1 NDUSTRIAL AVE,
S TE 3
N HWAH NJ 07430

P NE: 201.684.0055
F : 201.684.0066

Transcend Wireless

September 22, 2023

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

RE: Notice of Exempt Modification
349R Mountain Street, Willimantic, CT 06226
Latitude: 41.421113
Longitude: -72.131689
T-Mobile Site#: CT11505A - Anchor / L600

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 168-foot level of the existing 196-foot self support tower at 349R Mountain Street, Willimantic, CT. The 196-foot self support tower and property is owned and operated by SBA Towers. T-Mobile now intends to remove and replace nine (9) antennas at the 168-foot level of the existing tower. The antennas support 5G services. T-Mobile will be installing the associated ground equipment within their existing ground space.

Planned Modifications:
Tower:
Install New:
(3) AIR 6419 B41 Antennas
(3) APXVAALL24 Antennas
(3) VV-65A-R1 Antennas
(3) Radio 4480 B71 B85
(3) Radio 4460 B25 B66
(3) 6x24 Hybrid Cables
To Be Removed:
Existing Hybrid and Coax Cables
(3) RRUs11 B12
(3) LNX-6515DS-A1M Antennas
(3) AIR21 KRC1118023 Antennas
(3) AIR32 KRD901146 Antennas

Ground:
Remove:
(2) Existing Nortel Cabinets

Install New:
(1) 6160 Power Enclosure and (1) B160 Battery Cabinet

This facility was approved by the Town of Windham. The town file is no longer available - see attached letter from the Town Planner

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Tom DeVivo, Elected Official, and Matthew Vertefeuille , Director of Code Enforcement, as well as the tower and property owner.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments
cc: Tom DeVivo - Mayor of Windham
Matthew Vertefeuille - Director of Code Enforcement
SRR Towers LLC - Tower Owner

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS

1 OF 1

SHIP TO:
MATTHEW VERTEFEUILLE
979 MAIN STREET
WINDHAM CT 06226

CT 063 0-36

UPS GROUND
TRACKING #: 1Z V25 742 03 9333 2728

BILLING: P/P

Reference #1: CT11505A

XOL 23.09.02 NV45 38.0A 09/2023*

ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495

1 LBS

1 OF 1

SHIP TO:
MAYOR TOM DEVIVO
979 MAIN STREET
WINDHAM CT 06226

CT 063 0-36

UPS GROUND
TRACKING #: 1Z V25 742 03 9906 0298

BILLING: P/P

Reference #1: CT11505A

XOL 23.09.02 NV45 38.0A 09/2023*


ERIC BREUN
2016587728
1 INTERNATIONAL BLVD.
MAHWAH NJ 07495
1 LBS
1 OF 1
SHIP TO:
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVENUE
BOCA RATON FL 33487
FL 332 6-07
UPS GROUND
TRACKING #: 1Z V25 742 03 9142 6738
BILLING: P/P
Reference #1: CT11505A
XOL 23.09.02 NV45 38.0A 09/2023*
TM

Hello, your package has been delivered.

Delivery Date: Wednesday, 09/20/2023

Delivery Time: 10:11 AM

Signed by: BIBEAU

TRANSCEND WIRELESS

Tracking Number:	1ZV257420393332728
Ship To:	MATTHEW VERTEFEUILLE 979 MAIN STREET WINDHAM, CT 06226 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11505A

Your shipment
1ZV257420391426738

Estimated delivery

Tomorrow, September 22 by 7:00 P.M.

The next progress update is expected by **Thursday, September 21**

- Label Created
- **On the Way**
- Out for Delivery
- Delivery

Ship To
BOCA RATON, FL US

Proof of Delivery

Dear Customer,

This notice serves as proof of delivery for the shipment listed below.

Tracking Number
1ZV257420399060298

Weight
1.00 LBS

Service
UPS Ground

Shipped / Billed On
09/19/2023

Delivered On
09/20/2023 10:11 A.M.

Received By
BIBEAU

Delivered To
WILLIMANTIC, CT, US

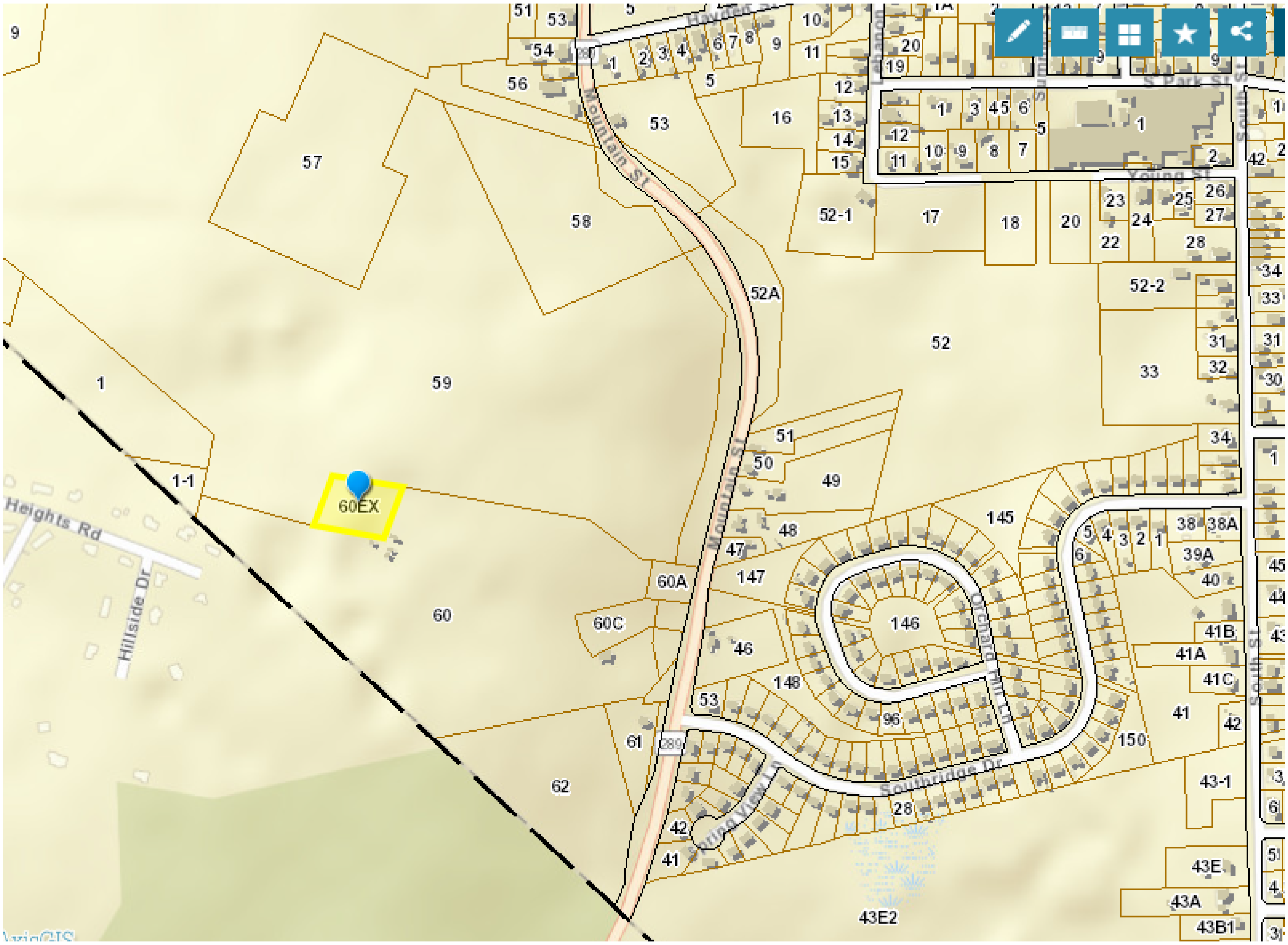
Left At
Office

Please print for your records as photo and details are only available for a limited time.

Sincerely,

UPS

Tracking results provided by UPS: 09/21/2023 10:06 A.M. EST



60EX
Mountain St
Heights Rd
Hillside Dr
Orchard Hill Ln
Southridge Dr
Young St
S Park St
289
57
58
59
53
56
54
16
52-1
17
18
20
52A
52
52-2
33
1
1-1
51
50
49
48
47
147
145
146
60A
60C
60
46
148
53
96
61
62
150
41
42
43-1
28
43E
43A
43B1
43E2
38
38A
39A
40
41A
41B
41C
ArcGIS

Property Location: 349R MOUNTAIN ST | **MAP ID:** 3/9 154/ 60/EX / | **Bldg Name:** | **State Use:** 304

Vision ID: 5568 | **Account #** 00004100 | **Bldg #:** 1 of 1 | **Sec #:** 1 of 1 | **Card** 1 of 1 | **Print Date:** 12/05/2018 18:06

CURRENT OWNER

SBA PROPERTIES INC

8051 CONGRESS AVE

BOCA RATON, FL 33487

Additional Owners:

TOPO.	UTILITIES	STRT./ROAD	LOCATION
2 Above Street	5 Well	3 Unpaved	
5 Steep	6 Septic		
	0 None		

SUPPLEMENTAL DATA

Other ID:	3- 9/154/ 60EX	LCI	C
Zoning	R4	ParcelStatus	
Neighborhood	250 - 0	Cost Flag	
Living Units	0	Lot Number	0
Census	8004	A_D	
District No	2		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
UTL LAND	4-1	124,400	87,080
UTL BLDG	4-2	29,900	20,930
UTL OUTBL	4-3	17,020	11,920
	Total	171,320	119,930

6163
WINDHAM, CT

VISION

RECORD OF OWNERSHIP

	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
SBA PROPERTIES INC	631/ 299	04/10/2001	U	I	108,650	22
NUTMEG BROADCASTING COMPANY	343/ 130	09/10/1990	U	I	0	0
NUTMEG BROADCASTING COMPANY	304/ 277	10/09/1987	Q	I	75,000	
SYNCOM CAPITAL CORPORATION	285/ 647	09/01/1985	U	I	0	
DELTA COMMUNICATIONS CORPORATION	263/ 635	06/01/1980	U	I	0	
DAWSON JEROME & HILDA	241/ 106	04/01/1975	U	I	0	

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2017	4-1	87,080	2016	4-1	87,080	2015	300	26,810
2017	4-2	26,810	2016	4-2	26,810	2015	300	87,080
2017	4-3	0	2016	4-3	0			
	Total:	113,890		Total:	113,890		Total:	113,890

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	29,900
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	17,020
Appraised Land Value (Bldg)	124,400
Special Land Value	0
Total Appraised Parcel Value	171,320
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	**171,320**

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A			433	I

NOTES

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
34217	03/12/2018	53	Cell Tower/Antennae	15,000		0		
32161	09/13/2016	53	Cell Tower/Antennae	79,651		0		
14063	07/01/2003	BP		6,000	07/10/2003	0	07/10/2003	06-26
13760	05/07/2003	BP		54,000	09/10/2003	0	09/10/2003	34-26
11453	03/13/2002	BP		30,000	09/09/2002	0	09/09/2002	34-26
10561	04/16/2001	BP		2,000	04/17/2001	0	04/17/2001	06-26
3086	03/01/1992	BP		0		0		16 26 #274

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
10/02/2002			BM	1	ENTRY + SIGN

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units	Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
1	304	Public Utility C	R4				1.00 AC	80,000.00	1.0000	0	1.0000	1.00	250	1.00	Topography;		1.00		80,000
1	304	Public Utility C					0.05 AC	1,400.00	1.0000	0	1.0000	1.00		0.00	Topography;		1.00		70
1	304	Public Utility C					1.00 AC	44,330.00	1.0000	0	1.0000	1.00		0.00			1.00		44,330

Total Card Land Units: 2.05 AC | Parcel Total Land Area: 2.05 AC | Total Land Value: 124,400

Property Location: 349R MOUNTAIN ST **MAP ID: 3/9 154/ 60/EX /** **Bldg Name:** **State Use: 304**

Vision ID: 5568 **Account # 00004100** **Bldg #: 1 of 1** **Sec #: 1 of 1** **Card 1 of 1** **Print Date: 12/05/2018 18:06**

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	79		Telephone Bldg
Model	94		Commercial
Grade	03		Average
Stories	1.0		
Occupancy	0		
Exterior Wall 1	15		Concrete/mas
Level From	01		01
Level To	01		01
Uncov Parking	0		
Perimeter	68		
Identical Units	1		
Efficiency	0		
1 Bedroom	0		
2 Bedroom	0		
3 Bedroom	0		
AC Type	03		Central
Structure Type	720		720
Bldg Use	304		Public Utility C
Percent Finish	100		
Heating	07		Electr Basebrd
Frame Type	02		Wood Frame
Plumbing	00		None
Local Modifier	2.75		
Partitions	00		None
Wall Height	10		
Size	280		

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
304	Public Utility C	100

COST/MARKET VALUATION

Adj. Base Rate:	146.29
AYB	1975
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	27
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	73
Apprais Val	29,900
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
FN3O	CHAIN LINK 6			L	120	16.90	1975				50	1,010
SH1O	SHED FRAME			L	288	15.00	1990				70	3,020
FN3O	CHAIN LINK 6			L	80	16.90	1990				70	950
FN4O	CHAIN LINK 8			L	320	22.25	2002				70	4,980
PC3O	PAVING CONC			L	1,296	6.81	2002				80	7,060

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Gross Area	Living Area	Eff. Area
BAS	First Floor	280	280	
	Ttl. Gross Liv/Lease Area:	280	280	

Deborah Chase

From: Chuck Regulbuto
Sent: Thursday, August 11, 2016 9:25 AM
To: Denise Sabo
Subject: Fwd: 349 Mountain Street - Rear; Zoning Approval

Thank you,

Chuck Regulbuto
Director of Operations

(860)394-7021
(860)324-3187

---------- Forwarded message ----------
From: **Matthew Vertefeuille** <codedirector@windhamct.com>
Date: Thu, Aug 11, 2016 at 9:22 AM
Subject: Re: 349 Mountain Street - Rear; Zoning Approval
To: Chuck Regulbuto <chuck@northeastsitesolutions.com>

The property at 349 Mountain Street had a tower long before Zoning existed in Town. It was a radio communications tower which the cell antennas where attached to. We do not have any documentation on its construction, or any approvals (if needed).

Matthew Vertefeuille, CZEO, Director
Department of Code Enforcement
Town of Windham Connecticut

On Thu, Aug 11, 2016 at 9:07 AM, Chuck Regulbuto <chuck@northeastsitesolutions.com> wrote:
Good morning Mr. Vertefeuille. Please allow me to introduce myself and our company. I am Chuck Regulbuto and our company, Northeast Site Solutions is contracted to T-Mobile in Connecticut to perform site acquisition services for their cell site locations. T-Mobile has asked us to begin the process to upgrade their equipment located on the tower at 349 Mountain Street, Windham.

We will be submitting an application to the Connecticut Siting Council (CSC) to start this process. Per the CSC we need to submit a copy of the original zoning approval for this tower. I was in your offices Wednesday, August 10 and your staff allowed me to search through the files pertaining to this site and the only document that was available was the building permit which the CSC does not accept as the original zoning approval.

If no original documentation is available all the CSC asks us to obtain is a letter or email from the municipality stating that the documents pertaining to the original zoning approval are not available. If you could, please send this letter or email to my email address. I greatly appreciate your attention to this matter.

Thank you,

Chuck Regulbuto
Director of Operations

(860)394-7021
(860)324-3187

T-Mobile

WILLIMANTIC - VERIZON
SITE ID: CT11505A
349R MOUNTAIN STREET
WILLIMANTIC, CT 06226

STRUCTURAL COMPLIANCE WORK NOTE:

NO EQUIPMENT SHALL BE INSTALLED ON THE HOST TOWER WITHOUT A PASSING TOWER STRUCTURAL ANALYSIS REPORT FROM A CONNECTICUT LICENSED ENGINEER AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.

T-MOBILE RF CONFIGURATION

67E5998E_1xAIR+1OP+1QP

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTON, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

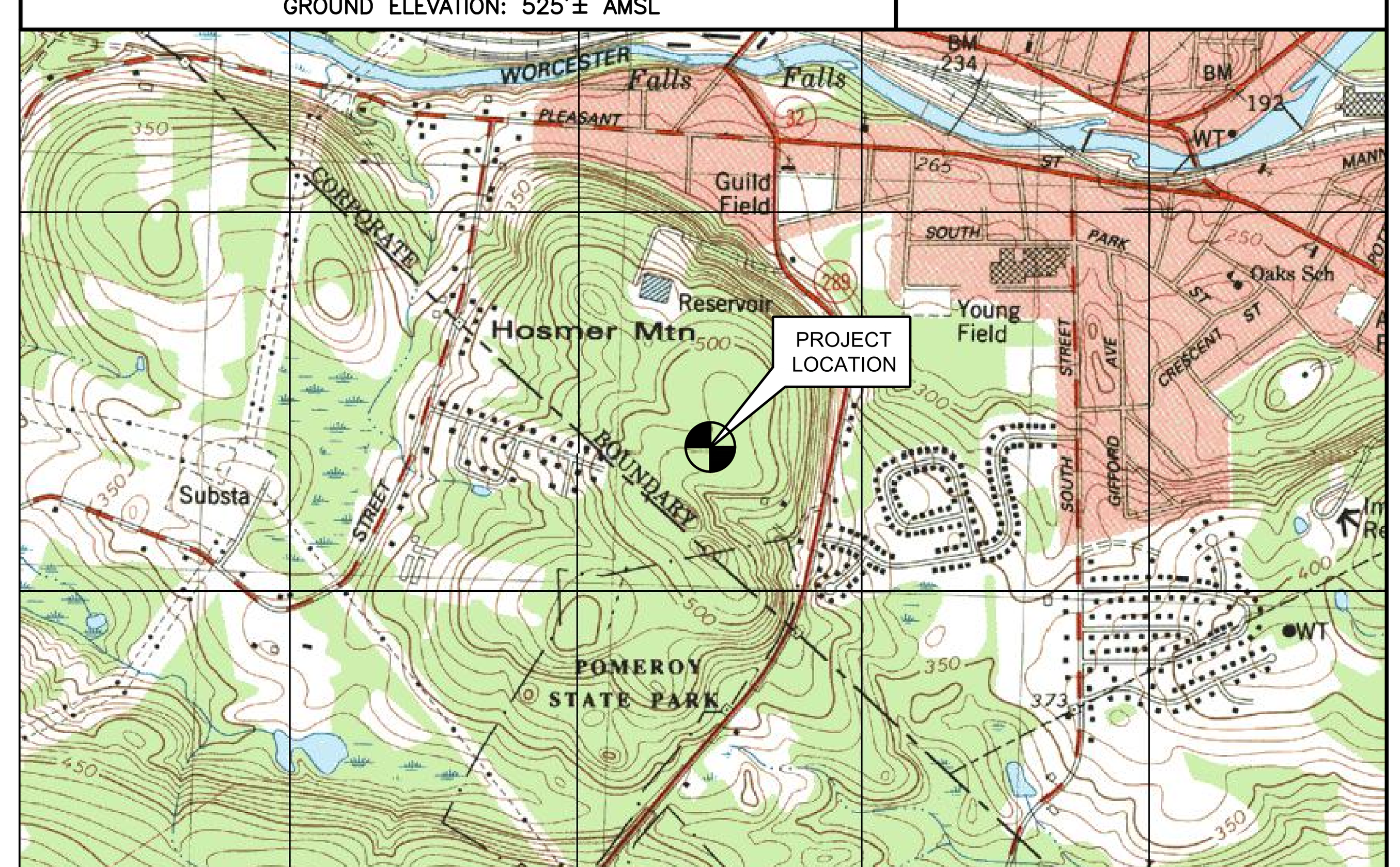
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 349R MOUNTAIN STREET
WILLIMANTIC, CT 06226

1.	START OUT GOING NORTH ON GRIFFIN RD TOWARD HARTMAN RD.	0.30 MI.
2.	TURN RIGHT ONTO DAY HILL RD.	0.14 MI.
3.	STAY STRAIGHT TO GO ONTO BLUE HILLS AVE/CT-187.	0.64 MI.
4.	TURN LEFT ONTO OLD WINDSOR RD/CT-305. CONTINUE TO FOLLOW CT-305.	1.24 MI.
5.	MERGE ONTO I-91 S TOWARD HARTFORD.	2.33 MI.
6.	MERGE ONTO I-291 E VIA EXIT 35A TOWARD MANCHESTER.	2.37 MI.
7.	TAKE THE EXIT TOWARD I-384/HARTFORD/I-84 W.	6.18 MI.
8.	MERGE ONTO I-384 E VIA THE RAMP ON THE LEFT.	0.35 MI.
9.	I-384 E BECOMES BOSTON TURNPIKE/US-44 E.	8.85 MI.
10.	I-384 E BECOMES BOSTON TURNPIKE/US-6 E/US-44 E.	0.22 MI.
11.	TAKE US-6 E TOWARD WILLIMANTIC/PROVIDENCE.	10.84 MI.
12.	STAY STRAIGHT TO GO ONTO WILLIMANTIC RD/CT-66. CONTINUE TO FOLLOW CT-66.	3.34 MI.
13.	TURN RIGHT ONTO BRIDGE ST/CT-289.	0.14 MI.
14.	TURN LEFT ONTO MOUNTAIN ST/CT-289.	0.78 MI.
15.	349 MOUNTAIN ST, #R, WILLIMANTIC, CT 06226-3230, 349 MOUNTAIN ST, #R IS ON THE RIGHT.	

SITE COORDINATES: LATITUDE: 41°-42'-11.13" N
LONGITUDE: 72°-13'-16.89" W
GROUND ELEVATION: 525'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

PROJECT SUMMARY

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

1. REMOVE (2) EXISTING NORTEL CABINETS
2. REMOVE ALL COAX CABLES
3. INSTALL (1) ENCLOSURE 6160.
4. INSTALL (1) BATTERY CABINET B160.
5. REMOVE (2) EXISTING HYBRID CABLES.
6. REMOVE (9) EXISTING ANTENNAS
7. INSTALL (3) RFS: APXVAALL24_43-U-NA20 ANTENNAS.
8. INSTALL (3) ERICSSON: AIR 6419 B41 ANTENNAS.
9. INSTALL (3) COMMSCOPE: VV-65A-R1 ANTENNAS.
10. INSTALL (3) 6X24 HYBRID CABLES
11. REMOVE (3) RRUS11 B12 RADIOS.
12. INSTALL (3) ERICSSON: 4480 B71+B85 RADIOS.
13. INSTALL (3) ERICSSON: 4460 B25+B66 RADIOS.
14. REMOVE EXISTING ANTENNA MOUNTS AND INSTALL (3) NEW VFA10-HD MOUNTS

PROJECT SUMMARY (STRUCTURAL)

FOR REQUIRED MOUNT MODIFICATIONS, SEE SHEET(S) C-4 FOR EQUIPMENT DETAILS.

1. PROPOSED SECTOR MOUNT, TYP. (1) PER SECTOR: TOTAL OF (3) SITE PRO P/N: VFA10-HD.

PROJECT INFORMATION

SITE NAME:	WILLIMANTIC - VERIZON
SITE ID:	CT11505A
SITE ADDRESS:	2047 BOSTON TURNPIKE COVENTRY, CT 06238
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°-42'-11.13" N LONGITUDE: 72°-13'-16.89" W GROUND ELEVATION: 525'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/03/23	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
D	05/18/23	BSP	TJR	CONSTRUCTION DRAWINGS - UPDATED BLDG. CODES
C	08/13/22	ANC	TJR	CONSTRUCTION DRAWINGS - REVISED PER RFDS DATED 07/05/22
B	07/27/20	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW
A	07/19/20	KAWJR	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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T-MOBILE NORTHEAST LLC
WILLIMANTIC - VERIZON
SITE ID: CT11505A
349R MOUNTAIN STREET
WILLIMANTIC, CT 06226

DATE:	07/06/20
SCALE:	AS NOTED
JOB NO.	20074.52

TITLE SHEET

T-1

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY III (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 MPH (Vasd) (EXPOSURE C/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-16).

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 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "DIG SAFE" (DIAL 811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
20. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
21. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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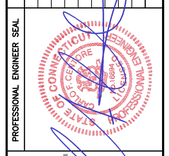

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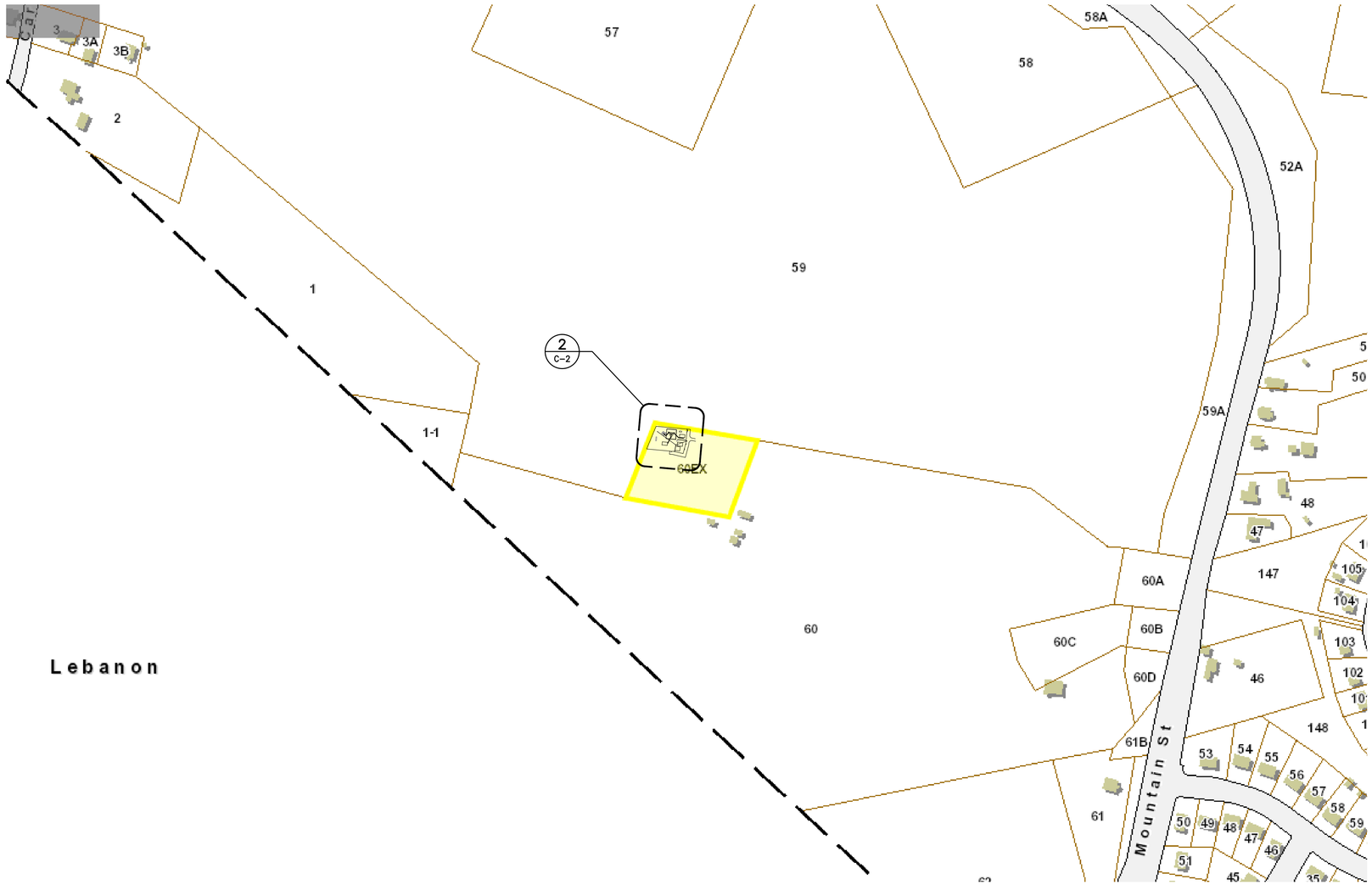
GENERAL NOTES AND SPECIFICATIONS

N-1

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

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	ANTENNA @ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(QTY) PROPOSED COAX (LENGTH)
A1	PROPOSED	RFS: APXVAALL24_43-U-NA20	169'	60°	(P) ERICSSON: 4480 B71+B85	(1) 6x24 HYBRID CABLE (±180')
A2	PROPOSED	ERICSSON: AIR6419 B41	169'	60°		
A3	PROPOSED	COMMSCOPE: VV-65A-R1	169'	60°	(P) ERICSSON: 4460 B25+B66	
B1	PROPOSED	RFS: APXVAALL24_43-U-NA20	169'	180°	(P) ERICSSON: 4480 B71+B85	(1) 6x24 HYBRID CABLE (±180')
B2	PROPOSED	ERICSSON: AIR6419 B41	169'	180°		
B3	PROPOSED	COMMSCOPE: VV-65A-R1	169'	180°	(P) ERICSSON: 4460 B25+B66	
C1	PROPOSED	RFS: APXVAALL24_43-U-NA20	169'	300°	(P) ERICSSON: 4480 B71+B85	(1) 6x24 HYBRID CABLE (±180')
C2	PROPOSED	ERICSSON: AIR6419 B41	169'	300°		
C3	PROPOSED	COMMSCOPE: VV-65A-R1	169'	300°	(P) ERICSSON: 4460 B25+B66	



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

TRUE NORTH

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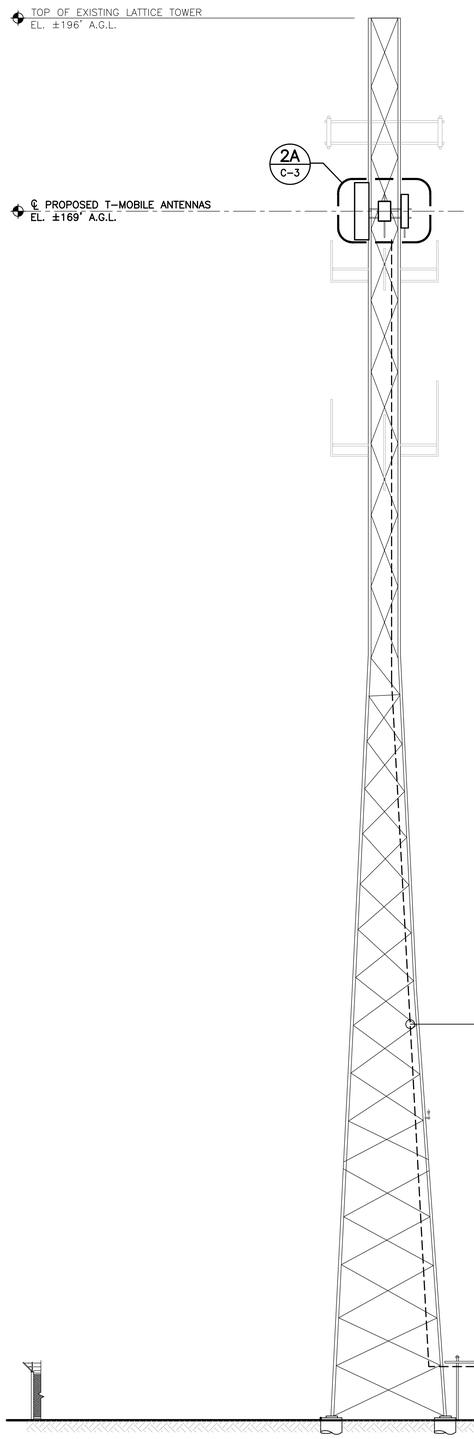
SCALE: AS NOTED
JOB NO. 20074.52

SITE LOCATION PLAN

C-1

Sheet No. 3 of 7



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

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

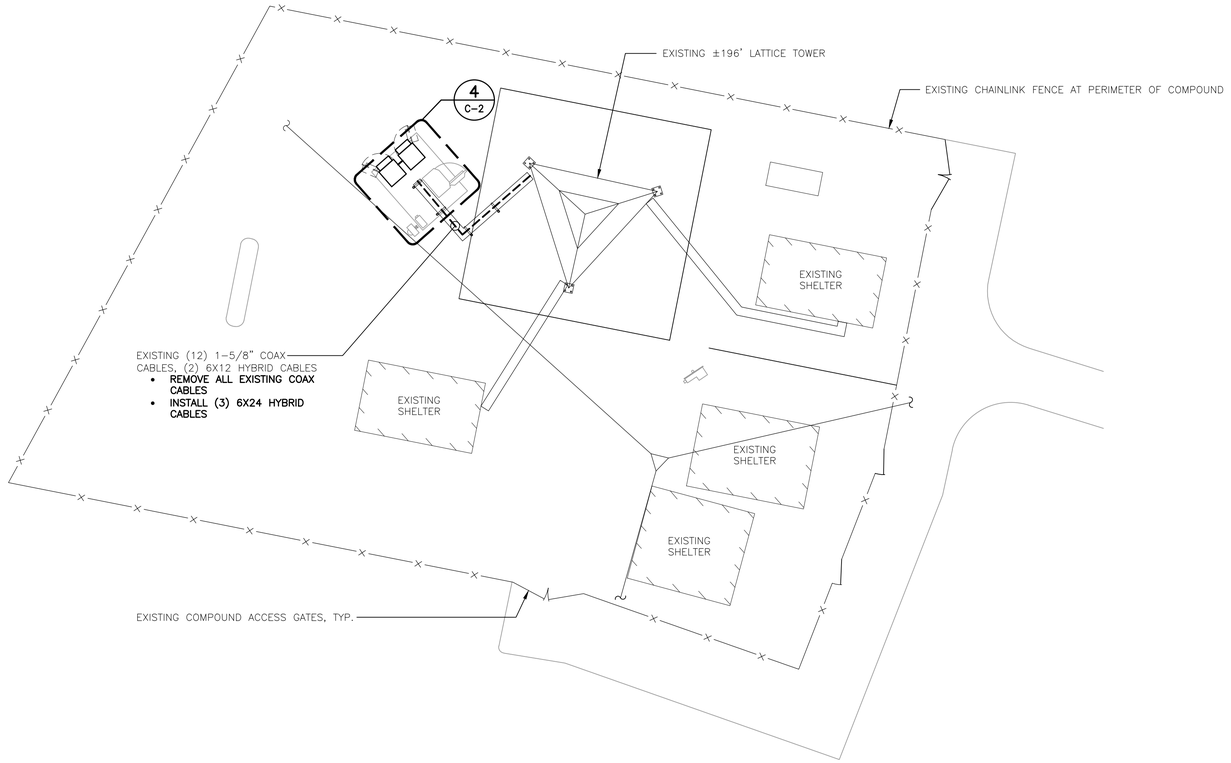
STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY DEFICIENT AND WARRANTING MODIFICATION PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT. FOR REQUIRED STRUCTURAL MODIFICATIONS, SEE SHEET(S) C-4 FOR ADDITIONAL DETAILS.

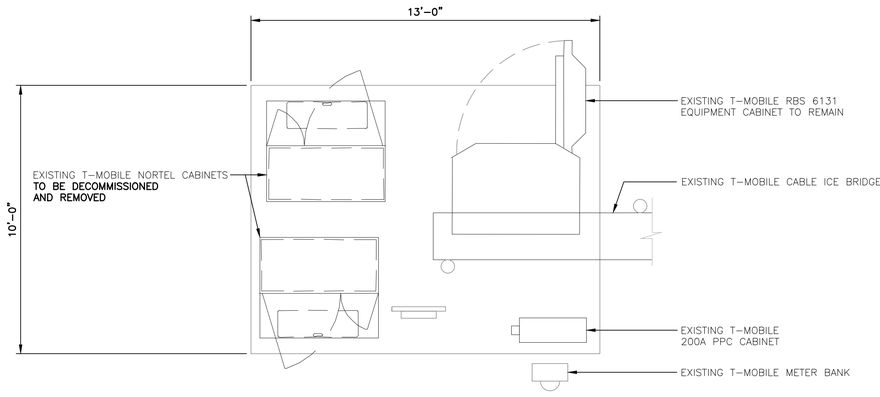
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 20074.52) DATED 05/18/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOST TOWER WITHOUT A PASSING TOWER STRUCTURAL ANALYSIS REPORT FROM A CONNECTICUT LICENSED ENGINEER AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



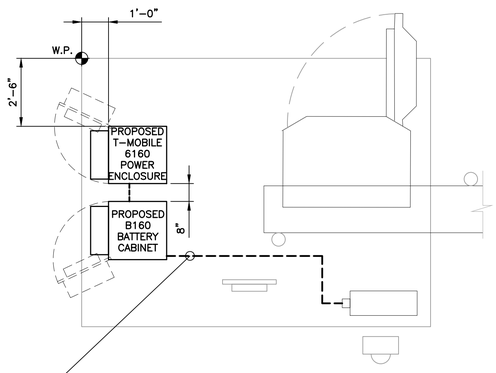
2 C-2 **COMPOUND PLAN - EXISTING**
SCALE: 1/8" = 1'

APPROXIMATE NORTH



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

APPROXIMATE NORTH



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

APPROXIMATE NORTH

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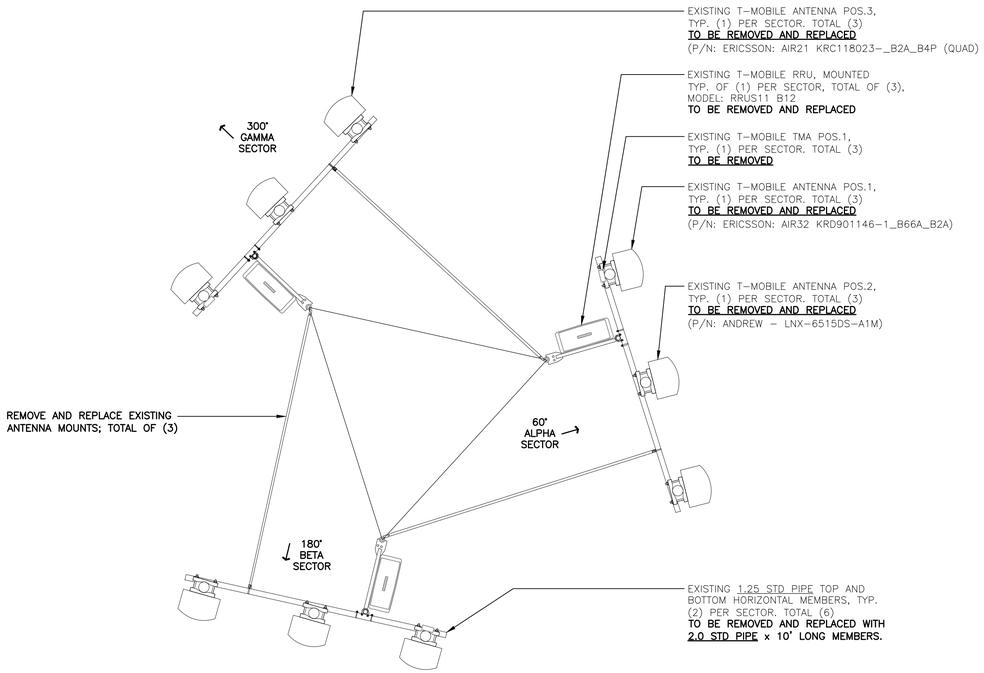
COMPOUND PLAN, EQUIPMENT PLAN, AND ELEVATION

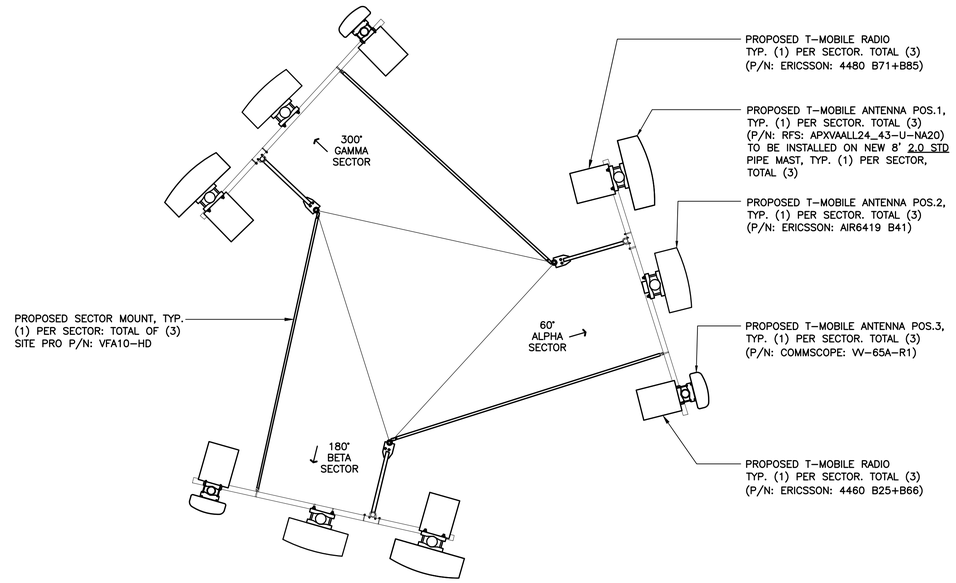
C-2

Sheet No. 4 of 7



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

APPROXIMATE NORTH

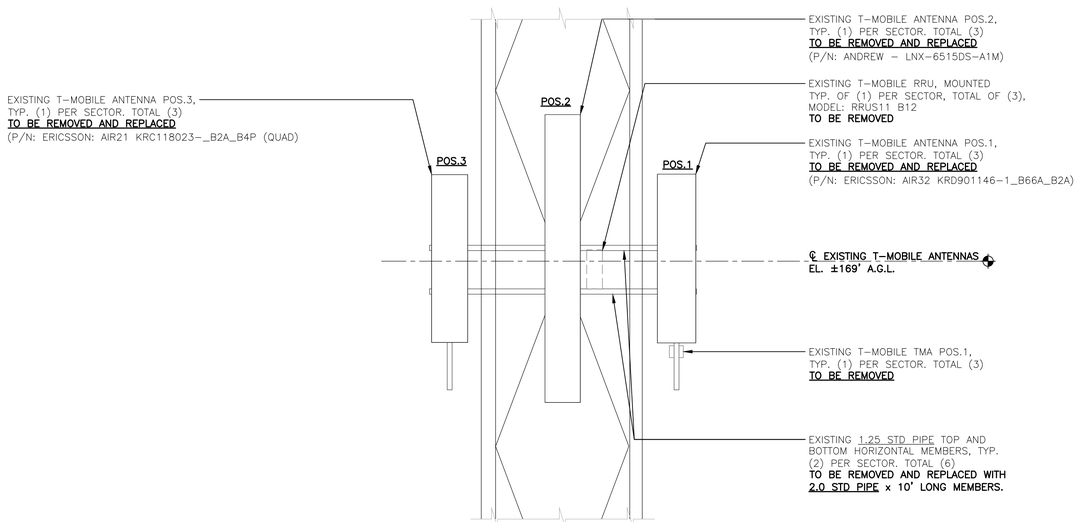


2 / C-3 **ANTENNA PLAN - PROPOSED**
SCALE: 1/2" = 1'

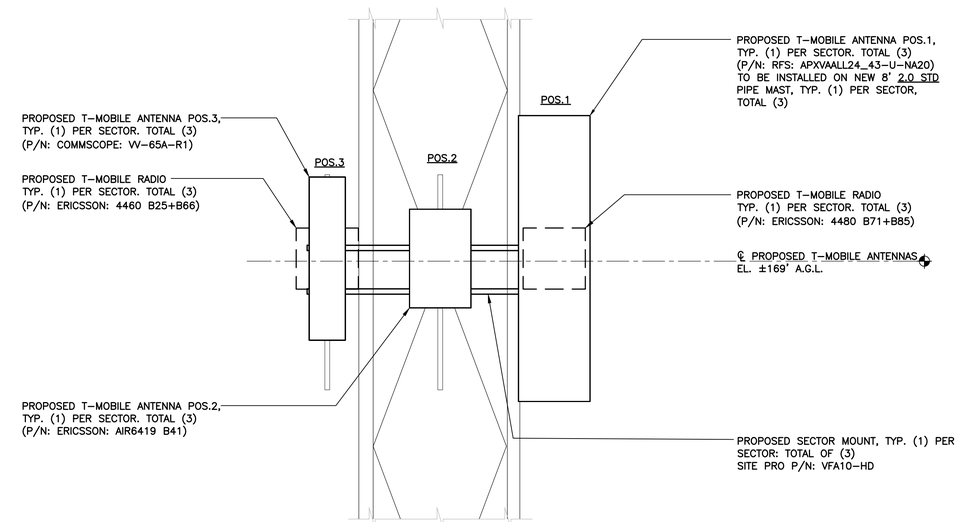
APPROXIMATE NORTH

STRUCTURAL COMPLIANCE WORK NOTE:

NO EQUIPMENT SHALL BE INSTALLED ON THE HOST TOWER WITHOUT A PASSING TOWER STRUCTURAL ANALYSIS REPORT FROM A CONNECTICUT LICENSED ENGINEER AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



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



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

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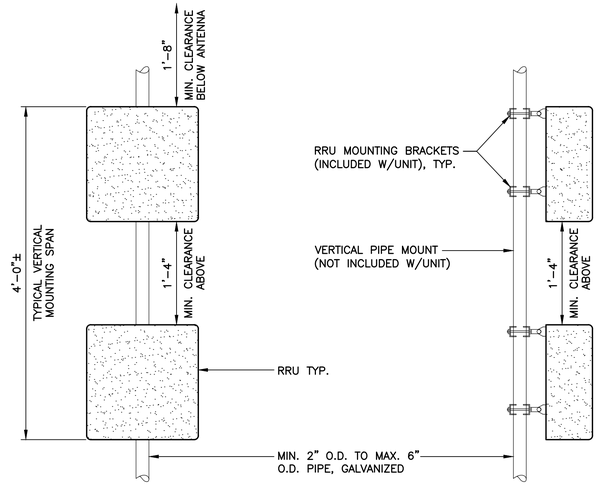
ANTENNA PLANS

C-3



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

AIR6419 B41

APXVAALL24_43-U-NA20

VV-65A-R1

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6419 B41	33"L x 16"W x 9"D	±41 LBS.
MAKE: RFS MODEL: APXVAALL24_43–U–NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.
MAKE: COMMSCOPE MODEL: VV–65A–R1	54.7"L x 12.08"W x 4.6"D	±23 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 C-4 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

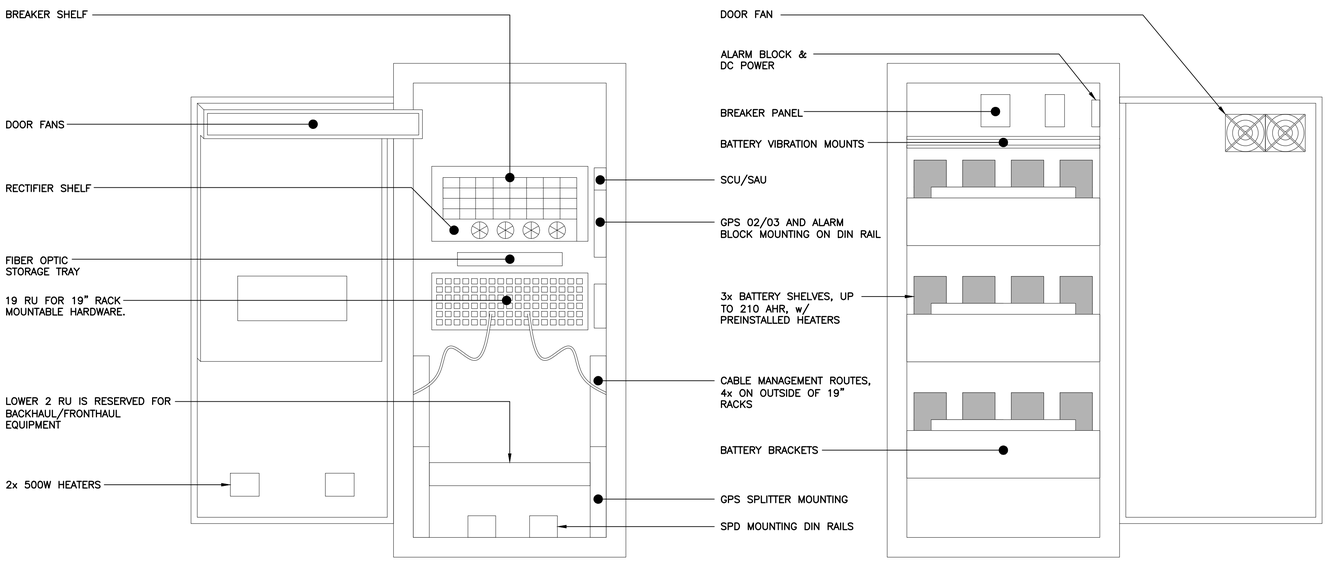
RADIO 4460 B25+B66

RADIO 4480 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4480 B71+B85	21.8"L x 15.7"W x 7.5"D	±84 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 C-4 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE



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

4 C-4 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE

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

5 C-4 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

STRUCTURAL COMPLIANCE WORK NOTE:

NO EQUIPMENT SHALL BE INSTALLED ON THE HOST TOWER WITHOUT A PASSING TOWER STRUCTURAL ANALYSIS REPORT FROM A CONNECTICUT LICENSED ENGINEER AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.

6 C-4 SITEPRO - VFA10-HD ANTENNA MOUNT

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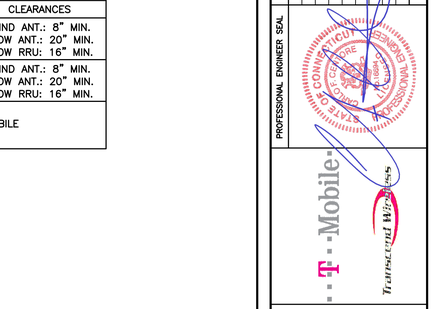

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T-MOBILE NORTHEAST LLC

WILLIMANTIC - VERIZON

SITE ID: CT11505A

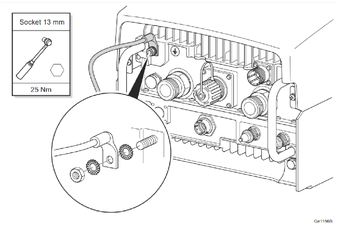
349R MOUNTAIN STREET
WILLIMANTIC, CT 06226

DATE:	07/06/20
SCALE:	AS NOTED
JOB NO.	20074.52

TYPICAL EQUIPMENT DETAILS

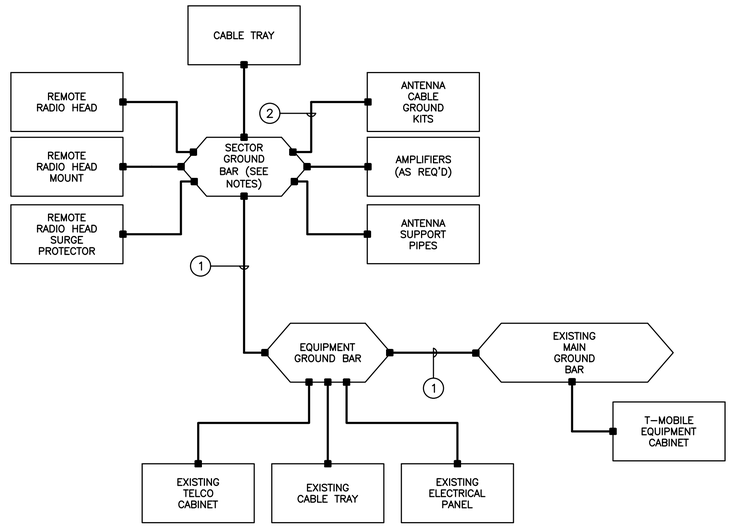
C-4

Sheet No. 6 of 7



1 E-1 TYPICAL RRU GROUNDING DETAILS

SCALE: NOT TO SCALE



GROUNDING SCHEMATIC NOTES

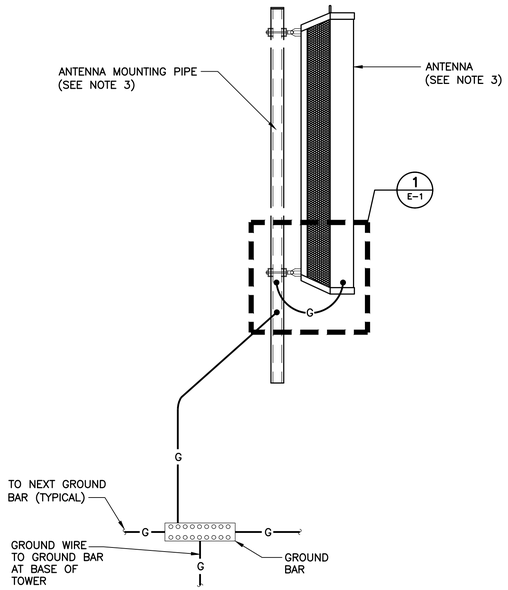
1. #2 AWG
2. #6 AWG

GENERAL NOTES:

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

4 E-1 TYPICAL GROUNDING SCHEMATIC DETAIL

SCALE: NOT TO SCALE

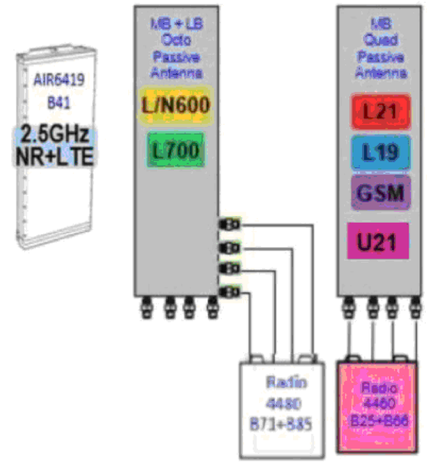


NOTES:

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

2 E-1 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

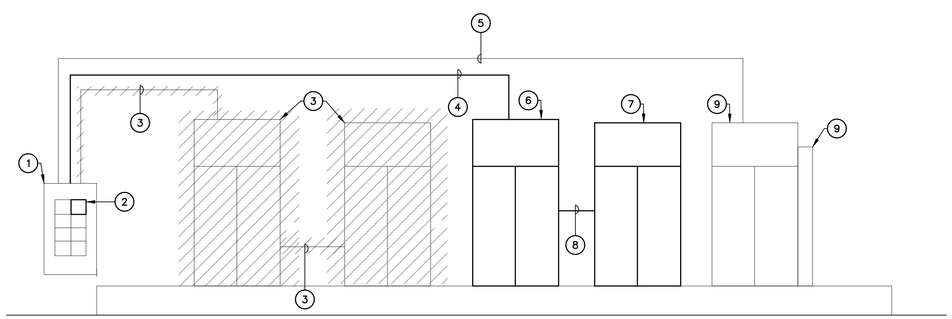


3 E-1 PROPOSED PLUMBING DIAGRAM

PER RFDS

RISER DIAGRAM NOTES

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



5 E-1 ELECTRICAL POWER RISER DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
O	08/03/23	BSP	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
D	05/18/23	BSP	TJR	CONSTRUCTION DRAWINGS – UPDATED BLDG. CODES
C	08/13/22	ANC	TJR	CONSTRUCTION DRAWINGS – REVISED PER RFDS DATED 07/05/22
B	07/27/20	BSP	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW
A	07/19/20	KAMJR	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

T-Mobile

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TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 7 of 7

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Structural Analysis Report

Antenna Mount Analysis

Proposed T-Mobile Antenna Upgrade

Site Ref: CT11505A

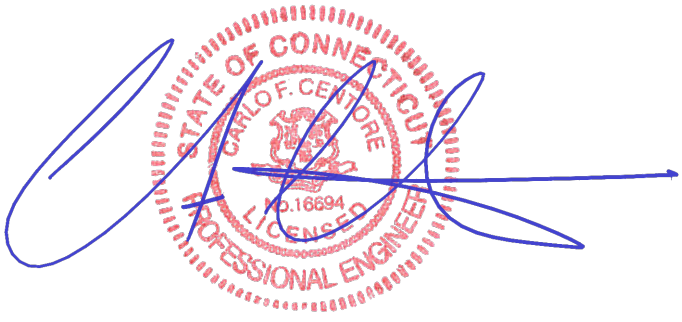
349R Mountain Street
Willimantic, CT

CENTEK Project No. 20074.52

~~Date: July 08, 2020~~

~~Rev 1.: August 12, 2022~~

Rev 2.: May 18, 2023



Prepared for:

T-Mobile Northeast, LLC
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

This structural analysis report (SAR) was prepared to address the structural viability of installing T-Mobile's proposed antenna configuration attached to the proposed V-Frame sector mounts (P/N:VFA10-HD). The antenna mounts are attached to the legs of a 196-ft self-supporting, 3-legged, host lattice tower located at 349R Mountain Street, Willimantic, Connecticut.

The antenna mount assembly consists of three pipe masts, the V-Frame sector Mount and two (2) stiffener arms. Each sector consists of two (2) 6 ft. and one (1) 8 ft. pipe mast. This structural analysis report verifies the adequacy of aforementioned antenna mount assembly only.

The current antenna mount assembly geometry and member information were gathered through a site visit to investigate the current conditions, performed by Centek personnel on 07/08/2020. Proposed/existing antenna and appurtenance information was taken from an RF data sheet dated 05/04/2023 provided by T-Mobile.

Primary Assumptions Used in the Analysis

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

Antenna and Equipment Summary

Location	Appurtenance / Equipment	Rad Center Elevation (AGL)	Mount Type
Per Sector	**(1) Ericsson Air 6419 B41 Antenna** **(1) Commscope VV-65A-R1 Antenna** **(1) RFS APXVAALL24_43-U_NA20 Antenna** **(1) Ericsson 4460 B25+B66 Radio** **(1) Ericsson 4480 B71+B85 Radio**	169-ft	Proposed V-Frame sector mounts attached to host lattice tower legs

Equipment – Indicates proposed equipment to be installed.

Analysis

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

Design Loading

Loading was determined per the requirements of the 2006 ANSI TIA-222-H, 2021 International Building Code amended by the 2022 CSBC and ASCE 7-16 “Minimum Design Loads for Buildings and Other Structures”.

Basic Wind Speed:	V_{ult} = 125 mph	*Appendix P of the 2022 CT State Building Code*
Basic Wind Speed w/ Ice:	V_i = 50 mph	*Annex B of TIA-222-H*
Risk Category:	II	*2021 IBC; Table 1604.05*
Exposure Category:	Surface Roughness B	*ASCE 7-16; Section 26.7.2*
Dead Load	Equipment and framing self-weight	*Identified within SAR design calculations*

Reference Standards

2021 International Building Code:

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

Results

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

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

Sector	Component	Stress Ratio (percentage of capacity)	Result
All Sectors	Pipe 2.0 STD (Proposed Antenna Mast)	28%	**PASS**
	Pipe 2.5 STD (Proposed V-Frame Horizontal)	15%	**PASS**
	Pipe 2.0 STD (Proposed V-Frame Stiffener Arm)	6%	**PASS**
	5/8" Threaded Rod (Proposed V-Frame Clamp Connection to Existing Tower Leg)	13%	**PASS**

Conclusion

This analysis shows that the **PROPOSED** replacement subject antenna mount V-Frames (P/N:VFA10-HD) are **STRUCTURALLY ADEQUATE** to support the proposed T-Mobile modified antenna configuration.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principle ~ Structural Engineer

Prepared by:

Pablo Perez-Gomez
Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

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Subject: TIA-222-H Wind Load Calculations

Location: Willimantic, CT

Rev. 2: 05/19/2023

Prepared by: PPG Checked by: TJL
Job No. 20074.52

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

Wind Speeds

Basic Wind Speed	$V := 125$	mph	(ASCE 7-16)
Basic Wind Speed with Ice	$V_i := 50$	mph	(Annex B of TIA-222-H)

Input

Structure Type =	$Structure\_Type := Antennas$		(User Input)
Structure Category =	$SC := II$		(User Input)
Exposure Category =	$Exp := B$		(User Input)
Topographic Category =	$T_c := 1$		(User Input)
Structure Height =	$h := 196$	ft	(User Input)
Height of Crest =	$H := 1$	ft	(User Input)
Base Elevation Above Sea Level =	$Zs := 525$	ft	(User Input)
Height to Center of Antennas =	$z := 169$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Shielding Factor For Appurtenances =	$K_a := 0.9$		(Section 16.6 TIA-222-H)
Gust Effect Factor =	$G_H = 1$		(Section 16.6 TIA-222-H)
Wind Direction Probability Factor =	$K_d = 0.95$		(Table 2-2 & S16.6 TIA-222-H)

Output

Importance Factors =

$$I_{Wind} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \, 0.87 \\ \text{if } SC = 2 \\ \quad \| \, 1.00 \\ \text{if } SC = 3 \\ \quad \| \, 1.15 \end{array} \right\| = 1 \qquad I_{Wind\_w\_Ice} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \, 0 \\ \text{if } SC = 2 \\ \quad \| \, 1.00 \\ \text{if } SC = 3 \\ \quad \| \, 1.00 \end{array} \right\| = 1 \qquad I_{ice} := \left\| \begin{array}{l} \text{if } SC = 1 \\ \quad \| \, 0 \\ \text{if } SC = 2 \\ \quad \| \, 1.00 \\ \text{if } SC = 3 \\ \quad \| \, 1.15 \\ \text{if } SC = 4 \\ \quad \| \, 1.25 \end{array} \right\| = 1$$

Topographic Factor =

$$K_{zt} := \left\| \begin{array}{l} \text{if } T_c = 1 \\ \quad \| \, 1.0 \\ \text{if } T_c > 1 \\ \quad \| \, \left(1 + \left(\frac{K_c \cdot K_t}{K_h}\right)\right)^2 \end{array} \right\| = 1$$

(2.6.6.2.1 - TIA-222-H)

Ground Elevation Factor = $K_e := 2.71828^{(-0.0000362 \cdot Zs)} = 0.981$

Height Escalation Factor = $K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.177$ (2.6.5.2 - TIA-222-H)

Factored Ice Thickness = $t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot {K_{zt}}^{0.35} = 1.177$

Velocity Pressure Coefficient Antennas = $Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.148$ (2.6.5.2 - TIA-222-H)

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot Kz \cdot K_{zt} \cdot K_e \cdot K_d \cdot V^2 = 42.805$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot Kz \cdot K_{zt} \cdot K_e \cdot K_d \cdot {V_i}^2 = 6.849$ psf

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6419 B41		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33$	in	(User Input)
Antenna Width =	$W_{ant} := 16$	in	(User Input)
Antenna Thickness =	$T_{ant} := 9$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 2.1$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 3.7$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 170$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 2.1$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 95$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 4.5$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 33$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.8$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 21$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 4752$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2617$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 85$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 85$	lbs

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS - APXVAALL24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 153.3$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 780$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 276$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 18$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 140$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 7.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 58$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 8545$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 277$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 277$	lbs

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CommScope VV-65A-R1		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 54.7$	in	(User Input)
Antenna Width =	$W_{ant} := 12.1$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 23$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.5$		
Antenna Force Coefficient =	$Ca_{ant} = 1.29$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.6$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 228$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 87$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 5.7$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 46$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 2.8$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 22$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3045$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2691$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 87$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 87$	lbs

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Development of Wind & Ice Load on RRUS's

RRUS Data:

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

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 110$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 52$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 22$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.7$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 12$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2567$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 1731$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 56$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 56$	lbs

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Development of Wind & Ice Load on RRUS's

RRUS Data:

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

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 99$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 76$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.8$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 20$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.2$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 16$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2006$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 65$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 65$	lbs

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Development of Wind & Ice Load on TMA's

TMA Data:

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

Wind Load (without ice)

Surface Area for One TMA =	$SA_{TMAF} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.4$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAF} = 19$	lbs
Surface Area for One TMA =	$SA_{TMAS} := \frac{L_{TMA} \cdot T_{TMA}}{144} = 0.2$	sf
Total TMA Wind Force =	$F_{TMA} := qz \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{TMAS} = 8$	lbs

Wind Load (with ice)

Surface Area for One TMA w/ Ice =	$SA_{ICETMAF} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz})}{144} = 0.7$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAF} = 5$	lbs
Surface Area for One TMA w/ Ice =	$SA_{ICETMAS} := \frac{(L_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz})}{144} = 0.4$	sf
Total TMA Wind Force w/ Ice =	$Fi_{TMA} := qz_{ice} \cdot G_H \cdot Ca_{TMA} \cdot K_a \cdot SA_{ICETMAS} = 3$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each TMA =	$V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 196$	cu in
Volume of Ice on Each TMA =	$V_{ice} := (L_{TMA} + 2 \cdot t_{iz}) \cdot (W_{TMA} + 2 \cdot t_{iz}) \cdot (T_{TMA} + 2 \cdot t_{iz}) - V_{TMA} = 374$	cu in
Weight of Ice on Each TMA =	$W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 12$	lbs
Weight of Ice on All TMAs =	$W_{ICETMA} \cdot N_{TMA} = 12$	lbs

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Development of Wind & Ice Load on Dipl's

Dipl Data:

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

Wind Load (without ice)

Surface Area for One Dipl =	$SA_{DiplF} := \frac{L_{Dipl} \cdot W_{Dipl}}{144} = 0.4$	sf
Total Dipl Wind Force =	$F_{Dipl} := qz \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{DiplF} = 17$	lbs
Surface Area for One Dipl =	$SA_{DiplS} := \frac{L_{Dipl} \cdot T_{Dipl}}{144} = 0.3$	sf
Total Dipl Wind Force =	$F_{Dipl} := qz \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{DiplS} = 16$	lbs

Wind Load (with ice)

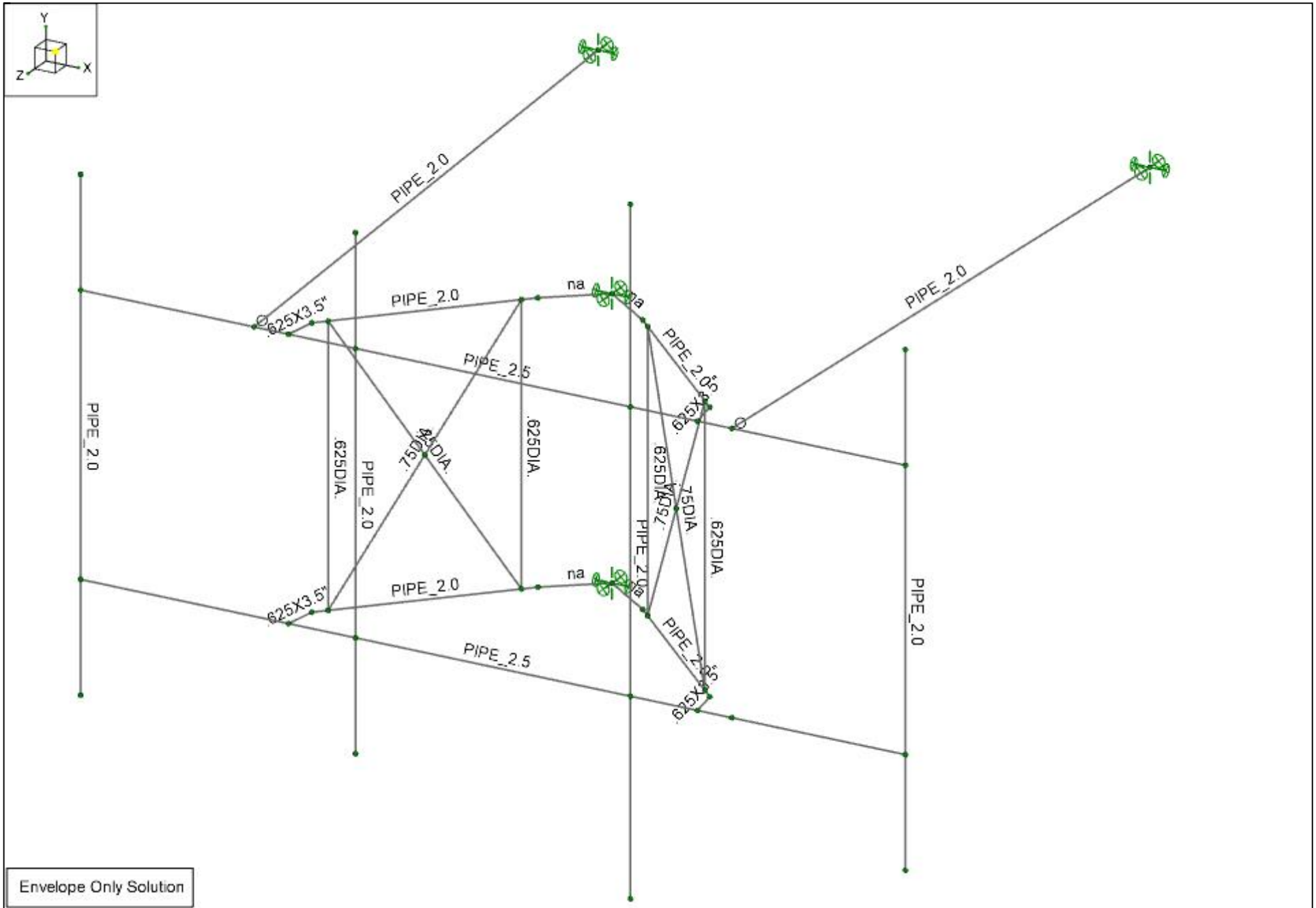
Surface Area for One Dipl w/ Ice =	$SA_{ICEDiplF} := \frac{(L_{Dipl} + 2 \cdot t_{iz}) \cdot (W_{Dipl} + 2 \cdot t_{iz})}{144} = 0.6$	sf
Total Dipl Wind Force w/ Ice =	$Fi_{Dipl} := qz_{ice} \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{ICEDiplF} = 5$	lbs
Surface Area for One Dipl w/ Ice =	$SA_{ICEDiplS} := \frac{(L_{Dipl} + 2 \cdot t_{iz}) \cdot (T_{Dipl} + 2 \cdot t_{iz})}{144} = 0.6$	sf
Total Dipl Wind Force w/ Ice =	$Fi_{Dipl} := qz_{ice} \cdot G_H \cdot Ca_{Dipl} \cdot K_a \cdot SA_{ICEDiplS} = 5$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Dipl =	$V_{Dipl} := L_{Dipl} \cdot W_{Dipl} \cdot T_{Dipl} = 320$	cu in	
Volume of Ice on Each Dipl =	$V_{ice} := (L_{Dipl} + 2 \cdot t_{iz}) \cdot (W_{Dipl} + 2 \cdot t_{iz}) \cdot (T_{Dipl} + 2 \cdot t_{iz}) - V_{Dipl} = 460$		
Weight of Ice on Each Dipl =	$W_{ICEDipl} := \frac{V_{ice}}{1728} \cdot Id = 15$	lbs	cu in
Weight of Ice on All Dipls =	$W_{ICEDipl} \cdot N_{Dipl} = 15$	lbs	



Envelope Only Solution

Centek Engineering	CT11505A - Mount	SK-2
PPG		May 18, 2023
20074.52		VFA10-HD.R3D

Node Coordinates

	Label	X [in]	Y [in]	Z [in]	Detach From Diaphragm
1	TF7	34.75	-40	31.56	
2	TF6	-34.75	0	31.56	
3	TF5	34.75	0	31.56	
4	N57A	9.183083	0	7.273968	
5	N56A	9.183083	-40	7.273968	
6	N55A	-9.183083	-40	7.273968	
7	N54A	-9.183083	0	7.273968	
8	N53_1	27.401968	0	25.315083	
9	N52_1	27.401968	-40	25.315083	
10	N51_1	-27.401968	-40	25.315083	
11	N50_1	-27.401968	0	25.315083	
12	N36_1	-20	0	31.56	
13	N34_1	-20	-40	31.56	
14	N18	-60	-40	31.56	
15	N17	-29.75	-40	31.56	
16	N16	29.75	-40	31.56	
17	N15	60	-40	31.56	
18	N14	60	0	31.56	
19	N13	29.75	0	31.56	
20	N12_1	-29.75	0	31.56	
21	N11	-60	0	31.56	
22	N10	28.951	0	26.849	
23	N9	7.634	0	5.74	
24	N8	7.634	-40	5.74	
25	N7	28.951	-40	26.849	
26	N6	0	0	0	
27	N5_1	0	-40	0	
28	N4	-28.951	-40	26.849	
29	N3	-7.634	-40	5.74	
30	N2	-7.634	0	5.74	
31	N1	-28.951	0	26.849	
32	N40_1	40.125	0	-69.499	
33	N41_1	-40.125	0	-69.499	
34	N35_1	-20	-56	31.56	
35	N37_1	-60	-56	31.56	
36	N38_1	-20	16	31.56	
37	N39_1	-60	16	31.56	
38	N42_1	20	-68	31.56	
39	N43_1	20	28	31.56	
40	N40	20	0	31.56	
41	N41	20	-40	31.56	
42	N42	18.292526	-20	16.294526	
43	N43	-18.292526	-20	16.294526	
44	N44	60	-56	31.56	
45	N45	60	16	31.56	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N6	Reaction	Reaction	Reaction	Reaction	Reaction
2	N5_1	Reaction	Reaction	Reaction	Reaction	Reaction
3	N40_1	Reaction	Reaction	Reaction	Reaction	Reaction
4	N41_1	Reaction	Reaction	Reaction	Reaction	Reaction

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
7	A53-b	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
8	Q235	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
9	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
10	Q235_3	29000	11154	0.3	0.65	0.49	34	1.5	58	1.2
11	J429-Gr5	29000	11154	0.3	0.65	0.49	92	1.5	120	1.2
12	Q235_1	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
13	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
14	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
15	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
16	Q235_2	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
17	Q235_4	29000	11154	0.3	0.65	0.49	34	1.5	58	1.2

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M31A	Y	-0.041	%50
2	M11	Y	-0.077	%12.5
3	M11	Y	-0.077	%87.5
4	M12	Y	-0.023	%50
5	M11	Y	-0.084	%65
6	M12	Y	-0.109	%65

Member Point Loads (BLC 3 : Weight of ICE on Equipment)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M31A	Y	-0.085	%50
2	M11	Y	-0.139	%87.5
3	M11	Y	-0.139	%12.5
4	M12	Y	-0.087	%50
5	M11	Y	-0.056	%65
6	M12	Y	-0.065	%65

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M31A	X	0.021	%50
2	M11	X	0.029	%12.5
3	M11	X	0.029	%87.5
4	M12	X	0.022	%50
5	M11	X	0.012	%65
6	M12	X	0.016	%65

Member Point Loads (BLC 5 : Wind(x))

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M31A	X	0.095	%50
2	M11	X	0.138	%87.5

Member Point Loads (BLC 5 : Wind(x)) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
3	M11	X	0.138	%12.5
4	M12	X	0.087	%50
5	M11	X	0.052	%65
6	M12	X	0.076	%65

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

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M31A	Z	0.033	%50
2	M11	Z	0.07	%12.5
3	M11	Z	0.07	%87.5
4	M12	Z	0.046	%50
5	M12	Z	0.02	%65
6	M11	Z	0.022	%65

Member Point Loads (BLC 7 : Wind(z))

	Member Label	Direction	Magnitude [k, k-ft]	Location [(in, %)]
1	M31A	Z	0.17	%50
2	M11	Z	0.39	%87.5
3	M11	Z	0.39	%12.5
4	M12	Z	0.228	%50
5	M12	Z	0.099	%65
6	M11	Z	0.11	%65

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

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	TB2	X	0.002	0.002	0	%100
2	TB1	X	0.002	0.002	0	%100
3	M16	X	0.002	0.002	0	%100
4	M17_1	X	0.002	0.002	0	%100
5	M4	X	0.002	0.002	0	%100
6	M2	X	0.002	0.002	0	%100
7	M1	X	0.002	0.002	0	%100
8	M3	X	0.002	0.002	0	%100
9	M12	X	0.002	0.002	0	%100
10	M31A	X	0.002	0.002	0	%100
11	M11	X	0.002	0.002	0	%100
12	M5	X	0.002	0.002	0	%100
13	M18	X	0.002	0.002	0	%100
14	M7	X	0.002	0.002	0	%100
15	M19_1	X	0.002	0.002	0	%100
16	M6	X	0.002	0.002	0	%100
17	M8	X	0.002	0.002	0	%100
18	M28	X	0.002	0.002	0	%100

Member Distributed Loads (BLC 5 : Wind(x))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	TB2	X	0.01	0.01	0	%100
2	TB1	X	0.01	0.01	0	%100
3	M2	X	0.01	0.01	0	%100
4	M16	X	0.01	0.01	0	%100

Member Distributed Loads (BLC 5 : Wind(x)) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
5	M1	X	0.01	0.01	0	%100
6	M4	X	0.01	0.01	0	%100
7	M17_1	X	0.01	0.01	0	%100
8	M3	X	0.01	0.01	0	%100
9	M5	X	0.01	0.01	0	%100
10	M18	X	0.01	0.01	0	%100
11	M6	X	0.01	0.01	0	%100
12	M7	X	0.01	0.01	0	%100
13	M19_1	X	0.01	0.01	0	%100
14	M8	X	0.01	0.01	0	%100
15	M12	X	0.01	0.01	0	%100
16	M31A	X	0.01	0.01	0	%100
17	M11	X	0.01	0.01	0	%100
18	M28	X	0.01	0.01	0	%100

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

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M14	Z	0.002	0.002	0	%100
2	M15	Z	0.002	0.002	0	%100
3	M16	Z	0.002	0.002	0	%100
4	M1	Z	0.002	0.002	0	%100
5	M7	Z	0.002	0.002	0	%100
6	M19_1	Z	0.002	0.002	0	%100
7	M5	Z	0.002	0.002	0	%100
8	M3	Z	0.002	0.002	0	%100
9	M17_1	Z	0.002	0.002	0	%100
10	M18	Z	0.002	0.002	0	%100
11	M12	Z	0.002	0.002	0	10
12	M12	Z	0.002	0.002	62	%100
13	M28	Z	0.002	0.002	0	%100

Member Distributed Loads (BLC 7 : Wind(z))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/in]	End Magnitude [k/ft, F, ksf, k-ft/in]	Start Location [(in, %)]	End Location [(in, %)]
1	M12	Z	0.01	0.01	62	%100
2	M12	Z	0.01	0.01	0	10
3	M14	Z	0.01	0.01	0	%100
4	M15	Z	0.01	0.01	0	%100
5	M16	Z	0.01	0.01	0	%100
6	M1	Z	0.01	0.01	0	%100
7	M7	Z	0.01	0.01	0	%100
8	M19_1	Z	0.01	0.01	0	%100
9	M17_1	Z	0.01	0.01	0	%100
10	M18	Z	0.01	0.01	0	%100
11	M5	Z	0.01	0.01	0	%100
12	M3	Z	0.01	0.01	0	%100
13	M28	Z	0.01	0.01	0	%100

Member Area Loads

No Data to Print...

Basic Load Cases

	BLC Description	Category	Y Gravity	Point	Distributed
1	Self Weight	None	-1		
2	Weight of Equipment	DL		6	
3	Weight of ICE on Equipment	DL		6	
4	Wind(x) w/ Ice	WLX		6	18
5	Wind(x)	WLX		6	18
6	Wind(z) w/ Ice	WLZ		6	13
7	Wind(z)	WLZ		6	13
8	Lm	None			
9	Lv	None			

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.2D + 1.0Wo(x)	Yes	Y	1	1.2	2	1.2	5	1		
2	1.2D + 1.0Wo(-x)	Yes	Y	1	1.2	2	1.2	5	-1		
3	1.2D + 1.0Wo(z)	Yes	Y	1	1.2	2	1.2	7	1		
4	1.2D + 1.0Wo(-z)	Yes	Y	1	1.2	2	1.2	7	-1		
5	1.2D + 1.0Di + 1.0Wi(x)	Yes	Y	1	1.2	2	1.2	3	1	4	1
6	1.2D + 1.0Di + 1.0Wi(-x)	Yes	Y	1	1.2	2	1.2	3	1	4	-1
7	1.2D + 1.0Di + 1.0Wi(z)	Yes	Y	1	1.2	2	1.2	3	1	6	1
8	1.2D + 1.0Di + 1.0Wi(-z)	Yes	Y	1	1.2	2	1.2	3	1	6	-1
9	1.4D	Yes	Y	1	1.4	2	1.4				
10	1.2D + 1.5Lm + 1.0Wm(x)	Yes	Y	1	1.2	2	1.2	8	1.5	4	1
11	1.2D + 1.5Lm + 1.0Wm(-x)	Yes	Y	1	1.2	2	1.2	8	1.5	4	-1
12	1.2D + 1.5Lm + 1.0Wm(z)	Yes	Y	1	1.2	2	1.2	8	1.5	6	1
13	1.2D + 1.5Lm + 1.0Wm(-z)	Yes	Y	1	1.2	2	1.2	8	1.5	6	-1
14	1.2D + 1.5Lv	Yes	Y	1	1.2	2	1.2	9	1.5		

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N5_1	max	0.363	2	0.741	8	1.455	4	-0.183	3	0	14	0.105	2
2		min	-0.544	1	0.329	3	-0.471	3	-0.441	8	0	1	-0.179	1
3	N41_1	max	0.063	2	0.026	9	0.394	2	-0.041	2	0	14	-0.003	2
4		min	-0.067	1	0.022	2	-0.474	1	-0.048	9	0	1	-0.012	5
5	N40_1	max	0.067	2	0.026	9	0.393	1	-0.038	4	0	14	0.001	2
6		min	-0.063	1	0.022	4	-0.472	2	-0.045	9	0	1	-0.006	5
7	N6	max	0.669	2	0.727	7	-0.051	4	-0.18	4	0	14	0.09	2
8		min	-0.488	1	0.319	4	-0.774	3	-0.431	7	0	1	-0.163	1
9	Totals:	max	1.162	2	1.475	6	1.796	4						
10		min	-1.162	1	0.904	1	-1.796	3						

Envelope Node Displacements

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	TF7	max	0.056	1	-0.002	3	0.045	2	2.207e-3	4	1.442e-3	1	4.305e-4	1
2		min	-0.042	2	-0.009	8	-0.06	1	-1.457e-3	3	-1.043e-3	2	-2.898e-4	2
3	TF6	max	0.003	1	-0.01	3	0.002	1	9.073e-4	2	9.841e-4	3	1.259e-3	5
4		min	-0.003	2	-0.017	8	-0.002	2	-5.049e-4	1	-9.351e-4	4	4.17e-4	2
5	TF5	max	0.003	1	-0.003	4	0.002	2	2.354e-3	3	6.569e-4	3	3.878e-4	1
6		min	-0.003	2	-0.009	7	-0.002	1	-1.586e-3	4	-5.817e-4	4	-2.666e-4	2
7	N57A	max	0.003	4	0	4	0.003	3	5.645e-5	7	3.836e-4	4	4.135e-5	5
8		min	-0.003	3	0	7	-0.003	4	2.316e-6	4	-3.84e-4	3	-6.141e-6	2
9	N56A	max	0.013	1	0	3	0.013	2	5.81e-5	5	1.789e-3	1	3.688e-5	7

Envelope Node Displacements (Continued)

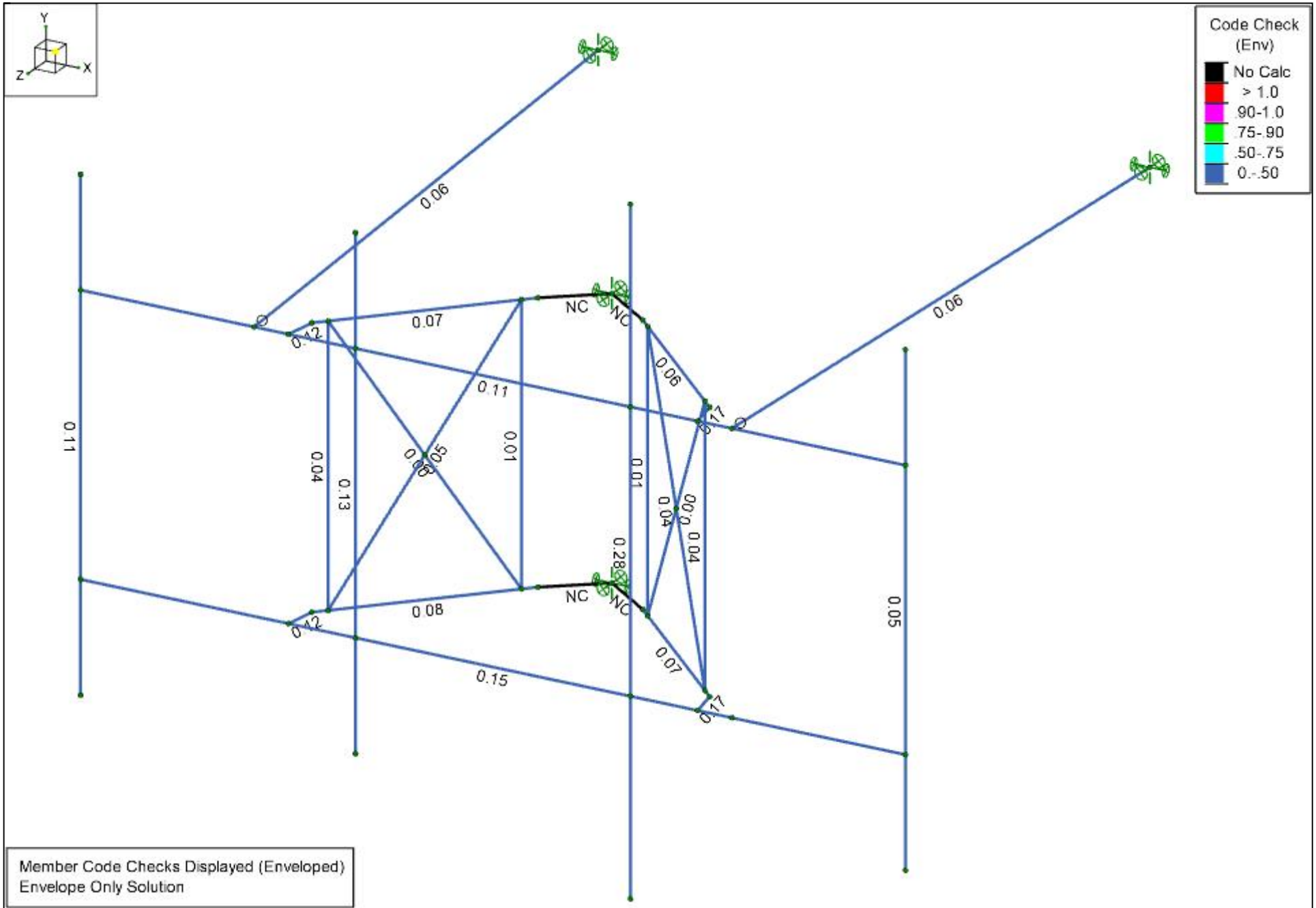
	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
10		min	-0.01	2	0	8	-0.016	1	3.835e-6	2	-1.382e-3	2	5.872e-6	4
11	N55A	max	0.013	1	0	2	0.016	1	3.114e-5	2	1.781e-3	1	5.174e-6	1
12		min	-0.01	2	0	5	-0.013	2	-1.033e-5	1	-1.39e-3	2	-2.391e-5	2
13	N54A	max	0.003	4	0	4	0.003	4	3.338e-5	2	3.007e-4	4	-5.642e-6	1
14		min	-0.003	3	0	5	-0.003	3	-1.464e-5	1	-2.824e-4	3	-2.366e-5	6
15	N53_1	max	0.004	4	-0.001	2	0.006	3	1.027e-3	5	4.802e-4	3	3.002e-4	3
16		min	-0.005	3	-0.003	5	-0.005	4	2.761e-4	2	-4.737e-4	4	-2.242e-4	4
17	N52_1	max	0.045	1	-0.001	2	0.037	2	9.733e-4	6	1.683e-3	1	2.779e-4	1
18		min	-0.035	2	-0.003	5	-0.049	1	4.869e-4	1	-1.267e-3	2	-1.914e-4	2
19	N51_1	max	0.045	1	-0.001	1	0.048	1	8.649e-4	6	1.683e-3	1	4.349e-4	1
20		min	-0.035	2	-0.003	6	-0.038	2	3.308e-4	1	-1.267e-3	2	-9.198e-6	2
21	N50_1	max	0.002	4	-0.001	1	0.003	4	8.649e-4	6	2.544e-4	3	4.135e-4	1
22		min	-0.002	3	-0.003	6	-0.003	3	4.051e-4	1	-2.792e-4	4	1.846e-5	2
23	N36_1	max	0.003	1	-0.001	1	0.002	4	6.292e-4	2	2.912e-4	4	4.057e-4	1
24		min	-0.003	2	-0.008	6	-0.001	3	-3.544e-4	1	-3.409e-4	3	-1.885e-4	2
25	N34_1	max	0.056	1	-0.001	1	0.036	1	7.121e-4	2	1.711e-3	1	1.959e-4	1
26		min	-0.042	2	-0.008	6	-0.028	2	-4.522e-4	1	-1.279e-3	2	-1.341e-6	2
27	N18	max	0.056	1	-0.018	2	0.086	1	1.319e-3	2	3.198e-3	3	1.435e-3	5
28		min	-0.043	2	-0.059	5	-0.069	2	-1.356e-3	1	-3.12e-3	4	7.651e-5	2
29	N17	max	0.056	1	-0.005	1	0.052	1	9.139e-4	2	1.603e-3	1	8.552e-4	5
30		min	-0.042	2	-0.012	6	-0.041	2	-4.428e-4	1	-1.209e-3	2	2.074e-4	2
31	N16	max	0.056	1	-0.003	3	0.04	2	2.362e-3	4	1.599e-3	1	4.577e-4	5
32		min	-0.042	2	-0.011	8	-0.053	1	-1.591e-3	3	-1.212e-3	2	-1.981e-4	2
33	N15	max	0.056	1	0.01	1	0.065	2	1.562e-3	1	1.019e-3	1	8.004e-4	1
34		min	-0.042	2	-0.02	2	-0.09	1	-9.126e-4	2	-6.336e-4	2	-6.805e-4	2
35	N14	max	0.003	1	0.01	1	0.011	2	1.715e-3	1	5.865e-4	1	1.015e-3	1
36		min	-0.003	2	-0.02	2	-0.012	1	-1.054e-3	2	-4.976e-4	2	-8.695e-4	2
37	N13	max	0.003	1	-0.003	2	0.005	3	2.495e-3	3	7.346e-4	3	4.075e-4	5
38		min	-0.003	2	-0.011	5	-0.004	4	-1.705e-3	4	-6.763e-4	4	-5.974e-5	2
39	N12_1	max	0.003	1	-0.005	1	0.002	4	8.355e-4	2	3.305e-4	3	8.459e-4	5
40		min	-0.003	2	-0.012	6	-0.002	3	-3.465e-4	1	-3.545e-4	4	2.566e-4	2
41	N11	max	0.003	1	-0.018	2	0.056	3	1.273e-3	2	2.769e-3	3	1.665e-3	1
42		min	-0.003	2	-0.059	5	-0.051	4	-1.299e-3	1	-2.51e-3	4	-2.163e-4	2
43	N10	max	0.004	4	-0.002	3	0.005	3	1.149e-3	5	6.459e-4	3	2.96e-4	3
44		min	-0.004	3	-0.005	5	-0.004	4	3.35e-4	2	-6.156e-4	4	-2.642e-4	4
45	N9	max	0.002	4	0	1	0.003	3	0	7	3.776e-4	4	0	1
46		min	-0.002	3	0	6	-0.003	4	0	4	-3.546e-4	3	0	2
47	N8	max	0.01	1	0	3	0.01	2	0	8	1.758e-3	1	0	1
48		min	-0.008	2	0	8	-0.013	1	0	3	-1.373e-3	2	0	2
49	N7	max	0.048	1	-0.002	4	0.039	2	1.1e-3	6	1.643e-3	1	2.914e-4	1
50		min	-0.037	2	-0.005	7	-0.052	1	5.184e-4	1	-1.246e-3	2	-2.462e-4	2
51	N6	max	0	1	0	4	0	3	0	7	3.776e-4	4	0	1
52		min	0	2	0	7	0	4	0	4	-3.546e-4	3	0	2
53	N5_1	max	0	1	0	3	0	3	0	8	1.758e-3	1	0	1
54		min	0	2	0	8	0	4	0	3	-1.373e-3	2	0	2
55	N4	max	0.048	1	-0.003	1	0.051	1	1.007e-3	6	1.651e-3	1	5.163e-4	5
56		min	-0.037	2	-0.006	6	-0.04	2	4.218e-4	1	-1.238e-3	2	2.776e-5	2
57	N3	max	0.01	1	0	2	0.013	1	0	8	1.758e-3	1	0	5
58		min	-0.008	2	0	5	-0.01	2	0	3	-1.373e-3	2	0	2
59	N2	max	0.002	4	0	2	0.003	4	0	6	3.776e-4	4	0	5
60		min	-0.002	3	0	5	-0.003	3	0	4	-3.546e-4	3	0	2
61	N1	max	0.002	1	-0.003	1	0.002	4	1.008e-3	6	2.884e-4	3	5.129e-4	5
62		min	-0.002	2	-0.006	6	-0.002	3	5.066e-4	1	-3.136e-4	4	5.573e-5	2
63	N40_1	max	0	1	0	4	0	2	0	9	2.5e-3	1	0	5
64		min	0	2	0	9	0	1	0	4	-2.502e-3	2	0	2

Envelope Node Displacements (Continued)

	Node Label		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
65	N41_1	max	0	1	0	2	0	1	0	9	2.499e-3	1	0	5
66		min	0	2	0	9	0	2	0	2	-2.503e-3	2	0	2
67	N35_1	max	0.059	1	-0.001	1	0.043	1	7.121e-4	2	1.711e-3	1	2.35e-4	1
68		min	-0.043	2	-0.008	6	-0.04	2	-4.522e-4	1	-1.279e-3	2	-4.045e-5	2
69	N37_1	max	0.079	1	-0.018	2	0.108	1	1.319e-3	2	3.198e-3	3	1.443e-3	5
70		min	-0.042	2	-0.059	5	-0.09	2	-1.356e-3	1	-3.12e-3	4	3.74e-5	2
71	N38_1	max	0	4	-0.001	1	0.01	2	6.293e-4	2	2.912e-4	4	3.666e-4	1
72		min	-0.003	3	-0.008	6	-0.005	1	-3.544e-4	1	-3.409e-4	3	-1.494e-4	2
73	N39_1	max	0	2	-0.018	2	0.039	3	1.273e-3	2	2.769e-3	3	1.626e-3	1
74		min	-0.024	5	-0.059	5	-0.034	4	-1.299e-3	1	-2.51e-3	4	-1.772e-4	2
75	N42_1	max	0.105	1	-0.004	2	0.15	3	6.304e-3	4	1.679e-3	1	2.029e-3	1
76		min	-0.086	2	-0.015	5	-0.174	4	-5.773e-3	3	-1.311e-3	2	-1.816e-3	2
77	N43_1	max	0.036	1	-0.004	2	0.175	3	6.452e-3	3	4.997e-4	3	1.65e-3	2
78		min	-0.042	2	-0.015	5	-0.158	4	-5.904e-3	4	-4.346e-4	4	-1.461e-3	1
79	N40	max	0.003	1	-0.004	2	0.012	3	3.012e-3	3	4.997e-4	3	2.851e-4	4
80		min	-0.003	2	-0.015	5	-0.01	4	-2.465e-3	4	-4.346e-4	4	-9.68e-5	3
81	N41	max	0.056	1	-0.004	2	0.027	2	2.88e-3	4	1.679e-3	1	6.073e-4	1
82		min	-0.043	2	-0.015	5	-0.037	1	-2.349e-3	3	-1.311e-3	2	-3.941e-4	2
83	N42	max	0.015	1	-0.001	2	0.013	2	1.006e-3	1	9.736e-4	1	9.426e-4	1
84		min	-0.012	2	-0.002	5	-0.017	1	-9.32e-4	2	-7.683e-4	2	-7.291e-4	2
85	N43	max	0.015	1	-0.001	1	0.017	1	7.663e-4	2	9.305e-4	1	9.111e-4	1
86		min	-0.012	2	-0.002	6	-0.013	2	-1.172e-3	1	-7.301e-4	2	-7.609e-4	2
87	N44	max	0.069	1	0.01	1	0.08	2	1.562e-3	1	1.019e-3	1	8.395e-4	1
88		min	-0.054	2	-0.02	2	-0.115	1	-9.126e-4	2	-6.336e-4	2	-7.195e-4	2
89	N45	max	0.01	2	0.01	1	0.017	3	1.715e-3	1	5.865e-4	1	9.757e-4	1
90		min	-0.013	1	-0.02	2	-0.008	4	-1.054e-3	2	-4.976e-4	2	-8.304e-4	2

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M2	.625X3.5"	0.12	0	1	0.038	4.778	y	1	67.869	68.906	0.897	5.024	1.718	H1-1b
2	M4	.625X3.5"	0.116	0	5	0.038	4.778	y	5	67.869	68.906	0.897	5.024	1.499	H1-1b
3	M6	.625X3.5"	0.166	0	3	0.022	4.778	y	3	67.869	68.906	0.897	5.024	2.102	H1-1b
4	M8	.625X3.5"	0.173	0	4	0.019	4.778	z	8	67.869	68.906	0.897	5.024	1.352	H1-1b
5	M11	PIPE_2.0	0.283	68	3	0.046	28		3	23.233	32.13	1.872	1.872	1	H1-1b
6	M12	PIPE_2.0	0.112	16.5	2	0.032	55.5		4	26.774	32.13	1.872	1.872	1	H1-1b
7	TB1	PIPE_2.0	0.059	49.547	1	0.007	101.202		1	18.616	32.13	1.872	1.872	1	H1-1b
8	M14	PIPE_2.5	0.112	25	3	0.096	88.75		4	47.986	50.715	3.596	3.596	1	H1-1b
9	M15	PIPE_2.5	0.149	30	4	0.099	88.75		3	47.986	50.715	3.596	3.596	1	H1-1b
10	M16	PIPE_2.0	0.073	2.188	5	0.053	1.875		5	31.129	32.13	1.872	1.872	1	H1-1b
11	M17_1	PIPE_2.0	0.075	2.188	5	0.051	1.875		5	31.129	32.13	1.872	1.872	1	H1-1b
12	M18	PIPE_2.0	0.071	0	4	0.055	30		8	31.129	32.13	1.872	1.872	1	H1-1b
13	M19_1	PIPE_2.0	0.06	1.875	4	0.055	1.875		8	31.129	32.13	1.872	1.872	1	H1-1b
14	M24_1	.625DIA.	0.037	0	1	0.008	40		1	4.355	9.664	0.101	0.101	1	H1-1b
15	M25_1	.625DIA.	0.012	0	1	0.008	40		1	4.355	9.664	0.101	0.101	1	H1-1b
16	M26_1	.625DIA.	0.011	0	1	0.008	40		1	4.355	9.664	0.101	0.101	1	H1-1b
17	M27_1	.625DIA.	0.036	40	2	0.007	40		1	4.355	9.664	0.101	0.101	1	H1-1b
18	M28_1	.75DIA.	0.044	47.512	2	0.012	47.512		2	5.191	13.916	0.174	0.174	1	H1-1b
19	M29_1	.75DIA.	0	47.512	14	0.012	47.512		2	5.191	13.916	0.174	0.174	1	H1-1a
20	M30_1	.75DIA.	0.049	0	5	0.014	0		1	5.191	13.916	0.174	0.174	1	H1-1b
21	M31_1	.75DIA.	0	47.512	14	0.014	0		1	5.191	13.916	0.174	0.174	1	H1-1a
22	M31A	PIPE_2.0	0.126	16.5	1	0.047	16.5		1	26.774	32.13	1.872	1.872	1	H1-1b
23	TB2	PIPE_2.0	0.059	49.547	2	0.012	101.202		1	18.616	32.13	1.872	1.872	1	H1-1b
24	M28	PIPE_2.0	0.048	55.5	4	0.014	16.5		1	21.2	33.048	1.925	1.925	1	H1-1b



Centek Engineering	CT11505A - Mount	SK-1
PPG		May 18, 2023
20074.52		VFA10-HD.R3D

CENTEK engineering
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Subject: Connection to Lattice Tower

Location: Willimantic, CT

Date: 05/19/2023

Prepared by: PPG; Checked by: CFC
Job No. 20074.52

V-Frame to Tower Leg Connection:

Anchor Data

5/8" Dia. X 6-1/2" Long Grade 5 Hex Thru Bolt

Number of Bolts =	$N := 2$	(User Input)
Spacing Between Bolts=	$S := 6\ in$	(User Input)
Design Tension Strength =	$\Phi F_{nt} := 22.7\ kip$	(User Input)
Design Shear Strength=	$\Phi F_{nv} := 17.5\ kip$	(User Input)

Design Reactions: Node 1 - Envelope

Force X =	$Shear_x := 0.544 \cdot kip$	(User Input)
Force Y=	$Vertical := 0.741\ kip$	(User Input)
Force Z=	$Shear_z := 1.455 \cdot kip$	(User Input)
Moment X=	$M_X := 0.441 \cdot kip \cdot ft$	(User Input)
Moment Y=	$M_Y := 0.00 \cdot kip \cdot ft$	(User Input)
Moment Z=	$M_Z := 0.179\ kip \cdot ft$	(User Input)

Anchor Check:

Max Tension Force =
$$T_{Max} := \frac{Shear_z}{N} + \frac{M_Y + M_X}{S \cdot \frac{N}{2}} = 1.61\ kip$$

Max Shear Force =
$$V_{Max} := \frac{Shear_x + Vertical}{N} + \frac{M_Z}{S \cdot \frac{N}{2}} = 1\ kip$$

Condition 1 =
$$Condition1 := \text{if}\left(\frac{T_{Max}}{\Phi F_{nt}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

Condition 2 =
$$Condition2 := \text{if}\left(\frac{V_{Max}}{\Phi F_{nv}} \le 1.00\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

Condition 3 =
$$Condition3 := \text{if}\left(\frac{T_{Max}}{\Phi F_{nt}} + \frac{V_{Max}}{\Phi F_{nv}} \le 1.0\ ,\ \text{“OK”}\ ,\ \text{“NG”}\right) = \text{“OK”}$$

% of Capacity =
$$\max\left(\frac{T_{Max}}{\Phi F_{nt}}, \frac{V_{Max}}{\Phi F_{nv}}, \left(\frac{T_{Max}}{\Phi F_{nt}}\right) + \left(\frac{V_{Max}}{\Phi F_{nv}}\right)\right) = 12.81\%$$

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Structural Analysis Report

Client: Verizon / T-Mobile (A-11)1

Client Site ID / Name: 467900 / CT11505A / Willimantic CT
Application #: 212428, v2

SBA Site ID / Name: CT06462-A / MOUNTAIN STREET

196' Self-Support Tower

349 Mountain Street
Windham, CT 06226
Lat: 41.703011; Long: -72.221391

Project number: CT06462-VTA-082323

Analysis Results

Tower	78.6%	Pass
Foundation	49.0%	Pass

Change in tower stress due to mount modification / replacement	0.0%

Prepared by:

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August 25, 2023

08/25/23

Table of Contents

Introduction

The purpose of this report is to summarize the analysis results on the 196' Self-Support Tower to support the proposed antennas and transmissions lines in addition to those currently installed.

Table 1 List of Documents Used

Item	Document
Tower Design	ROHN, Project # 49204TT, dated 9/27/2001
Foundation Design	ROHN, Project # A012046, dated 8/31/2001
Geotechnical report	BL Companies, Project # 00C672-C, dated 12/1/2000
Modification drawings	N/A
Carrier MA	CENTEK Engineering, Project # 20074.52 Rev 1, dated 08/12/2022
Latest SA Report	SBAE, Project # CT06462-VZW-081023, dated 8/14/2023

Analysis Criteria

Table 2 Code Related Data

Jurisdiction (State/County/City)	Connecticut / Windham/windham / Windham
Governing Codes	ANSI/TIA-222-H, 2021 IBC / 2022 CSBC
Ultimate Wind Speed (3-Sec gust)	121 mph
Wind Speed with Ice (3-Sec gust)	50 mph
Service Wind Speed (3-Sec gust)	60 mph
Ice Thickness	1 in
Risk category	II
Exposure Category	B
Topographic Category	5
Crest Height	295 ft.
Ground Elevation	522.16 ft.
Seismic Parameter S_s	0.192
Seismic Parameter S_1	0.055

This structural analysis is based upon the tower being classified as a Risk category II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Appurtenance Loading

Existing Loading:

Table 3 Existing Appurtenances

Mount Elev. (ft)	CL Elev. (ft)	Type	Qty	Manufacturer	Model	Feed Line Size	Mount Type Qty.	Carrier
185	185	Panel	3	Antel	BXA-80080/4CF	(3) 1-5/8"	Direct Mount	Verizon
		Diplexer	6	RFS	FD9R6004/2C-3L			
164	167	Omni	1	Commscope	DB586-Y	(8) 7/8" (1) 1/2"	(1) Side Arm (Commscope S-200)	Connecticut Light & Power / Eversource
	164	TTA	1	Powerwave	LGP104			
161	165	Omni	1	RFS	BA1312-0		(1) Side Arm (Commscope S-400)	
159	166.5	Omni	1	RFS	458-2		(1) Side Arm (Commscope S-400)	
152	163.6	Dipole	1	Comrod	876F-70-2HSMP40DF1/2		(1) Side Arm (Site Pro 1 USF-4U)	
130	140.4	Omni	1	RFS	220-3AN		(1) Side Arm (Commscope S-600)	
130	139.5	Omni	1	RFS	220-7N		(1) Side Arm (Commscope S-600)	
130	137	Omni	1	Kreco	CO-36A		(1) Side Arm (Wireless Solutions WS-400)	
169	169	Panel	3	Ericsson	AIR 21 B4A/B2P	(12) 1-5/8" (2) 1-5/8" Hybrid	(3) 10' T-Frames	Verizon / T-Mobile (A-11)1
		Panel	3	Andrew	LNX-6515DS-T4M 750 04 w/ Mount Pipe			
		Panel	3	Ericsson	AIR32 KRD901146-1_B66A_B2A (Octo)			
		Panel	3	Generic	72" x 12" Panel			
		TMA	3	Generic	Generic 12.5"x5.6"x3.7"			
		RRU	3	Ericsson	RRUS 11			
120	120	Panel	4	Commscope	SBNHH-1D65B	(8) 1-5/8" (2) 1-5/8" Hybrid	(3) Sector Frames	Verizon
		Panel	2	Commscope	SBNHH-1D45B			
		Panel	3	Samsung	MT6407-77A			
		RRU	3	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)			
		RRU	3	Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)			
		Box	2	RFS	DB-T1-6Z-8AB-0Z			
		Filter	6	Kaelus	KA-6030			
107	107	Panel	3	JMA Wireless	MX08FRO665-21	(1) 1.60" Hybrid	(3) Sector Mounts (Commscope MTC3975083)	Dish Wireless
		RRU	3	Fujitsu	TA08025-B605			
		RRU	3	Fujitsu	TA08025-B604			
		OVP	1	Raycap	RDIDC-9181-PF-48			

Proposed Loading:

Information pertaining to proposed antennas and transmission lines were based upon the Application #: 212428, v2 from Verizon / T-Mobile (A-11)1 and is listed in Table 4.

Table 4 Proposed Appurtenances

Mount Elev. (ft)	CL Elev. (ft)	Type	Qty	Manufacturer	Model	Feed Line Size	Mount Type Qty.	Carrier
169	169	Panel	3	RFS	APXVAALL24-43-U-NA20	(10) 1.625" (3) 1.625" Hybrid	(3) Sector Frames Valmont: VFA10-HD	Verizon / T-Mobile (A-11)1
		Panel	3	Ericsson	Air 6419 B41			
		Panel	3	Commscope	VV-65A-R1			
		Panel	3	Generic	72" x 12" Panel			
		RRU	3	Ericsson	4480 B71 + B85			
		RRU	3	Ericsson	4460 B25 B66			

Analysis Results

Tower

The results of the structural analysis are shown below in table 5. Additional information for the tower analysis is provided within the Appendix.

Table 5 Tower Analysis Summary

Structural Component	% capacity	Analysis Result
Leg	59.5	Pass
Diagonal	78.6	Pass
Top girt	15.2	Pass
Bolt	78.6	Pass
Anchor Bolt	39.9	Pass

Foundation

The results of the foundation analysis are shown below in table 6. Additional information for the foundation analysis is provided within the Appendix.

Table 6 Foundation Analysis Summary

Structural Component	Max Usage (%)	Analysis Result
Foundation	49.0	Pass

Conclusions

Based on the analysis results, the existing tower and foundation were found to be ***sufficient*** to safely support the equipment listed in this analysis. No modification to the tower and foundation is needed at this time.

Installation Requirements

This analysis was performed under the assumption that the carrier will place the proposed equipment and feed lines at the installation height listed in Table 4 and in accordance with the coax layout shown. TMAs and RRUs are to be installed on existing mounts behind tenant's antennas unless otherwise noted. No equipment is to be installed directly in the climbing path. All equipment is to be installed per mount manufacturer specifications. In case site conditions do not allow for the required installation parameters to be met the carrier must notify SBA Communications Corporation engineers for approval of an alternative placement.

Assumptions and Limitations

Assumptions

This analysis was completed based on the following assumptions:

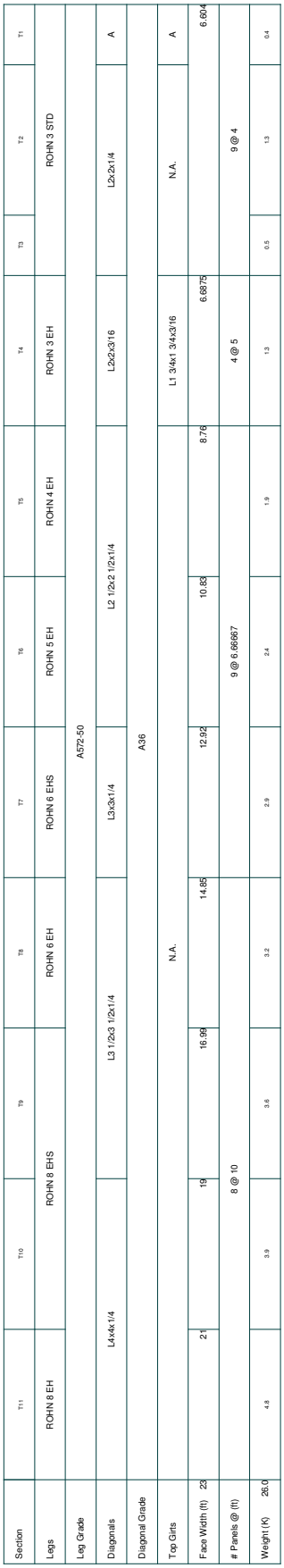
- Tower and foundation were built in accordance to manufacturer specifications.
- Tower and foundation has been properly maintained in accordance with the manufacturer's specifications
- All existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion
- Welds and bolts are assumed able to carry their intended original design loads.
- The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Table 3 and 4.
- This analysis may be affected if any assumptions are not valid or have been made in error. SBA should be notified to determine the effect on the structural integrity of the tower.

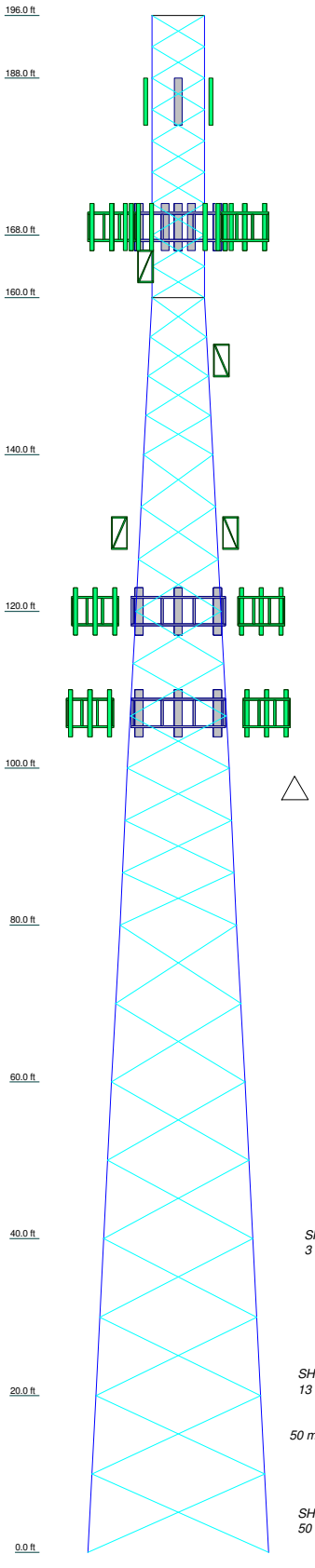
Limitations

The computer generated analysis performed by the tower software is limited to theoretical capacities of the towers structural members and does not account for any missing or damaged members or connections. The tower and foundation are assumed to have been properly designed, fabricated, installed and maintained, barring any conflicting findings from the most recent inspection.

SBA Communications Corporation has used its due diligence to verify the information provided to perform this analysis. It is unreasonable to perform a more detailed inspection of a tower and its components. This report is not a condition assessment of the tower or foundation.

Appendix





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	196	220-7N (228x2.8x2.8)	130
Pipe Mount	196	Side Arm (Commscope S-600)	130
SL1	196	CO-36A (144x0.63x0.63)	130
SL2	188	CO-36A (144x0.63x0.63)	130
BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	185	Side Arm (Wireless Solutions WS-400)	130
(2) FD9R6004/2C-3L (5.8x6.5x1.5)	185	(2) Empty Pipe Mount	120
(2) FD9R6004/2C-3L (5.8x6.5x1.5)	185	(2) Empty Pipe Mount	120
(2) FD9R6004/2C-3L (5.8x6.5x1.5)	185	Sector Mount (SM 309)	120
BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	185	Sector Mount (SM 309)	120
BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	185	SBNHH-1D65B w/mount pipe (72x11.85x7.1)	120
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	169	SBNHH-1D45B w/mount pipe (76.8x22.3x12.2)	120
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	169	SBNHH-1D45B w/mount pipe (76.8x22.3x12.2)	120
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	169	MT6407-77A w/mount pipe (35.12x16.06x5.51)	120
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	169	MT6407-77A w/mount pipe (35.12x16.06x5.51)	120
Air 6419 B41 (34.5" x 20" x 8") w/ mount pipe	169	B2/B66A RRH-BR049 (RFV01U-D1A) (15x15x10)	120
Air 6419 B41 (34.5" x 20" x 8") w/ mount pipe	169	B2/B66A RRH-BR049 (RFV01U-D1A) (15x15x10)	120
Air 6419 B41 (34.5" x 20" x 8") w/ mount pipe	169	B2/B66A RRH-BR049 (RFV01U-D1A) (15x15x10)	120
VV-65A-R1 (54.72" x 12.08" x 4.64") w/ mount pipe	169	B5/B13 RRH-BR04C (RFV01U-D2A) (15x15x8.1)	120
VV-65A-R1 (54.72" x 12.08" x 4.64") w/ mount pipe	169	B5/B13 RRH-BR04C (RFV01U-D2A) (15x15x8.1)	120
VV-65A-R1 (54.72" x 12.08" x 4.64") w/ mount pipe	169	DB-T1-6Z-8AB-0Z (24x24x10)	120
72" x 12" Panel (72" x 12" x 6") w/ mount pipe	169	DB-T1-6Z-8AB-0Z (24x24x10)	120
72" x 12" Panel (72" x 12" x 6") w/ mount pipe	169	(2) KA-6030 (10.6x10.9x3.15)	120
72" x 12" Panel (72" x 12" x 6") w/ mount pipe	169	(2) KA-6030 (10.6x10.9x3.15)	120
4480 B71 + B85 (19.2" x 15.1" x 7.5")	169	(2) KA-6030 (10.6x10.9x3.15)	120
4480 B71 + B85 (19.2" x 15.1" x 7.5")	169	(2) Empty Pipe Mount	120
4480 B71 + B85 (19.2" x 15.1" x 7.5")	169	(2) SBNHH-1D65B w/mount pipe (72x11.85x7.1)	120
4460 B25 B66 (19.56" x 15.74" x 12.08")	169	SBNHH-1D65B w/mount pipe (72x11.85x7.1)	120
4460 B25 B66 (19.56" x 15.74" x 12.08")	169	Sector Mount (SM 309)	120
4460 B25 B66 (19.56" x 15.74" x 12.08")	169	MT6407-77A w/mount pipe (35.12x16.06x5.51)	120
Sector Mount (SM 309)	169	B5/B13 RRH-BR04C (RFV01U-D2A) (15x15x8.1)	120
Sector Mount (SM 309)	169	SL6	120
Sector Mount (SM 309)	169	TA08025-B604 (15.75x14.96x7.87)	107
SL3	168	TA08025-B604 (15.75x14.96x7.87)	107
DB586-Y (52.56x2.5x2.5)	164	TA08025-B604 (15.75x14.96x7.87)	107
LGP104 (7x1.2x4)	164	RDIDC-9181-PF-48 (16.57x14.57x8.46)	107
Side Arm (Commscope S-200)	164	Sector Mount (Commscope MTC3975083)	107
BA1312-0 (104x2x2)	161	Sector Mount (Commscope MTC3975083)	107
Side Arm (Commscope S-400)	161	Sector Mount (Commscope MTC3975083)	107
SL4	160	MX08FRO665-21 (72x20x8)	107
458-2 (159.6x2.8x2.8)	159.9	MX08FRO665-21 (72x20x8)	107
Side Arm (Commscope S-400)	159.9	MX08FRO665-21 (72x20x8)	107
876F-70-2HSMP40DF1/2	152	TA08025-B605 (15.75x14.96x9.05)	107
Side Arm (Site Pro 1 USF-4U)	152	TA08025-B605 (15.75x14.96x9.05)	107
SL5	140	TA08025-B605 (15.75x14.96x9.05)	107
220-3AN (248x2.75x2.75)	130	SL7	100
Side Arm (Commscope S-600)	130	SL8	80
220-7N (228x2.8x2.8)	130	SL9	60
		SL10	40
		SL11	20

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x3/16		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 121 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 5 with Crest Height of 295.00 ft
8. TOWER RATING: 78.6%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 268 K
SHEAR: 31 K

UPLIFT: -223 K
SHEAR: 26 K

AXIAL 54 K
SHEAR 3 K *MOMENT 359 kip-ft*
TORQUE 0 kip-ft
SEISMIC

AXIAL 106 K
SHEAR 13 K *MOMENT 1386 kip-ft*
TORQUE 10 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 52 K
SHEAR 50 K *MOMENT 4997 kip-ft*
TORQUE 39 kip-ft
REACTIONS - 121 mph WIND

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Boca Raton, FL 33487
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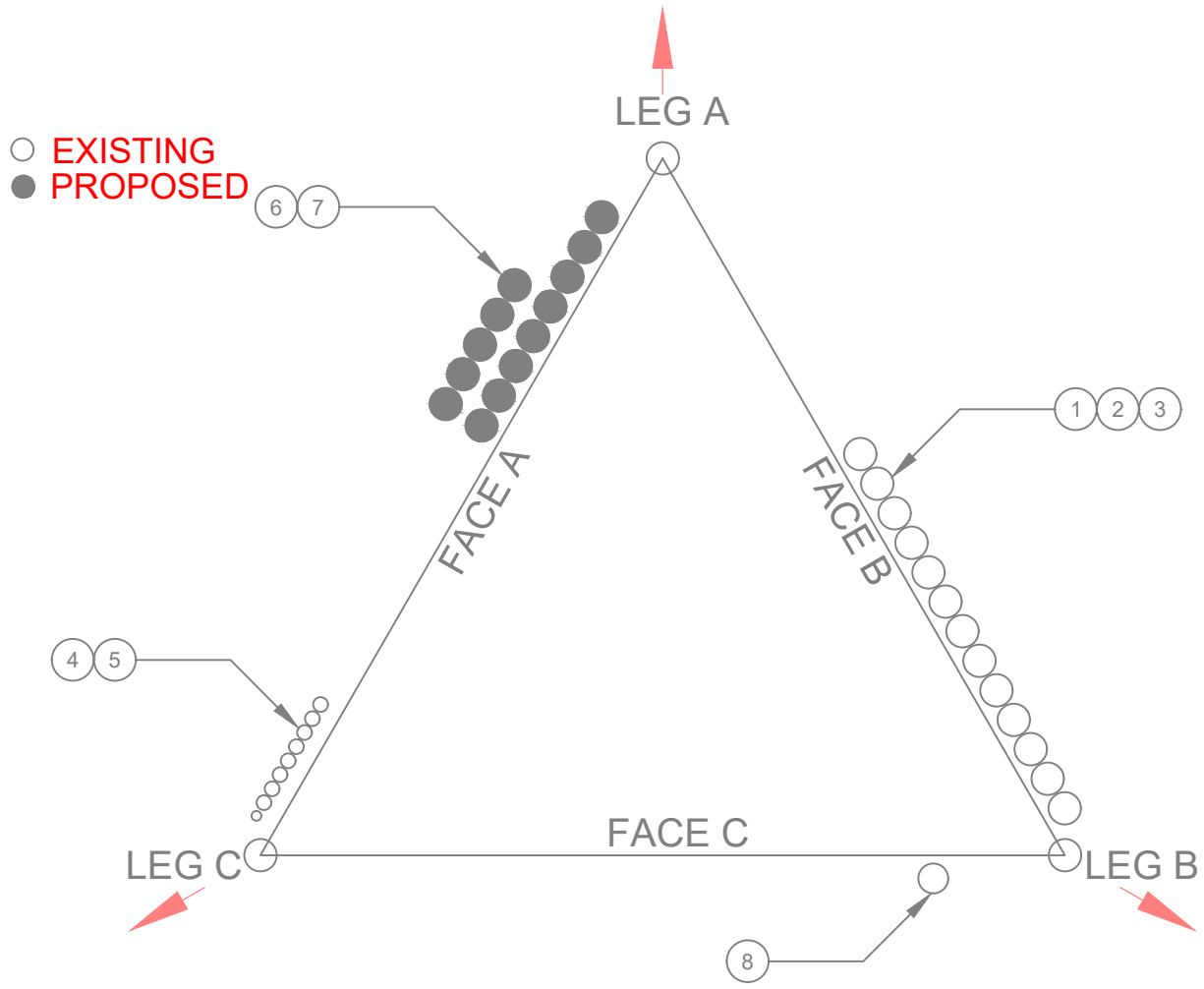
Job:			
Project: *CT06462-VTA-082323*			
Client:	Drawn by: sberthomieux		App'd:
Code: TIA-222-H	Date: 08/25/23		Scale: NTS
Path:			Dwg No. E-1

COAX LAYOUT



CT06462-A					
#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Verizon	1-5/8"	3	185'	
2		1-5/8"	8	120'	
3		1-5/8"	2		Hybrid
4	CLP	7/8"	8	130'-164'	
5		1/2"	1		
6	Verizon / T-Mobile (A-11)1	1.625"	10	169'	Proposed
7		1.625"	3		Proposed Hybrid
8	Dish Wireless	1.60"	1	107'	Hybrid

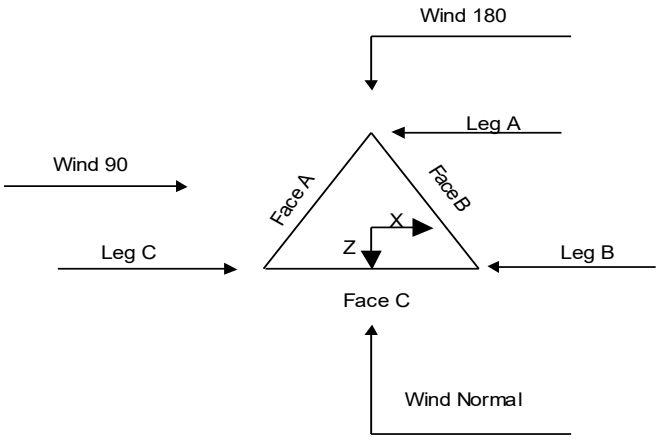
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 196.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.60 ft at the top and 23.00 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Windham County, Connecticut.
Tower base elevation above sea level: 522.16 ft.
Basic wind speed of 121 mph.
Risk Category II.
Exposure Category B.
Crest Height: 295.00 ft.
Rigorous Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Feature: Hill.
Slope Distance L: 1858.00 ft.
Distance from Crest x: 621.00 ft.
Horizontal Distance Downwind: Yes.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	196.00-188.00			6.60	1	8.00
T2	188.00-168.00			6.60	1	20.00
T3	168.00-160.00			6.60	1	8.00
T4	160.00-140.00			6.69	1	20.00
T5	140.00-120.00			8.76	1	20.00
T6	120.00-100.00			10.83	1	20.00
T7	100.00-80.00			12.92	1	20.00
T8	80.00-60.00			14.85	1	20.00
T9	60.00-40.00			16.99	1	20.00
T10	40.00-20.00			19.00	1	20.00
T11	20.00-0.00			21.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	196.00-188.00	4.00	X Brace	No	No	0.0000	0.0000
T2	188.00-168.00	4.00	X Brace	No	No	0.0000	0.0000
T3	168.00-160.00	4.00	X Brace	No	No	0.0000	0.0000
T4	160.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T5	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T6	120.00-100.00	6.67	X Brace	No	No	0.0000	0.0000
T7	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T8	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T9	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T10	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T11	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 196.00-188.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 188.00-168.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 168.00-160.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T4 160.00-140.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T5 140.00-120.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T6 120.00-100.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T7 100.00-80.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T8 80.00-60.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T10 40.00-20.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T11 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 196.00-188.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 160.00-140.00	Equal Angle	L1 3/4x1 3/4x3/16	A36	Solid Round		A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
			(36 ksi)			(36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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 196.00-188.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 188.00-168.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 168.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	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 196.00-188.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 188.00-168.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 168.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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
T5 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T11 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 196.00-188.00	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
T2 188.00-168.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 168.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 160.00-140.00	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
T5 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-80.00	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
T8 80.00-60.00	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
T9 60.00-40.00	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
T10 40.00-20.00	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
T11 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 196.00-188.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 188.00-168.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 168.00-160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 196.00-188.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 188.00-168.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 168.00-160.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 140.00-120.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 120.00-100.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 100.00-80.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 80.00-60.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 60.00-40.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 40.00-20.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T11 20.00-0.00	Flange	1.0000 A354-BC	0	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	No	No	Ar (CaAa)	196.00 - 0.00	0.0000	0.5	1	1	0.5000	0.3750		0.22
/-169 Feedline Ladder (Af)	A	No	No	Af (CaAa)	169.00 - 0.00	0.0000	0.35	1	1	0.5000	2.5000		8.40
1.625" coax	A	No	No	Ar (CaAa)	169.00 - 0.00	0.0000	0.35	10	5	0.5000	1.6250		0.82
1.625" Hybrid	A	No	No	Ar (CaAa)	169.00 - 0.00	0.0000	0.39	3	3	0.5000	1.6250		2.72
/-185-120 Feedline Ladder (Af)	B	No	No	Af (CaAa)	185.00 - 0.00	0.0000	0.35	1	1	0.5000	2.5000		8.40
LDF7-50A(1-5/8")	B	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	0.28	3	3	0.5000	1.9800		0.82
LDF7-50A(1-5/8")	B	No	No	Ar (CaAa)	120.00 - 0.00	0.0000	0.35	8	8	0.5000	1.9800		0.82
1-5/8" Hybrid	B	No	No	Ar (CaAa)	120.00 - 0.00	0.0000	0.3	2	2	0.5000	1.9800		2.72
/-164-130 Feedline Ladder (Af)	A	No	No	Af (CaAa)	164.00 - 0.00	0.0000	-0.4	1	1	0.5000	2.5000		8.40
LDF4-50A (1/2 FOAM)	A	No	No	Ar (CaAa)	164.00 - 0.00	0.0000	-0.43	1	1	0.5000	0.6300		0.15
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	164.00 - 161.00	0.0000	-0.4	2	2	0.5000	1.0900		0.33
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	161.00 - 159.90	0.0000	-0.4	3	3	0.5000	1.0900		0.33
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	159.90 - 152.00	0.0000	-0.4	4	4	0.5000	1.0900		0.33
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	152.00 - 130.00	0.0000	-0.4	5	5	0.5000	1.0900		0.33
LDF5-50A(7/8")	A	No	No	Ar (CaAa)	130.00 - 0.00	0.0000	-0.4	8	8	0.5000	1.0900		0.33
/-107 Feedline Ladder (Af)	C	No	No	Af (CaAa)	107.00 - 0.00	0.0000	-0.4	1	1	0.5000	2.5000		8.40
1.60" Hybrid	C	No	No	Ar (CaAa)	107.00 - 0.00	0.0000	-0.4	1	1	0.5000	1.6000		0.66

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	196.00-188.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.300	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	188.00-168.00	A	0.000	0.000	2.529	0.000	0.02
		B	0.000	0.000	17.931	0.000	0.19
		C	0.000	0.000	0.000	0.000	0.00
T3	168.00-160.00	A	0.000	0.000	23.133	0.000	0.24
		B	0.000	0.000	8.385	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T4	160.00-140.00	A	0.000	0.000	70.194	0.000	0.70
		B	0.000	0.000	20.963	0.000	0.22
		C	0.000	0.000	0.000	0.000	0.00
T5	140.00-120.00	A	0.000	0.000	74.347	0.000	0.71
		B	0.000	0.000	20.963	0.000	0.22
		C	0.000	0.000	0.000	0.000	0.00
T6	120.00-100.00	A	0.000	0.000	77.617	0.000	0.72
		B	0.000	0.000	60.563	0.000	0.46
		C	0.000	0.000	4.037	0.000	0.06
T7	100.00-80.00	A	0.000	0.000	77.617	0.000	0.72
		B	0.000	0.000	60.563	0.000	0.46
		C	0.000	0.000	11.533	0.000	0.18
T8	80.00-60.00	A	0.000	0.000	77.617	0.000	0.72
		B	0.000	0.000	60.563	0.000	0.46
		C	0.000	0.000	11.533	0.000	0.18
T9	60.00-40.00	A	0.000	0.000	77.617	0.000	0.72
		B	0.000	0.000	60.563	0.000	0.46
		C	0.000	0.000	11.533	0.000	0.18
T10	40.00-20.00	A	0.000	0.000	77.617	0.000	0.72
		B	0.000	0.000	60.563	0.000	0.46
		C	0.000	0.000	11.533	0.000	0.18
T11	20.00-0.00	A	0.000	0.000	77.617	0.000	0.72
		B	0.000	0.000	60.563	0.000	0.46
		C	0.000	0.000	11.533	0.000	0.18

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	196.00-188.00	A	1.254	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	2.306	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
T2	188.00-168.00	A	1.248	0.000	0.000	3.593	0.000	0.06
		B		0.000	0.000	39.260	0.000	0.51
		C		0.000	0.000	0.000	0.000	0.00
T3	168.00-160.00	A	1.242	0.000	0.000	35.913	0.000	0.57
		B		0.000	0.000	18.033	0.000	0.24
		C		0.000	0.000	0.000	0.000	0.00
T4	160.00-140.00	A	1.235	0.000	0.000	115.944	0.000	1.76
		B		0.000	0.000	44.982	0.000	0.59
		C		0.000	0.000	0.000	0.000	0.00

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
T5	140.00-120.00	A	1.223	0.000	0.000	122.805	0.000	1.83
		B		0.000	0.000	44.816	0.000	0.58
		C		0.000	0.000	0.000	0.000	0.00
T6	120.00-100.00	A	1.210	0.000	0.000	128.099	0.000	1.88
		B		0.000	0.000	120.532	0.000	1.50
		C		0.000	0.000	7.424	0.000	0.13
T7	100.00-80.00	A	1.193	0.000	0.000	127.567	0.000	1.87
		B		0.000	0.000	120.067	0.000	1.48
		C		0.000	0.000	21.076	0.000	0.36
T8	80.00-60.00	A	1.171	0.000	0.000	126.875	0.000	1.84
		B		0.000	0.000	119.461	0.000	1.46
		C		0.000	0.000	20.899	0.000	0.35
T9	60.00-40.00	A	1.140	0.000	0.000	125.907	0.000	1.81
		B		0.000	0.000	118.616	0.000	1.43
		C		0.000	0.000	20.653	0.000	0.34
T10	40.00-20.00	A	1.091	0.000	0.000	124.384	0.000	1.77
		B		0.000	0.000	117.284	0.000	1.39
		C		0.000	0.000	20.264	0.000	0.33
T11	20.00-0.00	A	0.986	0.000	0.000	121.082	0.000	1.67
		B		0.000	0.000	114.397	0.000	1.30
		C		0.000	0.000	19.419	0.000	0.31

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	196.00-188.00	0.3388	0.2153	1.6601	1.0012
T2	188.00-168.00	3.1399	0.8163	5.5337	1.7652
T3	168.00-160.00	0.6220	-7.9570	1.2077	-6.3678
T4	160.00-140.00	-1.2274	-7.0063	-1.4297	-4.9320
T5	140.00-120.00	-2.0517	-7.3349	-2.0676	-5.2636
T6	120.00-100.00	5.7736	-2.2226	5.8345	-0.4702
T7	100.00-80.00	7.4607	-1.8091	8.2480	0.6361
T8	80.00-60.00	8.5808	-2.0464	9.5184	0.7416
T9	60.00-40.00	8.9979	-2.1463	9.9559	0.7783
T10	40.00-20.00	9.0108	-2.1797	10.2233	0.7818
T11	20.00-0.00	9.4630	-2.2938	10.6499	0.7194

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Safety Line 3/8	188.00 - 196.00	0.6000	0.6000
T2	1	Safety Line 3/8	168.00 - 188.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	3	Feedline Ladder (Af)	168.00 - 169.00	0.6000	0.6000
T2	4	1.625" coax	168.00 - 169.00	0.6000	0.6000
T2	5	1.625" Hybrid	168.00 - 169.00	0.6000	0.6000
T2	7	Feedline Ladder (Af)	168.00 - 185.00	0.6000	0.6000
T2	8	LDF7-50A(1-5/8")	168.00 - 185.00	0.6000	0.6000
T3	1	Safety Line 3/8	160.00 - 168.00	0.6000	0.6000
T3	3	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.6000
T3	4	1.625" coax	160.00 - 168.00	0.6000	0.6000
T3	5	1.625" Hybrid	160.00 - 168.00	0.6000	0.6000
T3	7	Feedline Ladder (Af)	160.00 - 168.00	0.6000	0.6000
T3	8	LDF7-50A(1-5/8")	160.00 - 168.00	0.6000	0.6000
T3	12	Feedline Ladder (Af)	160.00 - 164.00	0.6000	0.6000
T3	13	LDF4-50A (1/2 FOAM)	160.00 - 164.00	0.6000	0.6000
T3	14	LDF5-50A(7/8")	161.00 - 164.00	0.6000	0.6000
T3	15	LDF5-50A(7/8")	160.00 - 161.00	0.6000	0.6000
T4	1	Safety Line 3/8	140.00 - 160.00	0.6000	0.6000
T4	3	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T4	4	1.625" coax	140.00 - 160.00	0.6000	0.6000
T4	5	1.625" Hybrid	140.00 - 160.00	0.6000	0.6000
T4	7	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T4	8	LDF7-50A(1-5/8")	140.00 - 160.00	0.6000	0.6000
T4	12	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T4	13	LDF4-50A (1/2 FOAM)	140.00 - 160.00	0.6000	0.6000
T4	15	LDF5-50A(7/8")	159.90 - 160.00	0.6000	0.6000
T4	16	LDF5-50A(7/8")	152.00 - 159.90	0.6000	0.6000
T4	17	LDF5-50A(7/8")	140.00 - 152.00	0.6000	0.6000
T5	1	Safety Line 3/8	120.00 - 140.00	0.6000	0.6000
T5	3	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T5	4	1.625" coax	120.00 - 140.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	5	1.625" Hybrid	120.00 - 140.00	0.6000	0.6000
T5	7	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T5	8	LDF7-50A(1-5/8")	120.00 - 140.00	0.6000	0.6000
T5	12	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T5	13	LDF4-50A (1/2 FOAM)	120.00 - 140.00	0.6000	0.6000
T5	17	LDF5-50A(7/8")	130.00 - 140.00	0.6000	0.6000
T5	18	LDF5-50A(7/8")	120.00 - 130.00	0.6000	0.6000
T6	1	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T6	3	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	4	1.625" coax	100.00 - 120.00	0.6000	0.6000
T6	5	1.625" Hybrid	100.00 - 120.00	0.6000	0.6000
T6	7	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	8	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T6	9	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.6000
T6	10	1-5/8" Hybrid	100.00 - 120.00	0.6000	0.6000
T6	12	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T6	13	LDF4-50A (1/2 FOAM)	100.00 - 120.00	0.6000	0.6000
T6	18	LDF5-50A(7/8")	100.00 - 120.00	0.6000	0.6000
T6	20	Feedline Ladder (Af)	100.00 - 107.00	0.6000	0.6000
T6	21	1.60" Hybrid	100.00 - 107.00	0.6000	0.6000
T7	1	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T7	3	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	4	1.625" coax	80.00 - 100.00	0.6000	0.6000
T7	5	1.625" Hybrid	80.00 - 100.00	0.6000	0.6000
T7	7	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	8	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T7	9	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T7	10	1-5/8" Hybrid	80.00 - 100.00	0.6000	0.6000
T7	12	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	13	LDF4-50A (1/2 FOAM)	80.00 - 100.00	0.6000	0.6000
T7	18	LDF5-50A(7/8")	80.00 - 100.00	0.6000	0.6000
T7	20	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	21	1.60" Hybrid	80.00 - 100.00	0.6000	0.6000
T8	1	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T8	3	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	4	1.625" coax	60.00 - 80.00	0.6000	0.6000
T8	5	1.625" Hybrid	60.00 - 80.00	0.6000	0.6000
T8	7	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	8	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T8	9	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T8	10	1-5/8" Hybrid	60.00 - 80.00	0.6000	0.6000
T8	12	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	13	LDF4-50A (1/2 FOAM)	60.00 - 80.00	0.6000	0.6000
T8	18	LDF5-50A(7/8")	60.00 - 80.00	0.6000	0.6000
T8	20	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	21	1.60" Hybrid	60.00 - 80.00	0.6000	0.6000
T9	1	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T9	3	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	4	1.625" coax	40.00 - 60.00	0.6000	0.6000
T9	5	1.625" Hybrid	40.00 - 60.00	0.6000	0.6000
T9	7	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	8	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T9	9	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T9	10	1-5/8" Hybrid	40.00 - 60.00	0.6000	0.6000
T9	12	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	13	LDF4-50A (1/2 FOAM)	40.00 - 60.00	0.6000	0.6000
T9	18	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T9	20	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	21	1.60" Hybrid	40.00 - 60.00	0.6000	0.6000
T10	1	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T10	3	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	4	1.625" coax	20.00 - 40.00	0.6000	0.6000
T10	5	1.625" Hybrid	20.00 - 40.00	0.6000	0.6000
T10	7	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	8	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	9	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T10	10	1-5/8" Hybrid	20.00 - 40.00	0.6000	0.6000
T10	12	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	13	LDF4-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T10	18	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T10	20	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	21	1.60" Hybrid	20.00 - 40.00	0.6000	0.6000
T11	1	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T11	3	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	4	1.625" coax	0.00 - 20.00	0.6000	0.6000
T11	5	1.625" Hybrid	0.00 - 20.00	0.6000	0.6000
T11	7	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	8	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	9	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T11	10	1-5/8" Hybrid	0.00 - 20.00	0.6000	0.6000
T11	12	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	13	LDF4-50A (1/2 FOAM)	0.00 - 20.00	0.6000	0.6000
T11	18	LDF5-50A(7/8")	0.00 - 20.00	0.6000	0.6000
T11	20	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T11	21	1.60" Hybrid	0.00 - 20.00	0.6000	0.6000

User Defined Loads - Seismic

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
SL1	196.00	0.00	0.0000	0.02	0.00	0.00	0.05
SL2	188.00	0.00	0.0000	0.16	0.00	0.00	0.48
SL3	168.00	0.00	0.0000	0.04	0.00	0.00	0.10
SL4	160.00	0.00	0.0000	0.10	0.00	0.00	0.24
SL5	140.00	0.00	0.0000	0.13	0.00	0.00	0.28
SL6	120.00	0.00	0.0000	0.31	0.00	0.00	0.63
SL7	100.00	0.00	0.0000	0.17	0.00	0.00	0.27
SL8	80.00	0.00	0.0000	0.19	0.00	0.00	0.22
SL9	60.00	0.00	0.0000	0.20	0.00	0.00	0.18
SL10	40.00	0.00	0.0000	0.22	0.00	0.00	0.12
SL11	20.00	0.00	0.0000	0.25	0.00	0.00	0.07

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
				°	ft		ft^2	ft^2	K
Lightning Rod	C	From Leg	0.00	0.0000	196.00	No Ice	0.25	0.25	0.03
			0.00			1/2" Ice	0.66	0.66	0.03
			10.00			1" Ice	0.97	0.97	0.04
Pipe Mount	C	From Leg	0.00	0.0000	196.00	No Ice	2.49	2.49	0.04
			0.00			1/2" Ice	3.54	3.54	0.06
			5.00			1" Ice	4.59	4.59	0.08
/-185									
BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	A	From Leg	1.00	0.0000	185.00	No Ice	5.75	4.74	0.04
			0.00			1/2" Ice	6.48	5.88	0.10
			0.00			1" Ice	7.15	6.87	0.15
BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	B	From Leg	1.00	0.0000	185.00	No Ice	5.75	4.74	0.04
			0.00			1/2" Ice	6.48	5.88	0.10
			0.00			1" Ice	7.15	6.87	0.15
BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	C	From Leg	1.00	0.0000	185.00	No Ice	5.75	4.74	0.04
			0.00			1/2" Ice	6.48	5.88	0.10
			0.00			1" Ice	7.15	6.87	0.15
(2) FD9R6004/2C-3L (5.8x6.5x1.5)	A	From Leg	1.00	0.0000	185.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L (5.8x6.5x1.5)	B	From Leg	1.00	0.0000	185.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L (5.8x6.5x1.5)	C	From Leg	1.00	0.0000	185.00	No Ice	0.31	0.08	0.00
			0.00			1/2" Ice	0.39	0.12	0.01
			0.00			1" Ice	0.47	0.17	0.01
/-120									
(2) SBNHH-1D65B w/mount pipe (72x11.85x7.1)	A	From Leg	3.00	0.0000	120.00	No Ice	8.53	7.24	0.08
			0.00			1/2" Ice	9.19	8.52	0.15
			0.00			1" Ice	9.82	9.66	0.23
SBNHH-1D65B w/mount pipe (72x11.85x7.1)	B	From Leg	3.00	0.0000	120.00	No Ice	8.53	7.24	0.08
			0.00			1/2" Ice	9.19	8.52	0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	9.82	9.66	0.23
SBNHH-1D65B w/mount pipe (72x11.85x7.1)	C	From Leg	3.00	0.0000	120.00	No Ice	8.53	7.24	0.08
			0.00			1/2" Ice	9.19	8.52	0.15
			0.00			1" Ice	9.82	9.66	0.23
SBNHH-1D45B w/mount pipe (76.8x22.3x12.2)	B	From Leg	3.00	0.0000	120.00	No Ice	15.15	10.81	0.13
			0.00			1/2" Ice	15.85	12.12	0.24
			0.00			1" Ice	16.53	13.28	0.37
SBNHH-1D45B w/mount pipe (76.8x22.3x12.2)	C	From Leg	3.00	0.0000	120.00	No Ice	15.15	10.81	0.13
			0.00			1/2" Ice	15.85	12.12	0.24
			0.00			1" Ice	16.53	13.28	0.37
MT6407-77A w/mount pipe (35.12x16.06x5.51)	A	From Leg	3.00	0.0000	120.00	No Ice	5.91	3.74	0.12
			0.00			1/2" Ice	6.72	4.79	0.17
			0.00			1" Ice	7.44	5.70	0.22
MT6407-77A w/mount pipe (35.12x16.06x5.51)	B	From Leg	3.00	0.0000	120.00	No Ice	5.91	3.74	0.12
			0.00			1/2" Ice	6.72	4.79	0.17
			0.00			1" Ice	7.44	5.70	0.22
MT6407-77A w/mount pipe (35.12x16.06x5.51)	C	From Leg	3.00	0.0000	120.00	No Ice	5.91	3.74	0.12
			0.00			1/2" Ice	6.72	4.79	0.17
			0.00			1" Ice	7.44	5.70	0.22
B2/B66A RRH-BR049 (RFV01U-D1A) (15x15x10)	A	From Leg	3.00	0.0000	120.00	No Ice	1.88	1.25	0.08
			0.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.54	0.12
B2/B66A RRH-BR049 (RFV01U-D1A) (15x15x10)	B	From Leg	3.00	0.0000	120.00	No Ice	1.88	1.25	0.08
			0.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.54	0.12
B2/B66A RRH-BR049 (RFV01U-D1A) (15x15x10)	C	From Leg	3.00	0.0000	120.00	No Ice	1.88	1.25	0.08
			0.00			1/2" Ice	2.05	1.39	0.10
			0.00			1" Ice	2.22	1.54	0.12
B5/B13 RRH-BR04C (RFV01U-D2A) (15x15x8.1)	A	From Leg	3.00	0.0000	120.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
B5/B13 RRH-BR04C (RFV01U-D2A) (15x15x8.1)	B	From Leg	3.00	0.0000	120.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
B5/B13 RRH-BR04C (RFV01U-D2A) (15x15x8.1)	C	From Leg	3.00	0.0000	120.00	No Ice	1.88	1.01	0.07
			0.00			1/2" Ice	2.05	1.14	0.09
			0.00			1" Ice	2.22	1.28	0.11
DB-T1-6Z-8AB-0Z (24x24x10)	B	From Leg	3.00	0.0000	120.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z (24x24x10)	C	From Leg	3.00	0.0000	120.00	No Ice	4.80	2.00	0.04
			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
(2) KA-6030 (10.6x10.9x3.15)	A	From Leg	3.00	0.0000	120.00	No Ice	0.96	0.29	0.02
			0.00			1/2" Ice	1.09	0.36	0.02
			0.00			1" Ice	1.22	0.45	0.03
(2) KA-6030 (10.6x10.9x3.15)	B	From Leg	3.00	0.0000	120.00	No Ice	0.96	0.29	0.02
			0.00			1/2" Ice	1.09	0.36	0.02
			0.00			1" Ice	1.22	0.45	0.03
(2) KA-6030 (10.6x10.9x3.15)	C	From Leg	3.00	0.0000	120.00	No Ice	0.96	0.29	0.02
			0.00			1/2" Ice	1.09	0.36	0.02
			0.00			1" Ice	1.22	0.45	0.03
(2) Empty Pipe Mount	A	From Leg	3.00	0.0000	120.00	No Ice	1.90	1.90	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.70	2.70	0.04
			0.00			1" Ice	3.30	3.30	0.06
(2) Empty Pipe Mount	B	From Leg	3.00	0.0000	120.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.70	2.70	0.04
			0.00			1" Ice	3.30	3.30	0.06
(2) Empty Pipe Mount	C	From Leg	3.00	0.0000	120.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.70	2.70	0.04
			0.00			1" Ice	3.30	3.30	0.06
Sector Mount (SM 309)	A	From Leg	1.50	0.0000	120.00	No Ice	13.18	8.04	0.16
			0.00			1/2" Ice	18.53	11.44	0.32
			0.00			1" Ice	23.88	14.84	0.48
Sector Mount (SM 309)	B	From Leg	1.50	0.0000	120.00	No Ice	13.18	8.04	0.16
			0.00			1/2" Ice	18.53	11.44	0.32
			0.00			1" Ice	23.88	14.84	0.48
Sector Mount (SM 309)	C	From Leg	1.50	0.0000	120.00	No Ice	13.18	8.04	0.16
			0.00			1/2" Ice	18.53	11.44	0.32
			0.00			1" Ice	23.88	14.84	0.48
/-169									
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	A	From Leg	3.00	0.0000	169.00	No Ice	20.24	10.63	0.15
			0.00			1/2" Ice	20.89	12.06	0.28
			0.00			1" Ice	21.55	13.34	0.43
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	B	From Leg	3.00	0.0000	169.00	No Ice	20.24	10.63	0.15
			0.00			1/2" Ice	20.89	12.06	0.28
			0.00			1" Ice	21.55	13.34	0.43
APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	C	From Leg	3.00	0.0000	169.00	No Ice	20.24	10.63	0.15
			0.00			1/2" Ice	20.89	12.06	0.28
			0.00			1" Ice	21.55	13.34	0.43
Air 6419 B41 (34.5" x 20" x 8") w/ mount pipe	A	From Leg	3.00	0.0000	169.00	No Ice	6.97	4.35	0.10
			0.00			1/2" Ice	7.80	5.41	0.16
			0.00			1" Ice	8.55	6.33	0.22
Air 6419 B41 (34.5" x 20" x 8") w/ mount pipe	B	From Leg	3.00	0.0000	169.00	No Ice	6.97	4.35	0.10
			0.00			1/2" Ice	7.80	5.41	0.16
			0.00			1" Ice	8.55	6.33	0.22
Air 6419 B41 (34.5" x 20" x 8") w/ mount pipe	C	From Leg	3.00	0.0000	169.00	No Ice	6.97	4.35	0.10
			0.00			1/2" Ice	7.80	5.41	0.16
			0.00			1" Ice	8.55	6.33	0.22
VV-65A-R1 (54.72" x 12.08" x 4.64") w/ mount pipe	A	From Leg	3.00	0.0000	169.00	No Ice	6.74	4.65	0.05
			0.00			1/2" Ice	7.46	5.82	0.11
			0.00			1" Ice	8.12	6.84	0.17
VV-65A-R1 (54.72" x 12.08" x 4.64") w/ mount pipe	B	From Leg	3.00	0.0000	169.00	No Ice	6.74	4.65	0.05
			0.00			1/2" Ice	7.46	5.82	0.11
			0.00			1" Ice	8.12	6.84	0.17
VV-65A-R1 (54.72" x 12.08" x 4.64") w/ mount pipe	C	From Leg	3.00	0.0000	169.00	No Ice	6.74	4.65	0.05
			0.00			1/2" Ice	7.46	5.82	0.11
			0.00			1" Ice	8.12	6.84	0.17
72" x 12" Panel (72" x 12" x 6") w/ mount pipe	A	From Leg	3.00	0.0000	169.00	No Ice	8.61	6.60	0.07
			0.00			1/2" Ice	9.27	7.88	0.14
			0.00			1" Ice	9.90	9.00	0.22
72" x 12" Panel (72" x 12" x 6") w/ mount pipe	B	From Leg	3.00	0.0000	169.00	No Ice	8.61	6.60	0.07
			0.00			1/2" Ice	9.27	7.88	0.14
			0.00			1" Ice	9.90	9.00	0.22
72" x 12" Panel (72" x 12" x 6") w/ mount pipe	C	From Leg	3.00	0.0000	169.00	No Ice	8.61	6.60	0.07
			0.00			1/2" Ice	9.27	7.88	0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	9.90	9.00	0.22
4480 B71 + B85 (19.2" x 15.1" x 7.5")	A	From Leg	3.00	0.0000	169.00	No Ice	2.42	1.20	0.09
			0.00			1/2" Ice	2.61	1.35	0.11
			0.00			1" Ice	2.81	1.51	0.13
4480 B71 + B85 (19.2" x 15.1" x 7.5")	B	From Leg	3.00	0.0000	169.00	No Ice	2.42	1.20	0.09
			0.00			1/2" Ice	2.61	1.35	0.11
			0.00			1" Ice	2.81	1.51	0.13
4480 B71 + B85 (19.2" x 15.1" x 7.5")	C	From Leg	3.00	0.0000	169.00	No Ice	2.42	1.20	0.09
			0.00			1/2" Ice	2.61	1.35	0.11
			0.00			1" Ice	2.81	1.51	0.13
4460 B25 B66 (19.56" x 15.74" x 12.08")	A	From Leg	3.00	0.0000	169.00	No Ice	2.57	1.97	0.11
			0.00			1/2" Ice	2.77	2.15	0.13
			0.00			1" Ice	2.97	2.34	0.16
4460 B25 B66 (19.56" x 15.74" x 12.08")	B	From Leg	3.00	0.0000	169.00	No Ice	2.57	1.97	0.11
			0.00			1/2" Ice	2.77	2.15	0.13
			0.00			1" Ice	2.97	2.34	0.16
4460 B25 B66 (19.56" x 15.74" x 12.08")	C	From Leg	3.00	0.0000	169.00	No Ice	2.57	1.97	0.11
			0.00			1/2" Ice	2.77	2.15	0.13
			0.00			1" Ice	2.97	2.34	0.16
Sector Mount (SM 309)	A	From Leg	1.50	0.0000	169.00	No Ice	13.18	8.04	0.16
			0.00			1/2" Ice	18.53	11.44	0.32
			0.00			1" Ice	23.88	14.84	0.48
Sector Mount (SM 309)	B	From Leg	1.50	0.0000	169.00	No Ice	13.18	8.04	0.16
			0.00			1/2" Ice	18.53	11.44	0.32
			0.00			1" Ice	23.88	14.84	0.48
Sector Mount (SM 309)	C	From Leg	1.50	0.0000	169.00	No Ice	13.18	8.04	0.16
			0.00			1/2" Ice	18.53	11.44	0.32
			0.00			1" Ice	23.88	14.84	0.48
/-164									
DB586-Y (52.56x2.5x2.5)	C	From Leg	2.00	0.0000	164.00	No Ice	1.01	1.01	0.01
			0.00			1/2" Ice	1.28	1.28	0.01
			3.00			1" Ice	1.56	1.56	0.01
LGP104 (7x1.2x4)	C	From Leg	2.00	0.0000	164.00	No Ice	0.08	0.23	0.01
			0.00			1/2" Ice	0.13	0.30	0.01
			3.00			1" Ice	0.18	0.37	0.01
Side Arm (Commscope S-200)	C	From Leg	1.00	0.0000	164.00	No Ice	0.46	0.91	0.02
			0.00			1/2" Ice	0.65	1.30	0.03
			0.00			1" Ice	0.84	1.69	0.04
/-161									
BA1312-0 (104x2x2)	A	From Leg	4.00	0.0000	161.00	No Ice	1.73	1.73	0.00
			0.00			1/2" Ice	2.63	2.63	0.02
			4.00			1" Ice	3.53	3.53	0.04
Side Arm (Commscope S-400)	A	From Leg	2.00	0.0000	161.00	No Ice	0.81	3.31	0.06
			0.00			1/2" Ice	1.30	5.00	0.08
			0.00			1" Ice	1.79	6.69	0.11
/-159									
458-2 (159.6x2.8x2.8)	A	From Leg	4.00	0.0000	159.90	No Ice	3.72	3.72	0.02
			0.00			1/2" Ice	5.09	5.09	0.05
			6.60			1" Ice	6.46	6.46	0.08
Side Arm (Commscope S-400)	A	From Leg	2.00	0.0000	159.90	No Ice	0.81	3.31	0.06
			0.00			1/2" Ice	1.30	5.00	0.08
			0.00			1" Ice	1.79	6.69	0.11
/-152									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
876F-70-2HSMP40DF1/2	B	From Leg	4.00	0.0000	152.00	No Ice	7.50	7.50	0.13
			0.00			1/2" Ice	10.13	10.13	0.18
			11.60			1" Ice	12.75	12.75	0.22
Side Arm (Site Pro 1 USF-4U)	B	From Leg	2.00	0.0000	152.00	No Ice	1.78	3.79	0.13
			0.00			1/2" Ice	2.24	4.47	0.15
			0.00			1" Ice	2.70	5.15	0.18
/-130									
220-3AN (248x2.75x2.75)	C	From Leg	6.00	0.0000	130.00	No Ice	5.68	5.68	0.02
			0.00			1/2" Ice	7.78	7.78	0.07
			10.40			1" Ice	9.90	9.90	0.12
Side Arm (Commscope S-600)	C	From Leg	3.00	0.0000	130.00	No Ice	1.08	5.31	0.12
			0.00			1/2" Ice	1.63	7.57	0.16
			0.00			1" Ice	2.18	9.83	0.20
220-7N (228x2.8x2.8)	A	From Leg	6.00	0.0000	130.00	No Ice	5.32	5.32	0.02
			0.00			1/2" Ice	7.25	7.25	0.06
			9.50			1" Ice	9.20	9.20	0.11
220-7N (228x2.8x2.8)	A	From Leg	6.00	0.0000	130.00	No Ice	5.32	5.32	0.02
			0.00			1/2" Ice	7.25	7.25	0.06
			9.50			1" Ice	9.20	9.20	0.11
Side Arm (Commscope S-600)	A	From Leg	3.00	0.0000	130.00	No Ice	1.08	5.31	0.12
			0.00			1/2" Ice	1.63	7.57	0.16
			0.00			1" Ice	2.18	9.83	0.20
CO-36A (144x0.63x0.63)	B	From Leg	4.00	0.0000	130.00	No Ice	0.76	0.76	0.01
			0.00			1/2" Ice	1.97	1.97	0.02
			7.00			1" Ice	3.20	3.20	0.04
CO-36A (144x0.63x0.63)	B	From Leg	4.00	0.0000	130.00	No Ice	0.76	0.76	0.01
			0.00			1/2" Ice	1.97	1.97	0.02
			7.00			1" Ice	3.20	3.20	0.04
Side Arm (Wireless Solutions WS-400)	B	From Leg	2.00	0.0000	130.00	No Ice	0.81	3.31	0.06
			0.00			1/2" Ice	1.30	5.00	0.08
			0.00			1" Ice	1.79	6.69	0.11
/-107									
MX08FRO665-21 (72x20x8)	A	From Leg	3.00	0.0000	107.00	No Ice	12.49	5.87	0.06
			0.00			1/2" Ice	12.99	6.32	0.14
			0.00			1" Ice	13.49	6.79	0.22
MX08FRO665-21 (72x20x8)	B	From Leg	3.00	0.0000	107.00	No Ice	12.49	5.87	0.06
			0.00			1/2" Ice	12.99	6.32	0.14
			0.00			1" Ice	13.49	6.79	0.22
MX08FRO665-21 (72x20x8)	C	From Leg	3.00	0.0000	107.00	No Ice	12.49	5.87	0.06
			0.00			1/2" Ice	12.99	6.32	0.14
			0.00			1" Ice	13.49	6.79	0.22
TA08025-B605 (15.75x14.96x9.05)	A	From Leg	3.00	0.0000	107.00	No Ice	1.96	1.19	0.07
			0.00			1/2" Ice	2.14	1.33	0.09
			0.00			1" Ice	2.32	1.48	0.11
TA08025-B605 (15.75x14.96x9.05)	B	From Leg	3.00	0.0000	107.00	No Ice	1.96	1.19	0.07
			0.00			1/2" Ice	2.14	1.33	0.09
			0.00			1" Ice	2.32	1.48	0.11
TA08025-B605 (15.75x14.96x9.05)	C	From Leg	3.00	0.0000	107.00	No Ice	1.96	1.19	0.07
			0.00			1/2" Ice	2.14	1.33	0.09
			0.00			1" Ice	2.32	1.48	0.11
TA08025-B604 (15.75x14.96x7.87)	A	From Leg	3.00	0.0000	107.00	No Ice	1.96	1.03	0.06
			0.00			1/2" Ice	2.14	1.17	0.08
			0.00			1" Ice	2.32	1.31	0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
TA08025-B604	B	From Leg	3.00	0.0000	107.00	No Ice	1.96	1.03	0.06
(15.75x14.96x7.87)			0.00			1/2" Ice	2.14	1.17	0.08
			0.00			1" Ice	2.32	1.31	0.10
TA08025-B604	C	From Leg	3.00	0.0000	107.00	No Ice	1.96	1.03	0.06
(15.75x14.96x7.87)			0.00			1/2" Ice	2.14	1.17	0.08
			0.00			1" Ice	2.32	1.31	0.10
RDIDC-9181-PF-48	A	From Leg	3.00	0.0000	107.00	No Ice	2.01	1.17	0.02
(16.57x14.57x8.46)			0.00			1/2" Ice	2.19	1.31	0.04
			0.00			1" Ice	2.37	1.46	0.06
Sector Mount (Commscope	A	From Leg	1.50	0.0000	107.00	No Ice	10.60	8.10	0.41
MTC3975083)			0.00			1/2" Ice	16.40	12.60	0.56
			0.00			1" Ice	22.20	17.10	0.70
Sector Mount (Commscope	B	From Leg	1.50	0.0000	107.00	No Ice	10.60	8.10	0.41
MTC3975083)			0.00			1/2" Ice	16.40	12.60	0.56
			0.00			1" Ice	22.20	17.10	0.70
Sector Mount (Commscope	C	From Leg	1.50	0.0000	107.00	No Ice	10.60	8.10	0.41
MTC3975083)			0.00			1/2" Ice	16.40	12.60	0.56
			0.00			1" Ice	22.20	17.10	0.70

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice

Comb. No.	Description
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	196 - 188	3.747	43	0.1627	0.0153
T2	188 - 168	3.474	43	0.1626	0.0155
T3	168 - 160	2.795	43	0.1578	0.0158
T4	160 - 140	2.529	43	0.1509	0.0157
T5	140 - 120	1.921	43	0.1279	0.0115
T6	120 - 100	1.415	43	0.1061	0.0099
T7	100 - 80	0.984	43	0.0873	0.0092
T8	80 - 60	0.634	43	0.0667	0.0077
T9	60 - 40	0.370	43	0.0484	0.0061
T10	40 - 20	0.177	43	0.0317	0.0041
T11	20 - 0	0.057	43	0.0139	0.0021

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.00	Lightning Rod	43	3.747	0.1627	0.0153	Inf
188.00	SL2	43	3.474	0.1626	0.0155	Inf
185.00	BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	43	3.371	0.1625	0.0156	929850
169.00	APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	43	2.829	0.1584	0.0158	223502
168.00	SL3	43	2.795	0.1578	0.0158	194192
164.00	DB586-Y (52.56x2.5x2.5)	43	2.661	0.1547	0.0158	101189
161.00	BA1312-0 (104x2x2)	43	2.562	0.1519	0.0158	71037
160.00	SL4	43	2.529	0.1509	0.0157	65906
159.90	458-2 (159.6x2.8x2.8)	43	2.526	0.1508	0.0157	65484
152.00	876F-70-2HSMP40DF1/2	43	2.274	0.1422	0.0144	51384
140.00	SL5	43	1.921	0.1279	0.0115	40986
130.00	220-3AN (248x2.75x2.75)	43	1.657	0.1165	0.0101	52884
120.00	(2) SBNHH-1D65B w/mount pipe (72x11.85x7.1)	43	1.415	0.1061	0.0099	75734
107.00	MX08FRO665-21 (72x20x8)	43	1.127	0.0939	0.0096	63726
100.00	SL7	43	0.984	0.0873	0.0092	57784
80.00	SL8	43	0.634	0.0667	0.0077	52572
60.00	SL9	43	0.370	0.0484	0.0061	73536
40.00	SL10	43	0.177	0.0317	0.0041	64870
20.00	SL11	43	0.057	0.0139	0.0021	65106

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	196 - 188	15.070	10	0.6562	0.0621
T2	188 - 168	13.968	10	0.6556	0.0631
T3	168 - 160	11.231	10	0.6365	0.0642
T4	160 - 140	10.159	10	0.6087	0.0638

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T5	140 - 120	7.704	10	0.5154	0.0467
T6	120 - 100	5.668	10	0.4271	0.0404
T7	100 - 80	3.933	10	0.3505	0.0376
T8	80 - 60	2.528	10	0.2675	0.0314
T9	60 - 40	1.474	10	0.1938	0.0246
T10	40 - 20	0.702	10	0.1264	0.0165
T11	20 - 0	0.223	10	0.0554	0.0086

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
196.00	Lightning Rod	10	15.070	0.6562	0.0621	679832
188.00	SL2	10	13.968	0.6556	0.0631	396004
185.00	BXA-80080/4CF w/mount pipe (48.2x11.2x5.9)	10	13.555	0.6553	0.0633	254178
169.00	APXVAALL24_43-U-NA20 (95.9" x 24" x 8.5") w/ mount pipe	10	11.367	0.6390	0.0641	56125
168.00	SL3	10	11.231	0.6365	0.0642	48400
164.00	DB586-Y (52.56x2.5x2.5)	10	10.691	0.6240	0.0644	24983
161.00	BA1312-0 (104x2x2)	10	10.291	0.6128	0.0641	17816
160.00	SL4	10	10.159	0.6087	0.0638	16543
159.90	458-2 (159.6x2.8x2.8)	10	10.146	0.6083	0.0638	16438
152.00	876F-70-2HSMP40DF1/2	10	9.131	0.5733	0.0585	12703
140.00	SL5	10	7.704	0.5154	0.0467	10153
130.00	220-3AN (248x2.75x2.75)	10	6.640	0.4692	0.0412	13034
120.00	(2) SBNHH-1D65B w/mount pipe (72x11.85x7.1)	10	5.668	0.4271	0.0404	18474
107.00	MX08FRO665-21 (72x20x8)	10	4.506	0.3775	0.0389	15635
100.00	SL7	10	3.933	0.3505	0.0376	14220
80.00	SL8	10	2.528	0.2675	0.0314	13012
60.00	SL9	10	1.474	0.1938	0.0246	18236
40.00	SL10	10	0.702	0.1264	0.0165	16171
20.00	SL11	10	0.223	0.0554	0.0086	16271

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	196	Leg	A325N	0.7500	4	0.09	30.10	0.003 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	0.27	5.81	0.046 ✔	1	Member Block Shear
		Top Girt	A325N	0.6250	1	0.02	5.81	0.003 ✔	1	Member Block Shear
T2	188	Leg	A325N	0.8750	4	1.64	41.56	0.039 ✔	1	Bolt Tension

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
		Diagonal	A325N	0.6250	1	1.70	9.11	0.186 ✔	1	Member Block Shear
T3	168	Leg	A325N	0.8750	4	3.91	41.56	0.094 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.17	9.11	0.348 ✔	1	Member Block Shear
T4	160	Leg	A325N	0.8750	4	9.62	41.56	0.231 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.30	6.83	0.483 ✔	1	Member Block Shear
T5	140	Leg	A325N	1.0000	4	14.82	54.52	0.272 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4.33	10.44	0.414 ✔	1	Member Bearing
T6	120	Leg	A325N	1.0000	6	14.27	54.52	0.262 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	6.19	11.96	0.518 ✔	1	Member Block Shear
T7	100	Leg	A325N	1.0000	6	19.26	54.52	0.353 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	7.04	12.62	0.558 ✔	1	Member Bearing
T8	80	Leg	A325N	1.0000	8	17.57	54.52	0.322 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	7.76	12.62	0.615 ✔	1	Member Bearing
T9	60	Leg	A325N	1.0000	8	20.84	54.52	0.382 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8.59	12.62	0.681 ✔	1	Member Bearing
T10	40	Leg	A325N	1.0000	8	24.05	54.52	0.441 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	9.19	12.62	0.729 ✔	1	Member Bearing
T11	20	Diagonal	A325N	0.7500	1	9.91	12.62	0.786 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	196 - 188	ROHN 3 STD	8.00	4.00	41.3 K=1.00	2.2285	-0.74	88.55	0.008 [1] ✔
T2	188 - 168	ROHN 3 STD	20.00	4.00	41.3 K=1.00	2.2285	-9.49	88.55	0.107 [1] ✔
T3	168 - 160	ROHN 3 STD	8.00	4.00	41.3 K=1.00	2.2285	-20.23	88.55	0.229 [1] ✔
T4	160 - 140	ROHN 3 EH	20.04	5.01	52.9 K=1.00	3.0159	-46.12	110.61	0.417 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	140 - 120	ROHN 4 EH	20.04	6.68	54.3 K=1.00	4.4074	-69.88	159.91	0.437 [1] ✔
T6	120 - 100	ROHN 5 EH	20.04	6.68	43.6 K=1.00	6.1120	-103.00	239.38	0.430 [1] ✔
T7	100 - 80	ROHN 6 EHS	20.03	6.68	36.0 K=1.00	6.7133	-137.61	274.78	0.501 [1] ✔
T8	80 - 60	ROHN 6 EH	20.04	10.02	54.8 K=1.00	8.4049	-167.15	303.72	0.550 [1] ✔
T9	60 - 40	ROHN 8 EHS	20.03	10.02	41.2 K=1.00	9.7193	-198.53	386.39	0.514 [1] ✔
T10	40 - 20	ROHN 8 EHS	20.03	10.02	41.2 K=1.00	9.7193	-229.81	386.40	0.595 [1] ✔
T11	20 - 0	ROHN 8 EH	20.03	10.02	41.8 K=1.00	12.7627	-260.69	505.56	0.516 [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	196 - 188	L1 3/4x1 3/4x3/16	7.72	3.57	124.7 K=1.00	0.6211	-0.28	11.42	0.025 [1] ✔
T2	188 - 168	L2x2x1/4	7.72	3.57	112.2 K=1.02	0.9380	-1.84	20.41	0.090 [1] ✔
T3	168 - 160	L2x2x1/4	7.77	3.61	113.1 K=1.02	0.9380	-3.22	20.19	0.159 [1] ✔
T4	160 - 140	L2x2x3/16	9.86	4.79	146.0 K=1.00	0.7150	-3.28	9.60	0.341 [1] ✔
T5	140 - 120	L2 1/2x2 1/2x1/4	12.43	6.08	148.5 K=1.00	1.1900	-4.63	15.45	0.300 [1] ✔
T6	120 - 100	L2 1/2x2 1/2x1/4	14.23	6.92	169.0 K=1.00	1.1900	-6.40	11.92	0.537 [1] ✔
T7	100 - 80	L3x3x1/4	15.99	7.73	156.7 K=1.00	1.4400	-7.04	16.78	0.419 [1] ✔
T8	80 - 60	L3 1/2x3 1/2x1/4	19.26	9.48	164.0 K=1.00	1.6900	-7.76	17.99	0.432 [1] ✔
T9	60 - 40	L3 1/2x3 1/2x1/4	21.03	10.26	177.3 K=1.00	1.6900	-8.68	15.38	0.565 [1] ✔
T10	40 - 20	L4x4x1/4	22.81	11.15	168.3 K=1.00	1.9400	-9.33	19.61	0.476 [1] ✔
T11	20 - 0	L4x4x1/4	24.62	12.06	182.0 K=1.00	1.9400	-10.24	16.77	0.611 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	196 - 188	L1 3/4x1 3/4x3/16	6.60	6.07	212.2 K=1.00	0.6211	-0.04	3.95	0.009 [1] ✔
T4	160 - 140	KL/R > 200 (C) - 5 L1 3/4x1 3/4x3/16	6.69	6.40	183.6 K=0.82	0.6211	-0.80	5.27	0.152 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	196 - 188	ROHN 3 STD	8.00	4.00	41.3	2.2285	0.38	100.28	0.004 [1] ✔
T2	188 - 168	ROHN 3 STD	20.00	4.00	41.3	2.2285	6.56	100.28	0.065 [1] ✔
T3	168 - 160	ROHN 3 STD	8.00	4.00	41.3	2.2285	15.64	100.28	0.156 [1] ✔
T4	160 - 140	ROHN 3 EH	20.04	5.01	52.9	3.0159	38.47	135.72	0.283 [1] ✔
T5	140 - 120	ROHN 4 EH	20.04	6.68	54.3	4.4074	59.29	198.34	0.299 [1] ✔
T6	120 - 100	ROHN 5 EH	20.04	6.68	43.6	6.1120	85.65	275.04	0.311 [1] ✔
T7	100 - 80	ROHN 6 EHS	20.03	6.68	36.0	6.7133	115.58	302.10	0.383 [1] ✔
T8	80 - 60	ROHN 6 EH	20.04	10.02	54.8	8.4049	140.56	378.22	0.372 [1] ✔
T9	60 - 40	ROHN 8 EHS	20.03	10.02	41.2	9.7193	166.74	437.37	0.381 [1] ✔
T10	40 - 20	ROHN 8 EHS	20.03	10.02	41.2	9.7193	192.40	437.37	0.440 [1] ✔
T11	20 - 0	ROHN 8 EH	20.03	10.02	41.8	12.7627	217.12	574.32	0.378 [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	196 - 188	L1 3/4x1 3/4x3/16	7.72	3.57	82.5	0.3604	0.27	15.68	0.017 [1] ✔
T2	188 - 168	L2x2x1/4	7.72	3.57	72.7	0.5629	1.70	24.49	0.069 [1] ✔
T3	168 - 160	L2x2x1/4	7.77	3.61	73.5	0.5629	3.17	24.49	0.129 [1] ✔
T4	160 - 140	L2x2x3/16	9.86	4.79	95.5	0.4308	3.30	18.74	0.176 [1] ✔
T5	140 - 120	L2 1/2x2 1/2x1/4	12.43	6.08	96.7	0.7519	4.33	32.71	0.132 [1] ✔
T6	120 - 100	L2 1/2x2 1/2x1/4	14.23	6.92	110.0	0.7284	6.19	31.69	0.195 [1] ✔
T7	100 - 80	L3x3x1/4	15.99	7.73	101.5	0.9159	7.04	39.84	0.177 [1] ✔
T8	80 - 60	L3 1/2x3 1/2x1/4	19.26	9.48	105.9	1.1034	7.76	48.00	0.162 [1] ✔
T9	60 - 40	L3 1/2x3 1/2x1/4	21.03	10.26	114.4	1.1034	8.59	48.00	0.179 [1] ✔
T10	40 - 20	L4x4x1/4	22.81	11.15	108.3	1.2909	9.19	56.16	0.164 [1] ✔
T11	20 - 0	L4x4x1/4	24.62	12.06	117.0	1.2909	9.91	56.16	0.177 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	196 - 188	L1 3/4x1 3/4x3/16	6.60	6.07	141.1	0.3604	0.02	15.68	0.001 [1] ✔
T4	160 - 140	L1 3/4x1 3/4x3/16	6.69	6.40	142.9	0.6211	0.80	20.12	0.040 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	196 - 188	Leg	ROHN 3 STD	1	-0.74	88.55	0.8	Pass
T2	188 - 168	Leg	ROHN 3 STD	19	-9.49	88.55	10.7	Pass
T3	168 - 160	Leg	ROHN 3 STD	52	-20.23	88.55	22.9	Pass
T4	160 - 140	Leg	ROHN 3 EH	68	-46.12	110.61	41.7	Pass
T5	140 - 120	Leg	ROHN 4 EH	98	-69.88	159.91	43.7	Pass
T6	120 - 100	Leg	ROHN 5 EH	119	-103.00	239.38	43.0	Pass
T7	100 - 80	Leg	ROHN 6 EHS	140	-137.61	274.78	50.1	Pass
T8	80 - 60	Leg	ROHN 6 EH	161	-167.15	303.72	55.0	Pass
T9	60 - 40	Leg	ROHN 8 EHS	176	-198.53	386.39	51.4	Pass
T10	40 - 20	Leg	ROHN 8 EHS	191	-229.81	386.40	59.5	Pass
T11	20 - 0	Leg	ROHN 8 EH	206	-260.69	505.56	51.6	Pass
T1	196 - 188	Diagonal	L1 3/4x1 3/4x3/16	8	-0.28	11.42	2.5 4.6 (b)	Pass
T2	188 - 168	Diagonal	L2x2x1/4	22	-1.84	20.41	9.0 18.6 (b)	Pass
T3	168 - 160	Diagonal	L2x2x1/4	56	-3.22	20.19	15.9 34.8 (b)	Pass
T4	160 - 140	Diagonal	L2x2x3/16	75	-3.28	9.60	34.1 48.3 (b)	Pass
T5	140 - 120	Diagonal	L2 1/2x2 1/2x1/4	102	-4.63	15.45	30.0 41.4 (b)	Pass
T6	120 - 100	Diagonal	L2 1/2x2 1/2x1/4	123	-6.40	11.92	53.7	Pass
T7	100 - 80	Diagonal	L3x3x1/4	142	-7.04	16.78	41.9 55.8 (b)	Pass
T8	80 - 60	Diagonal	L3 1/2x3 1/2x1/4	163	-7.76	17.99	43.2 61.5 (b)	Pass
T9	60 - 40	Diagonal	L3 1/2x3 1/2x1/4	178	-8.68	15.38	56.5 68.1 (b)	Pass
T10	40 - 20	Diagonal	L4x4x1/4	193	-9.33	19.61	47.6 72.9 (b)	Pass
T11	20 - 0	Diagonal	L4x4x1/4	210	-10.24	16.77	61.1 78.6 (b)	Pass
T1	196 - 188	Top Girt	L1 3/4x1 3/4x3/16	5	-0.04	3.95	0.9	Pass
T4	160 - 140	Top Girt	L1 3/4x1 3/4x3/16	70	-0.80	5.27	15.2	Pass
							Summary	
						Leg (T10)	59.5	Pass
						Diagonal (T11)	78.6	Pass
						Top Girt (T4)	15.2	Pass
						Bolt Checks	78.6	Pass
						RATING =	**78.6**	**Pass**

Loading for Seismic Analysis - Rev H (2.7.7.1 Equivalent Lateral Force Procedure) *V3.0 - 03/13/2020*

Project# : CT06462-VTA-082323 Analysis complete

Tower Data		Structure Date			
Tower type :	SST	Risk category :	II	I =	1.00
Height (ft) :	196	Site class :	D (default)	F_a =	1.60
Base face width (ft) :	23	Seismic Date		F_v =	2.40
Number of sections :	11	Short period (S_s):	0.192	T (sec) =	0.73
		1sec period (S_1) :	0.055	R =	3.00
		Long period transition (T_L) (Fig B-19):	6	Ke =	1.11
				C_s =	0.06
				V_s (kip) =	2.64
				Ts (sec) =	0.43

Note:

1: Get self weight & add weight (feedline) from "Mast Forces table (tnxTower Reports)"

2: Get appurtenance weight from "Appurt. Pressure table (tnxTower Reports)"

3: Get the guy weight from "WEIGHTAUXDATA" excel file from the tnx out put files

								Tnx User Forces	
Section	Top Elev	Top width	Self Weight	Add Weight (feedline)	Appurtenance Weight	Guy Weight	Total Weight	E_h (F_x)	*E_v
	ft	ft	kip	kip	kip	kip	kip	kip	kip
1	196	6.604	0.44	0	0.07		0.51	**0.05**	**0.02**
2	188	6.604	1.25	0.21	2.34		3.80	**0.48**	**0.16**
3	168	6.604	0.50	0.32	0.25		1.07	**0.10**	**0.04**
4	160	6.6875	1.26	0.92	0.19		2.37	**0.24**	**0.10**
5	140	8.76	1.85	0.93	0.38		3.16	**0.28**	**0.13**
6	120	10.83	2.36	1.24	4.07		7.67	**0.63**	**0.31**
7	100	12.92	2.87	1.36			4.23	**0.27**	**0.17**
8	80	14.85	3.17	1.36			4.53	**0.22**	**0.19**
9	60	17	3.58	1.36			4.94	**0.18**	**0.20**
10	40	19	3.95	1.36			5.31	**0.12**	**0.22**
11	20	21	4.75	1.36			6.11	**0.07**	**0.25**
		12.8	*25.98*	*10.42*	*7.3*		*43.7*	*2.64*	

V3.6 - 08/10/2021

Self Support Anchor Bolt Check

Project Information	
SBA Project # :	CT06462-VTA-082323
Code :	H

Leg Reaction			
Uplift(kips):	223	Shear (kips) :	26
Comp(kips):	268	Shear (kips) :	31

Bolt Information	
Quantity :	10
Diameter (in) :	1
Assumed lar (in) :	1
Bolt Fy (ksi) :	109
Bolt Fu (AISC Table 2-6) (ksi):	125
# of threads (AISC Table 7-17) :	8

Grout

☐ 5,000 psi Grout Present

Strength Reduction Factors	
Tension :	0.75
Compression :	0.90
Shear :	0.75
Flexure :	0.9

Bolt Capacity : 39.9% ***Pass***

Tower Engineering Solutions	Mat Foundation Design for Self Supporting Tower			Date
				8/23/2023
	Customer Name:	Verizon / T-Mobile (A-11)1	TIA Standard:	TIA-222-H
	Site Name:	Sutersville	Structure Height (Ft.):	196
	Site Nmber:	PA21882-S-SBA	Engineer Name:	S. Berthomieu
	Engr. Number:		Engineer Login ID:	

Foundation Info Obtained from: Drawings/Calculations

Analysis or Design? Analysis

Number of Tower Legs: 3 Legs

Base Reactions (Factored):

(1). Individual Leg:

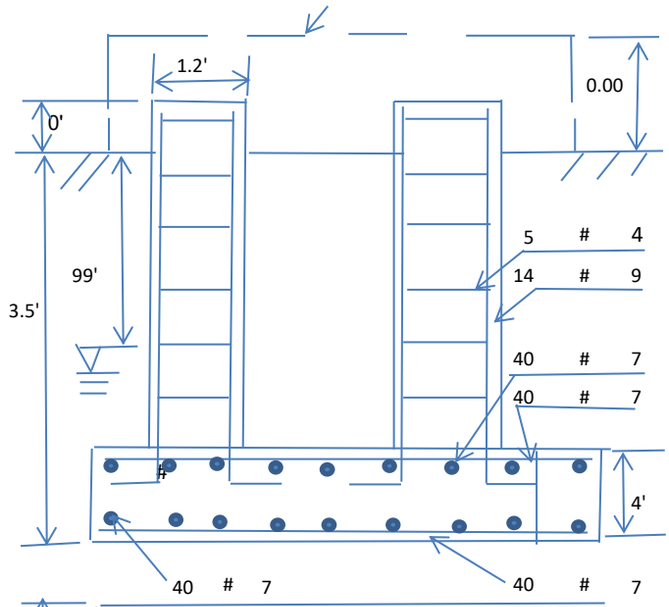
Axial Load (Kips):	268.0	Uplift Force (Kips):	223.0
Shear Force (Kips):	31.0		

(2). Tower Base:

Total Vertical Load (Kips):	52.0	Total Shear Force (Kips):	50.0
Moment (Kips-ft):	4997.0		

Foundation Geometries:

Leg distance (Center-to-Center ft.):		23.0	Mods required -Yes/No ?:	No	
Diameter of Pier (ft.):	Round	1.2	Pier Height A. G. (ft.):	0.00	
Tower center to mat center (ft):		0	Depth of Base BG (ft.):	3.5	
Length of Pad (ft.):		36	Width of Pad (ft.):	36	
Thickness of Pad (ft):		4.00			



Material Properties and Reabr Info:

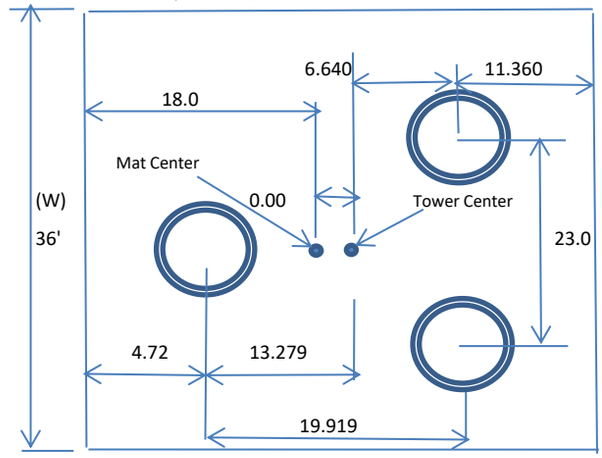
Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	9	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	14	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	7	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

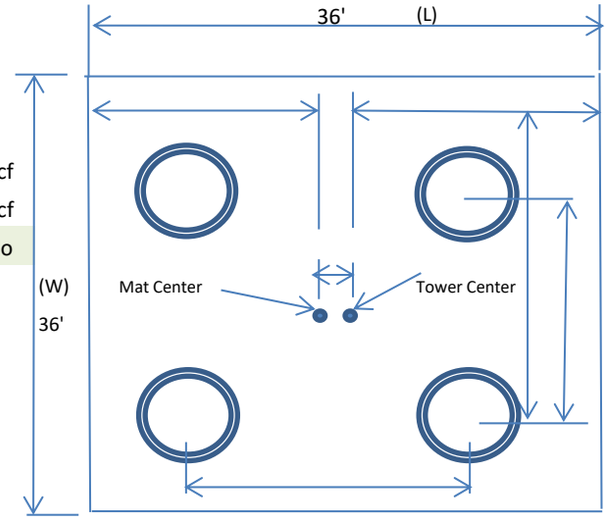
Rebar at the bottom of the concrete pad:

Qty. of Rebar in Pad (L):	40	Qty. of Rebar in Pad (W):	40

Rebar at the top of the concrete pad:

Qty. of Rebar in Pad (L):	40	Qty. of Rebar in Pad (W):	40





Soil Design Parameters:

Soil Unit Weight (pcf):	120.0	Soil Buoyant Weight:	57.6	Pcf
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	4000	Consider ties in concrete shear strength:		No
Consider Soil Lateral Resistance ?	No			

Apply 1.35 for e/w per G/H: 1.35

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 | Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	2.59	Total Dry Soil Weight (Kips):	0.31
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	0.31	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	5184.02	Total Dry Concrete Weight (Kips):	777.60
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	777.60	Total Vertical Load on Base (Kips):	829.91

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1323.50	<	Allowable Factored Soil Bearing (psf):	3000	0.44	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	13538.2	>	Design Factored Momont (kips-ft):	5197	0.38	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.60	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00

(2).Concrete Pad:

					Load/ Capacity Ratio	
One-Way Design Shear Capacity (L or W Direction, Kips):	1581.6	>	One-Way Factored Shear (L/W-Dir Kips)	418.5	0.26	OK!
One-Way Design Shear Capacity (Diagonal Dir., Kips):	1383.5	>	One-Way Factored Shear (Dia. Dir, Kips)	379.4	0.27	OK!
Lower Steel Pad Reinforcement Ratio (L or W-Direct.):	0.0012		Lower Steel Reinf. Ratio (Dia. Dir.):	0.0011		
Lower Steel Pad Moment Capacity (L or W-Dir. Kips-ft):	4742.2	>	Moment at Bottom (L-Direct. K-Ft):	2326.3	0.49	OK!
Lower Steel Pad Moment Capacity (Dia. Direction,K-ft):	4664.6	>	Moment at Bottom (Dia. Dir. K-Ft):	2055.6	0.44	OK!
Upper Steel Pad Reinforcement Ratio (L or W -Direction):	0.0012		Upper Steel Reinf. Ratio (Dia. Dir.):	0.0011		
Upper Steel Pad Moment Capacity (L or W-Dir., Kips-ft):	4742.2	>	Moment at the top (L-Dir Kips-Ft):	1188.3	0.25	OK!
Upper Steel Pad Moment Capacity (Dia. Direction, K-ft):	4664.6	>	Moment at the top (Dia. Dir., K-Ft):	737.0	0.16	OK!
Punching Failure Capacity From Down Load (Kips):	1356.4	>	Punch. Failure Factored Shear (K):	268.0	0.20	OK!
Punching Failure Capacity From Uplift (Kips):	1192.5	>	Punch. Failure Factored Shear (K):	226.0	0.19	OK!

(3). Check Max. eccentricity of Loading:

The maximum eccentricity of Loading:	6.26	ft.	Allowable eccentricity (0.45 W, ft.):	16.2	OK!

Reinforce Concrete Pad by enlarging the size of pier (Yes/No): No

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Section 1 - Site Information

Site ID: CT11505A
Status: Final
Version: 4
Project Type: Anchor
Approved: 03/21/2023 1:35:30 PM
Approved By: Michael.Lucey@T-Mobile.com
Last Modified: 03/21/2023 1:35:30 PM
Last Modified By: Michael.Lucey@T-Mobile.com

Site Name: Wilimantic - Verizon
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Verizon

Latitude: 41.70309
Longitude: -72.221358
Address: 349R Mountain Street
City, State: Willimantic, CT
Region: NORTHEAST

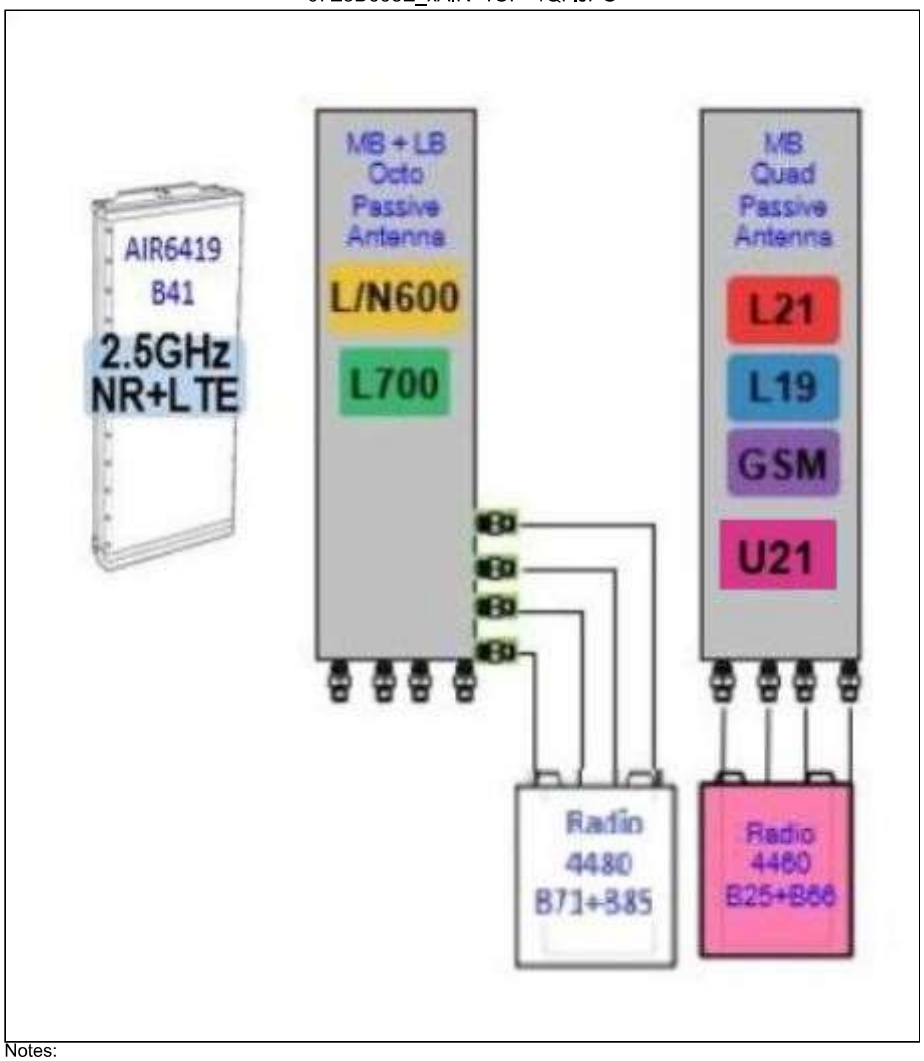
RAN Template: 67D5D998E Outdoor			AL Template: 67D5998E_1xAIR+1OP+1QP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

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

Section 3 - Proposed Template Images

67E5D998E_xAIR+1OP+1QP.JPG



Notes:

Section 4 - Siteplan Images

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

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 792DB Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	Ancillary Equipment (Ericsson)
Radio	RU22 (x 6) U2100 (DECOMMISSIONED)	
Baseband	BB 6630 L700 L1900 L2100 DUG20 G1900 DUW30 U2100 (DECOMMISSIONED) DUW30 U1900 (DECOMMISSIONED)	
Hybrid Cable System		Ericsson 6x12 HCS *Select Length & AWG* Ericsson 9x18 HCS *Select Length*

Proposed RAN Equipment

Template: 67D5D998E Outdoor

Enclosure	1	2	3
Enclosure Type	Enclosure 6160 AC V1	RBS 6131	B160
Baseband	RP 6651 N2500 L2500	BB 6630 N1900 L1900 L2100 DUG20 G1900 RP 6651 N600 L600 L700	
Transport System	CSR IXRe V2 (Gen2)		
Hybrid Cable System	Hybrid Trunk 6/24 4AWG 100m (x 2) PSU 4813 vR4A (Kit) (x 2)	Ericsson 6x12 HCS *Select Length & AWG* (x 2) Hybrid Trunk 6/24 4AWG 100m	

RAN Scope of Work:

Generator is pending.

U2100 and u1900 will decom.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) RP 6651 for L2500 and NR2500 in MMBB (mixed mode baseband) to new Enclosure 6160.

Add (1) RP 6651for L600 L700 and NR600 in MMBB (mixed mode baseband) to RBS 6131.

Add (1) PSU 4813 Power Booster

Existing: (12) 1-5/8" coax lines & (2) 6x12 HCS

Remove all Coaxial Lines.

Add (3) 6X24 HCS (Make sure there is [1] per sector for Anchor A&L Equipment). Length of new HCS will match that of existing HCS.

--- Remove (3) unconnected PCS TMAs.

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Section 6 - A&L Equipment

Existing Template: 792DB_2xAIR+1DP
Proposed Template: 67D5998E_1xAIR+1OP+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1		2	3			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	60		60	60			
M. Tilt	0		0	0			
Height (ft)	169		169	169			
Ports	P1	P2	P3	P4	P5	P6	P7
Active Tech	G1900		L700	L2100	L2100	L1900	L1900
Dark Tech							
Restricted Tech							
Decomm. Tech	U1900	U2100					
E. Tilt	2	2	2	2	2	2	2
Cables	Fiber Jumper **(x2)**	1-5/8" Coax - 220 ft. **(x2)**	Fiber Jumper **(x2)**				
TMAs		Generic Twin Style 1B - AWS (At Antenna)					
Diplexer / Combiners							
Radio			RRUS11 B12 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1				2		3	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				AIR 6419 B41 (Active Antenna - Massive MIMO)		Commscope_VV-65A-R1 (Quad)	
Azimuth	60				60		60	
M. Tilt	0				0		0	
Height (ft)	169				169		169	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**
Active Tech	N600 L700 L600	N600 L700 L600			N2500 L2500	N2500 L2500	L2100 L1900 G1900 N1900	L2100 L1900 G1900 N1900
Dark Tech								
Restricted Tech								
Decomm. Tech								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Fiber Jumper Coax Jumper **(x2)**	Fiber Jumper Coax Jumper **(x2)**
TMAs								
Diplexer / Combiners								
Radio	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)					Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)
Sector Equipment								

Unconnected Equipment:

Scope of Work:

*** L600 Scope of Work ***

Replace AIR 21l in Position 1 with (1) LB/MB Octo.

Add (1) Radio 4480 B71+B12 for L600, L700, and N600 in Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

***

*** Anchor Scope of Work ***

Remove LNX 6515 from Position 2.

Install (1) AIR6419 B41 for L2500 and N2500 in Position 2.

Remove AIR 32 DB and add (1) MB Quad and (1) Radio 4460 for L2100/L1900 (both carriers) and GSM to position 3.

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

***

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

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	**1**		**2**	**3**			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	180		180	180			
M. Tilt	0		0	0			
Height (ft)	169		169	169			
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**
Active Tech	G1900		L700	L2100	L2100	L1900	L1900
Dark Tech							
Restricted Tech							
Decomm. Tech	U1900	U2100					
E. Tilt	2	2	2	2	2	2	2
Cables	Fiber Jumper **(x2)**	1-5/8" Coax - 220 ft. **(x2)**	Fiber Jumper **(x2)**				
TMAs		Generic Twin Style 1B - AWS (At Antenna)					
Diplexer / Combiners							
Radio			RRUS11 B12 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1				2		3	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				AIR 6419 B41 (Active Antenna - Massive MIMO)		Commscope_VV-65A-R1 (Quad)	
Azimuth	180				180		180	
M. Tilt	0				0		0	
Height (ft)	169				169		169	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**
Active Tech	N600 L700 L600	N600 L700 L600			N2500 L2500	N2500 L2500	L2100 L1900 G1900 N1900	L2100 L1900 G1900 N1900
Dark Tech								
Restricted Tech								
Decomm. Tech								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**	Fiber Jumper Coax Jumper **(x2)**	Fiber Jumper Coax Jumper **(x2)**
TMAs								
Diplexer / Combiners								
Radio	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)					Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)
Sector Equipment								

Unconnected Equipment:

Scope of Work:

*** L600 Scope of Work ***

Replace AIR 21l in Position 1 with (1) LB/MB Octo.

Add (1) Radio 4480 B71+B12 for L600, L700, and N600 in Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

***

*** Anchor Scope of Work ***

Remove LNX 6515 from Position 2.

Install (1) AIR6419 B41 for L2500 and N2500 in Position 2.

Remove AIR 32 DB and add (1) MB Quad and (1) Radio 4460 for L2100/L1900 (both carriers) and GSM to position 3.

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

***

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

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1		2	3			
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)			
Azimuth	300		300	300			
M. Tilt	0		0	0			
Height (ft)	169		169	169			
Ports	P1	P2	P3	P4	P5	P6	P7
Active Tech	G1900		L700	L2100	L2100	L1900	L1900
Dark Tech							
Restricted Tech							
Decomm. Tech	U1900	U2100					
E. Tilt	2	2	2	2	2	2	2
Cables	Fiber Jumper **(x2)**	1-5/8" Coax - 220 ft. **(x2)**	Fiber Jumper **(x2)**				
TMAs		Generic Twin Style 1B - AWS (At Antenna)					
Diplexer / Combiners							
Radio			RRUS11 B12 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

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

CT11505A_Anchor_4

Print Name: Preliminary (RFDS_Correction)
PORs: Anchor_Phase 3
L600_CMP5

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1				2		3	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				AIR 6419 B41 (Active Antenna - Massive MIMO)		Commscope_VV-65A-R1 (Quad)	
Azimuth	300				300		300	
M. Tilt	0				0		0	
Height (ft)	169				169		169	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech	N600 L700 L600	N600 L700 L600			N2500 L2500	N2500 L2500	L2100 L1900 G1900 N1900	L2100 L1900 G1900 N1900
Dark Tech								
Restricted Tech								
Decomm. Tech								
E. Tilt	2	2	2	2	2	2	2	2
Cables	Coax Jumper (x2) Fiber Jumper (x2)	Coax Jumper (x2) Fiber Jumper			Fiber Jumper (x2)	Fiber Jumper (x2)	Fiber Jumper Coax Jumper (x2)	Fiber Jumper Coax Jumper (x2)
TMAs								
Diplexer / Combiners								
Radio	Radio 4480 B71+B85 (At Antenna)	Radio 4480 B71+B85 (At Antenna)					Radio 4460 B25+B66 (At Antenna)	Radio 4460 B25+B66 (At Antenna)
Sector Equipment								

Unconnected Equipment:

Scope of Work:

*** L600 Scope of Work ***

Replace AIR 21l in Position 1 with (1) LB/MB Octo.

Add (1) Radio 4480 B71+B12 for L600, L700, and N600 in Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo antenna.

***

*** Anchor Scope of Work ***

Remove LNX 6515 from Position 2.

Install (1) AIR6419 B41 for L2500 and N2500 in Position 2.

Remove AIR 32 DB and add (1) MB Quad and (1) Radio 4460 for L2100/L1900 (both carriers) and GSM to position 3.

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

***

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

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: CT11505A

Willimantic - Verizon
349R Mountain Street
Willimantic, Connecticut 06226

September 13, 2023

EBI Project Number: 6223003537

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**4.21%**

September 13, 2023

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

Emissions Analysis for Site: CT11505A - Willimantic - Verizon

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **349R Mountain Street** in **Willimantic, 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 349R Mountain Street in Willimantic, Connecticut using the equipment information listed below. Modeling of the antennas and associated equipment was completed using RoofMaster™ software, which is a widely-used predictive modeling program that has been developed to predict RF power density values for rooftop and tower telecommunications sites produced by vertical collinear antennas that are typically used in the cellular, PCS, paging and other communications services. Using the computational methods set forth in Federal Communications (FCC) Office of Engineering & Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields" (OET-65), RoofMaster™ calculates predicted power density in a scalable grid based on the contributions of all RF sources characterized in the study scenario. At each grid location, the cumulative power density is expressed as a percentage of the FCC limits. Manufacturer antenna pattern data is utilized in these calculations. RoofMaster™ models consist of the Far Field model as specified in OET-65 and an implementation of the OET-65 Cylindrical Model (Sula9). The models utilize several operational specifications for different types of antennas to produce a plot of spatially-averaged power densities that can be expressed as a percentage of the applicable exposure limit.

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 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. **All calculations were performed using Far Field Analysis.**

For all calculations, telecommunications equipment was modeled using the following assumptions:

1) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 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) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 1 GSM channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 10 Watts per Channel.

5) 1 LTE channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 80 Watts per Channel.

6) 1 NR channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 80 Watts per Channel.

7) 1 LTE channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 160 Watts per Channel.

8) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 45 Watts.

9) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 15 Watts.

10) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 90 Watts.

11) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 30 Watts.

12) 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.

13) 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 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.

14) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 600 MHz channel(s), the ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the RFS APXVAALL24_43-U-NA20 02DT 600 for the 600 MHz / 600 MHz / 700 MHz channel(s), the ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the COMMSCOPE VV-65A-R1 02DT 1900 for the 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications 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.

15) The antenna mounting height centerline of the proposed antennas is 169 feet above ground level (AGL).

16) Emissions values for additional carriers were calculated in Far Field utilizing the antenna models provided in the structural analysis.

17) All calculations were done in Far Field mode with respect to uncontrolled / general population threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600	Make / Model:	RFS APXVAALL24_43-U-NA20 02DT 600
Frequency Bands:	600 MHz / 600 MHz / 600 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	169 feet	Height (AGL):	169 feet	Height (AGL):	169 feet
Channel Count:	3	Channel Count:	3	Channel Count:	3
Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts	Total TX Power (W):	160.00 Watts
ERP (W):	2,878.76	ERP (W):	2,878.76	ERP (W):	2,878.76
Antenna A1 MPE %:	**0.93%**	Antenna B1 MPE %:	**0.93%**	Antenna C1 MPE %:	**0.93%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO	Make / Model:	ERICSSON SON_AIR6419 B41 LTE TB 02.09.21 2500 TMO
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd / 15.55 dBd / 15.55 dBd	Gain:	22.05 dBd / 22.05 dBd / 15.55 dBd / 15.55 dBd	Gain:	22.05 dBd / 22.05 dBd / 15.55 dBd / 15.55 dBd
Height (AGL):	169 feet	Height (AGL):	169 feet	Height (AGL):	169 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	180.00 Watts	Total TX Power (W):	180.00 Watts	Total TX Power (W):	180.00 Watts
ERP (W):	23,258.96	ERP (W):	22,299.14	ERP (W):	22,299.14
Antenna A2 MPE %:	**3.15%**	Antenna B2 MPE %:	**3.02%**	Antenna C2 MPE %:	**3.02%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900	Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900	Make / Model:	COMMSCOPE VV-65A-R1 02DT 1900
Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd	Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd	Gain:	15.77 dBd / 15.77 dBd / 15.77 dBd / 16.47 dBd
Height (AGL):	169 feet	Height (AGL):	169 feet	Height (AGL):	169 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	330.00 Watts	Total TX Power (W):	330.00 Watts	Total TX Power (W):	330.00 Watts
ERP (W):	11,718.26	ERP (W):	11,768.49	ERP (W):	11,768.49
Antenna A3 MPE %:	**1.59%**	Antenna B3 MPE %:	**1.59%**	Antenna C3 MPE %:	**1.59%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Combined Sectors):	0.49%
Verizon	2.18%
CPL/Eversource	0.78%
Dish	0.76%
Site Total MPE % :	4.21%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	0.48%
T-Mobile Sector B Total:	0.46%
T-Mobile Sector C Total:	0.46%
T-Mobile Total MPE % :	0.49%

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 600 MHz LTE	1	689.5408364	169	0.93304228	600 MHz LTE	400.0	0.23%
T-Mobile 600 MHz NR	1	1379.081673	169	1.866084561	600 MHz NR	400.0	0.47%
T-Mobile 700 MHz LTE	1	810.1398427	169	1.096229094	700 MHz LTE	467.0	0.23%
T-Mobile 2500 MHz LTE	1	7214.604258	169	9.762338143	2500 MHz LTE	1000.0	0.98%
T-Mobile 2500 MHz NR	1	14429.20852	169	19.52467629	2500 MHz NR	1000.0	1.95%
T-Mobile 2500 MHz LTE	1	538.382902	169	0.728505092	2500 MHz LTE	1000.0	0.07%
T-Mobile 2500 MHz NR	1	1076.765804	169	1.457010184	2500 MHz NR	1000.0	0.15%
T-Mobile 1900 MHz GSM	1	327.3406949	169	0.44293636	1900 MHz GSM	1000.0	0.04%
T-Mobile 1900 MHz LTE	1	2618.725559	169	3.543490883	1900 MHz LTE	1000.0	0.35%
T-Mobile 1900 MHz NR	1	2618.725559	169	3.543490883	1900 MHz NR	1000.0	0.35%
T-Mobile 2100 MHz LTE	1	6153.468513	169	8.326477548	2100 MHz LTE	1000.0	0.83%
						T-Mobile Total:	**0.49%**

• NOTE: Total T-Mobile MPE values reflect all T-Mobile antennas as reported by RoofMaster™ combined modeling.
• 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:	0.48%
Sector B:	0.46%
Sector C:	0.46%
T-Mobile Maximum MPE % (Sector A):	0.48%
T-Mobile Combined Sectors MPE %:	0.49%
Site Total:	4.21%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.21%** of the allowable FCC established general population limit sampled at the ground level at a distance of 66 feet away from the tower. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions or documents available on the Connecticut Siting Council website.

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.