NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Victoria Masse
420 Main Street #2, Sturbridge, MA 01566
860-306-2326
victoria@northeastsitesolutions.com

March 18, 2021

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

RE: Notice of Exempt Modification
227 Boombridge Road, North Stonington CT 06359
Latitude: 41.42879694
Longitude: -71.80907720
T-Mobile Site#: CT11048A_L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antenna at the 120-foot level of the existing 180-foot guyed tower located at 227 Boombridge Road, North Stonington CT. The tower is owned by Wireless Solution LLC. The property is owned by David Babcock Lewis LLC. T-Mobile now intends to add three (3) new 600/700/1900/2100 MHz 5G antenna. The new antenna would be installed at the 120-foot level of the tower. T-Mobile also intends to make the following modifications.

Planned Modifications:

Remove:
(3) Twin Style TMA

Remove and Replace:
(3) RRUS11 B12 (**Remove**) - (3) Radio 4449 B71 + B12 (**Replace**)
(3) Standoff Mount (**Remove**) - (3) VFA8-RRU Sector Frame (**Replace**)

Install New:
(3) APXVAALL24_43-U-NA20 600/700 MHz **5G** Antenna
(3) Hybrid Line

Existing to Remain:
(3) Air21 B4A/B12P Antenna 1900MHz
(3) Air21 B2A/B4P Antenna 2100MHz
(6) 1-5/8" Coax
(1) Hybrid Line

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This facility was originally approved by the Town of North Stonington Zoning and Building Official in 1997 (Building Permit No. 97-012). Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b) (2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman Michael A. Urgo, Juliet Hodge Planning, Development & Zoning Official, for the Town of North Stonington, as well as the property owner and the tower owner.

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

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

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

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

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

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

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

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

Sincerely,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: victoria@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

Attachments
cc: First Selectman Michael A. Urgo
Juliet Hodge- Planning, Development & Zoning Official
David Babcock Lewis, LLC- Property owner
Ken Thomas, Wireless Solutions LLC-Tower owner

Exhibit A

Town of North Stonington

Building Permit

Date: Feb 5 1987 Permit Number: 87002

Expiration Date of Permit: Feb 5 1988

Number of Stories: 0 [illegible] (Proposed Use)

Location: [illegible]

Zoning District: R-60

Subdivision: _____ Lot _____ Map. _____

I HEREBY CERTIFY THAT THE PROPOSED WORK IS AUTHORIZED BY THE OWNER OF RECORD AND I HAVE BEEN AUTHORIZED BY THE OWNER TO MAKE THIS APPLICATION AS HIS OR HER AUTHORIZED AGENT.

Signature of Authorized Agent _____

Address _____

_____ License Number: _____

Area in Square Feet: [illegible]

Estimated Cost of Construction: $2,000 Permit Fee: $25.00

Owner: David Lewis

Address: [illegible]

Building Official: [illegible] Date: 2-5-87

Copy Distribution

White - Applicant Canary - File Pink - Assessor

Exhibit B

Town of North Stonington, CT

Property Listing Report

Map Block Lot **119-6314** Account **L9857560**

Property Information

Property Location	227 BOOMBRIDGE RD
Owner	LEWIS DAVID BABCOCK LLC
Co-Owner	
Mailing Address	273 BOOMBRIDGE RD NORTH STONINGTON CT 06359
Land Use	4310 TEL REL TW
Land Class	I
Zoning Code	R60
Census Tract	7071
Sub Lot	

Neighborhood	
Acreage	1.38
Utilities	
Lot Setting/Desc	Rural Rolling
Survey Map	
Additional Info	

Photo

Sketch

Primary Construction Details

Year Built		Bedrooms		Exterior Walls	
Stories		Full Bathrooms		Interior Walls	
Building Style		Half Bathrooms		Heating Type	
Building Use		Bath Style		Heating Fuel	
Building Condition		Kitchen Style		AC Type	
Floors		Roof Style		Gross Bldg Area	
Total Rooms		Roof Cover		Total Living Area	

Report Created On **8/2/2019**

Town of North Stonington, CT

Property Listing Report | Map Block Lot **119-6314** | Account **L9857560**

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Outbuildings	0	0
Land	115000	80500
Total	115000	80500

Outbuilding and Extra Items

Type	Description

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
LEWIS DAVID BABCOCK LLC	140/ 513	12/28/2001	0
LEWIS ROSALIND M	126/ 960	8/5/1999	
LEWIS DAVID B EST & ROSALIND M	116/ 313	10/15/1997	0
LEWIS DAVID B & ROSALIND M	32/ 296	6/9/1964	0

Report Created On **8/2/2019**

Map Number: 119

THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY FOUND WITHIN THESE JURISDICTION AND IS COMPILED FROM RECORDED DEEDS, PLATS, AND OTHER PUBLIC RECORDS AND DATA. USERS OF THIS MAP ARE HEREBY NOTIFIED THAT THE AFOREMENTIONED PUBLIC PRIMARY INFORMATION CONTAINED ON THIS MAP, THE TOWNS AND THE MAPPING COMPANIES ASSUME NO LEGAL RESPONSIBILITIES FOR THE INFORMATION CONTAINED ON THIS MAP.

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 • (203) 404 - 7129

Town of North Stonington Connecticut

Planimetric Data and Property Maps 2018

Photography Dates:
March 24, 1996 (120 Series)
April 29, 1997 (449 Series)
December 16, 1997
(449 Series, 5-1, 5-3, 5-5)
Completion Date: April 28, 2000
Planimetric Update based on 2010 Photo

Revised Date: October 1, 2018

HORIZONTAL DATUM BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM, NAD 83 (1986)

1 inch = 200 Feet

0 100 200 400 600 800 1,000 Feet

0.1 0.05 0 0.1 Miles

N W E S

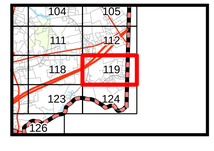
- Property Line
- Property Line Along Water
- Parcel in Dispute
- Town Line
- State Line
- ROW / Easement
- Surveyed Wetland
- Parcel Hook and Sub Lot

57 — Building / Street No.
(E) — Exempt Property
100' (100') — Record Dimension / Surveyed Dimension
2 Ac — Surveyed Acreage
2 AcC — Computed Acreage
Wall / Fence

- Deciduous Tree
- Evergreen Tree
- Vegetation
- Water
- Swamps
- Roads, Driveways, Trails, Flat Areas and Structures

		25	26	27				
		32	33	34	35	36	37	
		42	43	44	45	46	47	48	49
		54	55	56	57	58	59	60	61
66	67	68	69	70	71	72	73		
	76	77	78	79	80	81	82		
	84	85	86	87	88	89	90		
	92	93	94	95	96	97	98		
	99	100	101	102	103	104	105		
	106	107	108	109	110	111	112		
	113	114	115	116	117	118	119		
			120	121	122	123	124		
				125	126				

Map Number: 119



Map Produced: November 2018

Exhibit C

T-Mobile
NORTHEAST, LLC.

PROJECT: L600 / ZONING DRAWINGS

SITE I.D. NUMBER:

CT11048A

SITE NAME:

NORTH STONINGTON

SITE ADDRESS:

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

PROJECT INDEX

SITE NUMBER:	CT11048A
SITE NAME:	NORTH STONINGTON
SITE ADDRESS:	227 BOOM BRIDGE ROAD NORTH STONINGTON, CT 06359
PROPERTY OWNER:	WIRELESS SOLUTION LLC P.O. BOX 284 OLD LYME, CT 06371
APPLICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
STRUCTURE TYPE:	GUYED TOWER
LATITUDE (NAD83):	N 41.42879694°
LONGITUDE (NAD83):	W 71.8090772°
GRADE ELEVATION:	189' AMSL (PER GOOGLE EARTH)
MUNICIPALITY:	NORTH STONINGTON
ZONING:	R60
PARCEL ID:	119-6314

PROJECT CLIENT:	NORTHEAST SITE SOLUTIONS, LLC
CONTACT:	SHELDON FREINCLE
PHONE:	(201) 776-8521
ENGINEER/ STRUCTURAL ENG:	TECTONIC ENGINEERING CONSULTANTS, PC.
CONTACT:	EDWARD IAMICELI
PHONE:	(845) 567-6656x2811

VICINITY MAP (NTS)

SHEET INDEX

SHEET NO	DESCRIPTION	REVISION	DATE
T-1	TITLE SHEET	H	02/12/21
Z-1	SETBACK PLAN & BULK REQUIREMENTS	H	02/12/21
A-1	SITE PLAN & T-MOBILE EQUIPMENT AREA PLAN	H	02/12/21
A-2	EXIST T-MOBILE ELEVATION & ANTENNA PLANS	H	02/12/21
A-3	FINAL T-MOBILE ELEVATION & ANTENNA PLANS	H	02/12/21
A-4	DETAILS, ANTENNA SCHEDULE & SCHEMATIC	H	02/12/21
A-5	NOTES	H	02/12/21
E-1	ELECTRICAL NOTES & ONE-LINE DIAGRAM	H	02/12/21

CODE COMPLIANCE

CODE INFORMATION

- STATE OF CONNECTICUT BUILDING CODE, LATEST EDITION
- ANSI/TIA-222-G
- NATIONAL ELECTRIC CODE, LATEST EDITION

DESIGN NOTE

DESIGN BASED ON RFDS DATED 4/26/2019, VERSION 1.1
RAN TEMPLATE: 67D02C OUTDOOR
A&L TEMPLATE: 67D02C_2xAIR+1OP

STRUCTURAL NOTE

ANTENNA MOUNT

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

811 Know what's below. Call before you dig.

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED PROFESSIONAL ENGINEER

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Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11048A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/11/19	FOR COMMENT	RT
B	08/09/19	PER COMMENTS	BWY
C	08/12/19	PER COMMENTS	MB
D	10/16/20	PER COMMENTS	BWY
E	10/29/20	PER COMMENTS	BWY
F	01/13/21	PER COMMENTS	BWY
G	02/09/21	PER COMMENTS	BWY
H	02/12/21	PER COMMENTS	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

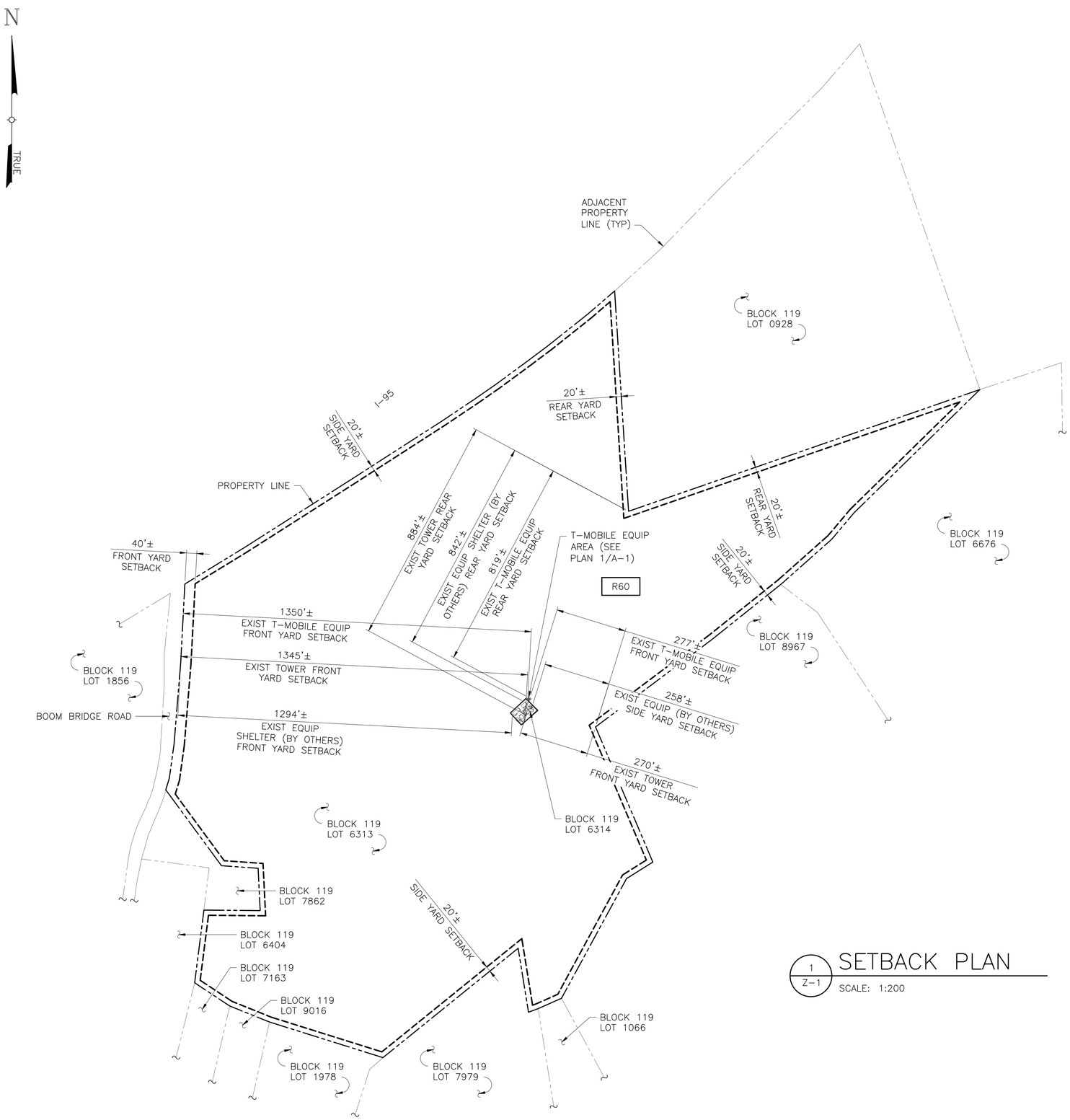
NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



1 / Z-1 SETBACK PLAN

SCALE: 1:200

GENERAL NOTES

1. EXISTING SITE FEATURES AND PROPERTY LINES BASED ON NORTH STONINGTON, CT GIS.
2. NORTH DETERMINED AS REFERENCED IN NOTE #1 (APPROXIMATE).
3. VERTICAL DATUM BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929 (APPROXIMATE).
4. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO ANSI/TIA-222-G-2005 "STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS" WITH A DESIGN WIND SPEED OF 110 MPH.
5. THE PROPOSED FACILITY IS MINIMAL, AND WILL CREATE NO ADDITIONAL STORM WATER RUNOFF AND WILL THEREFORE NOT IMPACT THE EXISTING STORM WATER DRAINAGE SYSTEM.
6. THE PROPOSED FACILITY IS UNMANNED, AND THEREFORE DOES NOT REQUIRE A MEANS OF WATER SUPPLY OR SEWAGE DISPOSAL.
7. THE PROPOSED FACILITY DOES NOT INCLUDE OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES.
8. NO LANDSCAPING IS PROPOSED WITH THIS APPLICATION.
9. EXISTING BUILDINGS AND ALL OTHER SIGNIFICANT FEATURES HAVE BEEN SHOWN WITHIN THE LIMITS OF DISTURBANCE. UNDERGROUND IMPROVEMENTS, IF ANY AND NOT VISIBLE, ARE NOT SHOWN.
10. THE PROPOSED UNMANNED FACILITY WILL REQUIRE MAINTENANCE VISITS OF APPROXIMATELY ONCE PER MONTH FOR GENERALLY AN HOUR AT A TIME. ADEQUATE PARKING EXISTS FOR THIS MAINTENANCE.
11. NO COMMERCIAL SIGNS ARE PROPOSED.

BULK REQUIREMENTS

CITY OF NORTH STONINGTON

ZONING DISTRICT: R60 (MEDIUM DENSITY RESIDENTIAL)

	REQUIRED	EXISTING	PROPOSED
MAXIMUM FLOOR AREA RATIO:	NA	NA	NO CHANGE
MAXIMUM BUILDING HEIGHT:	40'	180'***	NO CHANGE
MINIMUM LOT AREA (SQ.FT):	60,000	29,232	NO CHANGE
MINIMUM BUILDABLE AREA (SQ.FT):	32,400	NA	NO CHANGE
MINIMUM STREET FRONTAGE:	200'	807'	NO CHANGE
MINIMUM YARDS:			
FRONT:	40'	1294'**	NO CHANGE
SIDE:	20'	258'**	NO CHANGE
REAR:	20'	819'*	NO CHANGE

* EXISTING T-MOBILE SETBACK
** EXISTING SETBACK (BY OTHERS)
*** EXISTING HEIGHT OF TELECOMMUNICATIONS GUYED TOWER

LEGEND

- PROPERTY LINE
- ADJACENT PROPERTY LINE
- SETBACK ENVELOPE
- R60 — ZONING DISTRICT

STATE OF CONNECTICUT
EDWARD N. IANNICELLI
PEN.0028473
LICENSED PROFESSIONAL ENGINEER

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P.O. Box 37 — (800) 829-6531
Mountainville, NY 10953 — www.tectonicengineering.com
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1279 Route 300
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T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

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9927.CT11048A	EI

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ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

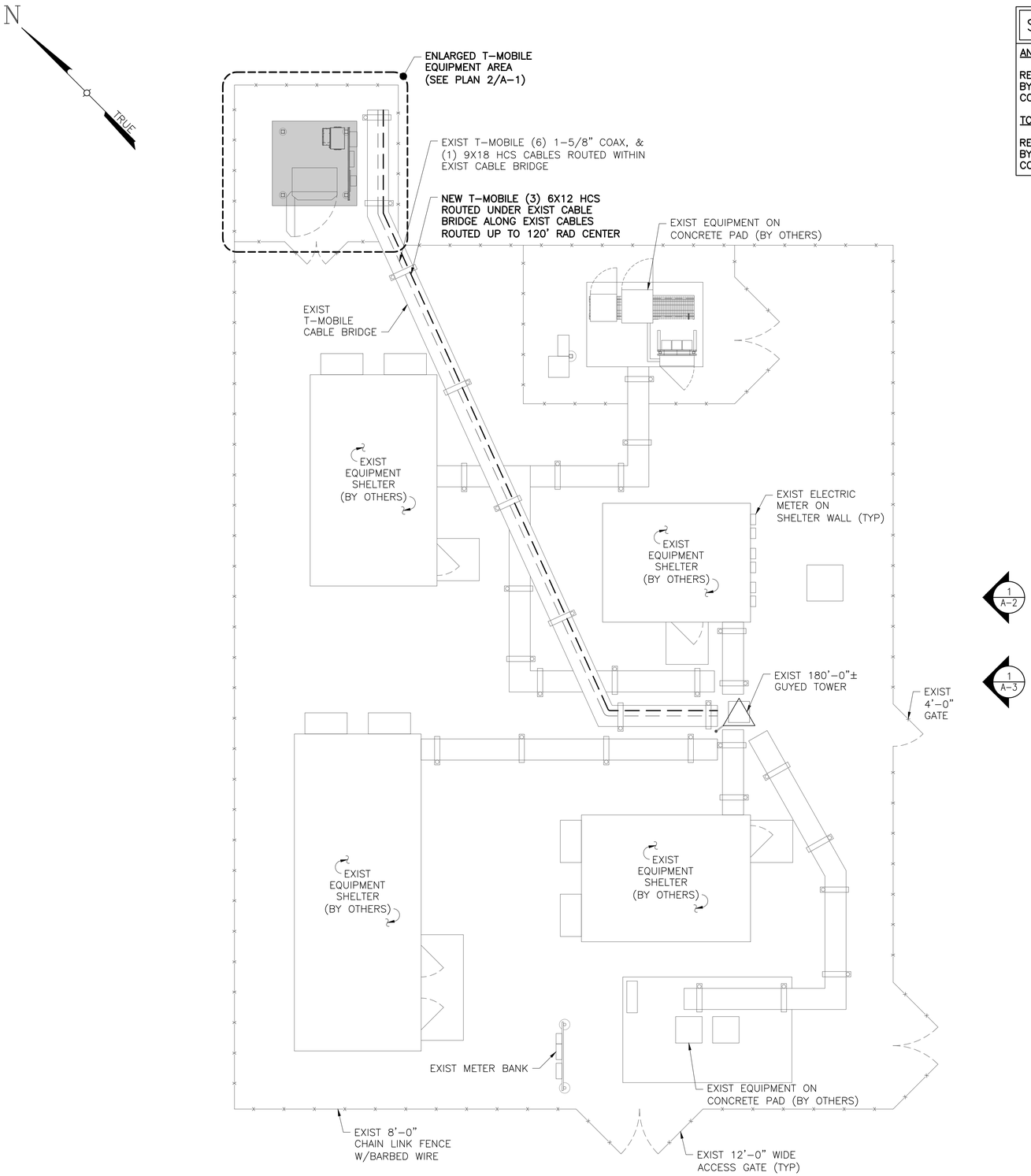
NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT
06359

SHEET TITLE

SETBACK PLAN &
BULK REQUIREMENTS

SHEET NUMBER

Z-1



1 / A-1 SITE PLAN

SCALE: 3/16" = 1'-0"

STRUCTURAL NOTE

ANTENNA MOUNT

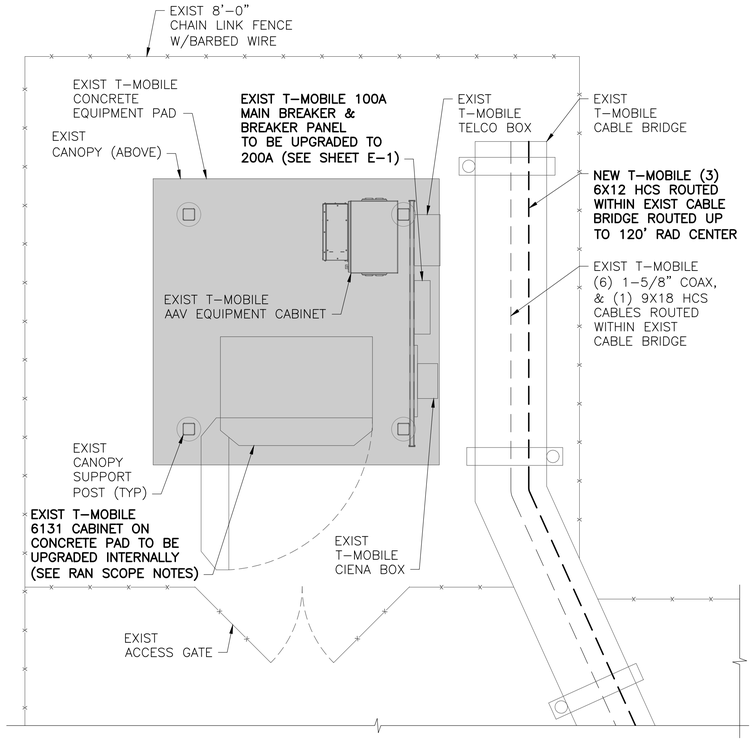
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

RAN SCOPE NOTES

1. REPLACE (1) DUS41 W/(1) BB6630 FOR LTE.
2. INSTALL (1) BB6630 FOR FUTURE 5G N600.
3. ADD (3) 6X12 HCS.
4. REMOVE (1) XMU.
5. EXIST (6) COAXIAL LINES & (1) 9X18 HCS.



2 / A-1 ENLARGED T-MOBILE EQUIPMENT PLAN

SCALE: 3/4" = 1'-0"

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0 1 2 3
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SITE INFORMATION

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CT11048A
227 BOOM BRIDGE ROAD
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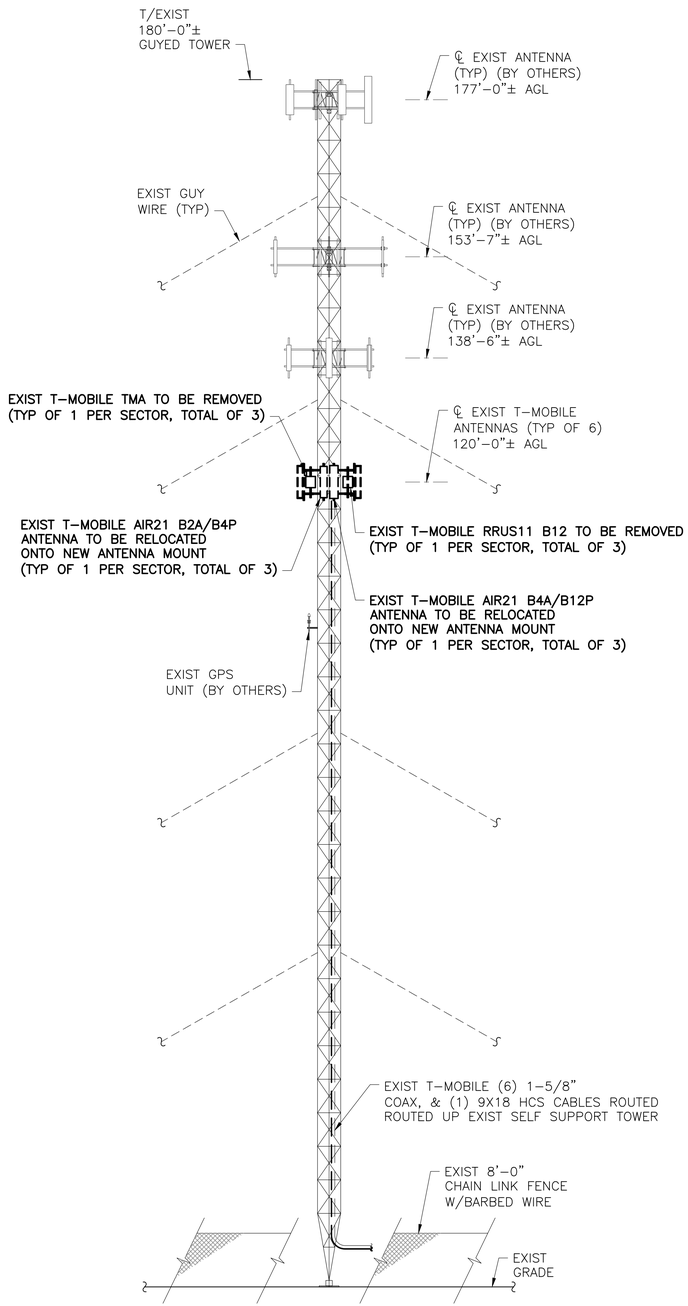
SHEET TITLE

SITE PLAN & T-MOBILE EQUIPMENT AREA PLAN

SHEET NUMBER

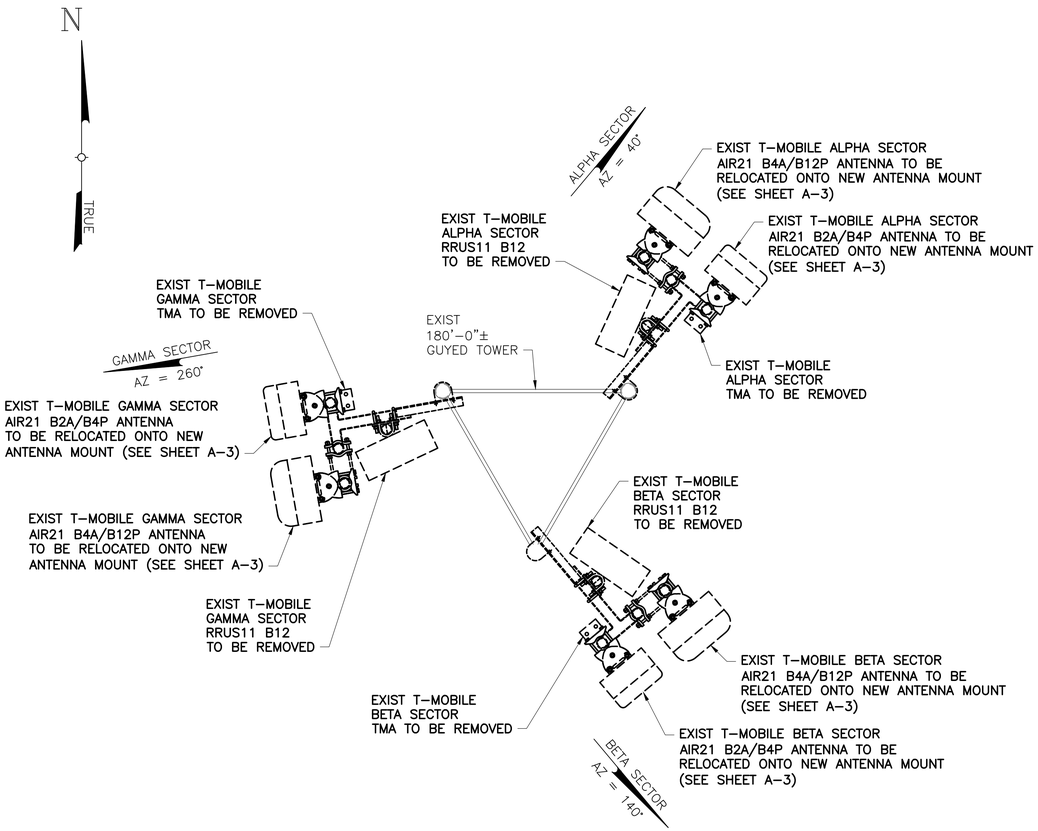
A-1



NOTE: NOT ALL SITE FEATURES SHOWN FOR CLARITY.

1 / A-2 EXIST ELEVATION

SCALE: 3/32" = 1'-0"



(ALL SECTORS)

2 / A-2 EXIST T-MOBILE ANTENNA PLAN @ ℄120' AGL

SCALE: 1/2" = 1'-0"

STRUCTURAL NOTE

ANTENNA MOUNT

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

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ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

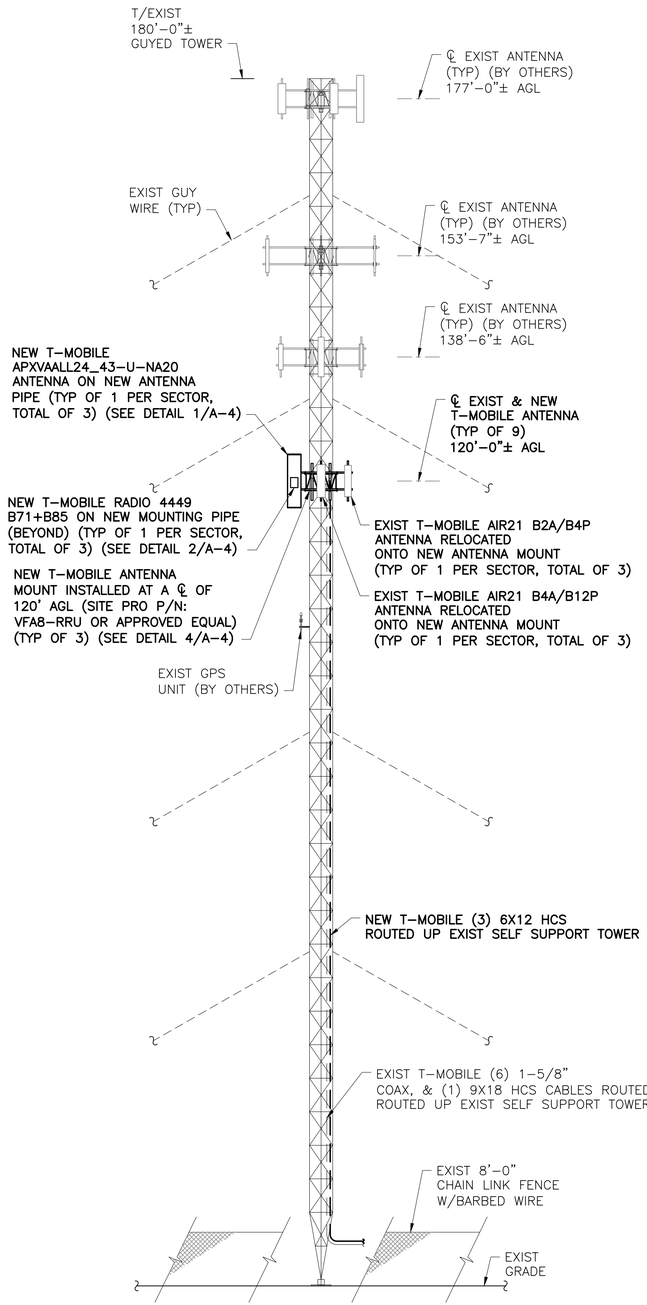
NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT
06359

SHEET TITLE

EXIST T-MOBILE ELEVATION
& ANTENNA PLANS

SHEET NUMBER

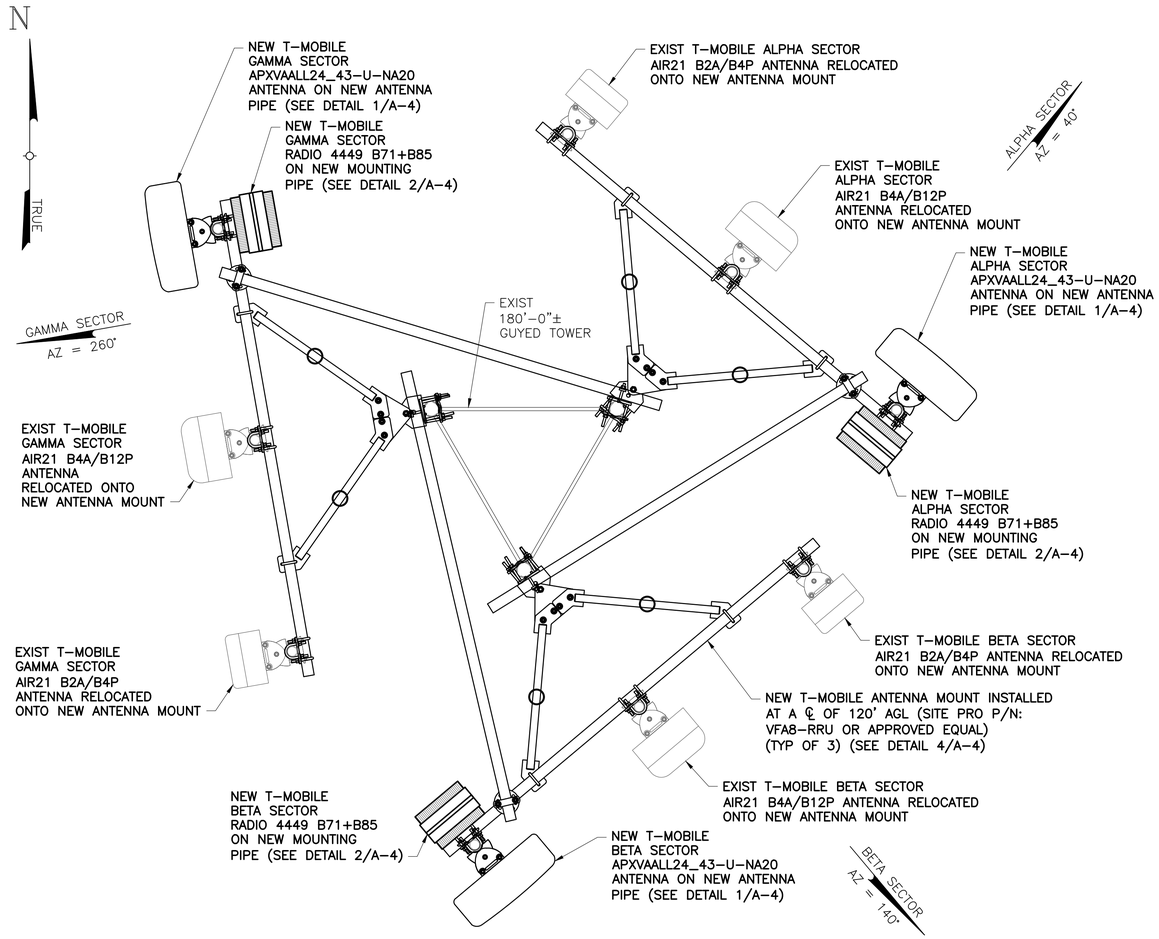
A-2



NOTE: NOT ALL SITE FEATURES SHOWN FOR CLARITY.

1 / A-3 FINAL ELEVATION

SCALE: 3/32" = 1'-0"



(ALL SECTORS)

2 / A-3 FINAL T-MOBILE ANTENNA PLAN @ ℄120' AGL

SCALE: 1/2" = 1'-0"

STRUCTURAL NOTE

ANTENNA MOUNT

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

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www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11048A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/11/19	FOR COMMENT	RT
B	08/09/19	PER COMMENTS	BWY
C	08/12/19	PER COMMENTS	MB
D	10/16/20	PER COMMENTS	BWY
E	10/29/20	PER COMMENTS	BWY
F	01/13/21	PER COMMENTS	BWY
G	02/09/21	PER COMMENTS	BWY
H	02/12/21	PER COMMENTS	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT
06359

SHEET TITLE

FINAL T-MOBILE ELEVATION
& ANTENNA PLANS

SHEET NUMBER

A-3

STRUCTURAL NOTE

ANTENNA MOUNT

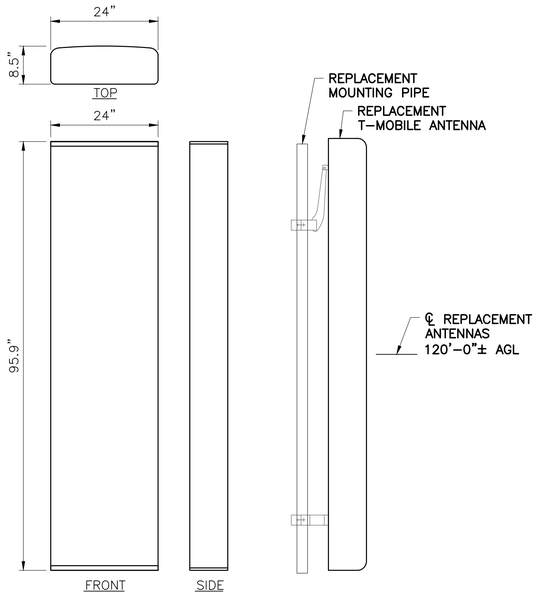
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED OCTOBER 16, 2020.

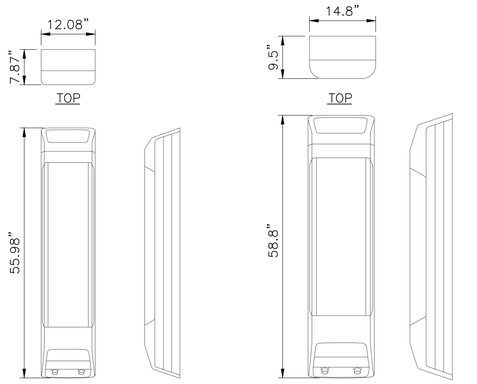
ANTENNA AND CABLE SCHEDULE

SECTOR MARK	ANTENNA MODEL	AZIMUTH	ELEC. DOWNTILT	MECH. DOWNTILT	ANTENNA CENTERLINE	SECTOR	TMA/RRU	CABLE	JUMPER TYPE	CABLE LENGTH
A-1 UMTS/GSM	ERICSSON AIR21 B2A/B4P	40°	2°	0°	120'-0"	LEFT ALPHA	0/0	EXIST (1) 1-5/8" & 9X18 HCS	DC/FIBER	150'-0"
									1/2" COAX	150'-0"
A-2 LTE	ERICSSON AIR21 B4A/B12P	40°	2°	0°	120'-0"	CENTER ALPHA	0/0	EXIST 9X18 HCS	DC/FIBER	150'-0"
									DC/FIBER	150'-0"
A-3 LTE	**RFS APXVAALL24_43-U-NA20**	**40°**	**0°**	**0°**	**120'-0"**	**RIGHT ALPHA**	**0/1**	**NEW 6X12 HCS**	**1/2" COAX**	**150'-0"**
									1/2" COAX	**150'-0"**
B-1 UMTS/GSM	ERICSSON AIR21 B2A/B4P	140°	2°	0°	120'-0"	LEFT BETA	0/0	EXIST (1) 1-5/8" & 9X18 HCS	DC/FIBER	150'-0"
									1/2" COAX	150'-0"
B-2 LTE	ERICSSON AIR21 B4A/B12P	140°	2°	0°	120'-0"	CENTER BETA	0/0	EXIST 9X18 HCS	DC/FIBER	150'-0"
									DC/FIBER	150'-0"
B-3 LTE	**RFS APXVAALL24_43-U-NA20**	**140°**	**0°**	**0°**	**120'-0"**	**RIGHT BETA**	**0/1**	**NEW 6X12 HCS**	**1/2" COAX**	**150'-0"**
									1/2" COAX	**150'-0"**
C-1 UMTS/GSM	ERICSSON AIR21 B2A/B4P	260°	2°	0°	120'-0"	LEFT GAMMA	0/0	EXIST (1) 1-5/8" & 9X18 HCS	DC/FIBER	150'-0"
									1/2" COAX	150'-0"
C-2 LTE	ERICSSON AIR21 B4A/B12P	260°	2°	0°	120'-0"	CENTER GAMMA	0/0	EXIST 9X18 HCS	DC/FIBER	150'-0"
									DC/FIBER	150'-0"
C-3 LTE	**RFS APXVAALL24_43-U-NA20**	**260°**	**0°**	**0°**	**120'-0"**	**RIGHT GAMMA**	**0/1**	**NEW 6X12 HCS**	**1/2" COAX**	**150'-0"**
									1/2" COAX	**150'-0"**



RFS: APXVAALL24_43_U_NA20
WEIGHT: 122.8 LBS

(PROPOSED)



ERICSSON: AIR21 B2A/B4P
WEIGHT: 83 LBS

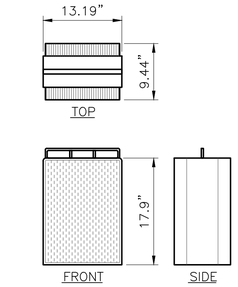
(EXIST)

ERICSSON: AIR21 B4A/B12P
WEIGHT: 124 LBS

(EXIST)

1 A-4 ANTENNA DETAILS

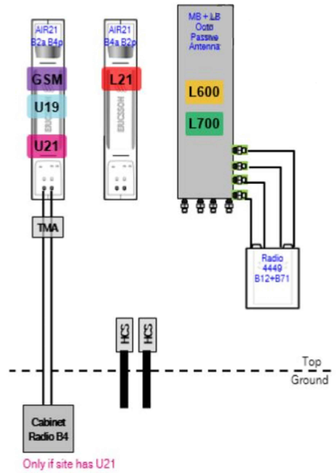
SCALE: 3/4" = 1'-0"



RRUS-4449_B71+B85
WEIGHT: 71.0 LBS

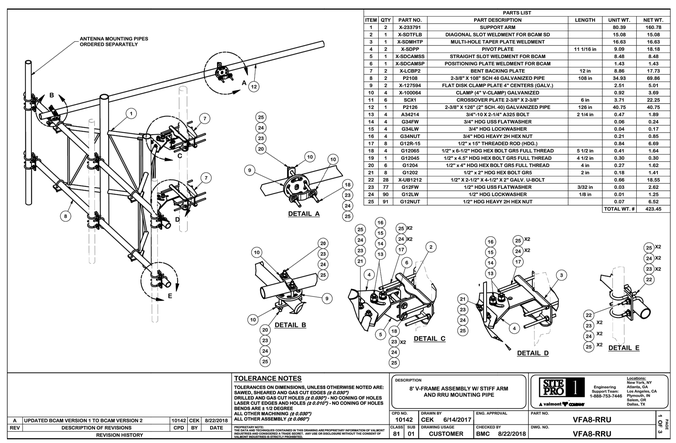
2 A-4 RADIO DETAIL

SCALE: 1" = 1'-0"



3 A-4 ANTENNA SCHEMATIC

SCALE: NTS



PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-233791	SUPPORT ARM		80.39	160.78
2	1	X-507713	DIAGONAL SLOT WELDMENT FOR BCAM SD		15.08	15.08
3	1	X-SDBHTP	MULTI-HOLE TAPER PLATE WELDMENT		16.63	16.63
4	2	X-SDPP	PIVOT PLATE	11 1/16 in	9.09	18.18
5	1	X-SDCAM8S	STRAIGHT SLOT WELDMENT FOR BCAM		8.48	8.48
6	1	X-SDCAM8P	POSITIONING PLATE WELDMENT FOR BCAM		1.43	1.43
7	2	X-LCBP2	BENT BACKING PLATE	12 in	8.86	17.73
8	2	P2158	2-3/8" X 109" SCH 40 GALVANIZED PIPE	108 in	34.93	69.86
9	2	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.51	5.01
10	4	X-100564	CLAMP (4" U-CLAMP) GALVANIZED		0.92	3.69
11	6	SCSY	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	22.25
12	1	P5120	2-3/8" X 120" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	40.75
13	4	A34214	3/4"-10 X 2-1/4" A325 BOLT	2 1/4 in	0.47	1.89
14	4	G34FW	3/4" HDG USS FLATWASHER		0.06	0.24
15	4	G34LW	3/4" HDG LOCKWASHER		0.04	0.17
16	4	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	0.85
17	8	G12S-15	1/2" x 15" THREADED ROD (HDG.)		0.84	6.69
18	4	G12065	1/2"-x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	5 1/2 in	0.41	1.64
19	1	G12045	1/2" x 4.5" HDG HEX BOLT GR5 FULL THREAD	4 1/2 in	0.30	0.30
20	6	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	1.62
21	8	G1202	1/2" x 2" HDG HEX BOLT GR5	2 in	0.18	1.41
22	28	X-UB1312	1/2" X 2-1/2" X 4-1/2" X 2" GALV. U-BOLT		0.66	18.55
23	77	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.62
24	90	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.25
25	91	G12NUT	1/2"-HDG HEAVY 2H HEX NUT		0.07	6.52
					TOTAL WT. #	423.45

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE: SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.010")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
ANGLES *(± 0.5 DEGREES)*
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: 8' V-FRAME ASSEMBLY W/ STIFF ARM AND RRU MOUNTING PIPE

SITE PRO 1 — A ratinom company — Engineering Support Center 1-855-733-7446 — LOCATIONS: New York, NY Dallas, TX Los Angeles, CA Plymouth, IN Phoenix, AZ Dallas, TX

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	UPDATED BCAM VERSION 1 TO BCAM VERSION 2	10142	CEK	8/22/2018

REVISION HISTORY

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	QTY.
10142	CEK 6/14/2017		VFA8-RRU	1
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 8/22/2018	VFA8-RRU

4 A-4 ANTENNA MOUNT SPECIFICATION

SCALE: NTS

STATE OF CONNECTICUT — EDWARD N. TAMIGELI — PEN.0028473 — LICENSED PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road — Phone: (845) 534-5959
P.O. Box 37 — (800) 829-6531
Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567-6656

T-Mobile NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
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SITE INFORMATION

NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT
06359

SHEET TITLE

DETAILS, ANTENNA SCHEDULE & SCHEMATIC

SHEET NUMBER

A-4

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE, LATEST VERSION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
3. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. DIMENSIONS SHOWN ARE TO FINISH SURFACES, UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE AUTHORIZED REPRESENTATIVE OR THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
6. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE "NOTICE TO PROCEED," CONTRACTOR WILL CONTACT THE CONSTRUCTION MANAGER OF RECORD A MINIMUM OF 48 HOURS PRIOR TO WORK START.
8. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
9. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
10. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS, AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
12. CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
14. CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE TO PROTECT THE OWNER.
15. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
16. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, AND PIPING. REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
17. REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
18. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
19. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
20. PROVIDE 48 HOURS WRITTEN NOTICE TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
21. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS AND OTHER DOCUMENTATION SHALL BE TURNED OVER TO AT COMPLETION OF CONSTRUCTION.
22. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE BY. ANY WORK, MATERIALS OR EQUIPMENT FOUND TO BE DEFECTIVE DURING THAT PERIOD SHALL BE CORRECTED IMMEDIATELY UPON WRITTEN NOTIFICATION AT NO ADDITIONAL COST TO T–MOBILE.

STRUCTURAL NOTES

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
2. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", LATEST EDITION.
3. STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992 (Fy=50ksi). STRUCTURAL STEEL PLATES AND ANGLES SHALL CONFORM TO ASTM A36.
4. ROUND AND SQUARE HOLLOW STRUCTURAL SECTIONS (HSS) CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE C.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 "PIPE, STEEL, BLACK AND HOT–DIPPED, ZINC–COATED WELDED AND SEAMLESS", TYPE E OR S, GRADE B.
6. CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:

   A) CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.

   B) STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".

   C) WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN AND YIELD STRENGTH.

   D) MINIMUM 3/16" FILLET E70–XX WELD SHALL APPLY UNLESS NOTED.

   E) MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.

   F) MINIMUM SIZE OF CLIP ANGLES SHALL BE L3x3x3/8" UNLESS NOTED.

   G) ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.

   H) ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
7. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS", LATEST EDITION. BOLTS SHALL BE 3/4 INCH DIA. UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
9. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
12. ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
13. SLEEVE ANCHORS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 3, CLASS 3, AS MANUFACTURED BY HILTI FASTENING SYSTEMS OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE (3) INCHES.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 4, CLASS 1, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE FOUR (4) INCHES.
15. EPOXY ANCHORING SYSTEM SHALL BE THE HILTI HY–270 FOR MASONRY CONSTRUCTION WITH HOLLOW BRICK OR BLOCK & THE HILTI HIT HY200 INJECTION ADHESIVE ANCHOR FOR GROUT FILLED CONCRETE MASONRY UNITS AND CONCRETE. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2"ø STAINLESS STEEL ANCHOR ROD W/NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE FOR THE HY–270 ONLY & AN EPOXY ADHESIVE (6" MIN EMBEDMENT). THE INSTALLATION PROCEDURE SHALL BE AS FOLLOWS

   A. DRILL THE HOLE USING MANUFACTURER RECOMMENDED DRILL BIT UP TO SPECIFIED DEPTH. HAMMERING IS NOT PERMITTED.

   B. CLEAN THE HOLE USING NYLON BRUSH AND/OR COMPRESSED AIR. THE HOLE SHOULD BE CLEAR OF ANY LOOSE MATERIAL. IF WET, THE MASONRY SHOULD BE ALLOWED TO DRY FULLY BEFORE ANCHOR INSTALLATION.

   C. INSERT SPECIFIED SCREEN TUBE INTO THE HOLE.

   D. FILL THE SCREEN TUBE COMPLETELY WITH ADHESIVE, BEGINNING AT THE BOTTOM END.

   E. INSERT ANCHOR ROD OR INTERNALLY THREADED INSERT INTO THE ADHESIVE–FILLED SCREEN TUBE, TWISTING SLIGHTLY.

   F. LOAD FASTENER ONLY AFTER MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
16. GRATING SHALL BE GALVANIZED WELDED STEEL BAR GRATING TYPE W/BA WITH 1–1/4" BEARING BARS AT 1–3/16" OC. FASTEN TO SUPPORTING MEMBERS WITH SADDLE–TYPE CLIPS AT 2'–0" O.C. AND BAND ALL EXPOSED EDGES.
17. SUBMIT DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
18. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
19. ALL WORK SHALL BE INSPECTED BY THE ENGINEER DURING AND AT THE COMPLETION OF CONSTRUCTION.
20. CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED BEHIND AND ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.
21. HAMMER DRILLS ARE NOT TO BE USED WHEN DRILLING HOLES FOR SLEEVE OR EXPANSION BOLTS INSTALLED IN MASONRY BLOCKS/BRICKS.
22. ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED.
23. NOTES ARE NOT PROJECT SPECIFIC.

SITE NOTES

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
2. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
4. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
5. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
6. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
7. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEER.
8. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH.
9. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
10. CARE SHALL BE TAKEN TO RETAIN NATURAL GROWTH AND PREVENT DAMAGE TO TREES WITHIN AND OUTSIDE THE LIMITS OF CONSTRUCTION AND SPECIFIED WORK AREAS CAUSED BY EQUIPMENT AND MATERIALS. ANY DAMAGE TO THIS NATURAL GROWTH SHALL BE RESTORED AT THE EXPENSE OF THE CONTRACTOR.
11. ALL AREAS DISTURBED BY THE CONTRACTOR WITHOUT AUTHORIZATION SHALL BE RESTORED BY THE CONTRACTOR.
12. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, HE SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE HIS WORK OPERATION UNTIL SERVICE IS RESTORED.

STATE OF CONNECTICUT
EDWARD N. IANNIELLI
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LICENSED PROFESSIONAL ENGINEER

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Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567–6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
9927.CT11048A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
A	7/11/19	FOR COMMENT	RT
B	08/09/19	PER COMMENTS	BWY
C	08/12/19	PER COMMENTS	MB
D	10/16/20	PER COMMENTS	BWY
E	10/29/20	PER COMMENTS	BWY
F	01/13/21	PER COMMENTS	BWY
G	02/09/21	PER COMMENTS	BWY
H	02/12/21	PER COMMENTS	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

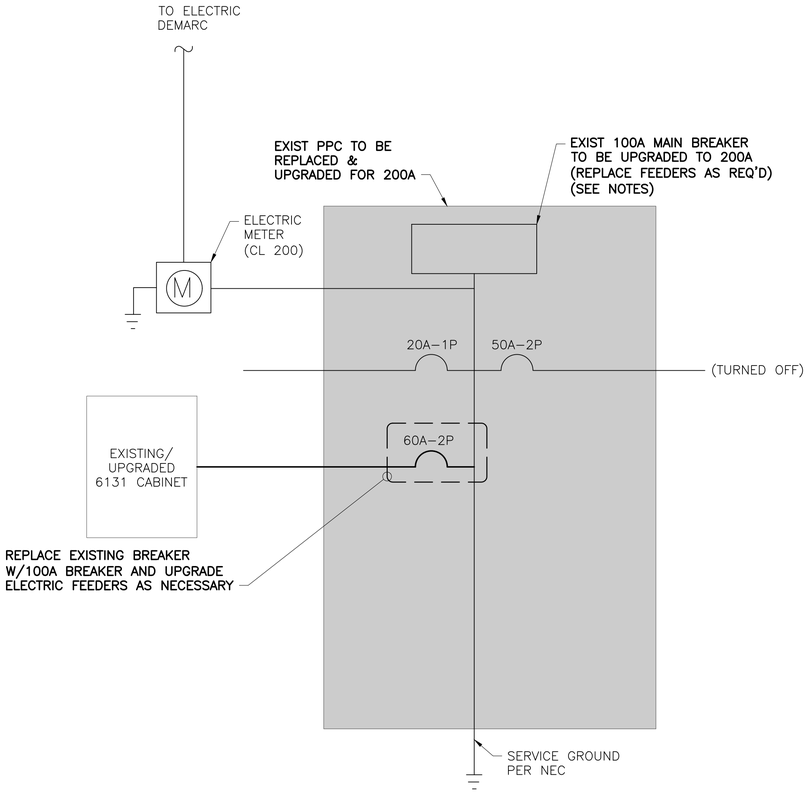
NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT
06359

SHEET TITLE

NOTES

SHEET NUMBER

A–5



NOTES:
1. THE ABOVE DIAGRAM IS GENERIC AND ANY ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NEC STANDARDS.
2. ELECTRICAL CONSULT SHALL BE PERFORMED TO CONSTRUCTION TO CONFIRM THE POWER REQUIREMENTS AND FEASIBILITY.

1 / E–1 ONE–LINE DIAGRAM

SCALE: NTS

GENERAL ELECTRICAL NOTES

1. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
2. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES (U.L.) AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. AND SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
4. CONTRACTOR TO COORDINATE WITH SITE OWNER FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
5. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
7. METER SOCKETS AMPERES, VOLTAGE AND NUMBER OF PHASES SHALL BE NOTED AND SHALL BE MANUFACTURED BY SQUARE "D" COMPANY, SANGAMO OR APPROVED EQUAL. METER SOCKET SHALL BE APPROVED BY UTILITY COMPANY PRIOR TO INSTALLATION.
8. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CONDUCTORS SHALL BE COPPER.
10. USE T–TAP CONNECTIONS ON ALL MULTI–CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.
11. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J–BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
12. CONDUIT:
    A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR.
    B. INTERMEDIATE METAL CONDUIT SHALL BE U.L. LABEL, FITTINGS SHALL BE THREADED ALUMINUM OR STEEL AND SHALL BE USED FOR ALL EXTERIOR RUNS. THREADLESS COUPLINGS AND CONNECTORS SHALL NOT BE USED.
    C. ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE NO SET SCREW OR CRIMP TYPE FITTINGS SHALL BE USED. GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
    D. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
    E. CONDUIT SHALL BE SIZED PER THE NEC AND AS SHOWN.
    F. CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH OWNER PRIOR TO INSTALLING.
    G. ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE.
13. COVERPLATES SHALL BE BRUSHED STAINLESS STEEL FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, AND SHALL HAVE ENGRAVED LETTERING WHERE INDICATED WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD–8 LIFT COVERPLATES.
14. REFER TO MANUFACTURERS MANUAL FOR RECOMMENDED FUSE AND WIRE SIZES.
15. ALL FINAL CONNECTIONS TO THE EQUIPMENT ARE TO BE OF FLEXIBLE WEATHERPROOF CONDUIT TO MEET APPLICABLE CODES.
16. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
17. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2, UNLESS OTHERWISE NOTED.
18. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
19. PROVIDE CONSTRUCTION MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH GAINING APPROVALS AND PAYING ALL FEES ASSESSED BY UTILITY COMPANY FOR ELECTRICAL SERVICE.

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Turnkey Wireless Development

APPROVALS

LANDLORD _____
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PROJECT NUMBER	DESIGNED BY
9927.CT11048A	EI

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ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

NORTH STONINGTON
CT11048A
227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT
06359

SHEET TITLE

ELECTRICAL NOTES
& ONE–LINE DIAGRAM

SHEET NUMBER

E–1

Exhibit D

STRUCTURAL ANALYSIS REPORT

TECTONIC WORK ORDER #:	9927.CT11048A
PROJECT SCOPE OF WORK:	T-MOBILE "L600 SCOPE"
SITE TYPE:	ANTENNA MOUNT ON 180' GUYED TOWER
DATE:	October 16, 2020
REVISION #:	1
SITE ID #:	CT11048A
SITE NAME:	NORTH STONINGTON / CDS_1
SITE ADDRESS:	227 BOOM BRIDGE RD, NORTH STONINGTON, CT 06359
PREPARED FOR:	NORTHEAST SITE SOLUTIONS

☒ PASS ☐ PASS WITH MODS ☐ FAIL

90% UTILIZATION

APPROVED BY: _____

EDWARD N. IAMICELI, P.E.

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Project Contact Info

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STRUCTURAL ANALYSIS REPORT

Project Information

W.O. Number:	9927.CT11048A	Report Date:	10/16/20
Client:	T-Mobile / Northeast Site Solutions	Revision:	1
Site Name:	North Stonington/CDT_1		
Owner:	Wireless Solution LLC		
Address:	227 Boom Bridge Rd	FCC Registration Number:	-
City, State, Zip:	North Stonington, CT 06359	County:	New London

Structure Information

Structure Type: Guyed Tower
Manufacturer: Rohn
Structure Height: 180 ft
Year Built: Unknown

Original Drawings: Structure: No Foundation: No

Previous Analysis: Yes

Documents provided:

Item	By	No.	Date
Previous Structural Analysis	EBI Consulting	81150090	2/13/15
Mount Mapping Report	Hightower Solutions	CT11048A	6/6/19
Construction Drawings	Tectonic	9927.CT11048A	6/28/19
Structural Analysis Report	Tectonic	9927.CT11048A	7/10/19
Structural Analysis Report	Nexius Solutions, Inc.	VZW11509-N_Stonington_2_CT	5/23/19
RFDS	T-Mobile	CT11048A	9/16/20

Inspection

Type: Limited visual inspection from ground. Date: 5/20/19
Tower Climb 6/6/19

General Condition:
Tower: Good
Foundation: Good

Observations: None

Finish: Galvanized Condition: Intact

Existing T-Mobile Installation

Antennas:

Height (ft.)	Carrier	Qty	Manuf.	Model	Mount	Comment
120	T-Mobile	3	Ericsson	Air-21 B4A/BP12	**(3) Existing Standoff Mounts**	To Relocate to new mount
		3	Ericsson	Air-21 B2A/B4P		
		3	**Ericsson**	**RRUS11 B12**		**To Be Removed**
		3	-	**Twin Style TMA**		

Cables:

Height (ft.)	Qty	Nom. Size	Location/Support
120	6	1-5/8" Coax	Existing to remain along waveguide on Face AC
120	1	9x18 Hybriflex	Existing to remain along waveguide on Face AC

Proposed T-Mobile Installation

T-Mobile is proposing to add three (3) new panel antennas along with associated appurtenances to the existing six (6) panel antennas. A new temporary mounting solution shall be installed approximately 10' below the existing level to support the new installation. The existing mounts at the 120' level will then be replaced with a new mounting system as detailed in the Tectonic Drawings and the T-Mobile equipment will be moved up from the temporary level below. The final T-Mobile configuration upon this installation will be as follows:

Antennas:

Height (ft.)	Carrier	Qty	Manuf.	Model	Mount	Comment
120	T-Mobile	3	Ericsson	Air-21 B4A/BP12	**(3) VFA8-RRU Sector Frames**	Final Location of T-Mobile
		3	Ericsson	AIR-21 B2A/B4P		
		3	**RFS**	**APXVAALL24_43-U-NA20**		
		3	**Ericson**	**RRUS B71+B85**		
110		-	-	-	**(3) VFA8-RRU Sector Frames**	Temporary Location

Cables:

Height (ft.)	Qty	Nom. Size	Location/Support
120	6	1-5/8" Coax	Existing to remain along waveguide on Face AC
120	1	9x18 Hybriflex	Existing to remain along waveguide on Face AC
120	**3**	**6x12 Hybriflex**	**Proposed to be routed alongside existing cables**

STRUCTURAL ANALYSIS REPORT (CONT.)

W.O. Number:	9927.CT11048A	Report Date:	10/16/2020
Client:	T-Mobile / Northeast Site Solutions	Revision:	1
Site Name:	North Stonington/CDT_1		

Analysis Criteria

Design Standard: ANSI/TIA/222-G-2005
Building Code: 2018 Connecticut State Building Code

	Capacity (no ice)	Capacity w/ ice	Service
Wind Speed:	105 mph*	50 mph	60 mph
Basic Ice Thickness:	0 inch	0.75 inch	0 inch

*This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 135 mph converted to a nominal 3-second gust wind speed of 105 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/were used in this analysis.

Structure Class: 2 Seismic: No
Exposure Category: C
Topo Category: 1 Crest Height: 0 ft

Assumptions:

1. The tower and foundation were designed, manufactured, and constructed in accordance with the approved design drawings and applicable codes and standards in affect at the time.
2. The tower and foundation have been properly maintained in accordance with industry standards.
3. The weight and wind area of certain appurtenances have been estimated based on site photos and the previous analysis report by EBI Consulting, referenced above.
4. The tower geometry is based solely on the previous analysis report by EBI Consulting, referenced above.
5. The existing Verizon Wireless load configuration are based solely on the previous analysis report by Nexius Solutions, Inc., referenced a

Analysis Results

Tower Members:

Element	% Usage
Legs	82
Diagonals	86
Horizontals	49
Guy Wires	65
Sector Frame Mounts	90

Service Load Deformations (Max):

Type	Actual	Allowable	% of Allowable
Tower Horizontal (in)	1.56	64.80	2%
Twist & Sway (deg):	0.21	4.00	5%

For detailed information, see the attached tnxTower output.

Conclusions

Based on our analysis, the existing tower has adequate capacity to support the proposed T-Mobile installation as described herein in accordance with current code requirements.

No information with regards to the foundation was made available at the time of this report. As such, the foundation has not been evaluated.

The existing antenna standoff mounts are not able to accommodate the new T-Mobile installation at the 120' level. These mounts are to be replaced with three (3) new sector frames. The T-Mobile installation may be temporarily relocated and supported on new sector mounts installed at approximately 110'. The existing standoffs can then be replaced and then the T-Mobile equipment raised back to the 120'. The temporary mount can then be removed. The replacement mount at both levels shall be SitePro1 VFA-8 RRU sector frames. See the Construction Drawings by Tectonic for more detail.

This analysis is based on a limited visual inspection from the ground, an antenna/coax verification & mount mapping report, and the information provided by the client. Any further changes to the antenna configuration or other appurtenances should be reviewed with respect to their effect on structural loads prior to implementation. If the existing conditions are not as represented in this report, the design engineer should be immediately notified prior to construction.

Prepared by: John Julien
Staff Engineer

Reviewed by: Ian Marinaccio, EIT
Project Engineer

Submitted By: *Edward N. Iamiceli* Date: *10/16/20*
Edward N. Iamiceli, P.E.
Managing Director - Structural

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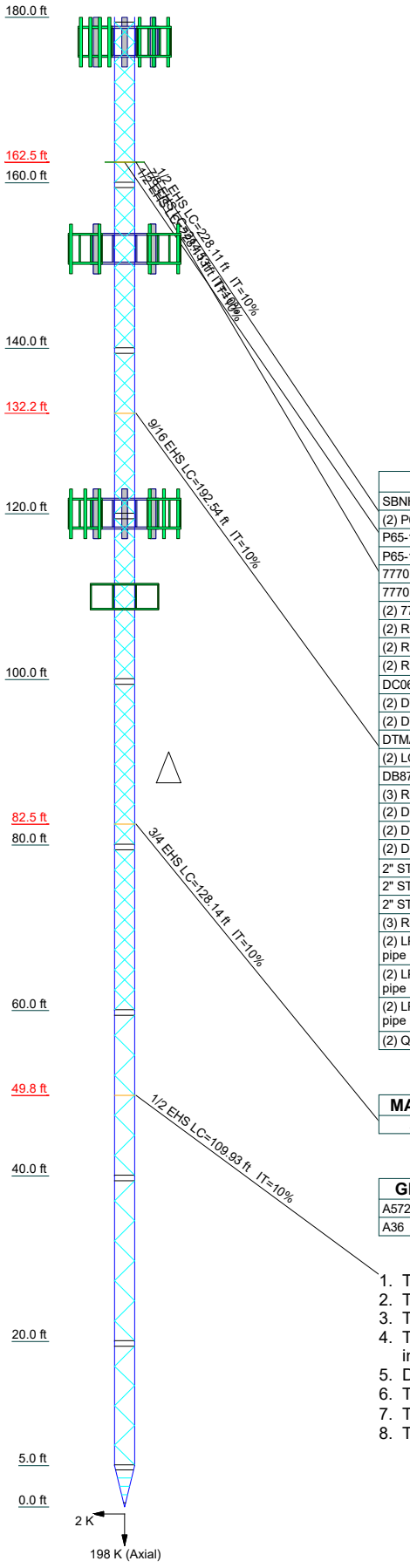
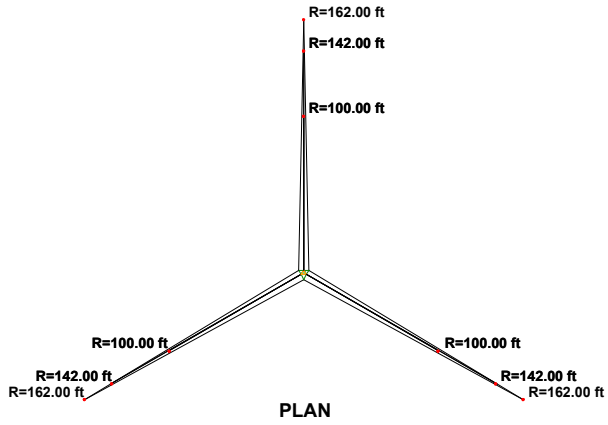
TOWER ANALYSIS

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs		ROHN 2.5 X-STR				ROHN 2.5 X STR					
Leg Grade						A572-50					
Diagonals	N.A.	L 2 x 2 x 1/4	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga			
Diagonal Grade	N.A.	A36				A53-B-42					
Top Girts	A	L 2 x 2 x 1/4	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga			
Bottom Girts	A	L 2 x 2 x 1/4	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	L3x3x1/2		
Horizontals	A					N.A.					
Top Guy Pull-Offs		2L2x2x1/4x3/8	N.A.	4x3/8	N.A.	2L2x2x1/4x3/8	N.A.	4x3/8	N.A.		
Face Width (ft)		3.42				64 @ 2.40885					
# Panels @ (ft)		1.8	1.0	0.9	1.0	0.9	1.0	0.7	0.7	0.6	0.3
Weight (K)											8.8





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
SBNH-1D6565C w/ Mount Pipe	177	(2) QS6656-5D w/ Mount Pipe	136
(2) P65-17-XLH-RR w/ Mount Pipe	177	(2) QS6656-5D w/ Mount Pipe	136
P65-17-XLH-RR w/ Mount Pipe	177	B2/B66 RRH-BR049	136
P65-17-XLH-RR w/ Mount Pipe	177	B2/B66 RRH-BR049	136
7770.00 w/ Mount Pipe	177	B2/B66 RRH-BR049	136
7770.00 w/ Mount Pipe	177	B5/B13 RRH-BR04C	136
(2) 7770.00 w/ Mount Pipe	177	B5/B13 RRH-BR04C	136
(2) RRUS 11 B12	177	B5/B13 RRH-BR04C	136
(2) RRUS 11 B12	177	DB-C1-12C-24AB-0Z	136
(2) RRUS 11 B12	177	Sector Mount P/N: VFA12-HD	136
DC06-48-60-0-1E	177	AIR 21 B2A/B4P w/ Mount Pipe	120
(2) DTMABP7819VG12A	177	AIR 21 B2A/B4P w/ Mount Pipe	120
(2) DTMABP7819VG12A	177	AIR 21 B2A/B4P w/ Mount Pipe	120
DTMABP7819VG12A	177	AIR 21 B4A/B12P-B5P 6 FT w/ Mount Pipe	120
(2) LGP21401	177		
DB874H120-SX w/Mount Pipe	177	AIR 21 B4A/B12P-B5P 6 FT w/ Mount Pipe	120
(3) Rohn 15' Boom Gate	177		
(2) DB950F85E-M w/ Mount	152	AIR 21 B4A/B12P-B5P 6 FT w/ Mount Pipe	120
(2) DB950F85E-M w/ Mount	152		
(2) DB950F85E-M w/ Mount	152	RADIO 4449 B71/B85	120
2" STD Pipe (2.375 OD)x6'-0"	152	RADIO 4449 B71/B85	120
2" STD Pipe (2.375 OD)x6'-0"	152	RADIO 4449 B71/B85	120
2" STD Pipe (2.375 OD)x6'-0"	152	APXVAALL24_43-U-NA20 w/ Mount Pipe	120
(3) Rohn 15' Boom Gate	152		
(2) LPA-80080-4CF-EDIN w/ mount pipe	136	APXVAALL24_43-U-NA20 w/ Mount Pipe	120
(2) LPA-80080-4CF-EDIN w/ mount pipe	136	APXVAALL24_43-U-NA20 w/ Mount Pipe	120
(2) LPA-80080-4CF-EDIN w/ mount pipe	136	(3) Valmont VFA8-RRU	120
(2) QS6656-5D w/ Mount Pipe	136	(3) Valmont VFA8-RRU	110
		GPS_A	98

SYMBOL LIST

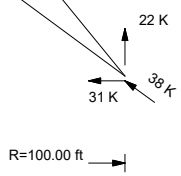
MARK	SIZE	MARK	SIZE
A	L4x4x1/4		

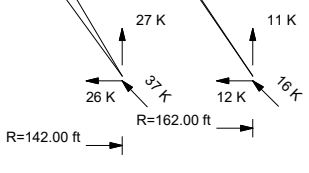
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 85.8%





ALL REACTIONS ARE FACTORED

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Phone: (845) 567-6656
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Job: ***9927.CT11048A - Rev 1***			
Project: ***180' Guyed Tower***			
Client: T-Mobile	Drawn by: John-Fritz Julien	App'd:	
Code: TIA-222-G	Date: 10/13/20	Scale: NTS	
Path: G:\Newburgh\Projects\9927 NSS-L600 project\CT11048A\Structural\Tower\Rev 1\9927.CT11048A - TowerSA_Rev1.eri		Dwg No. E-1	

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Newburgh, NY 12550
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Job	Page
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Project	**Date**
180' Guyed Tower	10/16/20
Client	**Designed by**
T-Mobile	John-Fritz Julien

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.00 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 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

1279 Route 300
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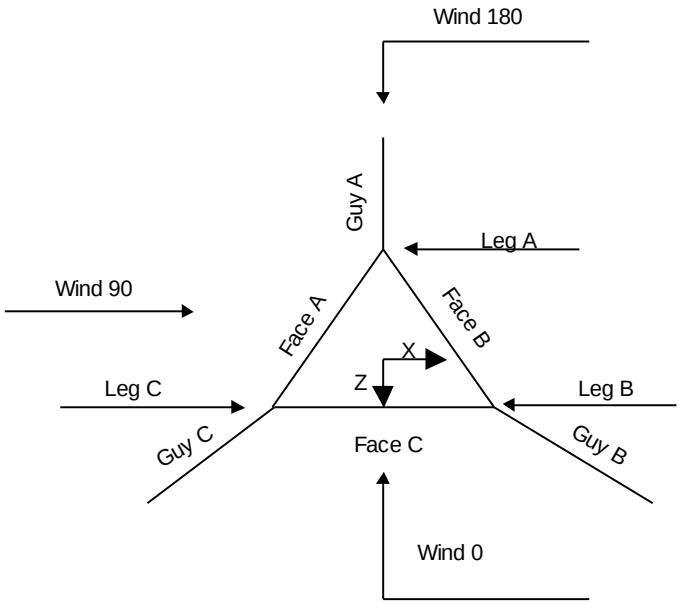

Corner & Starmount Guyed Tower

1279 Route 300
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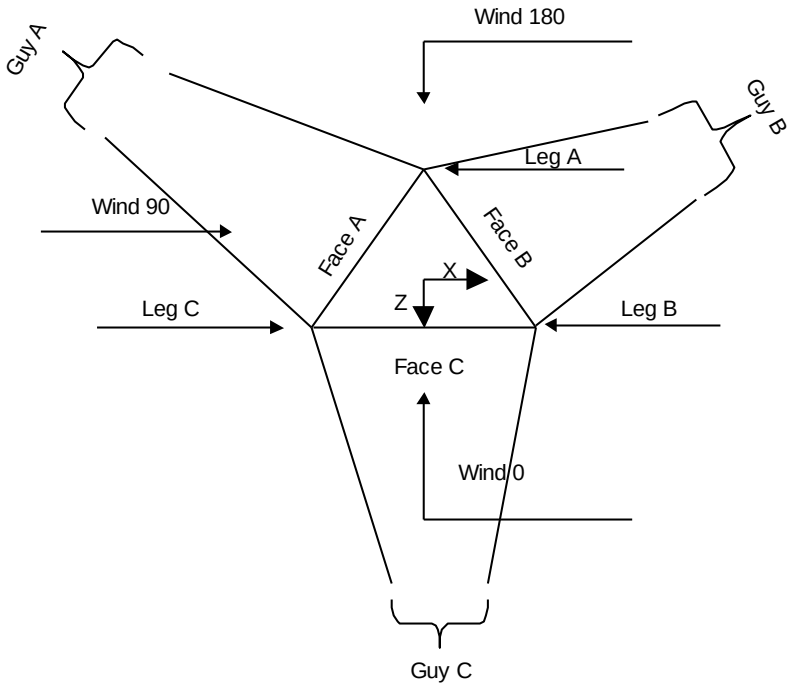

Face Guyed

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	180.00-160.00			3.42	1	20.00
T2	160.00-140.00			3.42	1	20.00
T3	140.00-120.00			3.42	1	20.00
T4	120.00-100.00			3.42	1	20.00
T5	100.00-80.00			3.42	1	20.00
T6	80.00-60.00			3.42	1	20.00
T7	60.00-40.00			3.42	1	20.00
T8	40.00-20.00			3.42	1	20.00
T9	20.00-5.00			3.42	1	15.00
T10	5.00-0.00			3.42	1	5.00

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	180.00-160.00	2.41	X Brace	No	No	7.3750	1.3750
T2	160.00-140.00	2.41	X Brace	No	No	7.3750	1.3750
T3	140.00-120.00	2.41	X Brace	No	No	7.3750	1.3750
T4	120.00-100.00	2.41	X Brace	No	No	7.3750	1.3750
T5	100.00-80.00	2.41	X Brace	No	No	7.3750	1.3750
T6	80.00-60.00	2.41	X Brace	No	No	7.3750	1.3750
T7	60.00-40.00	2.41	K Brace Right	No	No	7.3750	1.3750
T8	40.00-20.00	2.41	K Brace Right	No	No	7.3750	1.3750
T9	20.00-5.00	2.38	K Brace Right	No	No	7.3750	1.3750
T10	5.00-0.00	1.00	X Brace	No	Yes	6.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Single Angle	L 2 x 2 x 1/4	A36 (36 ksi)
T2 160.00-140.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.00-120.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.00-100.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 100.00-80.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T6 80.00-60.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 60.00-40.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 40.00-20.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 20.00-5.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 5.00-0.00	Pipe	ROHN 2.5 X STR	A572-50 (50 ksi)	Pipe		A572-50 (50 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 180.00-160.00	Single Angle	L 2 x 2 x 1/4	A36 (36 ksi)	Single Angle	L 2 x 2 x 1/4	A36 (36 ksi)
T2 160.00-140.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.00-120.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.00-100.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 100.00-80.00	Pipe	ROHN TS1.5x16 ga	A53-B-42	Pipe	ROHN TS1.5x16 ga	A53-B-42

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 80.00-60.00	Pipe	ROHN TS1.5x11 ga	(42 ksi) A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	(42 ksi) A53-B-42 (42 ksi)
T7 60.00-40.00	Pipe	ROHN TS1.5x16 ga	(42 ksi) A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	(42 ksi) A53-B-42 (42 ksi)
T8 40.00-20.00	Pipe	ROHN TS1.5x16 ga	(42 ksi) A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	(42 ksi) A53-B-42 (42 ksi)
T9 20.00-5.00	Pipe	ROHN TS1.5x16 ga	(42 ksi) A53-B-42 (42 ksi)	Single Angle	L3x3x1/2	(36 ksi) A36 (36 ksi)
T10 5.00-0.00	Single Angle	L4x4x1/4	A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T10 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-160.00	1.21	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 160.00-140.00	1.21	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 140.00-120.00	1.21	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 120.00-100.00	1.21	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 100.00-80.00	1.21	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 80.00-60.00	1.21	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 60.00-40.00	0.74	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 40.00-20.00	0.74	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 20.00-5.00	0.60	0.3750	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 5.00-0.00	0.60	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	No	No	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T9 20.00-5.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 5.00-0.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-160.00	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
T2 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
T3 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
T4 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
T5 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
T6 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
T7 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
T8 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
T9 20.00-5.00	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 5.00-0.00	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 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	Flange	0.7500	0	0.6250	1	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0
180.00-160.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
160.00-140.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
140.00-120.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
120.00-100.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
100.00-80.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6 80.00-60.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7 60.00-40.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8 40.00-20.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.5000	1	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9 20.00-5.00	Flange	0.7500	4	0.5000	1	0.5000	1	0.6250	2	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10 5.00-0.00	Flange	0.7500	4	0.5000	0	0.5000	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.523	EHS	A	1/2	2.69	10%	21000	0.517	227.92	162.00	0.0000	0.00	100%
		B	1/2	2.69	10%	21000	0.517	227.92	162.00	0.0000	0.00	100%
		C	1/2	2.69	10%	21000	0.517	227.92	162.00	0.0000	0.00	100%
162.523	EHS	A	7/8	7.97	10%	19000	1.581	214.33	142.00	0.0000	0.00	100%
		B	7/8	7.97	10%	19000	1.581	214.33	142.00	0.0000	0.00	100%
		C	7/8	7.97	10%	19000	1.581	214.33	142.00	0.0000	0.00	100%
132.159	EHS	A	9/16	3.50	10%	21000	0.671	192.38	142.00	0.0000	0.00	100%
		B	9/16	3.50	10%	21000	0.671	192.38	142.00	0.0000	0.00	100%
		C	9/16	3.50	10%	21000	0.671	192.38	142.00	0.0000	0.00	100%
82.5234	EHS	A	3/4	5.83	10%	19000	1.155	128.02	100.00	0.0000	0.00	100%
		B	3/4	5.83	10%	19000	1.155	128.02	100.00	0.0000	0.00	100%
		C	3/4	5.83	10%	19000	1.155	128.02	100.00	0.0000	0.00	100%
49.75	EHS	A	1/2	2.69	10%	21000	0.517	109.83	100.00	0.0000	0.00	100%
		B	1/2	2.69	10%	21000	0.517	109.83	100.00	0.0000	0.00	100%
		C	1/2	2.69	10%	21000	0.517	109.83	100.00	0.0000	0.00	100%

Guy Data*(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
162.523	Torque Arm	6.84	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
162.523	Corner						
132.159	Corner						
82.5234	Corner						
49.75	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
162.52	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Double Angle	
162.52	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
132.16	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8
82.52	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
49.75	A572-50 (50 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
162.523	0.12	0.12	0.12		4.92 3.8 sec/pulse	4.92 3.8 sec/pulse	4.92 3.8 sec/pulse	
162.523	0.34	0.34	0.34		4.49 3.7 sec/pulse	4.49 3.7 sec/pulse	4.49 3.7 sec/pulse	
132.159	0.13	0.13	0.13		3.51 3.2 sec/pulse	3.51 3.2 sec/pulse	3.51 3.2 sec/pulse	
82.5234	0.15	0.15	0.15		1.61 2.2 sec/pulse	1.61 2.2 sec/pulse	1.61 2.2 sec/pulse	
49.75	0.06	0.06	0.06		1.15 1.9 sec/pulse	1.15 1.9 sec/pulse	1.15 1.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
162.523	No	No	1	1	1	1	1	1
162.523	No	No			1	1	1	1
132.159	No	No			1	1	1	1
82.5234	No	No			1	1	1	1
49.75	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
162.523	0.0000 A325N	0	0.0000	1	0.6250 A572-50	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
162.523	0.6250 A325N	0	0.0000	0.75	0.6250 A572-50	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
132.159	0.6250 A325N	0	0.0000	0.75	0.6250 A572-50	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
82.5234	0.6250 A325N	0	0.0000	0.75	0.6250 A572-50	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
49.75	0.6250 A325N	0	0.0000	0.75	0.6250 A572-50	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
162.523	A	81.26	29	7	1.6415
	B	81.26	29	7	1.6415
	C	81.26	29	7	1.6415
162.523	A	81.26	29	7	1.6415
	B	81.26	29	7	1.6415
	C	81.26	29	7	1.6415
132.159	A	66.08	28	6	1.6079
	B	66.08	28	6	1.6079
	C	66.08	28	6	1.6079
82.5234	A	41.26	25	6	1.5339
	B	41.26	25	6	1.5339
	C	41.26	25	6	1.5339
49.75	A	24.88	23	5	1.4582
	B	24.88	23	5	1.4582
	C	24.88	23	5	1.4582

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
AVA7-50(1-5/8")	B	No	No	Ar (CaAa)	177.00 - 8.00	0.0000	0.4	6	6	1.0000	2.0100		0.70
AVA7-50(1-5/8")	A	No	No	Ar (CaAa)	177.00 - 8.00	0.0000	-0.4	6	4	1.0000 2.0100	2.0100		0.70
.4" Black Cable	A	No	No	Ar (CaAa)	177.00 - 8.00	0.0000	-0.4	1	1	1.0000 0.5200	0.5200		0.14
.8" DC Power	A	No	No	Ar (CaAa)	177.00 - 8.00	0.0000	-0.4	2	2	1.0000 1.0900	1.0900		0.25
***													
LDF7-50A(1-5/8")	A	No	No	Ar (CaAa)	152.00 - 8.00	0.0000	0.4	6	6	1.0000 1.9800	1.9800		0.82
FSJ4-50B(1/2")	A	No	No	Ar (CaAa)	152.00 - 8.00	0.0000	0.4	1	1	0.5200	0.5200		0.14
***													
561(1-5/8")	B	No	No	Ar (CaAa)	136.00 - 8.00	1.8000	0.4	12	12	1.0000 1.6250	1.6250		1.35
561(1-5/8")	B	No	No	Ar (CaAa)	136.00 - 8.00	1.8000	0.4	2	2	1.0000 1.6250	1.6250		1.35
***													
MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	A	No	No	Ar (CaAa)	120.00 - 8.00	1.8000	0.4	1	1	1.0000 1.6250	1.6250		1.07
AVA7-50(1-5/8")	A	No	No	Ar (CaAa)	120.00 - 8.00	1.8000	0.4	6	6	2.0100	2.0100		0.70
MLC Hybrid 6Power/12Fiber(1-1/2")	A	No	No	Ar (CaAa)	120.00 - 8.00	1.8000	0.4	3	3	1.0000 1.5000	1.5000		0.98
Feedline Ladder (Af)	A	No	No	Af (CaAa)	120.00 - 8.00	1.8000	0.4	1	1	3.0000	3.0000		8.40

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	180.00-160.00	A	0.000	0.000	25.092	0.000	0.08
		B	0.000	0.000	20.502	0.000	0.07
		C	0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.000	0.000	44.400	0.000	0.16
		B	0.000	0.000	24.120	0.000	0.08
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	0.000	0.000	54.320	0.000	0.20
		B	0.000	0.000	60.520	0.000	0.39
		C	0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	0.000	0.000	100.690	0.000	0.53
		B	0.000	0.000	69.620	0.000	0.46
		C	0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	0.000	0.000	100.690	0.000	0.53
		B	0.000	0.000	69.620	0.000	0.46
		C	0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	0.000	0.000	100.690	0.000	0.53
		B	0.000	0.000	69.620	0.000	0.46
		C	0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	0.000	0.000	100.690	0.000	0.53
		B	0.000	0.000	69.620	0.000	0.46

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	0.000	0.00
T8	40.00-20.00	A	0.000	0.000	100.690	0.000	0.53
		B	0.000	0.000	69.620	0.000	0.46
		C	0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	0.000	0.000	60.414	0.000	0.32
		B	0.000	0.000	41.772	0.000	0.28
		C	0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	180.00-160.00	A	1.767	0.000	0.000	61.261	0.000	0.94
		B		0.000	0.000	45.321	0.000	0.66
		C		0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	1.745	0.000	0.000	108.130	0.000	1.61
		B		0.000	0.000	53.185	0.000	0.76
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	1.720	0.000	0.000	131.736	0.000	1.93
		B		0.000	0.000	140.085	0.000	2.12
		C		0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	1.692	0.000	0.000	250.431	0.000	3.78
		B		0.000	0.000	161.315	0.000	2.43
		C		0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	1.658	0.000	0.000	248.797	0.000	3.72
		B		0.000	0.000	160.686	0.000	2.39
		C		0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	1.617	0.000	0.000	246.799	0.000	3.64
		B		0.000	0.000	159.917	0.000	2.35
		C		0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	1.564	0.000	0.000	244.203	0.000	3.53
		B		0.000	0.000	158.919	0.000	2.29
		C		0.000	0.000	0.000	0.000	0.00
T8	40.00-20.00	A	1.486	0.000	0.000	240.429	0.000	3.39
		B		0.000	0.000	157.469	0.000	2.21
		C		0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	1.361	0.000	0.000	140.642	0.000	1.89
		B		0.000	0.000	93.095	0.000	1.24
		C		0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	1.159	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-1.6441	3.0602	-1.2262	1.7162
T2	160.00-140.00	-2.4029	0.7651	-1.9102	0.3856

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T3	140.00-120.00	1.7620	0.8523	0.4423	0.4502
T4	120.00-100.00	1.0595	-3.4668	0.0932	-3.4814
T5	100.00-80.00	1.0478	-3.4425	0.0976	-3.3984
T6	80.00-60.00	1.0595	-3.4668	0.1133	-3.5566
T7	60.00-40.00	1.1186	-3.6091	0.1635	-4.3068
T8	40.00-20.00	1.1214	-3.6146	0.1930	-4.3688
T9	20.00-5.00	1.0272	-3.3974	0.2178	-4.1175
T10	5.00-0.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	AVA7-50(1-5/8")	160.00 - 177.00	0.6000	0.2877
T1	2	AVA7-50(1-5/8")	160.00 - 177.00	0.6000	0.2877
T1	3	.4" Black Cable	160.00 - 177.00	0.6000	0.2877
T1	4	.8" DC Power	160.00 - 177.00	0.6000	0.2877
T2	1	AVA7-50(1-5/8")	140.00 - 160.00	0.6000	0.3469
T2	2	AVA7-50(1-5/8")	140.00 - 160.00	0.6000	0.3469
T2	3	.4" Black Cable	140.00 - 160.00	0.6000	0.3469
T2	4	.8" DC Power	140.00 - 160.00	0.6000	0.3469
T2	6	LDF7-50A(1-5/8")	140.00 - 152.00	0.6000	0.3469
T2	7	FSJ4-50B(1/2")	140.00 - 152.00	0.6000	0.3469
T3	1	AVA7-50(1-5/8")	120.00 - 140.00	0.6000	0.3392
T3	2	AVA7-50(1-5/8")	120.00 - 140.00	0.6000	0.3392
T3	3	.4" Black Cable	120.00 - 140.00	0.6000	0.3392
T3	4	.8" DC Power	120.00 - 140.00	0.6000	0.3392
T3	6	LDF7-50A(1-5/8")	120.00 - 140.00	0.6000	0.3392
T3	7	FSJ4-50B(1/2")	120.00 - 140.00	0.6000	0.3392
T3	9	561(1-5/8")	120.00 - 136.00	0.6000	0.3392
T3	10	561(1-5/8")	120.00 - 136.00	0.6000	0.3392
T4	1	AVA7-50(1-5/8")	100.00 - 120.00	0.6000	0.3579
T4	2	AVA7-50(1-5/8")	100.00 - 120.00	0.6000	0.3579
T4	3	.4" Black Cable	100.00 - 120.00	0.6000	0.3579

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	4	.8" DC Power	100.00 - 120.00	0.6000	0.3579
T4	6	LDF7-50A(1-5/8")	100.00 - 120.00	0.6000	0.3579
T4	7	FSJ4-50B(1/2")	100.00 - 120.00	0.6000	0.3579
T4	9	561(1-5/8")	100.00 - 120.00	0.6000	0.3579
T4	10	561(1-5/8")	100.00 - 120.00	0.6000	0.3579
T4	12	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	100.00 - 120.00	0.6000	0.3579
T4	13	AVA7-50(1-5/8")	100.00 - 120.00	0.6000	0.3579
T4	15	MLC Hybrid 6Power/12Fiber(1-1/2")	100.00 - 120.00	0.6000	0.3579
T4	16	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.3579
T5	1	AVA7-50(1-5/8")	80.00 - 100.00	0.6000	0.3470
T5	2	AVA7-50(1-5/8")	80.00 - 100.00	0.6000	0.3470
T5	3	.4" Black Cable	80.00 - 100.00	0.6000	0.3470
T5	4	.8" DC Power	80.00 - 100.00	0.6000	0.3470
T5	6	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.3470
T5	7	FSJ4-50B(1/2")	80.00 - 100.00	0.6000	0.3470
T5	9	561(1-5/8")	80.00 - 100.00	0.6000	0.3470
T5	10	561(1-5/8")	80.00 - 100.00	0.6000	0.3470
T5	12	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	80.00 - 100.00	0.6000	0.3470
T5	13	AVA7-50(1-5/8")	80.00 - 100.00	0.6000	0.3470
T5	15	MLC Hybrid 6Power/12Fiber(1-1/2")	80.00 - 100.00	0.6000	0.3470
T5	16	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.3470
T6	1	AVA7-50(1-5/8")	60.00 - 80.00	0.6000	0.3735
T6	2	AVA7-50(1-5/8")	60.00 - 80.00	0.6000	0.3735
T6	3	.4" Black Cable	60.00 - 80.00	0.6000	0.3735
T6	4	.8" DC Power	60.00 - 80.00	0.6000	0.3735
T6	6	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.3735
T6	7	FSJ4-50B(1/2")	60.00 - 80.00	0.6000	0.3735
T6	9	561(1-5/8")	60.00 - 80.00	0.6000	0.3735
T6	10	561(1-5/8")	60.00 - 80.00	0.6000	0.3735
T6	12	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	60.00 - 80.00	0.6000	0.3735
T6	13	AVA7-50(1-5/8")	60.00 - 80.00	0.6000	0.3735
T6	15	MLC Hybrid 6Power/12Fiber(1-1/2")	60.00 - 80.00	0.6000	0.3735
T6	16	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.3735
T7	1	AVA7-50(1-5/8")	40.00 - 60.00	0.6000	0.5334
T7	2	AVA7-50(1-5/8")	40.00 - 60.00	0.6000	0.5334
T7	3	.4" Black Cable	40.00 - 60.00	0.6000	0.5334
T7	4	.8" DC Power	40.00 - 60.00	0.6000	0.5334
T7	6	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5334
T7	7	FSJ4-50B(1/2")	40.00 - 60.00	0.6000	0.5334
T7	9	561(1-5/8")	40.00 - 60.00	0.6000	0.5334
T7	10	561(1-5/8")	40.00 - 60.00	0.6000	0.5334
T7	12	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	40.00 - 60.00	0.6000	0.5334
T7	13	AVA7-50(1-5/8")	40.00 - 60.00	0.6000	0.5334
T7	15	MLC Hybrid 6Power/12Fiber(1-1/2")	40.00 - 60.00	0.6000	0.5334
T7	16	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5334
T8	1	AVA7-50(1-5/8")	20.00 - 40.00	0.6000	0.5569
T8	2	AVA7-50(1-5/8")	20.00 - 40.00	0.6000	0.5569

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	3	.4" Black Cable	20.00 - 40.00	0.6000	0.5569
T8	4	.8" DC Power	20.00 - 40.00	0.6000	0.5569
T8	6	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.5569
T8	7	FSJ4-50B(1/2")	20.00 - 40.00	0.6000	0.5569
T8	9	561(1-5/8")	20.00 - 40.00	0.6000	0.5569
T8	10	561(1-5/8")	20.00 - 40.00	0.6000	0.5569
T8	12	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	20.00 - 40.00	0.6000	0.5569
T8	13	AVA7-50(1-5/8")	20.00 - 40.00	0.6000	0.5569
T8	15	MLC Hybrid 6Power/12Fiber(1-1/2")	20.00 - 40.00	0.6000	0.5569
T8	16	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.5569
T9	1	AVA7-50(1-5/8")	8.00 - 20.00	0.6000	0.5581
T9	2	AVA7-50(1-5/8")	8.00 - 20.00	0.6000	0.5581
T9	3	.4" Black Cable	8.00 - 20.00	0.6000	0.5581
T9	4	.8" DC Power	8.00 - 20.00	0.6000	0.5581
T9	6	LDF7-50A(1-5/8")	8.00 - 20.00	0.6000	0.5581
T9	7	FSJ4-50B(1/2")	8.00 - 20.00	0.6000	0.5581
T9	9	561(1-5/8")	8.00 - 20.00	0.6000	0.5581
T9	10	561(1-5/8")	8.00 - 20.00	0.6000	0.5581
T9	12	MLE Hybrid 9Power/18Fiber RL 2(1 5/8")	8.00 - 20.00	0.6000	0.5581
T9	13	AVA7-50(1-5/8")	8.00 - 20.00	0.6000	0.5581
T9	15	MLC Hybrid 6Power/12Fiber(1-1/2")	8.00 - 20.00	0.6000	0.5581
T9	16	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.5581

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	5.56 6.07 6.59	4.47 4.97 5.47	0.08 0.17 0.26
(2) P65-17-XLH-RR w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	7.48 8.17 8.88	5.29 5.96 6.64	0.09 0.17 0.26
P65-17-XLH-RR w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	7.48 8.17 8.88	5.29 5.96 6.64	0.09 0.17 0.26
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	7.48 8.17 8.88	5.29 5.96 6.64	0.09 0.17 0.26
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice	5.75 6.18 6.61	4.25 5.01 5.71	0.06 0.10 0.16
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.00	0.0000	177.00	No Ice	5.75	4.25	0.06

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	6.18	5.01	0.10
			0.00			1" Ice	6.61	5.71	0.16
(2) RRUS 11 B12	A	From Leg	4.00	0.0000	177.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
(2) RRUS 11 B12	B	From Leg	4.00	0.0000	177.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
(2) RRUS 11 B12	C	From Leg	4.00	0.0000	177.00	No Ice	2.83	1.18	0.05
			0.00			1/2" Ice	3.04	1.33	0.07
			0.00			1" Ice	3.26	1.48	0.10
DC06-48-60-0-1E	C	From Leg	4.00	0.0000	177.00	No Ice	0.73	0.73	0.05
			0.00			1/2" Ice	0.85	0.84	0.06
			0.00			1" Ice	0.97	0.96	0.08
(2) DTMABP7819VG12A	A	From Leg	4.00	0.0000	177.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			0.00			1" Ice	1.23	0.51	0.04
(2) DTMABP7819VG12A	B	From Leg	4.00	0.0000	177.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			0.00			1" Ice	1.23	0.51	0.04
DTMABP7819VG12A	C	From Leg	4.00	0.0000	177.00	No Ice	0.98	0.34	0.02
			0.00			1/2" Ice	1.10	0.42	0.03
			0.00			1" Ice	1.23	0.51	0.04
(2) LGP21401	C	From Leg	4.00	0.0000	177.00	No Ice	1.10	0.21	0.01
			0.00			1/2" Ice	1.24	0.27	0.02
			0.00			1" Ice	1.38	0.35	0.03
DB874H120-SX w/Mount Pipe	C	From Leg	4.00	0.0000	177.00	No Ice	5.78	4.14	0.04
			0.00			1/2" Ice	6.42	5.17	0.09
			0.00			1" Ice	6.94	5.92	0.14
(3) Rohn 15' Boom Gate	A	None		0.0000	177.00	No Ice	40.10	40.10	2.40
						1/2" Ice	57.33	57.33	3.09
						1" Ice	74.56	74.56	3.78
***									
(2) DB950F85E-M w/ Mount	A	From Leg	4.00	0.0000	152.00	No Ice	2.79	6.03	0.06
			0.00			1/2" Ice	3.22	6.83	0.10
			0.00			1" Ice	3.64	7.58	0.15
(2) DB950F85E-M w/ Mount	B	From Leg	4.00	0.0000	152.00	No Ice	2.79	6.03	0.06
			0.00			1/2" Ice	3.22	6.83	0.10
			0.00			1" Ice	3.64	7.58	0.15
(2) DB950F85E-M w/ Mount	C	From Leg	4.00	0.0000	152.00	No Ice	2.79	6.03	0.06
			0.00			1/2" Ice	3.22	6.83	0.10
			0.00			1" Ice	3.64	7.58	0.15
2" STD Pipe (2.375 OD)x6'-0"	A	From Leg	4.00	0.0000	152.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
2" STD Pipe (2.375 OD)x6'-0"	B	From Leg	4.00	0.0000	152.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
2" STD Pipe (2.375 OD)x6'-0"	C	From Leg	4.00	0.0000	152.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
(3) Rohn 15' Boom Gate	A	None		0.0000	152.00	No Ice	40.10	40.10	2.40
						1/2" Ice	57.33	57.33	3.09
						1" Ice	74.56	74.56	3.78
***									
(2) LPA-80080-4CF-EDIN w/ mount pipe	A	From Leg	4.00	0.0000	136.00	No Ice	2.85	6.56	0.03
			0.00			1/2" Ice	3.21	7.19	0.08

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	3.59	7.83	0.13
(2) LPA-80080-4CF-EDIN w/ mount pipe	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.85 3.21 3.59	6.56 7.19 7.83	0.03 0.08 0.13
(2) LPA-80080-4CF-EDIN w/ mount pipe	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	2.85 3.21 3.59	6.56 7.19 7.83	0.03 0.08 0.13
(2) QS6656-5D w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.11 0.19 0.27
(2) QS6656-5D w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.11 0.19 0.27
(2) QS6656-5D w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	8.37 8.93 9.46	8.46 9.66 10.55	0.11 0.19 0.27
B2/B66 RRH-BR049	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
B2/B66 RRH-BR049	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
B2/B66 RRH-BR049	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
B5/B13 RRH-BR04C	A	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
B5/B13 RRH-BR04C	B	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
B5/B13 RRH-BR04C	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
DB-C1-12C-24AB-0Z	C	From Leg	4.00 0.00 0.00	0.0000	136.00	No Ice 1/2" Ice 1" Ice	4.06 4.32 4.58	3.10 3.34 3.58	0.03 0.07 0.11
Sector Mount P/N: VFA12-HD	C	None		0.0000	136.00	No Ice 1/2" Ice 1" Ice	30.43 43.02 55.43	30.43 43.02 55.43	1.69 2.30 3.10
****									
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	6.16 6.60 7.03	5.55 6.30 7.00	0.10 0.16 0.22
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	6.16 6.60 7.03	5.55 6.30 7.00	0.10 0.16 0.22
AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	6.16 6.60 7.03	5.55 6.30 7.00	0.10 0.16 0.22
AIR 21 B4A/B12P-B5P 6 FT w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	10.73 11.28 11.82	8.51 9.73 10.67	0.14 0.22 0.31
AIR 21 B4A/B12P-B5P 6 FT w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice	10.73 11.28 11.82	8.51 9.73 10.67	0.14 0.22 0.31
AIR 21 B4A/B12P-B5P 6 FT	C	From Leg	4.00	0.0000	120.00	No Ice	10.73	8.51	0.14

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
w/ Mount Pipe			0.00			1/2" Ice	11.28	9.73	0.22
			0.00			1" Ice	11.82	10.67	0.31
RADIO 4449 B71/B85	A	From Leg	4.00	0.0000	120.00	No Ice	1.64	1.31	0.07
			0.00			1/2" Ice	1.80	1.46	0.09
			0.00			1" Ice	1.97	1.61	0.11
RADIO 4449 B71/B85	B	From Leg	4.00	0.0000	120.00	No Ice	1.64	1.31	0.07
			0.00			1/2" Ice	1.80	1.46	0.09
			0.00			1" Ice	1.97	1.61	0.11
RADIO 4449 B71/B85	C	From Leg	4.00	0.0000	120.00	No Ice	1.64	1.31	0.07
			0.00			1/2" Ice	1.80	1.46	0.09
			0.00			1" Ice	1.97	1.61	0.11
APXVAALL24_43-U-NA20	A	From Leg	4.00	0.0000	120.00	No Ice	20.24	10.63	0.18
w/ Mount Pipe			0.00			1/2" Ice	20.89	12.06	0.31
			0.00			1" Ice	21.55	13.34	0.46
APXVAALL24_43-U-NA20	B	From Leg	4.00	0.0000	120.00	No Ice	20.24	10.63	0.18
w/ Mount Pipe			0.00			1/2" Ice	20.89	12.06	0.31
			0.00			1" Ice	21.55	13.34	0.46
APXVAALL24_43-U-NA20	C	From Leg	4.00	0.0000	120.00	No Ice	20.24	10.63	0.18
w/ Mount Pipe			0.00			1/2" Ice	20.89	12.06	0.31
			0.00			1" Ice	21.55	13.34	0.46
(3) Valmont VFA8-RRU	C	None		0.0000	120.00	No Ice	25.30	25.30	1.04
						1/2" Ice	35.43	35.43	1.46
						1" Ice	45.56	45.56	1.88
***									
(3) Valmont VFA8-RRU	C	None		0.0000	110.00	No Ice	25.30	25.30	1.04
						1/2" Ice	35.43	35.43	1.46
						1" Ice	45.56	45.56	1.88
***									
GPS_A	A	From Leg	4.00	0.0000	98.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			0.00			1" Ice	0.39	0.39	0.01
***									

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 160	Leg	Max Tension	4	27.35	-0.04	0.02
			Max. Compression	10	-32.63	-0.15	0.12
			Max. Mx	11	-19.44	1.50	-0.01
			Max. My	9	-19.55	0.75	-1.40
			Max. Vy	5	-3.68	-1.50	-0.01
			Max. Vx	2	3.63	0.05	1.40
		Diagonal	Max Tension	12	4.53	0.00	0.00
			Max. Compression	6	-7.06	0.00	0.00
			Max. Mx	9	-2.83	-0.05	0.00
			Max. My	3	-6.13	-0.01	0.02
			Max. Vy	23	-0.03	0.03	0.00
			Max. Vx	3	0.01	0.00	0.00
		Top Girt	Max Tension	4	0.42	0.00	0.00
			Max. Compression	10	-0.49	0.00	0.00
			Max. Mx	26	-0.18	-0.02	0.00
			Max. My	3	-0.05	0.00	-0.00
			Max. Vy	26	0.02	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	6	2.08	0.00	0.00
			Max. Compression	4	-0.11	0.00	0.00
			Max. Mx	14	1.23	-0.02	0.00
			Max. My	3	0.71	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Guy A	Bottom Tension	9	8.19		
			Top Tension	9	8.27		
			Top Cable Vert	9	5.98		
			Top Cable Norm	9	5.71		
			Top Cable Tan	9	0.08		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Vert	9	-5.71		
			Bot Cable Norm	9	5.86		
			Bot Cable Tan	9	0.11		
		Guy A	Bottom Tension	8	21.89		
			Top Tension	8	22.15		
			Top Cable Vert	8	16.96		
			Top Cable Norm	8	14.25		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-16.34		
			Bot Cable Norm	8	14.57		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	12	8.29		
			Top Tension	12	8.37		
			Top Cable Vert	12	6.06		
			Top Cable Norm	12	5.77		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-5.78		
			Bot Cable Norm	12	5.94		
			Bot Cable Tan	12	0.00		
		Guy B	Bottom Tension	11	22.35		
			Top Tension	11	22.60		
			Top Cable Vert	11	17.29		
			Top Cable Norm	11	14.56		
			Top Cable Tan	11	0.10		
			Bot Cable Vert	11	-16.69		
			Bot Cable Norm	11	14.86		
			Bot Cable Tan	11	0.21		
		Guy C	Bottom Tension	3	8.19		
			Top Tension	3	8.27		
			Top Cable Vert	3	5.99		
			Top Cable Norm	3	5.71		
			Top Cable Tan	3	0.08		
			Bot Cable Vert	3	-5.72		
			Bot Cable Norm	3	5.87		
			Bot Cable Tan	3	0.11		
		Guy C	Bottom Tension	4	22.40		
			Top Tension	4	22.66		
			Top Cable Vert	4	17.34		
			Top Cable Norm	4	14.58		
			Top Cable Tan	4	0.00		
			Bot Cable Vert	4	-16.73		
			Bot Cable Norm	4	14.90		
			Bot Cable Tan	4	0.00		
		Top Guy Pull-Off	Max Tension	11	7.79	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4.96	0.03	0.00
			Max. My	3	5.12	0.00	0.00
			Max. Vy	14	-0.04	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	5	5.93	-4.96	-0.00
			Max. Compression	6	-2.36	-15.64	0.00
			Max. Mx	4	-1.47	-18.79	0.00
			Max. My	3	4.73	-12.99	0.00
			Max. Vy	4	5.54	-18.79	0.00
			Max. Vx	3	0.00	-12.99	0.00
T2	160 - 140	Leg	Max Tension	6	16.58	-0.39	-0.60
			Max. Compression	5	-49.28	-0.09	0.13
			Max. Mx	5	-9.69	1.24	-0.48
			Max. My	8	-10.16	0.07	1.29
			Max. Vy	5	-3.64	-1.08	0.02
			Max. Vx	2	3.64	0.04	0.98

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	6	4.93	0.00	0.00
			Max. Compression	6	-5.49	0.00	0.00
			Max. Mx	3	1.96	-0.03	-0.01
			Max. My	3	-4.32	0.01	-0.01
			Max. Vy	17	0.02	-0.02	-0.00
			Max. Vx	3	-0.01	0.00	0.00
		Top Girt	Max Tension	4	1.63	0.00	0.00
			Max. Compression	10	-1.17	0.00	0.00
			Max. Mx	14	0.39	0.01	0.00
			Max. My	3	0.30	0.00	0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Bottom Girt	Max Tension	6	1.00	0.00	0.00
			Max. Compression	4	-0.26	0.00	0.00
			Max. Mx	14	0.39	0.01	0.00
			Max. My	3	0.23	0.00	0.00
			Max. Vy	14	-0.02	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	10	36.80	-0.18	0.08
			Max. Compression	5	-80.89	0.56	0.04
			Max. Mx	5	-26.89	0.84	-0.07
			Max. My	8	-4.28	0.08	0.86
			Max. Vy	5	-1.99	-0.09	0.14
			Max. Vx	2	1.83	0.07	0.39
		Diagonal	Max Tension	12	3.28	0.00	0.00
			Max. Compression	12	-3.40	0.00	0.00
			Max. Mx	3	1.75	-0.03	-0.01
			Max. My	3	-2.86	0.01	-0.01
			Max. Vy	18	0.02	-0.02	0.00
			Max. Vx	3	-0.01	0.00	0.00
		Top Girt	Max Tension	4	0.34	0.00	0.00
			Max. Compression	6	-0.08	0.00	0.00
			Max. Mx	14	0.21	0.01	0.00
			Max. My	3	0.12	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Bottom Girt	Max Tension	6	0.98	0.00	0.00
			Max. Compression	4	-0.46	0.00	0.00
			Max. Mx	14	0.30	0.01	0.00
			Max. My	9	0.20	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
		Guy A	Bottom Tension	8	13.57		
			Top Tension	8	13.66		
			Top Cable Vert	8	9.45		
			Top Cable Norm	8	9.86		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-9.18		
			Bot Cable Norm	8	9.99		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	11	14.98		
			Top Tension	11	15.06		
			Top Cable Vert	11	10.41		
			Top Cable Norm	11	10.89		
			Top Cable Tan	11	0.03		
			Bot Cable Vert	11	-10.14		
			Bot Cable Norm	11	11.02		
			Bot Cable Tan	11	0.13		
		Guy C	Bottom Tension	5	15.00		
			Top Tension	5	15.09		
			Top Cable Vert	5	10.43		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Norm	5	10.91		
			Top Cable Tan	5	0.03		
			Bot Cable Vert	5	-10.16		
			Bot Cable Norm	5	11.04		
			Bot Cable Tan	5	0.13		
		Top Guy Pull-Off	Max Tension	10	5.76	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2.97	0.03	0.00
			Max. My	5	3.51	0.00	0.00
			Max. Vy	14	-0.03	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T4	120 - 100	Leg	Max Tension	10	36.80	-0.29	0.16
			Max. Compression	5	-81.90	0.15	-0.57
			Max. Mx	11	-56.38	-1.61	-0.15
			Max. My	8	-45.97	-0.08	1.42
			Max. Vy	11	-3.55	-1.20	-0.13
			Max. Vx	8	3.14	-0.06	1.06
		Diagonal	Max Tension	11	4.42	0.00	0.00
			Max. Compression	11	-5.13	0.00	0.00
			Max. Mx	3	-1.75	0.04	-0.01
			Max. My	11	-5.13	-0.01	-0.01
			Max. Vy	18	0.02	-0.03	0.00
			Max. Vx	11	-0.01	0.00	0.00
		Top Girt	Max Tension	10	1.34	0.00	0.00
			Max. Compression	12	-0.52	0.00	0.00
			Max. Mx	14	0.54	0.01	0.00
			Max. My	9	0.30	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	9	0.00	0.00	0.00
		Bottom Girt	Max Tension	12	0.92	0.00	0.00
			Max. Compression	2	-0.01	0.00	0.00
			Max. Mx	14	0.61	0.01	0.00
			Max. My	3	0.30	0.00	-0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	10	4.88	0.98	-0.54
			Max. Compression	15	-57.02	-0.00	0.01
			Max. Mx	11	-56.38	-1.20	-0.13
			Max. My	8	-45.97	-0.06	1.06
			Max. Vy	11	-3.56	0.98	-0.01
			Max. Vx	8	3.17	0.06	-0.89
		Diagonal	Max Tension	11	5.47	0.00	0.00
			Max. Compression	11	-5.53	0.00	0.00
			Max. Mx	3	1.15	-0.02	-0.00
			Max. My	12	-4.58	0.01	-0.01
			Max. Vy	18	0.02	-0.02	0.00
			Max. Vx	12	-0.00	0.00	0.00
		Top Girt	Max Tension	10	1.13	0.00	0.00
			Max. Compression	12	-0.60	0.00	0.00
			Max. Mx	14	0.36	0.01	0.00
			Max. My	3	0.24	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	15	0.83	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.78	0.01	0.00
			Max. My	3	0.53	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Guy A	Bottom Tension	9	22.06		
			Top Tension	9	22.15		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Vert	9	14.32		
			Top Cable Norm	9	16.90		
			Top Cable Tan	9	0.00		
			Bot Cable Vert	9	-14.07		
			Bot Cable Norm	9	16.99		
			Bot Cable Tan	9	0.12		
		Guy B	Bottom Tension	11	26.96		
			Top Tension	11	27.05		
			Top Cable Vert	11	17.45		
			Top Cable Norm	11	20.67		
			Top Cable Tan	11	0.05		
			Bot Cable Vert	11	-17.20		
			Bot Cable Norm	11	20.75		
			Bot Cable Tan	11	0.17		
		Guy C	Bottom Tension	5	26.99		
			Top Tension	5	27.08		
			Top Cable Vert	5	17.48		
			Top Cable Norm	5	20.69		
			Top Cable Tan	5	0.05		
			Bot Cable Vert	5	-17.22		
			Bot Cable Norm	5	20.78		
			Bot Cable Tan	5	0.17		
		Top Guy Pull-Off	Max Tension	10	9.92	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4.77	0.03	0.00
			Max. My	3	5.45	0.00	-0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-58.04	-0.12	0.22
			Max. Mx	5	-44.87	0.74	0.15
			Max. My	8	-13.57	0.08	0.69
			Max. Vy	5	-1.80	-0.36	0.06
			Max. Vx	8	-1.60	-0.03	-0.29
		Diagonal	Max Tension	12	2.30	0.00	0.00
			Max. Compression	12	-2.97	-0.02	-0.01
			Max. Mx	9	0.56	-0.04	0.00
			Max. My	6	-2.85	0.02	0.01
			Max. Vy	18	0.02	-0.04	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Top Girt	Max Tension	4	1.38	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.01	0.01	0.00
			Max. My	3	0.53	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	24	0.82	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	0.74	0.01	0.00
			Max. My	3	0.73	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-62.54	-0.28	0.10
			Max. Mx	6	-44.90	-0.64	-0.32
			Max. My	12	-37.13	0.40	0.59
			Max. Vy	11	1.31	0.48	-0.07
			Max. Vx	8	-1.30	-0.27	-0.37
		Diagonal	Max Tension	12	4.15	0.00	0.00
			Max. Compression	12	-4.31	0.00	0.00
			Max. Mx	18	0.16	0.01	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	19	0.92	0.00	0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	11	0.59	0.00	0.00
			Max. Compression	6	-0.66	0.00	0.00
			Max. Mx	23	0.09	0.01	0.00
			Max. My	3	0.53	0.00	-0.00
			Max. Vy	23	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	1.29	0.00	0.00
			Max. Compression	11	-0.98	0.00	0.00
			Max. Mx	23	0.17	0.01	0.00
			Max. My	3	0.58	0.00	-0.00
			Max. Vy	23	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Guy A	Bottom Tension	10	9.09		
			Top Tension	10	9.11		
			Top Cable Vert	10	4.15		
			Top Cable Norm	10	8.11		
			Top Cable Tan	10	0.03		
			Bot Cable Vert	10	-4.06		
			Bot Cable Norm	10	8.13		
			Bot Cable Tan	10	0.10		
		Guy B	Bottom Tension	11	11.58		
			Top Tension	11	11.61		
			Top Cable Vert	11	5.28		
			Top Cable Norm	11	10.34		
			Top Cable Tan	11	0.01		
			Bot Cable Vert	11	-5.18		
			Bot Cable Norm	11	10.36		
			Bot Cable Tan	11	0.06		
		Guy C	Bottom Tension	5	11.58		
			Top Tension	5	11.61		
			Top Cable Vert	5	5.28		
			Top Cable Norm	5	10.34		
			Top Cable Tan	5	0.01		
			Bot Cable Vert	5	-5.18		
			Bot Cable Norm	5	10.36		
			Bot Cable Tan	5	0.06		
		Top Guy Pull-Off	Max Tension	11	6.31	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	2.95	0.02	0.00
			Max. My	3	0.64	0.00	-0.00
			Max. Vy	23	0.03	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-66.85	-0.18	0.22
			Max. Mx	5	-51.44	0.61	-0.29
			Max. My	8	-37.05	-0.01	0.58
			Max. Vy	11	1.34	0.33	-0.12
			Max. Vx	8	-1.30	-0.23	-0.22
		Diagonal	Max Tension	6	2.90	0.00	0.00
			Max. Compression	12	-3.37	0.00	0.00
			Max. Mx	24	0.04	0.01	0.00
			Max. My	19	-0.14	0.00	0.00
			Max. Vy	24	-0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	12	1.02	0.00	0.00
			Max. Compression	5	-0.89	0.00	0.00
			Max. Mx	23	0.11	0.01	0.00
			Max. My	3	-0.36	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	23	0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	0.46	0.00	0.00
			Max. Compression	11	-0.28	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	5	0.46	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T9	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-67.14	-0.02	0.08
			Max. Mx	24	-66.48	1.88	0.96
			Max. My	22	-66.63	-0.08	-2.12
			Max. Vy	24	-17.83	1.88	0.96
			Max. Vx	20	20.62	-0.10	-2.12
		Diagonal	Max Tension	11	2.48	0.00	0.00
			Max. Compression	5	-2.58	0.00	0.00
			Max. Mx	24	0.44	0.01	0.00
			Max. My	19	-0.08	0.00	0.00
			Max. Vy	24	-0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	11	0.58	0.00	0.00
			Max. Compression	5	-0.34	0.00	0.00
			Max. Mx	14	0.18	0.01	0.00
			Max. My	5	-0.34	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
		Bottom Girt	Max Tension	20	12.00	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	11.67	-0.03	0.00
			Max. My	5	8.84	0.00	0.00
			Max. Vy	25	0.04	0.00	0.00
			Max. Vx	5	-0.00	0.00	0.00
T10	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-71.85	-0.04	-0.04
			Max. Mx	9	-37.90	-2.28	0.03
			Max. My	5	-40.88	1.18	-0.47
			Max. Vy	9	7.88	-2.24	-0.00
			Max. Vx	5	-0.98	-1.59	0.06
		Horizontal	Max Tension	10	0.09	0.15	-0.04
			Max. Compression	19	-0.37	0.11	-0.05
			Max. Mx	9	-0.14	0.59	-0.20
			Max. My	9	-0.17	0.40	-0.24
			Max. Vy	5	-0.25	0.44	-0.10
			Max. Vx	10	-0.12	0.12	-0.04
		Top Girt	Max Tension	19	3.58	0.32	-0.09
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	11	2.27	0.42	-0.12
			Max. My	11	2.14	0.23	-0.16
			Max. Vy	11	-0.13	0.42	-0.12
			Max. Vx	10	-0.03	0.12	-0.05
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	9	-4.22	1.60	-0.61
			Max. Mx	9	-3.64	1.65	-0.58
			Max. My	9	-3.71	0.99	-0.62
			Max. Vy	5	-2.48	1.29	-0.33
			Max. Vx	10	-0.82	0.27	-0.12

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	19	197.63	-0.27	-0.32
	Max. H_x	11	133.01	2.06	0.23
	Max. H_z	2	130.08	0.02	1.22
	Max. M_x	1	0.00	0.02	-0.02
	Max. M_z	1	0.00	0.02	-0.02
	Max. Torsion	1	0.00	0.02	-0.02
	Min. Vert	1	82.07	0.02	-0.02
	Min. H_x	5	132.95	-2.01	0.23
	Min. H_z	8	111.49	0.02	-1.67
	Min. M_x	1	0.00	0.02	-0.02
	Min. M_z	1	0.00	0.02	-0.02
	Min. Torsion	1	0.00	0.02	-0.02
Guy C @ 162 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.97	-0.65	0.37
	Max. H_x	10	-0.97	-0.65	0.37
	Max. H_z	4	-11.21	-9.98	5.76
	Min. Vert	5	-11.28	-10.14	5.60
	Min. H_x	5	-11.28	-10.14	5.60
	Min. H_z	10	-0.97	-0.65	0.37
Guy B @ 162 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.98	0.66	0.38
	Max. H_x	11	-11.27	10.13	5.60
	Max. H_z	12	-11.12	9.89	5.72
	Min. Vert	11	-11.27	10.13	5.60
	Min. H_x	6	-0.98	0.66	0.38
	Min. H_z	6	-0.98	0.66	0.38
Guy A @ 162 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-1.01	-0.00	-0.79
	Max. H_x	11	-6.91	0.50	-6.93
	Max. H_z	2	-1.01	-0.00	-0.79
	Min. Vert	8	-10.95	0.00	-11.26
	Min. H_x	5	-6.86	-0.50	-6.88
	Min. H_z	8	-10.95	0.00	-11.26
Guy C @ 142 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.93	-0.56	0.32
	Max. H_x	10	-0.93	-0.56	0.32
	Max. H_z	4	-26.47	-22.08	12.75
	Min. Vert	5	-26.87	-22.61	12.66
	Min. H_x	5	-26.87	-22.61	12.66
	Min. H_z	10	-0.93	-0.56	0.32
Guy B @ 142 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.95	0.57	0.33
	Max. H_x	11	-26.83	22.58	12.65
	Max. H_z	11	-26.83	22.58	12.65
	Min. Vert	11	-26.83	22.58	12.65
	Min. H_x	6	-0.95	0.57	0.33
	Min. H_z	6	-0.95	0.57	0.33
Guy A @ 142 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.99	-0.00	-0.70
	Max. H_x	11	-13.84	0.66	-13.09
	Max. H_z	2	-0.99	-0.00	-0.70
	Min. Vert	8	-25.53	0.00	-24.56

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_x	5	-13.74	-0.66	-13.00
	Min. H_z	8	-25.53	0.00	-24.56
Guy C @ 100 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.05	-0.06	0.03
	Max. H_x	10	-0.05	-0.06	0.03
	Max. H_z	5	-22.41	-27.08	15.37
	Min. Vert	5	-22.41	-27.08	15.37
	Min. H_x	5	-22.41	-27.08	15.37
	Min. H_z	10	-0.05	-0.06	0.03
Guy B @ 100 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.05	0.06	0.03
	Max. H_x	11	-22.38	27.06	15.36
	Max. H_z	11	-22.38	27.06	15.36
	Min. Vert	11	-22.38	27.06	15.36
	Min. H_x	6	-0.05	0.06	0.03
	Min. H_z	6	-0.05	0.06	0.03
Guy A @ 100 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.05	0.00	-0.08
	Max. H_x	11	-11.38	0.37	-15.90
	Max. H_z	2	-0.05	0.00	-0.08
	Min. Vert	9	-18.06	0.16	-24.97
	Min. H_x	5	-11.40	-0.37	-15.94
	Min. H_z	9	-18.06	0.16	-24.97

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	82.07	-0.02	0.02	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	130.08	-0.02	-1.22	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	123.90	0.86	-1.03	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	113.82	1.72	-0.98	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	132.95	2.01	-0.23	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	135.39	1.31	0.75	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	122.40	0.48	1.30	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	111.49	-0.02	1.67	0.00	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	123.89	-0.50	1.31	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	136.45	-1.35	0.80	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	133.01	-2.06	-0.23	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	113.43	-1.73	-0.97	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	122.45	-0.88	-1.05	0.00	0.00	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Ice+1.0 Temp+Guy	194.80	-0.07	0.12	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.52	-0.07	-0.22	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.08	0.10	-0.20	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	196.73	0.25	-0.06	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.12	0.31	0.13	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.63	0.27	0.32	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.01	0.13	0.43	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	196.57	-0.07	0.44	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.01	-0.26	0.43	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.60	-0.41	0.32	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.09	-0.45	0.14	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	196.70	-0.39	-0.06	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	197.05	-0.24	-0.20	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	82.54	-0.02	-0.39	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	82.52	0.17	-0.32	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	82.54	0.39	-0.22	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	82.56	0.53	0.02	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	82.56	0.40	0.26	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	82.52	0.17	0.35	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	82.52	-0.02	0.42	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	82.52	-0.22	0.36	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	82.56	-0.45	0.27	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	82.56	-0.58	0.02	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	82.54	-0.43	-0.21	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	82.52	-0.21	-0.32	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-31.07	0.00	-0.00	31.05	0.00	0.037%
2	0.08	-37.03	-52.79	-0.08	37.03	52.77	0.035%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
3	26.36	-36.73	-45.55	-26.37	36.73	45.54	0.016%
4	49.26	-36.44	-28.46	-49.25	36.44	28.46	0.017%
5	60.83	-36.73	-0.08	-60.82	36.73	0.09	0.018%
6	49.08	-37.03	28.27	-49.07	37.03	-28.26	0.021%
7	25.75	-36.73	44.64	-25.73	36.73	-44.63	0.024%
8	-0.08	-36.44	52.31	0.08	36.44	-52.30	0.014%
9	-26.36	-36.73	45.55	26.35	36.73	-45.55	0.016%
10	-49.68	-37.03	28.71	49.65	37.03	-28.70	0.039%
11	-60.83	-36.73	0.08	60.82	36.73	-0.07	0.018%
12	-48.66	-36.44	-28.03	48.66	36.44	28.03	0.006%
13	-25.75	-36.73	-44.64	25.75	36.73	44.62	0.024%
14	0.00	-126.07	0.00	0.00	126.07	-0.01	0.007%
15	0.01	-126.34	-15.68	-0.01	126.34	15.68	0.004%
16	8.03	-126.07	-13.90	-8.03	126.07	13.89	0.009%
17	14.23	-125.81	-8.22	-14.22	125.81	8.22	0.005%
18	16.46	-126.07	-0.01	-16.45	126.07	0.01	0.009%
19	14.18	-126.34	8.18	-14.17	126.34	-8.18	0.005%
20	7.97	-126.07	13.82	-7.97	126.07	-13.81	0.009%
21	-0.01	-125.81	15.63	0.01	125.81	-15.62	0.005%
22	-8.03	-126.07	13.90	8.02	126.07	-13.89	0.008%
23	-14.26	-126.34	8.24	14.26	126.34	-8.24	0.005%
24	-16.46	-126.07	0.01	16.45	126.07	-0.00	0.008%
25	-14.14	-125.81	-8.16	14.14	125.81	8.16	0.005%
26	-7.97	-126.07	-13.82	7.97	126.07	13.81	0.009%
27	0.02	-31.13	-10.77	-0.02	31.13	10.77	0.012%
28	5.38	-31.07	-9.29	-5.38	31.06	9.29	0.026%
29	10.05	-31.01	-5.81	-10.04	31.01	5.80	0.027%
30	12.41	-31.07	-0.02	-12.41	31.06	0.02	0.018%
31	10.02	-31.13	5.77	-10.01	31.12	-5.77	0.019%
32	5.25	-31.07	9.11	-5.25	31.07	-9.10	0.029%
33	-0.02	-31.01	10.67	0.02	31.01	-10.67	0.024%
34	-5.38	-31.07	9.29	5.38	31.06	-9.29	0.026%
35	-10.14	-31.13	5.86	10.13	31.13	-5.86	0.014%
36	-12.41	-31.07	0.02	12.41	31.06	-0.01	0.018%
37	-9.93	-31.01	-5.72	9.93	31.00	5.72	0.015%
38	-5.25	-31.07	-9.11	5.25	31.07	9.10	0.029%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00085239
2	Yes	15	0.00043606	0.00063744
3	Yes	16	0.00015063	0.00065980
4	Yes	11	0.00022750	0.00054421
5	Yes	16	0.00017658	0.00063079
6	Yes	16	0.00020105	0.00071280
7	Yes	15	0.00034176	0.00047920
8	Yes	11	0.00017717	0.00045297
9	Yes	16	0.00015052	0.00066076
10	Yes	15	0.00046620	0.00070861
11	Yes	16	0.00017651	0.00062712
12	Yes	12	0.00008701	0.00062215
13	Yes	15	0.00034205	0.00048157
14	Yes	7	0.00070259	0.00020270
15	Yes	12	0.00042432	0.00017072

16	Yes	11	0.00078534	0.00035016
17	Yes	11	0.00041094	0.00021706
18	Yes	11	0.00079214	0.00036450
19	Yes	12	0.00046975	0.00022286
20	Yes	11	0.00075160	0.00029669
21	Yes	11	0.00040067	0.00019340
22	Yes	11	0.00070962	0.00031123
23	Yes	12	0.00045530	0.00018454
24	Yes	11	0.00075236	0.00034072
25	Yes	11	0.00040856	0.00023955
26	Yes	11	0.00078859	0.00031432
27	Yes	9	0.00000001	0.00022979
28	Yes	9	0.00000001	0.00036096
29	Yes	8	0.00068786	0.00039865
30	Yes	9	0.00000001	0.00032145
31	Yes	9	0.00046558	0.00033907
32	Yes	8	0.00086510	0.00043836
33	Yes	8	0.00066252	0.00035801
34	Yes	9	0.00000001	0.00035946
35	Yes	9	0.00000001	0.00026818
36	Yes	9	0.00000001	0.00031417
37	Yes	9	0.00000001	0.00024208
38	Yes	8	0.00087119	0.00044298

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	180 - 160	0.869	33	0.0598	0.2075
T2	160 - 140	1.079	29	0.0828	0.2147
T3	140 - 120	1.409	30	0.0612	0.2801
T4	120 - 100	1.560	30	0.0155	0.3857
T5	100 - 80	1.352	30	0.0802	0.4338
T6	80 - 60	0.957	30	0.0712	0.4952
T7	60 - 40	0.715	36	0.0528	0.5250
T8	40 - 20	0.540	36	0.0443	0.5994
T9	20 - 5	0.334	36	0.0655	0.6404
T10	5 - 0	0.086	36	0.0797	0.6523

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
177.00	SBNH-1D6565C w/ Mount Pipe	33	0.889	0.0642	0.2069	109414
162.52	Guy	29	1.046	0.0813	0.2114	31884
162.52	Guy	29	1.046	0.0813	0.2114	31884
152.00	(2) DB950F85E-M w/ Mount	30	1.206	0.0827	0.2323	181505
136.00	(2) LPA-80080-4CF-EDIN w/ mount pipe	30	1.464	0.0468	0.3016	18232
132.16	Guy	30	1.506	0.0318	0.3236	15951
120.00	AIR 21 B2A/B4P w/ Mount Pipe	30	1.560	0.0155	0.3857	11867
110.00	(3) Valmont VFA8-RRU	30	1.498	0.0441	0.4129	14415
98.00	GPS_A	30	1.315	0.0838	0.4393	25261
82.52	Guy	30	1.002	0.0751	0.4890	22636

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
49.75	Guy	36	0.623	0.0456	0.5610	147014

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	9.003	10	0.4365	1.1344
T2	160 - 140	10.690	10	0.5465	1.1644
T3	140 - 120	12.698	10	0.3989	1.4221
T4	120 - 100	13.484	10	0.1344	1.8442
T5	100 - 80	12.141	10	0.5091	2.0305
T6	80 - 60	9.513	10	0.5617	2.2526
T7	60 - 40	7.271	10	0.5318	2.3832
T8	40 - 20	5.196	5	0.5132	2.7052
T9	20 - 5	2.939	5	0.6255	2.9127
T10	5 - 0	0.750	5	0.7019	2.9593

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	SBNH-1D6565C w/ Mount Pipe	10	9.236	0.4584	1.1324	22885
162.52	Guy	10	10.448	0.5403	1.1514	6691
162.52	Guy	10	10.448	0.5403	1.1514	6691
152.00	(2) DB950F85E-M w/ Mount	10	11.519	0.5384	1.2335	45256
136.00	(2) LPA-80080-4CF-EDIN w/ mount pipe	10	13.002	0.3081	1.5078	2910
132.16	Guy	10	13.233	0.2130	1.5955	2592
120.00	AIR 21 B2A/B4P w/ Mount Pipe	10	13.484	0.1344	1.8442	1991
110.00	(3) Valmont VFA8-RRU	10	13.063	0.2937	1.9524	2348
98.00	GPS_A	10	11.907	0.5404	2.0505	3636
82.52	Guy	10	9.843	0.5708	2.2298	4629
49.75	Guy	10	6.193	0.5123	2.5339	24302

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	180	Diagonal	A325N	0.6250	1	7.06	12.43	0.569	1	Bolt Shear
		Top Girt	A325N	0.6250	1	0.42	9.11	0.046	1	Member Block Shear
		Bottom Girt	A325N	0.6250	1	2.08	9.11	0.229	1	Member Block Shear
T2	160	Leg	A325N	0.7500	4	2.41	29.82	0.081	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	0.5000	1	5.49	7.95	0.690	1	Bolt Shear
		Top Girt	A325N	0.5000	1	1.63	7.95	0.205	1	Bolt Shear
		Bottom Girt	A325N	0.5000	1	1.00	7.95	0.125	1	Bolt Shear
T3	140	Leg	A325N	0.7500	4	4.14	29.82	0.139	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3.28	6.38	0.515	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.34	4.49	0.076	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.98	4.49	0.219	1	Member Bearing
T4	120	Leg	A325N	0.7500	4	9.20	29.82	0.308	1	Bolt Tension
		Diagonal	A325N	0.5000	1	5.13	7.95	0.646	1	Bolt Shear
		Top Girt	A325N	0.5000	1	1.34	7.95	0.168	1	Bolt Shear
		Bottom Girt	A325N	0.5000	1	0.92	7.95	0.115	1	Bolt Shear
T5	100	Leg	A325N	0.7500	4	4.70	29.82	0.158	1	Bolt Tension
		Diagonal	A325N	0.5000	1	5.47	6.38	0.858	1	Member Bearing
		Top Girt	A325N	0.5000	1	1.13	4.49	0.252	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.83	4.49	0.186	1	Member Bearing
T6	80	Leg	A325N	0.7500	4	4.76	29.82	0.159	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2.97	7.95	0.374	1	Bolt Shear
		Top Girt	A325N	0.5000	1	1.38	7.95	0.174	1	Bolt Shear
		Bottom Girt	A325N	0.5000	1	0.82	7.95	0.103	1	Bolt Shear
T7	60	Leg	A325N	0.7500	4	4.84	29.82	0.162	1	Bolt Tension
		Diagonal	A325N	0.5000	1	4.15	6.38	0.651	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.59	4.49	0.131	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	1.29	4.49	0.287	1	Member Bearing
T8	40	Leg	A325N	0.7500	4	5.21	29.82	0.175	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2.90	6.38	0.454	1	Member Bearing
		Top Girt	A325N	0.5000	1	1.02	4.49	0.228	1	Member Bearing
		Bottom Girt	A325N	0.5000	1	0.46	4.49	0.102	1	Member Bearing
T9	20	Leg	A325N	0.7500	4	5.57	29.82	0.187	1	Bolt Tension
		Diagonal	A325N	0.5000	1	2.48	6.38	0.388	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.58	4.49	0.128	1	Member Bearing
		Bottom Girt	A325N	0.6250	2	6.00	12.43	0.483	1	Bolt Shear
T10	5	Leg	A325N	0.7500	4	5.80	29.82	0.194	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T1	162.52 (A) (462)	1/2 EHS	2.69	26.90	8.27	16.14	1.000	1.952
	162.52 (A) (463)	1/2 EHS	2.69	26.90	7.99	16.14	1.000	2.021
	162.52 (B) (458)	1/2 EHS	2.69	26.90	8.16	16.14	1.000	1.977
	162.52 (B) (459)	1/2 EHS	2.69	26.90	8.37	16.14	1.000	1.928
	162.52 (C) (454)	1/2 EHS	2.69	26.90	8.16	16.14	1.000	1.978
	162.52 (C) (455)	1/2 EHS	2.69	26.90	8.27	16.14	1.000	1.951
	162.52 (A) (471)	7/8 EHS	7.97	79.70	22.15	47.82	1.000	2.159
	162.52 (B) (470)	7/8 EHS	7.97	79.70	22.60	47.82	1.000	2.116

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
	162.52 (C) (466)	7/8 EHS	7.97	79.70	22.66	47.82	1.000	2.111
T3	132.16 (A) (477)	9/16 EHS	3.50	35.00	13.66	21.00	1.000	1.537
	132.16 (B) (476)	9/16 EHS	3.50	35.00	15.06	21.00	1.000	1.394
	132.16 (C) (472)	9/16 EHS	3.50	35.00	15.09	21.00	1.000	1.392
T5	82.52 (A) (483)	3/4 EHS	5.83	58.30	22.15	34.98	1.000	1.579
	82.52 (B) (482)	3/4 EHS	5.83	58.30	27.05	34.98	1.000	1.293
	82.52 (C) (478)	3/4 EHS	5.83	58.30	27.08	34.98	1.000	1.292
T7	49.75 (A) (489)	1/2 EHS	2.69	26.90	9.11	16.14	1.000	1.771
	49.75 (B) (488)	1/2 EHS	2.69	26.90	11.61	16.14	1.000	1.391
	49.75 (C) (484)	1/2 EHS	2.69	26.90	11.61	16.14	1.000	1.391

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	ROHN 2.5 X-STR	20.00	2.41	31.3 K=1.00	2.2535	1.00	-32.63	94.41	0.346 [1]
T2	160 - 140	ROHN 2.5 X STR	20.00	2.41	31.5 K=1.00	2.4278	1.00	-47.13	101.59	0.464 [1]
T3	140 - 120	ROHN 2.5 X STR	20.00	2.41	31.5 K=1.00	2.4278	0.99	-79.07	100.94	0.783 [1]
T4	120 - 100	ROHN 2.5 X STR	20.00	2.41	31.5 K=1.00	2.4278	0.99	-80.80	100.92	0.801 [1]
T5	100 - 80	ROHN 2.5 X STR	20.00	0.11	1.5 K=1.00	2.4278	0.91	-57.02	99.86	0.571 [1]
T6	80 - 60	ROHN 2.5 X STR	20.00	2.41	31.5 K=1.00	2.4278	1.00	-58.02	101.59	0.571 [1]
T7	60 - 40	ROHN 2.5 X STR	20.00	2.41	63.1 K=2.00	2.4278	1.00	-62.24	81.69	0.762 [1]
T8	40 - 20	ROHN 2.5 X STR	20.00	2.41	63.1 K=2.00	2.4278	1.00	-66.65	81.69	0.816 [1]
T9	20 - 5	ROHN 2.5 X STR	15.00	2.38	62.3 K=2.00	2.4278	1.00	-67.14	82.29	0.816 [1]
T10	5 - 0	ROHN 2.5 X STR	5.38	1.08	14.1 K=1.00	2.4278	0.92	-71.85	99.31	0.723 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L 2 x 2 x 1/4	4.18	1.95	59.7 K=1.00	0.9380	-7.06	25.19	0.280 [1]
T2	160 - 140	ROHN TS1.5x11 ga	4.18	1.95	47.7 K=1.00	0.5202	-5.49	17.10	0.321 [1]
T3	140 - 120	ROHN TS1.5x16 ga	4.18	1.95	45.9 K=1.00	0.2823	-3.40	9.38	0.362 [1]
T4	120 - 100	ROHN TS1.5x11 ga	4.18	1.95	47.7 K=1.00	0.5202	-5.13	17.10	0.300 [1]
T5	100 - 80	ROHN TS1.5x16 ga	4.18	1.95	45.9 K=1.00	0.2823	-5.53	9.38	0.590 [1]
T6	80 - 60	ROHN TS1.5x11 ga	4.18	1.95	47.7 K=1.00	0.5202	-2.97	17.10	0.174 [1]
T7	60 - 40	ROHN TS1.5x16 ga	4.18	3.89	91.8 K=1.00	0.2823	-4.31	6.36	0.678 [1]
T8	40 - 20	ROHN TS1.5x16 ga	4.18	3.89	91.8 K=1.00	0.2823	-3.37	6.36	0.530 [1]
T9	20 - 5	ROHN TS1.5x16 ga	4.17	3.87	91.4 K=1.00	0.2823	-2.58	6.39	0.404 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	5 - 0	L4x4x1/4	2.39	2.15	32.5 K=1.00	1.9400	-0.37	57.55	0.006 [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	180 - 160	L 2 x 2 x 1/4	3.42	3.18	97.6 K=1.00	0.9380	-0.49	18.40	0.026 [1]
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	0.5202	-1.17	13.54	0.086 [1]
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.08	7.55	0.011 [1]
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	0.5202	-0.52	13.54	0.038 [1]
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.60	7.55	0.079 [1]
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.66	7.55	0.087 [1]
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.89	7.55	0.118 [1]
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	-0.34	7.55	0.045 [1]

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

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 160	L 2 x 2 x 1/4	3.42	3.18	97.6 K=1.00	0.9380	-0.11	18.40	0.006 [1]
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	0.5202	-0.26	13.54	0.019 [1]
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.46	7.55	0.061 [1]
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	77.9 K=1.00	0.5202	-0.01	13.54	0.001 [1]
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.98	7.55	0.129 [1]
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	75.0 K=1.00	0.2823	-0.28	7.55	0.038 [1]
T10	5 - 0	L4x4x1/4	0.34	0.10	1.5 K=1.00	1.9400	-4.22	60.72	0.070 [1]

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 160 (456)	C12x20.7	3.42	3.30	49.6 K=1.00	6.0900	-1.22	173.38	0.007
T1	180 - 160 (457)	C12x20.7	3.42	3.30	49.6 K=1.00	6.0900	-1.28	173.38	0.007
T1	180 - 160 (460)	C12x20.7	3.42	3.30	49.6 K=1.00	6.0900	-1.05	173.38	0.006
T1	180 - 160 (461)	C12x20.7	3.42	3.30	49.6 K=1.00	6.0900	-1.47	173.38	0.008
T1	180 - 160 (464)	C12x20.7	3.42	3.30	49.6 K=1.00	6.0900	-1.57	173.38	0.009
T1	180 - 160 (465)	C12x20.7	3.42	3.30	49.6 K=1.00	6.0900	-1.17	173.38	0.007

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160 (456)	C12x20.7	-18.77	68.58	0.274	0.00	7.01	0.000
T1	180 - 160 (457)	C12x20.7	-18.42	68.58	0.269	0.00	7.01	0.000
T1	180 - 160 (460)	C12x20.7	-18.54	68.58	0.270	0.00	7.01	0.000
T1	180 - 160 (461)	C12x20.7	-18.79	68.58	0.274	0.00	7.01	0.000
T1	180 - 160 (464)	C12x20.7	-18.74	68.58	0.273	0.00	7.01	0.000
T1	180 - 160 (465)	C12x20.7	-18.45	68.58	0.269	0.00	7.01	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.007	0.274	0.000	0.277	1.000	4.8.1
T1	180 - 160 (457)	C12x20.7	0.007	0.269	0.000	0.272	1.000	4.8.1
T1	180 - 160 (460)	C12x20.7	0.006	0.270	0.000	0.273	1.000	4.8.1
T1	180 - 160 (461)	C12x20.7	0.008	0.274	0.000	0.278	1.000	4.8.1
T1	180 - 160 (464)	C12x20.7	0.009	0.273	0.000	0.278	1.000	4.8.1
T1	180 - 160 (465)	C12x20.7	0.007	0.269	0.000	0.272	1.000	4.8.1

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	ROHN 2.5 X-STR	20.00	2.41	31.3	2.2535	27.35	101.41	0.270 [1]
T2	160 - 140	ROHN 2.5 X STR	20.00	0.11	1.5	2.4278	16.58	109.25	0.152 [1]
T3	140 - 120	ROHN 2.5 X STR	20.00	0.11	1.5	2.4278	36.80	109.25	0.337 [1]
T4	120 - 100	ROHN 2.5 X STR	20.00	0.61	8.0	2.4278	36.80	109.25	0.337 [1]
T5	100 - 80	ROHN 2.5 X STR	20.00	0.61	8.0	2.4278	4.88	109.25	0.045 [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	180 - 160	L 2 x 2 x 1/4	4.18	1.95	38.3	0.5629	4.53	24.49	0.185 [1]
T2	160 - 140	ROHN TS1.5x11 ga	4.18	1.95	47.7	0.5202	4.93	19.67	0.251 [1]
T3	140 - 120	ROHN TS1.5x16 ga	4.18	1.95	45.9	0.2823	3.28	10.67	0.308 [1]
T4	120 - 100	ROHN TS1.5x11 ga	4.18	1.95	47.7	0.5202	4.42	19.67	0.225 [1]
T5	100 - 80	ROHN TS1.5x16 ga	4.18	1.95	45.9	0.2823	5.47	10.67	0.513 [1]
T6	80 - 60	ROHN TS1.5x11 ga	4.18	1.95	47.7	0.5202	2.30	19.67	0.117 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T7	60 - 40	ROHN TS1.5x16 ga	4.18	3.89	91.8	0.2823	4.15	10.67	0.389 [1]
T8	40 - 20	ROHN TS1.5x16 ga	4.18	3.89	91.8	0.2823	2.90	10.67	0.272 [1]
T9	20 - 5	ROHN TS1.5x16 ga	4.17	3.87	91.4	0.2823	2.48	10.67	0.232 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T10	5 - 0	L4x4x1/4	1.03	0.79	7.5	1.9400	0.09	62.86	0.001 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 160	L 2 x 2 x 1/4	3.42	3.18	62.7	0.5629	0.42	24.49	0.017 [1]
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	1.63	19.67	0.083 [1]
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	0.34	10.67	0.032 [1]
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	1.34	19.67	0.068 [1]
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	1.13	10.67	0.106 [1]
T6	80 - 60	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	1.38	19.67	0.070 [1]
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	0.59	10.67	0.055 [1]
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	1.02	10.67	0.096 [1]
T9	20 - 5	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	0.58	10.67	0.054 [1]
T10	5 - 0	L4x4x1/4	3.08	2.84	27.2	1.9400	3.58	62.86	0.057 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 160	L 2 x 2 x 1/4	3.42	3.18	62.7	0.5629	2.08	24.49	0.085 [1]
T2	160 - 140	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	1.00	19.67	0.051 [1]
T3	140 - 120	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	0.98	10.67	0.092 [1]
T4	120 - 100	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	0.92	19.67	0.047 [1]
T5	100 - 80	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	0.83	10.67	0.078 [1]
T6	80 - 60	ROHN TS1.5x11 ga	3.42	3.18	77.9	0.5202	0.82	19.67	0.042 [1]
T7	60 - 40	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	1.29	10.67	0.121 [1]
T8	40 - 20	ROHN TS1.5x16 ga	3.42	3.18	75.0	0.2823	0.46	10.67	0.043 [1]
T9	20 - 5	L3x3x1/2	3.42	3.18	42.5	1.7813	12.00	77.48	0.155 [1]

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

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 160	2L2x2x1/4x3/8 2L 'a' > 18.3775 in - 469	3.42	3.18	62.7	1.4100	7.79	68.74	0.113 [1]
T3	140 - 120	4x3/8	3.42	3.18	352.5	1.1250	5.76	54.84	0.105 [1]
T5	100 - 80	2L2x2x1/4x3/8 2L 'a' > 18.3770 in - 480	3.42	3.18	62.7	1.4100	9.92	68.74	0.144 [1]
T7	60 - 40	4x3/8	3.42	3.18	352.5	1.1250	6.31	54.84	0.115 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
T1	180 - 160	2L2x2x1/4x3/8	0.00	2.78	0.000	0.00	4.71	0.000
T3	140 - 120	4x3/8	0.00	0.53	0.000	0.00	5.63	0.000
T5	100 - 80	2L2x2x1/4x3/8	0.00	2.78	0.000	0.00	4.71	0.000
T7	60 - 40	4x3/8	0.00	0.53	0.000	0.00	5.63	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							
T1	180 - 160	2L2x2x1/4x3/8	0.113	0.000	0.000	0.113 [1]	1.000	4.8.1
T3	140 - 120	4x3/8	0.105	0.000	0.000	0.105 [1]	1.000	4.8.1
T5	100 - 80	2L2x2x1/4x3/8	0.144	0.000	0.000	0.144 [1]	1.000	4.8.1
T7	60 - 40	4x3/8	0.115	0.000	0.000	0.115 [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (456)	C12x20.7	3.42	3.30	49.6	6.0900	0.07	197.32	0.000
T1	180 - 160 (457)	C12x20.7	3.42	3.30	49.6	6.0900	1.62	197.32	0.008
T1	180 - 160 (460)	C12x20.7	3.42	3.30	49.6	6.0900	1.19	197.32	0.006
T1	180 - 160 (461)	C12x20.7	3.42	3.30	49.6	6.0900	1.08	197.32	0.005
T1	180 - 160 (464)	C12x20.7	3.42	3.30	49.6	6.0900	0.11	197.32	0.001
T1	180 - 160 (465)	C12x20.7	3.42	3.30	49.6	6.0900	1.58	197.32	0.008

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160 (456)	C12x20.7	-18.71	68.58	0.273	-0.00	7.01	0.000
T1	180 - 160 (457)	C12x20.7	-18.24	68.58	0.266	0.00	7.01	0.000
T1	180 - 160 (460)	C12x20.7	-18.33	68.58	0.267	0.00	7.01	0.000
T1	180 - 160 (461)	C12x20.7	-18.32	68.58	0.267	0.00	7.01	0.000
T1	180 - 160 (464)	C12x20.7	-18.69	68.58	0.273	0.00	7.01	0.000
T1	180 - 160 (465)	C12x20.7	-18.27	68.58	0.266	-0.00	7.01	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.000	0.273	0.000	0.273	1.000	4.8.1
T1	180 - 160 (457)	C12x20.7	0.008	0.266	0.000	0.270	1.000	4.8.1
T1	180 - 160 (460)	C12x20.7	0.006	0.267	0.000	0.270	1.000	4.8.1
T1	180 - 160 (461)	C12x20.7	0.005	0.267	0.000	0.270	1.000	4.8.1
T1	180 - 160 (464)	C12x20.7	0.001	0.273	0.000	0.273	1.000	4.8.1
T1	180 - 160 (465)	C12x20.7	0.008	0.266	0.000	0.270	1.000	4.8.1

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2.5 X-STR	1	-32.63	94.41	34.6	Pass
T2	160 - 140	Leg	ROHN 2.5 X STR	58	-47.13	101.59	46.4	Pass
T3	140 - 120	Leg	ROHN 2.5 X STR	115	-79.07	100.94	78.3	Pass
T4	120 - 100	Leg	ROHN 2.5 X STR	172	-80.80	100.92	80.1	Pass
T5	100 - 80	Leg	ROHN 2.5 X STR	231	-57.02	99.86	57.1	Pass
T6	80 - 60	Leg	ROHN 2.5 X STR	288	-58.02	101.59	57.1	Pass
T7	60 - 40	Leg	ROHN 2.5 X STR	345	-62.24	81.69	76.2	Pass
T8	40 - 20	Leg	ROHN 2.5 X STR	378	-66.65	81.69	81.6	Pass
T9	20 - 5	Leg	ROHN 2.5 X STR	411	-67.14	82.29	81.6	Pass
T10	5 - 0	Leg	ROHN 2.5 X STR	438	-71.85	99.31	72.3	Pass
T1	180 - 160	Diagonal	L 2 x 2 x 1/4	13	-7.06	25.19	28.0 56.9 (b)	Pass
T2	160 - 140	Diagonal	ROHN TS1.5x11 ga	112	-5.49	17.10	32.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							69.0 (b)	
T3	140 - 120	Diagonal	ROHN TS1.5x16 ga	150	-3.40	9.38	36.2	Pass
							51.5 (b)	
T4	120 - 100	Diagonal	ROHN TS1.5x11 ga	181	-5.13	17.10	30.0	Pass
							64.6 (b)	
T5	100 - 80	Diagonal	ROHN TS1.5x16 ga	244	-5.53	9.38	59.0	Pass
							85.8 (b)	
T6	80 - 60	Diagonal	ROHN TS1.5x11 ga	339	-2.97	17.10	17.4	Pass
							37.4 (b)	
T7	60 - 40	Diagonal	ROHN TS1.5x16 ga	362	-4.31	6.36	67.8	Pass
T8	40 - 20	Diagonal	ROHN TS1.5x16 ga	407	-3.37	6.36	53.0	Pass
T9	20 - 5	Diagonal	ROHN TS1.5x16 ga	418	-2.58	6.39	40.4	Pass
T10	5 - 0	Horizontal	L4x4x1/4	447	-0.20	60.29	1.3	Pass
T1	180 - 160	Top Girt	L 2 x 2 x 1/4	5	-0.49	18.40	2.6	Pass
							4.6 (b)	
T2	160 - 140	Top Girt	ROHN TS1.5x11 ga	62	-1.17	13.54	8.6	Pass
							20.5 (b)	
T3	140 - 120	Top Girt	ROHN TS1.5x16 ga	119	0.34	10.67	3.2	Pass
							7.6 (b)	
T4	120 - 100	Top Girt	ROHN TS1.5x11 ga	176	1.34	19.67	6.8	Pass
							16.8 (b)	
T5	100 - 80	Top Girt	ROHN TS1.5x16 ga	233	1.13	10.67	10.6	Pass
							25.2 (b)	
T6	80 - 60	Top Girt	ROHN TS1.5x11 ga	290	1.38	19.67	7.0	Pass
							17.4 (b)	
T7	60 - 40	Top Girt	ROHN TS1.5x16 ga	346	-0.66	7.55	8.7	Pass
							13.1 (b)	
T8	40 - 20	Top Girt	ROHN TS1.5x16 ga	381	-0.89	7.55	11.8	Pass
							22.8 (b)	
T9	20 - 5	Top Girt	ROHN TS1.5x16 ga	412	0.58	10.67	5.4	Pass
							12.8 (b)	
T10	5 - 0	Top Girt	L4x4x1/4	441	3.58	62.86	5.7	Pass
T1	180 - 160	Bottom Girt	L 2 x 2 x 1/4	9	2.08	24.49	8.5	Pass
							22.9 (b)	
T2	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	66	1.00	19.67	5.1	Pass
							12.5 (b)	
T3	140 - 120	Bottom Girt	ROHN TS1.5x16 ga	123	0.98	10.67	9.2	Pass
							21.9 (b)	
T4	120 - 100	Bottom Girt	ROHN TS1.5x11 ga	180	0.92	19.67	4.7	Pass
							11.5 (b)	
T5	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	235	0.83	10.67	7.8	Pass
							18.6 (b)	
T6	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	292	0.82	19.67	4.2	Pass
							10.3 (b)	
T7	60 - 40	Bottom Girt	ROHN TS1.5x16 ga	351	-0.98	7.55	12.9	Pass
							28.7 (b)	
T8	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	382	0.46	10.67	4.3	Pass
							10.2 (b)	
T9	20 - 5	Bottom Girt	L3x3x1/2	417	12.00	77.48	15.5	Pass
							48.3 (b)	
T10	5 - 0	Bottom Girt	L4x4x1/4	444	-4.22	60.72	12.7	Pass
T1	180 - 160	Guy A@162.523	1/2	462	8.27	16.14	51.2	Pass
		Guy A@162.523	7/8	471	22.15	47.82	46.3	Pass
T3	140 - 120	Guy A@132.159	9/16	477	13.66	21.00	65.0	Pass
T5	100 - 80	Guy A@82.5234	3/4	483	22.15	34.98	63.3	Pass
T7	60 - 40	Guy A@49.75	1/2	489	9.11	16.14	56.5	Pass
T1	180 - 160	Guy B@162.523	1/2	459	8.37	16.14	51.9	Pass
		Guy B@162.523	7/8	470	22.60	47.82	47.3	Pass
T3	140 - 120	Guy B@132.159	9/16	476	15.06	21.00	71.7	Pass
T5	100 - 80	Guy B@82.5234	3/4	482	27.05	34.98	77.3	Pass
T7	60 - 40	Guy B@49.75	1/2	488	11.61	16.14	71.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	180 - 160	Guy C@162.523	1/2	455	8.27	16.14	51.3	Pass
		Guy C@162.523	7/8	466	22.66	47.82	47.4	Pass
T3	140 - 120	Guy C@132.159	9/16	472	15.09	21.00	71.9	Pass
T5	100 - 80	Guy C@82.5234	3/4	478	27.08	34.98	77.4	Pass
T7	60 - 40	Guy C@49.75	1/2	484	11.61	16.14	71.9	Pass
T1	180 - 160	Top Guy Pull-Off@162.523	2L2x2x1/4x3/8	469	7.79	68.74	11.3	Pass
T3	140 - 120	Top Guy Pull-Off@132.159	4x3/8	474	5.76	54.84	10.5	Pass
T5	100 - 80	Top Guy Pull-Off@82.5234	2L2x2x1/4x3/8	480	9.92	68.74	14.4	Pass
T7	60 - 40	Top Guy Pull-Off@49.75	4x3/8	486	6.31	54.84	11.5	Pass
T1	180 - 160	Torque Arm Top@162.523	C12x20.7	461	-1.47	173.38	27.8	Pass
							Summary	
						Leg (T9)	81.6	Pass
						Diagonal (T5)	85.8	Pass
						Horizontal (T10)	1.3	Pass
						Top Girt (T5)	25.2	Pass
						Bottom Girt (T9)	48.3	Pass
						Guy A (T3)	65.0	Pass
						Guy B (T5)	77.3	Pass
						Guy C (T5)	77.4	Pass
						Top Guy Pull-Off (T5)	14.4	Pass
						Torque Arm Top (T1)	27.8	Pass
						Bolt Checks	85.8	Pass
						RATING =	**85.8**	**Pass**

MOUNT ANALYSIS

Tectonic PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.	Job No. 9927.CT11048A - Rev 1			
	Sheet No.	1	of	3
	Calculated By	JJ	Date :	10/16/20
	Checked By	IM	Date :	10/16/20

WIND AND ICE LOADS PER TIA-222-G

W.O.	9927.CT11048A - Rev 1
Project Name	North Stonington/ CDT_1
Location	227 Boom Bridge Rd, North Stonington, CT 06359
County	New London

Tower Type	GT	Guyed Tower
Structure Class	2	Substantial hazard
Exposure Category	C	Open terrain
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft

Basic Wind Speed (3-sec gust):		
Without ice	105	mph*
With ice	50	mph
Maintenance	40	mph
Ice thickness	0.75	in

*Nominal converted from 135mph ultimate risk cat. 2

Importance Factor	
Wind only	1.00
Wind with ice	1.00
Ice thickness	1.00
Supporting Data:	
K_e	1.00
K_t	N/A
f	N/A
z_g	900
α	9.5
$K_{z,min}$	0.85
K_d	0.95
G_h	1.00

Height	z (ft)	120
	Kh	N/A
	Kzt	1.00
	Kz	1.32
	Kiz	1.14
Wind Pressure, qz (psf)	No Ice	35.26
	With Ice	8.00
	Service	5.12
(tiz)	Ice Thk	1.71
Appurtenances (qzGh)	No Ice	35.26
	With Ice	8.00
	Service	5.12

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.	9927.CT11048A - Rev 1		
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Calculated By	JJ	Date :	10/16/20
Checked By	IM	Date :	10/16/20

Appurtenance Information

Effective Projected Area for Appurtenance $(EPA)_A=Max((EPA)_N,(EPA)_T)$

$(EPA)_T=\sum(C_aA_A)_T$ | $(EPA)_N=\sum(C_aA_A)_N$ | Reduction Factor = 1

Wind Only Load Combinations

Antenna Configuration	(E) or (P)	Qty per Sector	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(Aa)_T$ (ft^2)	Wind ward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Antenna Weight (lb)	Total Weight (lb)
AIR-21 B4A/B12P	E	1	120	4.67	12.00	8.00	Flat	1.40	1.30	3.11	4.36	4.67	6.05	213	154	83.0	83.0
AIR-21 B2A/B4P	E	1	120	4.67	12.00	8.00	Flat	1.40	1.30	3.11	4.36	4.67	6.05	213	154	83.0	83.0
RRU 4449 B71+B85	**P**	1	120	1.25	13.20	10.40	Flat	1.20	1.20	1.08	1.30	1.38	1.65	58	46	75.0	75.0
APXVAALL24_43-U-NA20	**P**	1	120	7.99	24.00	8.50	Flat	1.54	1.27	5.66	8.73	15.98	20.24	714	308	149.9	149.9
										$\sum(CaA_A)_T$	18.74	$\sum(CaA_A)_N$	33.99				391

Wind with Ice Load Combinations | **Ice Thk=** 1.71 in

Antenna Configuration	(E) or (P)	Qty per Sector	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Ice Area for Weight (ft^2)	Ice Weight Alone (lbs)
AIR-21 B4A/B12P	E	1	120	4.95	15.41	11.41	Cylindrical	0.73	0.73	4.71	3.44	6.36	4.64	37	27	15.6	123.9
AIR-21 B2A/B4P	E	1	120	4.95	15.41	11.41	Cylindrical	0.73	0.73	4.71	3.44	6.36	4.64	37	27	15.6	123.9
RRU 4449 B71+B85	P	1	120	1.53	16.61	13.81	Cylindrical	0.7	0.7	1.77	1.24	2.12	1.49	12	10	4.9	39.2
APXVAALL24_43-U-NA20	P	1	120	8.28	27.41	11.91	Cylindrical	0.72	0.72	8.22	5.96	18.91	13.71	110	48	43.3	344.8
										$\sum(CaA_A)_T$	14.07	$\sum(CaA_A)_N$	24.48				632

Maintenance Load Combinations

AIR-21 B4A/B12P	(E) or (P)	Qty per Sector	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)
AIR-21 B4A/B12P	E	1	120	4.67	12.00	8.00	Flat	1.40	1.30	3.11	4.36	4.67	6.05	31	22
AIR-21 B2A/B4P	E	1	120	4.67	12.00	8.00	Flat	1.40	1.30	3.11	4.36	4.67	6.05	31	22
RRU 4449 B71+B85	P	1	120	1.25	13.20	10.40	Flat	1.20	1.20	1.08	1.30	1.38	1.65	8	7
APXVAALL24_43-U-NA20	P	1	120	7.99	24.00	8.50	Flat	1.54	1.27	5.66	8.73	15.98	20.24	104	45

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.	9927.CT11048A - Rev 1		
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Calculated By	JJ	Date :	10/16/20
Checked By	IM	Date :	10/16/20

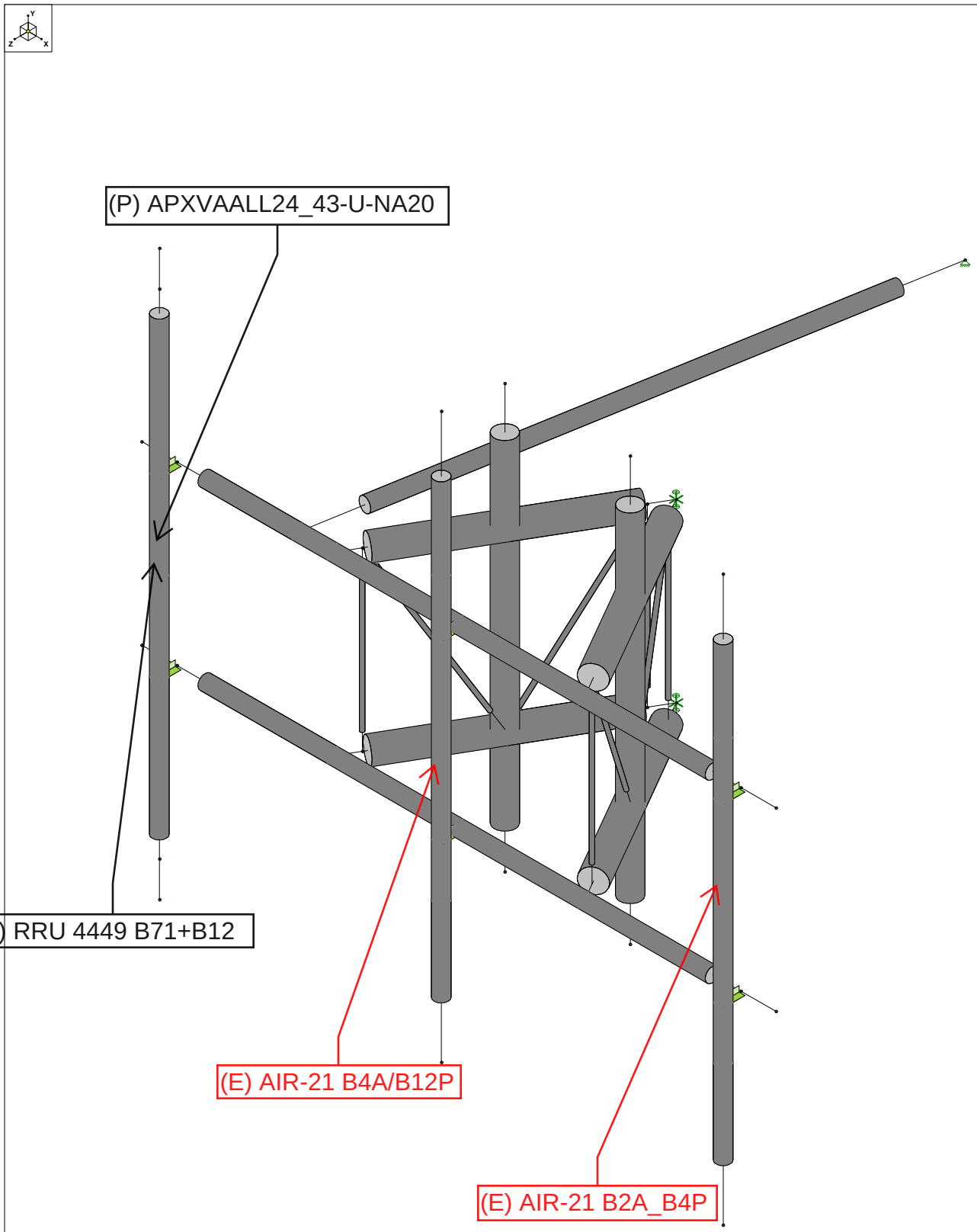
Proposed Sector Frames

Mount Center Line=	120 ft

Member lengths and widths based on SitePro1 VFA-8-RRU specifications

Reduction Factor = 1

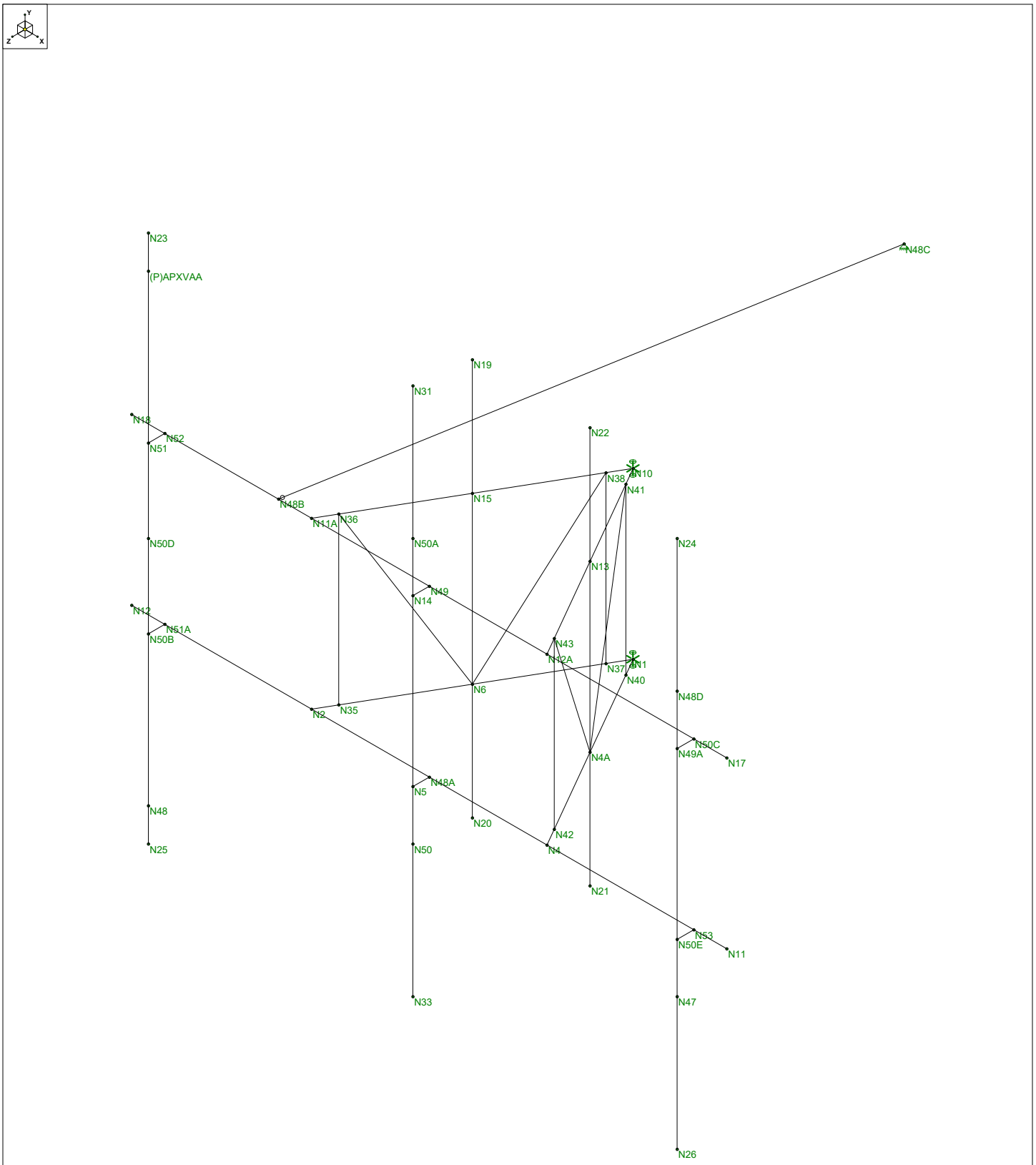
Mount Part	Quantity per sector	Length (ft)	Projected Width (in)	Depth (in)	Flat or Cylindrical ?	Drag Factor	Projected Area (ft^2)	Wind Force (lbs/ft)	Ice Weight Area (ft^2)	Ice Weight (lbs/ft)	Projected Area with Ice (ft^2)	Wind Force Ice (lbs/ft)	Mainten-ance Force (lbs/ft)
1.25" STD Pipe - Standoff	4	3.50	1.66	1.66	Cylindrical	1.2	2.32	5.9	6.08	3.5	7.10	4.1	0.8
2" STD Pipe -Face Horizontal	2	10.50	2.38	2.38	Cylindrical	1.2	4.99	8.4	13.05	4.9	12.16	4.6	1.2
2" STD Pipe - Mount Pipe	4	8.00	2.38	2.38	Cylindrical	1.2	7.60	8.4	19.89	4.9	18.52	4.6	1.2
5/8" SR - Brace	8	2.50	0.63	0.63	Cylindrical	1.2	1.25	2.2	3.27	1.3	8.08	3.2	0.3
3.5" STD Pipe - RRH Pipe	2	8.00	4.00	4.00	Flat	2	10.67	23.5	21.33	10.6	19.77	9.9	3.4



(P) PROPOSED
(E) EXISTING

NOTES:
1)EXISTING AND PROPOSED ANTENNAS AND MOUNTING PIPES HAVE BEEN VERTICALLY CENTERED ALONG THE EXISTING (NO OFFSET).
2) LISTED APPURTENANCES ABOVE ARE TYPICAL FOR ALL SECTORS.
3) RADIOS ARE LOCATED BEHIND THE ANTENNAS.

Envelope Only Solution



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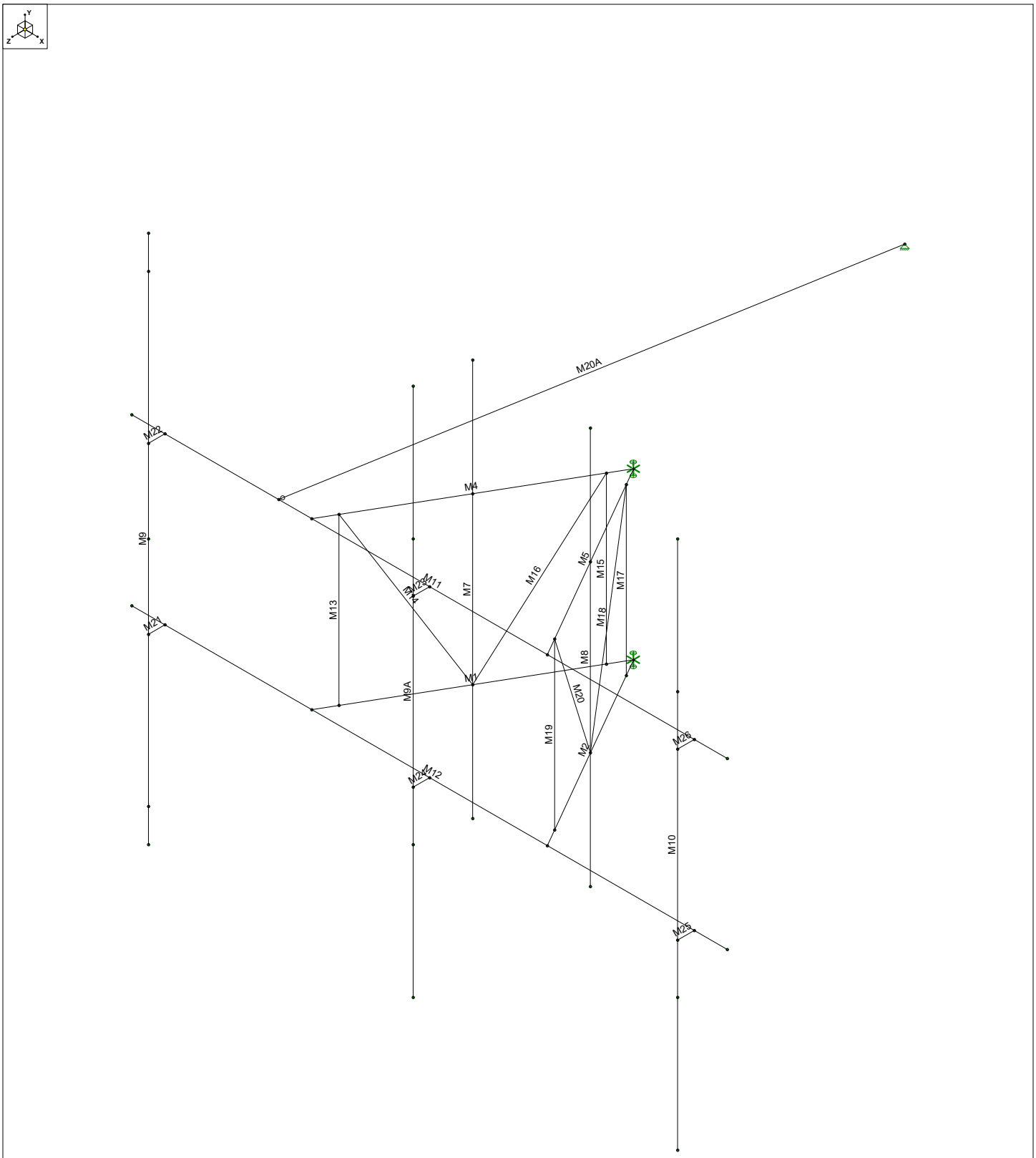

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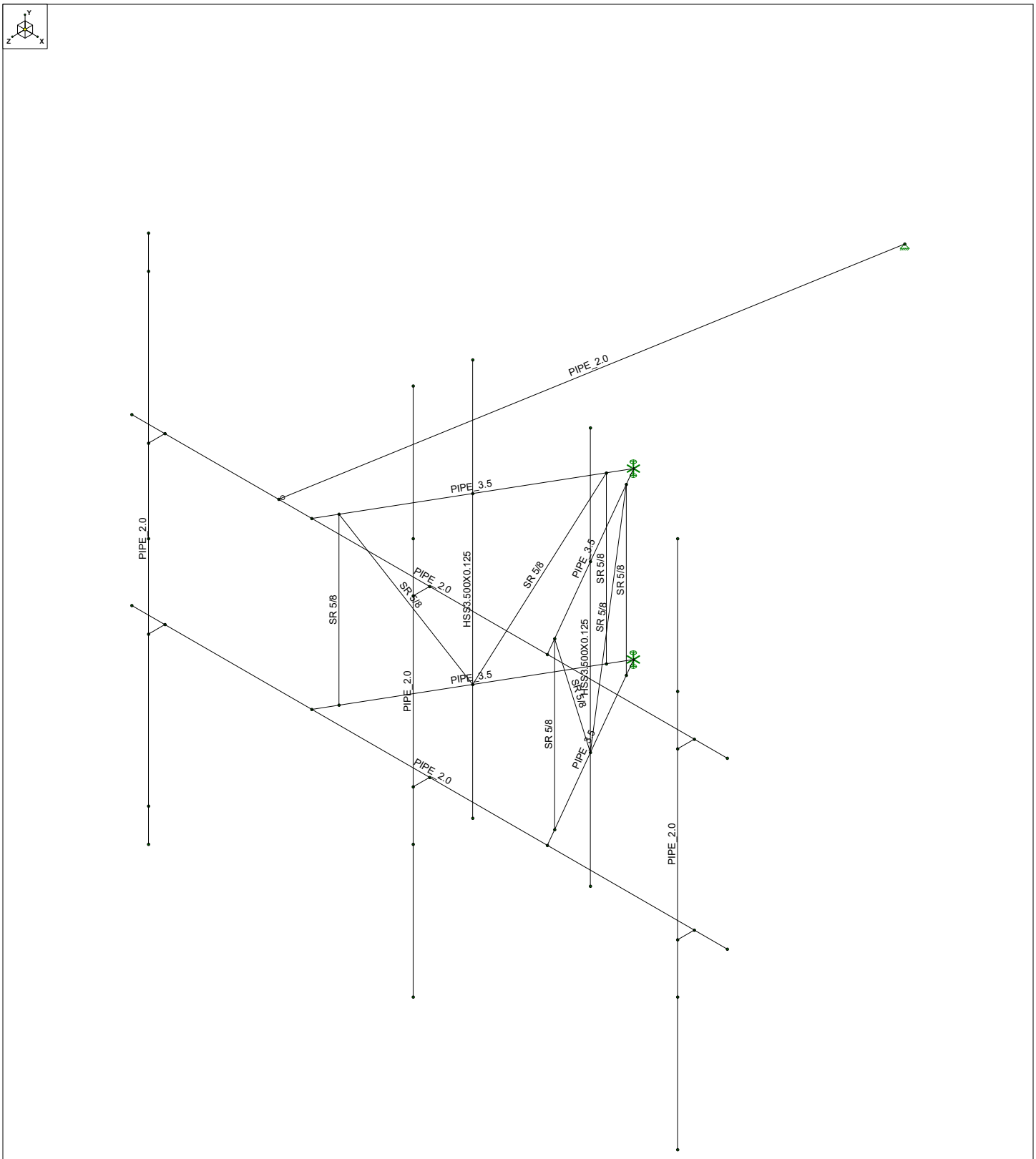

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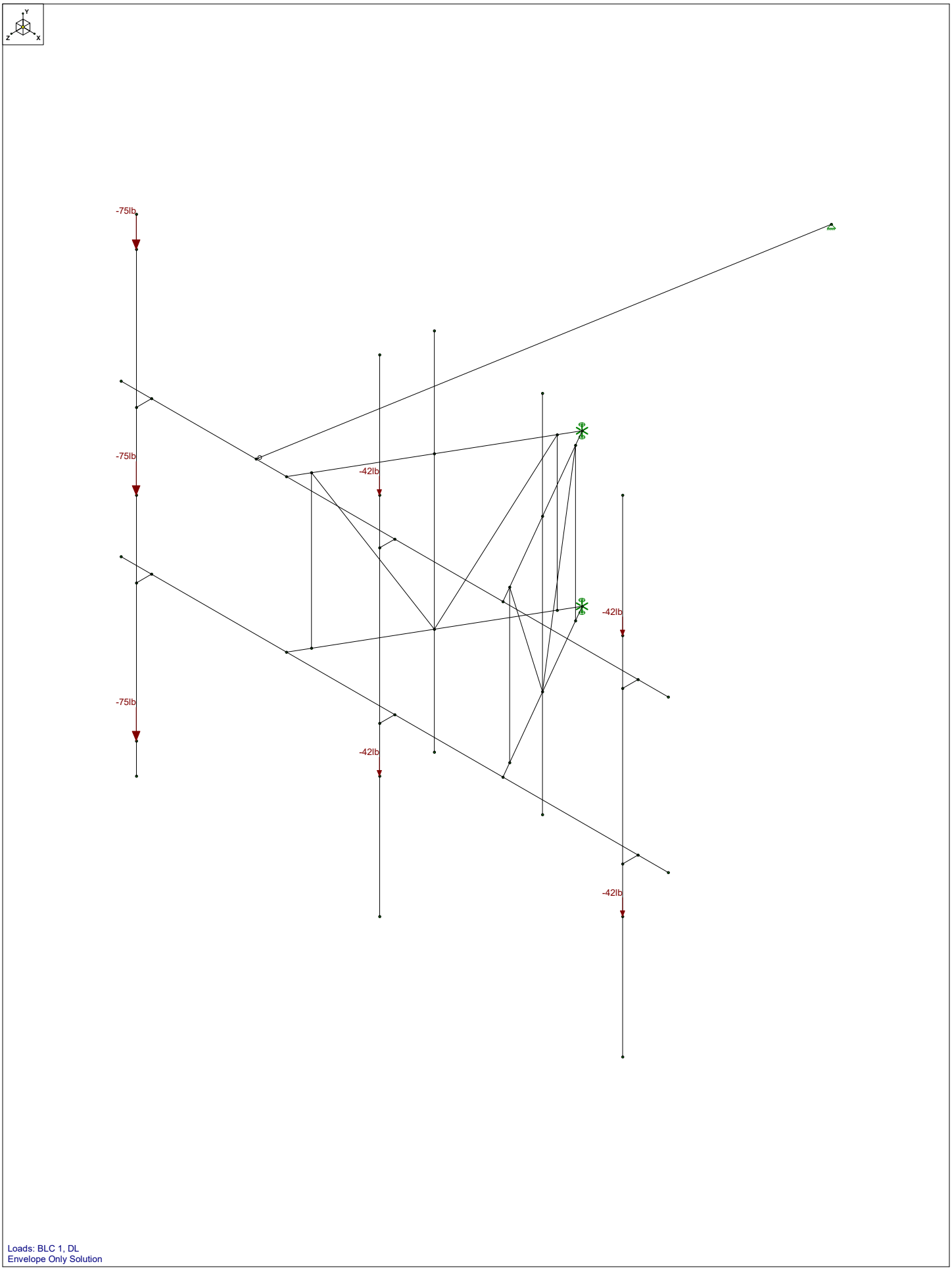
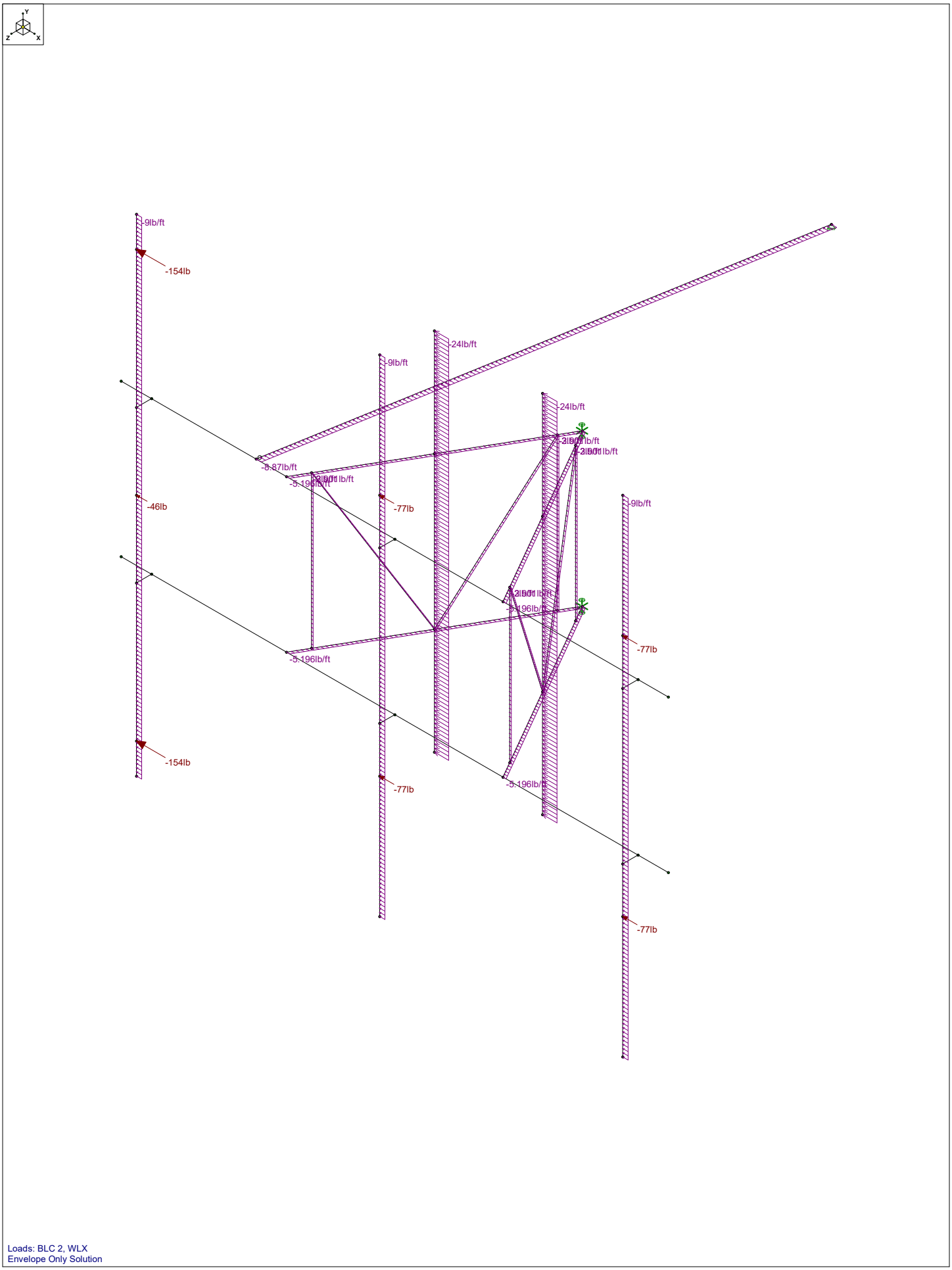
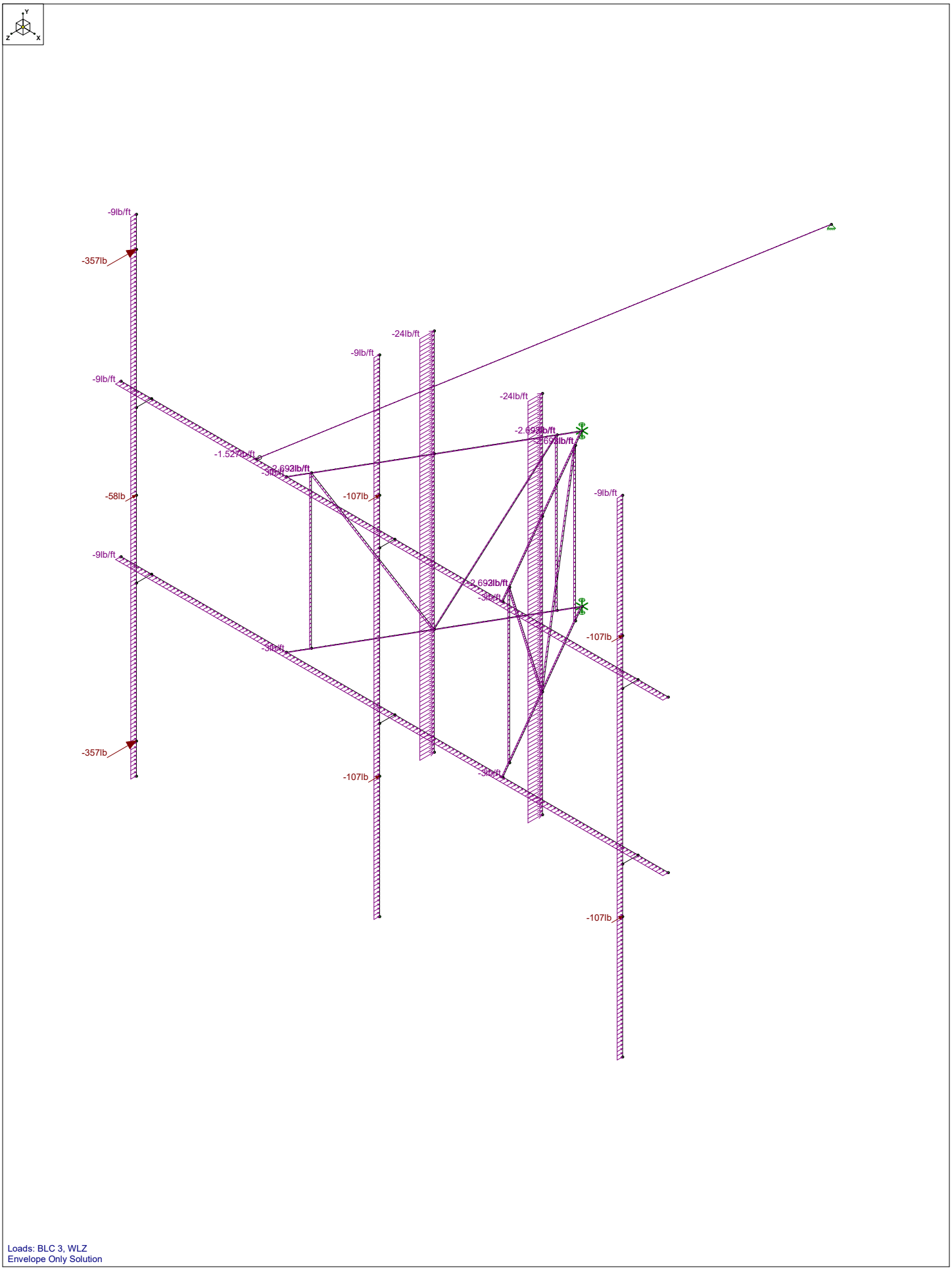


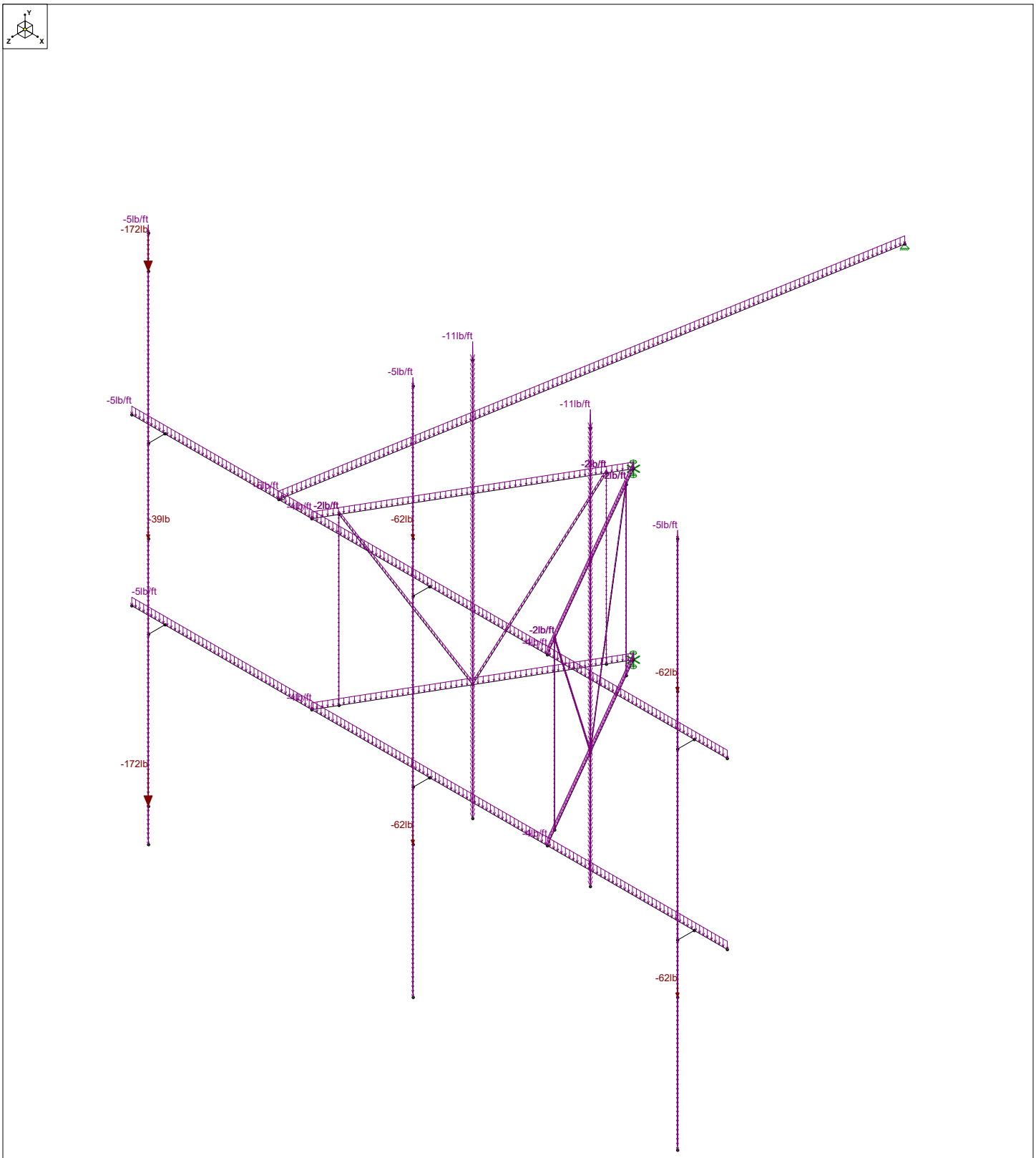
Loads: BLC 1, DL
Envelope Only Solution



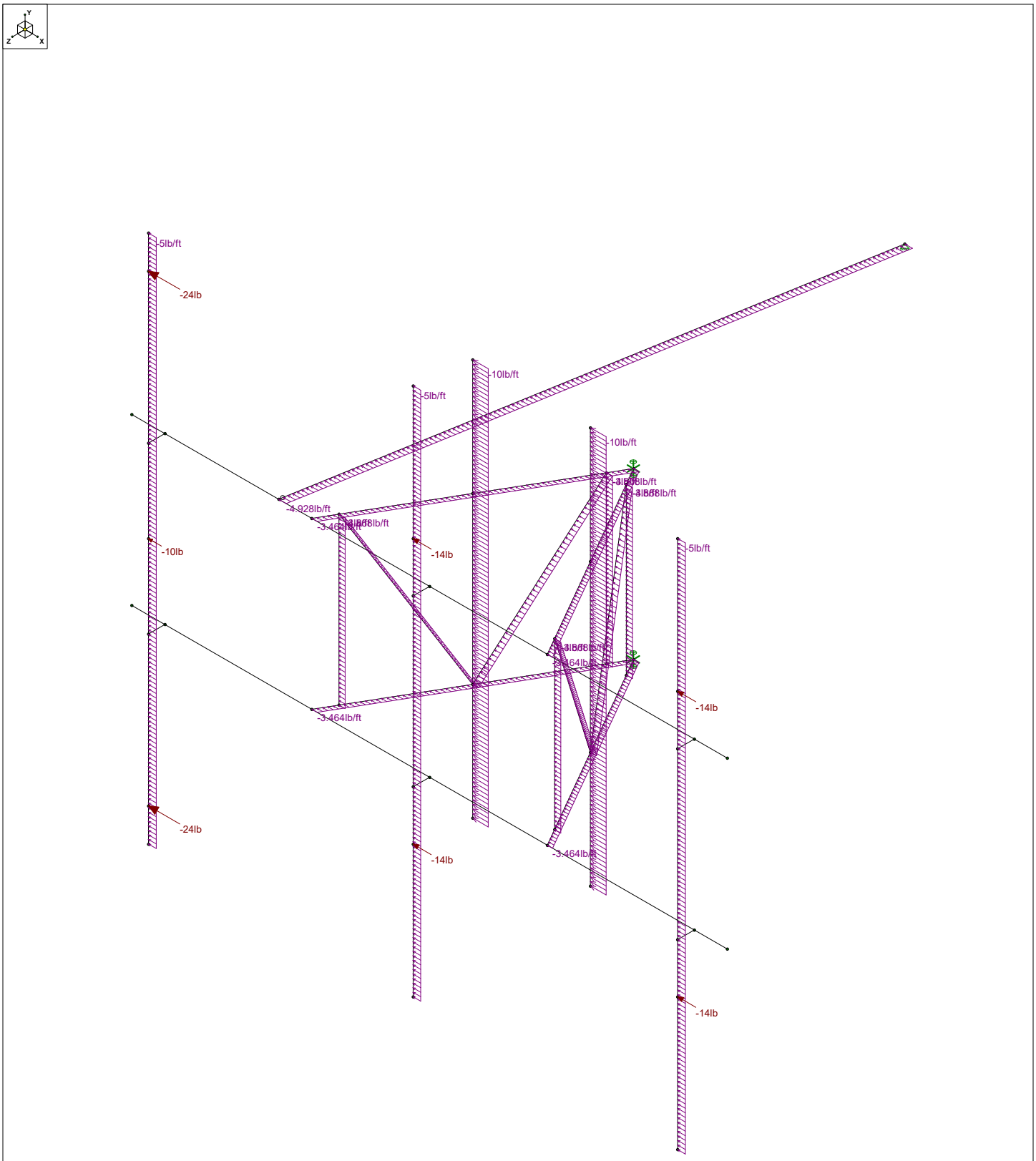
Loads: BLC 2, WLX
Envelope Only Solution



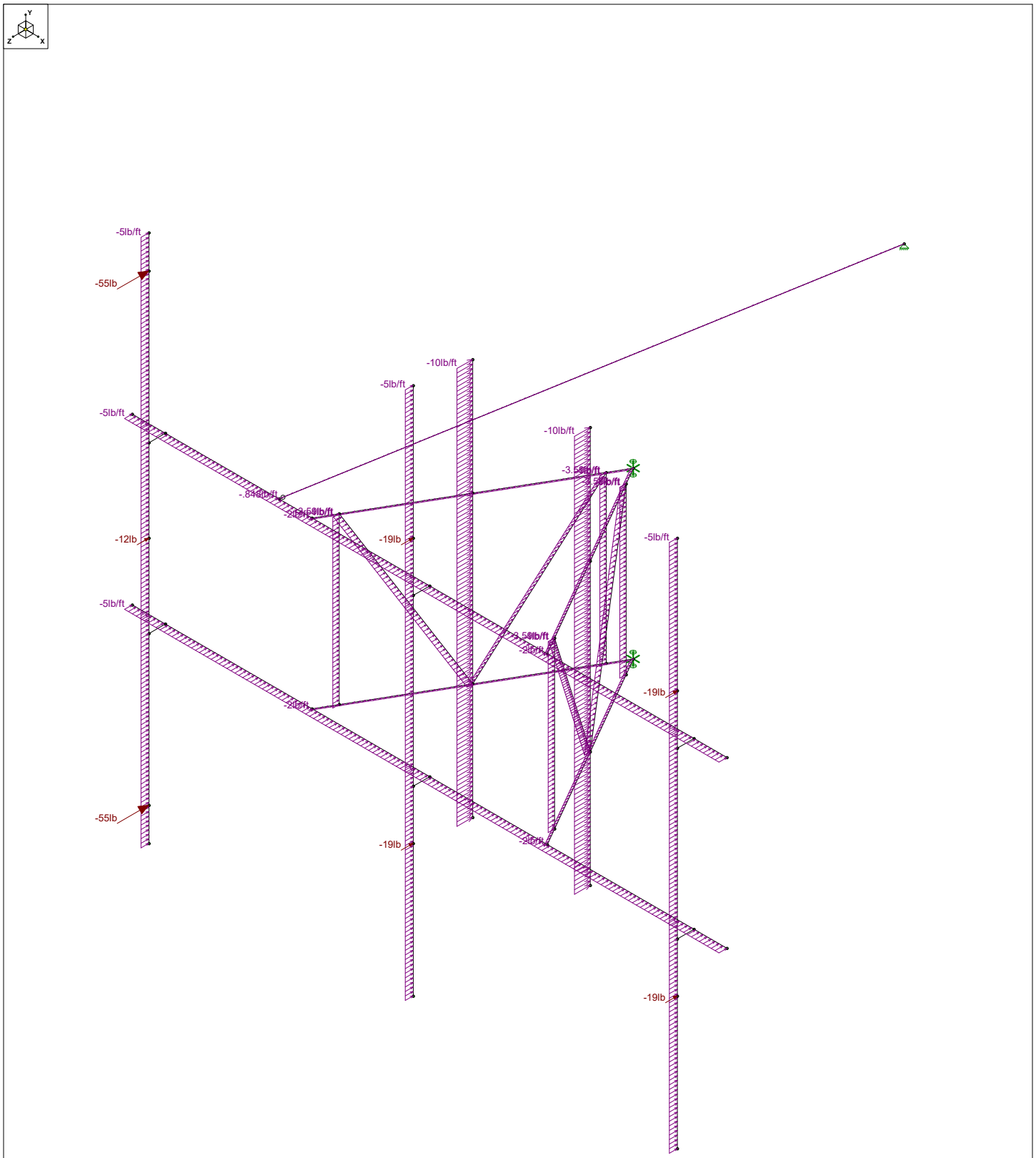
Loads: BLC 3, WLZ
Envelope Only Solution



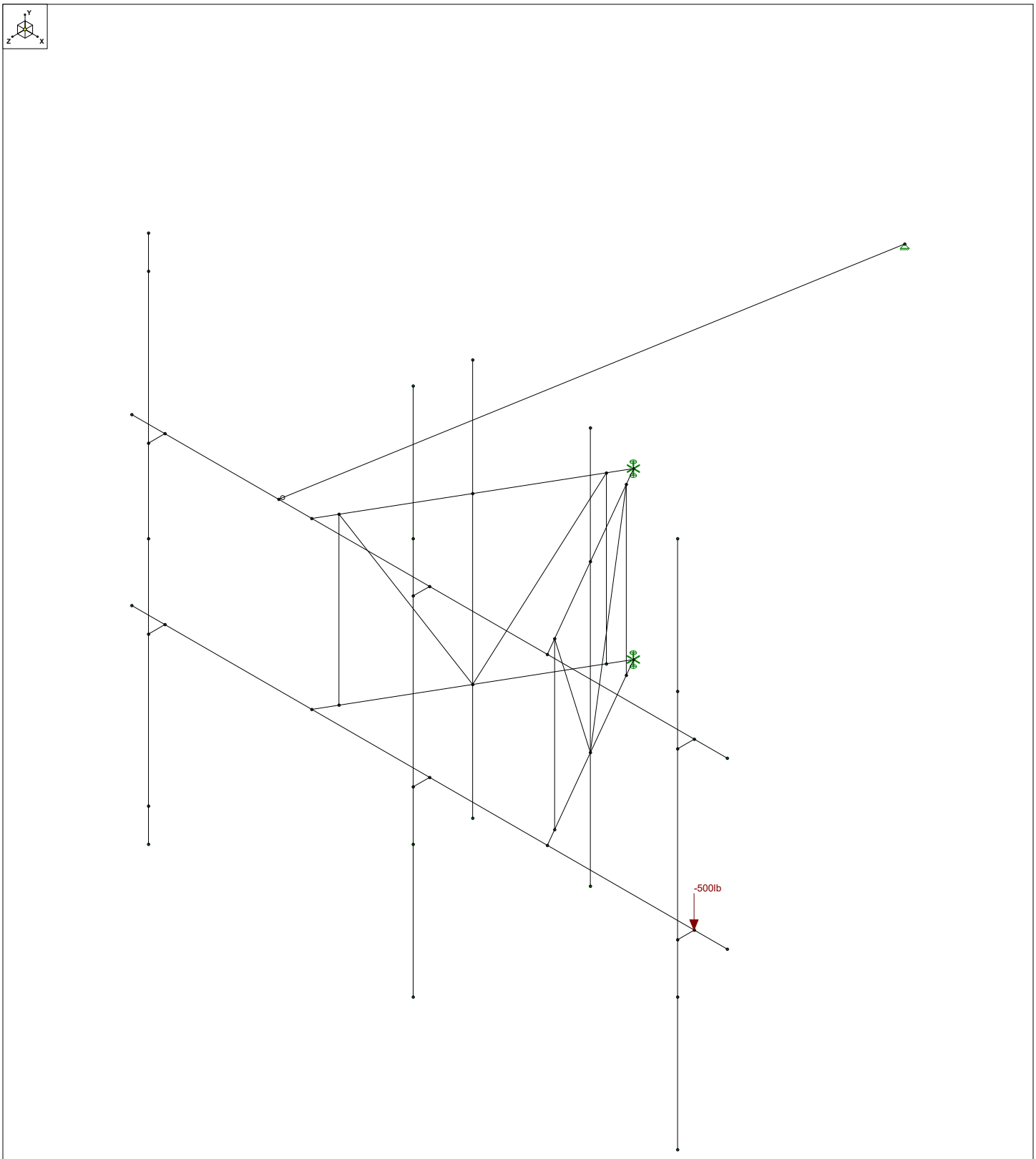
Loads: BLC 4, DL (ICE)
Envelope Only Solution



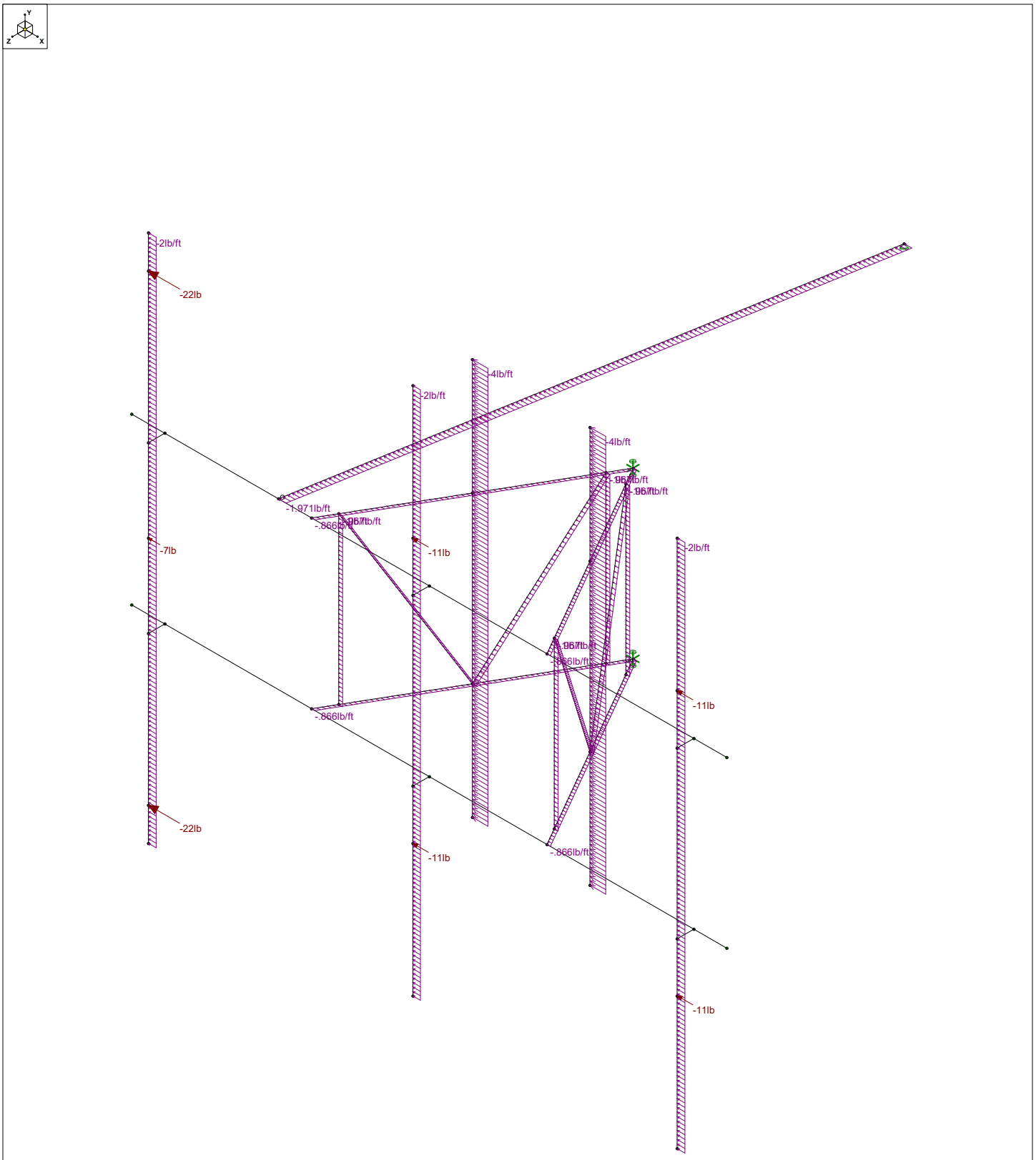
Loads: BLC 5, WLX (ICE)
Envelope Only Solution



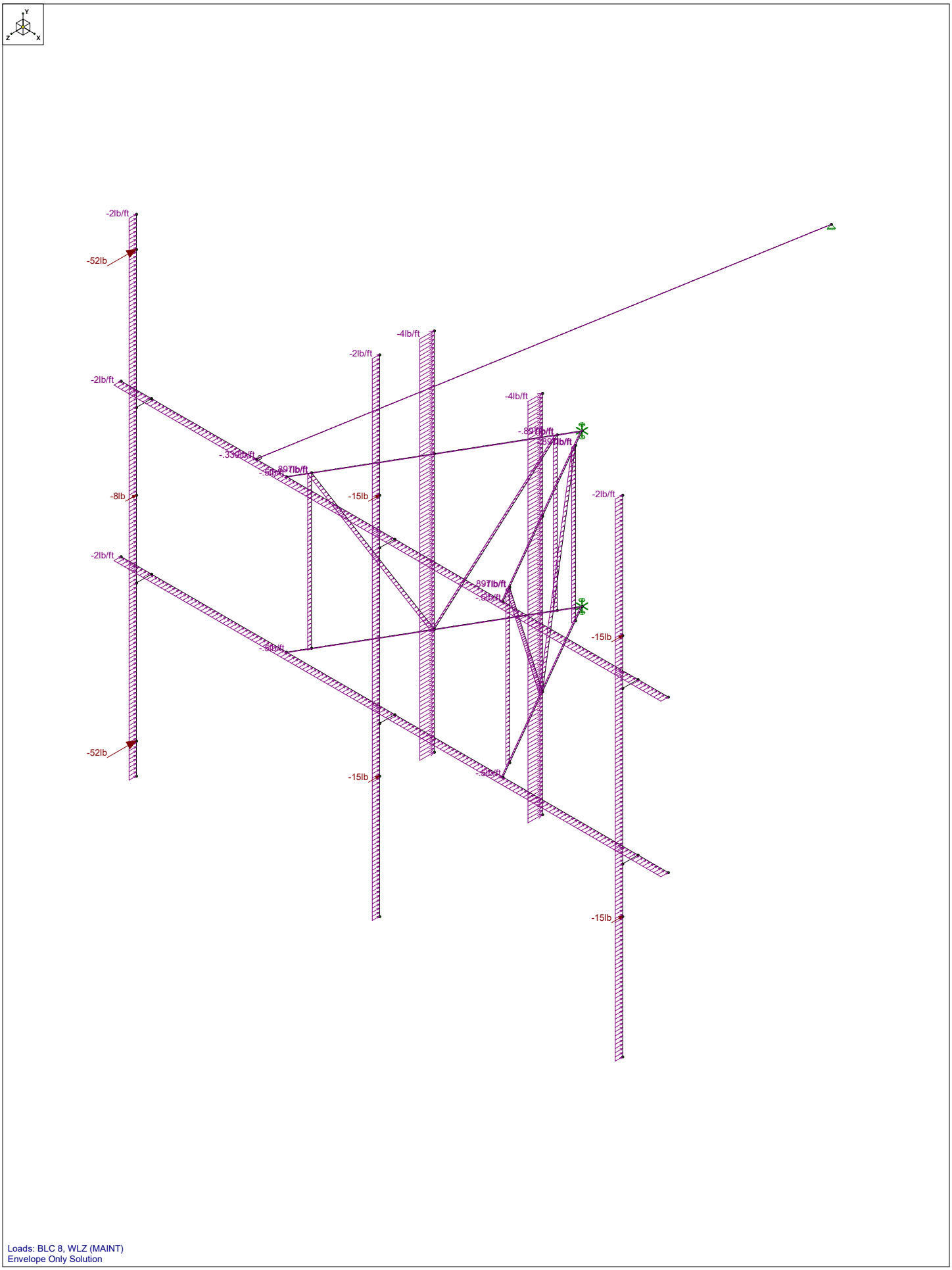
Loads: BLC 6, WLZ (ICE)
Envelope Only Solution



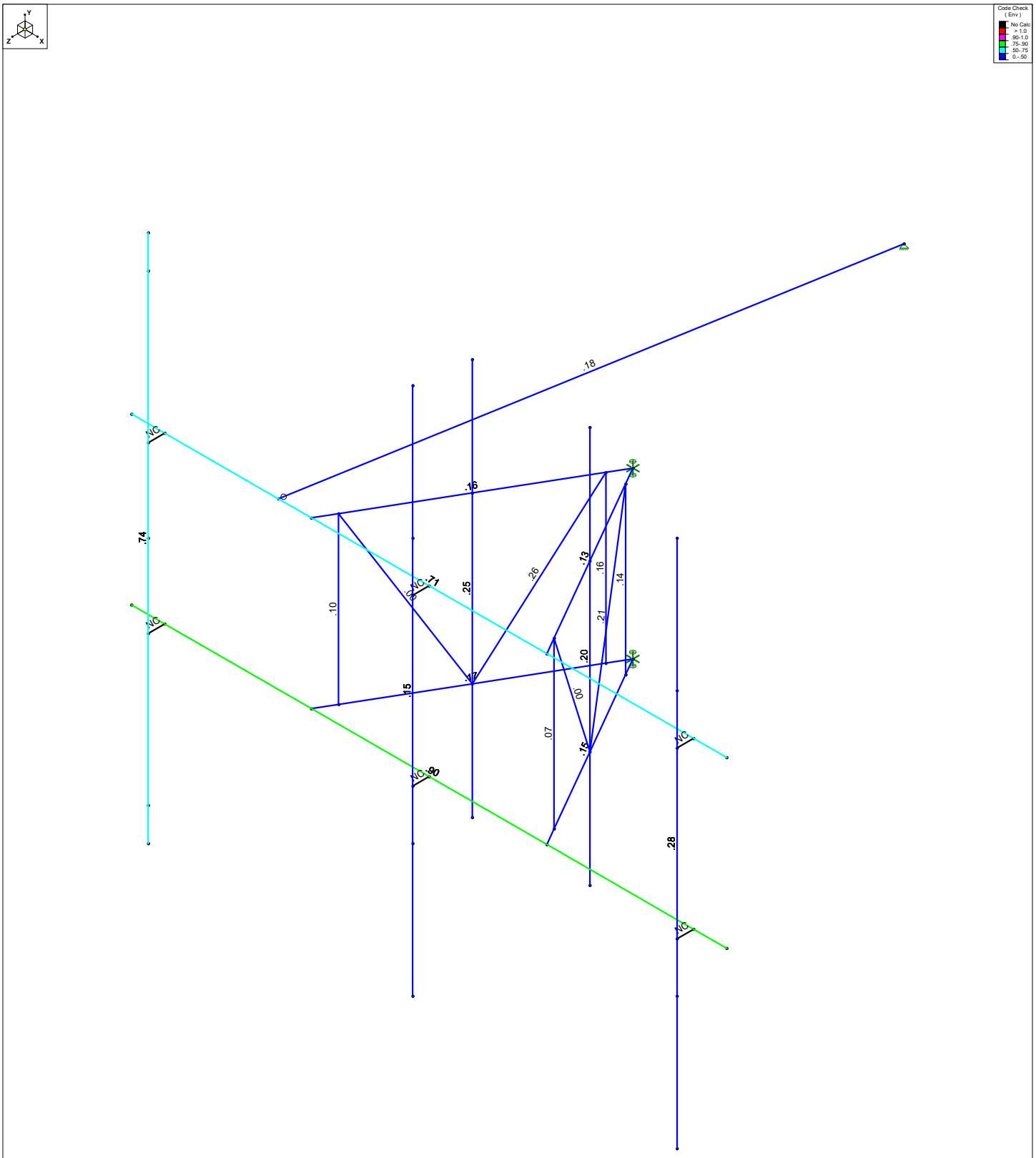
Loads: BLC 9, Lm1
Envelope Only Solution



Loads: BLC 7, WLX (MAINT)
Envelope Only Solution



Loads: BLC 8, WLZ (MAINT)
Envelope Only Solution



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	DL		-1.05		7				
2	WLX	WL+X				7		20		
3	WLZ	WL+Z				7		20		
4	DL (ICE)	SL				7		20		
5	WLX (ICE)	WL+X				7		20		
6	WLZ (ICE)	WL+Z				7		20		
7	WLX (MAINT)	WL+X				7		20		
8	WLZ (MAINT)	WL+Z				7		20		
9	Lm1	OL1				1				
10	Lm2	OL2				1				
11	Lm3	OL3				1				

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4																		
2	1.2D+1.6WLX	Yes	Y		1	1.2	2	1.6																
3	1.2D+1.6WLZ	Yes	Y		1	1.2	3	1.6																
4	1.2D+1.6(WLX+WLZ) - 0 Deg	Yes	Y		1	1.2	2	1.6																
5	1.2D+1.6(WLX+WLZ) - 30 Deg	Yes	Y		1	1.2	2	1.3...	3	.8														
6	1.2D+1.6(WLX+WLZ) - 60 Deg	Yes	Y		1	1.2	2	.8	3	1.3...														
7	1.2D+1.6(WLX+WLZ) - 90 Deg	Yes	Y		1	1.2	2		3	1.6														
8	1.2D+1.6(WLX+WLZ) - 120 Deg	Yes	Y		1	1.2	2	-.8	3	1.3...														
9	1.2D+1.6(WLX+WLZ) - 150 Deg	Yes	Y		1	1.2	2	-1....	3	.8														
10	1.2D+1.6(WLX+WLZ) - 180 Deg	Yes	Y		1	1.2	2	-1.6	3															
11	1.2D+1.6(WLX+WLZ) - 210 Deg	Yes	Y		1	1.2	2	-1....	3	-.8														
12	1.2D+1.6(WLX+WLZ) - 240 Deg	Yes	Y		1	1.2	2	-.8	3	-1....														
13	1.2D+1.6(WLX+WLZ) - 270 Deg	Yes	Y		1	1.2	2		3	-1.6														
14	1.2D+1.6(WLX+WLZ) - 300 Deg	Yes	Y		1	1.2	2	.8	3	-1....														
15	1.2D+1.6(WLX+WLZ) - 330 Deg	Yes	Y		1	1.2	2	1.3...	3	-.8														
16	**Wind Load with Ice**																							
17	1.2D+1.0Di+1.0WLXi	Yes	Y		1	1.2	4	1	5	1														
18	1.2D+1.0Di+1.0WLZi	Yes	Y		1	1.2	4	1			6	1												
19	1.2D+1.0Di+1.0(WLXi+WLZi) - 0...	Yes	Y		1	1.2	4	1	5	1	6													
20	1.2D+1.0Di+1.0(WLXi+WLZi) - 3...	Yes	Y		1	1.2	4	1	5	.87	6	.5												
21	1.2D+1.0Di+1.0(WLXi+WLZi) - 6...	Yes	Y		1	1.2	4	1	5	.5	6	.87												
22	1.2D+1.0Di+1.0(WLXi+WLZi) - 9...	Yes	Y		1	1.2	4	1	5		6	1												
23	1.2D+1.0Di+1.0(WLXi+WLZi) - 1...	Yes	Y		1	1.2	4	1	5	-.5	6	.87												
24	1.2D+1.0Di+1.0(WLXi+WLZi) - 1...	Yes	Y		1	1.2	4	1	5	-.87	6	.5												
25	1.2D+1.0Di+1.0(WLXi+WLZi) - 1...	Yes	Y		1	1.2	4	1	5	-1	6													
26	1.2D+1.0Di+1.0(WLXi+WLZi) - 2...	Yes	Y		1	1.2	4	1	5	-.87	6	-.5												
27	1.2D+1.0Di+1.0(WLXi+WLZi) - 2...	Yes	Y		1	1.2	4	1	5	-.5	6	-.87												
28	1.2D+1.0Di+1.0(WLXi+WLZi) - 2...	Yes	Y		1	1.2	4	1	5		6	-1												
29	1.2D+1.0Di+1.0(WLXi+WLZi) - 3...	Yes	Y		1	1.2	4	1	5	.5	6	-.87												

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
30	1.2D+1.0Di+1.0(WLXi+WLZi) - 3..	Yes	Y		1	1.2	4	1	5	.87	6	-.5														
31	**Maintenance Load (With Servi...		Y																							
32	1.2D+1.5Lm1+1.0WLX (service)	Yes	Y		1	1.2	9	1.5	7	1	8															
33	1.2D+1.5Lm1+1.0WLZ (service)	Yes	Y		1	1.2	9	1.5	7		8	1														
34	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	1	8															
35	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	.87	8	.5														
36	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	.5	8	.87														
37	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7		8	1														
38	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	-.5	8	.87														
39	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	-.87	8	.5														
40	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	-1	8															
41	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	-.87	8	-.5														
42	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	-.5	8	-.87														
43	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7		8	-1														
44	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	.5	8	-.87														
45	1.2D+1.5Lm1+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	9	1.5	7	.87	8	-.5														
46	**Maintenance Load (With Servi...		Y																							
47	1.2D+1.5Lm2+1.0WLX (service)	Yes	Y		1	1.2	10	1.5	7	1	8															
48	1.2D+1.5Lm2+1.0WLZ (service)	Yes	Y		1	1.2	10	1.5	7		8	1														
49	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	1	8															
50	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	.87	8	.5														
51	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	.5	8	.87														
52	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7		8	1														
53	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	-.5	8	.87														
54	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	-.87	8	.5														
55	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	-1	8															
56	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	-.87	8	-.5														
57	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	-.5	8	-.87														
58	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7		8	-1														
59	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	.5	8	-.87														
60	1.2D+1.5Lm2+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	10	1.5	7	.87	8	-.5														
61	**Maintenance Load (With Servi...		Y																							
62	1.2D+1.5Lm3+1.0WLX (service)	Yes	Y		1	1.2	11	1.5	7	1	8															
63	1.2D+1.5Lm3+1.0WLZ (service)	Yes	Y		1	1.2	11	1.5	7		8	1														
64	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	1	8															
65	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	.87	8	.5														
66	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	.5	8	.87														
67	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7		8	1														
68	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	-.5	8	.87														
69	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	-.87	8	.5														
70	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	-1	8															
71	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	-.87	8	-.5														
72	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	-.5	8	-.87														
73	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7		8	-1														
74	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	.5	8	-.87														
75	1.2D+1.5Lm3+1.0(WLX+WLZ, S..	Yes	Y		1	1.2	11	1.5	7	.87	8	-.5														

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	1.25" STD Pipe	PIPE_3.5	None	None	A53 Gr.B	Typical	2.5	4.52	4.52	9.04
2	2.0" STD Pipe	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	5/8" SR	SR 5/8	None	None	A36 Gr.36	Typical	.307	.007	.007	.015
4	3.5" STD Pipe	HSS3.500X0.125	None	None	A36 Gr.36	Typical	1.23	1.77	1.77	3.53

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N1	max	1024.588	34	276.706	13	2637.641	22	0	75	1818.949	4	0	75
2		min	-1598.886	70	113.332	3	-534.702	13	0	1	-2126.807	10	0	1
3	N10	max	1681.82	64	1756.707	24	452.473	11	0	75	1500.542	15	0	75
4		min	-1101.697	40	640.499	13	-2731.407	30	0	1	-1265.904	9	0	1
5	N48C	max	398.183	12	38.604	26	2526.202	6	0	75	0	75	0	75
6		min	-404.561	6	17.392	66	-2491.394	12	0	1	0	1	0	1
7	Totals:	max	2202.182	4	2049.624	26	3171.982	7						
8		min	-2202.182	10	935.461	6	-3171.982	13						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc		phi*P	phi*P	phi*M	phi*M	Cb	Eqn
1	M12	PIPE_2.0	.900	2.719	7	.377	2.7...	7	12143...	32130	1871....	1871....	1.597	H3-6
2	M9	PIPE_2.0	.736	2.75	7	.075	2.75	13	14916...	32130	1871....	1871....	3.352	H1-1b
3	M11	PIPE_2.0	.711	2.25	13	.360	2.25	6	12143...	32130	1871....	1871....	1.555	H1-1b
4	M10	PIPE_2.0	.275	2.75	41	.057	2.75	41	14916...	32130	1871....	1871....	4.869	H1-1b
5	M16	SR 5/8	.260	0	72	.008	2.9...	10	1392....	9940....	103.5...	103.5...	2.434	H1-1...
6	M7	HSS3.500X0.1...	.245	4.25	72	.095	1.75	72	32967...	39852	3591	3591	4.843	H1-1b
7	M18	SR 5/8	.213	0	36	.009	2.9...	11	1392....	9940....	103.5...	103.5...	2.535	H1-1...
8	M8	HSS3.500X0.1...	.201	4.25	36	.073	4.25	36	32967...	39852	3591	3591	4.859	H1-1b
9	M20A	PIPE_2.0	.178	8.192	6	.006	8.1...	10	14370...	32130	1871....	1871....	1.136	H1-1...
10	M1	PIPE_3.5	.173	1.78	72	.097	1.78	73	74784...	78750	7953....	7953....	1.472	H1-1b
11	M15	SR 5/8	.165	2.5	71	.003	2.5	70	1880....	9940....	103.5...	103.5...	2.256	H1-1...
12	M4	PIPE_3.5	.165	1.78	66	.091	.297	68	74784...	78750	7953....	7953....	1.531	H1-1b
13	M9A	PIPE_2.0	.154	2.75	12	.033	2.75	12	14916...	32130	1871....	1871....	4.257	H1-1b
14	M2	PIPE_3.5	.152	3.56	11	.079	1.78	42	74784...	78750	7953....	7953....	1.961	H1-1b
15	M17	SR 5/8	.137	2.5	45	.003	2.5	12	1880....	9940....	103.5...	103.5...	2.281	H1-1...
16	M5	PIPE_3.5	.133	1.78	35	.074	1.78	36	74784...	78750	7953....	7953....	1.53	H1-1b
17	M13	SR 5/8	.097	2.5	24	.016	0	12	1880....	9940....	103.5...	103.5...	2.371	H1-1b
18	M19	SR 5/8	.073	2.5	36	.012	0	12	1880....	9940....	103.5...	103.5...	2.317	H1-1b
19	M14	SR 5/8	.000	0	75	.007	0	12	1392....	9940....	103.5...	103.5...	1	H1-1a
20	M20	SR 5/8	.000	0	75	.009	0	12	1392....	9940....	103.5...	103.5...	2.715	H1-1a

THE MAXIMUM MEMBER STRESS IS AT 90% OF ITS CAPACITY. THEREFORE IT IS ADEQUATE TO SUPPORT THE PROPOSED T-MOBILE UPGRADE.

BASED ON THE CURRENT REACTIONS AND STRESS RATIO'S IN THE FRAME MEMBERS, WE EXPECT THE CONNECTIONS TO BE ADEQUATE TO SUPPORT THE PROPOSED UPGRADE.

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

Municipality	Ground Snow Load	*Wind Design Parameters*							
		MCE Spectral Accelerations (%g)		Ultimate Design Wind Speeds, V_{ult} (mph)			Nominal Design Wind Speeds, V_{asd} (mph)		
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
North Branford	30	0.179	0.061	120	130	140	93	101	108
North Canaan	40	0.173	0.065	105	115	120	81	89	93
North Haven	30	0.184	0.062	115	125	135	89	97	105
North Stonington	30	0.163	0.059	125	135	145	97	105	112
Norwalk	30	0.232	0.067	110	120	130	85	93	101
Norwich	30	0.168	0.060	125	135	145	97	105	112
Old Lyme	30	0.164	0.059	125	135	145	97	105	112
Old Saybrook	30	0.164	0.059	125	135	145	97	105	112
Orange	30	0.192	0.063	115	125	135	89	97	105
Oxford	30	0.196	0.064	110	125	130	85	97	101
Plainfield	35	0.170	0.061	125	135	145	97	105	112
Plainville	35	0.184	0.064	115	125	135	89	97	105
Plymouth	35	0.186	0.064	110	120	130	85	93	101
Pomfret	40	0.172	0.063	120	130	140	93	101	108
Portland	30	0.180	0.063	115	130	135	89	101	105
Preston	30	0.167	0.060	125	135	145	97	105	112
Prospect	30	0.188	0.064	115	125	135	89	97	105
Putnam	40	0.172	0.063	120	130	140	93	101	108
Redding	30	0.220	0.067	110	120	130	85	93	101
Ridgefield	30	0.230	0.068	110	120	125	85	93	97
Rocky Hill	30	0.181	0.063	115	125	135	89	97	105
Roxbury	35	0.197	0.065	110	120	125	85	93	97
Salem	30	0.170	0.060	120	135	140	93	105	108
Salisbury	40	0.173	0.065	105	115	120	81	89	93
Scotland	30	0.172	0.061	120	130	140	93	101	108
Seymour	30	0.194	0.064	115	125	135	89	97	105
Sharon	40	0.179	0.065	105	115	120	81	89	93
Shelton	30	0.199	0.064	115	125	135	89	97	105
Sherman	35	0.202	0.066	105	115	120	81	89	93
Simsbury	35	0.179	0.064	110	120	130	85	93	101
Somers	35	0.174	0.064	115	125	135	89	97	105
Southbury	35	0.198	0.065	110	120	130	85	93	101
Southington	30	0.185	0.064	115	125	135	89	97	105
South Windsor	30	0.178	0.064	115	125	135	89	97	105
Sprague	30	0.171	0.061	120	130	140	93	101	108
Stafford	35	0.173	0.064	115	125	135	89	97	105
Stamford	30	0.249	0.069	110	120	130	85	93	101
Sterling	35	0.170	0.061	125	135	145	97	105	112
Stonington	30	0.159	0.058	125	140	150	97	108	116
Stratford	30	0.201	0.064	115	125	135	89	97	105
Suffield	35	0.176	0.065	110	120	130	85	93	101
Thomaston	35	0.186	0.064	110	120	130	85	93	101

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Oct 12 2020

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Exhibit E

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: CT11048A

North Stonington/CDT_1
227 Boom Bridge Road
North Stonington, Connecticut 06359

October 27, 2020

EBI Project Number: 6220005558

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**13.57%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

October 27, 2020

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

Emissions Analysis for Site: CT11048A - North Stonington/CDT_1

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **227 Boom Bridge Road** in **North Stonington, 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 227 Boom Bridge Road in North Stonington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

5) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

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

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

9) The antennas used in this modeling are the Ericsson AIR 21 for the 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 21 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s) in Sector A, the Ericsson AIR 21 for the 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 21 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s) in Sector B, the Ericsson AIR 21 for the 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 21 for the 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is 120 feet above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21
Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz	Frequency Bands:	1900 MHz / 1900 MHz
Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd	Gain:	15.35 dBd / 15.35 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts	Total TX Power (W):	180 Watts
ERP (W):	6,169.82	ERP (W):	6,169.82	ERP (W):	6,169.82
Antenna A1 MPE %:	**1.54%**	Antenna B1 MPE %:	**1.54%**	Antenna C1 MPE %:	**1.54%**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21	Make / Model:	Ericsson AIR 21
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.35 dBd	Gain:	15.35 dBd	Gain:	15.35 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,113.21	ERP (W):	4,113.21	ERP (W):	4,113.21
Antenna A2 MPE %:	**1.03%**	Antenna B2 MPE %:	**1.03%**	Antenna C2 MPE %:	**1.03%**
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A3 MPE %:	**2.47%**	Antenna B3 MPE %:	**2.47%**	Antenna C3 MPE %:	**2.47%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	5.03%
AT&T	2.18%
Sprint	2.25%
Verizon	4.11%
Site Total MPE % :	13.57%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	5.03%
T-Mobile Sector B Total:	5.03%
T-Mobile Sector C Total:	5.03%
Site Total MPE % :	13.57%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz GSM	4	1028.30	120.0	10.27	1900 MHz GSM	1000	1.03%
T-Mobile 1900 MHz UMTS	2	1028.30	120.0	5.13	1900 MHz UMTS	1000	0.51%
T-Mobile 2100 MHz LTE	2	2056.61	120.0	10.27	2100 MHz LTE	1000	1.03%
T-Mobile 600 MHz LTE	2	591.73	120.0	2.95	600 MHz LTE	400	0.74%
T-Mobile 600 MHz NR	1	1577.94	120.0	3.94	600 MHz NR	400	0.98%
T-Mobile 700 MHz LTE	2	695.22	120.0	3.47	700 MHz LTE	467	0.74%
						Total:	**5.03%**

• 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.

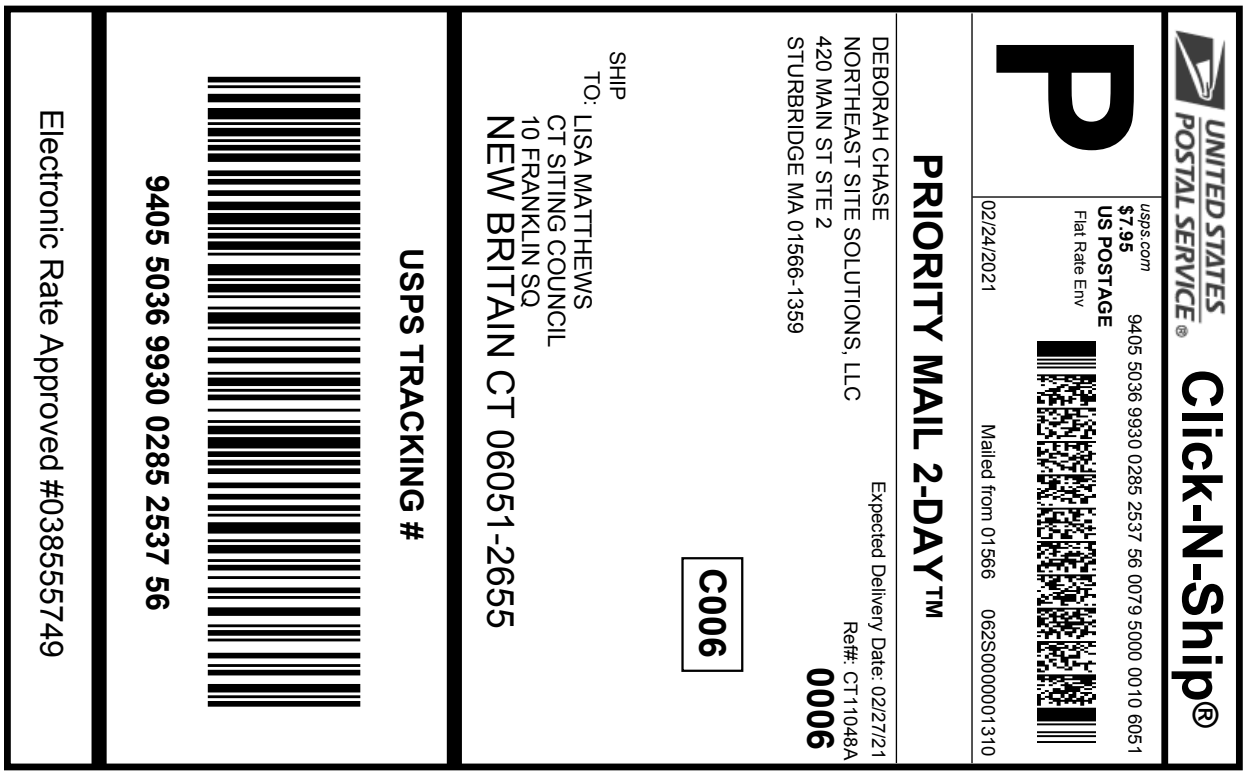
The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	5.03%
Sector B:	5.03%
Sector C:	5.03%
T-Mobile Maximum MPE % (Sector A):	5.03%
Site Total:	13.57%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **13.57%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit F



Cut on dotted line.

Instructions

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2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 2537 56

Trans. #:	525597760
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: CT11048A
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: LISA MATTHEWS
CT SITING COUNCIL
10 FRANKLIN SQ
NEW BRITAIN CT 06051-2655

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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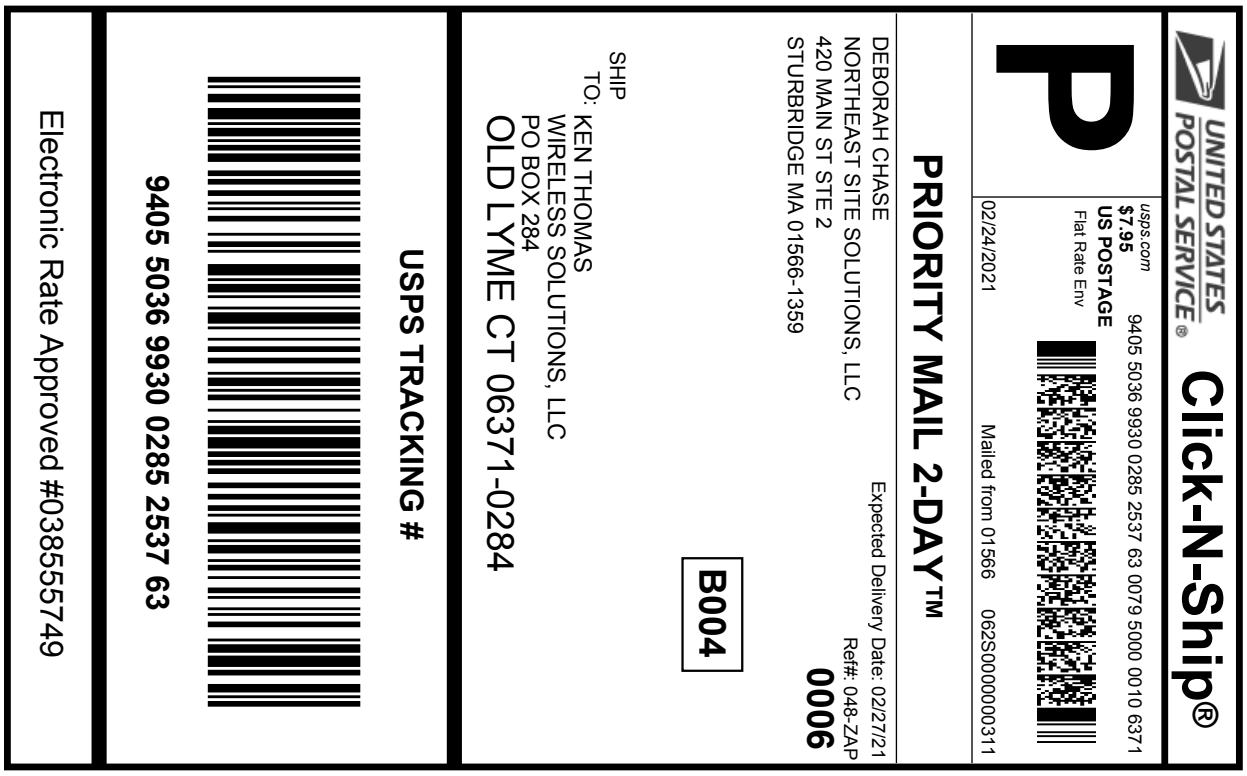

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USPS TRACKING # :
9405 5036 9930 0285 2537 63

Trans. #:	525597760
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: 048-ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: KEN THOMAS
WIRELESS SOLUTIONS, LLC
PO BOX 284
OLD LYME CT 06371-0284

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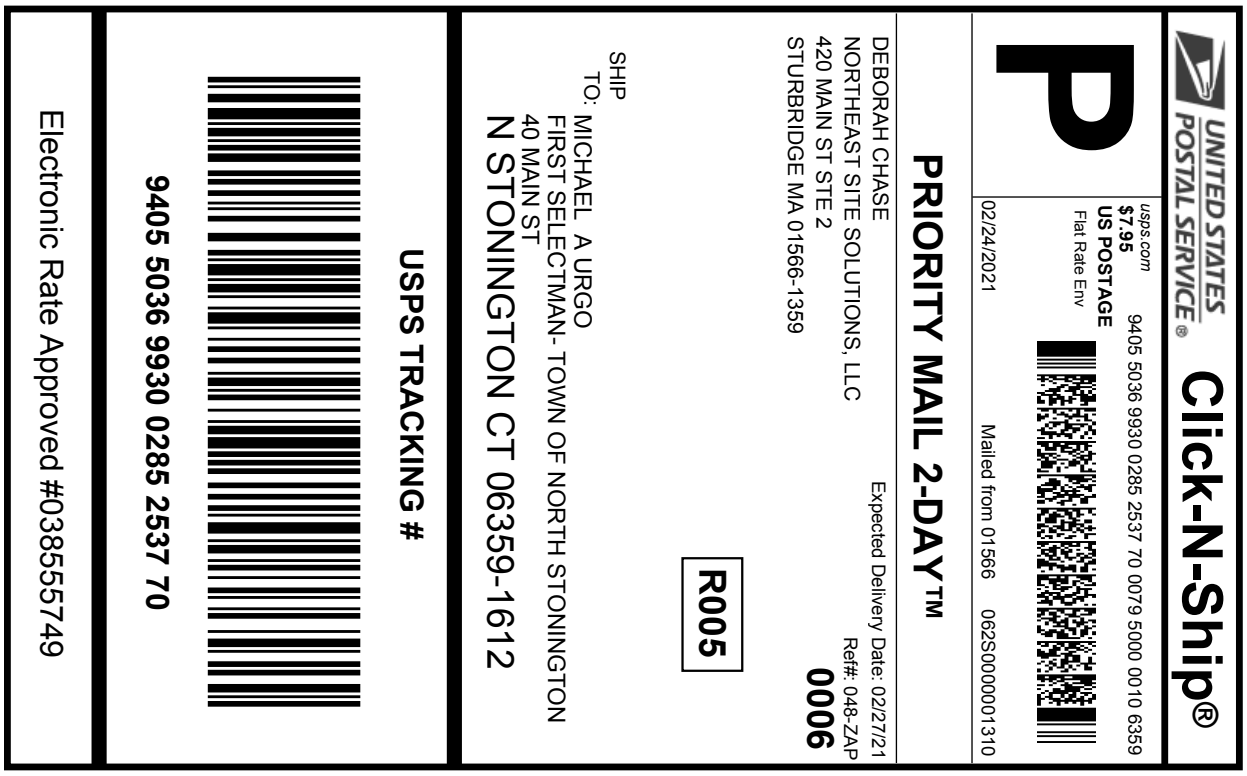

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 2537 70

Trans. #:	525597760
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: 048-ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: MICHAEL A URGO
FIRST SELECTMAN- TOWN OF NORTH STONINGTON
40 MAIN ST
N STONINGTON CT 06359-1612

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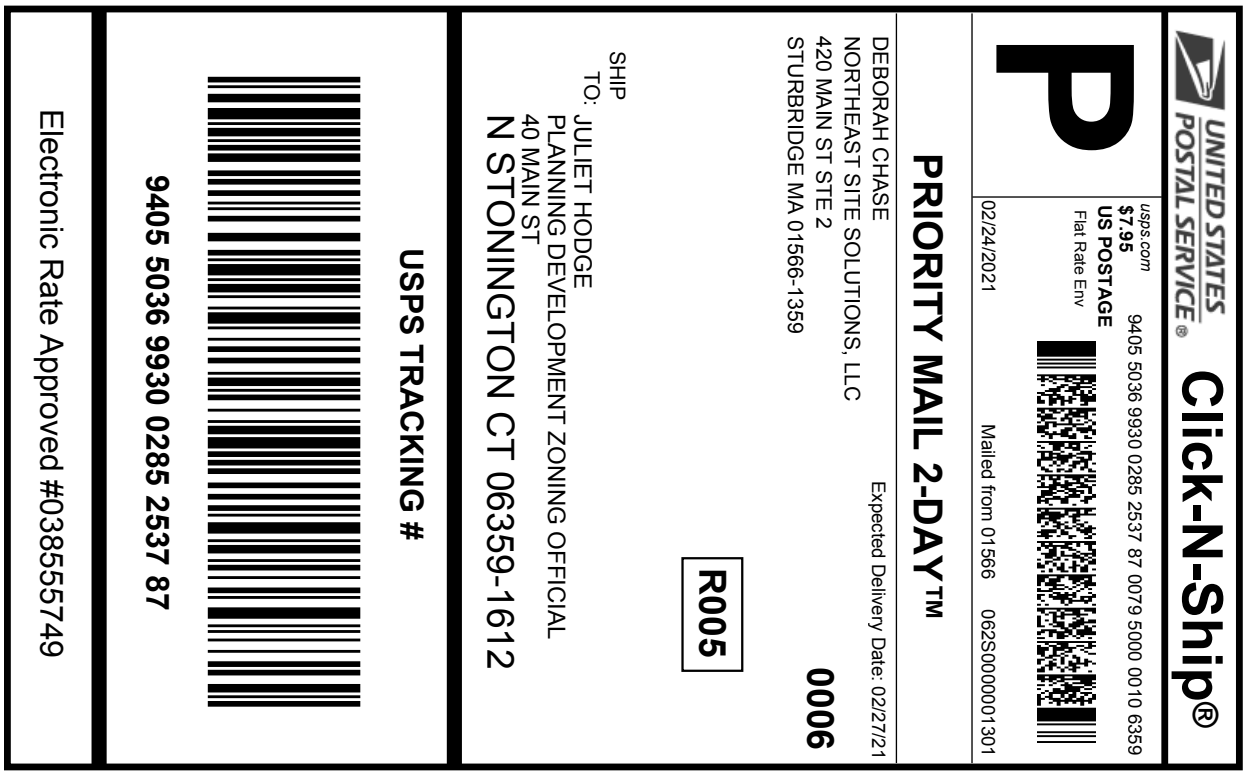

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 2537 87

Trans. #:	525597760
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: JULIET HODGE
PLANNING DEVELOPMENT ZONING OFFICIAL
40 MAIN ST
N STONINGTON CT 06359-1612

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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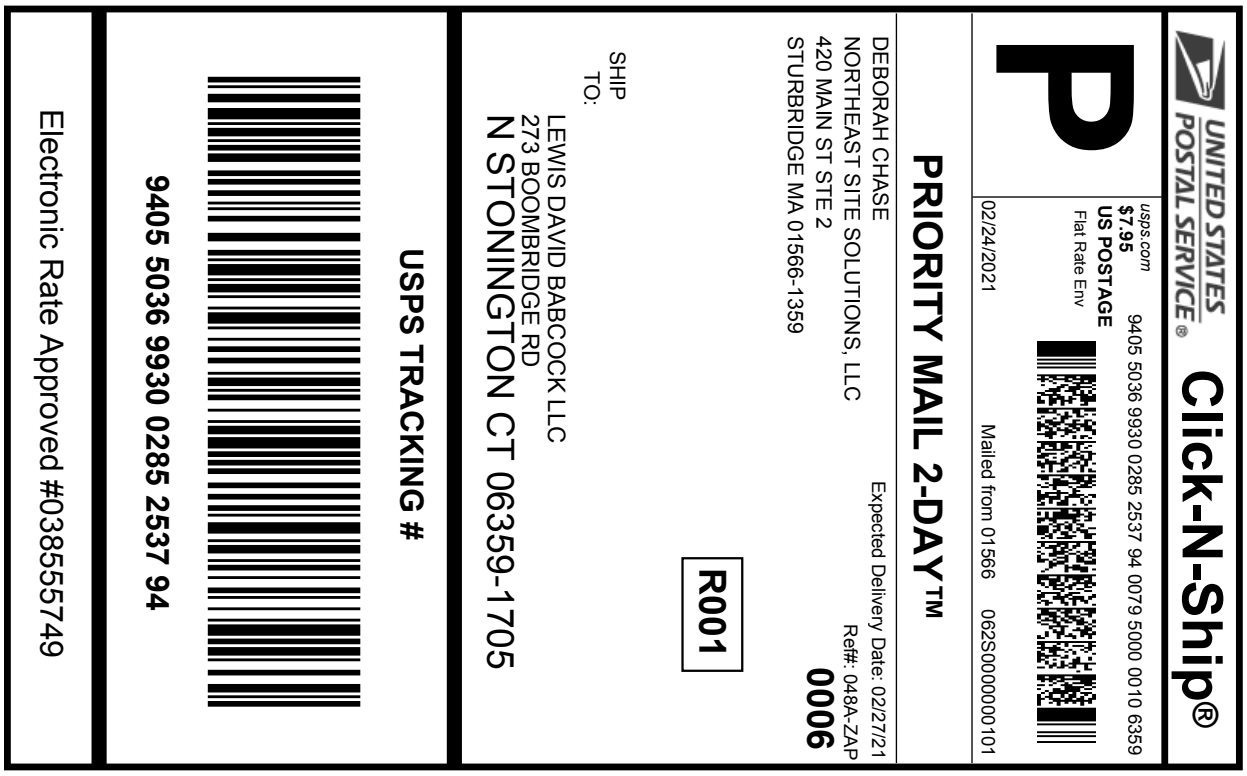

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USPS TRACKING # :
9405 5036 9930 0285 2537 94

Trans. #:	525597760
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: 048A-ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: LEWIS DAVID BABCOCK LLC
273 BOOMBRIDGE RD
N STONINGTON CT 06359-1705

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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Exhibit G

Deborah Chase

From: Deborah Chase
Sent: Thursday, March 18, 2021 3:32 PM
To: 'murgo@northstoningtonct.gov'; 'jhodge@northstoningtonct.gov'
Cc: 'Ken Thomas'
Subject: 174 BOOM BRIDGE ROAD, NORTH STONINGTON CT 06359 T-MOBILE EM APPLICATION (CT11048A_L600)
Attachments: 174 BOOM BRIDGE NORTH STONINGTON CT 06359 T-MOBILE EM APPLICATION (CT11048A_L600).pdf

Good afternoon,
This is to inform you that you will be receiving a copy of T-Mobile's Exempt Modification (Zoning) Application to the CT Siting Council for the site listed above.
It will be delivered via Priority Mail.
Please let me know if you have any questions.
Thank you very much

Deborah Chase
Senior Project Coordinator & Analyst
Mobile: 860-490-8839

NORTHEAST
SITE SOLUTIONS
Turnkey Wireless Development
www.northeastsitesolutions.com

Save a tree. Refuse.Reduce. Reuse. Recycle.