [1] ✔
T2	175.35 - 160.1	ROHN TS1.5x16 ga	4.23	3.94	92.6	0.2627	1.67	9.93	0.168 [1] ✔
T3	160.1 - 140.1	ROHN TS1.5x16 ga	4.22	3.98	93.6	0.2627	1.13	9.93	0.114 [1] ✔
T4	140.1 - 120.1	ROHN TS1.5x16 ga	4.22	3.98	93.6	0.2627	0.92	9.93	0.092 [1] ✔
T5	120.1 - 100.1	ROHN TS1.5x16 ga	4.22	3.98	93.6	0.2627	0.59	9.93	0.059 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	100.1 - 80.1	ROHN TS1.5x16 ga	4.22	3.98	93.6	0.2627	0.89	9.93	0.089 [1]
T7	80.1 - 60.1	ROHN TS1.5x16 ga	4.22	3.98	93.6	0.2627	0.38	9.93	0.038 [1]
T8	60.1 - 40.1	ROHN TS1.5x16 ga	4.22	3.93	92.4	0.2627	1.17	9.93	0.117 [1]
T9	40.1 - 20.1	ROHN TS1.5x16 ga	4.22	3.93	92.4	0.2627	1.11	9.93	0.112 [1]
T10	20.1 - 4.854	ROHN TS1.5x16 ga	4.23	3.94	92.6	0.2627	0.84	9.93	0.085 [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 $\frac{P_u}{\phi P_n}$
T2	175.35 - 160.1	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.30	9.93	0.030 [1]
T3	160.1 - 140.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.27	9.93	0.027 [1]
T4	140.1 - 120.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	2.14	9.93	0.216 [1]
T5	120.1 - 100.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.27	9.93	0.027 [1]
T6	100.1 - 80.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.33	9.93	0.033 [1]
T7	80.1 - 60.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.34	9.93	0.034 [1]
T8	60.1 - 40.1	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.14	9.93	0.014 [1]
T9	40.1 - 20.1	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.43	9.93	0.043 [1]
T10	20.1 - 4.854	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.29	9.93	0.029 [1]
T11	4.854 - 0	14x3/16	2.98	2.74	608.2	2.6250	2.97	85.05	0.035 [1]
		L/R > 500 (T) - 436							

[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	190.6 - 175.35	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.27	9.93	0.027 [1] ✔
T2	175.35 - 160.1	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.65	9.93	0.065 [1] ✔
T3	160.1 - 140.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	2.06	9.93	0.207 [1] ✔
T4	140.1 - 120.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.28	9.93	0.028 [1] ✔
T5	120.1 - 100.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.35	9.93	0.035 [1] ✔
T6	100.1 - 80.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.44	9.93	0.045 [1] ✔
T7	80.1 - 60.1	ROHN TS1.5x16 ga	3.46	3.26	76.7	0.2627	0.28	9.93	0.028 [1] ✔
T8	60.1 - 40.1	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.50	9.93	0.050 [1] ✔
T9	40.1 - 20.1	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	0.27	9.93	0.027 [1] ✔
T10	20.1 - 4.854	ROHN TS1.5x16 ga	3.46	3.22	75.7	0.2627	4.18	9.93	0.421 [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 $\frac{P_u}{\phi P_n}$
T11	4.854 - 0	14x3/16	2.15	1.91	422.9	2.6250	0.08	85.05	0.001 [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 $\frac{P_u}{\phi P_n}$
T1	190.6 - 175.35	4 1/2x3/8	3.46	3.22	356.8	1.6875	2.91	54.67	0.053 [1]
T6	100.1 - 80.1	C4x5.4	3.46	3.26	87.1	1.5900	2.13	51.52	0.041 [1]
T8	60.1 - 40.1	C4x5.4	3.46	3.22	86.0	1.5900	1.76	51.52	0.034 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	190.6 - 175.35	4 1/2x3/8	0.00	5.13	0.000	0.00	0.43	0.000
T6	100.1 - 80.1	C4x5.4	0.00	5.74	0.000	0.00	1.15	0.000
T8	60.1 - 40.1	C4x5.4	0.00	5.75	0.000	0.00	1.15	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	190.6 - 175.35	4 1/2x3/8	0.053	0.000	0.000	0.053 [1] ✔	1.000	4.8.1 ✔
T6	100.1 - 80.1	C4x5.4	0.041	0.000	0.000	0.041 [1] ✔	1.000	4.8.1 ✔
T8	60.1 - 40.1	C4x5.4	0.034	0.000	0.000	0.034 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	140.1 - 120.1 (453)	C10x15.3	3.59	3.49	58.7	4.4900	0.10	145.48	0.001
T4	140.1 - 120.1 (454)	C10x15.3	3.59	3.49	58.7	4.4900	2.11	145.48	0.015
T4	140.1 - 120.1 (457)	C10x15.3	3.59	3.49	58.7	4.4900	2.40	145.48	0.017
T4	140.1 - 120.1 (458)	C10x15.3	3.59	3.49	58.7	4.4900	2.16	145.48	0.015
T4	140.1 - 120.1 (461)	C10x15.3	3.59	3.49	58.7	4.4900	0.11	145.48	0.001
T4	140.1 - 120.1 (462)	C10x15.3	3.59	3.49	58.7	4.4900	2.22	145.48	0.015

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T4	140.1 - 120.1 (453)	C10x15.3	-27.74	41.58	0.667	-0.00	4.70	0.000
T4	140.1 - 120.1	C10x15.3	-23.82	41.58	0.573	-0.00	4.70	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T4	140.1 - 120.1 (454)	C10x15.3	-24.79	41.58	0.596	0.00	4.70	0.000
T4	140.1 - 120.1 (457)	C10x15.3	-24.21	41.58	0.582	0.00	4.70	0.000
T4	140.1 - 120.1 (458)	C10x15.3	-27.67	41.58	0.666	0.00	4.70	0.000
T4	140.1 - 120.1 (461)	C10x15.3	-24.04	41.58	0.578	0.00	4.70	0.000
T4	140.1 - 120.1 (462)							

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	140.1 - 120.1 (453)	C10x15.3	0.001	0.667	0.000	0.668 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (454)	C10x15.3	0.015	0.573	0.000	0.580 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (457)	C10x15.3	0.017	0.596	0.000	0.604 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (458)	C10x15.3	0.015	0.582	0.000	0.590 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (461)	C10x15.3	0.001	0.666	0.000	0.666 ✔	1.000	4.8.1 ✔
T4	140.1 - 120.1 (462)	C10x15.3	0.015	0.578	0.000	0.586 ✔	1.000	4.8.1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	190.6 - 175.35	Leg	ROHN 2.5 X-STR	1	-13.41	75.62	17.7	Pass
T2	175.35 - 160.1	Leg	ROHN 2.5 X-STR	29	-11.00	75.62	14.5	Pass
T3	160.1 - 140.1	Leg	ROHN 2 STD	56	-24.76	43.76	56.6	Pass
T4	140.1 - 120.1	Leg	ROHN 2 STD	113	-26.98	43.67	61.8	Pass
T5	120.1 - 100.1	Leg	ROHN 2 STD	171	-26.09	43.67	59.8	Pass
T6	100.1 - 80.1	Leg	ROHN 2 STD	228	-32.09	43.67	73.5	Pass
T7	80.1 - 60.1	Leg	ROHN 2 EH	285	-30.50	60.00	50.8	Pass
T8	60.1 - 40.1	Leg	ROHN 2.5 STD	342	-31.15	58.22	53.5	Pass
T9	40.1 - 20.1	Leg	ROHN 2.5 STD	373	-30.76	58.22	52.8	Pass
T10	20.1 - 4.854	Leg	ROHN 2.5 STD	406	-31.34	58.01	54.0	Pass
T11	4.854 - 0	Leg	ROHN 2.5 X-STR	433	-33.89	93.97	36.1	Pass
T1	190.6 - 175.35	Diagonal	ROHN TS1.5x16 ga	25	-2.26	5.86	38.6 54.1 (b)	Pass
T2	175.35 - 160.1	Diagonal	ROHN TS1.5x16 ga	38	-1.70	5.86	29.0 40.1 (b)	Pass
T3	160.1 - 140.1	Diagonal	ROHN TS1.5x16 ga	66	-1.23	5.80	21.3 27.1 (b)	Pass
T4	140.1 - 120.1	Diagonal	ROHN TS1.5x16 ga	164	-1.14	5.80	19.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							22.0 (b)	
T5	120.1 - 100.1	Diagonal	ROHN TS1.5x16 ga	181	-0.83	5.80	14.3	Pass
T6	100.1 - 80.1	Diagonal	ROHN TS1.5x16 ga	256	-1.00	5.80	17.2	Pass
							21.3 (b)	
T7	80.1 - 60.1	Diagonal	ROHN TS1.5x16 ga	339	-0.60	5.80	10.4	Pass
T8	60.1 - 40.1	Diagonal	ROHN TS1.5x16 ga	350	-1.41	5.88	24.0	Pass
							28.0 (b)	
T9	40.1 - 20.1	Diagonal	ROHN TS1.5x16 ga	404	-1.29	5.88	22.0	Pass
							26.6 (b)	
T10	20.1 - 4.854	Diagonal	ROHN TS1.5x16 ga	431	-0.80	5.86	13.7	Pass
							20.2 (b)	
T2	175.35 - 160.1	Top Girt	ROHN TS1.5x16 ga	32	-0.30	6.99	4.3	Pass
							7.2 (b)	
T3	160.1 - 140.1	Top Girt	ROHN TS1.5x16 ga	59	0.27	9.93	2.7	Pass
							6.5 (b)	
T4	140.1 - 120.1	Top Girt	ROHN TS1.5x16 ga	116	-2.17	6.92	31.4	Pass
							51.4 (b)	
T5	120.1 - 100.1	Top Girt	ROHN TS1.5x16 ga	172	0.27	9.93	2.7	Pass
							6.4 (b)	
T6	100.1 - 80.1	Top Girt	ROHN TS1.5x16 ga	229	0.33	9.93	3.3	Pass
							8.0 (b)	
T7	80.1 - 60.1	Top Girt	ROHN TS1.5x16 ga	287	0.34	9.93	3.4	Pass
							8.2 (b)	
T8	60.1 - 40.1	Top Girt	ROHN TS1.5x16 ga	343	0.14	9.93	1.4	Pass
							3.4 (b)	
T9	40.1 - 20.1	Top Girt	ROHN TS1.5x16 ga	377	0.43	9.93	4.3	Pass
							10.3 (b)	
T10	20.1 - 4.854	Top Girt	ROHN TS1.5x16 ga	410	0.29	9.93	2.9	Pass
							6.9 (b)	
T11	4.854 - 0	Top Girt	14x3/16	436	2.97	85.05	3.5	Pass
T1	190.6 - 175.35	Bottom Girt	ROHN TS1.5x16 ga	8	-0.23	6.99	3.3	Pass
							4.6 (b)	
T2	175.35 - 160.1	Bottom Girt	ROHN TS1.5x16 ga	35	-0.60	6.99	8.6	Pass
							10.9 (b)	
T3	160.1 - 140.1	Bottom Girt	ROHN TS1.5x16 ga	61	2.06	9.93	20.7	Pass
							34.8 (b)	
T4	140.1 - 120.1	Bottom Girt	ROHN TS1.5x16 ga	119	0.28	9.93	2.8	Pass
							4.7 (b)	
T5	120.1 - 100.1	Bottom Girt	ROHN TS1.5x16 ga	176	0.35	9.93	3.5	Pass
							5.9 (b)	
T6	100.1 - 80.1	Bottom Girt	ROHN TS1.5x16 ga	233	0.44	9.93	4.5	Pass
							7.5 (b)	
T7	80.1 - 60.1	Bottom Girt	ROHN TS1.5x16 ga	290	0.28	9.93	2.8	Pass
							4.7 (b)	
T8	60.1 - 40.1	Bottom Girt	ROHN TS1.5x16 ga	347	0.50	9.93	5.0	Pass
							8.4 (b)	
T9	40.1 - 20.1	Bottom Girt	ROHN TS1.5x16 ga	380	-0.19	6.99	2.7	Pass
							4.5 (b)	
T10	20.1 - 4.854	Bottom Girt	ROHN TS1.5x16 ga	412	4.18	9.93	42.1	Pass
							70.7 (b)	
T11	4.854 - 0	Bottom Girt	14x3/16	439	-0.96	73.69	6.9	Pass
T11	4.854 - 0	Mid Girt	14x3/16	444	-0.17	10.51	1.6	Pass
T1	190.6 - 175.35	Guy A@189.985	1/2	450	10.55	16.14	65.3	Pass
T4	140.1 - 120.1	Guy A@139.485	1/2	460	9.44	16.14	58.5	Pass
T6	100.1 - 80.1	Guy A@87.3695	7/16	468	5.55	12.48	44.5	Pass
T8	60.1 - 40.1	Guy A@44.9464	3/8	474	3.32	9.24	36.0	Pass
T1	190.6 - 175.35	Guy B@189.985	1/2	449	10.67	16.14	66.1	Pass
T4	140.1 - 120.1	Guy B@139.485	1/2	455	9.49	16.14	58.8	Pass
T6	100.1 - 80.1	Guy B@87.3695	7/16	467	5.73	12.48	45.9	Pass
T8	60.1 - 40.1	Guy B@44.9464	3/8	473	3.37	9.24	36.5	Pass
T1	190.6 - 175.35	Guy C@189.985	1/2	448	10.71	16.14	66.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T4	140.1 - 120.1	Guy C@139.485	1/2	452	9.33	16.14	57.8	Pass
T6	100.1 - 80.1	Guy C@87.3695	7/16	463	5.67	12.48	45.5	Pass
T8	60.1 - 40.1	Guy C@44.9464	3/8	469	3.30	9.24	35.7	Pass
T1	190.6 - 175.35	Top Guy Pull-Off@189.985	4 1/2x3/8	4	2.91	54.67	5.3	Pass
T6	100.1 - 80.1	Top Guy Pull-Off@87.3695	C4x5.4	464	2.13	51.52	4.1	Pass
T8	60.1 - 40.1	Top Guy Pull-Off@44.9464	C4x5.4	470	1.76	51.52	3.4	Pass
T4	140.1 - 120.1	Torque Arm Top@139.485	C10x15.3	453	-2.69	121.35	66.8	Pass
							Summary	
						Leg (T6)	73.5	Pass
						Diagonal (T1)	54.1	Pass
						Top Girt (T4)	51.4	Pass
						Bottom Girt (T10)	70.7	Pass
						Mid Girt (T11)	1.6	Pass
						Guy A (T1)	65.3	Pass
						Guy B (T1)	66.1	Pass
						Guy C (T1)	66.3	Pass
						Top Guy Pull-Off (T1)	5.3	Pass
						Torque Arm Top (T4)	66.8	Pass
						Bolt Checks	70.7	Pass
						RATING =	**73.5**	**Pass**

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

Job :	T-Mobile ~ CT11156A: 190-ft Guyed Lattice Tower	Project No.	20074.28	Sheet	1	of	2
Address:	812 Providence Pike, Danileson, CT	Computed by	TJL	Date		5/27/20	
Description:	Guy Anchor Evaluation	Checked by	CAG	Date			

CHECK UPLIFT RESISTANCE

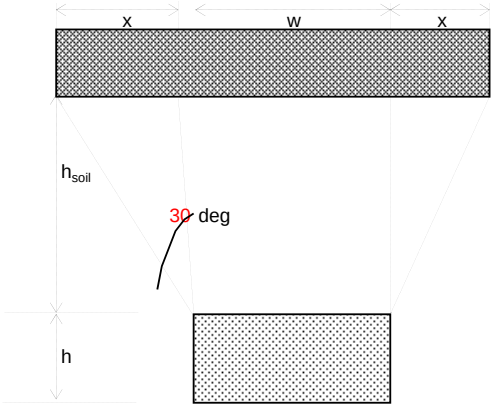
ANCHOR (C) AT 99ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	24	kips
Sliding =	15	kips
Wdepth =	1	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	4	ft
h =	2	ft
d =	7	ft
Vol. =	0.00	ft^3
Vol.sub =	56.00	ft^3
Wc =	*4.91*	kips
Ø =	*0.90*	
	4.42	



Foundation Section

SOIL PARAMETERS:

γ_{soil} =	100	pcf
$\gamma_{soil.sub}$ =	37.6	pcf
h_{soil} =	8	ft
x =	*4.62*	ft

Soil Weight (Wr):

B1 =	28.00
B2 =	182.25
B3 =	214.95

W.soil =	19.84	kips
W.soil.sub =	24.71	kips
Total =	*44.55*	kips
Ø =	*0.75*	
	33.41	

SF AGAINST SLIDING

2.06 **>** *1* ***OK***

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

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Branford, CT 06405 F: (203) 488-8587

Job :	T-Mobile ~ CT11156A: 190-ft Guyed Lattice Tower	Project No.	20074.28	Sheet	2	of	2
Address:	812 Providence Pike, Danileson, CT	Computed by	TJL	Date		5/27/20	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

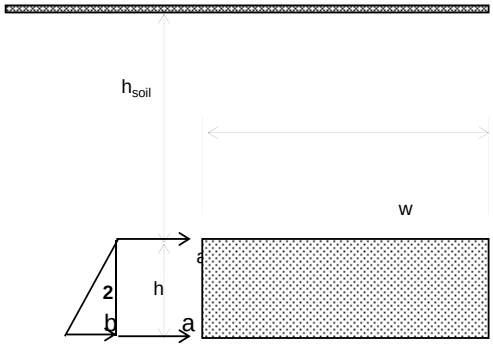
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	100	pcf
$\gamma soil$ =	37.6	pcf
h_{soil} =	8	ft
h =	2	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.0	ft
h =	2.0	ft
d =	7.0	ft



Foundation Elevation View

K_p = 3.00

HORIZONTAL FORCES

		1.09	ksf
		1.32	ksf
RESIST TO SLIDING =		16.83	k
SOIL & CONCRETE WEIGHT =	Wr + Wc =	37.83	k
UPLIFT REACTIONS =		-24	k
SUM =		13.83	k
COEF. OF FRICTION, (0.45) =		6.22	k
RESIST TO SLIDING =		16.83	k
SUM =		23.06	k

SF AGAINST SLIDING

SF = 1.5 > 1 OK

GUY ANCHORS AGAINST SLIDING NEED REINFORCEMENT

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

Subject:	Base Foundation Analysis
Location:	190-ft Guyed Lattice Tower Danielson, CT
Rev. 0: 5/27/20	Prepared by: T.J.L. Checked by: C.A.G. Job No. 20074.28

Guyed Tower Base Foundation:

Input Data:

Tower Data

Shear Force =	$Shear := 1 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$Axial := 93 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 190 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 4.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 3.75 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 1.0 \cdot ft$	(User Input)	
Width of Pier =	$W_p := 2.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 1.25 \cdot ft$	(User Input)	
Width of Footing =	$W_{f1} := 4 \cdot ft$	(User Input)	
Length of Footing =	$W_{f2} := 4 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_s := 12000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 1$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	
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 =

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

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 87.6 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 57.6 \cdot pcf$

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

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 0.475 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.475 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 0.691 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.583 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 1.25$

$A_p := W_{f1} \cdot T_p = 5$

Soil Shear Resistance = $Sl_1 := P_{ave} \cdot A_p = 2.92 \cdot kip$

Weight of Concrete = $WT_c := [(W_{f1} \cdot W_{f2} \cdot T_f) + W_p^2 L_p] \cdot \gamma_c = 3.07 \cdot kip$

Total Weight = $WT_{tot} := WT_c + Axial = 96.07 \cdot kip$

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 43.23 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := Sl_1 + Sl_2 = 46.15 \cdot kips$

Sliding Resistance Ratio = $Sliding\_Resistance_{ratio} := \frac{0.75 Sl_{tot}}{Shear} = 34.61$

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

Sliding_Resistance_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_{f1} \cdot W_{f2} = 16$

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{A_{mat}} = 6 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < 0.6 q_s, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Section 1 - Site Information

Site ID: CT11156A
Status: Draft
Version: 3
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 5/19/2020 5:53:27 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

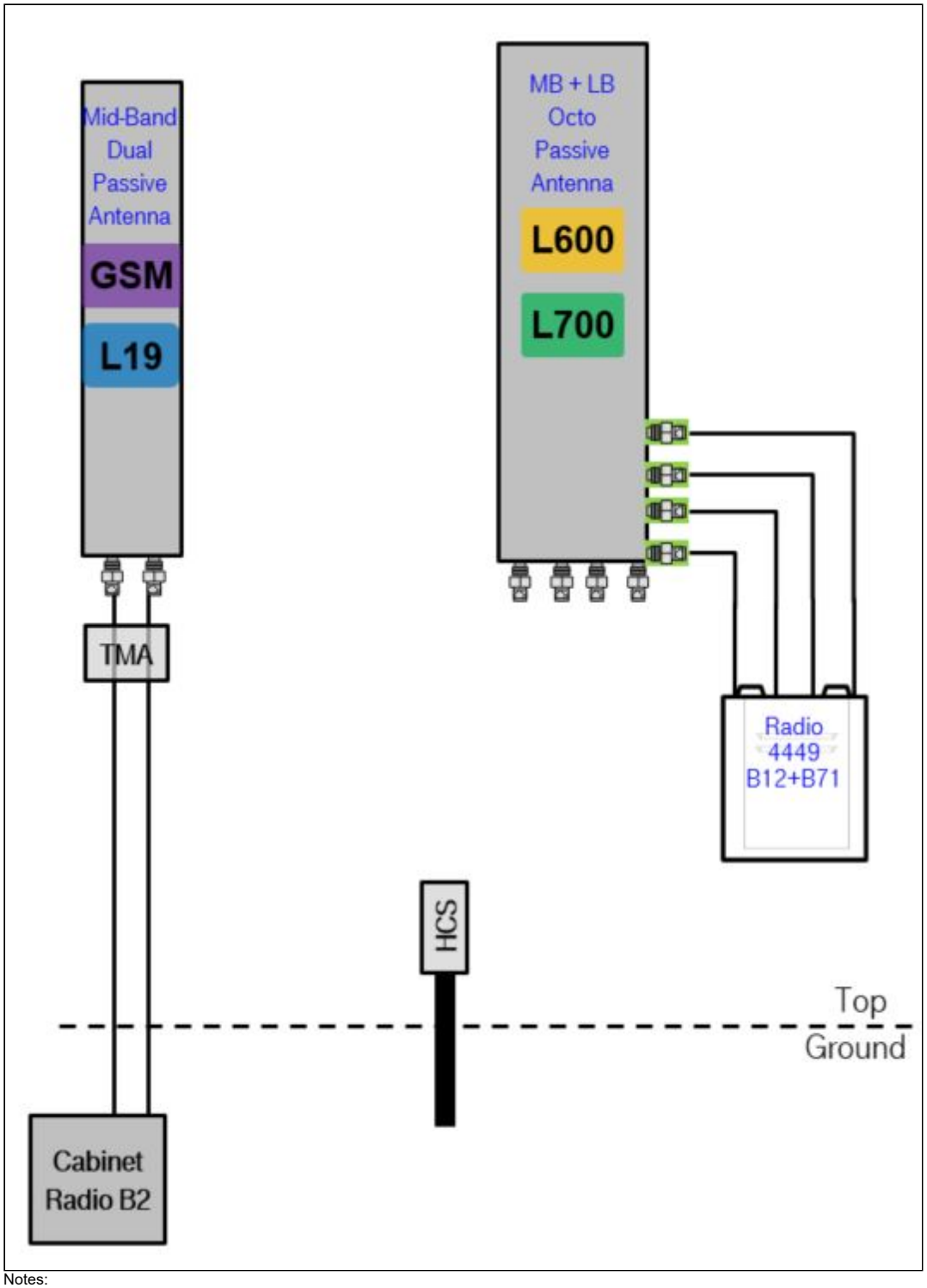
Site Name: Killingly/ Margaret Henr1
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: <undefined>

Latitude: 41.79141700
Longitude: -71.82236100
Address: 818 Providence Pike
City, State: Killingly, CT
Region: NORTHEAST

RAN Template: 67D5A998C ODE+6160			AL Template: 67D5998C_1xAIR+1QP+1OP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 9

Section 2 - Existing Template Images

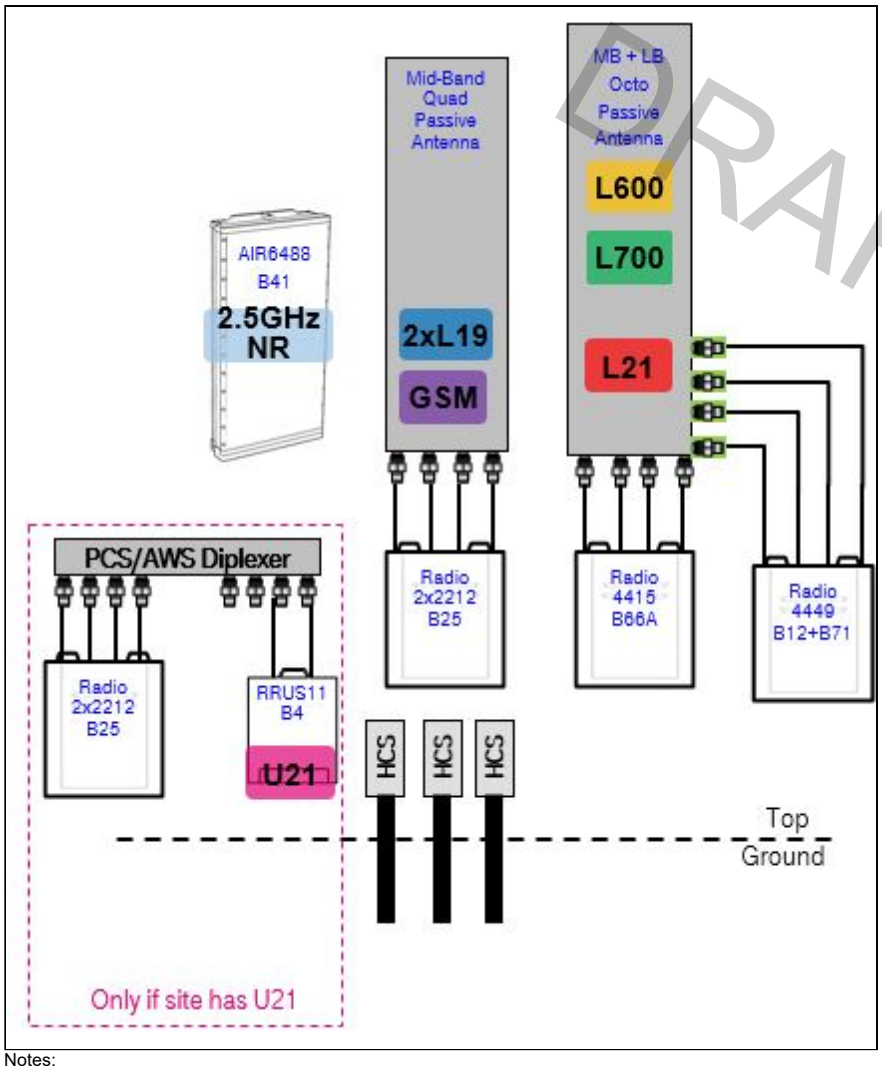
Capture.JPG


Mid-Band
Dual
Passive
Antenna
GSM
L19
MB + LB
Octo
Passive
Antenna
L600
L700
TMA
Radio
4449
B12+B71
HCS
Top
Ground
Cabinet
Radio B2

Notes:

Section 3 - Proposed Template Images

67D5998C.JPG



Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 67D04G

Enclosure	1
Enclosure Type	RBS 6201 ODE
Baseband	DUG20 (G1900); BB 6630 (L1900, L700, L600); BB 6630 (N600)
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG*
Radio	RUS01 B2 **(x 3)** (G1900); RUS01 B2 **(x 3)** (L1900)

Proposed RAN Equipment

Template: 67D5A998C ODE+6160

Enclosure	1	2	3
Enclosure Type	RBS 6201 ODE	Enclosure 6160	B160
Baseband	DUG20 (G1900); BB 6630 (L1900, L700, L600); BB 6630 (N600)	BB 6630 **(x 3)** (L2500); BB 6648 (N2500)	
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG*	Ericsson 6x12 HCS *Select AWG & Length* **(x 3)**	
Radio	RUS01 B2 **(x 6)**		

RAN Scope of Work:

Existing Cabinet Radios (RUS01 B2) will become dark, as GSM and L1900 (both carriers) will move to the new Radio 4424 B25.

Location of new cabinets to be determined.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (3) BB6630 for L2500 to new Enclosure 6160.

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

Existing: (6) Coaxial Lines and (1) 6X12 HCS at end of L600 work.

Remove all coaxial lines.

Add (3) 6X12 HCS. Length of new HCS will match that of existing HCS.

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Section 6 - A&L Equipment

Existing Template: 67D04G_1DP+1OP
Proposed Template: 67D5998C_1xAIR+1QP+1OP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	90		90			
M. Tilt	0		0			
Height	145		145			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L1900 G1900		L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2		2	2		
Cables	1-5/8" Coax - 165 ft. **(x2)**					
TMAs	Generic Twin Style 1A - PCS (AtAntenna)					
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Two Mounts per Sector ***
Replace EMS antenna in Position 1 with RFS APX16 Quad.
Connect (2) 1-5/8" Coaxial Lines to PCS TMA in Position 1.
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (1) Radio 4449 B71+B12 for L600 and L700 to Postion 2 at antenna.

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	90		90				90	
M. Tilt	0		0				0	
Height	145		145				145	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L1900 G1900	L1900	L700 L600 N600	L700 L600 N600	L2100	L2100	L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2		2	2				
Cables								
TMAs								
Diplexers / Combiners								
Radio	Radio 4424 B25 (At Antenna)	SHARED Radio 4424 B25 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B66A (At Antenna)		
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Remove Coaxial Lines

Remove TMAs

Add (1) Radio 4424 B25 for GSM and L1900 (both carriers) to Position 1 at antenna, and connect its ports to the Quad antenna.

Add (1) Radio 4415 B66 for L2100 to Position 2 at antenna, and connect its ports to the Mid-Band Ports of the Octo antenna.

Add (1) AIR6449 B41 for L2500 and N2500 to Position 3.

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

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	**1**		**2**			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	200		200			
M. Tilt	0		0			
Height	145		145			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L1900 G1900		L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2		2	2		
Cables	1-5/8" Coax - 165 ft. **(x2)**					
TMAs	Generic Twin Style 1A - PCS (AtAntenna)					
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Two Mounts per Sector ***
Replace EMS antenna in Position 1 with RFS APX16 Quad.
Connect (2) 1-5/8" Coaxial Lines to PCS TMA in Position 1.
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (1) Radio 4449 B71+B12 for L600 and L700 to Postion 2 at antenna.

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	200		200				200	
M. Tilt	0		0				0	
Height	145		145				145	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L1900 G1900	L1900	L700 L600 N600	L700 L600 N600	L2100	L2100	L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2		2	2				
Cables								
TMAs								
Diplexers / Combiners								
Radio	Radio 4424 B25 (At Antenna)	SHARED Radio 4424 B25 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B66A (At Antenna)		
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Remove Coaxial Lines

Remove TMAs

Add (1) Radio 4424 B25 for GSM and L1900 (both carriers) to Position 1 at antenna, and connect its ports to the Quad antenna.

Add (1) Radio 4415 B66 for L2100 to Position 2 at antenna, and connect its ports to the Mid-Band Ports of the Octo antenna.

Add (1) AIR6449 B41 for L2500 and N2500 to Position 3.

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

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	315		315			
M. Tilt	0		0			
Height	145		145			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L1900 G1900		L700 L600 N600	L700 L600 N600		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2		2	2		
Cables	1-5/8" Coax - 165 ft. **(x2)**					
TMAs	Generic Twin Style 1A - PCS (AtAntenna)					
Diplexers / Combiners						
Radio			Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Two Mounts per Sector ***
Replace EMS antenna in Position 1 with RFS APX16 Quad.
Connect (2) 1-5/8" Coaxial Lines to PCS TMA in Position 1.
Replace LB Dual in Position 2 with (1) LB/MB Octo.
Add (1) Radio 4449 B71+B12 for L600 and L700 to Postion 2 at antenna.

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	315		315				315	
M. Tilt	0		0				0	
Height	145		145				145	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L1900 G1900	L1900	L700 L600 N600	L700 L600 N600	L2100	L2100	L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt	2		2	2				
Cables								
TMAs								
Diplexers / Combiners								
Radio	Radio 4424 B25 (At Antenna)	SHARED Radio 4424 B25 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)	Radio 4415 B66A (At Antenna)	SHARED Radio 4415 B66A (At Antenna)		
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Remove Coaxial Lines

Remove TMAs

Add (1) Radio 4424 B25 for GSM and L1900 (both carriers) to Position 1 at antenna, and connect its ports to the Quad antenna.

Add (1) Radio 4415 B66 for L2100 to Position 2 at antenna, and connect its ports to the Mid-Band Ports of the Octo antenna.

Add (1) AIR6449 B41 for L2500 and N2500 to Position 3.

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

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

RAN Template:	A&L Template:
67D5A998C ODE+6160	67D5998C_1xAIR+1QP+1OP

CT11156A_Anchor_3_draft

Print Name: Standard
PORs: Anchor_Phase 3

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

Exhibit E

Mount Analysis

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

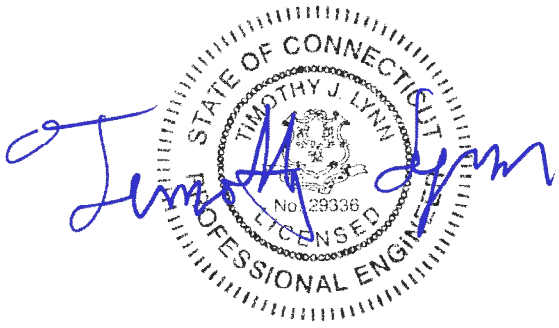
T-Mobile Site #: CT11156A

812 Providence Pike
Danielson, CT

Centek Project No. 20074.28

Date: May 27, 2020

Max Stress Ratio = 45.9%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

CENTEK engineering

Centered on Solutions℠

May 27, 2020

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11156A
812 Providence Pike
Danielson, CT 06239

Centek Project No. 20074.28

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 mount, consisting three (3) V -frame sector mounts (Commscope P/N: SF-QV12-B) with stiff arms to support the proposed/existing equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  V-Frames: Three (3) RFS APXVAARR24-43-NA20 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson 4449 B71_B12 remote radio units, three (3) Ericsson 4415 remote radio units and three (3) Ericsson 4424 remote radio units mounted on three (3) V-Frames with a RAD center elevation of 140-ft +/- AGL.

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

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

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

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

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

Section 2 - Calculations

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

Subject: TIA-222-G Loads

Location: Danielson, CT

Rev. 0: 5/27/20

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 20074.28

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

Wind Speeds

Basic Wind Speed: $V := 101$ mph (User Input - 2018 CSBC Appendix N)

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

Input

Structure Type = $Structure\_Type := Lattice$ (User Input)

Structure Category = $SC := II$ (User Input)

Exposure Category = $Exp := B$ (User Input)

Structure Height = $h := 190$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 140$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

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

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 0.85$ (User Input)

Output

Wind Direction Probability Factor = $K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.85$ (Per Table 2-2 of TIA-222-G)

Importance Factors = $I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$ (Per Table 2-3 of TIA-222-G)

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

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

$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.155$

$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.733$

Velocity Pressure Coefficient Antennas = $Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.088$

Velocity Pressure w/o Ice Antennas = $qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 24.15$

Velocity Pressure with Ice Antennas = $qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 5.918$

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAARR24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 416$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.8$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 151$	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 =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 121$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 53$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 153$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 427$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 427$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPX16DWV-16DWVS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 133$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 32$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.8$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 44$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.7$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 18$	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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4179$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 135$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 135$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6449		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 116$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 47$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 37$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 18$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 4680$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 152$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 152$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model =	Ericsson 4449 B71B12		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		(User Input)
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 34$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 27$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 13$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.8$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 11$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2045$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2199$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 71$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 71$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4415 B25

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 14.9$ in (User Input)

RRUS Width = $W_{RRUS} := 13.2$ in (User Input)

RRUS Thickness = $T_{RRUS} := 5.4$ in (User Input)

RRUS Weight = $WT_{RRUS} := 47$ lbs (User Input)

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

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

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

Wind Load (without ice)

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

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 34$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 14$ lbs

Wind Load (with ice)

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

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

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 7$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 47$ lbs

Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1652$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 54$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 54$ lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4424

RRUS Shape = Flat (User Input)

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

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

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

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

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

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

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

Wind Load (without ice)

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

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 42$ lbs

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

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 33$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.6$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 15$ lbs

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

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

Gravity Load (without ice)

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

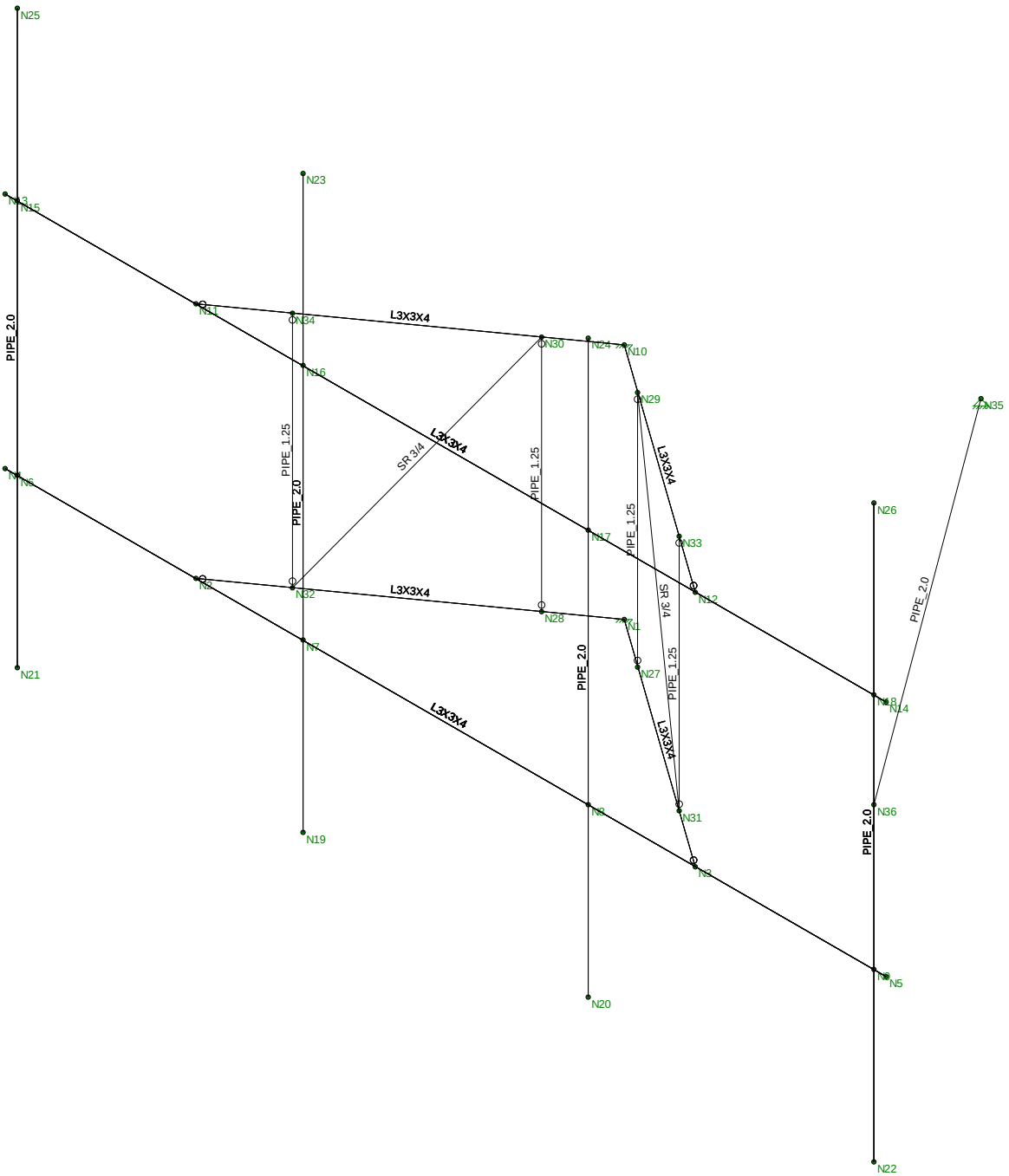
Gravity Loads (ice only)

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

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2643$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 86$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 86$ lbs



Envelope Only Solution

Centek		
TJL	CT11156A	May 27, 2020 at 1:29 PM
20074.28	Member Framing	Antenna Mount.r3d

(Global) Model Settings

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

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

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

(Global) Model Settings, Continued

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

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	L3x3x1/4	L3X3X4	Beam	Pipe	A36 Gr.36	Typical	1.44	1.23	1.23	.031
2	Pipe 1.25	PIPE_1.25	Column	Pipe	A53 Grade B	Typical	.625	.184	.184	.368
3	Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Antenna Mast Pipe 2.0	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	SR3/4	SR 3/4	Beam	Pipe	A36 Gr.36	Typical	.442	.016	.016	.031

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	L3x3x1/4	4.301			Lbyy						Lateral
2	M2	L3x3x1/4	4.301			Lbyy						Lateral
3	M3	L3x3x1/4	12.34			Lbyy						Lateral
4	M4	L3x3x1/4	4.301			Lbyy						Lateral
5	M5	L3x3x1/4	4.301			Lbyy						Lateral
6	M6	L3x3x1/4	12.34			Lbyy						Lateral
7	M7	Antenna Mast Pipe ...	8			Lbyy						Lateral
8	M8	Antenna Mast Pipe ...	8			Lbyy						Lateral
9	M9	Antenna Mast Pipe ...	8			Lbyy						Lateral
10	M10	Antenna Mast Pipe ...	8			Lbyy						Lateral
11	M11	Pipe 1.25	3.333			Lbyy						Lateral
12	M12	Pipe 1.25	3.333			Lbyy						Lateral
13	M13	Pipe 1.25	3.333			Lbyy						Lateral
14	M14	Pipe 1.25	3.333			Lbyy						Lateral
15	M15	SR3/4	4.166			Lbyy						Lateral
16	M16	SR3/4	4.166			Lbyy						Lateral
17	M17	Pipe 2.0	7.049			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N3		270	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
2	M2	N1	N2			L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
3	M3	N4	N5		180	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
4	M4	N10	N12		180	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
5	M5	N10	N11		90	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
6	M6	N13	N14		270	L3x3x1/4	Beam	Pipe	A36 Gr.36	Typical
7	M7	N25	N21			Antenna Mast Pipe 2.0	Column	Pipe	A53 Gra...	Typical
8	M8	N23	N19			Antenna Mast Pipe 2.0	Column	Pipe	A53 Gra...	Typical
9	M9	N20	N24			Antenna Mast Pipe 2.0	Column	Pipe	A53 Gra...	Typical
10	M10	N26	N22			Antenna Mast Pipe 2.0	Column	Pipe	A53 Gra...	Typical
11	M11	N29	N27			Pipe 1.25	Column	Pipe	A53 Gra...	Typical
12	M12	N33	N31			Pipe 1.25	Column	Pipe	A53 Gra...	Typical
13	M13	N30	N28			Pipe 1.25	Column	Pipe	A53 Gra...	Typical
14	M14	N34	N32			Pipe 1.25	Column	Pipe	A53 Gra...	Typical
15	M15	N30	N32			SR3/4	Beam	Pipe	A36 Gr.36	Typical
16	M16	N29	N31			SR3/4	Beam	Pipe	A36 Gr.36	Typical
17	M17	N36	N35			Pipe 2.0	Beam	Pipe	A53 Gra...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	-3.5	0	2.5	0	
3	N3	3.5	0	2.5	0	
4	N4	-6.17	0	2.5	0	
5	N5	6.17	0	2.5	0	
6	N6	-6	0	2.5	0	
7	N7	-2	0	2.5	0	
8	N8	2	0	2.5	0	
9	N9	6	0	2.5	0	
10	N10	0	3.333	0	0	
11	N11	-3.5	3.333	2.5	0	
12	N12	3.5	3.333	2.5	0	
13	N13	-6.17	3.333	2.5	0	
14	N14	6.17	3.333	2.5	0	
15	N15	-6	3.333	2.5	0	
16	N16	-2	3.333	2.5	0	
17	N17	2	3.333	2.5	0	
18	N18	6	3.333	2.5	0	
19	N19	-2	-2.333	2.5	0	
20	N20	2	-2.333	2.5	0	
21	N21	-6	-2.333	2.5	0	
22	N22	6	-2.333	2.5	0	
23	N23	-2	5.667	2.5	0	
24	N24	2	5.667	2.5	0	
25	N25	-6	5.667	2.5	0	
26	N26	6	5.667	2.5	0	
27	N27	0.675399	0	0.482428	0	
28	N28	-0.675399	0	0.482428	0	
29	N29	0.675399	3.333	0.482428	0	
30	N30	-0.675399	3.333	0.482428	0	
31	N31	2.709732	0	1.935523	0	
32	N32	-2.709732	0	1.935523	0	
33	N33	2.709732	3.333	1.935523	0	
34	N34	-2.709732	3.333	1.935523	0	
35	N35	1.825	2	-3.18	0	
36	N36	6	2	2.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N35	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Y	-.077	.5
2	M9	Y	-.077	7.5
3	M10	Y	-.021	2

Member Point Loads (BLC 2 : Dead Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M10	Y	-.021	6
5	M9	Y	-.074	3.5
6	M8	Y	-.052	.5
7	M8	Y	-.052	4
8	M9	Y	-.047	5.5
9	M10	Y	-.086	4.5

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Y	-.214	.5
2	M9	Y	-.214	7.5
3	M10	Y	-.068	2
4	M10	Y	-.068	6
5	M9	Y	-.071	3.5
6	M8	Y	-.076	.5
7	M8	Y	-.076	4
8	M9	Y	-.054	5.5
9	M10	Y	-.086	4.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	X	.027	.5
2	M9	X	.027	7.5
3	M10	X	.009	2
4	M10	X	.009	6
5	M9	X	.011	3.5
6	M8	X	.009	.5
7	M8	X	.009	4
8	M9	X	.007	5.5
9	M10	X	.013	4.5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	X	.076	.5
2	M9	X	.076	7.5
3	M10	X	.016	2
4	M10	X	.016	6
5	M9	X	.027	3.5
6	M8	X	.024	.5
7	M8	X	.024	4
8	M9	X	.014	5.5
9	M10	X	.033	4.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Z	.061	.5
2	M9	Z	.061	7.5
3	M10	Z	.022	2
4	M10	Z	.022	6
5	M8	Z	.019	.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
6	M8	Z	.019	4
7	M8	Z	.058	.5
8	M8	Z	.058	4

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M9	Z	.208	.5
2	M9	Z	.208	7.5
3	M10	Z	.067	2
4	M10	Z	.067	6

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.002	.002	0	0
2	M2	X	.002	.002	0	0
3	M4	X	.002	.002	0	0
4	M5	X	.002	.002	0	0
5	M8	X	.002	.002	0	0
6	M9	X	.002	.002	0	0
7	M17	X	.002	.002	0	0
8	M10	X	.002	.002	0	0
9	M7	X	.002	.002	0	0
10	M8	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.009	.009	0	0
2	M2	X	.009	.009	0	0
3	M4	X	.009	.009	0	0
4	M5	X	.009	.009	0	0
5	M8	X	.009	.009	0	0
6	M9	X	.009	.009	0	0
7	M17	X	.009	.009	0	0
8	M10	X	.009	.009	0	0
9	M7	X	.009	.009	0	0
10	M8	X	.009	.009	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M6	Z	.002	.002	0	0
2	M3	Z	.002	.002	0	0
3	M2	Z	.002	.002	0	0
4	M5	Z	.002	.002	0	0
5	M4	Z	.002	.002	0	0
6	M1	Z	.002	.002	0	0
7	M8	Z	.002	.002	0	0
8	M9	Z	.002	.002	0	0
9	M7	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M6	Z	.009	.009	0	0
2	M3	Z	.009	.009	0	0
3	M2	Z	.009	.009	0	0
4	M5	Z	.009	.009	0	0
5	M4	Z	.009	.009	0	0
6	M1	Z	.009	.009	0	0
7	M8	Z	.009	.009	0	0
8	M9	Z	.009	.009	0	0
9	M7	Z	.009	.009	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Dead Load	None					9			
3	Ice Load	None					9			
4	Wind with Ice X	None					9	10		
5	Wind X	None					9	10		
6	Wind with Ice Z	None					8	9		
7	Wind Z	None					4	9		

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D + 1.6W (X-direc...	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W (X-direc...	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	4	1														
4	1.2D + 1.6W (Z-direc...	Yes	Y		1	1.2	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-direc...	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi...	Yes	Y		1	1.2	2	1.2	3	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	.977	6	.865	6	1.21	3	-.106	5	.672	4	.524	1
2		min	-.421	2	.327	2	-.378	5	-.289	6	-.983	2	-.268	5
3	N10	max	-.225	5	1.126	3	-.626	2	-.158	2	.591	5	.366	4
4		min	-1.228	1	.407	5	-1.549	6	-.387	3	-1.046	1	-.427	2
5	N35	max	.136	1	.024	6	.266	1	0	6	0	6	0	6
6		min	-.114	5	.012	2	-.165	5	0	1	0	1	0	1
7	Totals:	max	0	6	1.993	6	0	3						
8		min	-1.415	1	.8	2	-1.829	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	N1	max	0	6	0	6	0	6	0	6	0	6	0	6
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	.101	2	-.015	2	.141	2	9.377e-04	6	5.359e-03	1	-6.117e-04	5
4		min	-.078	4	-.03	6	-.108	4	6.298e-05	5	-4.296e-03	5	-2.572e-03	6

Envelope Joint Displacements (Continued)

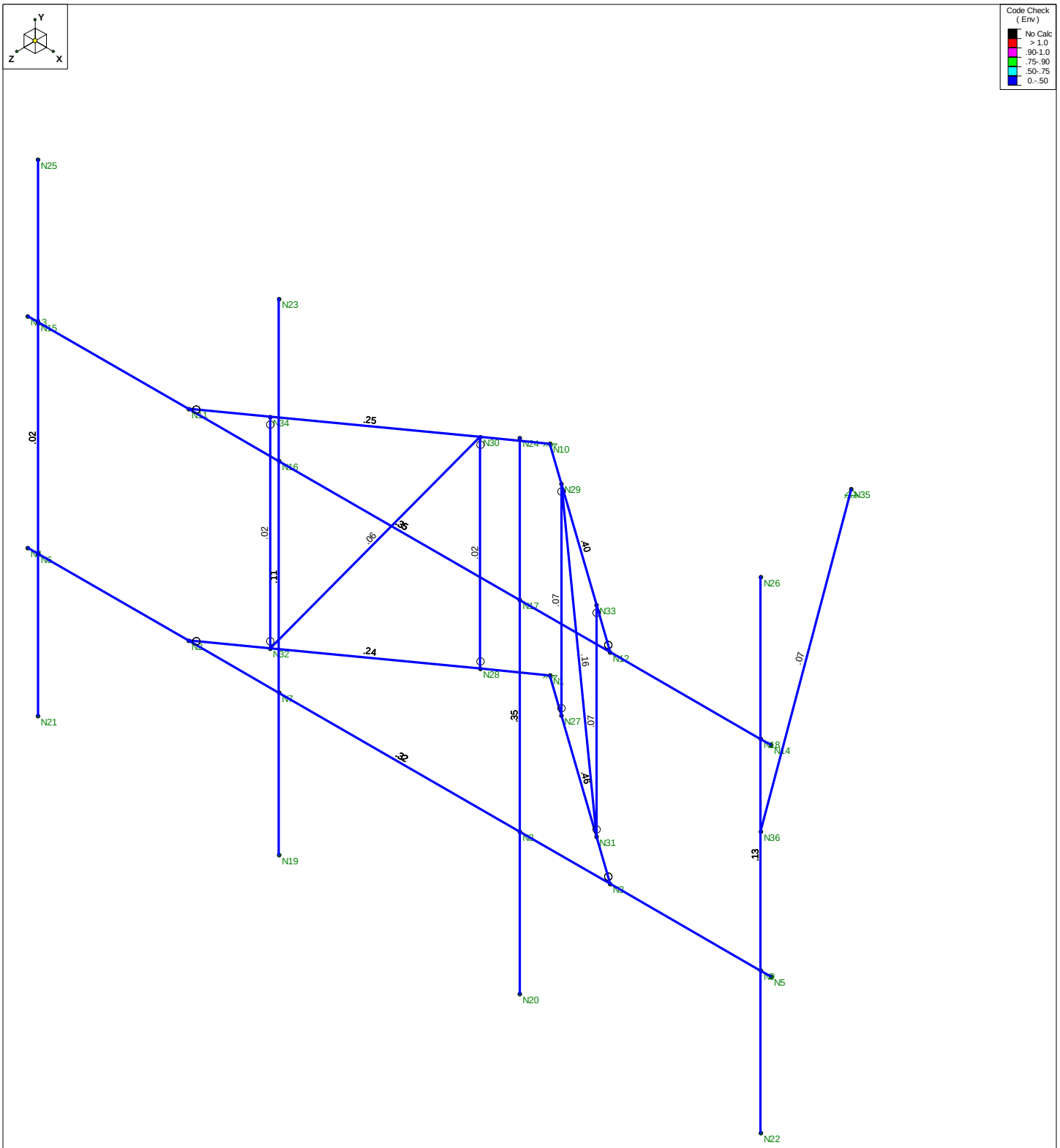
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
5	N3	max	.101	2	-.029	2	.111	4	6.783e-04	1	1.029e-03	5	-1.22e-05	3
6		min	-.079	4	-.098	6	-.142	2	-5.475e-03	5	-7.295e-04	3	-4.515e-04	4
7	N4	max	.101	2	.031	6	.309	2	1.433e-03	3	5.199e-03	2	-2.519e-04	2
8		min	-.078	4	0	1	-.22	4	1.184e-04	5	-3.202e-03	4	-1.421e-03	6
9	N5	max	.102	2	-.054	5	.099	4	2.237e-03	2	8.298e-05	3	-1.311e-05	5
10		min	-.079	4	-.16	6	-.126	2	-2.468e-03	4	-9.398e-04	2	-1.946e-03	3
11	N6	max	.101	2	.028	6	.299	2	1.433e-03	3	5.199e-03	2	-2.519e-04	2
12		min	-.078	4	-.002	1	-.213	4	1.184e-04	5	-3.202e-03	4	-1.421e-03	6
13	N7	max	.101	2	-.026	5	.047	2	1.879e-03	6	4.963e-03	2	-2.976e-04	5
14		min	-.078	4	-.075	6	-.032	6	7.937e-05	5	-4.962e-03	4	-1.82e-03	6
15	N8	max	.102	2	-.037	2	.126	5	-2.323e-05	3	1.458e-03	2	7.978e-04	1
16		min	-.079	4	-.112	6	-.128	2	-1.019e-02	4	-7.902e-04	6	-4.552e-04	5
17	N9	max	.102	2	-.054	5	.098	4	2.237e-03	2	8.296e-05	3	-1.314e-05	5
18		min	-.079	4	-.156	6	-.127	2	-2.468e-03	4	-9.398e-04	2	-1.946e-03	3
19	N10	max	0	6	0	6	0	6	0	6	0	6	0	6
20		min	0	1	0	1	0	1	0	1	0	1	0	1
21	N11	max	.115	1	-.008	5	.16	1	1.964e-03	6	5.443e-03	2	-6.719e-04	2
22		min	-.062	5	-.03	3	-.085	5	3.496e-04	2	-4.51e-03	4	-2.663e-03	6
23	N12	max	.115	1	-.022	5	.09	5	5.986e-03	5	2.096e-03	4	2.605e-04	5
24		min	-.063	5	-.096	3	-.159	1	-4.771e-04	1	-2.503e-04	2	-3.461e-04	1
25	N13	max	.115	1	.03	6	.339	1	1.437e-03	3	5.542e-03	1	-1.717e-04	5
26		min	-.062	5	0	1	-.194	5	6.419e-04	2	-3.042e-03	5	-1.27e-03	6
27	N14	max	.115	1	-.057	5	.067	5	1.078e-03	5	1.807e-04	5	-1.052e-04	2
28		min	-.063	5	-.16	6	-.099	1	-1.253e-03	1	-1.954e-03	1	-2.145e-03	6
29	N15	max	.115	1	.028	6	.328	1	1.437e-03	3	5.541e-03	1	-1.718e-04	5
30		min	-.062	5	-.002	1	-.188	5	6.419e-04	2	-3.042e-03	5	-1.27e-03	6
31	N16	max	.115	1	-.026	5	.065	1	3.294e-03	6	5.18e-03	1	-7.496e-04	2
32		min	-.062	5	-.076	6	.006	5	3.929e-04	2	-4.967e-03	5	-2.011e-03	6
33	N17	max	.115	1	-.037	2	.129	5	1.036e-02	5	1.983e-03	1	6.291e-04	4
34		min	-.063	5	-.112	6	-.138	1	-2.5e-04	1	1.051e-03	5	-5.505e-04	2
35	N18	max	.115	1	-.054	5	.068	5	1.078e-03	5	1.809e-04	5	-1.052e-04	2
36		min	-.063	5	-.156	6	-.103	1	-1.253e-03	1	-1.954e-03	1	-2.144e-03	6
37	N19	max	.1	2	-.026	5	.036	2	1.837e-03	6	4.963e-03	2	9.178e-05	2
38		min	-.091	4	-.075	6	-.084	6	-2.223e-04	5	-4.962e-03	4	-1.819e-03	6
39	N20	max	.172	2	-.037	2	.533	5	-2.313e-05	3	1.458e-03	2	3.118e-03	1
40		min	-.091	4	-.112	6	-.122	2	-1.601e-02	5	-7.902e-04	6	-4.547e-04	5
41	N21	max	.101	2	.028	6	.281	2	1.433e-03	3	5.199e-03	2	4.98e-05	2
42		min	-.095	4	-.002	1	-.215	4	-1.833e-04	5	-3.202e-03	4	-1.421e-03	6
43	N22	max	.074	2	-.054	5	.169	4	2.236e-03	2	8.296e-05	3	-1.313e-05	5
44		min	-.086	4	-.156	6	-.19	2	-2.526e-03	4	-9.398e-04	2	-1.934e-03	6
45	N23	max	.167	1	-.026	5	.176	6	4.627e-03	6	5.18e-03	1	-8.654e-04	5
46		min	-.038	5	-.076	6	.044	5	3.932e-04	2	-4.967e-03	5	-2.176e-03	1
47	N24	max	.179	1	-.037	2	.542	5	1.622e-02	4	1.983e-03	1	6.3e-04	4
48		min	-.08	5	-.112	6	-.145	1	-2.504e-04	1	1.051e-03	5	-2.879e-03	2
49	N25	max	.135	1	.028	6	.351	1	1.445e-03	4	5.541e-03	1	-1.718e-04	5
50		min	-.057	5	-.002	1	-.154	5	6.42e-04	2	-3.042e-03	5	-1.27e-03	6
51	N26	max	.131	1	-.054	5	.099	5	1.137e-03	5	1.809e-04	5	-4.215e-04	2
52		min	-.022	5	-.156	6	-.138	1	-1.254e-03	1	-1.954e-03	1	-2.147e-03	6
53	N27	max	.005	2	-.002	5	.006	4	1.63e-04	3	1.916e-03	1	-2.427e-05	2
54		min	-.004	4	-.004	3	-.008	2	-4.866e-04	5	-1.165e-03	5	-3.68e-04	4
55	N28	max	.006	2	0	5	.008	2	3.31e-04	6	1.748e-03	2	1.027e-05	2
56		min	-.004	4	-.002	3	-.005	4	8.519e-05	5	-1.375e-03	4	-1.5e-04	6

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
57	N29	max	.007	1	-.003	2	.005	5	9.735e-04	4	1.89e-03	1	3.486e-04	5
58		min	-.003	5	-.007	6	-.009	1	1.505e-04	2	-1.143e-03	5	-2.282e-04	3
59	N30	max	.006	1	-.001	5	.009	1	6.001e-04	6	2.061e-03	1	4.397e-05	2
60		min	-.003	5	-.003	3	-.004	5	9.649e-05	2	-1.022e-03	5	-1.982e-04	6
61	N31	max	.071	2	-.009	5	.064	5	2.648e-03	3	4.515e-03	2	-7.294e-04	2
62		min	-.046	5	-.025	6	-.101	1	-7.808e-04	5	-4.241e-03	4	-3.689e-03	6
63	N32	max	.066	2	-.003	5	.092	2	1.944e-03	6	4.859e-03	2	4.679e-04	4
64		min	-.054	4	-.008	3	-.075	4	6.249e-04	2	-3.468e-03	4	2.608e-04	6
65	N33	max	.071	2	-.009	5	.064	4	3.859e-03	4	5.767e-03	1	1.634e-03	5
66		min	-.044	4	-.028	6	-.098	2	6.464e-04	2	-2.871e-03	5	-3.364e-03	3
67	N34	max	.079	1	-.004	5	.11	1	2.626e-03	6	5.235e-03	1	1.438e-04	1
68		min	-.04	5	-.009	3	-.055	5	6.84e-04	2	-2.975e-03	5	-5.124e-04	6
69	N35	max	0	6	0	6	0	6	2.036e-03	3	4.045e-03	1	-5.248e-04	2
70		min	0	1	0	1	0	1	6.49e-04	5	-1.614e-03	5	-2.977e-03	6
71	N36	max	.12	1	-.054	5	.059	5	2.005e-04	2	-1.717e-04	6	1.79e-04	2
72		min	-.079	5	-.156	6	-.09	1	-1.05e-03	6	-1.111e-03	1	-8.719e-04	6

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...			phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M1	L3X3X4	.459	3....	6	.057	3.36	z	6	30.969	46.656	1.688	3.725	1.6...	H2-1
2	M2	L3X3X4	.243	0	2	.026	3.36	y	6	30.969	46.656	1.688	3.754	1.7...	H2-1
3	M3	L3X3X4	.324	8....	4	.056	9....	z	5	5.077	46.656	1.688	3.112	1.9...	H2-1
4	M4	L3X3X4	.396	3....	3	.061	0	y	6	30.969	46.656	1.688	3.719	1.6...	H2-1
5	M5	L3X3X4	.248	0	1	.026	0	z	6	30.969	46.656	1.688	3.75	1.7...	H2-1
6	M6	L3X3X4	.349	8....	4	.054	9....	y	4	5.077	46.656	1.688	3.051	1.8...	H2-1
7	M7	PIPE_2.0	.023	5....	4	.013	2....		3	14.916	32.13	1.872	1.872	2.0...	H1-...
8	M8	PIPE_2.0	.105	2....	6	.017	2....		3	14.916	32.13	1.872	1.872	4.6...	H1-...
9	M9	PIPE_2.0	.351	5....	4	.062	5....		6	14.916	32.13	1.872	1.872	3.5...	H1-...
10	M10	PIPE_2.0	.133	3....	2	.068	2....		1	14.916	32.13	1.872	1.872	1.9...	H1-...
11	M11	PIPE_1.25	.066	3....	6	.002	0		3	14.908	19.688	.801	.801	1	H1-...
12	M12	PIPE_1.25	.072	3....	3	.045	0		6	14.908	19.688	.801	.801	1	H1-...
13	M13	PIPE_1.25	.021	3....	6	.012	0		6	14.908	19.688	.801	.801	1	H1-...
14	M14	PIPE_1.25	.023	3....	3	.020	0		6	14.908	19.688	.801	.801	1	H1-...
15	M15	SR 3/4	.056	4....	3	.011	4....		1	1.404	14.314	.179	.179	3.0...	H1-...
16	M16	SR 3/4	.160	4....	6	.009	4....		2	1.404	14.314	.179	.179	2.4...	H1-...
17	M17	PIPE_2.0	.065	2....	1	.005	7....		1	17.707	32.13	1.872	1.872	1.1...	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11156A	May 27, 2020 at 1:29 PM
20074.28	Unity Check	Antenna Mount.r3d

Exhibit F

Power Density/RF Emissions Report

EBI Consulting

environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11156A

Killingly/ Margaret Henr1
818 Providence Pike
Killingly, Connecticut 06239

June 23, 2020

EBI Project Number: 6220002637

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**11.21%**

June 23, 2020

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

Emissions Analysis for Site: CT11156A - Killingly/ Margaret Henr1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **818 Providence Pike** in **Killingly, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 818 Providence Pike in Killingly, 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) 2 LTE channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

8) 2 NR channels (BRS Band - 2500 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

9) 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.

10) 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.

11) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz channel(s), the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antenna mounting height centerline of the proposed antennas is 140 feet above ground level (AGL).

13) 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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE %:	**1.71%**	Antenna B1 MPE %:	**1.71%**	Antenna C1 MPE %:	**1.71%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 16.35 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	7	Channel Count:	7	Channel Count:	7
Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts	Total TX Power (W):	320 Watts
ERP (W):	9,237.25	ERP (W):	9,237.25	ERP (W):	9,237.25
Antenna A2 MPE %:	**2.73%**	Antenna B2 MPE %:	**2.73%**	Antenna C2 MPE %:	**2.73%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts	Total TX Power (W):	160 Watts
ERP (W):	25,651.93	ERP (W):	25,651.93	ERP (W):	25,651.93
Antenna A3 MPE %:	**4.71%**	Antenna B3 MPE %:	**4.71%**	Antenna C3 MPE %:	**4.71%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	9.14%
Verizon	2.07%
Site Total MPE % :	11.21%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	9.14%
T-Mobile Sector B Total:	9.14%
T-Mobile Sector C Total:	9.14%
Site Total MPE % :	11.21%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1167.14	140.0	8.56	1900 MHz GSM	1000	0.86%
T-Mobile 1900 MHz LTE	2	2334.27	140.0	8.56	1900 MHz LTE	1000	0.86%
T-Mobile 600 MHz LTE	2	591.73	140.0	2.17	600 MHz LTE	400	0.54%
T-Mobile 600 MHz NR	1	1577.94	140.0	2.89	600 MHz NR	400	0.72%
T-Mobile 700 MHz LTE	2	648.82	140.0	2.38	700 MHz LTE	467	0.51%
T-Mobile 2100 MHz LTE	2	2589.11	140.0	9.50	2100 MHz LTE	1000	0.95%
T-Mobile 2500 MHz LTE	2	6412.98	140.0	23.53	2500 MHz LTE	1000	2.35%
T-Mobile 2500 MHz NR	2	6412.98	140.0	23.53	2500 MHz NR	1000	2.35%
						Total:	**9.14%**

• 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:	9.14%
Sector B:	9.14%
Sector C:	9.14%
T-Mobile Maximum MPE % (Sector A):	9.14%
Site Total:	11.21%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.21%** 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.

Exhibit G

Mailing Receipts/Proof of Notice

View/Print Label

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

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

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

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

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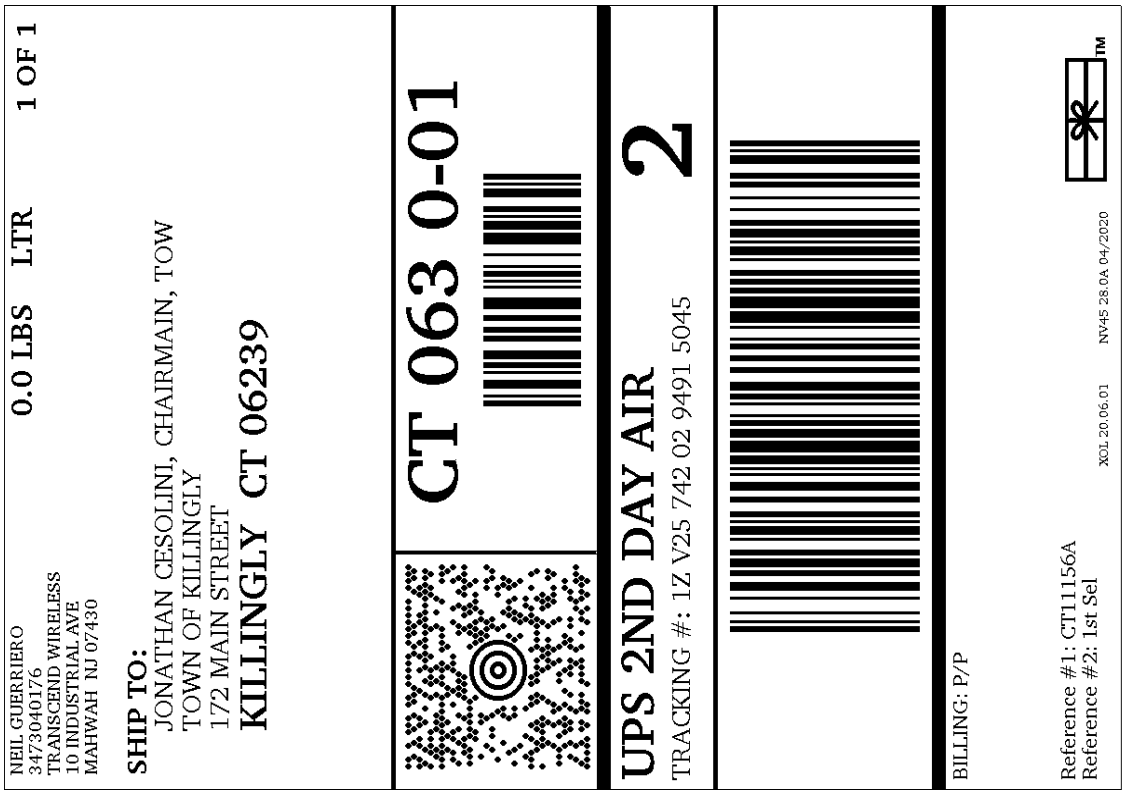

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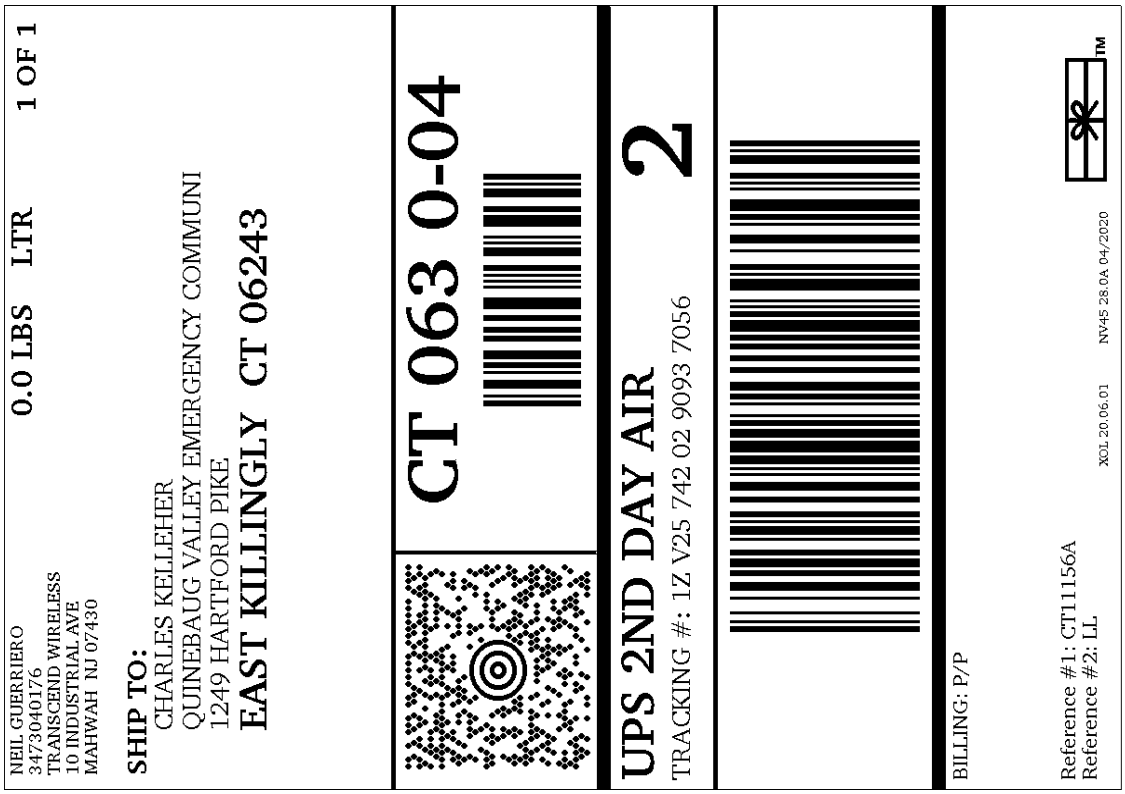

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