EVERSOURCE ENERGY

56 Prospect Street,
P.O. Box 270
Hartford, CT 06103

Kathleen M. Shanley
Manager – Transmission Siting
Tel: (860) 728-4527

January 8, 2021

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

RE: **Notice of Exempt Modification**
Eversource Site # ES-009 Westbrook
315 Spencer Plains Road, Westbrook, CT 06498
Latitude: 41-17-32.79 N / Longitude: 72-25-49.33 W

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") currently maintains one antenna on an existing 180-foot self-support tower located at 315 Spencer Plains Road in Westbrook. See Attachment A, Parcel Map and Property Card. The tower and property are owned by the State of Connecticut Department of Emergency Services and Public Protection ("DESPP"). Eversource and DESPP have entered into an agreement allowing the modification of Eversource's equipment on the Connecticut State Police tower. See Attachment B, Letter of Authorization. Eversource plans to install one 3-foot 8-inch tall omni-directional antenna to be mounted at 159 feet above ground level ("AGL"), one 5.5-foot tall dipole antenna mounted at 121 feet AGL, and two 7/8-inch diameter coaxial cables. There will be no changes to the area of the fenced compound, the tower or the existing antennas and equipment currently mounted on the tower. The antennas will be mounted to the existing tower on new 4-foot stand-off mounts. See Attachment C, Mount Analysis. The tower and existing and proposed equipment are depicted on Attachment D, Construction Drawings, dated November 17, 2020 and Attachment E, Structural Analysis, dated July 31, 2020. The Connecticut Siting Council approved the self-support tower at this location in Petition No. 61 in September 1980 and subsequently approved Eversource's Tower Share application under TS-CL&P-154-121022.

The proposed installation is part of Eversource's program to update the current obsolete analog voice radio communications system to a modern digital voice communications system. The new system will enable the highest level of voice communications under all operating conditions, including during critical emergency and storm restoration activities. The new radio system will also provide for remote control of distribution safety equipment.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ("R.C.S.A.") §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being delivered to Noel

Bishop, First Selectman for the Town of Westbrook and Eric Knapp, Planning, Zoning & Development Coordinator for the Town of Westbrook, via private carrier. Proof of delivery is attached. See Attachment F, Proof of Delivery of Notice.

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. There will be no change to the height of the existing tower.
2. The proposed modifications will not require an extension of the site boundary.
3. The proposed modification 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 new antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard as shown in the attached Radio Frequency Emissions Report, dated November 23, 2020 (Attachment G – Power Density Report)[1].
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure, antenna mounts, and its foundation can support the proposed loading.

For the foregoing reasons, Eversource 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). One original copy of this notice is enclosed.

Communications regarding this Notice of Exempt Modification should be directed to Kathleen Shanley at (860) 728-4527.

By: _____
Kathleen M. Shanley
Manager – Transmission Siting

cc: Honorable Noel Bishop, First Selectman, Town of Westbrook
Eric Knapp, Planning, Zoning and Development Coordinator, Town of Westbrook
DESPP

Attachments

A. Parcel Map and Property Card
B. Letter of Authorization
C. Mount Analysis
D. Construction Drawings
E. Structural Analysis
F. Proof of Delivery of Notice
G. Power Density Report

[1] Any receive-only antennas are not included in the Power Density Report, as they are irrelevant in terms of the % MPE calculations.

ATTACHMENT A – PARCEL MAP AND PROPERTY CARD

ES-009 Westbrook Parcel Map

Property Information

Property ID	165/015
Location	315 SPENCER PLAINS RD
Owner	CONNECTICUT STATE OF

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Westbrook, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Geometry updated October 2018
Data updated 11/19/2018

Legend

Approximate Tower Location

315 SPENCER PLAINS RD

Location	315 SPENCER PLAINS RD	**Mblu**	165/ / 015/ /
Acct#	S0513700	**Owner**	CONNECTICUT STATE OF
Assessment	$925,500	**Appraisal**	$1,322,140
PID	3667	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$988,230	$333,910	$1,322,140

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$691,760	$233,740	$925,500

Owner of Record

Owner	CONNECTICUT STATE OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	315 SPENCER PLAINS RD WESTBROOK, CT 06498	**Book & Page**	0046/0350
		Sale Date	01/01/1901
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
CONNECTICUT STATE OF	$0		0046/0350	25	01/01/1901

Building Information

Building 1 : Section 1

Year Built:	1958
Living Area:	8,282
Replacement Cost:	$1,272,938
Building Percent Good:	62
Replacement Cost Less Depreciation:	$789,220

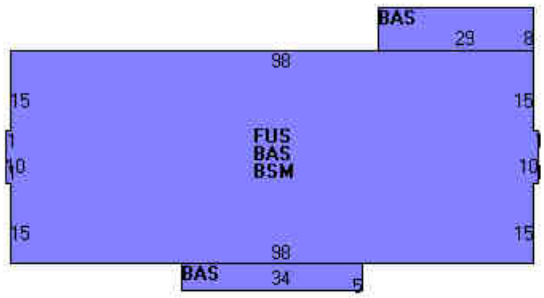
Building Attributes

Field	Description
STYLE	Other State
MODEL	Comm/Ind
Grade	A
Stories:	1.0
Occupancy	1.00
Exterior Wall 1	Brick
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Linoleum
Interior Floor 2	Carpet
Heating Fuel	Oil
Heating Type	Hot Water
AC Percent	100
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	4
% Sprinklers	0
Usrfld 219	
1st Floor Use:	
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	9.00
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos2/WestbrookCTPhotos//\00\00\07\37.JPG)

Building Layout



(http://images.vgsi.com/photos2/WestbrookCTPhotos//Sketches/3667_366

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	4,342	4,342
FUS	Finished Upper Story	3,940	3,940
BSM	Basement	3,940	0
		12,222	8,282

Building 2 : Section 1

Year Built: 1958
Living Area: 5,832
Replacement Cost: $290,737
Building Percent Good: 62
Replacement Cost Less Depreciation: $180,260

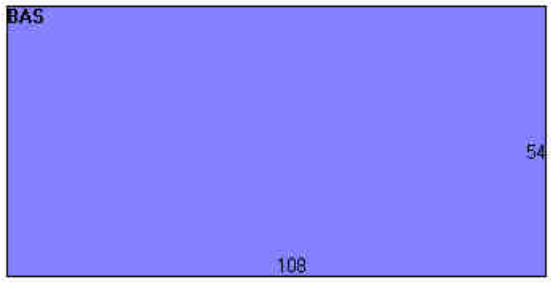
Building Attributes : Bldg 2 of 2	
Field	Description

STYLE	Comm Garage
MODEL	Svc Sta/Garage
Grade	C+
Stories:	1.0
Occupancy	0.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Tar & Gravel
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Hot Air
AC Percent	0
Foundation	Slab
Bldg Use	Exempt Ind
Total Rooms	0
Total Bedrms	0
Total Fixtures	4
% Sprinklers	0
Usrfld 219	
1st Floor Use:	
Heat/AC	NONE
Frame Type	REINF. CONCR
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	20.00
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos2/WestbrookCTPhotos//default.jpg)

Building Layout



(http://images.vgsi.com/photos2/WestbrookCTPhotos//Sketches/3667_517

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	5,832	5,832
		5,832	5,832

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Land Line Valuation

Use Code	920	**Size (Acres)**	3.2
Description	Exempt Comm	**Depth**	
Zone	LDR	**Assessed Value**	$233,740
Neighborhood	COM	**Appraised Value**	$333,910
Alt Land Appr	No		
Category			

Outbuildings

Outbuildings							Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**	**Comment**
PAV1	Paving			25000.00 S.F.	$18,750	1	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$988,230	$333,910	$1,322,140
2018	$988,230	$333,910	$1,322,140
2017	$988,230	$333,910	$1,322,140

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$691,760	$233,740	$925,500
2018	$691,760	$233,740	$925,500
2017	$691,760	$233,740	$925,500

ATTACHMENT B – LETTER OF AUTHORIZATION

STATE OF CONNECTICUT

DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION

March 3, 2020

Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Letter of Authorization** – Co-location on Connecticut State Police tower
Property address: 315 Spencer Plains Road, Westbrook, CT
Latitude: 41-17-32.6" Longitude: 72-25-49.31"

To Whom It May Concern:

Eversource Energy (Eversource) has an Agreement with the Connecticut Department of Emergency Services and Public Protection (DESPP) to co-locate its communications equipment on the DESPP tower located at 315 Spencer Plains Road, Westbrook, Connecticut.

Eversource shall be required by the terms of the agreement to seek and obtain all necessary permits and approvals. As a duly authorized representative of the DESPP, permission is hereby granted to Eversource and agents thereof, for the purpose of consummating any applications necessary to gain the required approvals from the State of Connecticut.

Any fees or charges associated with all applications or permits and any conditions placed on the applicant shall be the sole responsibility of Eversource.

Yours truly,

Brian Benito
Planning Specialist
State Of Connecticut
Department of Emergency Services and Public Protection
CTS Unit
860-685-8297
brian.benito@ct.gov

ATTACHMENT C – MOUNT ANALYSIS

BLACK & VEATCH
Building a world of difference.
BLACK & VEATCH CORPORATION
6800 W 115TH ST, SUITE 2292, OVERLAND PARK, KS 66211
+1 913-458-2522 | RILEYJJ@BV.COM

November 30, 2020

MOUNT EVALUATION LETTER

Site Number: 3667
Site Name: WESTBROOK TROOP F CSP
Site Data: 315 Spencer Plains Rd.
Westbrook, CT 06498
Latitude: 41° 17' 32.79"
Longitude: -72° 25' 49.33"

Black & Veatch Corporation is pleased to submit this "Mount Evaluation Letter" to determine the structural integrity of antenna mounting system on the above-mentioned site. The purpose of this evaluation is to determine the capacity of the system in supporting the final loading in the attached "Loading Summary".

Based on our evaluation we have determined the existing antenna mounting system to be: **SUFFICIENT**

Structure Rating (max from all components) =	17.1%

Proposed Mounting System
SitePro 1 (USF-4U) 48" Ultimate Universal Stand-off Frame

The proposed mounting system will be capable of supporting the proposed equipment, under the following conditions:

- Contractor shall be responsible for the means and methods of construction.
- Contractor shall inspect the condition of all existing and proposed structural members, all relevant members and connections and report any deficiencies to the engineer prior to installation of any new antennas and other equipment.

The scope of this evaluation pertains only to the proposed antenna mounting system and does not include examination of the loads imparted by the antenna mounting system to the existing tower and its structural components. This document was prepared based on information provided to Black & Veatch. If existing conditions do not reflect those represented, this analysis is no longer valid.

Please contact Josh Riley in our Overland Park Office
at 913-458-2522 if you have any questions or comments.

Sincerely,
Black & Veatch Corporation

Prepared By: Joohwan Jung
Submitted By: Josh Riley, P.E.

11/30/2020

TABLE OF CONTENTS

1. LOADING SUMMARY

Appurtenance								
Carrier	Position	Sector	Antenna RAD Center (ft)	Mount Centerline (ft)	Qty	Type	Manufacturer	Model
Eversource	1	-	162	159	1	Omni	Telewave	ANT220F2

2. ANALYSIS CRITERIA SUMMARY

ANALYSIS CRITERIA	
STANDARD	TIA-222-H
WIND SPEED	Ultimate of 145 mph
WIND SPEED WITH ICE	50 mph with 2" radial ice thickness
EXPOSURE CATEGORY	C
RISK CATEGORY	III
TOPO CATEGORY	Hill
CREST HEIGHT	66.5 ft

3. REFERENCES

- American Institute of Steel Construction, AISC 15th Edition
- Telecommunications Industry Association Standard, TIA-222-H & 2018 Connecticut State Building Code
- Antenna Mount Assembly Drawing (Model: USF-4U) by SitePro 1, dated 02/16/2011

4. ASSUMPTIONS

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch should be notified to determine the effect on the structural integrity of the antenna mounting system.

- The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- The configuration of antennas, mounts, and other appurtenances are as specified in the Loading Summary and the referenced drawings.
- All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- Sector frame center line: located equidistant between top & bottom boom; Platform center line: located at the base perimeter of platform, unless otherwise specified.
- Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR B-35)
Connection Bolts	ASTM A325

5. RESULTS SUMMARY

Name	Bending Stress Ratio		Shear Stress Ratio	
Arm: HSS3X3X3/16	15.1%	Pass	3.1%	Pass
Bracing: Pipe 2.0 Std	17.1%	Pass	2.2%	Pass
Mount Pipe: Pipe 3.0 Std	8.6%	Pass	3.9%	Pass

*Von Mises SR = (Max Von Mises Value From RISA-3D)/(0.9*Fy)

**Capacity rating per TIA-222-H Section 15.5.

APPENDIX 1:
MOUNT ANALYSIS REPORT

Dead and Live Loads

Maintenance Live Load: L_V = 250 lb
Installation Live Load: L_M = 0 lb

Appurtenance Dead Loads	
Name	Weight (lb)
ANT220F2	11

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Appurtenance Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Basic Wind Speed, V =	145	mph		
Height Above Ground, z =	162	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	66.5 ft	ft		
Velocity Pressure Coefficient, K_z =	1.40		$K_e = e^{-0.000032 z s}$	2.6.8
Topographic Factor, K_{zt} =	1.01			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factor, K_e =	1.000		$F_A = q_z G_h (EPA)$	2.6.11.2
Wind Velocity Pressure, q_z =	72.21	psf		
Gust Effect Factor, G_h =	1.00		$F_M = q_z G_h C_f D_p$	2.6.11.2

Appurtenance Wind Loads

Name	Height (ft)	Width (ft)	Depth (ft)	Normal			Tangential		
				C_a	EPA FT2	F_A (lb)	C_a	EPA FT2	F_A (lb)
ANT220F2	3.67	0.23	0.23	1.70	1.29	92.84	1.70	1.29	92.84

BLACK & VEATCH	Client:	Eversource	Computed By: Joohwan Jung
	Site Name:	WESTBROOK TROOP F CSP (3667)	Date: 11/30/2020
			Verified By: JW
	Title:	MOUNT ANALYSIS REPORT	Date: 11/30/2020

Member Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Basic Wind Speed, V =	145	mph		
Height Above Ground, z =	162	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	66.5 ft	ft		
Velocity Pressure Coefficient, K_z =	1.40		$K_e = e^{-0.000032 z_s}$	2.6.8
Topographic Factor, K_{zt} =	1.01			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factor, K_e =	1.000		$F_A = q_z G_h (EPA)$	2.6.11.2
Wind Velocity Pressure, q_z =	72.21	psf		
Gust Effect Factor, G_h =	1.00		$F_M = q_z G_h C_f D_p$	2.6.11.2

Member Wind Loads

Name	Depth (ft)	Width (ft)	C_f	D_p (ft)	F_M (lb)
Arm: HSS3X3X3/16	0.25	0.25	2	0.25	36.11
Bracing: Pipe 2.0 Std	0.20		1.2	0.20	17.15
Mount Pipe: Pipe 3.0 Std	0.29		1.2	0.29	25.27

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Appurtenance Ice Dead Loading

			Equations	TIA-222-H
Exposure Category =	C			
Risk Category =	III		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Topographic Category =	1			
Height Above Ground, z =	162	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	66.5 ft	ft		
Design Ice Thickness, T_i =	2.00	in	$K_{iz} = (z/33)^{0.10}$	2.6.10
Importance Factor, I =	1.15			
Topographic Factor, K_{zt} =	1.01		$T_{iz} = T_i I K_{iz}(K_{zt})^{0.35}$	2.6.10
Height Escalation Factor, K_{iz} =	1.17			
Factored Ice Thickness, T_{iz} =	2.70	in	$DL_{ice}=[(H_{ice}*D_{ice}*W_{ice}) - (H*W*D)]*56pcf$	
Grating Ice Dead Load, D_{Gice} =	12.62	psf		

Appurtenance Ice Dead Loads

Name	Height w/ ice (ft)	Width w/ice (ft)	Depth w/ ice (ft)	V_{ice} (ft^3)	DL_{ice} (lb)
ANT220F2	4.12	0.68	0.68	1.71	95.80

BLACK & VEATCH	Client:	Eversource	Computed By: Joohwan Jung
	Site Name:	WESTBROOK TROOP F CSP (3667)	Date: 11/30/2020
			Verified By: JW
	Title:	MOUNT ANALYSIS REPORT	Date: 11/30/2020

Member Ice Dead Loading

Exposure Category =	C		
Risk Category =	III		
Topographic Category =	1		
Height Above Ground, z =	162	ft	
Crest Height, H =	66.5 ft	ft	
Design Ice Thickness, T_i =	2.00	in	
Importance Factor, I =	1.15		
Topographic Factor, K_{zt} =	1.01		
Height Escalation Factor, K_{iz} =	1.17		
Factored Ice Thickness, T_{iz} =	2.70	in	
Grating Ice Dead Load, D_{Gice} =	12.62	psf	

Equations

	TIA-222-H
$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
$K_{iz} = (z/33)^{0.10}$	2.6.10
$T_{iz} = T_i I K_{iz} (K_{zt})^{0.35}$	2.6.10
Aiz = pi*Tiz*(Dc+Tiz)	2.6.10
DL_{ice}=Aiz*56pcf	

Member Ice Dead Loads

Name	Depth w/ ice (ft)	Width w/ ice (ft)	Dc (ft)	Aiz (ft^2)	DL_{ice} (lb/ft)
Arm: HSS3X3X3/16	0.70	0.70	0.35	0.41	22.95
Bracing: Pipe 2.0 Std	0.65		0.20	0.30	16.78
Mount Pipe: Pipe 3.0 Std	0.74		0.29	0.37	20.50

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Appurtenance Ice Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Ice Wind Speed, V_{ice} =	50	mph		
Height Above Ground, z =	162	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	66.5 ft	ft		
Velocity Pressure Coefficient, K_z =	1.40	psf	$K_e = e^{-0.000032 \cdot zs}$	2.6.8
Topographic Factor, K_{zt} =	1.01			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factory, K_e =	1.000		$F_{A(ice)} = q_{z(ice)} G_h (EPA)_{A(ice)}$	2.6.11.2
Ice Wind Velocity Pressure, $q_{z(ice)}$ =	8.586			
Factored Ice Thickness, T_{iz} =	2.70	in	$F_{M(ice)} = q_{z(ice)} G_h C_f D_{p(ice)}$	2.6.11.2
Gust Effect Factor, G_h =	1			

Appurtenance Ice Wind Loads

Name	Height w/ Ice (ft)	Width w/ Ice (ft)	Depth w/ Ice (ft)	Normal			Tangential		
				C_a	EPA FT2	F_A (lb)	C_a	EPA FT2	F_A (lb)
ANT220F2	4.12	0.68	0.68	-	2.40	20.61	-	2.40	20.61

Client:	Eversource	Computed By:	Joohwan Jung
Site Name:	WESTBROOK TROOP F CSP (3667)	Date:	11/30/2020
		Verified By:	JW
Title:	MOUNT ANALYSIS REPORT	Date:	11/30/2020

BLACK & VEATCH

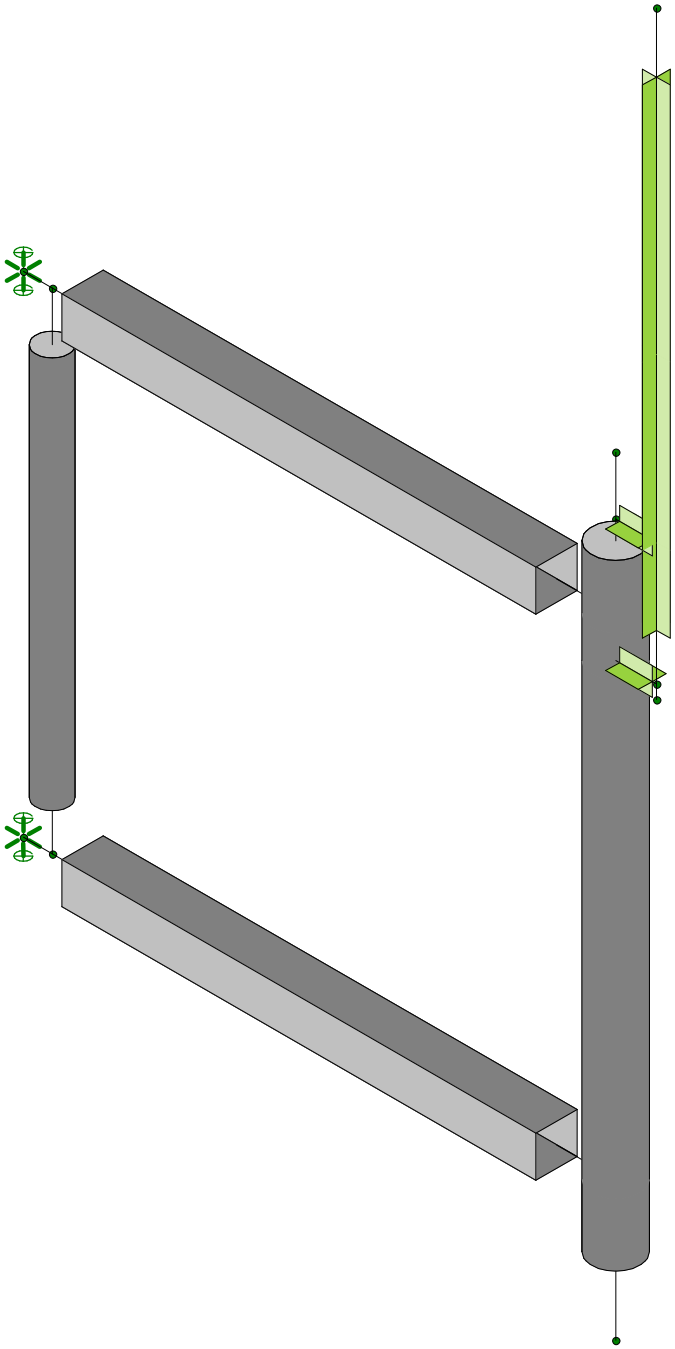
Member Ice Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Ice Wind Speed, V_{ice} =	50	mph		
Height Above Ground, z =	162	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	66.5 ft	ft		
Velocity Pressure Coefficient, K_z =	1.40	psf	$K_e = e^{-0.000032 z_s}$	2.6.8
Topographic Factor, K_{zt} =	1.01			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factory, K_e =	1.000		$F_{A(ice)} = q_{z(ice)} G_h (EPA)_{A(ice)}$	2.6.11.2
Ice Wind Velocity Pressure, $q_{z(ice)}$ =	8.586			
Factored Ice Thickness, T_{iz} =	2.70	in	$F_{M(ice)} = q_{z(ice)} G_h C_f D_{p(ice)}$	2.6.11.2
Gust Effect Factor, G_h =	1			

Member Ice Wind Loads

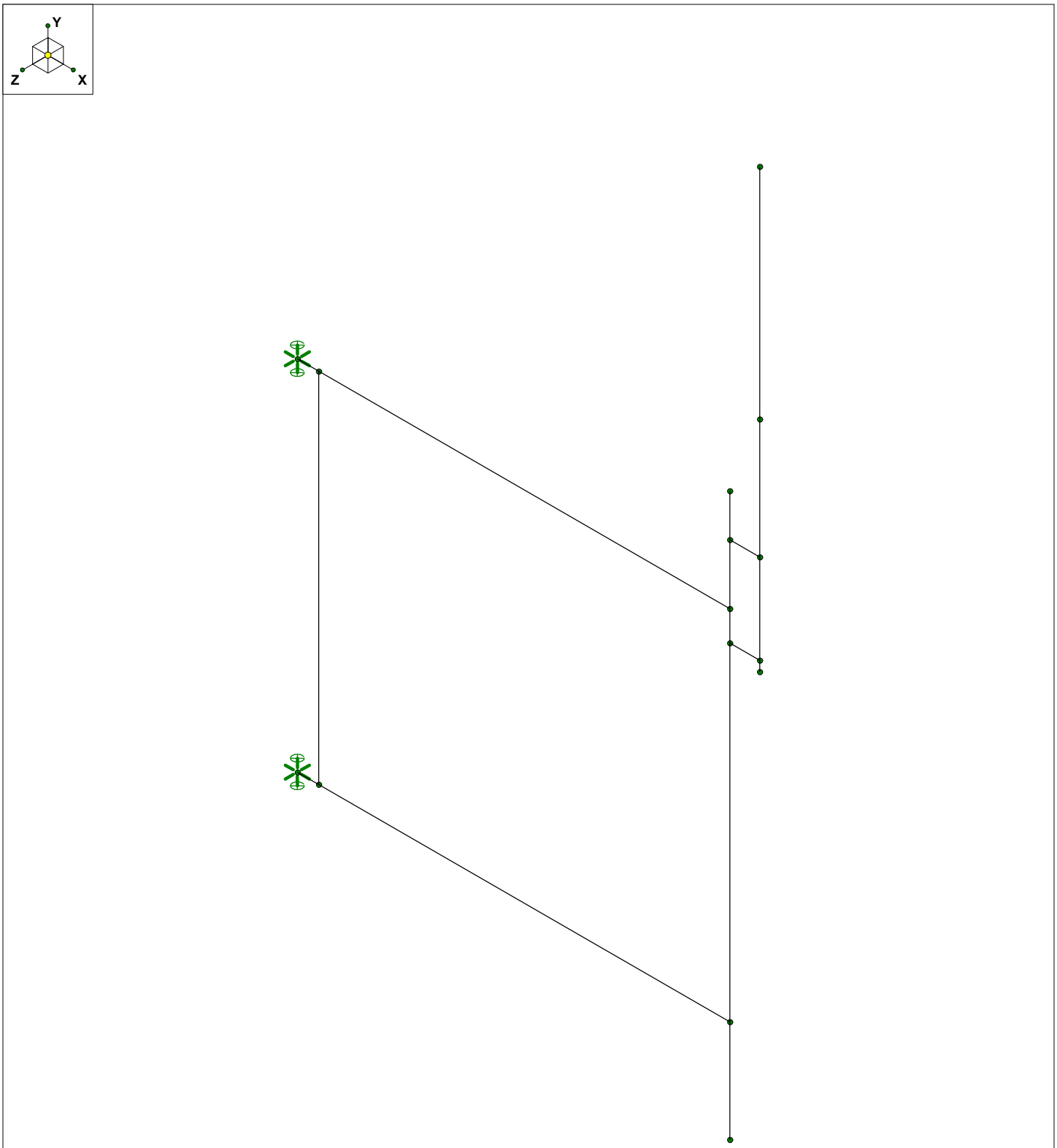
Name	Depth w/ Ice (ft)	Width w/ Ice (ft)	C_f	$D_{p(ice)}$ (ft)	$F_{M(ice)}$ (lb/ft)
Arm: HSS3X3X3/16	0.70	0.70	2	0.70	12.03
Bracing: Pipe 2.0 Std	0.65		1.2	0.65	6.68
Mount Pipe: Pipe 3.0 Std	0.74		1.2	0.74	7.65

APPENDIX 2:
RISA PRINTOUTS



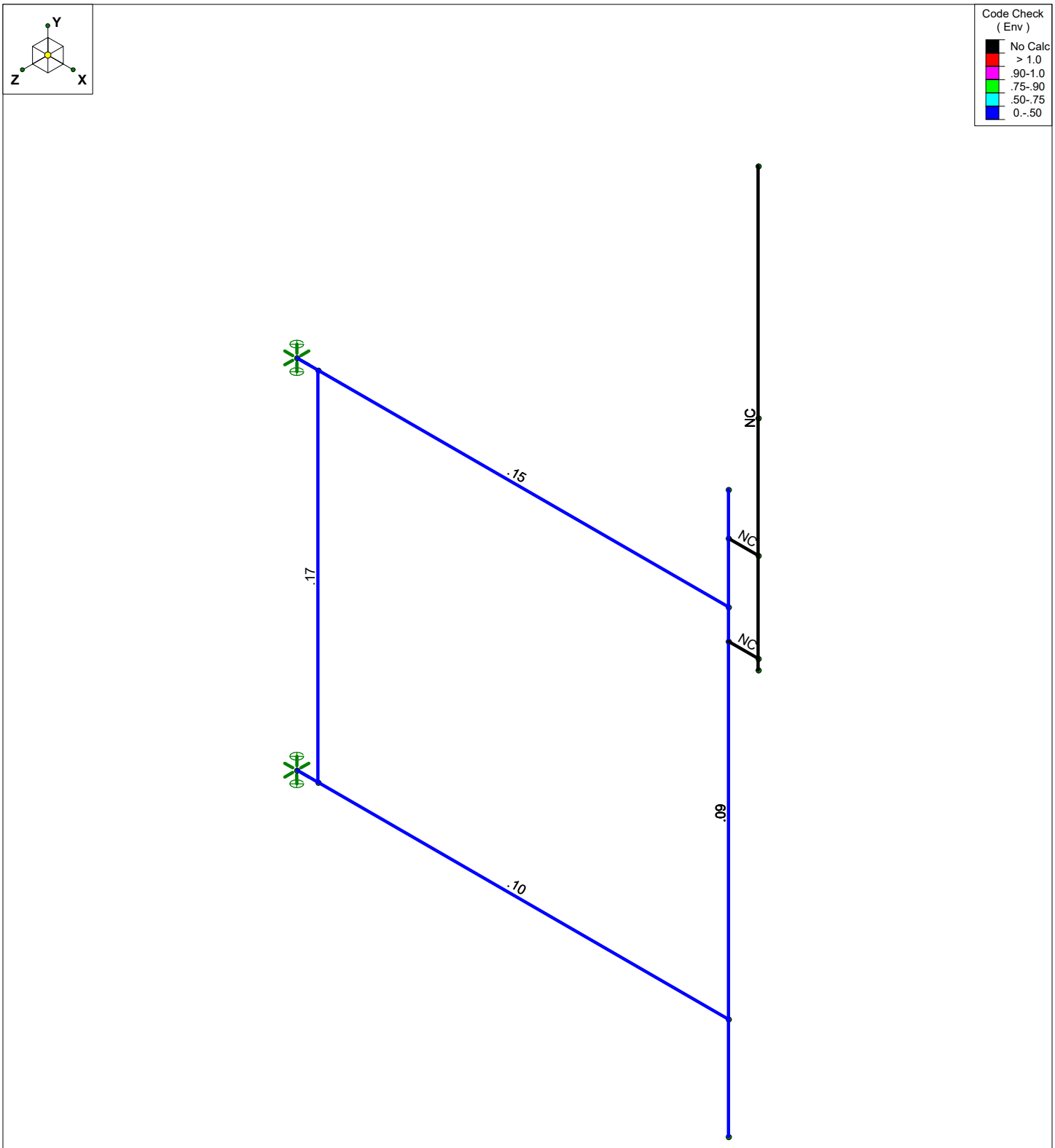
Envelope Only Solution

Black & Veatch	WESTBROOKTRPF USF-4U Model_162ft	SK - 1
Joohwan Jung		Nov 24, 2020 at 10:47 AM
405025.2021.2200		WESTBROOKTRPF USF-4U Mod...



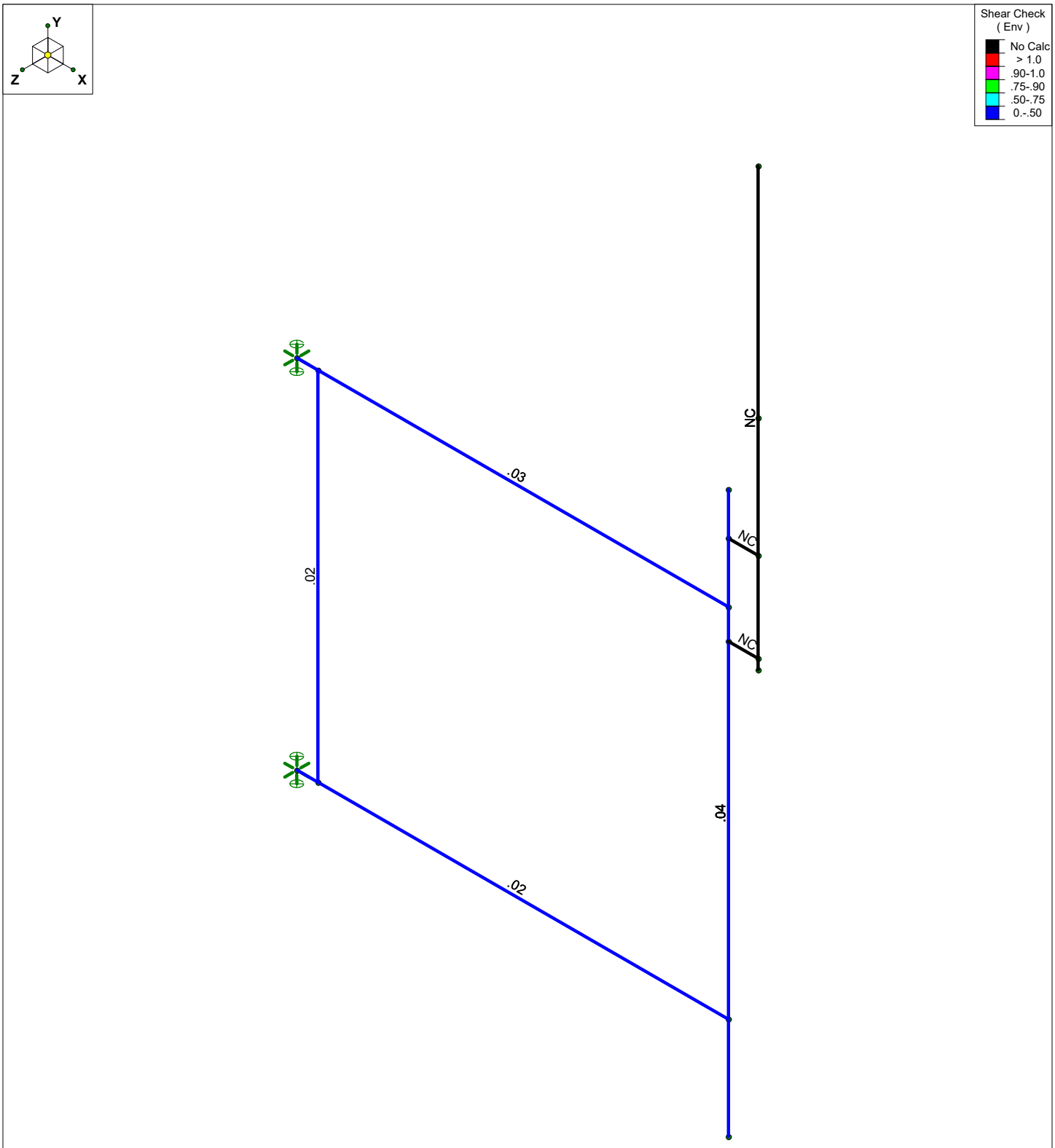
Envelope Only Solution

Black & Veatch	WESTBROOKTRPF USF-4U Model_162ft	SK - 2
Joohwan Jung		Nov 24, 2020 at 10:47 AM
405025.2021.2200		WESTBROOKTRPF USF-4U Mod...



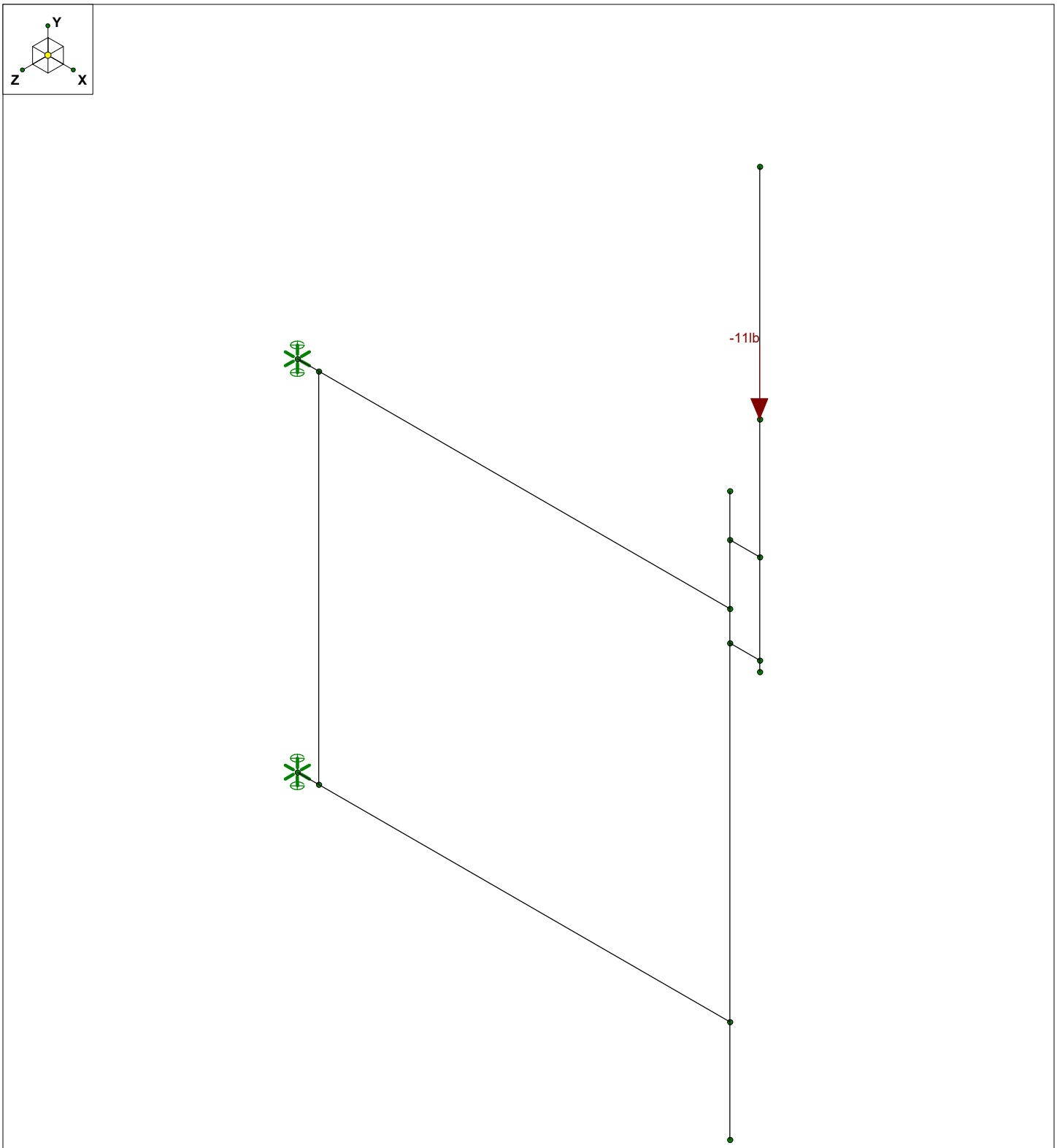
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Black & Veatch	WESTBROOKTRPF USF-4U Model_162ft	SK - 3
Joohwan Jung		Nov 24, 2020 at 10:47 AM
405025.2021.2200		WESTBROOKTRPF USF-4U Mod...



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Black & Veatch	WESTBROOKTRPF USF-4U Model_162ft	SK - 4
Joohwan Jung		Nov 24, 2020 at 10:47 AM
405025.2021.2200		WESTBROOKTRPF USF-4U Mod...



Loads: BLC 1, DL
Envelope Only Solution

Black & Veatch	WESTBROOKTRPF USF-4U Model_162ft	SK - 5
Joohwan Jung		Nov 24, 2020 at 10:47 AM
405025.2021.2200		WESTBROOKTRPF USF-4U Mod...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Arm	HSS3X3X3	Beam	SquareTube	A53 Gr.B	Typical	1.89	2.46	2.46	4.03
2	Bracing	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Mount Pipe	PIPE_3.0	Column	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]
1	gen_Conc3NW	3155	1372	.15	.6	.145
2	gen_Conc4NW	3644	1584	.15	.6	.145
3	gen_Conc3LW	2085	906	.15	.6	.11
4	gen_Conc4LW	2408	1047	.15	.6	.11
5	gen_Alum	10100	4077	.3	1.29	.173
6	gen_Steel	29000	11154	.3	.65	.49
7	gen_Plywood	1800	38	0	.3	.035
8	RIGID	1e+6		.3	0	0

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction		Reaction	
2	N3	Reaction	Reaction	Reaction		Reaction	

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Arm	Beam	SquareTube	A53 Gr.B	Typical
2	M2	N3	N4			Arm	Beam	SquareTube	A53 Gr.B	Typical
3	M3	N5	N6			Bracing	Column	Pipe	A53 Gr.B	Typical
4	M4	N7	N8			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
5	M5	N9	N10			RIGID	None	None	RIGID	Typical
6	M6	N12	N13			RIGID	None	None	RIGID	Typical
7	M7	N15	N14			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5						Yes	** NA **			None
6	M6						Yes	** NA **			None
7	M7						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Arm	43.5			Lbyy						Lateral
2	M2	Arm	43.5			Lbyy						Lateral
3	M3	Bracing	36									Lateral
4	M4	Mount Pipe	56.5									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	DL	DL		-1		1				
2	Maintenance LL - LV	LL				1				
3	Installation LL - LM	LL				1				
4	Wind - 0 Deg (X)	WL				1		4		
5	Wind - 30 Deg (X)	WL				1		4		
6	Wind - 60 Deg (X)	WL				1		4		
7	Wind - 90 Deg (X)	WL				1		4		
8	Wind - 120 Deg (X)	WL				1		4		
9	Wind - 150 Deg (X)	WL				1		4		
10	Wind - 180 Deg (X)	WL				1		4		
11	Wind - 210 Deg (X)	WL				1		4		
12	Wind - 240 Deg (X)	WL				1		4		
13	Wind - 270 Deg (X)	WL				1		4		
14	Wind - 300 Deg (X)	WL				1		4		
15	Wind - 330 Deg (X)	WL				1		4		
16	Wind - 0 Deg (Z)	WL				1		4		
17	Wind - 30 Deg (Z)	WL				1		4		
18	Wind - 60 Deg (Z)	WL				1		4		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
19	Wind - 90 Deg (Z)	WL				1		4		
20	Wind - 120 Deg (Z)	WL				1		4		
21	Wind - 150 Deg (Z)	WL				1		4		
22	Wind - 180 Deg (Z)	WL				1		4		
23	Wind - 210 Deg (Z)	WL				1		4		
24	Wind - 240 Deg (Z)	WL				1		4		
25	Wind - 270 Deg (Z)	WL				1		4		
26	Wind - 300 Deg (Z)	WL				1		4		
27	Wind - 330 Deg (Z)	WL				1		4		
28	Ice DL	DL				1		4		
29	Ice Wind - 0 Deg (X)	WL				1		4		
30	Ice Wind - 30 Deg (X)	WL				1		4		
31	Ice Wind - 60 Deg (X)	WL				1		4		
32	Ice Wind - 90 Deg (X)	WL				1		4		
33	Ice Wind - 120 Deg (X)	WL				1		4		
34	Ice Wind - 150 Deg (X)	WL				1		4		
35	Ice Wind - 180 Deg (X)	WL				1		4		
36	Ice Wind - 210 Deg (X)	WL				1		4		
37	Ice Wind - 240 Deg (X)	WL				1		4		
38	Ice Wind - 270 Deg (X)	WL				1		4		
39	Ice Wind - 300 Deg (X)	WL				1		4		
40	Ice Wind - 330 Deg (X)	WL				1		4		
41	Ice Wind - 0 Deg (Z)	WL				1		4		
42	Ice Wind - 30 Deg (Z)	WL				1		4		
43	Ice Wind - 60 Deg (Z)	WL				1		4		
44	Ice Wind - 90 Deg (Z)	WL				1		4		
45	Ice Wind - 120 Deg (Z)	WL				1		4		
46	Ice Wind - 150 Deg (Z)	WL				1		4		
47	Ice Wind - 180 Deg (Z)	WL				1		4		
48	Ice Wind - 210 Deg (Z)	WL				1		4		
49	Ice Wind - 240 Deg (Z)	WL				1		4		
50	Ice Wind - 270 Deg (Z)	WL				1		4		
51	Ice Wind - 300 Deg (Z)	WL				1		4		
52	Ice Wind - 330 Deg (Z)	WL				1		4		

Load Combinations

	Description	S...	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	WIND LOAD COMBOS (145 MPH)																									
2	1.2DL + WL (0 DEG)	Y...	Y		1	1.2	4	1	16	1																
3	1.2DL + WL (30 DEG)	Y...	Y		1	1.2	5	1	17	1																
4	1.2DL + WL (60 DEG)	Y...	Y		1	1.2	6	1	18	1																
5	1.2DL + WL (90 DEG)	Y...	Y		1	1.2	7	1	19	1																
6	1.2DL + WL (120 DEG)	Y...	Y		1	1.2	8	1	20	1																
7	1.2DL + WL (150 DEG)	Y...	Y		1	1.2	9	1	21	1																
8	1.2DL + WL (180 DEG)	Y...	Y		1	1.2	10	1	22	1																
9	1.2DL + WL (210 DEG)	Y...	Y		1	1.2	11	1	23	1																
10	1.2DL + WL (240 DEG)	Y...	Y		1	1.2	12	1	24	1																
11	1.2DL + WL (270 DEG)	Y...	Y		1	1.2	13	1	25	1																
12	1.2DL + WL (300 DEG)	Y...	Y		1	1.2	14	1	26	1																
13	1.2DL + WL (330 DEG)	Y...	Y		1	1.2	15	1	27	1																
14																										
15	MOUNT LOAD COMBOS (30 MPH)																									
16	1.4DL	Y...	Y		1	1.4																				
17	1.2DL + 1.5LV	Y...	Y		1	1.2	2	1.5																		
18	1.2DL + 1.5LM + WL (0 DEG)	Y...	Y		1	1.2	3	1.5	4	.043	16	.043														

Load Combinations (Continued)

	Description	S...	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
19	1.2DL + 1.5LM + WL (30 DEG)	Y...	Y		1	1.2	3	1.5	5	.043	17	.043												
20	1.2DL + 1.5LM + WL (60 DEG)	Y...	Y		1	1.2	3	1.5	6	.043	18	.043												
21	1.2DL + 1.5LM + WL (90 DEG)	Y...	Y		1	1.2	3	1.5	7	.043	19	.043												
22	1.2DL + 1.5LM + WL (120 DEG)	Y...	Y		1	1.2	3	1.5	8	.043	20	.043												
23	1.2DL + 1.5LM + WL (150 DEG)	Y...	Y		1	1.2	3	1.5	9	.043	21	.043												
24	1.2DL + 1.5LM + WL (180 DEG)	Y...	Y		1	1.2	3	1.5	10	.043	22	.043												
25	1.2DL + 1.5LM + WL (210 DEG)	Y...	Y		1	1.2	3	1.5	11	.043	23	.043												
26	1.2DL + 1.5LM + WL (240 DEG)	Y...	Y		1	1.2	3	1.5	12	.043	24	.043												
27	1.2DL + 1.5LM + WL (270 DEG)	Y...	Y		1	1.2	3	1.5	13	.043	25	.043												
28	1.2DL + 1.5LM + WL (300 DEG)	Y...	Y		1	1.2	3	1.5	14	.043	26	.043												
29	1.2DL + 1.5LM + WL (330 DEG)	Y...	Y		1	1.2	3	1.5	15	.043	27	.043												
30																								
31	ICE LOAD COMBOS (2", 50 MPH)																							
32	1.2DL + Ice DL + Ice WL (0 DEG)	Y...	Y		1	1.2	28	1	29	1	41	1												
33	1.2DL + Ice DL + Ice WL (30 DEG)	Y...	Y		1	1.2	28	1	30	1	42	1												
34	1.2DL + Ice DL + Ice WL (60 DEG)	Y...	Y		1	1.2	28	1	31	1	43	1												
35	1.2DL + Ice DL + Ice WL (90 DEG)	Y...	Y		1	1.2	28	1	32	1	44	1												
36	1.2DL + Ice DL + Ice WL (120 DEG)	Y...	Y		1	1.2	28	1	33	1	45	1												
37	1.2DL + Ice DL + Ice WL (150 DEG)	Y...	Y		1	1.2	28	1	34	1	46	1												
38	1.2DL + Ice DL + Ice WL (180 DEG)	Y...	Y		1	1.2	28	1	35	1	47	1												
39	1.2DL + Ice DL + Ice WL (210 DEG)	Y...	Y		1	1.2	28	1	36	1	48	1												
40	1.2DL + Ice DL + Ice WL (240 DEG)	Y...	Y		1	1.2	28	1	37	1	49	1												
41	1.2DL + Ice DL + Ice WL (270 DEG)	Y...	Y		1	1.2	28	1	38	1	50	1												
42	1.2DL + Ice DL + Ice WL (300 DEG)	Y...	Y		1	1.2	28	1	39	1	51	1												
43	1.2DL + Ice DL + Ice WL (330 DEG)	Y...	Y		1	1.2	28	1	40	1	52	1												
44																								

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	252.723	2	280.476	38	352.525	5	0	43	775.242	11	0	43
2		min	-552.818	17	-4.005	2	-352.525	11	0	2	-775.242	5	0	2
3	N3	max	552.818	17	286.277	32	168.325	5	0	43	489.082	11	0	43
4		min	-68.795	8	-1.064	8	-168.325	11	0	2	-489.082	5	0	2
5	Totals:	max	520.853	2	528.829	38	520.851	5						
6		min	-520.853	8	121.445	2	-520.851	11						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear...	Loc[...	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M1	HSS3X3X3	.151	0	11	.031	2.266	z	11	55265....	59535	5171.25	5171.25	2...	H1-1b
2	M2	HSS3X3X3	.099	43.5	17	.018	2.266	z	11	55265....	59535	5171.25	5171.25	2...	H1-1b
3	M3	PIPE_2.0	.171	0	17	.022	0		17	28843....	32130	1871.6...	1871.6...	2...	H1-1b
4	M4	PIPE_3.0	.086	45.906	17	.039	10.5...		17	57908....	65205	5748.75	5748.75	1...	H1-1b

APPENDIX 3:
ATTACHMENTS

TELEWAVE, INC.®

195 - 260 MHz

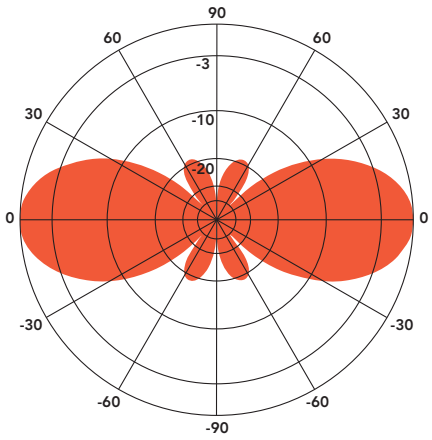
ANT220F2DIN

FIBERGLASS COLLINEAR ANTENNA 2.5 dBd

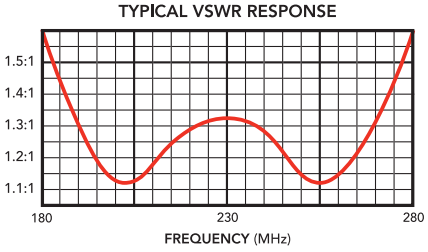
The Telewave ANT220F2 is an extremely rugged collinear antenna, with moderate gain and wide vertical beamwidth. This compact antenna produces 2.5 dBd gain, and is designed for operation in all environmental conditions. The antenna is constructed with brass and copper elements, with a path to ground potential for lightning impulse protection. The ANT220F2 is an excellent choice for wireless PTC systems in urban or rural areas.

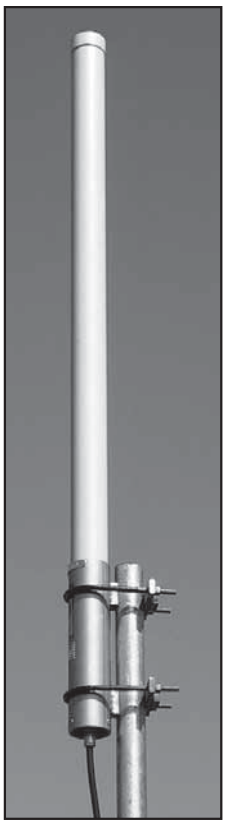
All junctions are fully soldered to prevent RF intermodulation, and each antenna is completely protected within a rugged, high-tech radome to ensure survivability in the worst environments. The "Cool Blue" radome provides maximum protection from corrosive gases, ultraviolet radiation, icing, salt spray, acid rain, and wind blown abrasives.

The ANT220F2 includes the ANTC485 dual clamp set for mounting to a 1.5" to 3" O.D. support pipe, and a 24" removable RG-213 DIN-Male jumper.



ANT220F2 - 230 MHz
Vertical Plane
Gain = 2.58 dBd



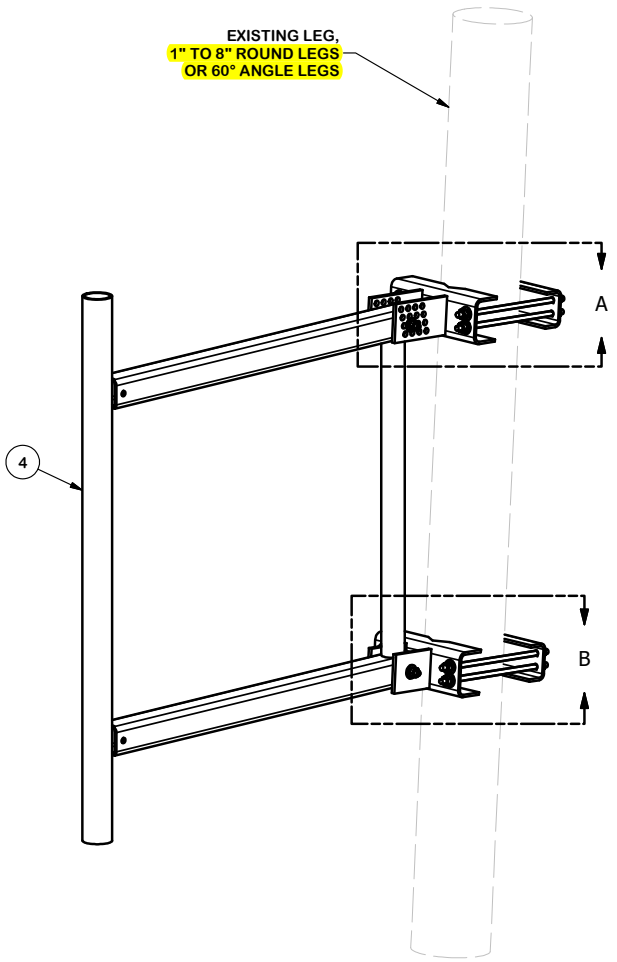


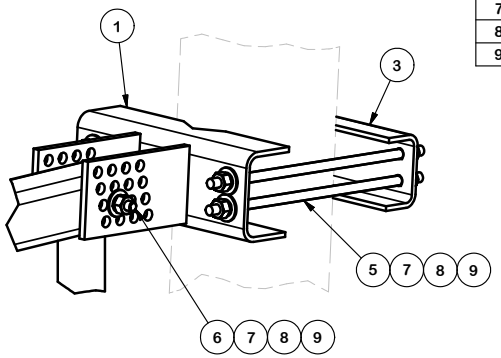
ONE SITE PRO 1 P/N DCP18K CLAMP SET REQUIRED.

SPECIFICATIONS			
Frequency (continuous)	195-260 MHz	**Dimensions (L x base diam.) in.**	44 x 2.75
Gain	2.5 dBd	**Tower weight (antenna + clamps)**	11 lb.
Power rating (typ.)	500 watts	**Shipping weight**	14 lb.
Impedance	50 ohms	**Wind rating / with 0.5" ice**	200 / 150 MPH
VSWR	1.5:1 or less	**Maximum exposed area**	1.1 ft.²
Pattern	Omnidirectional	**Lateral thrust at 100 MPH**	44 lb.
Vertical beamwidth	38°	**Bending moment at top clamp**	47 ft. lb.
Termination	7-16 DIN-F	**(100 MPH, 40 PSF flat plate equiv.)**	

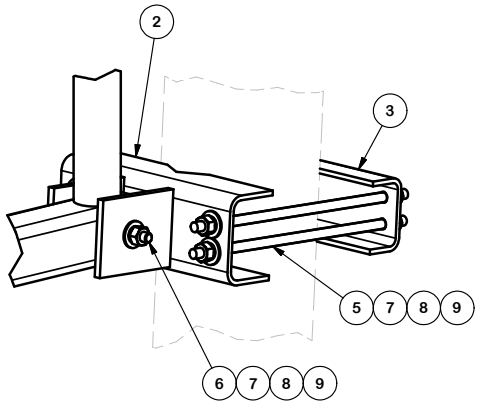
TOWER/MAST SIZE AT PROPOSED ANTENNA ATTACHMENT = 5"± DIAMETER.

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	CFM	UPPER GATE FOOT WELDMENT		13.90	13.90
2	1	CFS	LOWER GATE FOOT WELDMENT		12.72	12.72
3	2	GBB	GATE BACKING BAR		4.53	9.06
4	1	4PBG	48" PIPE MOUNT STANDOFF ARM		113.96	113.96
5	8	G12R-12	1/2" x 12" GALV. THREADED ROD		0.67	5.35
5	8	G12R-15	1/2" x 15" GALV. THREADED ROD		0.84	6.69
6	2	A1205	1/2" x 5" A325 HDG BOLT		0.34	0.69
7	18	G12FW	1/2" HDG USS FLATWASHER		0.03	0.61
8	18	G12LW	1/2" HDG LOCKWASHER		0.01	0.25
9	18	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.29
					TOTAL WT. #	164.53

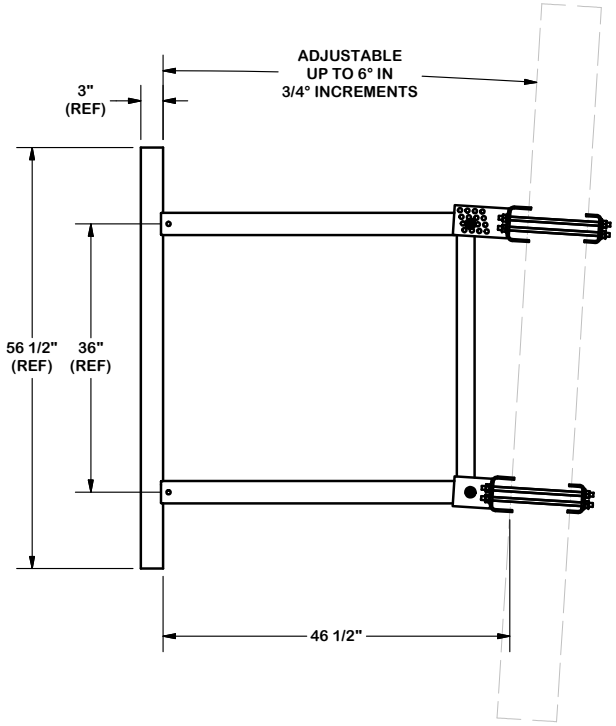




DETAIL A



DETAIL B



TOLERANCE NOTES

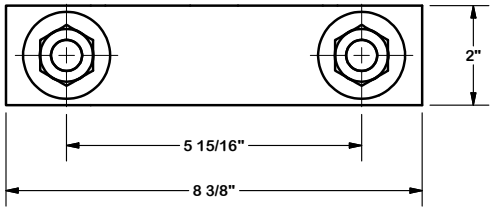
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

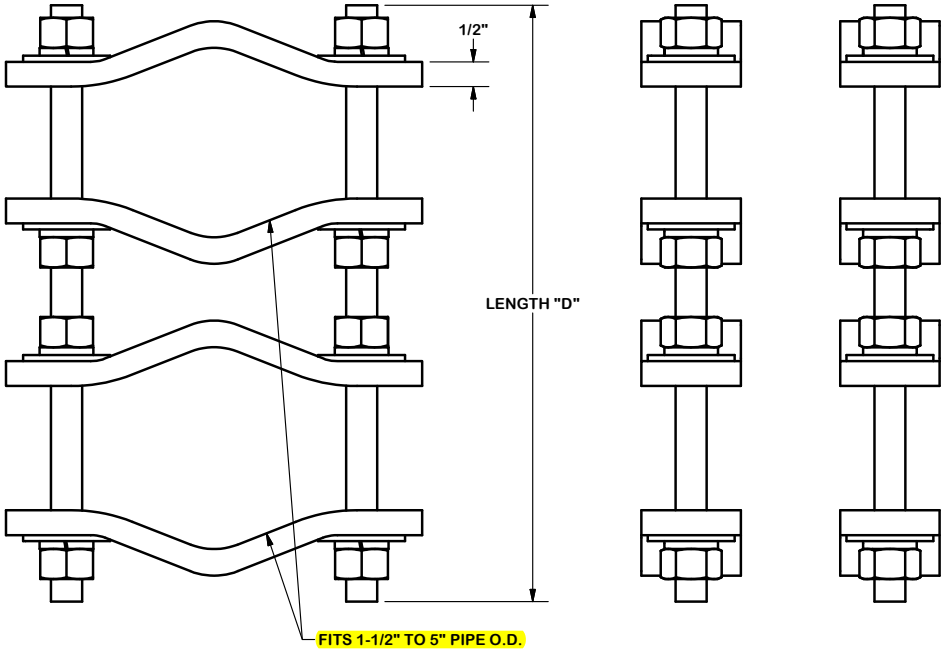
DESCRIPTION: 48" ULTIMATE UNIVERSAL STANDOFF FRAME

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	RCH 2/4/2011		USF-4U	1 OF 1

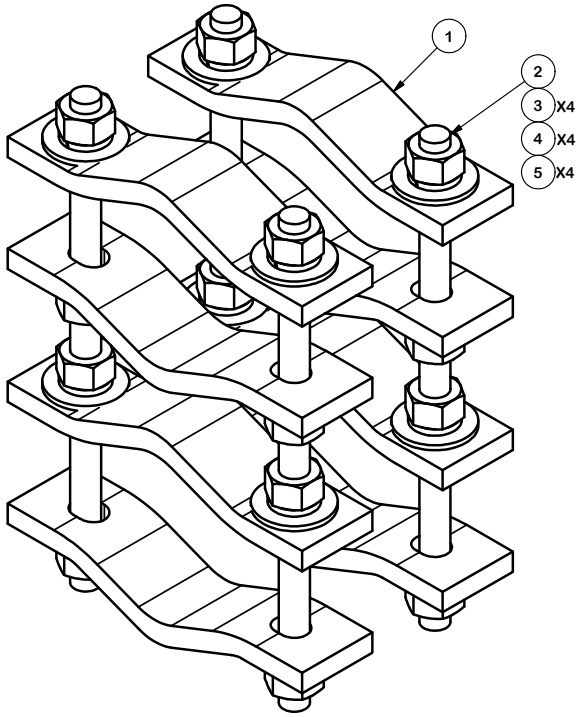
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 2/16/2011	USF-4U





PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	8	DCP	CLAMP HALF, 1/2" THICK, 8-3/8"		2.40	19.20
2	B	C	5/8" THREADED ROD	D	E	F
3	16	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	2.08
4	16	G58LW	5/8" HDG LOCKWASHER		0.03	0.42
5	16	G58FW	5/8" HDG USS FLATWASHER		0.07	1.13

VARIABLE PARTS TABLE						
ASSEMBLY "A"	QTY "B"	PART "C"	LENGTH "D"	UNIT WT. "E"	NET WT. "F"	TOTAL WEIGHT
DCP12K	4	G58R-12	12"	1.05	4.18	27.01
DCP18K	4	G58R-18	18"	1.57	6.27	29.10



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
PIPE TO PIPE CLAMP SET
1-1/2" TO 5" PIPE
1/2" THICK CLAMP

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	KC8 8/21/2012		SEE ASSEMBLY "A"	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	CEK 1/22/2013	DCPxxK

BLACK & VEATCH
Building a world of difference.
BLACK & VEATCH CORPORATION
6800 W 115TH ST, SUITE 2292, OVERLAND PARK, KS 66211
+1 913-458-2522 | RILEYJJ@BV.COM

November 30, 2020

MOUNT EVALUATION LETTER

Site Number: 3667
Site Name: WESTBROOK TROOP F CSP
Site Data: 315 Spencer Plains Rd.
Westbrook, CT 06498
Latitude: 41° 17’ 32.79”
Longitude: -72° 25’ 49.33”

Black & Veatch Corporation is pleased to submit this “Mount Evaluation Letter” to determine the structural integrity of antenna mounting system on the above-mentioned site. The purpose of this evaluation is to determine the capacity of the system in supporting the final loading in the attached “Loading Summary”.

Based on our evaluation we have determined the existing antenna mounting system to be: **SUFFICIENT**

Structure Rating (max from all components) =	22.4%

Proposed Mounting System
SitePro 1 (USF-4U) 48” Ultimate Universal Stand-off Frame

The proposed mounting system will be capable of supporting the proposed equipment, under the following conditions:

- Contractor shall be responsible for the means and methods of construction.
- Contractor shall inspect the condition of all existing and proposed structural members, all relevant members and connections and report any deficiencies to the engineer prior to installation of any new antennas and other equipment.

The scope of this evaluation pertains only to the proposed antenna mounting system and does not include examination of the loads imparted by the antenna mounting system to the existing tower and its structural components. This document was prepared based on information provided to Black & Veatch. If existing conditions do not reflect those represented, this analysis is no longer valid.

Please contact Josh Riley in our Overland Park Office
at 913-458-2522 if you have any questions or comments.

Sincerely,
Black & Veatch Corporation

Prepared By: Joohwan Jung
Submitted By: Josh Riley, P.E.

11/30/2020

TABLE OF CONTENTS

1. LOADING SUMMARY

Appurtenance								
Carrier	Position	Sector	Antenna RAD Center (ft)	Mount Centerline (ft)	Qty	Type	Manufacturer	Model
Eversource	1	-	124	121	1	Dipole	COMPROD	871F-70-220-025

2. ANALYSIS CRITERIA SUMMARY

ANALYSIS CRITERIA	
STANDARD	TIA-222-H
WIND SPEED	Ultimate of 145 mph
WIND SPEED WITH ICE	50 mph with 2" radial ice thickness
EXPOSURE CATEGORY	C
RISK CATEGORY	III
TOPO CATEGORY	Flat
CREST HEIGHT	N/A

3. REFERENCES

- American Institute of Steel Construction, AISC 15th Edition
- Telecommunications Industry Association Standard, TIA-222-H & 2018 Connecticut State Building Code
- Antenna Mount Assembly Drawing (Model: USF-4U) by SitePro 1, dated 02/16/2011

4. ASSUMPTIONS

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch should be notified to determine the effect on the structural integrity of the antenna mounting system.

- The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- The configuration of antennas, mounts, and other appurtenances are as specified in the Loading Summary and the referenced drawings.
- All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- Sector frame center line: located equidistant between top & bottom boom; Platform center line: located at the base perimeter of platform, unless otherwise specified.
- Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR B-35)
Connection Bolts	ASTM A325

5. RESULTS SUMMARY

Name	Bending Stress Ratio		Shear Stress Ratio	
Arm: HSS3X3X3/16	22.4%	Pass	5.4%	Pass
Bracing: Pipe 2.0 Std	17.5%	Pass	2.4%	Pass
Mount Pipe: Pipe 3.0 Std	8.7%	Pass	4.4%	Pass

*Von Mises SR = (Max Von Mises Value From RISA-3D)/(0.9*Fy)

**Capacity rating per TIA-222-H Section 15.5.

APPENDIX 1:
MOUNT ANALYSIS REPORT

Dead and Live Loads

Maintenance Live Load: L_V = 250 lb
Installation Live Load: L_M = 0 lb

Appurtenance Dead Loads	
Name	Weight (lb)
871F-70-220-025	12.5

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Appurtenance Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Basic Wind Speed, V =	145	mph		
Height Above Ground, z =	124	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	N/A	ft		
Velocity Pressure Coefficient, K_z =	1.32		$K_e = e^{-0.000032 z s}$	2.6.8
Topographic Factor, K_{zt} =	1.00			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factor, K_e =	1.000		$F_A = q_z G_h (EPA)$	2.6.11.2
Wind Velocity Pressure, q_z =	67.71	psf		
Gust Effect Factor, G_h =	1.00		$F_M = q_z G_h C_f D_p$	2.6.11.2

Appurtenance Wind Loads

Name	Height (ft)	Width (ft)	Depth (ft)	Normal			Tangential		
				C_a	EPA FT2	F_A (lb)	C_a	EPA FT2	F_A (lb)
871F-70-220-025	5.50	2.58	0.16	1.66	3.07	208.09	1.66	3.07	208.09

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Member Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Basic Wind Speed, V =	145	mph		
Height Above Ground, z =	124	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	N/A	ft		
Velocity Pressure Coefficient, K_z =	1.32		$K_e = e^{-0.000032 z_s}$	2.6.8
Topographic Factor, K_{zt} =	1.00			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factor, K_e =	1.000		$F_A = q_z G_h (EPA)$	2.6.11.2
Wind Velocity Pressure, q_z =	67.71	psf		
Gust Effect Factor, G_h =	1.00		$F_M = q_z G_h C_f D_p$	2.6.11.2

Member Wind Loads

Name	Depth (ft)	Width (ft)	C_f	D_p (ft)	F_M (lb)
Arm: HSS3X3X3/16	0.25	0.25	2	0.25	33.86
Bracing: Pipe 2.0 Std	0.20		1.2	0.20	16.08
Mount Pipe: Pipe 3.0 Std	0.29		1.2	0.29	23.70

Client:	Eversource	Computed By:	Joohwan Jung
Site Name:	WESTBROOK TROOP F CSP (3667)	Date:	11/30/2020
		Verified By:	JW
Title:	MOUNT ANALYSIS REPORT	Date:	11/30/2020

BLACK & VEATCH

Appurtenance Ice Dead Loading

Exposure Category =	C		
Risk Category =	III		
Topographic Category =	1		
Height Above Ground, z =	124	ft	
Crest Height, H =	N/A	ft	
Design Ice Thickness, T_i =	2.00	in	
Importance Factor, I =	1.15		
Topographic Factor, K_{zt} =	1.00		
Height Escalation Factor, K_{iz} =	1.14		
Factored Ice Thickness, T_{iz} =	2.63	in	
Grating Ice Dead Load, D_{Gice} =	12.25	psf	

Equations

$K_h = e^{(f \cdot z / H)}$

$K_{zt} = [1 + K_c K_t / K_h]^2$

$K_{iz} = (z/33)^{0.10}$

$T_{iz} = T_i I K_{iz}(K_{zt})^{0.35}$

$DL_{ice}=[(H_{ice}*D_{ice}*W_{ice}) - (H*W*D)]*56pcf$

TIA-222-H

2.6.6.2.1

2.6.6.2.1

2.6.10

2.6.10

Appurtenance Ice Dead Loads

Name	Height w/ ice (ft)	Width w/ice (ft)	Depth w/ ice (ft)	V_{ice} (ft^3)	DL_{ice} (lb)
871F-70-220-025	5.94	3.02	0.60	3.15	176.24

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Member Ice Dead Loading

Exposure Category =	C	
Risk Category =	III	
Topographic Category =	1	
Height Above Ground, z =	124	ft
Crest Height, H =	N/A	ft
Design Ice Thickness, T_i =	2.00	in
Importance Factor, I =	1.15	
Topographic Factor, K_{zt} =	1.00	
Height Escalation Factor, K_{iz} =	1.14	
Factored Ice Thickness, T_{iz} =	2.63	in
Grating Ice Dead Load, D_{Gice} =	12.25	psf

Equations

	TIA-222-H
$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
$K_{iz} = (z/33)^{0.10}$	2.6.10
$T_{iz} = T_i I K_{iz} (K_{zt})^{0.35}$	2.6.10
Aiz = pi*Tiz*(Dc+Tiz)	2.6.10
DL_{ice}=Aiz*56pcf	

Member Ice Dead Loads

Name	Depth w/ ice (ft)	Width w/ ice (ft)	Dc (ft)	Aiz (ft^2)	DL_{ice} (lb/ft)
Arm: HSS3X3X3/16	0.69	0.69	0.35	0.39	22.03
Bracing: Pipe 2.0 Std	0.64		0.20	0.29	16.04
Mount Pipe: Pipe 3.0 Std	0.73		0.29	0.35	19.65

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

Appurtenance Ice Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Ice Wind Speed, V_{ice} =	50	mph		
Height Above Ground, z =	124	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	N/A	ft		
Velocity Pressure Coefficient, K_z =	1.32	psf	$K_e = e^{-0.000032 \cdot zs}$	2.6.8
Topographic Factor, K_{zt} =	1.00			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factory, K_e =	1.000		$F_{A(ice)} = q_{z(ice)} G_h (EPA)_{A(ice)}$	2.6.11.2
Ice Wind Velocity Pressure, $q_{z(ice)}$ =	8.051			
Factored Ice Thickness, T_{iz} =	2.63	in	$F_{M(ice)} = q_{z(ice)} G_h C_f D_{p(ice)}$	2.6.11.2
Gust Effect Factor, G_h =	1			

Appurtenance Ice Wind Loads

Name	Height w/ Ice (ft)	Width w/ Ice (ft)	Depth w/ Ice (ft)	Normal			Tangential		
				C_a	EPA FT2	F_A (lb)	C_a	EPA FT2	F_A (lb)
871F-70-220-025	5.94	3.20	0.60	-	17.69	142.46	-	4.62	37.23

BLACK & VEATCH	Client: Eversource		Computed By: Joohwan Jung
	Site Name: WESTBROOK TROOP F CSP (3667)		Date: 11/30/2020
			Verified By: JW
	Title: MOUNT ANALYSIS REPORT		Date: 11/30/2020

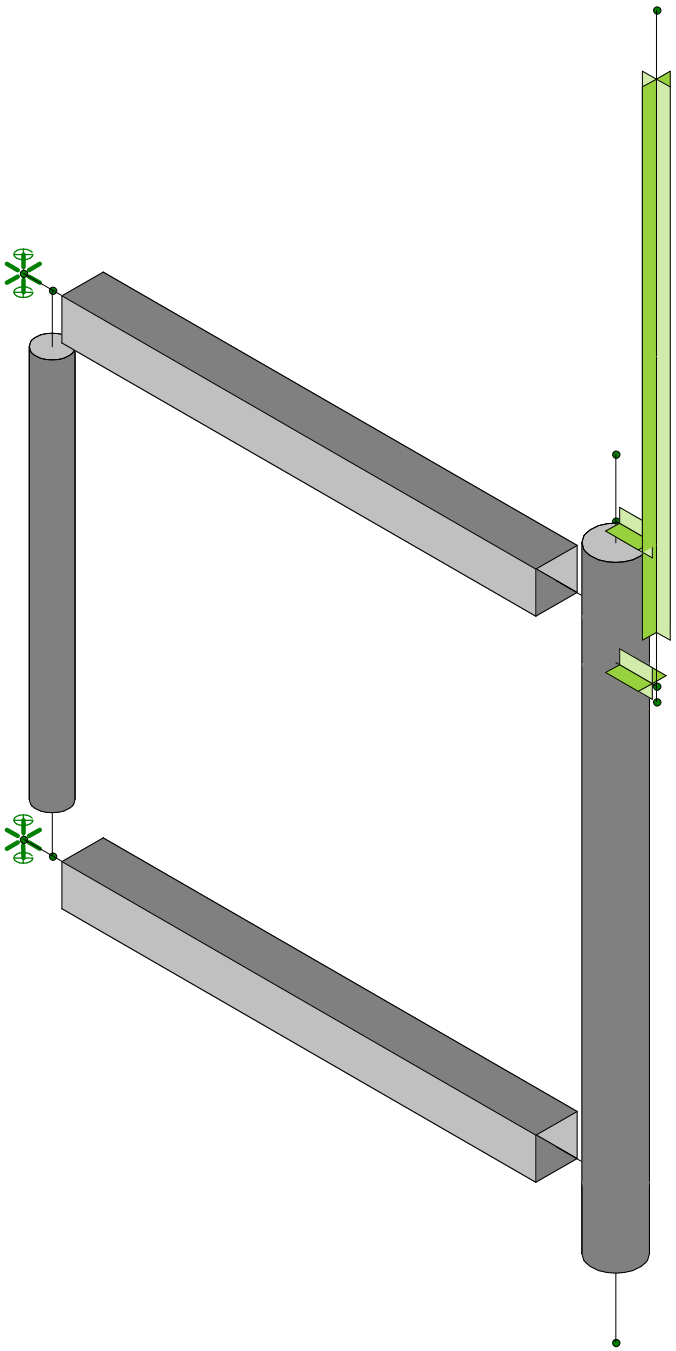
Member Ice Wind Loading

			Equations	TIA-222-H
Exposure Category =	C		$K_z = 2.01\ (z / z_g)^{2/\alpha}$	2.6.5.2
Risk Category =	III			
Topographic Category =	1		$K_h = e^{(f \cdot z / H)}$	2.6.6.2.1
Ice Wind Speed, V_{ice} =	50	mph		
Height Above Ground, z =	124	ft	$K_{zt} = [1 + K_c K_t / K_h]^2$	2.6.6.2.1
Crest Height, H =	N/A	ft		
Velocity Pressure Coefficient, K_z =	1.32	psf	$K_e = e^{-0.000032 z_s}$	2.6.8
Topographic Factor, K_{zt} =	1.00			
Wind Directionality Factor, K_d =	0.95		$q_z = 0.00256\ K_z K_{zt} K_e K_d V^2$	2.6.11.6
Shielding Factor, K_a =	0.90			
Ground Elevation Factory, K_e =	1.000		$F_{A(ice)} = q_{z(ice)} G_h (EPA)_{A(ice)}$	2.6.11.2
Ice Wind Velocity Pressure, $q_{z(ice)}$ =	8.051			
Factored Ice Thickness, T_{iz} =	2.63	in	$F_{M(ice)} = q_{z(ice)} G_h C_f D_{p(ice)}$	2.6.11.2
Gust Effect Factor, G_h =	1			

Member Ice Wind Loads

Name	Depth w/ Ice (ft)	Width w/ Ice (ft)	C_f	$D_{p(ice)}$ (ft)	$F_{M(ice)}$ (lb/ft)
Arm: HSS3X3X3/16	0.69	0.69	2	0.69	11.07
Bracing: Pipe 2.0 Std	0.64		1.2	0.64	6.14
Mount Pipe: Pipe 3.0 Std	0.73		1.2	0.73	7.05

APPENDIX 2:
RISA PRINTOUTS



Envelope Only Solution

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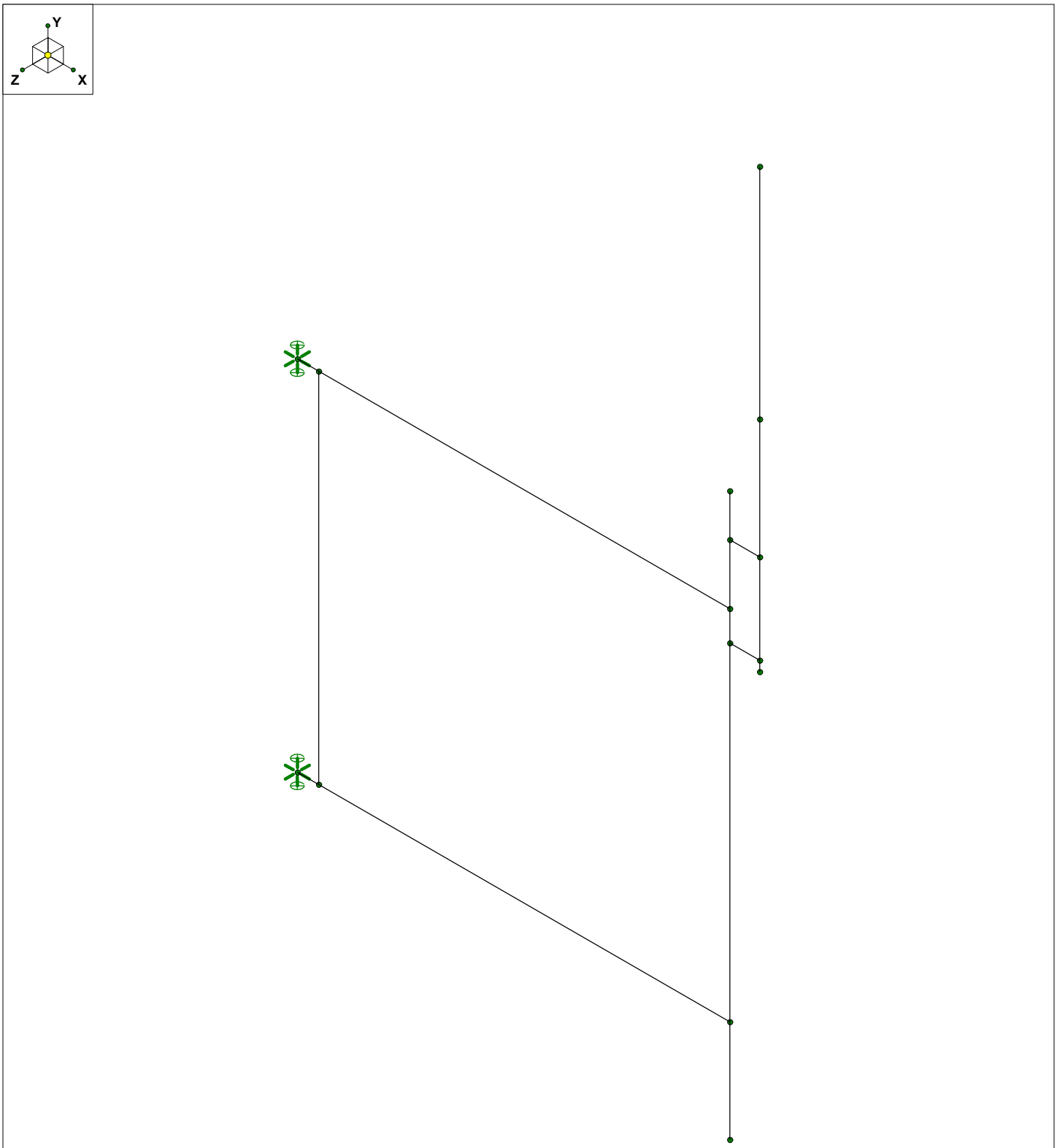

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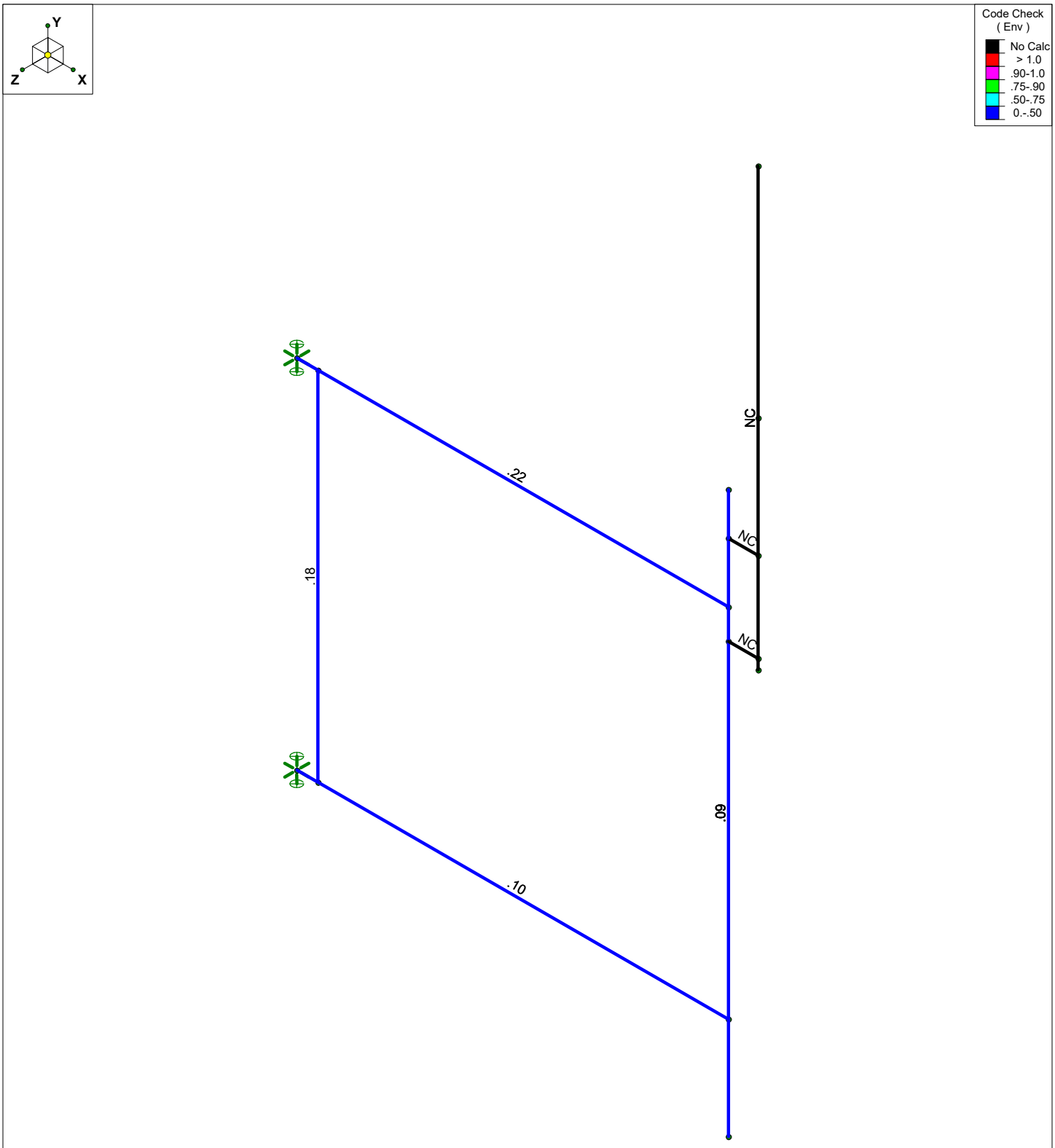

Member Code Checks Displayed (Enveloped)
Envelope Only Solution

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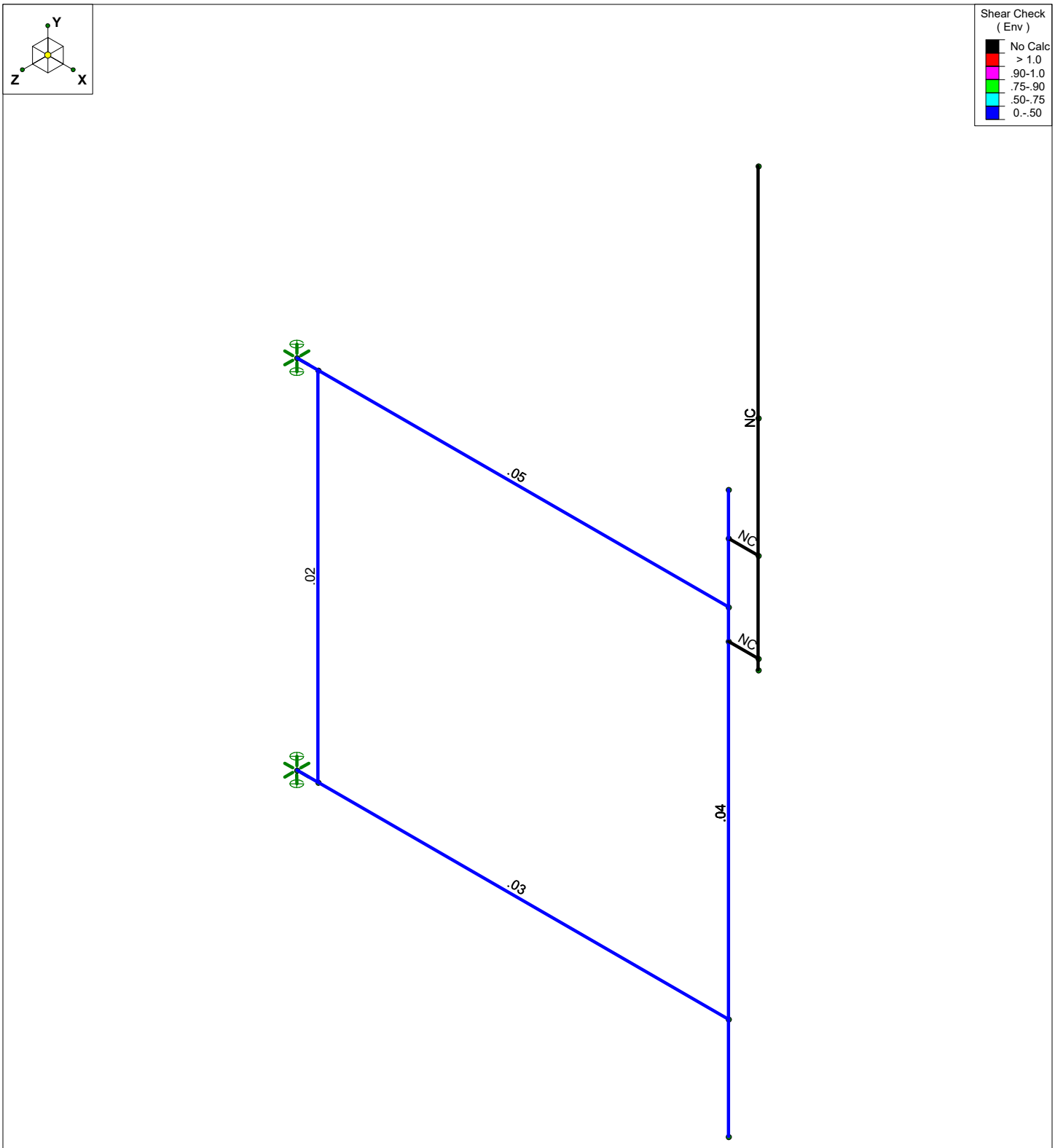

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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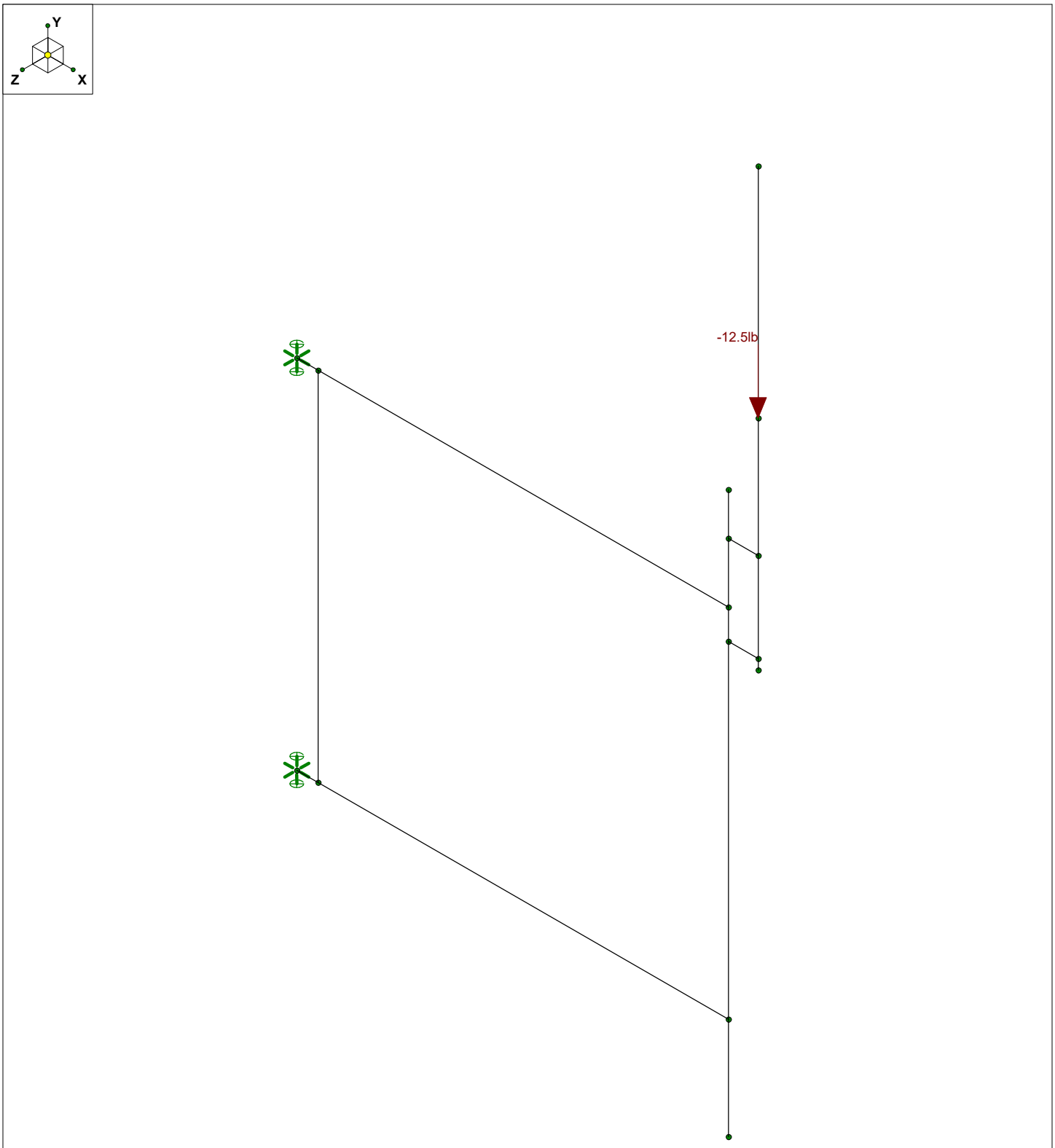

Loads: BLC 1, DL
Envelope Only Solution

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Joohwan Jung		Nov 30, 2020 at 10:16 AM
405025.2021.2200		WESTBROOKTRPF USF-4U Mod...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Arm	HSS3X3X3	Beam	SquareTube	A53 Gr.B	Typical	1.89	2.46	2.46	4.03
2	Bracing	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Mount Pipe	PIPE_3.0	Column	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]
1	gen_Conc3NW	3155	1372	.15	.6	.145
2	gen_Conc4NW	3644	1584	.15	.6	.145
3	gen_Conc3LW	2085	906	.15	.6	.11
4	gen_Conc4LW	2408	1047	.15	.6	.11
5	gen_Alum	10100	4077	.3	1.29	.173
6	gen_Steel	29000	11154	.3	.65	.49
7	gen_Plywood	1800	38	0	.3	.035
8	RIGID	1e+6		.3	0	0

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction		Reaction	
2	N3	Reaction	Reaction	Reaction		Reaction	

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Arm	Beam	SquareTube	A53 Gr.B	Typical
2	M2	N3	N4			Arm	Beam	SquareTube	A53 Gr.B	Typical
3	M3	N5	N6			Bracing	Column	Pipe	A53 Gr.B	Typical
4	M4	N7	N8			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
5	M5	N9	N10			RIGID	None	None	RIGID	Typical
6	M6	N12	N13			RIGID	None	None	RIGID	Typical
7	M7	N15	N14			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5						Yes	** NA **			None
6	M6						Yes	** NA **			None
7	M7						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Arm	43.5			Lbyy						Lateral
2	M2	Arm	43.5			Lbyy						Lateral
3	M3	Bracing	36									Lateral
4	M4	Mount Pipe	56.5									Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	DL	DL		-1		1				
2	Maintenance LL - LV	LL				1				
3	Installation LL - LM	LL				1				
4	Wind - 0 Deg (X)	WL				1		4		
5	Wind - 30 Deg (X)	WL				1		4		
6	Wind - 60 Deg (X)	WL				1		4		
7	Wind - 90 Deg (X)	WL				1		4		
8	Wind - 120 Deg (X)	WL				1		4		
9	Wind - 150 Deg (X)	WL				1		4		
10	Wind - 180 Deg (X)	WL				1		4		
11	Wind - 210 Deg (X)	WL				1		4		
12	Wind - 240 Deg (X)	WL				1		4		
13	Wind - 270 Deg (X)	WL				1		4		
14	Wind - 300 Deg (X)	WL				1		4		
15	Wind - 330 Deg (X)	WL				1		4		
16	Wind - 0 Deg (Z)	WL				1		4		
17	Wind - 30 Deg (Z)	WL				1		4		
18	Wind - 60 Deg (Z)	WL				1		4		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
19	Wind - 90 Deg (Z)	WL				1		4		
20	Wind - 120 Deg (Z)	WL				1		4		
21	Wind - 150 Deg (Z)	WL				1		4		
22	Wind - 180 Deg (Z)	WL				1		4		
23	Wind - 210 Deg (Z)	WL				1		4		
24	Wind - 240 Deg (Z)	WL				1		4		
25	Wind - 270 Deg (Z)	WL				1		4		
26	Wind - 300 Deg (Z)	WL				1		4		
27	Wind - 330 Deg (Z)	WL				1		4		
28	Ice DL	DL				1		4		
29	Ice Wind - 0 Deg (X)	WL				1		4		
30	Ice Wind - 30 Deg (X)	WL				1		4		
31	Ice Wind - 60 Deg (X)	WL				1		4		
32	Ice Wind - 90 Deg (X)	WL				1		4		
33	Ice Wind - 120 Deg (X)	WL				1		4		
34	Ice Wind - 150 Deg (X)	WL				1		4		
35	Ice Wind - 180 Deg (X)	WL				1		4		
36	Ice Wind - 210 Deg (X)	WL				1		4		
37	Ice Wind - 240 Deg (X)	WL				1		4		
38	Ice Wind - 270 Deg (X)	WL				1		4		
39	Ice Wind - 300 Deg (X)	WL				1		4		
40	Ice Wind - 330 Deg (X)	WL				1		4		
41	Ice Wind - 0 Deg (Z)	WL				1		4		
42	Ice Wind - 30 Deg (Z)	WL				1		4		
43	Ice Wind - 60 Deg (Z)	WL				1		4		
44	Ice Wind - 90 Deg (Z)	WL				1		4		
45	Ice Wind - 120 Deg (Z)	WL				1		4		
46	Ice Wind - 150 Deg (Z)	WL				1		4		
47	Ice Wind - 180 Deg (Z)	WL				1		4		
48	Ice Wind - 210 Deg (Z)	WL				1		4		
49	Ice Wind - 240 Deg (Z)	WL				1		4		
50	Ice Wind - 270 Deg (Z)	WL				1		4		
51	Ice Wind - 300 Deg (Z)	WL				1		4		
52	Ice Wind - 330 Deg (Z)	WL				1		4		

Load Combinations

	Description	S...	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	WIND LOAD COMBOS (145 MPH)																									
2	1.2DL + WL (0 DEG)	Y...	Y		1	1.2	4	1	16	1																
3	1.2DL + WL (30 DEG)	Y...	Y		1	1.2	5	1	17	1																
4	1.2DL + WL (60 DEG)	Y...	Y		1	1.2	6	1	18	1																
5	1.2DL + WL (90 DEG)	Y...	Y		1	1.2	7	1	19	1																
6	1.2DL + WL (120 DEG)	Y...	Y		1	1.2	8	1	20	1																
7	1.2DL + WL (150 DEG)	Y...	Y		1	1.2	9	1	21	1																
8	1.2DL + WL (180 DEG)	Y...	Y		1	1.2	10	1	22	1																
9	1.2DL + WL (210 DEG)	Y...	Y		1	1.2	11	1	23	1																
10	1.2DL + WL (240 DEG)	Y...	Y		1	1.2	12	1	24	1																
11	1.2DL + WL (270 DEG)	Y...	Y		1	1.2	13	1	25	1																
12	1.2DL + WL (300 DEG)	Y...	Y		1	1.2	14	1	26	1																
13	1.2DL + WL (330 DEG)	Y...	Y		1	1.2	15	1	27	1																
14																										
15	MOUNT LOAD COMBOS (30 MPH)																									
16	1.4DL	Y...	Y		1	1.4																				
17	1.2DL + 1.5LV	Y...	Y		1	1.2	2	1.5																		
18	1.2DL + 1.5LM + WL (0 DEG)	Y...	Y		1	1.2	3	1.5	4	.043	16	.043														

Load Combinations (Continued)

	Description	S...	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
19	1.2DL + 1.5LM + WL (30 DEG)	Y...	Y		1	1.2	3	1.5	5	.043	17	.043														
20	1.2DL + 1.5LM + WL (60 DEG)	Y...	Y		1	1.2	3	1.5	6	.043	18	.043														
21	1.2DL + 1.5LM + WL (90 DEG)	Y...	Y		1	1.2	3	1.5	7	.043	19	.043														
22	1.2DL + 1.5LM + WL (120 DEG)	Y...	Y		1	1.2	3	1.5	8	.043	20	.043														
23	1.2DL + 1.5LM + WL (150 DEG)	Y...	Y		1	1.2	3	1.5	9	.043	21	.043														
24	1.2DL + 1.5LM + WL (180 DEG)	Y...	Y		1	1.2	3	1.5	10	.043	22	.043														
25	1.2DL + 1.5LM + WL (210 DEG)	Y...	Y		1	1.2	3	1.5	11	.043	23	.043														
26	1.2DL + 1.5LM + WL (240 DEG)	Y...	Y		1	1.2	3	1.5	12	.043	24	.043														
27	1.2DL + 1.5LM + WL (270 DEG)	Y...	Y		1	1.2	3	1.5	13	.043	25	.043														
28	1.2DL + 1.5LM + WL (300 DEG)	Y...	Y		1	1.2	3	1.5	14	.043	26	.043														
29	1.2DL + 1.5LM + WL (330 DEG)	Y...	Y		1	1.2	3	1.5	15	.043	27	.043														
30																										
31	ICE LOAD COMBOS (2", 50 MPH)																									
32	1.2DL + Ice DL + Ice WL (0 DEG)	Y...	Y		1	1.2	28	1	29	1	41	1														
33	1.2DL + Ice DL + Ice WL (30 DEG)	Y...	Y		1	1.2	28	1	30	1	42	1														
34	1.2DL + Ice DL + Ice WL (60 DEG)	Y...	Y		1	1.2	28	1	31	1	43	1														
35	1.2DL + Ice DL + Ice WL (90 DEG)	Y...	Y		1	1.2	28	1	32	1	44	1														
36	1.2DL + Ice DL + Ice WL (120 DEG)	Y...	Y		1	1.2	28	1	33	1	45	1														
37	1.2DL + Ice DL + Ice WL (150 DEG)	Y...	Y		1	1.2	28	1	34	1	46	1														
38	1.2DL + Ice DL + Ice WL (180 DEG)	Y...	Y		1	1.2	28	1	35	1	47	1														
39	1.2DL + Ice DL + Ice WL (210 DEG)	Y...	Y		1	1.2	28	1	36	1	48	1														
40	1.2DL + Ice DL + Ice WL (240 DEG)	Y...	Y		1	1.2	28	1	37	1	49	1														
41	1.2DL + Ice DL + Ice WL (270 DEG)	Y...	Y		1	1.2	28	1	38	1	50	1														
42	1.2DL + Ice DL + Ice WL (300 DEG)	Y...	Y		1	1.2	28	1	39	1	51	1														
43	1.2DL + Ice DL + Ice WL (330 DEG)	Y...	Y		1	1.2	28	1	40	1	52	1														
44																										

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	412.664	2	325.213	38	514.817	5	0	43	1155.418	11	0	43
2		min	-662.39	38	-48.627	2	-514.817	11	0	2	-1155.418	5	0	2
3	N3	max	588.359	32	324.688	32	98.582	5	0	43	508.591	11	0	43
4		min	3.184	8	-45.811	8	-98.582	11	0	2	-508.591	5	0	2
5	Totals:	max	613.402	2	599.847	38	613.399	5						
6		min	-613.402	8	123.245	2	-613.399	11						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear...	Loc[...	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M1	HSS3X3X3	.224	0	11	.054	2.266	z	11	55265....	59535	5171.25	5171.25	2...	H1-1b
2	M2	HSS3X3X3	.103	2.266	11	.028	2.266	z	11	55265....	59535	5171.25	5171.25	2...	H1-1b
3	M3	PIPE_2.0	.175	0	38	.024	0		40	28843....	32130	1871.6...	1871.6...	2...	H1-1b
4	M4	PIPE_3.0	.087	45.906	17	.044	13.5...		11	57908....	65205	5748.75	5748.75	1...	H1-1b

APPENDIX 3:
ATTACHMENTS

220MHz EXPOSED DIPOLES 215-225 MHz

870 Series 220MHz Exposed Dipoles

The 870 Series 220MHz Exposed Dipoles are available in 1, 2, 4, 8 dipole configurations. All our antennas can be completely customized to your particular applications. Our antennas can be black anodized, adjustable, or fixed, side mount or top mount, and heavy-duty versions are available.

- Each antenna is offered in a 1/4, 3/8 or 1/2 wave spacing versions.
- The 87XA-70 has external cabling and a field-adjustable pattern.
- The 87XF-70 has internal cabling and fixed dipole-mast spacing.
- Heavy-duty versions are available. Please contact our Technical Support team for consultation.

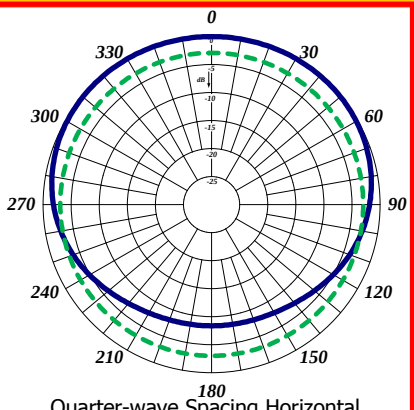
Electrical Specifications	871F-70-2	872F-70-2	874F-70-2
Frequency Range, MHz	215-225	215-225	215-225
Nominal Gain, dBd	2.0-2.5	5.0-5.5	8.0-8.5
Number of Dipoles	1	2	4
Bandwidth 1.5:1 VSWR, MHz	10	10	10
Polarization	Vertical	Vertical	Vertical
Pattern	Offset / bi	Offset / bi	Offset / bi
Power Rating, Watts	200	300	500
Nominal Impedance, Ohms	50	50	50
Lightning Protection	DC Ground	DC Ground	DC Ground
Standard Termination	Type DIN Male	Type N Male	Type N Male
Mechanical Specifications	**871F-70-2**	**872F-70-2**	**874F-70-2**
Length, in (mm)	66 (1676)	112 (2845)	200 (5080)
Width (1/2 Wave Spacing), in (mm)	31 (787)	31 (787)	32 (813)
Weight, lbs. (kg)	12.5 (5.7)	21 (9.5)	51 (23)
Rated Wind Velocity, No Ice, mph (km/h)	165 (266)	150 (241)	145 (233)
Rated Wind Velocity, 0.5" (13mm) ice, mph (km/h)	140 (225)	130 (209)	105 (177)
Lateral Thrust @ 100 mph, wind, lbs. (kg)	40 (18)	66 (30)	143 (65)
Bending Moment @ top clamp: 100 mph, ft.*lb (kg*m)	58 (8)	150 (21)	610 (84)
Projected Area, ft^2 (m^2)	1.5 (0.14)	2.6 (0.24)	5.5 (0.51)
Mounting Information Mast O.D. (mm)	1.9" (48)	1.9" (48)	2.4" (60)
* See next page for ordering information (page 3) *			

872F-70-2

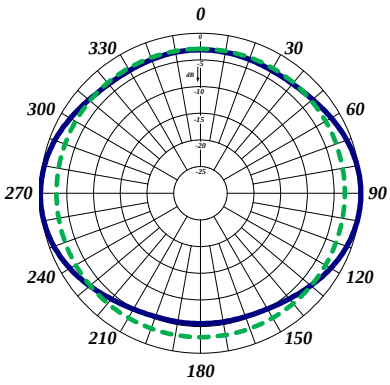
ONE SITE PRO 1 P/N DCP12K CLAMP SET REQUIRED.

220MHz EXPOSED DIPOLES — 215-225 MHz

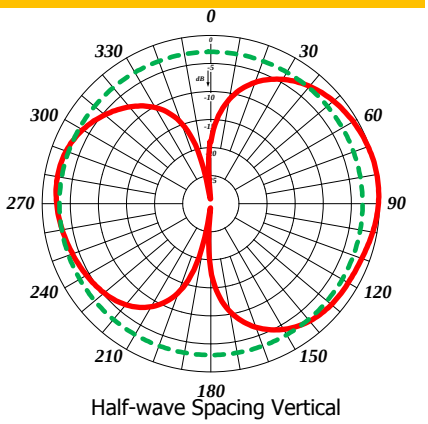
871F-70-2



Quarter-wave Spacing Horizontal

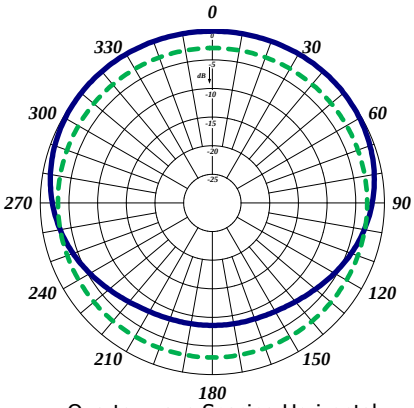


Half-wave Spacing Horizontal

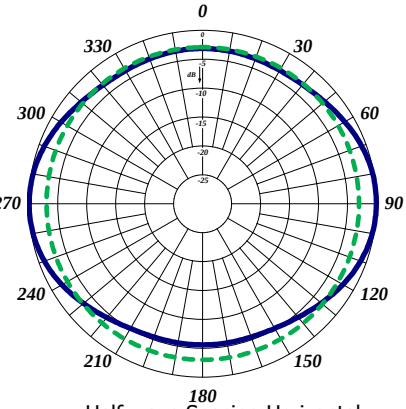


Half-wave Spacing Vertical

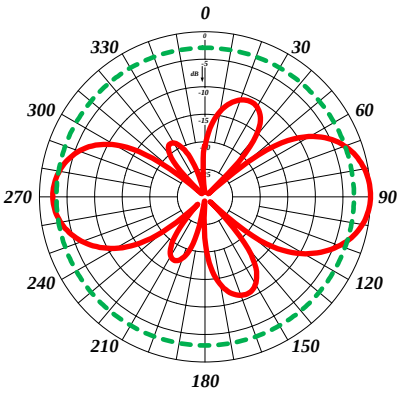
872F-70-2



Quarter-wave Spacing Horizontal

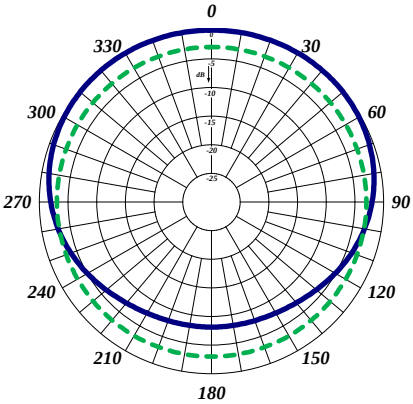


Half-wave Spacing Horizontal

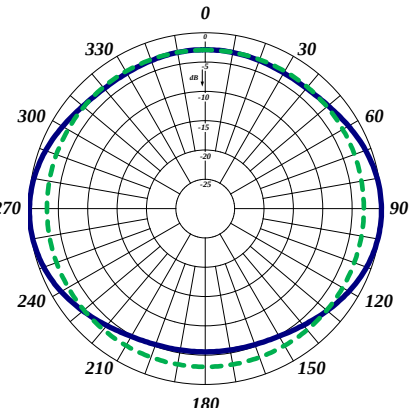


Half-wave Spacing Vertical

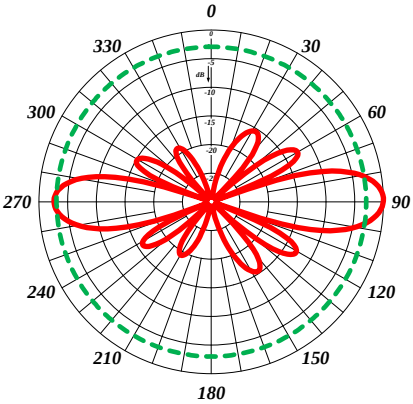
874F-70-2



Quarter-wave Spacing Horizontal



Half-wave Spacing Horizontal

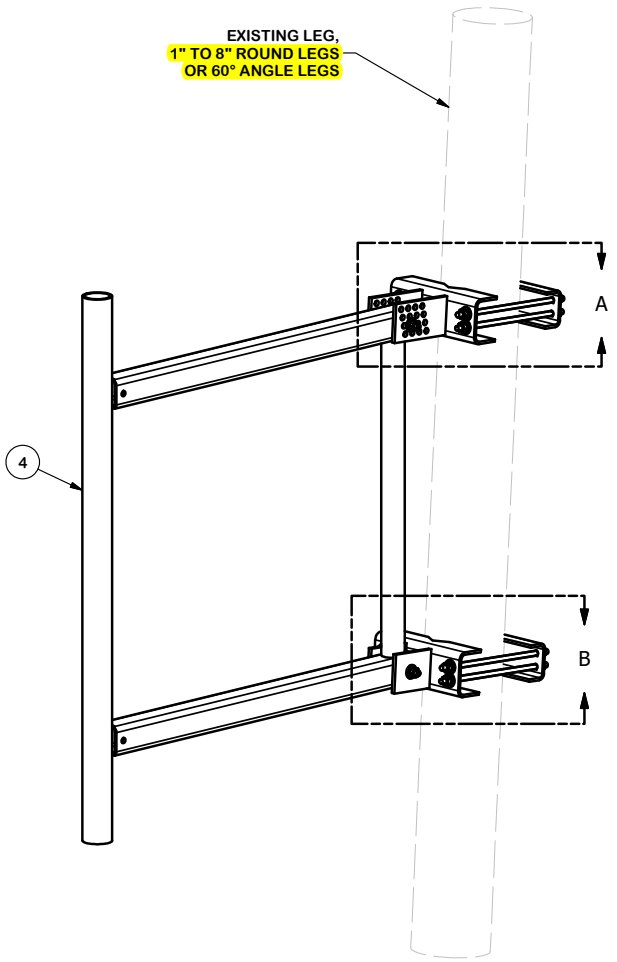


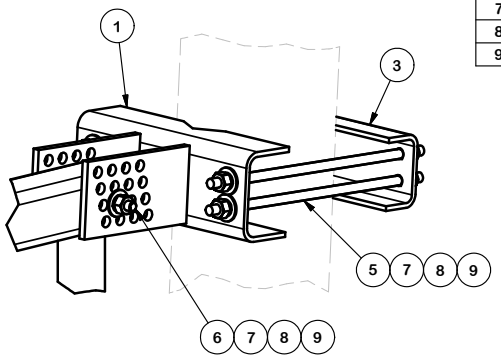
Half-wave Spacing Vertical

COMPROD Simplifying RF Solutions
www.comprodcom.com
Tel: US 1.877.825.2007 / CAN 1.800.603.1454
Email: sales@comprodcom.com
Fax: 1.800.554.1033

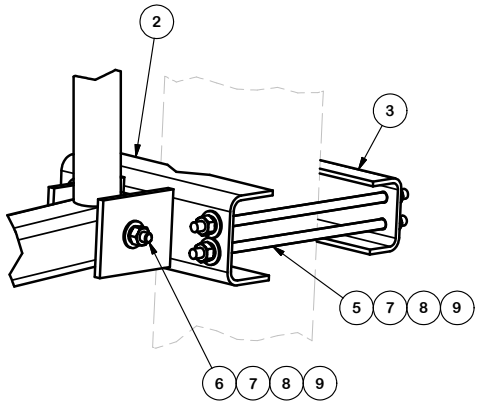
TOWER/MAST SIZE AT PROPOSED ANTENNA ATTACHMENT = 5"± DIAMETER.

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	CFM	UPPER GATE FOOT WELDMENT		13.90	13.90
2	1	CFS	LOWER GATE FOOT WELDMENT		12.72	12.72
3	2	GBB	GATE BACKING BAR		4.53	9.06
4	1	4PBG	48" PIPE MOUNT STANDOFF ARM		113.96	113.96
5	8	G12R-12	1/2" x 12" GALV. THREADED ROD		0.67	5.35
5	8	G12R-15	1/2" x 15" GALV. THREADED ROD		0.84	6.69
6	2	A1205	1/2" x 5" A325 HDG BOLT		0.34	0.69
7	18	G12FW	1/2" HDG USS FLATWASHER		0.03	0.61
8	18	G12LW	1/2" HDG LOCKWASHER		0.01	0.25
9	18	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.29
					TOTAL WT. #	164.53

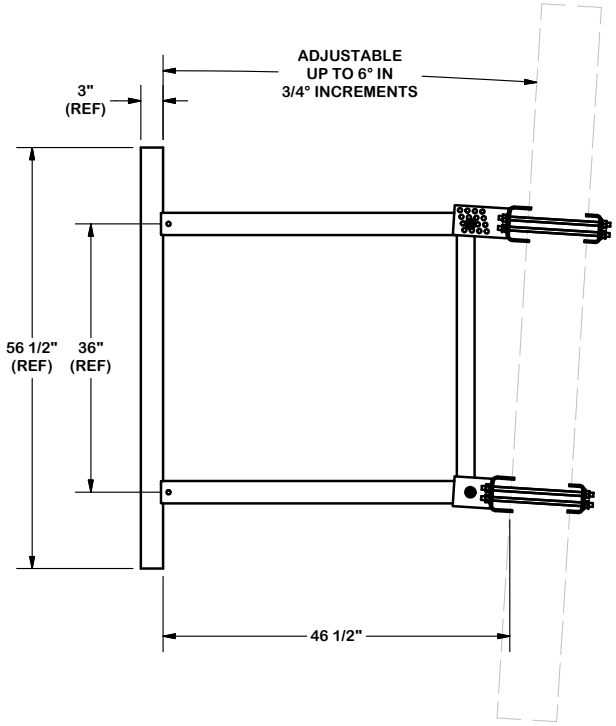




DETAIL A



DETAIL B



TOLERANCE NOTES

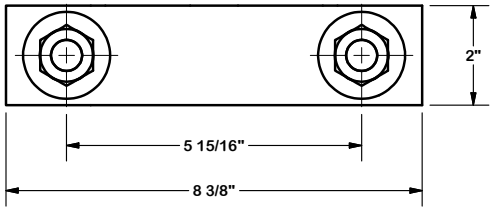
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

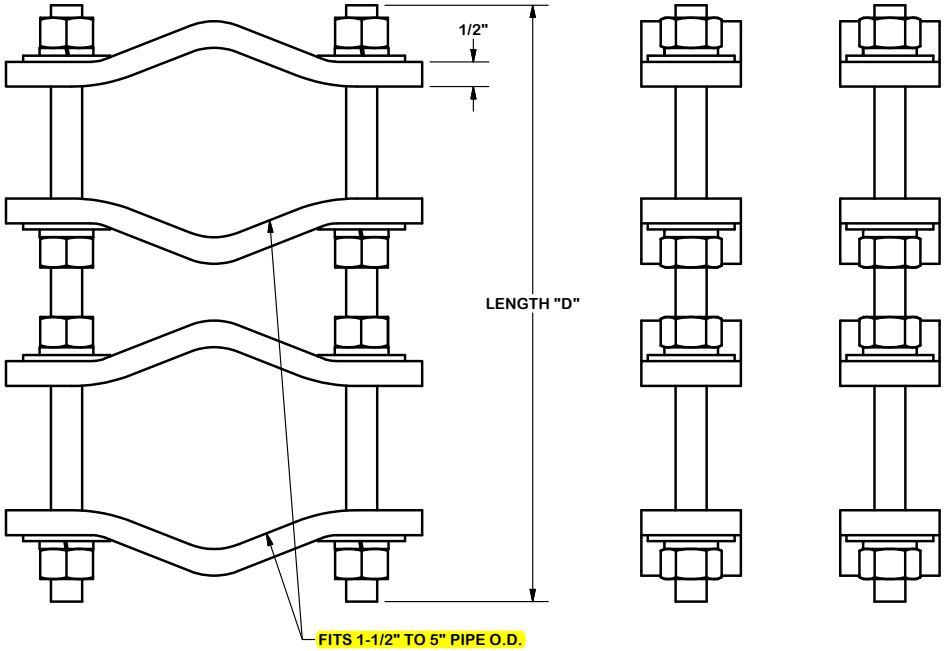
DESCRIPTION: 48" ULTIMATE UNIVERSAL STANDOFF FRAME

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	RCH 2/4/2011		USF-4U	1 OF 1

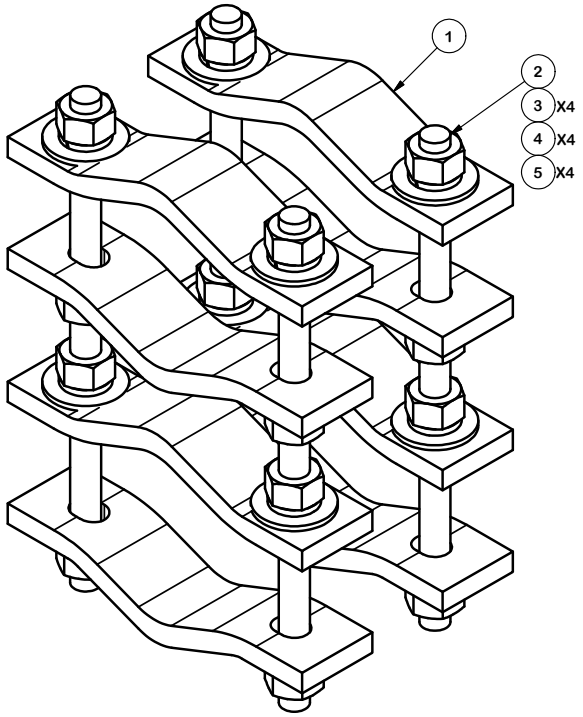
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 2/16/2011	USF-4U





PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	8	DCP	CLAMP HALF, 1/2" THICK, 8-3/8"		2.40	19.20
2	B	C	5/8" THREADED ROD	D	E	F
3	16	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	2.08
4	16	G58LW	5/8" HDG LOCKWASHER		0.03	0.42
5	16	G58FW	5/8" HDG USS FLATWASHER		0.07	1.13

VARIABLE PARTS TABLE						
ASSEMBLY "A"	QTY "B"	PART "C"	LENGTH "D"	UNIT WT. "E"	NET WT. "F"	TOTAL WEIGHT
DCP12K	4	G58R-12	12"	1.05	4.18	27.01
DCP18K	4	G58R-18	18"	1.57	6.27	29.10



TOLERANCE NOTES

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SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
PIPE TO PIPE CLAMP SET
1-1/2" TO 5" PIPE
1/2" THICK CLAMP

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	KC8 8/21/2012		SEE ASSEMBLY "A"	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	CEK 1/22/2013	DCPxxK

ATTACHMENT D – CONSTRUCTION DRAWINGS

EVERSOURCE ENERGY

WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. INSTALL (1) NEW OMNI/WHIP ANTENNA AT ELEVATION 163'–4"± AGL
2. INSTALL (1) DIPOLE ANTENNA AT ELEVATION 126'–9"± AGL
3. INSTALL (1) NEW RACK WITH DMR EQUIPMENT IN EXISTING TELECOM SHELTER

GOVERNING CODES

2018 CONNECTICUT STATE BUILDING CODE (2015 IBC BASIS)
2017 NATIONAL ELECTRIC CODE
TIA–222–H

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SITE INFORMATION

SITE NAME:	WESTBROOK TROOP F CSP
SITE ID NUMBER:	3667
SITE ADDRESS:	315 SPENCER PLAINS ROAD WESTBROOK, CT 06498
MAP:	165
LOT:	015
ZONE:	LDR
LATITUDE:	41° 17' 32.79" N
LONGITUDE:	72° 25' 49.33" W
ELEVATION:	98'± AMSL
FEMA/FIRM DESIGNATION:	X
ACREAGE:	3.2± AC (BOOK: 0046, PAGE: 0350)

CONTACT INFORMATION

APPLICANTS:
EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037

PROPERTY OWNER:
STATE OF CONNECTICUT
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

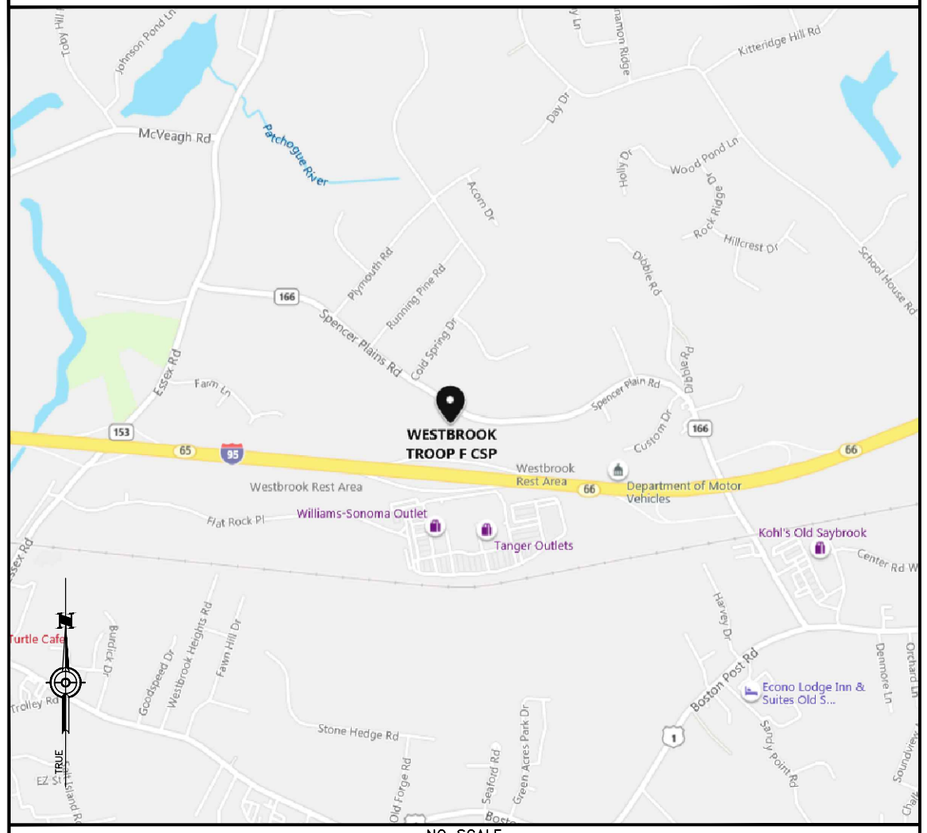
EVERSOURCE ENERGY
PROJECT MANAGER:
NIKOLL PRECI
(860) 655–3079

POWER PROVIDER:
EVERSOURCE ENERGY
(800) 286–2000

TELCO PROVIDER:
FRONTIER
(800) 921–8102

CALL BEFORE YOU DIG:
(800) 922–4455

LOCATION MAP



NO SCALE

DESIGN TYPE

SITE UPGRADE
SELF–SUPPORT TOWER

DRAWING INDEX

SHEET NO:	SHEET TITLE
T–1	TITLE SHEET
C–1	SITE PLAN
C–2	TOWER ELEVATION
C–3	ANTENNA EQUIPMENT
G–1	GROUNDING DETAILS
N–1	NOTES & SPECIFICATIONS
N–2	NOTES & SPECIFICATIONS
N–3	NOTES & SPECIFICATIONS

DO NOT SCALE DRAWINGS

SUBCONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME

UNDERGROUND SERVICE ALERT

UTILITIES PROTECTION CENTER, INC.
811

48 HOURS BEFORE YOU DIG

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

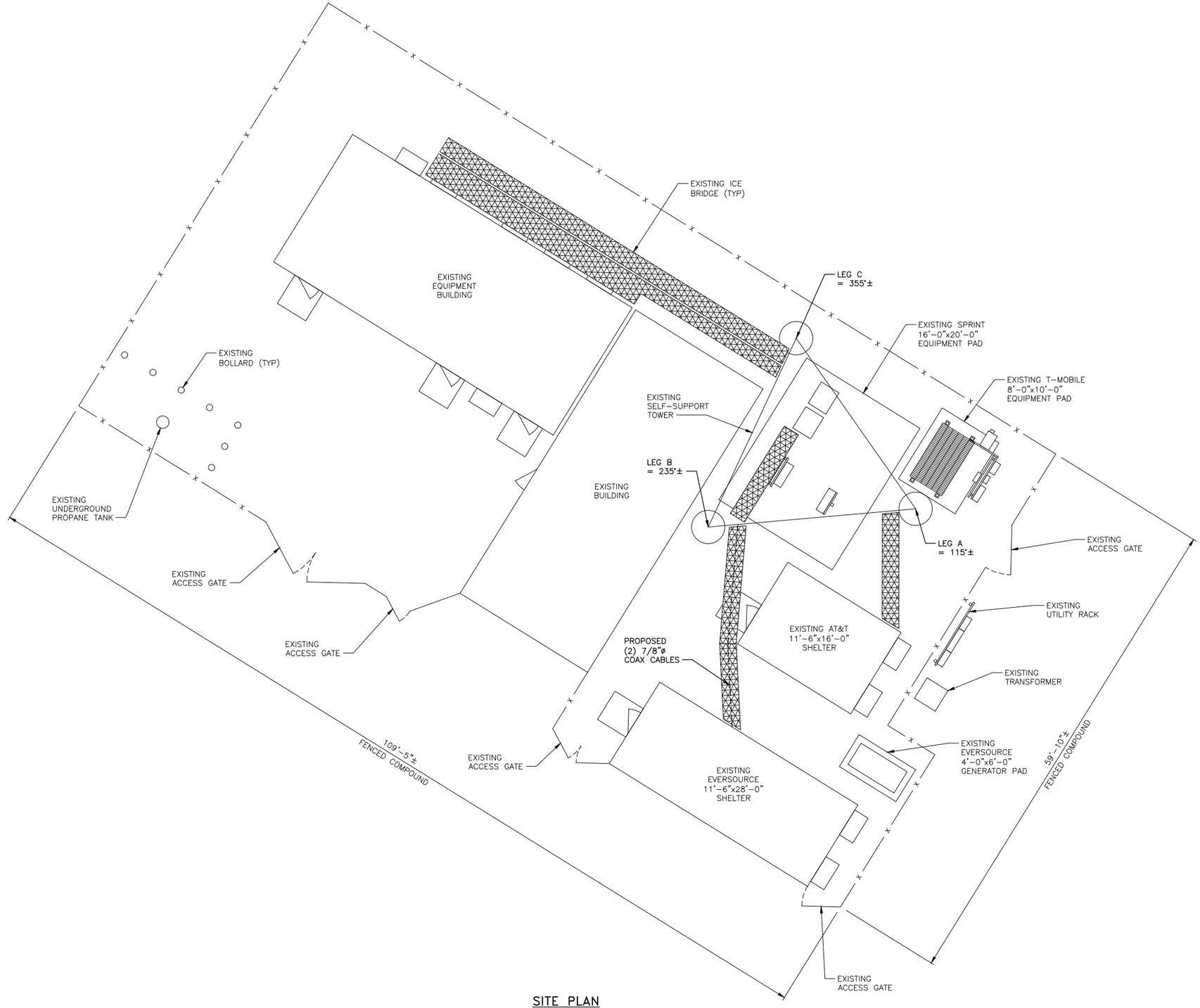
REV	DATE	DESCRIPTION
0	11/17/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
11/17/2020

WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



SITE PLAN
NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286-2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-2522

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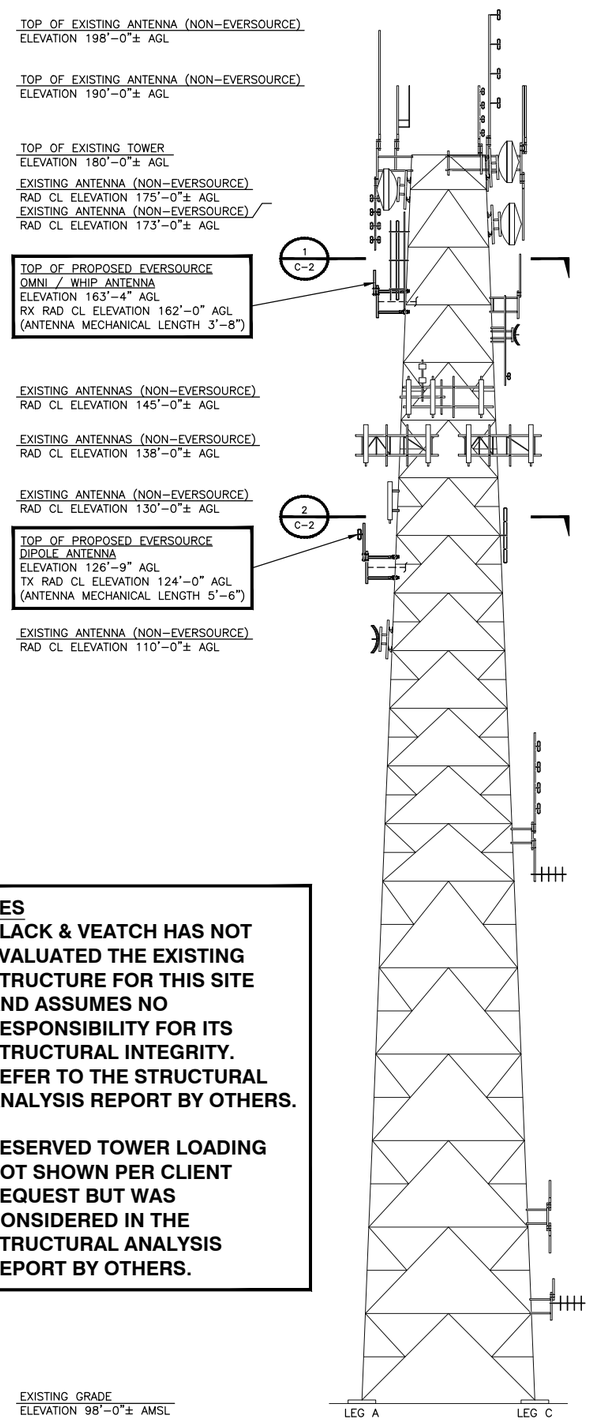
11/17/2020

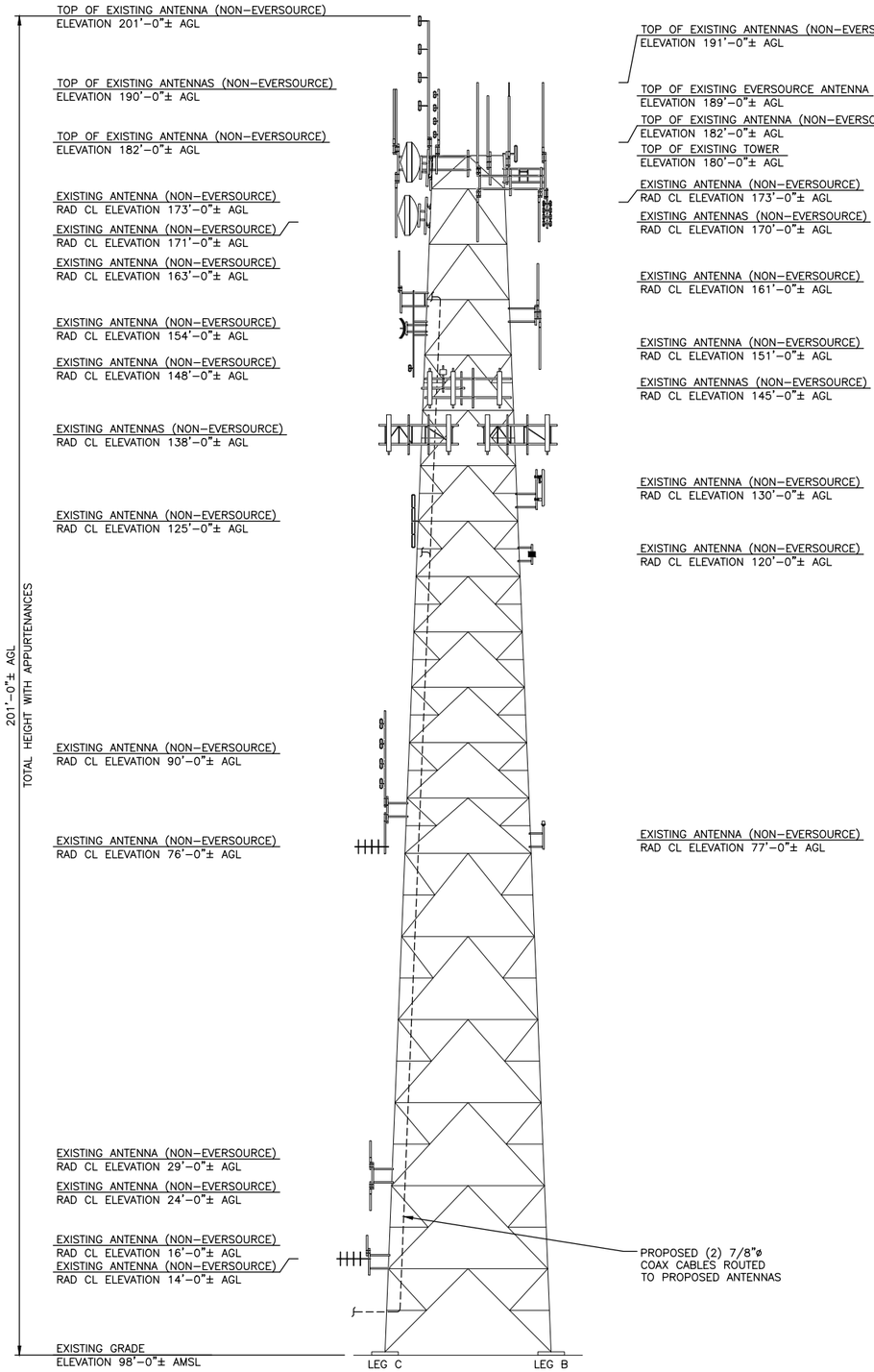
WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE
SITE PLAN

SHEET NUMBER
C-1



TOWER ELEVATION FACE AC
NO SCALE



TOWER ELEVATION FACE CB
NO SCALE

NOTES

1. **BLACK & VEATCH HAS NOT EVALUATED THE EXISTING STRUCTURE FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO THE STRUCTURAL ANALYSIS REPORT BY OTHERS.**

2. **RESERVED TOWER LOADING NOT SHOWN PER CLIENT REQUEST BUT WAS CONSIDERED IN THE STRUCTURAL ANALYSIS REPORT BY OTHERS.**

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286-2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

REV	DATE	DESCRIPTION
0	11/17/20	ISSUED FOR FILING

11/17/2020

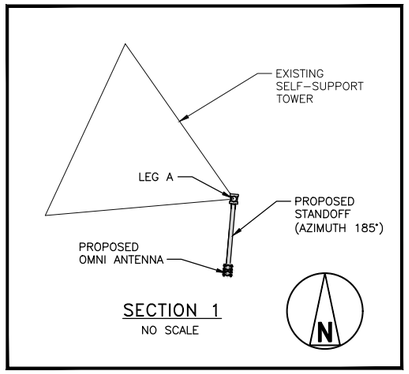
WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE

TOWER ELEVATION & ANTENNA EQUIPMENT

SHEET NUMBER

C-2



SECTION 1

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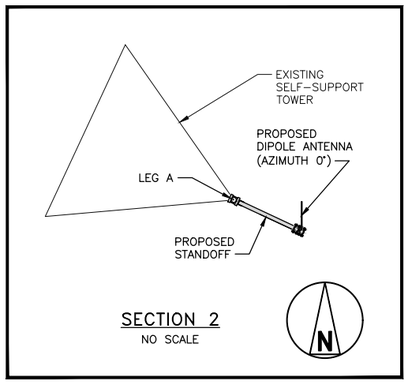


SECTION 2

NO SCALE

EVERSOURCE ENERGY

107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

REV	DATE	DESCRIPTION
0	11/17/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED
PROFESSIONAL ENGINEER

11/17/2020

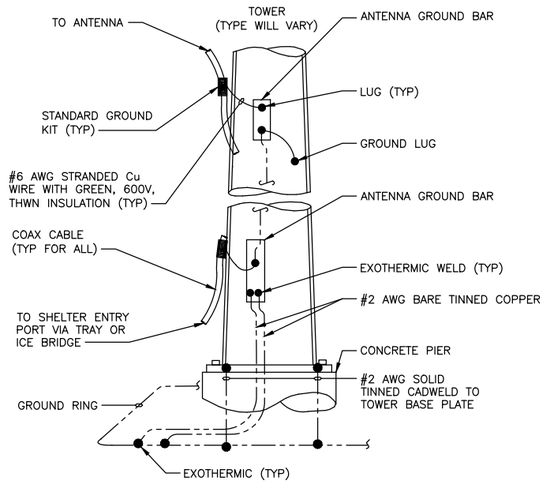
WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE

ANTENNA EQUIPMENT

SHEET NUMBER

C-3

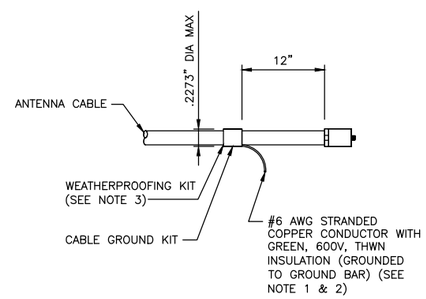


NOTE

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

ANTENNA CABLE GROUNDING

NO SCALE

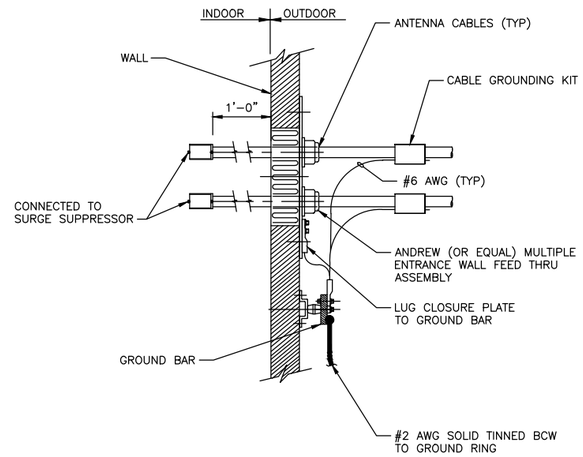


NOTES

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

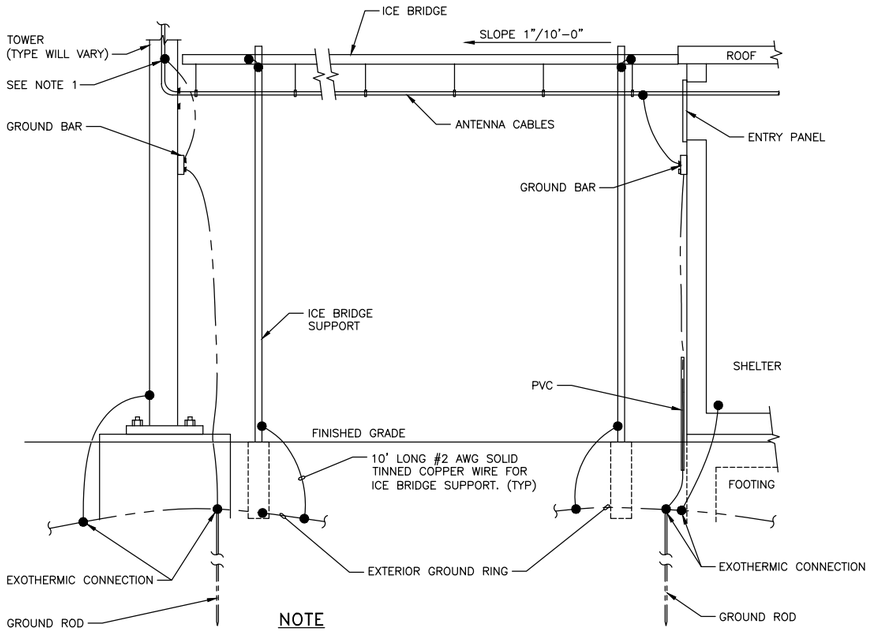
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NO SCALE



CABLE INSTALLATION WITH WALL FEED THRU ASSEMBLY

NO SCALE



NOTE

1. PROVIDE GROUND KIT 6" BEFORE TURN

ICE BRIDGE AND ANTENNA CABLE DETAIL

NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286-2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

REV	DATE	DESCRIPTION
0	11/17/20	ISSUED FOR FILING

STATE OF CONNECTICUT · MARK P. STILES · 34358 · LICENSED PROFESSIONAL ENGINEER

11/17/2020

WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-1

DESIGN BASIS

1. GOVERNING CODE: 2018 CONNECTICUT STATE BUILDING CODE (2015 IBC BASIS).

GENERAL CONDITIONS

1. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL BUILDING CODES, PERMIT CONDITIONS AND SAFETY CODES DURING CONSTRUCTION.

2. THE ENGINEER IS NOT: A GUARANTOR OF THE INSTALLING CONTRACTOR'S WORK; RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE WORK SITE; IN CONTROL OF THE SAFETY OR ADEQUACY OF ANY BUILDING COMPONENT, SCAFFOLDING OR SUPERINTENDING THE WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL PERMITS, INSPECTIONS, TESTING AND CERTIFICATES NEEDED FOR LEGAL OCCUPANCY OF THE FINISHED PROJECT.

4. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THIS COMPLETE PLAN SET AND VERIFY THE EXISTING CONDITIONS SHOWN IN THESE PLANS AS THEY RELATE TO THE WORK PRIOR TO SUBMITTING PRICE. SIGNIFICANT DEVIATIONS FROM WHAT IS SHOWN AFFECTING THE WORK SHALL BE REPORTED IMMEDIATELY TO THE CONSTRUCTION MANAGER.

5. DETAILS INCLUDED IN THIS PLAN SET ARE TYPICAL AND APPLY TO SIMILAR CONDITIONS.

6. EXISTING ELECTRICAL AND MECHANICAL FIXTURES, PIPING, WIRING, AND EQUIPMENT OBSTRUCTING THE WORK SHALL BE REMOVED AND/OR RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER. TEMPORARY SERVICE INTERRUPTIONS MUST BE COORDINATED WITH OWNER.

7. THE CONTRACTOR SHALL DILIGENTLY PROTECT THE EXISTING BUILDING/SITE CONDITIONS AND THOSE OF ANY ADJOINING BUILDING/SITES AND RESTORE ANY DAMAGE CAUSED BY HIS ACTIVITIES TO THE PRE-CONSTRUCTION CONDITION.

8. THE CONTRACTOR SHALL SAFEGUARD AGAINST: CREATING A FIRE HAZARD, AFFECTING TENANT EGRESS OR COMPROMISING BUILDING SITE SECURITY MEASURES.

9. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND CONSTRUCTION WASTE FROM THE SITE EACH DAY. WORK AREAS SHALL BE SWEPT AND MADE CLEAN AT THE END OF EACH WORK DAY.

10. THE CONTRACTOR'S HOURS OF WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES AND BE APPROVED BY OWNER.

11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER IF ASBESTOS IS ENCOUNTERED DURING THE EXECUTION OF HIS WORK. THE CONTRACTOR SHALL CEASE ALL ACTIVITIES WHERE THE ASBESTOS MATERIAL IS FOUND UNTIL NOTIFIED BY THE CONSTRUCTION MANAGER TO RESUME OPERATIONS.

THERMAL & MOISTURE PROTECTION

1. FIRE-STOP ALL PENETRATIONS FOR ELECTRICAL CONDUITS OR WAVEGUIDE CABLING THROUGH BUILDING WALLS, FLOORS, AND CEILINGS SHALL BE FIRESTOPPED WITH ACCEPTED MATERIALS TO MAINTAIN THE FIRE RATING OF THE EXISTING ASSEMBLY. ALL FILL MATERIAL SHALL BE SHAPED, FITTED, AND PERMANENTLY SECURED IN PLACE. FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH ASTM E814.

2. HILTI CP620 FIRE FOAM OR 3M FIRE BARRIER FILL, VOID OR CAVITY MATERIAL OR ACCEPTED EQUAL SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ASSOCIATED UNDERWRITERS LABORATORIES (UL) SYSTEM NUMBER.

3. FIRESTOPPING SHALL BE APPLIED AS SOON AS PRACTICABLE AFTER PENETRATIONS ARE MADE AND EQUIPMENT INSTALLED.

4. FIRESTOPPED PENETRATIONS SHALL BE LEFT EXPOSED AND MADE AVAILABLE FOR INSPECTION BEFORE CONCEALING SUCH PENETRATIONS. FIRESTOPPING MATERIAL CERTIFICATES SHALL BE MADE AVAILABLE AT THE TIME OF INSPECTION.

5. ANY BUILDING ROOF PENETRATION AND/OR RESTORATION SHALL BE PERFORMED SO THAT THE ROOF WARRANTY IN PLACE IS NOT COMPROMISED. CONTRACTOR SHALL ARRANGE FOR OWNER'S ROOFING CONTRACTOR TO PERFORM ANY AND ALL ROOFING WORK IF SO REQUIRED BY EXISTING ROOF WARRANTY. OTHERWISE, ROOF SHALL BE MADE WATERTIGHT WITH LIKE CONSTRUCTION AS SOON AS PRACTICABLE AND AT COMPLETION OF CONSTRUCTION.

6. ALL PENETRATIONS INTO AND/OR THROUGH BUILDING EXTERIOR WALLS SHALL BE SEALED WITH SILICONE SEALER.

7. WHERE CONDUIT AND CABLES PENETRATES FIRE RATED WALLS AND FLOORS, FIRE GROUT ALL PENETRATIONS IN ORDER TO MAINTAIN THE FIRE RATING USING A LISTED FIRE SEALING DEVICE OR GROUT.

8. CONTRACTOR TO REMOVE AND RE-INSTALL ALL FIRE PROOFING AS REQUIRED DURING CONSTRUCTION.

SUBMITTALS

1. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO FABRICATION.

2. CONTRACTOR TO NOTIFY ENGINEER FOR INSPECTION PRIOR TO CLOSING PENETRATIONS.

3. CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. THE ENGINEER SHALL BE NOTIFIED OF ANY CONDITIONS WHICH PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

4. ALL STEEL MATERIAL EXPOSED TO WEATHER SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 " ZINC (HOT-DIPPED GALVANIZED) COATINGS" ON IRON AND STEEL PRODUCTS.

5. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS FOR REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

STEEL

1. MATERIAL:

WIDE FLANGE:	ASTM A572, GR 50
TUBING:	ASTM A500, GR C
PIPE:	ASTM A53, GR B AND ASTM 572, GR 50
ANGLE:	ASTM A570, GR 50 AND ASTM A36
BOLTS:	ASTM A325
GRATING:	TYPE GW-2 (1"x3/16" BARS)
MISC. MATERIAL:	ASTM A36

ALL STEEL SHAPES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 WITH A COATING WEIGHT OF 2 OZ/SF.

2. DAMAGED GALVANIZED SURFACES SHALL BE CLEANED WITH A WIRE BRUSH AND PAINTED WITH TWO COATS OF COLD ZINC, "GALVANOX", "DRY GALV", "ZINC IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES. TOUCH UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT IN SHOP OR FIELD.

3. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION.

4. THE STEEL STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER COMPLETION. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.

5. ALL STEEL ELEMENTS SHALL BE INSTALLED PLUMB AND LEVEL.

6. TOWER MANUFACTURER'S DESIGNS SHALL PREVAIL FOR TOWER.

SITE GENERAL

1. CONTRACTOR SHALL FOLLOW CONDITIONS OF ALL APPLICABLE PERMITS AND WORK IN ACCORDANCE WITH OSHA REGULATIONS.

2. THESE PLANS DEPICT KNOWN UNDERGROUND STRUCTURES, CONDUITS, AND/OR PIPELINES. THE LOCATIONS FOR THESE ELEMENTS ARE BASED UPON THE VARIOUS RECORD DRAWINGS AVAILABLE. THE CONTRACTOR IS HEREBY ADVISED THAT THESE DRAWINGS MAY NOT ACCURATELY DEPICT AS-BUILT LOCATIONS AND OTHER UNKNOWN STRUCTURES. THE CONTRACTOR SHALL THEREFORE DETERMINE THE EXACT LOCATION OF EXISTING UNDERGROUND ELEMENTS AND EXCAVATE WITH CARE AFTER CALLING MARKOUT SERVICE AT 1-800-272-4480 48 HOURS BEFORE DIGGING, DRILLING OR BLASTING.

3. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, AND OTHER UTILITIES WHERE ENCOUNTERED, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION, SHALL BE RELOCATED AS DIRECTED BY ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL HAND DIG UTILITIES AS NEEDED. CONTRACTOR SHALL PROVIDE, BUT IS NOT LIMITED TO, APPROPRIATE A) FALL PROTECTION, B) CONFINED SPACE ENTRY, C) ELECTRICAL SAFETY, AND D) TRENCHING AND EXCAVATION.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, OR OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE CONSTRUCTION MANAGER.

6. CONTRACTOR IS RESPONSIBLE FOR REPAIRING OR REPLACING STRUCTURES OR UTILITIES DAMAGED DURING CONSTRUCTION.

7. CONTRACTOR SHALL PROTECT EXISTING PAVED AND GRAVEL SURFACES, CURBS, LANDSCAPE AND STRUCTURES AND RESTORE SITE OR PRE-CONSTRUCTION CONDITION WITH AS GOOD, OR BETTER, MATERIALS. NEW MATERIALS SHALL MATCH EXISTING THICKNESS AND TYPE.

8. THE CONTRACTOR SHALL SHORE ALL TRENCH EXCAVATIONS GREATER THAN 5 FEET IN DEPTH OR LESS WHERE SOIL CONDITIONS ARE DEEMED UNSTABLE. ALL SHEETING AND/OR SHORING METHODS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.

9. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING GROUNDWATER LEVELS IN THE VICINITY OF EXCAVATIONS TO PROTECT ADJACENT PROPERTIES AND NEW WORK. GROUNDWATER SHALL BE DRAINED IN ACCORDANCE WITH LOCAL SEDIMENTATION AND EROSION CONTROL GUIDELINES.

EVERSOURCE ENERGY
107 SELDEN STREET
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PHONE: (800) 286-2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	TH

REV	DATE	DESCRIPTION
0	11/17/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
11/17/2020

WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE
NOTES & SPECIFICATIONS

SHEET NUMBER
N-1

ELECTRICAL

1. CONTRACTOR SHALL VERIFY EXISTING ELECTRIC SERVICE TYPE AND CAPACITY AND ORDER NEW ELECTRIC SERVICE FROM LOCAL ELECTRIC UTILITY, WHERE APPLICABLE.
2. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES, AND SHALL BE ACCEPTABLE TO ALL AUTHORITIES HAVING JURISDICTION. WHERE A CONFLICT EXISTS BETWEEN CODES, PLAN AND SPECIFICATIONS, OR AUTHORITIES HAVING JURISDICTION, THE MORE STRINGENT AUTHORITIES SHALL APPLY.
3. 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 THE DRAWINGS AND AS SPECIFIED HEREIN AND/OR OTHERWISE REQUIRED.
4. ALL ELECTRICAL CONDUCTORS SHALL BE 100% COPPER AND SHALL HAVE TYPE THHN INSULATION UNLESS INDICATED OTHERWISE.
5. CONDUIT SHALL BE THREADED RIGID GALVANIZED STEEL OR EMT WITH ONLY COMPRESSION TYPE COUPLINGS AND CONNECTORS, ALL MADE UP WRENCH TIGHT.
6. ALL BURIED CONDUIT SHALL BE MINIMUM SCH 40 PVC UNLESS NOTED OTHERWISE, OR AS PER LOCAL CODE REQUIREMENTS.
7. PROVIDE FLEXIBLE STEEL CONDUIT OR LIQUID TIGHT FLEXIBLE STEEL CONDUIT TO ALL VIBRATING EQUIPMENT, INCLUDING HVAC UNITS, TRANSFORMERS, MOTORS, ETC, OR WHERE EQUIPMENT IS PLACED UPON A SLAB ON GRADE.
8. ALL BRANCH CIRCUITS AND FEEDERS SHALL HAVE A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR BONDED TO ALL ENCLOSURES, PULLBOXES, ETC.
9. CONDUIT AND CABLE WITHIN CORRIDORS SHALL BE CONCEALED AND EXPOSED ELSEWHERE, UNLESS NOTED OTHERWISE.
10. ELECTRICAL MATERIALS INSTALLED ON ROOFTOP SHALL BE LISTED FOR NEMA 3R USE. –AND ALL WIRING WITHIN A VENTILATION DUCT SHALL BE LISTED FOR SUCH USE. IN GENERAL WIRING METHODS WITHIN A DUCT SHALL BE AN MC CABLE WITH SMOOTH OR CORRUGATED METAL JACKET AND HAVE NO OUTER COVERING OVER THE METAL JACKET. INTERLOCKED ARMOR TYPE OF MC CABLE IS NOT ACCEPTABLE FOR THIS APPLICATION. CONTRACTOR CAN ALSO USE TYPE MI CABLE IN THE VENTILATION DUCT PROVIDED IT DOES NOT HAVE ANY OUTER COVERINGS OVER THE METAL EXTERIOR.
11. WIRING DEVICES SHALL BE SPECIFICATION GRADE, AND WIRING DEVICE COVER PLATES SHALL BE PLASTIC WITH ENGRAVING AS SPECIFIED.
12. GROUNDING SYSTEM RESISTANCE SHALL BE MEASURED, RECORDED, AND DATED USING MEGGER DET14 OR SIMILAR INSTRUMENT. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION.
13. COORDINATE WITH BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK INVOLVING EXISTING SYSTEMS OR EQUIPMENT IN ORDER TO DETERMINE THE EFFECT, IF ANY, ON OTHER TENANTS WITHIN THE BUILDING, AND TO DETERMINE THE APPROPRIATE TIME FOR PERFORMING THIS WORK.
14. THE CONTRACTOR SHALL BE REQUIRED TO VISIT THE SITE PRIOR TO SUBMITTING BID IN ORDER TO DETERMINE THE EXTENT OF THE EXISTING CONDITIONS.
15. ALL CONDUCTOR ENDS SHALL BE TAGGED AND ELECTRICAL EQUIPMENT LABELED WITH ENGRAVED IDENTIFICATION PLATES.
16. CONTRACTOR IS RESPONSIBLE FOR ALL CONTROL WIRING AND ALARM TIE–INS.

GROUNDING

1. #6 THWN SHALL BE STRANDED #6 COPPER WITH GREEN THWN INSULATION SUITABLE FOR WET INSTALLATIONS.
2. #2 THWN SHALL BE STRANDED #2 COPPER WITH THWN INSULATION SUITABLE FOR WET INSTALLATIONS.
3. #2 BARE TINNED SHALL BE SOLID COPPER TINNED. ALL BURIED WIRE SHALL MEET THIS CRITERIA.
4. ALL LUGS SHALL BE 2–HOLE, LONG BARREL, TINNED SOLID COPPER UNLESS OTHERWISE SPECIFIED, LUGS SHALL BE THOMAS AND BETTS SERIES 548##BE OR EQUIVALENT (IE #2 THWN – 54856BE, #2 SOLID – 54856BE, AND #6 THWN – 54852BE).
5. ALL HARDWARE, BOLTS, NUTS, AND WASHERS SHALL BE 18–8 STAINLESS STEEL. EVERY CONNECTION SHALL BE BOLT–FLAT WASHER–BUSS–LUG–FLAT WASHER–BELLEVILLE WASHER–NUT IN THAT EXACT ORDER. BACK–TO–BACK LUGGING, BOLT–FLAT WASHER–LUG–BUSS–LUG–FLAT WASHER–BELLEVILLE WASHER–NUT, IN THAT EXACT ORDER, IS ACCEPTED WHERE NECESSARY TO CONNECT MANY LUGS TO A BUSS BAR. STACKING OF LUGS, BUSS–LUG–LUG, IS NOT ACCEPTABLE.
6. WHERE CONNECTIONS ARE MADE TO STEEL OR DISSIMILAR METALS, A THOMAS AND BETTS DRAGON TOOTH WASHER MODEL DTWXXX SHALL BE USED BETWEEN THE LUG AND THE STEEL, BOLT–FLAT WASHER–STEEL–DRAGON TOOTH WASHER–LUG–FLAT WASHER–BELEVILE WASHER–NUT.
7. ALL CONNECTIONS, INTERIOR AND EXTERIOR, SHALL BE MADE WITH THOMAS AND BETTS KPOR–SHIELD. COAT ALL WIRES BEFORE LUGGING AND COAT ALL SURFACES BEFORE CONNECTING.
8. THE MINIMUM BEND RADIUS SHALL BE 8 INCHES FOR #6 WIRE AND SMALLER AND 12 INCHES FOR WIRE LARGER THAN #6.
9. ALL CONNECTIONS TO THE GROUND RING SHALL BE EXOTHERMIC WELD.
10. BOND THE FENCE TO THE GROUND RING AT EACH CORNER, AND AT EACH GATE POST WITH #2 SOLID TINNED WIRE. EXOTHERMIC WELD BOTH ENDS.
11. GROUND KITS SHALL BE SOLID COPPER STRAP WITH #6 WIRE 2–HOLE COMPRESSION CRIMPED LUGS AND SHALL BE SEALED ACCORDING TO MANUFACTURER INSTRUCTIONS.

ANTENNA & CABLE NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRANSMISSION CABLES, JUMPERS, CONNECTORS, GROUNDING STRAPS, ANTENNAS, MOUNTS AND HARDWARE. ALL MATERIALS SHALL BE INSPECTED BY THE CONTRACTOR FOR DAMAGE UPON DELIVERY. JUMPERS SHALL BE SUPPLIED AT ANTENNAS AND EQUIPMENT INSIDE SHELTER COORDINATE LENGTH OF JUMP CABLES WITH EVERSOURCE. COORDINATE AND VERIFY ALL OF THE MATERIALS TO BE PROVIDED WITH EVERSOURCE PRIOR TO SUBMITTING BID AND ORDERING MATERIALS.
2. AFTER INSTALLATION, THE TRANSMISSION LINE SYSTEM SHALL BE PIM/SWEEP TESTED FOR PROPER INSTALLATION AND DAMAGE WITH ANTENNAS CONNECTED. CONTRACTOR TO OBTAIN LATEST TESTING PROCEDURES FROM EVERSOURCE PRIOR TO BIDDING.
3. ANTENNA CABLES SHALL BE COLOR CODED AT THE FOLLOWING LOCATIONS:
   – AT THE ANTENNAS.
   – AT THE WAVEGUIDE ENTRY PLATE ON BOTH SIDES OF THE EQUIPMENT SHELTER WALL.
   – JUMPER CABLES AT THE EQUIPMENT ENTER.
4. SYSTEM INSTALLATION:
   THE CONTRACTOR SHALL INSTALL ALL CABLES AND ANTENNAS TO THE MANUFACTURER'S SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROCUREMENT AND INSTALLATION OF THE FOLLOWING:
   – ALL CONNECTORS, ASSOCIATED CABLE MOUNTING, AND GROUNDING HARDWARE.
   – WALL MOUNTS, STANDOFFS, AND ASSOCIATED HARDWARE.
   – 1/2 INCH HELIAX ANTENNA JUMPERS OF APPROPRIATE LENGTHS.
5. MINIMUM BENDING RADIUS FOR COAXIAL CABLES:
   – 7/8 INCH, RMIN = 15 INCHES
   – 1 5/8 INCH, RMIN = 25 INCHES
6. CABLE SHALL BE INSTALLED WITH A MINIMUM NUMBER OF BENDS WHERE POSSIBLE. CABLE SHALL NOT BE LEFT UNTERMINATED AND SHALL BE SEALED IMMEDIATELY AFTER BEING INSTALLED.
7. ALL CABLE CONNECTIONS OUTSIDE SHALL BE COVERED WITH WATERPROOF SPLICING KIT.
8. CONTRACTOR SHALL VERIFY EXACT LENGTH AND DIRECTION OF TRAVEL IN FIELD PRIOR TO CONSTRUCTION.
9. CABLE SHALL BE FURNISHED WITHOUT SPLICES AND WITH CONNECTORS AT EACH END.

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STATE OF CONNECTICUT · MARK P. STILES · 24358 · LICENSED PROFESSIONAL ENGINEER

11/17/2020

WESTBROOK TROOP F CSP
315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE
NOTES
& SPECIFICATIONS

SHEET NUMBER
N-2

SYMBOLS

●	EXOTHERMIC CONNECTION
■	COMPRESSION CONNECTION
⏚●	5/8"ø x 10'-0" COPPER CLAD STEEL GROUND ROD.
⏚◉	TEST GROUND ROD WITH INSPECTION SLEEVE
- - -	GROUNDING CONDUCTOR
(A)	KEY NOTES
CHAINLINK FENCE	X X X X X
WOOD FENCE	
LEASE AREA	
ICE BRIDGE	
CABLE TRAY	
GAS LINE	G G G G G
UNDERGROUND ELECTRICAL/TELCO	E/T E/T E/T E/T
UNDERGROUND ELECTRICAL/CONTROL	E/C E/C E/C E/C
UNDERGROUND ELECTRICAL	E E E E E
UNDERGROUND TELCO	T T T T T
PROPERTY LINE (PL)	

ABBREVIATIONS

AC	ALTERNATING CURRENT
AIC	AMPERAGE INTERRUPTION CAPACITY
ANI	AUXILIARY NETWORK INTERFACE
ATM	ASYNCHRONOUS TRANSFER MODE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
AWS	ADVANCED WIRELESS SERVICES
BATT	BATTERY
BBU	BASEBAND UNIT
BTC	BARE TINNED COPPER CONDUCTOR
BTS	BASE TRANSCEIVER STATION
CCU	CLIMATE CONTROL UNIT
CDMA	CODE DIVISION MULTIPLE ACCESS
CHG	CHARGING
CLU	CLIMATE UNIT
COMM	COMMON
DC	DIRECT CURRENT
DIA	DIAMETER
DWG	DRAWING
EC	ELECTRICAL CONDUCTOR
EMT	ELECTRICAL METALLIC TUBING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
HVAC	HEAT/VENTILATION/AIR CONDITIONING
ICF	INTERCONNECTION FRAME
IGR	INTERIOR GROUNDING RING (HALO)
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUNDING BAR
MIN	MINIMUM
MW	MICROWAVE
MTS	MANUAL TRANSFER SWITCH
NEC	NATIONAL ELECTRICAL CODE
OC	ON CENTER
PP	POLARIZING PRESERVING
PCU	PRIMARY CONTROL UNIT
PDU	PROTOCOL DATA UNIT
PWR	POWER
RECT	RECTIFIER
RET	REMOTE ELECTRICAL TILT
RMC	RIGID METALLIC CONDUIT
RF	RADIO FREQUENCY
RUC	RACK USER COMMISSIONING
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SFP	SMALL FORM-FACTOR PLUGGABLE
SIAD	SMART INTEGRATED ACCESS DEVICE
SSC	SITE SOLUTIONS CABINET
T1	1544KBPS DIGITAL LINE
TDMA	TIME-DIVISION MULTIPLE ACCESS
TMA	TOWER MOUNT AMPLIFIER
TVSS	TRANSIENT VOLTAGE SUPPRESSION SYSTEM
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATION SYSTEM
UPS	UNINTERRUPTIBLE POWER SUPPLY (DC POWER PLANT)

EVERSOURCE ENERGY

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STATE OF CONNECTICUT · JOSHUA J. RILEY · 33208 · LICENSED PROFESSIONAL ENGINEER

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315 SPENCER PLAINS RD
WESTBROOK, CT 06498

SHEET TITLE

NOTES & SPECIFICATIONS

SHEET NUMBER

N-3

REFERENCE CUTSHEETS

TELEWAVE, INC.®

195 - 260 MHz

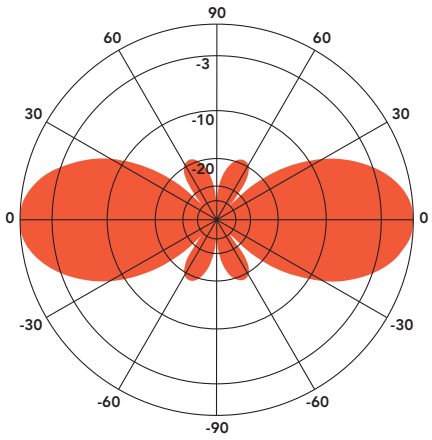
ANT220F2DIN

FIBERGLASS COLLINEAR ANTENNA 2.5 dBd

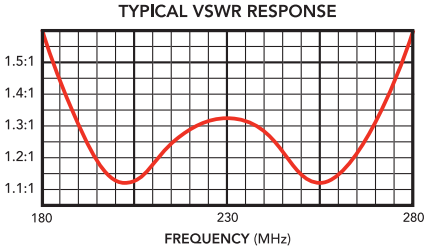
The Telewave ANT220F2 is an extremely rugged collinear antenna, with moderate gain and wide vertical beamwidth. This compact antenna produces 2.5 dBd gain, and is designed for operation in all environmental conditions. The antenna is constructed with brass and copper elements, with a path to ground potential for lightning impulse protection. The ANT220F2 is an excellent choice for wireless PTC systems in urban or rural areas.

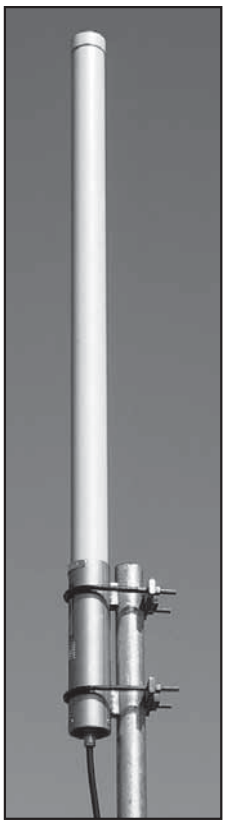
All junctions are fully soldered to prevent RF intermodulation, and each antenna is completely protected within a rugged, high-tech radome to ensure survivability in the worst environments. The "Cool Blue" radome provides maximum protection from corrosive gases, ultraviolet radiation, icing, salt spray, acid rain, and wind blown abrasives.

The ANT220F2 includes the ANTC485 dual clamp set for mounting to a 1.5" to 3" O.D. support pipe, and a 24" removable RG-213 DIN-Male jumper.



ANT220F2 - 230 MHz
Vertical Plane
Gain = 2.58 dBd





ONE SITE PRO 1 P/N DCP18K CLAMP SET REQUIRED.

SPECIFICATIONS			
Frequency (continuous)	195-260 MHz	**Dimensions (L x base diam.) in.**	44 x 2.75
Gain	2.5 dBd	**Tower weight (antenna + clamps)**	11 lb.
Power rating (typ.)	500 watts	**Shipping weight**	14 lb.
Impedance	50 ohms	**Wind rating / with 0.5" ice**	200 / 150 MPH
VSWR	1.5:1 or less	**Maximum exposed area**	1.1 ft.²
Pattern	Omnidirectional	**Lateral thrust at 100 MPH**	44 lb.
Vertical beamwidth	38°	**Bending moment at top clamp**	47 ft. lb.
Termination	7-16 DIN-F	**(100 MPH, 40 PSF flat plate equiv.)**	

220MHz EXPOSED DIPOLES — 215-225 MHz

870 Series 220MHz Exposed Dipoles

The 870 Series 220MHz Exposed Dipoles are available in 1, 2, 4, 8 dipole configurations. All our antennas can be completely customized to your particular applications. Our antennas can be black anodized, adjustable, or fixed, side mount or top mount, and heavy-duty versions are available.

- Each antenna is offered in a 1/4, 3/8 or 1/2 wave spacing versions.
- The 87XA-70 has external cabling and a field-adjustable pattern.
- The 87XF-70 has internal cabling and fixed dipole-mast spacing.
- Heavy-duty versions are available. Please contact our Technical Support team for consultation.

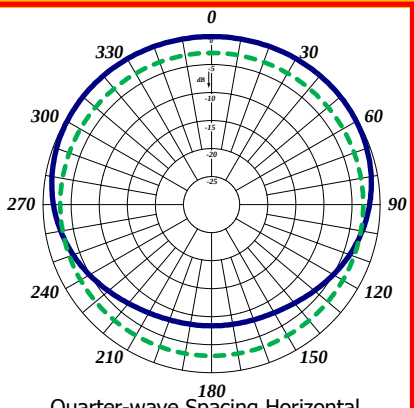
Electrical Specifications	871F-70-2	872F-70-2	874F-70-2
Frequency Range, MHz	215-225	215-225	215-225
Nominal Gain, dBd	2.0-2.5	5.0-5.5	8.0-8.5
Number of Dipoles	1	2	4
Bandwidth 1.5:1 VSWR, MHz	10	10	10
Polarization	Vertical	Vertical	Vertical
Pattern	Offset / bi	Offset / bi	Offset / bi
Power Rating, Watts	200	300	500
Nominal Impedance, Ohms	50	50	50
Lightning Protection	DC Ground	DC Ground	DC Ground
Standard Termination	Type DIN Male	Type N Male	Type N Male
Mechanical Specifications	**871F-70-2**	**872F-70-2**	**874F-70-2**
Length, in (mm)	66 (1676)	112 (2845)	200 (5080)
Width (1/2 Wave Spacing), in (mm)	31 (787)	31 (787)	32 (813)
Weight, lbs. (kg)	12.5 (5.7)	21 (9.5)	51 (23)
Rated Wind Velocity, No Ice, mph (km/h)	165 (266)	150 (241)	145 (233)
Rated Wind Velocity, 0.5" (13mm) ice, mph (km/h)	140 (225)	130 (209)	105 (177)
Lateral Thrust @ 100 mph, wind, lbs. (kg)	40 (18)	66 (30)	143 (65)
Bending Moment @ top clamp: 100 mph, ft.*lb (kg*m)	58 (8)	150 (21)	610 (84)
Projected Area, ft^2 (m^2)	1.5 (0.14)	2.6 (0.24)	5.5 (0.51)
Mounting Information Mast O.D. (mm)	1.9" (48)	1.9" (48)	2.4" (60)
* See next page for ordering information (page 3) *			

872F-70-2

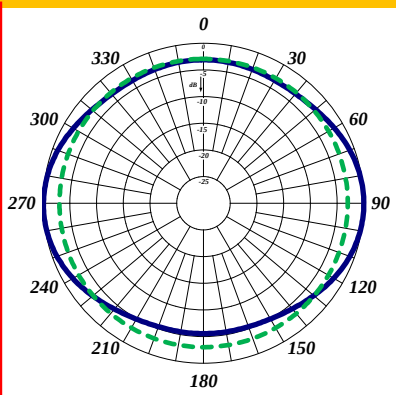
ONE SITE PRO 1 P/N DCP12K CLAMP SET REQUIRED.

220MHz EXPOSED DIPOLES — 215-225 MHz

871F-70-2



Quarter-wave Spacing Horizontal



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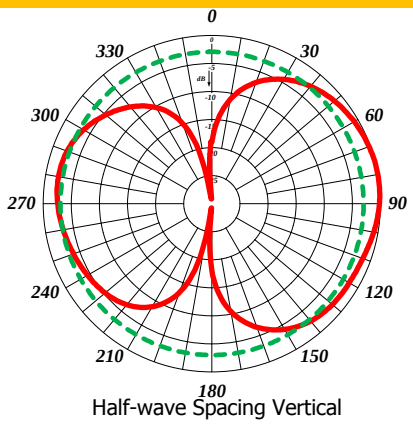
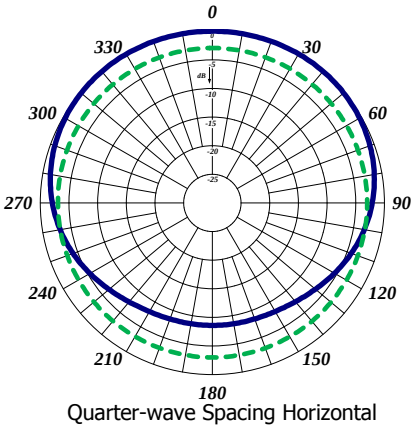
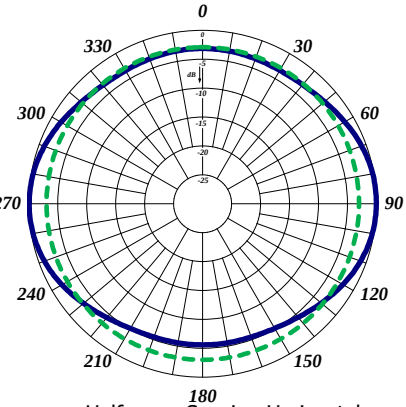


Half-wave Spacing Vertical

872F-70-2



Quarter-wave Spacing Horizontal



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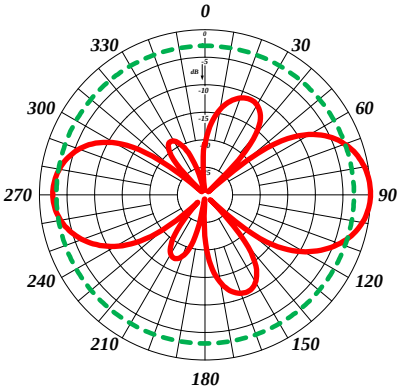
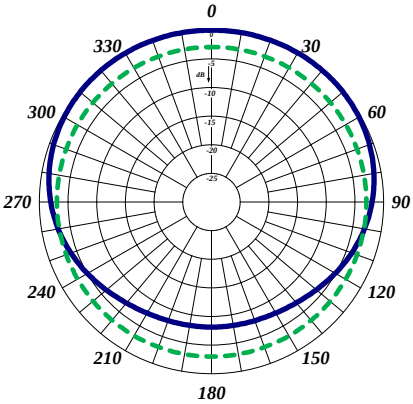
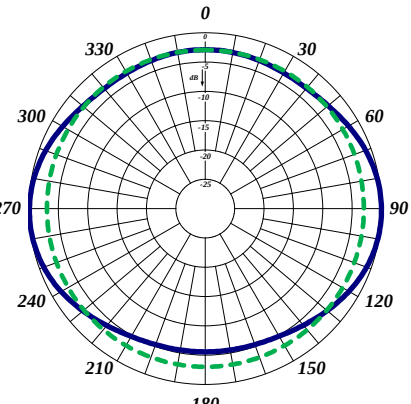


Half-wave Spacing Vertical

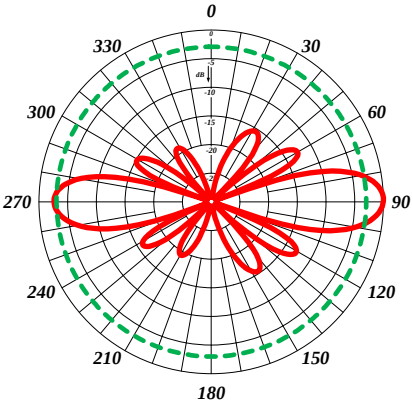
874F-70-2



Quarter-wave Spacing Horizontal



Half-wave Spacing Horizontal

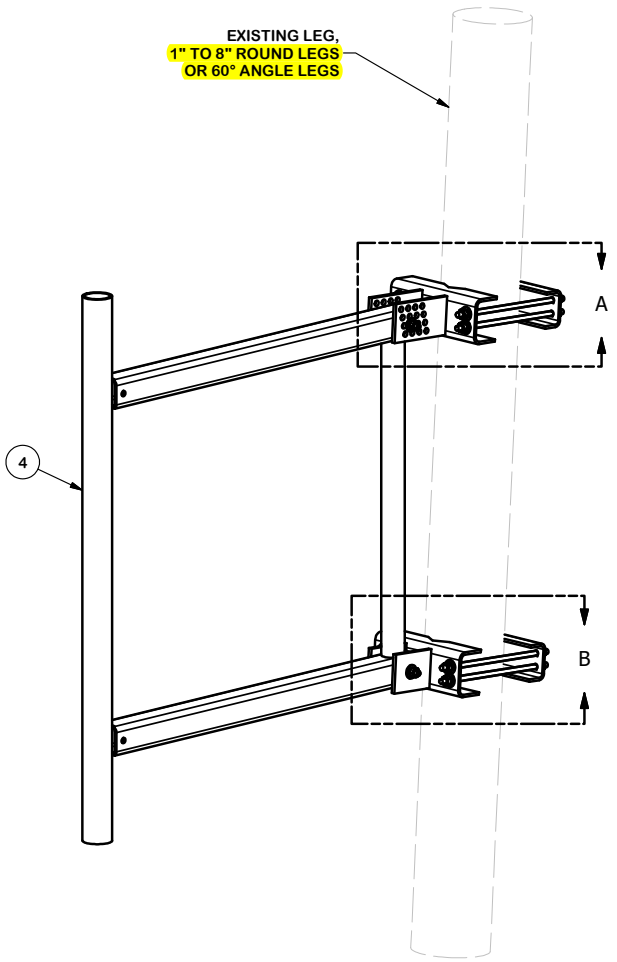


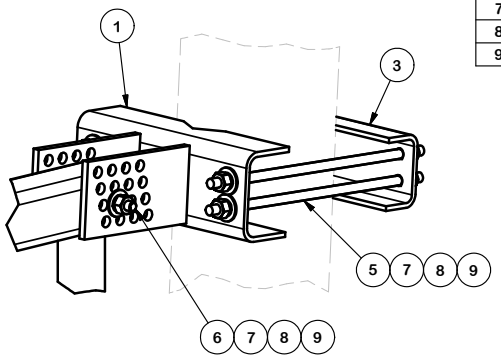
Half-wave Spacing Vertical

COMPROD Simplifying RF Solutions
www.comprodcom.com
Tel: US 1.877.825.2007 / CAN 1.800.603.1454
Email: sales@comprodcom.com
Fax: 1.800.554.1033

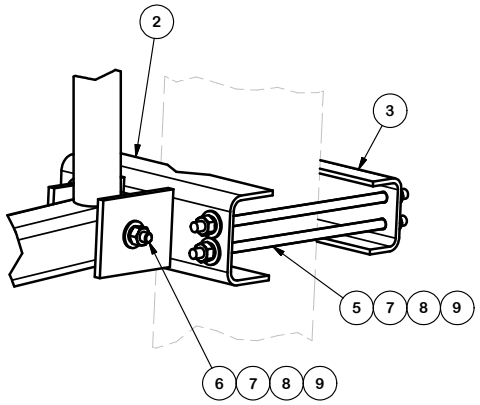
TOWER/MAST SIZE AT PROPOSED ANTENNA ATTACHMENT = 5"± DIAMETER.

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	CFM	UPPER GATE FOOT WELDMENT		13.90	13.90
2	1	CFS	LOWER GATE FOOT WELDMENT		12.72	12.72
3	2	GBB	GATE BACKING BAR		4.53	9.06
4	1	4PBG	48" PIPE MOUNT STANDOFF ARM		113.96	113.96
5	8	G12R-12	1/2" x 12" GALV. THREADED ROD		0.67	5.35
5	8	G12R-15	1/2" x 15" GALV. THREADED ROD		0.84	6.69
6	2	A1205	1/2" x 5" A325 HDG BOLT		0.34	0.69
7	18	G12FW	1/2" HDG USS FLATWASHER		0.03	0.61
8	18	G12LW	1/2" HDG LOCKWASHER		0.01	0.25
9	18	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.29
					TOTAL WT. #	164.53

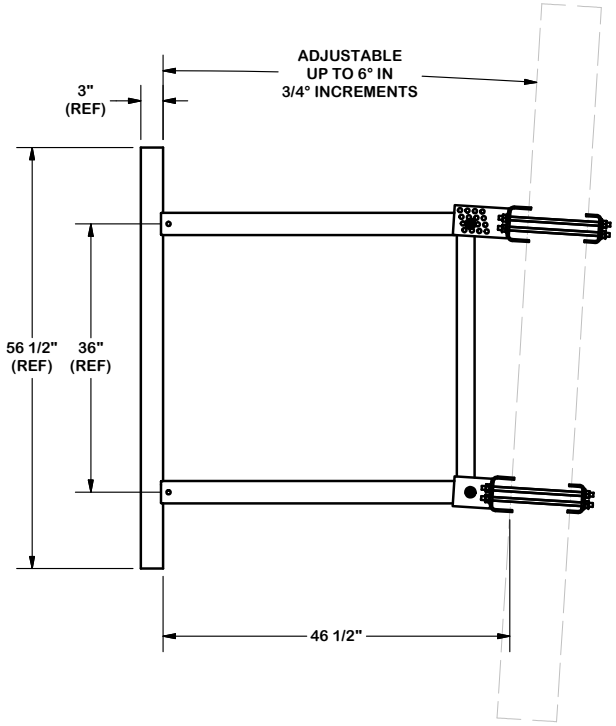




DETAIL A



DETAIL B



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: 48" ULTIMATE UNIVERSAL STANDOFF FRAME

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	RCH 2/4/2011		USF-4U	1 OF 1

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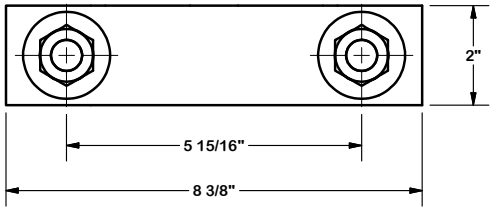
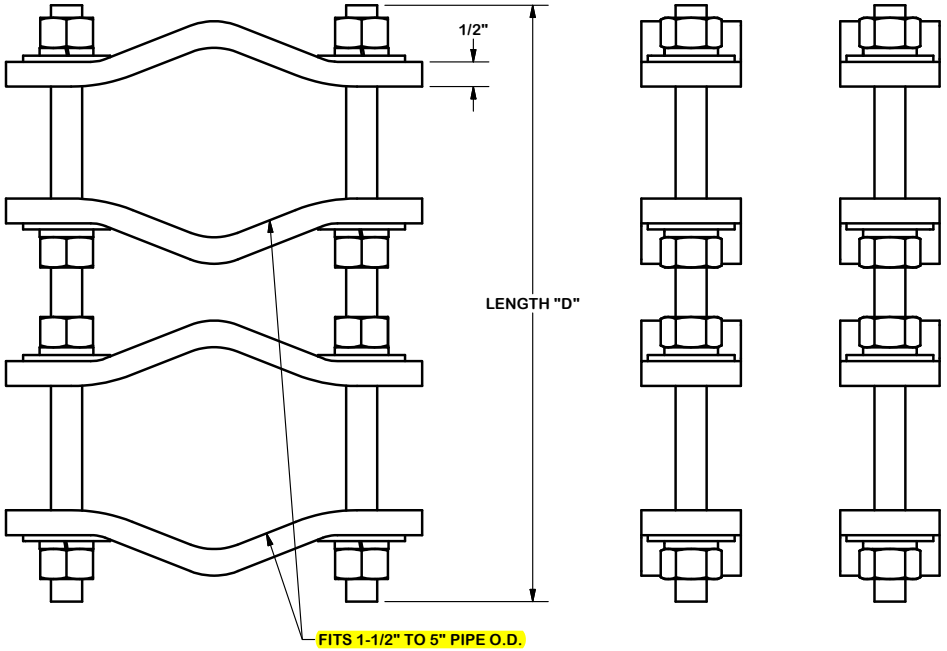
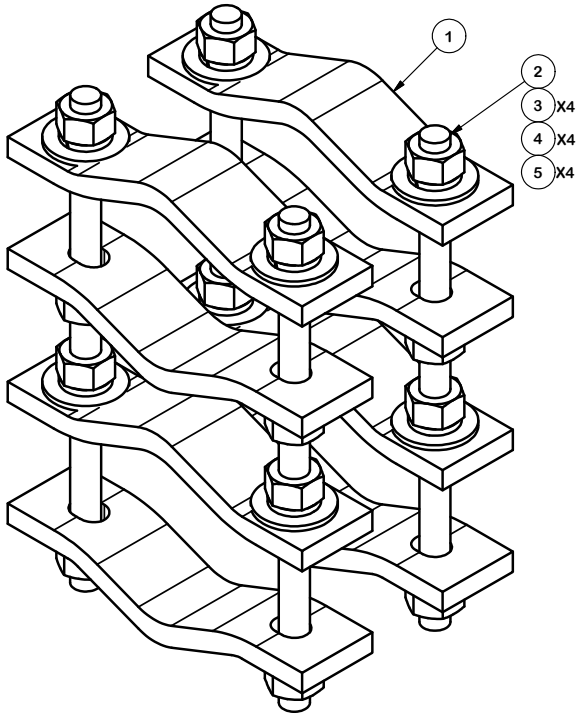




PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	8	DCP	CLAMP HALF, 1/2" THICK, 8-3/8"		2.40	19.20
2	B	C	5/8" THREADED ROD	D	E	F
3	16	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	2.08
4	16	G58LW	5/8" HDG LOCKWASHER		0.03	0.42
5	16	G58FW	5/8" HDG USS FLATWASHER		0.07	1.13

VARIABLE PARTS TABLE						
ASSEMBLY "A"	QTY "B"	PART "C"	LENGTH "D"	UNIT WT. "E"	NET WT. "F"	TOTAL WEIGHT
DCP12K	4	G58R-12	12"	1.05	4.18	27.01
DCP18K	4	G58R-18	18"	1.57	6.27	29.10



TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
PIPE TO PIPE CLAMP SET
1-1/2" TO 5" PIPE
1/2" THICK CLAMP

SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

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	KC8 8/21/2012		SEE ASSEMBLY "A"	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	CEK 1/22/2013	DCPxxK

ATTACHMENT E – STRUCTURAL ANALYSIS

AECOM

Submitted to
Eversource Energy
107 Selden Street
Berlin, CT 06037

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
July 31, 2020

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 180’ SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

EVERSOURCE ENERGY

Site Name: Connecticut State Police Tower #36
Site Address: 315 Spencer Plains Road
Westbrook, Connecticut

60627191
EVS-018 Revision 3 (b)

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and evaluation of the 180' self-supporting lattice tower located at 315 Spencer Plains Road in Westbrook, Connecticut.

The structural analysis was conducted in accordance with the 2018 Connecticut State Building Code which includes the TIA-222-H[1] Standard, 2018 International Building Code, the 2018 Connecticut State Building Code Amendments, the AISC[2] Load Resistance Factor Design (LRFD), the ASCE 7[3] design Code, and the Connecticut State Police Requirements which include the TIA/EIA-222-F[4] Standard.

The antenna loading considered in the analysis consists of all the existing antennas, transmission lines and ancillary items as outlined in the Introduction Section of this report.

The proposed Eversource antenna installation is listed below:

Antenna and Other Appurtenances	Carrier	Antenna Center Elevation
Install: **(1) Telewave ANT220F2 Omni Antenna (Installed Antenna Centerline Elevation @ 162')** **(1) SitePro1 USF-4U Side-arm Mount (installed at Centerline Elevation @ 159')** **(1) RFS LCF78-50J 7/8" diameter Coaxial Cable (installed at antenna elevation of 162' ; cable length appx. 190 ft)**	**Eversource (Proposed)**	**@ 162'**
(1) Comprod 871F-70-220-025 Dipole Antenna (Installed Antenna Centerline Elevation @ 124') **(1) SitePro1 USF-4U Side-arm Mount (installed at Centerline Elevation @ 121')** **(1) RFS LCF78-50J 7/8" diameter Coaxial Cable (installed at antenna elevation of 124' ; cable length appx. 152 ft)**	**Eversource (Proposed)**	**@ 124'**

The results of the analysis herein indicates:

1. The existing steel tower structure IS considered structurally adequate for the existing antenna loading with the wind classification specified herein.
2. The existing tower anchor IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
3. The existing foundation IS considered structurally adequate for the proposed antenna loading with the load classification specified herein.
4. The existing tower's sway (deflection) is 0.6041 degrees, and the existing tower's twist (rotation) is 0.0776 degrees. These figures combined IS within the Connecticut State Police requirement of 0.75 degrees for combined twist (rotation) and sway (deflection) with the load classification specified herein
5. **The maximum structural capacity rating calculated herein is 99.9%**

1. TIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version H)

2. AISC = American Institute of Steel Construction (15th Edition)

3. ASCE 7 = American Society of Civil Engineers Standard 7 (2016 Edition)

4. TIA/EIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version F)

1. EXECUTIVE SUMMARY *(continued)*

This analysis is based on:

1) The tower structure's theoretical capacity not including any assessment of the condition of the tower.

2) Tower geometry, member sizes and foundation taken from manufacturers original design documents prepared by Stainless, Inc. project number 358811 signed and sealed June 14, 1994.

3) Previous structural analysis and tower reinforcement performed by URS Corporation on behalf of T-Mobile, Northeast Utilities and AT&T, project number SAI-063 / 36924430, signed and sealed June 16, 2011.

4) Geotechnical Study for Evaluation of tower site report performed by Dr. Clarence Welti, P.E., P.C., signed on March 24, 2015.

5) Tower Mapping and Inventory by D&K Nationwide Communications, Inc. performed on March 19, 2016.

6) Removal of Existing Antennas owned by Connecticut State Police confirmed via e-mail dated August 30, 2016, with a follow-up to existing inventory obtained via e-mail dated March 6, 2020.

7) Previous structural analysis and modification performed by AECOM on behalf of AT&T, project number SAI-092 / 60508377, signed and sealed September 9, 2017.

8) Removal of three future Connecticut State Police microwave dishes at elevation 180' per e-mail received August 18, 2017.

9) Previous structural analysis and modification performed by AECOM on behalf of Sprint, project number ASM-009 Revision 1 / 60577720, signed and sealed on September 17, 2018.

10) Proposed Eversource inventory, obtained via e-mail, dated February 7, 2020.

11) Previous structural analysis and evaluation performed by AECOM on behalf of Eversource, project EVS-018 / 60627193, signed and sealed April 21, 2020.

12) Communication e-mail related to Connecticut State Police tower loading procedures, obtained via e-mail dated May 29, 2020.

13) Coax cable orientation as specified in section 6 of this report.

14) Antenna inventory as specified in Sections 2 and 6 of this report

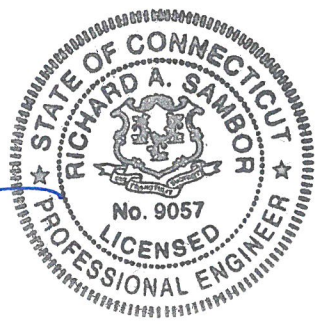
1. EXECUTIVE SUMMARY *(continued)*

This report is only valid as per the information and data provided by others for antenna inventory, mounts, tower structure, existing foundation and associated cables. The user of this report shall field verify the antenna, cabling and mount configuration used, as well as the physical condition of the tower members, connections and foundations. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please contact Michael Egan (860) 263-5817.

Sincerely,

AECOM,



Richard A. Sambor, P.E.
Senior Structural Engineer
RAS/mcd

cc: DJR – AECOM
CF/Book

2. INTRODUCTION

The subject tower is located at 315 Spencer Plains Road in Westbrook, Connecticut. The structure is a self-supporting three-legged 180' steel tapered lattice tower manufactured by Stainless Incorporated

The structural analysis was conducted in accordance with the following:

- 2018 International Building Code (compliant with the TIA-222-H design loads)
- 2015 International Building Code with 2018 Connecticut State Building Code Amendments for a wind speed of 112 mph (3-second gust)
- 2016 AISC Load Resistance Factor Design (LRFD)
- 2016 ASCE 7 Minimum Design Loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-H Standard
- Connecticut State Police Requirements for a wind velocity of 95 mph (fastest mile) and 90 mph (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice, analyzed under the TIA/EIA-222-F design Standard.

The inventory together with the proposed Eversource antenna arrangement is summarized in the table below:

Antenna Type	***Carrier***	***Mount***	***Centerline Elevation***	***Cable***
Lightning Rod on 18' Pipe	Tower (existing)	18' Vertical Pipe	200'	n/a
(1) 14' Omni Antenna	D&K-52 ST# 10 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	186'	(1) 7/8" Coax Cables
(1) 16' Omni Antenna	D&K-59 ST# 13 (existing)	(1) 6' T-Bar Antenna Mount Frame @ 177.5' *(Shared with ST# 13,14,15)*	185.5'	(1) 1-5/8" Coax Cable
(1) 16' Whip Antenna	D&K-48 ST# 8 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	185.5'	(1) 1-1/4" Coax Cable
(1) 16' Omni Antenna	D&K-57 ST# 6 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	185.5'	(1) 1-1/4" Coax Cable
(1) 11' Whip Antenna	D&K-53 ST# 3 (existing)	(2) 6' Side-Arm Mount Assemblies @ 178.5' *(Shared with ST# 1-4)*	185'	(1) 1-5/8" Coax Cable
(1) 4-Bay 10' Dipole Antenna	D&K-54 ST# 2 (existing)	(2) 6' Side-Arm Mount Assemblies @ 178.5' *(Shared with ST# 1-4)*	185'	(1) 7/8" Coax Cable
(1) 10' Omni Antenna w/ (4) Wire Elements	D&K-58 ST# 5 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	182.5'	(1) 7/8" Coax Cable
(1) 1-Bay Dipole Antenna	D&K-51 ST# 11 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	181'	(1) 7/8" Coax Cables
(1) 4-Bay 18' Dipole Antenna	D&K-55 ST# 1 (existing)	(2) 6' Side-Arm Mount Assemblies @ 178.5' *(Shared with ST# 1-4)*	181'	(1) 7/8" Coax Cable
(1) 11"x8"x12" Junction Box	ST# 16 (existing)	Mounted to Tower Face	178'	(1) 7/8" Coax Cable

Antenna Type	*Carrier*	*Mount*	*Centerline Elevation*	*Cable*
(1) 6' Dish with Radome	D&K-45 ST# 17 (existing)	1' Side-arm Mount *(@ 176')*	178'	(1) 2" Elliptical Cable
(1) 6"x6"x2" TTA Control Box	D&K-47 ST# 9 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	177.5'	(1) 1/2" Coax Cable
(1) 6' Dish with Radome	D&K-44 ST# 18 (existing)	1' Side-arm Mount	176'	(1) 2" Elliptical Cable
(1) (Inverted) 11' Whip Antenna	D&K-42 ST# 4 (existing)	(2) 6' Side-Arm Mount Assemblies @ 178.5' *(Shared with ST# 1-4)*	173'	(1) 1-5/8" Coax Cable
(1) 6' Dish with Radome	D&K-43 ST# 19 (existing)	1' Side-arm Mount	172'	(1) 2" Elliptical Cable
(1) (Inverted) 16' Whip Antenna	D&K-38 ST# 15 (existing)	(1) 6' T-Bar Antenna Mount Frame @ 177.5' *(Shared with ST# 13,14,15)*	170'	(1) 1-5/8" Coax Cable
(1) (Inverted) 16' Whip Antenna	D&K-39 ST# 14 (existing)	(1) 6' T-Bar Antenna Mount Frame @ 177.5' *(Shared with ST# 13,14,15)*	170'	(1) 1-5/8" Coax Cable
(1) (Inverted) 10' 8-Bay Dipole Antenna	D&K-41 ST# 12 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	170'	(1) 7/8" Coax Cable
(1) (Inverted) 10' 8-Bay Dipole Antenna	D&K-40 ST#7 (existing)	(4) 6' Side-Arm Mount Assemblies @ 177.5' *(Shared with ST# 5 – 12)*	170'	(1) 7/8" Coax Cable
(1) Telewave ANT150F2 Omni	ST# 20 (existing)	(1) 3' Side Mount Standoff (Mounted @ 164')	166.5'	(1) 7/8" Coax Cable
(1) Telewave ANT220F2 Omni	**Eversource (Proposed)**	**(1) Sitepro USF-4U Mount Assembly (Mounted @ 159')**	**162'**	**(1) RFS LCF78-50JA-A7 Coaxial Cable**
(1) Telewave ANT450F6 Whip Antenna	D&K-35 ST# 21 (existing)	2' Side-arm Mount (Mounted @ 157')	161'	(1) 7/8 Coax Cable
(1) 9' Whip Antenna	D&K-33 ST# 24 (existing)	3' Side Arm Mount @ Elevation 156' *(Shared with ST# 24, 25)*	160'	(1) 7/8 Coax Cable
(1) Kathrein PRF-950 Grid Dish	DNK-37 ST# 23 (existing)	(1) 1' Side-arm Mount (Mounted @ 156')	156'	(1) 7/8" Coax Cable
(1) 1-Bay Dipole Antenna (ANT400D)	D&K-34 ST# 22 (existing)	2' Side-arm Mount (Mounted @ 156')	151'	(1) 7/8" Coax Cable

Antenna Type	*Carrier*	*Mount*	*Centerline Elevation*	*Cable*
(1) (Inverted) 14' Whip Antenna	D&K-32 ST# 25 (existing)	3' Side Arm Mount @ Elevation 156' *(Shared with ST# 24, 25)*	149'	(1) 1-5/8" Coax Cable
(6) Powerwave 7770 Panel Antennas (3) KMW AM-X-CD-14-65 Panel Antennas (6) TT19-08BP111-001 TMA Units (3) Ericsson RRUS-11 RRH Units (3) Ericsson RRUS-12 RRH Units (1) Squid Surge Arrestor Unit	AT&T (existing)	(3) 13' T-frame Sector Mounts	148'	(12) 1 1/4" coax cables (1) Fiber Cables (10mm) (2) DC Cables (0.645")
(3) RFS APXVTM14-ALU-120 Panels (3) Commscope NNVV-65B-R4 Panels (3) ALU TD-RRH-8x20-25 RRH Units (6) ALU RRH-2x50 800 MHz RRH Units (3) 1900 MHz (4x45W) RRH Units	Sprint (existing)	(3) SitePro1 Stiff Arm Kits STK-U attached to (3) 13' Lightweight T-Frames (existing)	137'	(4) Hybrid Cables (1-1/4" Outside Diameter)
(3) Commscope DBXNH-6565B-A2M Panel Antennas (6) TMA Units	T-Mobile (existing)	(3) Side-Arm Mount Frames	130'	(12) 7/8" Coaxial Cables
(1) Decibel DB210-C Dipole (Single)	D&K-9 ST# 45 (existing)	1.5' Side Arm Mount	125'	(1) 7/8" Coax Cable
(1) Comprod 871F-70 Dipole Antenna	**Eversource (Proposed)**	**(1) Sitepro USF-4U Mount Assembly (Mounted @ 121')**	**124'**	**(1) RFS LCF78-50JA-A7 Coaxial Cable**
(1) 19.5"x19.5" Panel Antenna	D&K-10 ST# 46 (existing)	1' Side Arm Mount	123'	(1) 7/8" Coax Cable
(1) Kathrein PRF-950 Grid Dish	D&K-8 ST# 47 (existing)	2' Side-arm Mount	111'	(1) 7/8" Coax Cable
-----	(existing)	1' Side-arm Mount	102'	-----
(1) 20' 4-Bay Dipole Antenna	D&K-7 ST# 48 (existing)	1' Side Arm Mount @ Elevation 82.5' *(Shared with ST# 48,49)*	89.5'	(1) 7/8" Coax Cable
(1) 3' Yagi Antenna	D&K-6 ST# 49 (existing)	1' Side Arm Mount @ Elevation 82.5' *(Shared with ST# 48,49)*	81'	(1) 7/8" Coax Cable
(1) GPS Antenna	D&K-5 ST# 50 Sprint (existing)	1' Side-arm Mount	81'	(1) 1-1/16" Coax Cable

Antenna Type	*Carrier*	*Mount*	*Centerline Elevation*	*Cable*
(1) DB803M-XC Omni Whip antenna	D&K-4 ST# 51 (existing)	4' Side Arm Mount @ Elevation 32' *(Shared with ST# 51,52)*	34'	(1) ½" Coax Cable
(1) (inverted) DB803M-XC Omni Whip antenna	D&K-3 ST# 52 (existing)	4' Side Arm Mount @ Elevation 32' *(Shared with ST# 51,52)*	29.5'	(1) ½" Coax Cable
(1) 3' Whip Antenna	D&K-2 ST# 53 (existing)	4' Side Arm Mount @ Elevation 18' *(Shared with ST# 53,54)*	19.5'	(1) ½" Coax Cable
(1) 3' Yagi Antenna	D&K-1 ST# 54 (existing)	4' Side Arm Mount @ Elevation 18' *(Shared with ST# 53,54)*	17.5'	(1) ½" Coax Cable

NOTE: Antenna ID Numbering and elevations obtained from Tower Mapping and Existing inventory via tower climb performed by D&K Nationwide Communications, Inc. on March 19, 2016 and from Stainless Inc. Tower Mapping report dated December 11, 2019 (St# above).

This structural analysis of the communications tower was performed by AECOM, on behalf of Eversource. The purpose of this analysis was to investigate the structural integrity of the existing tower and foundation for existing antenna loads in compliance with the 2018 Connecticut State Building Code and the forthcoming TIA-222-H Standard. This analysis was conducted to evaluate stress on the tower and the effect forces to the foundation of the tower resulting from existing antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with, the TIA-222-H–Structural Standard for Antenna Towers and Antenna Supporting Structures and Antennas, the 2015 International Building Code with 2018 Connecticut State Building Code Amendments, the 2018 International Building Code (in compliance with the TIA-222-H Standard) and the American Institute of Steel Construction (AISC) Manual of Steel Construction– Load Resistance Factor Design (LRFD)

The structural analysis was conducted using TNX Tower version 8.0.5.0 and used the following conditions for this tower review (following the TIA-222-H Standard):

- Structure Class 3 – (Essential Communications)
  - NOTE: ASCE 7 and CT State Building Code Applied Risk Category 4 for design wind loads (see below)
- Topographic Category 1 – (No Abrupt elevation changes to location of structure)
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
  - Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA-222-H Standard.

Basic Wind Speed:

- IBC 2018 w/ 2018 CT State Building Code Amendment:
  - (2018) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 “Designs using TIA-222” applies for determination of Design Wind Load obtained as “V.ult” are to be converted to “V.asd” when applying the TIA-222-H design Standard (under Section 1609.3) for Basic Wind Speed. The TNX program implements the use of the V.ult for design and analysis and internally applies this loading exception.
  - (2018) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
    - **V.ult = 145 mph** (3-Second Gust) Wind Design Parameter for the Town of Westbrook, Connecticut for Risk Category four (IV) for essential communications (Connecticut State Police). *NOTE: Risk category 3 (III) requires equivalent wind speed for design loading.*

LOAD CONDITION 1 = 145 MPH (3-SECOND GUST) WIND LOAD (WITHOUT ICE) + TOWER DEAD LOAD
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Ice Load + Tower Dead Load

Ice thickness used for this analysis is **1.00 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-H and follows the same design criteria as the ASCE 7 (2016) Standard.

The load condition below implements the design requirements of the Connecticut State Police for the tower structures deflection limits with the allowable deflection limit of the combination of the tower’s sway (deflection) and twist (rotation) under the TIA/EIA-222-F design Standard. This design limit required the design combined value of sway (deflection) and twist (rotation) to be under 0.75 degrees following the TIA/EIA-222-F design Standard.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (cont.)

Load Condition 3 = 90 mph (fastest mile) Wind Load (with Ice) + Ice Load + Dead Load

Seismic event consideration factors/values for design:

- S.s = 0.167 (2018 CT State Building Code – Location Specific Value)
- S.1 = 0.059 (2018 CT State Building Code – Location Specific Value)
- Site Classification = “D”
- Seismic Design Category = “A” – (2018 International Building Code)
- F.a = 1.6 (Obtained from TIA-222-H Table 2-11 Considering above conditions)
- F.v = 2.4 (Obtained from TIA-222-H Table 2-12 Considering above conditions)

NOTE: TIA-222-H Section 9.8 require S.s values to be greater than 1.0 to be applied for analysis. Due to the S.s value below this threshold, the seismic base shear calculation is omitted from this structural analysis report.

Strength Limit State Load Combinations (TIA-222-H Section 2.3.2):

The structural analysis herein has considered the following load combinations within the analysis:

1. ***1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.6 Wind load without ice***
2. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Dead weight of ice due to factored ice thickness + 1.0 Concurrent wind load with factored ice thickness + 1.0 Load effects due to temperature
3. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Earthquake Load

NOTE 1: The above **bolded** load combination is considered to create the governing design loads per the results of the analysis.

NOTE 2: The above “Dead Load Guy Assemblies” are not considered as part of the analysis and are considered as a value of zero.

NOTE 3: The “Load effects due to temperature” do not apply for structures that are self-sustaining (from the TIA-222-H Standard)

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the strength design in accordance with AISC (LRFD). The results of the analysis indicated that the existing tower structure, existing tower anchor bolts and foundations have enough capacity to support the existing loading conditions indicated herein.

The existing tower deflection (sway) is 0.6041 degrees, and the tower rotation (twist) is 0.0776 degrees with a wind velocity of 90 mph concurrent with 0.5" ice. The tower deflection and rotation ARE within the Connecticut State Police specification of 0.75 degrees of combined deflection (sway) and rotation (twist).

Tower Base Reactions (Factored):

Description	Current (TIA-222-H)
Pier Compression (kips)	513
Pier Uplift (kips)	450
Overall Overturning (kip-ft)	10633
Overall Shear (kips)	105
Shear per Leg (kips)	59.9

Proposed Tower Component Stress vs. Capacity Summary

Component / (Section No.)	Controlling Component/ Elevation	Stress (% capacity)	Pass/Fail
Leg (T14)	Stainless P6.8750 O.D. x 0.5" / 0' – 12.5' / Compression	95.9	**Pass**
Diagonal (T10)	2L 3x2-1/2x1/4x3/8(gap) / 75' – 83.333' / Member Bearing	99.9	**Pass**
Horizontal (T11)	L4x4x1/4 / 37.5' – 50' / Compression	88.7	**Pass**
Top Grit (T12)	2L 4x4x1/4 / 25' – 37.5' / Compression	46.7	**Pass**
Redundant Horizontal Bracing (T14)	L2-1/2x2-1/2x3/16 / 0' – 12.5' / Compression	60.4	**Pass**
Redundant Diagonal Bracing (T14)	L2-1/2x2-1/2x3/16 / 0' - 12.5' / Compression	85.3	**Pass**
Inner Bracing (T12)	L2-1/2x2-1/2x3/16 / 25' – 37.5' / Compression	10.6	**Pass**
Bolt Checks (T10)	(1) ¾" A325X Bolt / 75' - 83.3' / Diagonal Member Bearing on Bolt	99.9	**Pass**

4. FINDINGS AND EVALUATION (cont.)

Foundation Summary

Component	Required	Computed	% Capacity	Pass/Fail
Tower Anchor Rod Capacity (TIA-222-H) (Previously Modified – Refer to Section 6)	Ratio < 1.0	0.767	76.7	**Pass**
Ultimate Soil Bearing Pressure	6ksf * 0.75 Reduction = 4.50 ksf	2.33 ksf	51.8	**Pass**
Ultimate Punching Shear (ACI Eq. 11-33)	702.05 kip	699.5 kip	99.6	**Pass**
Ultimate Beam Shear (ACI Eq. 11-2)	320.42 Kip	251.84 kip	78.6	**Pass**
Foundation Pad Bending Capacity	1346.08 kip*ft	892.72 kip*ft	66.3	**Pass**
Foundation Uplift Resistance	538.88 kips (Applying 0.750 Reduction Factor – TIA-222-H Sect. 9)	449.947 kip	83.5	**Pass**

Structure Rating (Maximum from all components) =	**99.9 %**	**Pass**

Maximum Deformations – Proposed Condition

TIA-222-H Section 2.8.2 - Limit State Deformations

1. A rotation of 4 degrees about the vertical axis (twist) or any horizontal axis (sway) of the structure
2. A horizontal displacement (in feet) of 3% of the height of the structure.

Load Case Description	Current		Allowable	
	Sway (degree)	Displacement (Feet)	Sway (degree)	Displacement (Feet)
Service Wind Load (60 mph)	0.1352	0.2518	4.0	5.4

Tower Twist & Sway at Top (Connecticut State Police Requirements –TIA/EIA-222-F):

Description	Current	Total	Allowable
Tower Twist (degrees)	0.0776	**0.6817**	0.750
Tower Sway (degrees)	0.6041		

NOTE: Values of <u>combined</u> twist and sway are required to be below 0.75 degrees combined under the DESPP / CSP required loading and shall not be considered "passing" until below this limit.

5. CONCLUSIONS

The results of the analysis herein indicates:

1. The existing steel tower structure IS considered structurally adequate for the existing antenna loading with the wind classification specified herein.
2. The existing tower anchor IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
3. The existing foundation IS NOT considered structurally adequate for the proposed antenna loading with the load classification specified herein.
4. The existing tower's sway (deflection) is 0.6041 degrees, and the existing tower's twist (rotation) is 0.0776 degrees. These figures combined IS within the Connecticut State Police requirement of 0.75 degrees for combined twist (rotation) and sway (deflection) with the load classification specified herein
5. **The maximum structural capacity rating calculated herein is 99.9%**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations are in good condition without defects and were properly constructed to support original design loads as specified in the original design documents.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

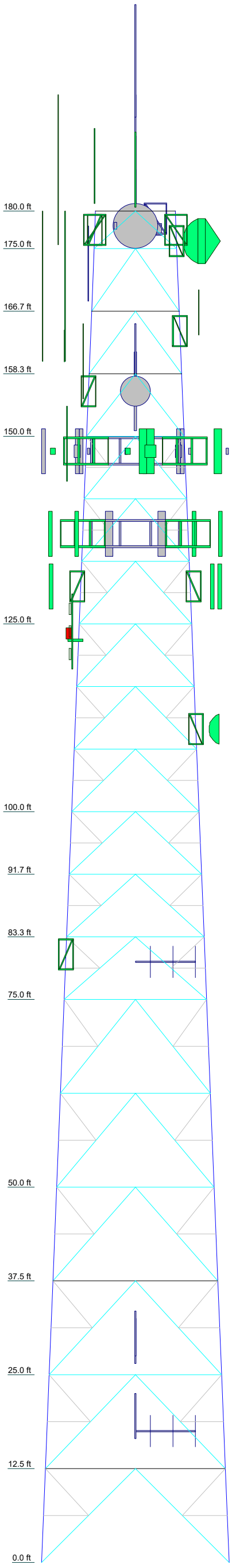
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The tower owner shall refer to TIA-222-H Section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. It is also recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

TNX TOWER INPUT / OUPUT SUMMARY

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Section														
Legs		Stainless P5x0.250			Stainless P5x0.300					Stainless P6.875x0.400			Stainless P6.875x0.500	
Leg Grade					A513-50					A572-60				
Diagonals			2L2 1/2x2x3/16x3/8		2L2 1/2x2x5/16x3/8					2L3 1/2x3 1/2x5/16x3/8				
Diagonal Grade						A36							A529-50	
Top Girts	L3x3x1/4	N.A.	L2 1/2x2 1/2x3/16											
Horizontals	N.A.	B	N.A.		L3x2 1/2x1/4									
Red. Horizontals			N.A.											
Red. Diagonals			N.A.											
Inner Bracing			N.A.											
Face Width (ft)	10.599	11	11.6667	12.3333	13		17	17.6667	18.3333	19		22	23	24
# Panels @ (ft)	1 @ 5				12 @ 8.33333							6 @ 12.5		
Weight (lb)	592.3	755.5	768.1	780.9	3994.8		1971.3	2177.7	2217.6	6256.5		3953.2	3858.0	4407.3



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15' (DNK-56 (L.R.))	200	Raycap RVZDC-6627-PF-48 (ATT)	148
2" Dia 10' Omni (DNK-52 (St# 10))	186	(2) 7770.00 panel antenna (ATT)	148
3" Dia 20' Omni (DNK-59 (St# 13))	185.5	AM-X-CD-16-65-00T Panels (ATT)	148
3" Dia 12' Omni (DNK-48 (St# 8))	185.5	(2) TMAT1921xB68-21A TMA Units (ATT)	148
3" Dia 20' Omni (DNK-57 (St# 6))	185.5	Ericsson RRUS-11 RRH Unit (ATT)	148
2" Dia 10' Omni (DNK-53 (St# 3))	185	Ericsson RRUS-12 RRH Unit (ATT)	148
10' - 2 Bay Dipole (DNK-54 (St# 2))	185	Raycap RVZDC-6627-PF-48 (ATT)	148
1" Dia 8' Omni (DNK-58 (St# 5))	182.5	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
1 Bay Dipole ANT400D (DNK-51 (St# 11))	181	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
20' 4-Bay Dipole (DNK-55 (St# 1))	181	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	APXVTM14-C-120 Panel Antenna (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	APXVTM14-C-120 Panel Antenna (Sprint)	137
11"x8"x12" Junction Box ((St# 16))	178	APXVTM14-C-120 Panel Antenna (Sprint)	137
6' w/Radome (DNK-45 (St# 17))	178	NNVV-65B-R4 Panel Antenna (Sprint)	137
Pirod 6' Side Mount Standoff (1) (DNK-38,39 (St# 13,14,15,16))	177.5	NNVV-65B-R4 Panel Antenna (Sprint)	137
		NNVV-65B-R4 Panel Antenna (Sprint)	137
432E-83I-01T TTA Unit (DNK-47 (St# 9))	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
1' Side Arm (DNK-44 (St# 18))	176	(2) ALU 800MHz 2x50W (Sprint)	137
1' Side Arm (DNK-45 (St# 17))	176	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
6' w/Radome (DNK-44 (St# 18))	176	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
(inverted) 2" Dia 10' Omni (DNK-42 (St# 4))	173	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
(Inverted) 3" Dia 20' Omni (DNK-38 (St# 15))	170	Commscope DBXNH-6565A-A2M Panel (T-Mobile DNK-11,12,13)	130
(Inverted) 3" Dia 20' Omni (DNK-39 (St# 14))	170		
(inverted) 10' 8 Bay Di-Pole (DNK-41 (St# 12))	170	Commscope DBXNH-6565A-A2M Panel (T-Mobile DNK-11,12,13)	130
(inverted) 10' 8 Bay Di-Pole (DNK-40 (St# 7))	170		
Telewave 150F2 Omni ((St # 20))	166.5	(2) Ericsson TMA Unit (T-Mobile DNK-11,12,13)	130
Pirod 4' Side Mount Standoff (1) ((St # 20))	164	Commscope DBXNH-6565A-A2M Panel (T-Mobile DNK-11,12,13)	130
Telewave ANT220F2 - Omni Antenna (Eversource - Proposed)	162	2' Sidearm (T-Mobile DNK-11,12,13)	130
ANT450F6 (DNK-35 (St# 21))	161	2' Sidearm (T-Mobile DNK-11,12,13)	130
3" Dia 9' Omni (DNK-33 (St# 24))	160	2' Sidearm (T-Mobile DNK-11,12,13)	130
Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource - Proposed)	159	(2) Ericsson TMA Unit (T-Mobile DNK-11,12,13)	130
		(2) Ericsson TMA Unit (T-Mobile DNK-11,12,13)	130
2' Sidearm (DNK-35 (St# 21))	157	1' Side Arm (DNK-9 (St# 45))	125
1' Side Arm (DNK-37 (St# 23))	156	Decibel DB210-C Dipole (Single) (DNK-9 (St# 45))	125
Pirod 4' Side Mount Standoff (1) (DNK-32, 33 (St# 24,25))	156	Comprod 871F-70 Dipole (Eversource - Proposed)	124
		19.5"x19.5" Panel Antenna (DNK-10 (St# 46))	123
10'6"x4" Pipe Mount (DNK-34 (St# 22))	156	1' Side Arm (DNK-10 (St# 46))	123
4' Paraflector [PRF-950] (DNK-37 (St# 23))	156	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource - Proposed)	121
1 Bay Dipole ANT400D (DNK-34 (St# 22))	151		
2" Dia 14' Omni (inverted) (DNK-32 (St# 25))	149	2' Sidearm (DNK-8 (St# 47))	111
13' Sector Mount (1) (ATT)	148	4' Paraflector [PRF-950] (DNK-8 (St# 47))	111
13' Sector Mount (1) (ATT)	148	1' Side Arm (Un-used Mount)	102
13' Sector Mount (1) (ATT)	148	20' 4-Bay Dipole (DNK-7 (St# 48))	89.5
(2) 7770.00 panel antenna (ATT)	148	1' Side Arm (DNK-6,7 (St# 48,49))	82.5
AM-X-CD-16-65-00T Panels (ATT)	148	1' Side Arm (DNK-5 (St# 50))	81
(2) TMAT1921xB68-21A TMA Units (ATT)	148	3' Yagi (DNK-6 (St# 49))	81
Ericsson RRUS-11 RRH Unit (ATT)	148	GPS (DNK-5 (St# 50))	81
Ericsson RRUS-12 RRH Unit (ATT)	148	1.5" Dia 3' Omni (DNK-4 (St# 51))	34 - 27
Raycap RVZDC-6627-PF-48 (ATT)	148	1.5" Dia 3' Omni (inverted) (DNK-3 (St# 52))	29.5
(2) 7770.00 panel antenna (ATT)	148	4' Side Mount Standoff (1) (DNK-3,4 (St# 51,52))	26
AM-X-CD-16-65-00T Panels (ATT)	148	1.5" Dia 3' Omni (DNK-2 (St# 53))	19.5
(2) TMAT1921xB68-21A TMA Units (ATT)	148	4' Side Mount Standoff (1) (DNK 1,2 (St# 53,54))	18
Ericsson RRUS-11 RRH Unit (ATT)	148	3' Yagi (DNK-1 (St# 54))	17.5
Ericsson RRUS-12 RRH Unit (ATT)	148		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Stainless P5x0.500	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A513-50	50 ksi	66 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi	A529-50	50 ksi	65 ksi
A500-42	42 ksi	58 ksi			

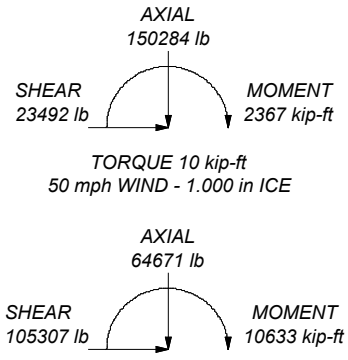
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 145 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category III.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. P-Delta for analysis does not apply for this case - TIA-222-H Section 3.
8. Previous MODification note: Top Girt Horizontals @ 12.5' _37.5' were previous MODifications from Project SAI-063 (06/2011) and considered constructed.
9. Appurtenance Reference # based on Tower Inventory/Mapping Report from Stainless Inc.
10. Carrier Centerlines (ATI/T-Mobile/Sprint) are based on Carrier RFDS Centerlines from previously obtained information listed in Section 1 of this S.A. report.
11. UPDATE!! - 06/09/2020 - Removal of (3) Wind-Load Dishes per CSP request.
12. TOWER RATING: 99.9%

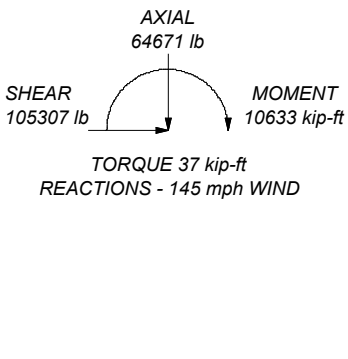
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 512666 lb
SHEAR: 59885 lb

UPLIFT: -449947 lb
SHEAR: 53389 lb



TORQUE 10 kip-ft
50 mph WIND - 1.000 in ICE



TORQUE 37 kip-ft
REACTIONS - 145 mph WIND

AECOM
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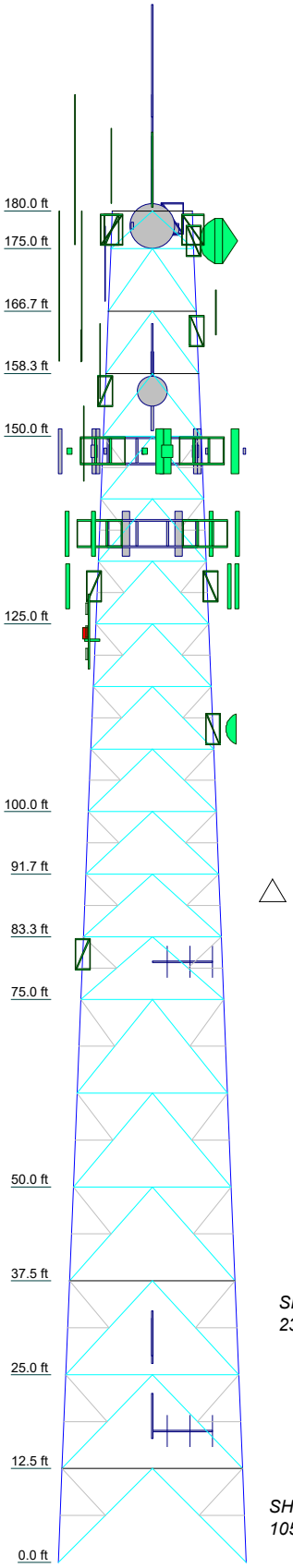
Rocky Hill, CT
Phone: 860-263-5800
FAX: 860-812-2094

Job:	***Analysis - 180' Lattice Tower (CSP #36)***		
Project:	***Westbrook, Connecticut - Evaluation (b)***		
Client: Eversource / EVS-018 / "TIA-222-H" Loads	Drawn by: MCD	App'd:	
Code: TIA-222-H	Date: 07/31/20	Scale: NTS	
Path:		Dwg No. E-1	

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Legs			Stainless P5x0.250			Stainless P5x0.300	Stainless P5x0.400				Stainless P6.875x0.400			Stainless P6.875x0.500	
Leg Grade						A513-50		A	B		A500-42			A572-60	
Diagonals			2L2 1/2x2x3/16x3/8			2L2 1/2x2x5/16x3/8		2L3x2 1/2x1/4x3/8			2L3 1/2x3 1/2x5/16x3/8	C		2L3 1/2x3 1/2x5/16x3/8	
Diagonal Grade							A36							A529-50	
Top Girts		D	N.A.	L2 1/2x2 1/2x3/16				N.A.					2L4x4x1/4	N.A.	2L4x4x5/16
Horizontals		N.A.	E	N.A.		L3x2 1/2x1/4	L3x3x5/16		2L3x3x1/4		L4x4x1/4		N.A.	L4x4x3/8	N.A.
Red. Horizontals			N.A.				L2x2x3/16						L2 1/2x2 1/2x3/16		
Red. Diagonals			N.A.				L2x2x3/16						L2 1/2x2 1/2x3/16		
Inner Bracing			N.A.				L2 1/2x2 1/2x3/16						L2 1/2x2 1/2x3/16	L3x3x1/4	
Face Width (ft)	25	11	10.599	11.6667	12.3333	13	15	17	17.6667	18.3333	19	21	22	23	24
# Panels @ (ft)		1 @ 5				12 @ 8.33333							6 @ 12.5		
Weight (lb)	39906.9	592.3	755.5	768.1	780.9	3994.8	4822.1	1971.3	2177.7	2217.6	6256.5	3351.7	3863.2	3858.0	4407.3



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Stainless P5x0.500	D	L3x3x1/4
B	1/3 Pipe w/ 5"x0.5 Stainless	E	L2 1/2x2 1/2x3/16
C	2L3 1/2x3x5/16x3/8		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A513-50	50 ksi	66 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi	A529-50	50 ksi	65 ksi
A500-42	42 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 145 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category III.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. P-Delta for analysis does not apply for this case - TIA-222-H Section 3.
8. Previous MODification note: Top Girt Horizontals @ 12.5' _37.5' were previous MODifications from Project SAI-063 (06/2011) and considered constructed.
9. Appurtenance Reference # based on Tower Inventory/Mapping Report from Stainless Inc.
10. Carrier Centerlines (AT⌶/T-Mobile/Sprint) are based on Carrier RFDS Centerlines from previously obtained information listed in Section 1 of this S.A. report.
11. UPDATE!! - 06/09/2020 - Removal of (3) Wind-Load Dishes per CSP request.
12. TOWER RATING: 99.9%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 512666 lb
SHEAR: 59885 lb

UPLIFT: -449947 lb
SHEAR: 53389 lb

AXIAL 150284 lb
SHEAR 23492 lb *MOMENT 2367 kip-ft*
TORQUE 10 kip-ft
50 mph WIND - 1.000 in ICE

AXIAL 64671 lb
SHEAR 105307 lb *MOMENT 10633 kip-ft*
TORQUE 37 kip-ft
REACTIONS - 145 mph WIND

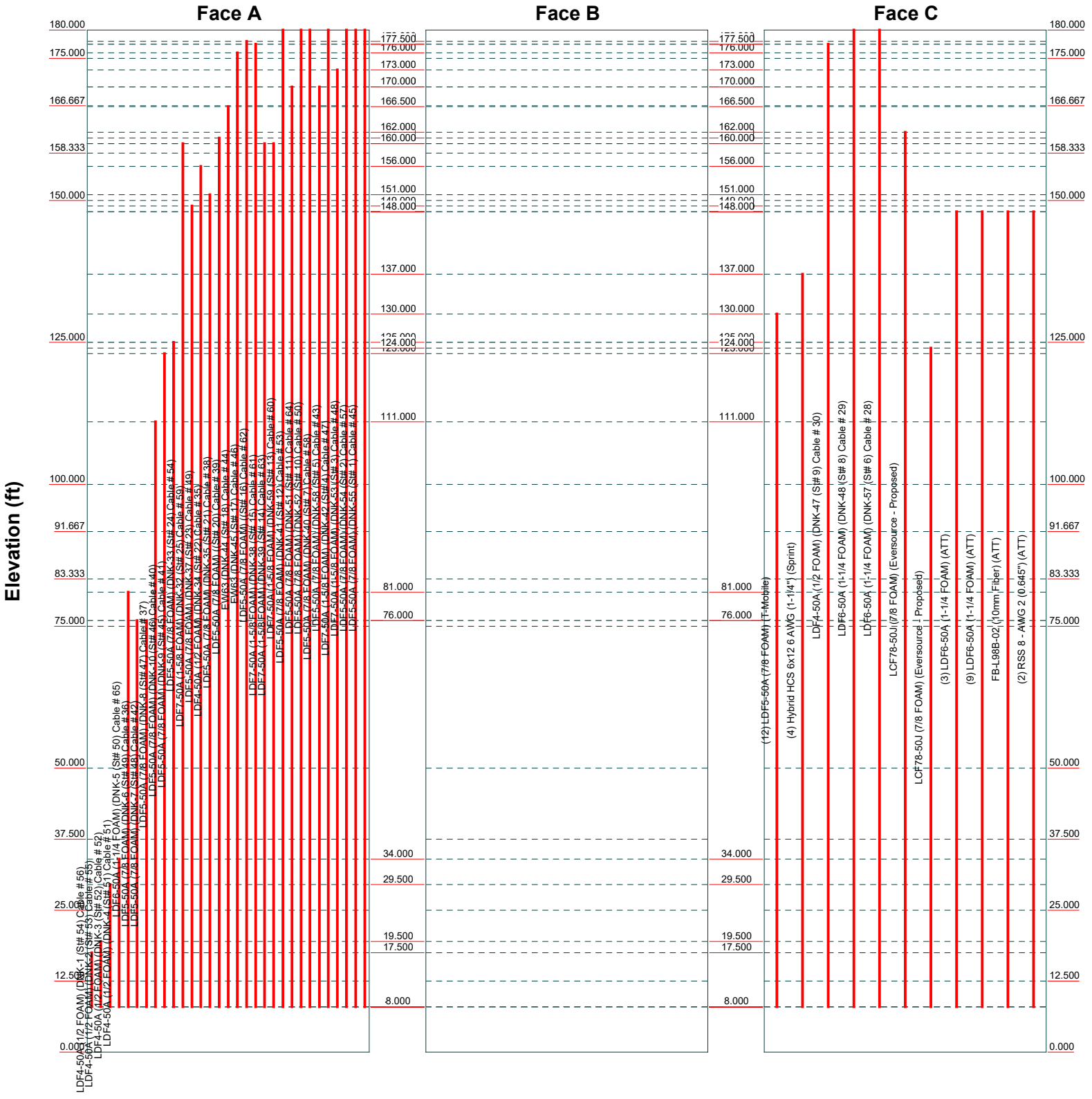
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-263-5800
FAX: 860-812-2094

Job: ***Analysis - 180' Lattice Tower (CSP #36)***			
Project: ***Westbrook, Connecticut - Evaluation (b)***			
Client: Eversource / EVS-018 / "TIA-222-H" Loads	Drawn by: MCD	App'd:	
Code: TIA-222-H	Date: 07/31/20	Scale: NTS	
Path:		Dwg No. E-1	

TNX TOWER FEEDLINE DISTRIBUTION

Feed Line Distribution Chart
0' - 180'

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



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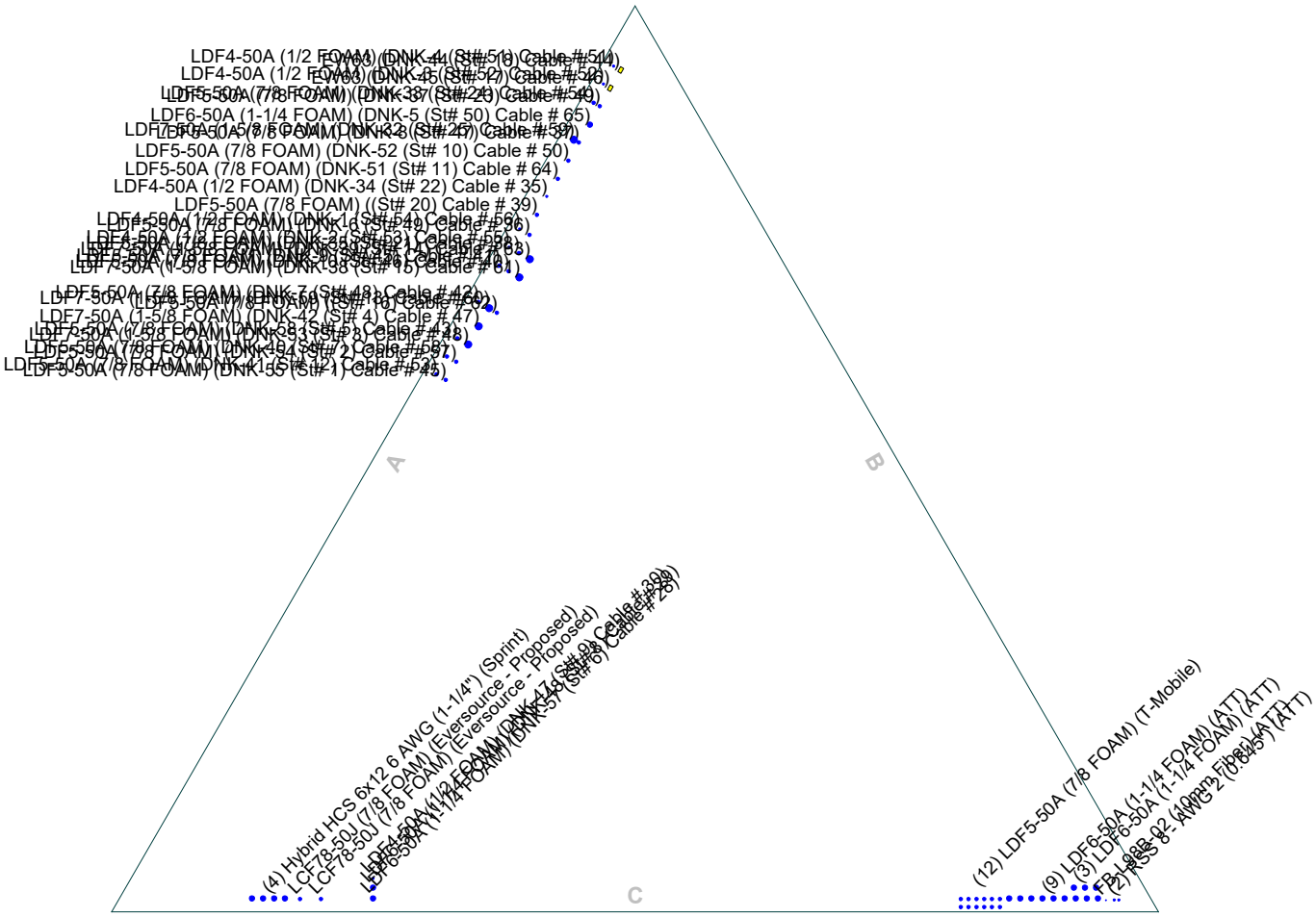
Job:	***Analysis - 180' Lattice Tower (CSP #36)***		
Project:	***Westbrook, Connecticut - Evaluation (b)***		
Client: Eversource / EVS-018 / "TIA-222-H" Loads		Drawn by: MCD	App'd:
Code: TIA-222-H		Date: 07/31/20	Scale: NTS
Path:			Dwg No. E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round Flat App In Face App Out Face

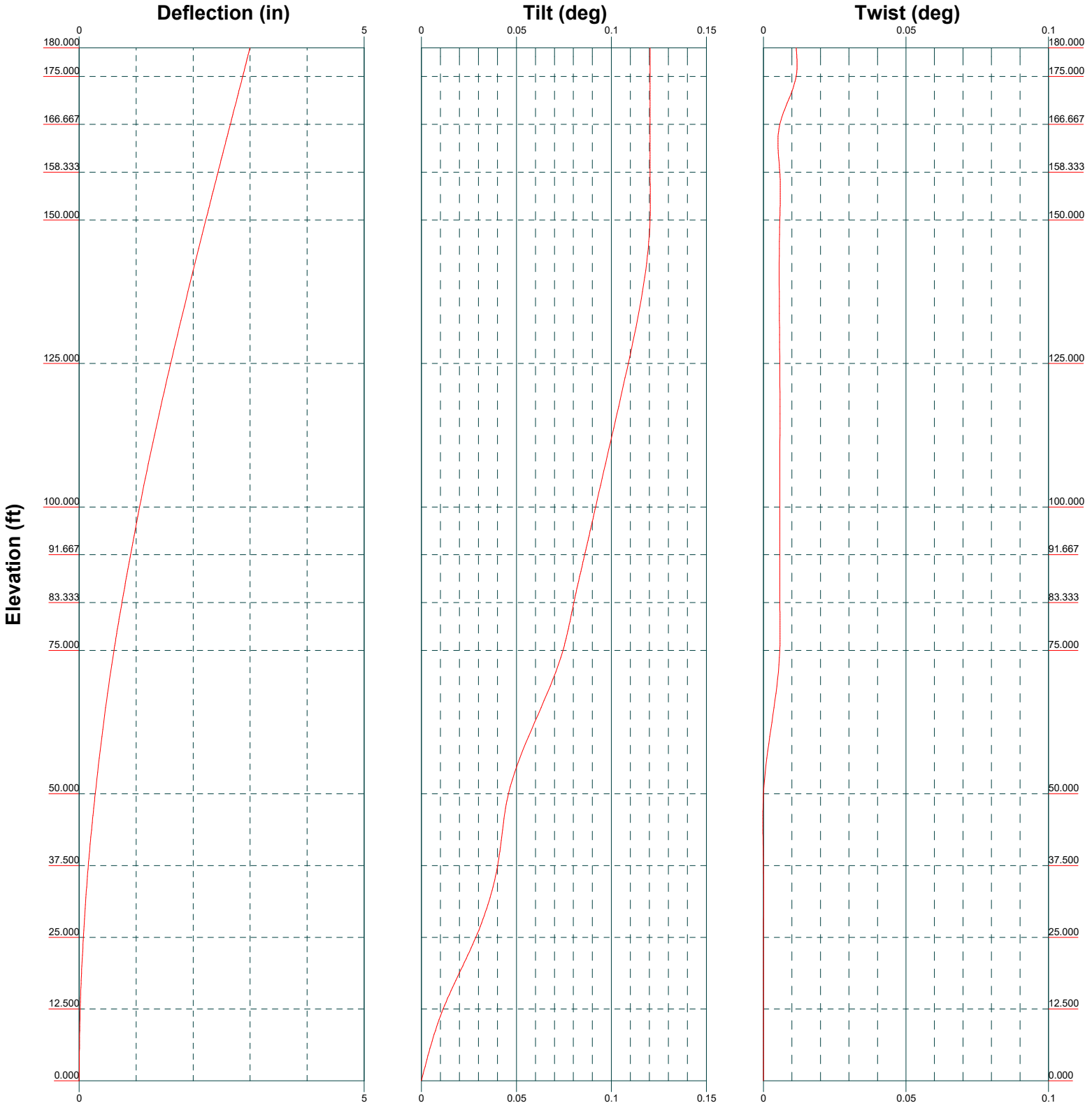


AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-263-5800 FAX: 860-812-2094	Job: ***Analysis - 180' Lattice Tower (CSP #36)***		
	Project: ***Westbrook, Connecticut - Evaluation (b)***		
	Client: Eversource / EVS-018 / "TIA-222-H" Loads	Drawn by: MCD	App'd:
	Code: TIA-222-H	Date: 07/31/20	Scale: NTS
	Path:		Dwg No. E-7

TNX TOWER DEFLECTION, TILT, AND TWIST

TIA-222-H - Service - 60 mph

Maximum Values



AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-263-5800
FAX: 860-812-2094

Job: ***Analysis - 180' Lattice Tower (CSP #36)***			
Project: ***Westbrook, Connecticut - Evaluation (b)***			
Client: Eversource / EVS-018 / "TIA-222-H" Loads	Drawn by: MCD	App'd:	
Code: TIA-222-H	Date: 07/31/20	Scale: NTS	
Path:		Dwg No. E-5	

TNX TOWER DETAILED OUTPUT

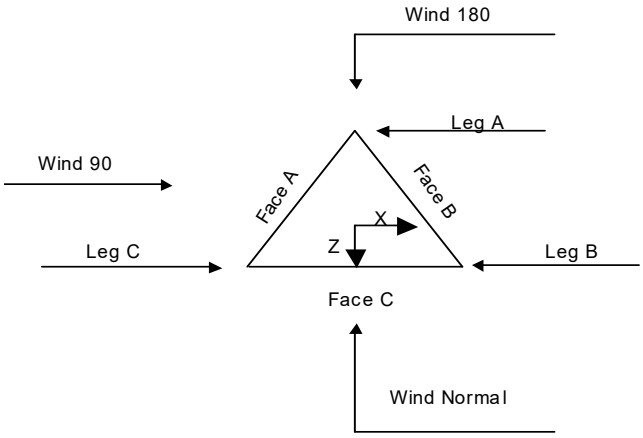
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 10.599 ft at the top and 25.000 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 0.000 ft.
Basic wind speed of 145 mph.
Risk Category III.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.000 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.
Deflections calculated using a wind speed of 60 mph.
P-Delta for analysis does not apply for this case - TIA-222-H Section 3..
Previous MODification note: Top Girt Horizontals @ 12.5' & 37.5' were previous MODifications from Project SAI-063 (06/2011) and considered constructed..
Appurtenance Reference # based on Tower Inventory/Mapping Report from Stainless Inc..
Carrier Centerlines (AT&T/T-Mobile/Sprint) are based on Carrier RFDS Centerlines from previously obtained information listed in Section 1 of this S.A. report..
UPDATE!! - 06/09/2020 - Removal of (3) Wind-Load Dishes per CSP request..
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.000-175.000			10.599	1	5.000
T2	175.000-166.667			11.000	1	8.333
T3	166.667-158.333			11.667	1	8.333
T4	158.333-150.000			12.333	1	8.333
T5	150.000-125.000			13.000	1	25.000
T6	125.000-100.000			15.000	1	25.000
T7	100.000-91.667			17.000	1	8.333
T8	91.667-83.333			17.667	1	8.333
T9	83.333-75.000			18.333	1	8.333
T10	75.000-50.000			19.000	1	25.000
T11	50.000-37.500			21.000	1	12.500
T12	37.500-25.000			22.000	1	12.500
T13	25.000-12.500			23.000	1	12.500
T14	12.500-0.000			24.000	1	12.500

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	180.000-175.000	5.000	K Brace Down	No	Yes	0.000	0.000
T2	175.000-166.667	8.333	K Brace Down	No	Yes	0.000	0.000
T3	166.667-158.333	8.333	K Brace Down	No	Yes	0.000	0.000
T4	158.333-150.000	8.333	K Brace Down	No	Yes	0.000	0.000
T5	150.000-125.000	8.333	K1 Down	No	Yes	0.000	0.000
T6	125.000-100.000	8.333	K1 Down	No	Yes	0.000	0.000
T7	100.000-91.667	8.333	K1 Down	No	Yes	0.000	0.000
T8	91.667-83.333	8.333	K1 Down	No	Yes	0.000	0.000
T9	83.333-75.000	8.333	K1 Down	No	Yes	0.000	0.000
T10	75.000-50.000	12.500	K1 Down	No	Yes	0.000	0.000
T11	50.000-37.500	12.500	K1 Down	No	Yes	0.000	0.000
T12	37.500-25.000	12.500	K1 Down	No	Yes	0.000	0.000
T13	25.000-12.500	12.500	K1 Down	No	Yes	0.000	0.000
T14	12.500-0.000	12.500	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-175.000	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 175.000-166.667	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 166.667-158.333	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 158.333-150.000	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T5 150.000-125.000	Pipe	Stainless P5x0.300	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x5/16x3/8	A36 (36 ksi)
T6 125.000-100.000	Pipe	Stainless P5x0.400	A513-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T7 100.000-91.667	Pipe	Stainless P5x0.500	A513-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T8 91.667-83.333	Arbitrary Shape	1/3 Pipe w/ 5"x0.5 Stainless	A500-42 (42 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T9 83.333-75.000	Arbitrary Shape	1/3 Pipe w/ 5"x0.5 Stainless	A500-42 (42 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T10 75.000-50.000	Pipe	Stainless P6.875x0.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T11 50.000-37.500	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3x5/16x3/8	A36 (36 ksi)
T12 37.500-25.000	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)
T13 25.000-12.500	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)
T14 12.500-0.000	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (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 180.000-175.000	Single Angle	L3x3x1/4	A36 (36 ksi)	Pipe		A36 (36 ksi)
T3 166.667-158.333	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Pipe		A36 (36 ksi)
T4 158.333-150.000	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Pipe		A36 (36 ksi)
T12 37.500-25.000	Double Equal Angle	2L4x4x1/4	A36 (36 ksi)	Pipe		A36 (36 ksi)
T14 12.500-0.000	Double Equal Angle	2L4x4x5/16	A36 (36 ksi)	Pipe		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
T1 180.000-175.000	None	Pipe		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T2 175.000-166.667	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 166.667-158.333	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 158.333-150.000	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 150.000-125.000	None	Pipe		A36 (36 ksi)	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)
T6 125.000-100.000	None	Pipe		A36 (36 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T7 100.000-91.667	None	Pipe		A36 (36 ksi)	Double Equal Angle	2L3x3x1/4	A36 (36 ksi)
T8 91.667-83.333	None	Pipe		A36 (36 ksi)	Double Angle	2L3x3x1/4	A36 (36 ksi)
T9 83.333-75.000	None	Pipe		A36 (36 ksi)	Double Angle	2L3x3x1/4	A36 (36 ksi)
T10 75.000-50.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T11 50.000-37.500	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T12 37.500-25.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T13 25.000-12.500	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x3/8	A529-50 (50 ksi)
T14 12.500-0.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T5 150.000-125.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 125.000-100.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 100.000-91.667	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 91.667-83.333	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 83.333-75.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T10 75.000-50.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T11 50.000-37.500	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T12 37.500-25.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 25.000-12.500	Solid Round		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T14 12.500-0.000	Solid Round		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T5 150.000-125.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T6 125.000-100.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T7 100.000-91.667	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T8 91.667-83.333	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T9 83.333-75.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T10 75.000-50.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T11 50.000-37.500	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T12 37.500-25.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T13 25.000-12.500	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T14 12.500-0.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.000-175.000	0.000	0.000	A36 (36 ksi)	1	1	1	29.736	Third-Pt	Third-Pt
T2 175.000-166.667	0.000	0.000	A36 (36 ksi)	1	1	1	40.696	Third-Pt	Third-Pt
T3 166.667-158.333	0.000	0.000	A36 (36 ksi)	1	1	1	41.476	Third-Pt	Third-Pt
T4 158.333-150.000	0.000	0.000	A36 (36 ksi)	1	1	1	42.280	Third-Pt	Third-Pt
T5 150.000-125.000	0.000	0.000	A36 (36 ksi)	1	1	1	33.639	Third-Pt	Third-Pt
T6 125.000-100.000	0.000	0.000	A36 (36 ksi)	1	1	1	47.620	Third-Pt	Third-Pt
T7 100.000-91.667	0.000	0.000	A36 (36 ksi)	1	1	1	48.580	Third-Pt	Third-Pt
T8 91.667-83.333	0.000	0.000	A36 (36 ksi)	1	1	1	37.170	Third-Pt	Third-Pt
T9 83.333-75.000	0.000	0.000	A36 (36 ksi)	1	1	1	37.917	Third-Pt	Third-Pt
T10 75.000-50.000	0.000	0.000	A36 (36 ksi)	1	1	1	65.308	Third-Pt	Third-Pt
T11 50.000-37.500	0.000	0.000	A36 (36 ksi)	1	1	1	24.980	Third-Pt	Third-Pt
T12 37.500-25.000	0.000	0.000	A36 (36 ksi)	1	1	1	67.952	Third-Pt	Third-Pt
T13 25.000-12.500	0.000	0.000	A36 (36 ksi)	1	1	1	51.990	Third-Pt	Third-Pt
T14 12.500-0.000	0.000	0.000	A36 (36 ksi)	1	1	1	53.040	Mid-Pt	Third-Pt

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 180.000-175.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 175.000-166.667	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 166.667-158.333	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 158.333-150.0	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
00															
T5	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
150.000-125.0				1	1	1	1	1	1	1	1	1	1	1	1
00															
T6	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
125.000-100.0				1	1	1	1	1	1	1	1	1	1	1	1
00															
T7	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
100.000-91.66				1	1	1	1	1	1	1	1	1	1	1	1
7															
T8	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
91.667-83.333				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
83.333-75.000				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
75.000-50.000				1	1	1	1	1	1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
50.000-37.500				1	1	1	1	1	1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
37.500-25.000				1	1	1	1	1	1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
25.000-12.500				1	1	1	1	1	1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
12.500-0.000				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
180.000-175.0														
00														
T2	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
175.000-166.6														
67														
T3	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
166.667-158.3														
33														
T4	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
158.333-150.0														
00														
T5	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
150.000-125.0														
00														
T6	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
125.000-100.0														
00														

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
T7 100.000-91.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 91.667-83.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 83.333-75.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 75.000-50.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 50.000-37.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T12 37.500-25.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 25.000-12.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 12.500-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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 180.000-175.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T2 175.000-166.667	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T3 166.667-158.333	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T4 158.333-150.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T5 150.000-125.000	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T6 125.000-100.000	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T7 100.000-91.667	Flange	1.000 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T8 91.667-83.333	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T9 83.333-75.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T10 75.000-50.000	Flange	1.000 A325X	8	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T11 50.000-37.500	Flange	1.000 A325X	8	1.000 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T12 37.500-25.000	Flange	1.000 A325X	0	1.000 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T13 25.000-12.500	Flange	1.000 A325X	8	1.000 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T14 12.500-0.000	Flange	1.000 A325X	0	1.000 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
* Stainless Inc. Tower Mapping (12/11/2019)													
LDF4-50A (1/2 FOAM) (DNK-1 (St# 54) Cable # 56)	A	No	No	Ar (CaAa)	17.500 - 8.000	-3.000	0.26	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-2 (St# 53) Cable # 55)	A	No	No	Ar (CaAa)	19.500 - 8.000	-3.000	0.24	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-3 (St# 52) Cable # 52)	A	No	No	Ar (CaAa)	29.500 - 8.000	-3.000	0.42	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-4 (St# 51) Cable # 51)	A	No	No	Ar (CaAa)	34.000 - 8.000	-3.000	0.44	1	1	0.630	0.630		0.150
LDF6-50A (1-1/4 FOAM) (DNK-5 (St# 50) Cable # 65)	A	No	No	Ar (CaAa)	81.000 - 8.000	-5.000	0.38	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-6 (St# 49) Cable # 36)	A	No	No	Ar (CaAa)	76.000 - 8.000	-6.000	0.26	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-7 (St# 48) Cable # 42)	A	No	No	Ar (CaAa)	76.000 - 8.000	-3.000	0.18	1	1	1.090	1.090		0.330

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
LDF5-50A (7/8 FOAM) (DNK-8 (St# 47) Cable # 37)	A	No	No	Ar (CaAa)	111.000 - 8.000	-5.000	0.36	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-10 (St# 46) Cable # 40)	A	No	No	Ar (CaAa)	123.000 - 8.000	-6.000	0.22	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-9 (St# 45) Cable # 41) * TMW Proposed 5-1-2019	A	No	No	Ar (CaAa)	125.000 - 8.000	-3.000	0.22	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (T-Mobile) * TMW Proposed 5-1-2019	C	No	No	Ar (CaAa)	130.000 - 8.000	-3.000	-0.33	12	6	1.090	1.090		0.330
* Sprint Hybrid HCS 6x12 6 AWG (1-1/4") (Sprint) * Sprint *AT&T *AT&T * Stainless Inc. Tower Mapping (12/11/2019)	C	No	No	Ar (CaAa)	137.000 - 8.000	-3.000	0.35	4	4	1.540	1.540		1.700
LDF5-50A (7/8 FOAM) (DNK-33 (St# 24) Cable # 54)	A	No	No	Ar (CaAa)	160.000 - 8.000	-3.000	0.4	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-32 (St# 25) Cable # 59)	A	No	No	Ar (CaAa)	149.000 - 8.000	-3.000	0.36	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-37 (St# 23) Cable # 49)	A	No	No	Ar (CaAa)	156.000 - 8.000	-5.000	0.4	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM) (DNK-34 (St# 22) Cable # 35)	A	No	No	Ar (CaAa)	151.000 - 8.000	-5.000	0.3	1	1	0.630	0.630		0.150
LDF5-50A (7/8 FOAM) (DNK-35 (St# 21) Cable #	A	No	No	Ar (CaAa)	161.000 - 8.000	-6.000	0.24	1	1	1.090	1.090		0.330

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
38)													
LDF5-50A (7/8 FOAM) ((St# 20) Cable # 39)	A	No	No	Ar (CaAa)	166.500 - 8.000	-5.000	0.28	1	1	1.090	1.090		0.330
EW63 (DNK-44 (St# 18) Cable # 44)	A	No	No	Af (CaAa)	176.000 - 8.000	-5.000	0.44	1	1	1.574	1.574		0.510
EW63 (DNK-45 (St# 17) Cable # 46)	A	No	No	Af (CaAa)	178.000 - 8.000	-5.000	0.42	1	1	1.574	1.574		0.510
LDF5-50A (7/8 FOAM) ((St# 16) Cable # 62)	A	No	No	Ar (CaAa)	177.500 - 8.000	-9.000	0.18	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-38 (St# 15) Cable # 61)	A	No	No	Ar (CaAa)	160.000 - 8.000	-9.000	0.22	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-39 (St# 14) Cable # 63)	A	No	No	Ar (CaAa)	160.000 - 8.000	-9.000	0.24	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-59 (St# 13) Cable # 60)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.18	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-41 (St# 12) Cable # 53)	A	No	No	Ar (CaAa)	170.000 - 8.000	-3.000	0.1	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-51 (St# 11) Cable # 64)	A	No	No	Ar (CaAa)	180.000 - 8.000	-5.000	0.32	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-52 (St# 10) Cable # 50)	A	No	No	Ar (CaAa)	180.000 - 8.000	-5.000	0.34	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM) (DNK-47 (St# 9) Cable # 30)	C	No	No	Ar (CaAa)	177.500 - 8.000	-9.000	0.25	1	1	0.630	0.630		0.150
LDF6-50A (1-1/4 FOAM) (DNK-48 (St# 8) Cable # 29)	C	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.25	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-40 (St# 7) Cable # 58)	A	No	No	Ar (CaAa)	170.000 - 8.000	-3.000	0.12	1	1	1.090	1.090		0.330
LDF6-50A	C	No	No	Ar (CaAa)	180.000 -	-3.000	0.25	1	1	1.550	1.550		0.660

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
(1-1/4 FOAM) (DNK-57 (St# 6) Cable # 28)					8.000								
LDF5-50A (7/8 FOAM) (DNK-58 (St# 5) Cable # 43)	A	No	No	Ar (CaAa)	180.000 - 8.000	-3.000	0.14	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-42 (St# 4) Cable # 47)	A	No	No	Ar (CaAa)	173.000 - 8.000	-6.000	0.16	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-53 (St# 3) Cable # 48)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.14	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-54 (St# 2) Cable # 57)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.12	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-55 (St# 1) Cable # 45) * Stainless Inc. Tower Mapping (12/11/2019) * Eversource Proposed (4/20/2020)	A	No	No	Ar (CaAa)	180.000 - 8.000	-6.000	0.1	1	1	1.090	1.090		0.330
LCF78-50J (7/8 FOAM) (Eversource - Proposed)	C	No	No	Ar (CaAa)	162.000 - 8.000	-3.000	0.32	1	1	1.100	1.100		0.530
LCF78-50J (7/8 FOAM) (Eversource - Proposed) *AT&T	C	No	No	Ar (CaAa)	124.000 - 8.000	-3.000	0.3	1	1	1.100	1.100		0.530
LDF6-50A (1-1/4 FOAM) (ATT)	C	No	No	Ar (CaAa)	148.000 - 8.000	-6.000	-0.43	3	3	1.550	1.550		0.660
LDF6-50A (1-1/4 FOAM) (ATT)	C	No	No	Ar (CaAa)	148.000 - 8.000	-3.000	-0.4	9	9	1.550	1.550		0.660
FB-L98B-02 (10mm Fiber) (ATT)	C	No	No	Ar (CaAa)	148.000 - 8.000	-3.000	-0.45	1	1	0.394	0.394		0.300
RSS 8 - AWG 2 (0.645") (ATT) *AT&T	C	No	No	Ar (CaAa)	148.000 - 8.000	-3.000	-0.46	2	2	0.645	0.645		0.300

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement* *ft*	*Total Number*	*C_AA_A* *ft^2/ft*	*Weight* *plf*
* TMW Proposed 5-1-2019								
* Sprint								
*AT&T								
* Stainless Inc. Tower Mapping (12/11/2019)								
*AT&T								

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* *lb*
T1	180.000-175.000	A	0.000	0.000	6.027	0.000	19.315
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.708	0.000	6.975
T2	175.000-166.667	A	0.000	0.000	15.103	0.000	46.060
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	3.108	0.000	12.250
T3	166.667-158.333	A	0.000	0.000	18.612	0.000	57.858
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	3.512	0.000	14.193
T4	158.333-150.000	A	0.000	0.000	23.331	0.000	75.047
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	4.025	0.000	16.667
T5	150.000-125.000	A	0.000	0.000	76.895	0.000	250.430
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	72.660	0.000	354.260
T6	125.000-100.000	A	0.000	0.000	83.524	0.000	270.720
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	113.524	0.000	552.220
T7	100.000-91.667	A	0.000	0.000	28.423	0.000	92.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	37.878	0.000	184.250
T8	91.667-83.333	A	0.000	0.000	28.423	0.000	92.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	37.878	0.000	184.250
T9	83.333-75.000	A	0.000	0.000	29.571	0.000	96.620
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	37.878	0.000	184.250
T10	75.000-50.000	A	0.000	0.000	94.593	0.000	309.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	113.634	0.000	552.750
T11	50.000-37.500	A	0.000	0.000	47.297	0.000	154.500
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	56.817	0.000	276.375
T12	37.500-25.000	A	0.000	0.000	48.147	0.000	156.525
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	56.817	0.000	276.375
T13	25.000-12.500	A	0.000	0.000	49.628	0.000	160.050
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	56.817	0.000	276.375
T14	12.500-0.000	A	0.000	0.000	18.161	0.000	58.320

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 lb
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	20.454	0.000	99.495

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 lb
T1	180.000-175.000	A	1.361	0.000	0.000	17.321	0.000	208.517
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	5.109	0.000	63.637
T2	175.000-166.667	A	1.356	0.000	0.000	41.220	0.000	492.202
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	9.886	0.000	119.847
T3	166.667-158.333	A	1.349	0.000	0.000	52.106	0.000	620.335
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	11.245	0.000	135.770
T4	158.333-150.000	A	1.342	0.000	0.000	65.460	0.000	782.657
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	12.969	0.000	155.950
T5	150.000-125.000	A	1.326	0.000	0.000	215.903	0.000	2562.962
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	209.345	0.000	2500.064
T6	125.000-100.000	A	1.300	0.000	0.000	235.371	0.000	2744.131
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	291.024	0.000	3643.441
T7	100.000-91.667	A	1.279	0.000	0.000	79.598	0.000	916.705
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	96.650	0.000	1199.961
T8	91.667-83.333	A	1.268	0.000	0.000	79.134	0.000	905.586
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	96.380	0.000	1191.057
T9	83.333-75.000	A	1.255	0.000	0.000	81.786	0.000	931.168
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	96.086	0.000	1181.389
T10	75.000-50.000	A	1.226	0.000	0.000	260.082	0.000	2908.010
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	286.212	0.000	3477.214
T11	50.000-37.500	A	1.183	0.000	0.000	127.142	0.000	1387.204
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	141.609	0.000	1690.093
T12	37.500-25.000	A	1.144	0.000	0.000	128.439	0.000	1363.164
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	140.245	0.000	1646.425
T13	25.000-12.500	A	1.087	0.000	0.000	131.028	0.000	1333.234
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	138.263	0.000	1583.796
T14	12.500-0.000	A	0.974	0.000	0.000	45.328	0.000	427.270
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	48.361	0.000	526.571

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.000-175.000	-3.171	-5.213	-5.512	-7.909
T2	175.000-166.667	-4.554	-10.277	-7.279	-12.977
T3	166.667-158.333	-5.625	-12.229	-8.781	-15.570
T4	158.333-150.000	-6.433	-15.200	-9.682	-19.295
T5	150.000-125.000	4.424	-4.020	5.720	-4.612
T6	125.000-100.000	6.694	0.518	6.429	-0.901
T7	100.000-91.667	6.862	0.222	6.626	-1.375
T8	91.667-83.333	6.140	0.220	6.437	-1.284
T9	83.333-75.000	6.127	-0.494	6.405	-2.255
T10	75.000-50.000	6.881	-1.690	6.558	-3.979
T11	50.000-37.500	7.144	-1.753	7.011	-3.866
T12	37.500-25.000	7.259	-2.319	7.251	-4.908
T13	25.000-12.500	7.245	-3.143	7.302	-6.301
T14	12.500-0.000	3.562	-1.802	4.417	-3.541

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	36	EW63	175.00 - 176.00	0.6000	0.6000
T1	37	EW63	175.00 - 178.00	0.6000	0.6000
T1	38	LDF5-50A (7/8 FOAM)	175.00 - 177.50	0.6000	0.6000
T1	41	LDF7-50A (1-5/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	43	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	44	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	45	LDF4-50A (1/2 FOAM)	175.00 - 177.50	0.6000	0.6000
T1	46	LDF6-50A (1-1/4 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	48	LDF6-50A (1-1/4 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	49	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	51	LDF7-50A (1-5/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	52	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T1	53	LDF5-50A (7/8 FOAM)	175.00 - 180.00	0.6000	0.6000
T2	36	EW63	166.67 - 175.00	0.6000	0.6000
T2	37	EW63	166.67 - 175.00	0.6000	0.6000
T2	38	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	41	LDF7-50A (1-5/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	42	LDF5-50A (7/8 FOAM)	166.67 - 170.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	43	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	44	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	45	LDF4-50A (1/2 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	46	LDF6-50A (1-1/4 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	47	LDF5-50A (7/8 FOAM)	166.67 - 170.00	0.6000	0.6000
T2	48	LDF6-50A (1-1/4 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	49	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	50	LDF7-50A (1-5/8 FOAM)	166.67 - 173.00	0.6000	0.6000
T2	51	LDF7-50A (1-5/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	52	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T2	53	LDF5-50A (7/8 FOAM)	166.67 - 175.00	0.6000	0.6000
T3	29	LDF5-50A (7/8 FOAM)	158.33 - 160.00	0.6000	0.6000
T3	33	LDF5-50A (7/8 FOAM)	158.33 - 161.00	0.6000	0.6000
T3	34	LDF5-50A (7/8 FOAM)	158.33 - 166.50	0.6000	0.6000
T3	36	EW63	158.33 - 166.67	0.6000	0.6000
T3	37	EW63	158.33 - 166.67	0.6000	0.6000
T3	38	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	39	LDF7-50A (1-5/8 FOAM)	158.33 - 160.00	0.6000	0.6000
T3	40	LDF7-50A (1-5/8 FOAM)	158.33 - 160.00	0.6000	0.6000
T3	41	LDF7-50A (1-5/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	42	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	43	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	44	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	45	LDF4-50A (1/2 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	46	LDF6-50A (1-1/4 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	47	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	48	LDF6-50A (1-1/4 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	49	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	50	LDF7-50A (1-5/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	51	LDF7-50A (1-5/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	52	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	53	LDF5-50A (7/8 FOAM)	158.33 - 166.67	0.6000	0.6000
T3	56	LCF78-50J (7/8 FOAM)	158.33 - 162.00	0.6000	0.6000
T4	29	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	31	LDF5-50A (7/8 FOAM)	150.00 - 156.00	0.6000	0.6000
T4	32	LDF4-50A (1/2 FOAM)	150.00 - 151.00	0.6000	0.6000
T4	33	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	34	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	36	EW63	150.00 - 158.33	0.6000	0.6000
T4	37	EW63	150.00 - 158.33	0.6000	0.6000
T4	38	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	39	LDF7-50A (1-5/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	40	LDF7-50A (1-5/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	41	LDF7-50A (1-5/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	42	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	43	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	44	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	45	LDF4-50A (1/2 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	46	LDF6-50A (1-1/4 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	47	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	48	LDF6-50A (1-1/4 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	49	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	50	LDF7-50A (1-5/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	51	LDF7-50A (1-5/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	52	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	53	LDF5-50A (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T4	56	LCF78-50J (7/8 FOAM)	150.00 - 158.33	0.6000	0.6000
T5	13	LDF5-50A (7/8 FOAM)	125.00 - 130.00	0.6000	0.6000
T5	18	Hybrid HCS 6x12 6 AWG (1-1/4")	125.00 - 137.00	0.6000	0.6000
T5	29	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	30	LDF7-50A (1-5/8 FOAM)	125.00 - 149.00	0.6000	0.6000
T5	31	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	32	LDF4-50A (1/2 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	33	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	34	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	36	EW63	125.00 - 150.00	0.6000	0.6000
T5	37	EW63	125.00 - 150.00	0.6000	0.6000
T5	38	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	39	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	40	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	41	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	42	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	43	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	44	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	45	LDF4-50A (1/2 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	46	LDF6-50A (1-1/4 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	47	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	48	LDF6-50A (1-1/4 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	49	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	50	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	51	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	52	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	53	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	56	LCF78-50J (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T5	59	LDF6-50A (1-1/4 FOAM)	125.00 - 148.00	0.6000	0.6000
T5	60	LDF6-50A (1-1/4 FOAM)	125.00 - 148.00	0.6000	0.6000
T5	61	FB-L98B-02 (10mm Fiber)	125.00 - 148.00	0.6000	0.6000
T5	62	RSS 8 - AWG 2 (0.645")	125.00 - 148.00	0.6000	0.6000
T6	9	LDF5-50A (7/8 FOAM)	100.00 - 111.00	0.6000	0.6000
T6	10	LDF5-50A (7/8 FOAM)	100.00 - 123.00	0.6000	0.6000
T6	11	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	13	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	18	Hybrid HCS 6x12 6 AWG (1-1/4")	100.00 - 125.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	29	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	30	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	31	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	32	LDF4-50A (1/2 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	33	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	34	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	36	EW63	100.00 - 125.00	0.6000	0.6000
T6	37	EW63	100.00 - 125.00	0.6000	0.6000
T6	38	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	39	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	40	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	41	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	42	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	43	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	44	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	45	LDF4-50A (1/2 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	46	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	47	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	48	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	49	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	50	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	51	LDF7-50A (1-5/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	52	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	53	LDF5-50A (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	56	LCF78-50J (7/8 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	57	LCF78-50J (7/8 FOAM)	100.00 - 124.00	0.6000	0.6000
T6	59	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	60	LDF6-50A (1-1/4 FOAM)	100.00 - 125.00	0.6000	0.6000
T6	61	FB-L98B-02 (10mm Fiber)	100.00 - 125.00	0.6000	0.6000
T6	62	RSS 8 - AWG 2 (0.645")	100.00 - 125.00	0.6000	0.6000
T7	9	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	10	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	11	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	13	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	18	Hybrid HCS 6x12 6 AWG (1-1/4")	91.67 - 100.00	0.6000	0.6000
T7	29	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	30	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	31	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	32	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	33	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	34	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	36	EW63	91.67 - 100.00	0.6000	0.6000
T7	37	EW63	91.67 - 100.00	0.6000	0.6000
T7	38	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	39	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	40	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	41	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	42	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	43	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	44	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	45	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	46	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	47	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	48	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	49	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	50	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	51	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	52	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	53	LDF5-50A (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	56	LCF78-50J (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	57	LCF78-50J (7/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	59	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	60	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T7	61	FB-L98B-02 (10mm Fiber)	91.67 - 100.00	0.6000	0.6000
T7	62	RSS 8 - AWG 2 (0.645")	91.67 - 100.00	0.6000	0.6000
T8	9	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	10	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	11	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	13	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	18	Hybrid HCS 6x12 6 AWG (1-1/4")	83.33 - 91.67	0.6000	0.6000
T8	29	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	30	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	31	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	32	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	33	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	34	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	36	EW63	83.33 - 91.67	0.6000	0.6000
T8	37	EW63	83.33 - 91.67	0.6000	0.6000
T8	38	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	39	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	40	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	41	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	42	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	43	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	44	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	45	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	46	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	47	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	48	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	49	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	50	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	51	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	52	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	53	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	56	LCF78-50J (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	57	LCF78-50J (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	59	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	60	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000
T8	61	FB-L98B-02 (10mm Fiber)	83.33 - 91.67	0.6000	0.6000
T8	62	RSS 8 - AWG 2 (0.645")	83.33 - 91.67	0.6000	0.6000
T9	6	LDF6-50A (1-1/4 FOAM)	75.00 - 81.00	0.6000	0.6000
T9	7	LDF5-50A (7/8 FOAM)	75.00 - 76.00	0.6000	0.6000
T9	8	LDF5-50A (7/8 FOAM)	75.00 - 76.00	0.6000	0.6000
T9	9	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	10	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	11	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	13	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	18	Hybrid HCS 6x12 6 AWG (1-1/4")	75.00 - 83.33	0.6000	0.6000
T9	29	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	30	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	31	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	32	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	33	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	34	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	36	EW63	75.00 - 83.33	0.6000	0.6000
T9	37	EW63	75.00 - 83.33	0.6000	0.6000
T9	38	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	39	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	40	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	41	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	42	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	43	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	44	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	45	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	46	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	47	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	48	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	49	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	50	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	51	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	52	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	53	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	56	LCF78-50J (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	57	LCF78-50J (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	59	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	60	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T9	61	FB-L98B-02 (10mm Fiber)	75.00 - 83.33	0.6000	0.6000
T9	62	RSS 8 - AWG 2 (0.645")	75.00 - 83.33	0.6000	0.6000
T10	6	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	7	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	8	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	9	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	10	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	11	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	13	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	18	Hybrid HCS 6x12 6 AWG (1-1/4")	50.00 - 75.00	0.6000	0.6000
T10	29	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	30	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	31	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	32	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	33	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	34	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	36	EW63	50.00 - 75.00	0.6000	0.6000
T10	37	EW63	50.00 - 75.00	0.6000	0.6000
T10	38	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	39	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	40	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	41	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	42	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	43	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	44	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	45	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	46	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	47	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	48	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	49	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	50	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	51	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	52	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	53	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	56	LCF78-50J (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	57	LCF78-50J (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	59	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	60	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T10	61	FB-L98B-02 (10mm Fiber)	50.00 - 75.00	0.6000	0.6000
T10	62	RSS 8 - AWG 2 (0.645")	50.00 - 75.00	0.6000	0.6000
T11	6	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	7	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	8	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	9	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	10	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	11	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	13	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	18	Hybrid HCS 6x12 6 AWG (1-1/4")	37.50 - 50.00	0.6000	0.6000
T11	29	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	30	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	31	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	32	LDF4-50A (1/2 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	33	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	34	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	36	EW63	37.50 - 50.00	0.6000	0.6000
T11	37	EW63	37.50 - 50.00	0.6000	0.6000
T11	38	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	39	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	40	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	41	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	42	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	43	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	44	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	45	LDF4-50A (1/2 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	46	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	47	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	48	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	49	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	50	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	51	LDF7-50A (1-5/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	52	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	53	LDF5-50A (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	56	LCF78-50J (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	57	LCF78-50J (7/8 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	59	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	60	LDF6-50A (1-1/4 FOAM)	37.50 - 50.00	0.6000	0.6000
T11	61	FB-L98B-02 (10mm Fiber)	37.50 - 50.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	62	RSS 8 - AWG 2 (0.645")	37.50 - 50.00	0.6000	0.6000
T12	4	LDF4-50A (1/2 FOAM)	25.00 - 29.50	0.6000	0.6000
T12	5	LDF4-50A (1/2 FOAM)	25.00 - 34.00	0.6000	0.6000
T12	6	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	7	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	8	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	9	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	10	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	11	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	13	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	18	Hybrid HCS 6x12 6 AWG (1-1/4")	25.00 - 37.50	0.6000	0.6000
T12	29	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	30	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	31	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	32	LDF4-50A (1/2 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	33	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	34	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	36	EW63	25.00 - 37.50	0.6000	0.6000
T12	37	EW63	25.00 - 37.50	0.6000	0.6000
T12	38	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	39	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	40	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	41	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	42	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	43	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	44	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	45	LDF4-50A (1/2 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	46	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	47	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	48	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	49	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	50	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	51	LDF7-50A (1-5/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	52	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	53	LDF5-50A (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	56	LCF78-50J (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	57	LCF78-50J (7/8 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	59	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	60	LDF6-50A (1-1/4 FOAM)	25.00 - 37.50	0.6000	0.6000
T12	61	FB-L98B-02 (10mm Fiber)	25.00 - 37.50	0.6000	0.6000
T12	62	RSS 8 - AWG 2 (0.645")	25.00 - 37.50	0.6000	0.6000
T13	2	LDF4-50A (1/2 FOAM)	12.50 - 17.50	0.6000	0.6000
T13	3	LDF4-50A (1/2 FOAM)	12.50 - 19.50	0.6000	0.6000
T13	4	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	5	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	6	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	7	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	8	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	9	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	10	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	11	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	13	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	18	Hybrid HCS 6x12 6 AWG (1-1/4")	12.50 - 25.00	0.6000	0.6000
T13	29	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	30	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	31	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	32	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	33	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	34	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	36	EW63	12.50 - 25.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	37	EW63	12.50 - 25.00	0.6000	0.6000
T13	38	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	39	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	40	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	41	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	42	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	43	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	44	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	45	LDF4-50A (1/2 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	46	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	47	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	48	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	49	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	50	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	51	LDF7-50A (1-5/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	52	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	53	LDF5-50A (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	56	LCF78-50J (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	57	LCF78-50J (7/8 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	59	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	60	LDF6-50A (1-1/4 FOAM)	12.50 - 25.00	0.6000	0.6000
T13	61	FB-L98B-02 (10mm Fiber)	12.50 - 25.00	0.6000	0.6000
T13	62	RSS 8 - AWG 2 (0.645")	12.50 - 25.00	0.6000	0.6000
T14	2	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	3	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	4	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	5	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	6	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	7	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	8	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	9	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	10	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	11	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	13	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	18	Hybrid HCS 6x12 6 AWG (1-1/4")	8.00 - 12.50	0.6000	0.6000
T14	29	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	30	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	31	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	32	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	33	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	34	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	36	EW63	8.00 - 12.50	0.6000	0.6000
T14	37	EW63	8.00 - 12.50	0.6000	0.6000
T14	38	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	39	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	40	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	41	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	42	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	43	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	44	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	45	LDF4-50A (1/2 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	46	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	47	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	48	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	49	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	50	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	51	LDF7-50A (1-5/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	52	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	53	LDF5-50A (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	56	LCF78-50J (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	57	LCF78-50J (7/8 FOAM)	8.00 - 12.50	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	59	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	60	LDF6-50A (1-1/4 FOAM)	8.00 - 12.50	0.6000	0.6000
T14	61	FB-L98B-02 (10mm Fiber)	8.00 - 12.50	0.6000	0.6000
T14	62	RSS 8 - AWG 2 (0.645")	8.00 - 12.50	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
* Stainless Inc. Tower Mapping (12/11/2019)									
3' Yagi	A	From Leg	4.000	0.0000	17.500	No Ice	2.083	2.083	30.950
(DNK-1 (St# 54))			0.000			1/2" Ice	3.787	3.787	52.866
			0.000			1" Ice	5.517	5.517	85.272
1.5" Dia 3' Omni	A	From Leg	4.000	0.0000	19.500	No Ice	0.944	0.944	22.300
(DNK-2 (St# 53))			0.000			1/2" Ice	1.393	1.393	32.810
			0.000			1" Ice	1.782	1.782	46.940
4' Side Mount Standoff (1)	A	From Leg	0.000	0.0000	18.000	No Ice	2.720	2.720	50.000
(DNK 1,2 (St# 53,54))			0.000			1/2" Ice	4.910	4.910	89.000
			0.000			1" Ice	7.100	7.100	128.000
1.5" Dia 3' Omni (inverted)	A	From Leg	4.000	0.0000	29.500	No Ice	0.944	0.944	22.300
(DNK-3 (St# 52))			0.000			1/2" Ice	1.393	1.393	32.810
			0.000			1" Ice	1.782	1.782	46.940
1.5" Dia 3' Omni	A	From Leg	4.000	0.0000	27.000 - 34.000	No Ice	0.944	0.944	22.300
(DNK-4 (St# 51))			0.000			1/2" Ice	1.393	1.393	32.810
			0.000			1" Ice	1.782	1.782	46.940
4' Side Mount Standoff (1)	A	From Leg	0.000	0.0000	26.000	No Ice	2.720	2.720	50.000
(DNK-3,4 (St# 51,52))			0.000			1/2" Ice	4.910	4.910	89.000
			0.000			1" Ice	7.100	7.100	128.000
GPS	C	From Leg	1.000	0.0000	81.000	No Ice	1.000	1.000	10.000
(DNK-5 (St# 50))			0.000			1/2" Ice	1.500	1.500	15.000
			0.000			1" Ice	2.000	2.000	20.000
1' Side Arm	C	From Leg	0.000	0.0000	81.000	No Ice	2.500	2.500	55.000
(DNK-5 (St# 50))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
3' Yagi	A	From Leg	1.000	0.0000	81.000	No Ice	2.083	2.083	30.950
(DNK-6 (St# 49))			0.000			1/2" Ice	3.787	3.787	52.866
			-1.000			1" Ice	5.517	5.517	85.272
20' 4-Bay Dipole	A	From Leg	0.000	0.0000	89.500	No Ice	4.000	4.000	55.000
(DNK-7 (St# 48))			0.000			1/2" Ice	6.000	6.000	100.000
			1.000			1" Ice	8.000	8.000	145.000
1' Side Arm	A	From Leg	0.500	0.0000	82.500	No Ice	2.500	2.500	55.000
(DNK-6,7 (St# 48,49))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
1' Side Arm	A	From Leg	0.000	0.0000	102.000	No Ice	2.500	2.500	55.000
(Un-used Mount)			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
19.5"x19.5" Panel Antenna	C	From Leg	1.500	0.0000	123.000	No Ice	1.200	0.131	10.000
(DNK-10 (St# 46))			0.000			1/2" Ice	1.337	0.208	16.287
			0.000			1" Ice	1.481	0.290	24.389

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 lb
1' Side Arm	C	From Leg	0.500	0.0000	123.000	No Ice	2.500	2.500	55.000
(DNK-10 (St# 46))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
2' Sidearm	B	From Leg	0.000	0.0000	111.000	No Ice	3.900	3.900	87.000
(DNK-8 (St# 47))			0.000			1/2" Ice	4.400	4.400	97.000
			0.000			1" Ice	4.900	4.900	107.000
Decibel DB210-C Dipole	A	From Leg	1.500	0.0000	125.000	No Ice	0.800	0.800	5.500
(Single)			0.000			1/2" Ice	1.440	1.440	7.150
(DNK-9 (St# 45))			0.000			1" Ice	2.080	2.080	8.800
1' Side Arm	A	From Leg	0.500	0.0000	125.000	No Ice	2.500	2.500	55.000
(DNK-9 (St# 45))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
* Stainless Inc. Tower Mapping (12/11/2019)									
* T-Mobile Equipment (Reverted - see below)									
* T-Mobile Equipment (Reverted - see below)									
* Sprint Inventory (moved below)									
* Sprint Inventory (moved below)									
* AT&T Carrier Antennas @ 148' (moved below)									
* AT&T Carrier Antennas @ 148' (moved below)									
* Stainless Inc. Tower Mapping (12/11/2019)									
2" Dia 14' Omni (inverted)	C	From Leg	3.000	0.0000	149.000	No Ice	2.000	2.000	10.000
(DNK-32 (St# 25))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000			1" Ice	4.060	4.060	40.000
Pirod 4' Side Mount Standoff	C	From Leg	0.000	0.0000	156.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(DNK-32, 33 (St# 24,25))			0.000			1" Ice	7.100	7.100	128.000
3" Dia 9' Omni	C	From Leg	1.000	0.0000	160.000	No Ice	4.000	4.000	55.000
(DNK-33 (St# 24))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
1' Side Arm	A	From Leg	0.000	0.0000	156.000	No Ice	2.500	2.500	55.000
(DNK-37 (St# 23))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
1 Bay Dipole ANT400D	A	From Leg	0.000	0.0000	151.000	No Ice	1.879	0.518	13.300
(DNK-34 (St# 22))			0.000			1/2" Ice	2.093	0.742	27.514
			0.000			1" Ice	2.317	0.984	44.738
10'6"x4" Pipe Mount	A	From Leg	0.000	0.0000	156.000	No Ice	2.875	2.875	114.000
(DNK-34 (St# 22))			0.000			1/2" Ice	5.615	5.615	146.840
			0.000			1" Ice	6.252	6.252	186.706
ANT450F6	A	From Leg	0.000	0.0000	161.000	No Ice	1.900	1.900	8.000
(DNK-35 (St# 21))			0.000			1/2" Ice	2.728	2.728	22.340
			0.000			1" Ice	3.401	3.401	41.961
2' Sidearm	A	From Leg	0.000	0.0000	157.000	No Ice	3.900	3.900	87.000
(DNK-35 (St# 21))			0.000			1/2" Ice	4.400	4.400	97.000
			0.000			1" Ice	4.900	4.900	107.000
Telewave 150F2 Omni	B	From Leg	3.000	0.0000	166.500	No Ice	1.281	1.281	16.000
((St # 20))			0.000			1/2" Ice	1.598	1.598	26.284
			0.000			1" Ice	1.911	1.911	40.056
Pirod 4' Side Mount Standoff	B	From Leg	0.000	0.0000	164.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000

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 lb
((St # 20))			0.000			1" Ice	7.100	7.100	128.000
1' Side Arm	B	From Leg	0.000	0.0000	176.000	No Ice	2.500	2.500	55.000
(DNK-44 (St# 18))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
1' Side Arm	A	From Leg	0.000	0.0000	176.000	No Ice	2.500	2.500	55.000
(DNK-45 (St# 17))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000			1" Ice	4.226	4.226	91.000
11"x8"x12" Junction Box	A	From Face	0.000	0.0000	178.000	No Ice	0.733	1.100	25.000
((St# 16))			0.000			1/2" Ice	0.843	1.231	36.278
			0.000			1" Ice	0.959	1.370	49.759
(Inverted) 3" Dia 20' Omni	C	From Leg	6.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-38 (St# 15))			-3.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
(Inverted) 3" Dia 20' Omni	C	From Leg	6.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-39 (St# 14))			3.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
Pirod 6' Side Mount Standoff	C	From Leg	0.000	0.0000	177.500	No Ice	4.970	4.970	70.000
(1)			0.000			1/2" Ice	6.120	6.120	130.000
(DNK-38,39 (St# 13,14,15,16))			0.000			1" Ice	7.270	7.270	190.000
3" Dia 20' Omni	C	From Leg	6.000	0.0000	185.500	No Ice	4.000	4.000	55.000
(DNK-59 (St# 13))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
(inverted) 10' 8 Bay Di-Pole	C	From Face	4.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-41 (St# 12))			-6.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
1 Bay Dipole ANT400D	C	From Leg	1.000	0.0000	181.000	No Ice	1.879	0.518	13.300
(DNK-51 (St# 11))			0.000			1/2" Ice	2.093	0.742	27.514
			0.000			1" Ice	2.317	0.984	44.738
2" Dia 10' Omni	C	From Leg	0.500	0.0000	186.000	No Ice	2.000	2.000	10.000
(DNK-52 (St# 10))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000			1" Ice	4.060	4.060	40.000
432E-83I-01T TTA Unit	B	From Face	0.500	0.0000	177.500	No Ice	2.850	0.973	25.000
(DNK-47 (St# 9))			0.000			1/2" Ice	3.059	1.111	44.704
			0.000			1" Ice	3.276	1.255	67.389
3" Dia 12' Omni	C	From Face	0.500	0.0000	185.500	No Ice	2.000	2.000	10.000
(DNK-48 (St# 8))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000			1" Ice	4.060	4.060	40.000
(inverted) 10' 8 Bay Di-Pole	C	From Face	4.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-40 (St# 7))			6.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
3" Dia 20' Omni	A	From Leg	6.000	0.0000	185.500	No Ice	4.000	4.000	55.000
(DNK-57 (St# 6))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
1" Dia 8' Omni	A	From Leg	2.000	0.0000	182.500	No Ice	2.000	2.000	5.000
(DNK-58 (St# 5))			0.000			1/2" Ice	3.030	3.030	18.000
			0.000			1" Ice	4.060	4.060	31.000
6' Side-Arm(1)	B	From Leg	0.000	0.0000	177.500	No Ice	10.600	10.600	140.000
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000			1" Ice	20.200	20.200	284.000
6' Side-Arm(1)	C	From Leg	0.000	0.0000	177.500	No Ice	10.600	10.600	140.000
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000			1" Ice	20.200	20.200	284.000
6' Side-Arm(1)	C	From Face	0.000	-45.0000	177.500	No Ice	10.600	10.600	140.000
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000			1" Ice	20.200	20.200	284.000
6' Side-Arm(1)	C	From Face	0.000	45.0000	177.500	No Ice	10.600	10.600	140.000

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 lb
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000			1" Ice	20.200	20.200	284.000
(inverted) 2" Dia 10' Omni	A	From Face	4.000	0.0000	173.000	No Ice	2.000	2.000	10.000
(DNK-42 (St# 4))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000			1" Ice	4.060	4.060	40.000
2" Dia 10' Omni	A	From Leg	0.500	0.0000	185.000	No Ice	2.000	2.000	10.000
(DNK-53 (St# 3))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000			1" Ice	4.060	4.060	40.000
10' - 2 Bay Dipole	A	From Leg	0.500	0.0000	185.000	No Ice	1.408	1.408	10.000
(DNK-54 (St# 2))			0.000			1/2" Ice	1.556	1.556	27.727
			0.000			1" Ice	1.712	1.712	48.176
20' 4-Bay Dipole	A	From Leg	0.500	0.0000	181.000	No Ice	4.000	4.000	55.000
(DNK-55 (St# 1))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000			1" Ice	8.000	8.000	145.000
Lightning Rod 2"x15'	A	From Leg	0.000	0.0000	200.000	No Ice	3.000	3.000	80.000
(DNK-56 (L.R.))			0.000			1/2" Ice	4.525	4.525	103.137
			0.000			1" Ice	6.067	6.067	135.792
6' Side-Arm(1)	A	From Leg	0.000	0.0000	179.000	No Ice	10.600	10.600	140.000
(Mts for St# 4-1 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000			1" Ice	20.200	20.200	284.000
6' Side-Arm(1)	B	From Face	0.000	45.0000	179.000	No Ice	10.600	10.600	140.000
(Mts for St# 4-1 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000			1" Ice	20.200	20.200	284.000
* Everesource Proposed Eq (4/20/2020)									
Telewave ANT220F2 - Omni	C	From Leg	4.000	0.0000	162.000	No Ice	1.022	1.022	14.000
Antenna			0.000			1/2" Ice	1.290	1.290	22.796
(Eversource - Proposed)			0.000			1" Ice	1.560	1.560	34.620
Sitepro1 USF-4U Mount	C	From Leg	0.000	0.0000	159.000	No Ice	2.483	5.145	165.000
Assembly (Ca = 1.4 assumed)			0.000			1/2" Ice	3.247	6.910	318.000
(Eversource - Proposed)			0.000			1" Ice	4.029	8.675	474.000
Comprod 871F-70 Dipole	C	From Leg	1.000	0.0000	124.000	No Ice	1.700	0.468	13.000
(Eversource - Proposed)			0.000			1/2" Ice	1.894	0.672	26.826
			0.000			1" Ice	2.097	0.890	43.619
Sitepro1 USF-4U Mount	C	From Leg	0.000	0.0000	121.000	No Ice	2.483	5.145	165.000
Assembly (Ca = 1.4 assumed)			0.000			1/2" Ice	3.247	6.910	318.000
(Eversource - Proposed)			0.000			1" Ice	4.029	8.675	474.000
*** Reverted T-Mobile									
2' Sidearm	A	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	87.000
(T-Mobile DNK-11,12,13)			0.000			1/2" Ice	4.400	4.400	97.000
			0.000			1" Ice	4.900	4.900	107.000
2' Sidearm	B	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	87.000
(T-Mobile DNK-11,12,13)			0.000			1/2" Ice	4.400	4.400	97.000
			0.000			1" Ice	4.900	4.900	107.000
2' Sidearm	C	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	87.000
(T-Mobile DNK-11,12,13)			0.000			1/2" Ice	4.400	4.400	97.000
			0.000			1" Ice	4.900	4.900	107.000
(2) Ericsson TMA Unit	A	From Leg	1.000	0.0000	130.000	No Ice	0.591	0.591	19.473
(T-Mobile DNK-11,12,13)			0.000			1/2" Ice	0.698	0.761	28.287
			0.000			1" Ice	0.813	0.948	39.619
(2) Ericsson TMA Unit	B	From Leg	1.000	0.0000	130.000	No Ice	0.591	0.591	19.473
(T-Mobile DNK-11,12,13)			0.000			1/2" Ice	0.698	0.761	28.287
			0.000			1" Ice	0.813	0.948	39.619
(2) Ericsson TMA Unit	C	From Leg	1.000	0.0000	130.000	No Ice	0.591	0.591	19.473
(T-Mobile DNK-11,12,13)			0.000			1/2" Ice	0.698	0.761	28.287
			0.000			1" Ice	0.813	0.948	39.619
Commscope	B	From Leg	4.000	0.0000	130.000	No Ice	5.277	3.840	76.090

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 lb
DBXNH-6565A-A2M Panel			1.000			1/2" Ice	5.686	4.430	119.812
(T-Mobile DNK-11,12,13)			0.000			1" Ice	6.104	5.036	170.007
Commscope	B	From Leg	4.000	0.0000	130.000	No Ice	5.277	3.840	76.090
DBXNH-6565A-A2M Panel			-1.000			1/2" Ice	5.686	4.430	119.812
(T-Mobile DNK-11,12,13)			0.000			1" Ice	6.104	5.036	170.007
Commscope	C	From Leg	4.000	0.0000	130.000	No Ice	5.277	3.840	76.090
DBXNH-6565A-A2M Panel			1.000			1/2" Ice	5.686	4.430	119.812
(T-Mobile DNK-11,12,13)			0.000			1" Ice	6.104	5.036	170.007
*** Reverted T-Mobile									
*** Sprint (after ASM-009)									
@ 137'									
Pirod 12' PCS T-Frame (1)	A	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	565.000
104569			0.000			1/2" Ice	18.973	10.444	588.000
(Sprint)			0.000			1" Ice	25.347	13.160	650.000
Pirod 12' PCS T-Frame (1)	B	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	565.000
104569			0.000			1/2" Ice	18.973	10.444	588.000
(Sprint)			0.000			1" Ice	25.347	13.160	650.000
Pirod 12' PCS T-Frame (1)	C	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	565.000
104569			0.000			1/2" Ice	18.973	10.444	588.000
(Sprint)			0.000			1" Ice	25.347	13.160	650.000
APXVTM14-C-120 Panel	A	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	72.000
Antenna			-3.500			1/2" Ice	6.716	3.967	111.526
(Sprint)			0.000			1" Ice	7.097	4.333	156.120
APXVTM14-C-120 Panel	B	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	72.000
Antenna			-3.500			1/2" Ice	6.716	3.967	111.526
(Sprint)			0.000			1" Ice	7.097	4.333	156.120
APXVTM14-C-120 Panel	C	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	72.000
Antenna			-3.500			1/2" Ice	6.716	3.967	111.526
(Sprint)			0.000			1" Ice	7.097	4.333	156.120
NNVV-65B-R4 Panel	A	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	85.000
Antenna			3.500			1/2" Ice	12.766	6.207	157.141
(Sprint)			0.000			1" Ice	13.268	6.671	235.920
NNVV-65B-R4 Panel	B	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	85.000
Antenna			3.500			1/2" Ice	12.766	6.207	157.141
(Sprint)			0.000			1" Ice	13.268	6.671	235.920
NNVV-65B-R4 Panel	C	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	85.000
Antenna			3.500			1/2" Ice	12.766	6.207	157.141
(Sprint)			0.000			1" Ice	13.268	6.671	235.920
ALU TD-RRH-8x20-25	A	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	76.200
(Sprint)			3.500			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
ALU TD-RRH-8x20-25	B	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	76.200
(Sprint)			3.500			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
ALU TD-RRH-8x20-25	C	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	76.200
(Sprint)			3.500			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
(2) ALU 800MHz 2x50W	A	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	64.000
(Sprint)			3.500			1/2" Ice	2.240	2.109	86.121
			0.000			1" Ice	2.429	2.293	111.302
(2) ALU 800MHz 2x50W	B	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	64.000
(Sprint)			3.500			1/2" Ice	2.240	2.109	86.121
			0.000			1" Ice	2.429	2.293	111.302
(2) ALU 800MHz 2x50W	C	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	64.000
(Sprint)			3.500			1/2" Ice	2.240	2.109	86.121
			0.000			1" Ice	2.429	2.293	111.302
ALU 4x45-1900 MHz RRH	A	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	69.500

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 lb
Unit			-3.500			1/2" Ice	2.709	2.709	95.231
(Sprint)			0.000			1" Ice	2.926	2.926	124.333
ALU 4x45-1900 MHz RRH	B	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	69.500
Unit			-3.500			1/2" Ice	2.709	2.709	95.231
(Sprint)			0.000			1" Ice	2.926	2.926	124.333
ALU 4x45-1900 MHz RRH	C	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	69.500
Unit			-3.500			1/2" Ice	2.709	2.709	95.231
(Sprint)			0.000			1" Ice	2.926	2.926	124.333
*** Sprint (after ASM-009) @ 137'									
* AT&T Carrier Antennas @ 148' (HudsonGrp. Mount Analysis)									
13' Sector Mount (1)	A	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	220.000
(ATT)			0.000			1/2" Ice	16.100	16.100	420.000
			0.000			1" Ice	20.200	20.200	620.000
13' Sector Mount (1)	B	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	220.000
(ATT)			0.000			1/2" Ice	16.100	16.100	420.000
			0.000			1" Ice	20.200	20.200	620.000
13' Sector Mount (1)	C	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	220.000
(ATT)			0.000			1/2" Ice	16.100	16.100	420.000
			0.000			1" Ice	20.200	20.200	620.000
(2) 7770.00 panel antenna	A	From Face	4.000	0.0000	148.000	No Ice	5.528	4.007	52.033
(ATT)			-6.000			1/2" Ice	5.892	4.635	97.080
			0.000			1" Ice	6.263	5.280	148.332
AM-X-CD-16-65-00T Panels	A	From Face	4.000	0.0000	148.000	No Ice	8.024	4.642	48.500
(ATT)			-2.000			1/2" Ice	8.480	5.088	94.996
			0.000			1" Ice	8.943	5.542	147.499
(2) TMAT1921xB68-21A TMA Units	A	From Face	4.000	0.0000	148.000	No Ice	0.660	0.311	17.600
(ATT)			6.000			1/2" Ice	0.762	0.388	23.273
			0.000			1" Ice	0.872	0.472	30.560
Ericsson RRUS-11 RRH Unit	A	From Face	4.000	0.0000	148.000	No Ice	2.790	1.190	50.700
(ATT)			2.000			1/2" Ice	3.000	1.340	71.570
			0.000			1" Ice	3.210	1.500	95.480
Ericsson RRUS-12 RRH Unit	A	From Face	4.000	0.0000	148.000	No Ice	3.145	1.285	58.000
(ATT)			-2.000			1/2" Ice	3.365	1.438	81.222
			0.000			1" Ice	3.592	1.600	107.645
Raycap RVZDC-6627-PF-48	A	From Leg	0.000	0.0000	148.000	No Ice	2.510	3.780	32.000
(ATT)			0.000			1/2" Ice	2.720	4.030	64.000
			0.000			1" Ice	2.940	4.290	98.560
(2) 7770.00 panel antenna	B	From Face	4.000	0.0000	148.000	No Ice	5.528	4.007	52.033
(ATT)			-6.000			1/2" Ice	5.892	4.635	97.080
			0.000			1" Ice	6.263	5.280	148.332
AM-X-CD-16-65-00T Panels	B	From Face	4.000	0.0000	148.000	No Ice	8.024	4.642	48.500
(ATT)			-2.000			1/2" Ice	8.480	5.088	94.996
			0.000			1" Ice	8.943	5.542	147.499
(2) TMAT1921xB68-21A TMA Units	B	From Face	4.000	0.0000	148.000	No Ice	0.660	0.311	17.600
(ATT)			6.000			1/2" Ice	0.762	0.388	23.273
			0.000			1" Ice	0.872	0.472	30.560
Ericsson RRUS-11 RRH Unit	B	From Face	4.000	0.0000	148.000	No Ice	2.790	1.190	50.700
(ATT)			2.000			1/2" Ice	3.000	1.340	71.570
			0.000			1" Ice	3.210	1.500	95.480
Ericsson RRUS-12 RRH Unit	B	From Face	4.000	0.0000	148.000	No Ice	3.145	1.285	58.000
(ATT)			-2.000			1/2" Ice	3.365	1.438	81.222
			0.000			1" Ice	3.592	1.600	107.645
Raycap RVZDC-6627-PF-48	B	From Leg	0.000	0.0000	148.000	No Ice	2.510	3.780	32.000
(ATT)			0.000			1/2" Ice	2.720	4.030	64.000

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 lb
			0.000			1" Ice	2.940	4.290	98.560
(2) 7770.00 panel antenna (ATT)	C	From Face	4.000 -6.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice	5.528 5.892 6.263	4.007 4.635 5.280	52.033 97.080 148.332
AM-X-CD-16-65-00T Panels (ATT)	C	From Face	4.000 -2.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice	8.024 8.480 8.943	4.642 5.088 5.542	48.500 94.996 147.499
(2) TMAT1921xB68-21A TMA Units (ATT)	C	From Face	4.000 6.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice	0.660 0.762 0.872	0.311 0.388 0.472	17.600 23.273 30.560
Ericsson RRUS-11 RRH Unit (ATT)	C	From Face	4.000 2.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice	2.790 3.000 3.210	1.190 1.340 1.500	50.700 71.570 95.480
Ericsson RRUS-12 RRH Unit (ATT)	C	From Face	4.000 -2.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice	3.145 3.365 3.592	1.285 1.438 1.600	58.000 81.222 107.645
Raycap RVZDC-6627-PF-48 (ATT)	C	From Leg	0.000 0.000 0.000	0.0000	148.000	No Ice 1/2" Ice 1" Ice	2.510 2.720 2.940	3.780 4.030 4.290	32.000 64.000 98.560
* AT&T Carrier Antennas @ 148' (HudsonGrp. Mount Analysis)									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
6' w/Radome (DNK-45 (St# 17))	A	Paraboloid w/Radome	From Leg	0.500 0.000 0.000	-30.0000		178.000	6.000	No Ice 1/2" Ice 1" Ice	28.274 29.065 29.856	380.000 450.000 520.000
6' w/Radome (DNK-44 (St# 18))	B	Paraboloid w/Radome	From Leg	1.000 0.000 0.000	-60.0000		176.000	6.000	No Ice 1/2" Ice 1" Ice	28.274 29.065 29.856	380.000 450.000 520.000
4' Paraflector [PRF-950] (DNK-8 (St# 47))	B	Grid	From Leg	2.000 0.000 0.000	-60.0000		111.000	4.000	No Ice 1/2" Ice 1" Ice	16.000 16.674 17.347	34.000 48.000 62.000
4' Paraflector [PRF-950] (DNK-37 (St# 23))	A	Grid	From Leg	2.000 0.000 0.000	-52.3000		156.000	4.000	No Ice 1/2" Ice 1" Ice	16.000 16.674 17.347	34.000 48.000 62.000

222-H Verification Constants

Constant	Value
K_d	0.85
Ice Thickness Importance Factor	1.15

Constant	Value
Z_g	900
α	9.5
K_{zmin}	0.85
K_c	n/a
K_t	1
f	1
K_e	1

222-H Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
T1 180.000-175.000	1	Stainless P5x0.250	72.2	38.448	C	0.173	0.306	2.086	3.221	0.942	1.935
	1	Stainless P5x0.250	72.2	38.448	A	0.173	0.306	2.086	3.221	0.942	1.935
	2	Stainless P5x0.250	72.2	38.448	C	0.173	0.306	2.086	3.221	0.942	1.935
	2	Stainless P5x0.250	72.2	38.448	B	0.173	0.306	2.086	3.221	0.942	1.935
	3	Stainless P5x0.250	72.2	38.448	B	0.173	0.306	2.086	3.221	0.942	1.935
	3	Stainless P5x0.250	72.2	38.448	A	0.173	0.306	2.086	3.221	0.942	1.935
					A		Sum:	4.171	6.441	1.883	3.871
					B			4.171	6.441	1.883	3.871
					C			4.171	6.441	1.883	3.871
T2 175.000-166.667	13	Stainless P5x0.250	71.91	38.241	C	0.135	0.239	3.476	5.361	1.514	3.122
	13	Stainless P5x0.250	71.91	38.241	A	0.135	0.239	3.476	5.361	1.514	3.122
	14	Stainless P5x0.250	71.91	38.241	C	0.135	0.239	3.476	5.361	1.514	3.122
	14	Stainless P5x0.250	71.91	38.241	B	0.135	0.239	3.476	5.361	1.514	3.122
	15	Stainless P5x0.250	71.91	38.241	B	0.135	0.239	3.476	5.361	1.514	3.122
	15	Stainless P5x0.250	71.91	38.241	A	0.135	0.239	3.476	5.361	1.514	3.122
					A		Sum:	6.952	10.721	3.028	6.244
					B			6.952	10.721	3.028	6.244
					C			6.952	10.721	3.028	6.244
T3 166.667-158.333	25	Stainless P5x0.250	71.532	37.974	C	0.13	0.23	3.476	5.351	1.512	3.106
	25	Stainless P5x0.250	71.532	37.974	A	0.13	0.23	3.476	5.351	1.512	3.106
	26	Stainless P5x0.250	71.532	37.974	C	0.13	0.23	3.476	5.351	1.512	3.106
	26	Stainless P5x0.250	71.532	37.974	B	0.13	0.23	3.476	5.351	1.512	3.106
	27	Stainless P5x0.250	71.532	37.974	B	0.13	0.23	3.476	5.351	1.512	3.106
	27	Stainless P5x0.250	71.532	37.974	A	0.13	0.23	3.476	5.351	1.512	3.106
					A		Sum:	6.952	10.702	3.023	6.212
					B			6.952	10.702	3.023	6.212
					C			6.952	10.702	3.023	6.212
T4 158.333-150.000	37	Stainless P5x0.250	71.137	37.695	C	0.126	0.222	3.476	5.341	1.511	3.091
	37	Stainless P5x0.250	71.137	37.695	A	0.126	0.222	3.476	5.341	1.511	3.091
	38	Stainless P5x0.250	71.137	37.695	C	0.126	0.222	3.476	5.341	1.511	3.091
	38	Stainless P5x0.250	71.137	37.695	B	0.126	0.222	3.476	5.341	1.511	3.091
	39	Stainless P5x0.250	71.137	37.695	B	0.126	0.222	3.476	5.341	1.511	3.091
	39	Stainless P5x0.250	71.137	37.695	A	0.126	0.222	3.476	5.341	1.511	3.091
					A		Sum:	6.952	10.683	3.022	6.183
					B			6.952	10.683	3.022	6.183
					C			6.952	10.683	3.022	6.183
T5 150.000-125.00	49	Stainless P5x0.300	70.286	37.095	C	0.145	0.265	10.428	15.960	4.651	9.400

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
0											
	49	Stainless P5x0.300	70.286	37.095	A	0.145	0.265	10.428	15.960	4.651	9.400
	50	Stainless P5x0.300	70.286	37.095	C	0.145	0.265	10.428	15.960	4.651	9.400
	50	Stainless P5x0.300	70.286	37.095	B	0.145	0.265	10.428	15.960	4.651	9.400
	51	Stainless P5x0.300	70.286	37.095	B	0.145	0.265	10.428	15.960	4.651	9.400
	51	Stainless P5x0.300	70.286	37.095	A	0.145	0.265	10.428	15.960	4.651	9.400
					A		Sum:	20.856	31.921	9.303	18.799
					B			20.856	31.921	9.303	18.799
					C			20.856	31.921	9.303	18.799
T6	124	Stainless P5x0.400	68.817	36.07	C	0.142	0.254	10.428	15.850	4.698	9.288
125.000-100.000											
0											
	124	Stainless P5x0.400	68.817	36.07	A	0.142	0.254	10.428	15.850	4.698	9.288
	125	Stainless P5x0.400	68.817	36.07	C	0.142	0.254	10.428	15.850	4.698	9.288
	125	Stainless P5x0.400	68.817	36.07	B	0.142	0.254	10.428	15.850	4.698	9.288
	126	Stainless P5x0.400	68.817	36.07	B	0.142	0.254	10.428	15.850	4.698	9.288
	126	Stainless P5x0.400	68.817	36.07	A	0.142	0.254	10.428	15.850	4.698	9.288
					A		Sum:	20.856	31.701	9.397	18.576
					B			20.856	31.701	9.397	18.576
					C			20.856	31.701	9.397	18.576
T7	199	Stainless P5x0.500	67.665	35.273	C	0.137	0.244	3.476	5.255	1.574	3.066
100.000-91.667											
	199	Stainless P5x0.500	67.665	35.273	A	0.137	0.244	3.476	5.255	1.574	3.066
	200	Stainless P5x0.500	67.665	35.273	C	0.137	0.244	3.476	5.255	1.574	3.066
	200	Stainless P5x0.500	67.665	35.273	B	0.137	0.244	3.476	5.255	1.574	3.066
	201	Stainless P5x0.500	67.665	35.273	B	0.137	0.244	3.476	5.255	1.574	3.066
	201	Stainless P5x0.500	67.665	35.273	A	0.137	0.244	3.476	5.255	1.574	3.066
					A		Sum:	6.952	10.509	3.149	6.132
					B			6.952	10.509	3.149	6.132
					C			6.952	10.509	3.149	6.132
T8					A		Sum:	0.000	0.000	0.000	0.000
91.667-83.333					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T9					A		Sum:	0.000	0.000	0.000	0.000
83.333-75.000					B			0.000	0.000	0.000	0.000
					C			0.000	0.000	0.000	0.000
T10	280	Stainless P6.875x0.400	88.946	41.608	C	0.135	0.212	14.338	19.451	5.899	11.218
75.000-50.000	280	Stainless P6.875x0.400	88.946	41.608	A	0.135	0.212	14.338	19.451	5.899	11.218
	281	Stainless P6.875x0.400	88.946	41.608	C	0.135	0.212	14.338	19.451	5.899	11.218
	281	Stainless P6.875x0.400	88.946	41.608	B	0.135	0.212	14.338	19.451	5.899	11.218
	282	Stainless P6.875x0.400	88.946	41.608	B	0.135	0.212	14.338	19.451	5.899	11.218
	282	Stainless P6.875x0.400	88.946	41.608	A	0.135	0.212	14.338	19.451	5.899	11.218
					A		Sum:	28.676	38.903	11.798	22.436
					B			28.676	38.903	11.798	22.436
					C			28.676	38.903	11.798	22.436
T11	331	Stainless P6.875x0.500	85.668	39.706	C	0.13	0.202	7.169	9.636	2.930	5.538
50.000-37.500	331	Stainless P6.875x0.500	85.668	39.706	A	0.13	0.202	7.169	9.636	2.930	5.538
	332	Stainless P6.875x0.500	85.668	39.706	C	0.13	0.202	7.169	9.636	2.930	5.538
	332	Stainless P6.875x0.500	85.668	39.706	B	0.13	0.202	7.169	9.636	2.930	5.538
	333	Stainless	85.668	39.706	B	0.13	0.202	7.169	9.636	2.930	5.538

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	Face	e	e w/Ice	A_r ft^2	A_r w/Ice ft^2	A_rR_r ft^2	A_rR_r w/Ice ft^2
		P6.875x0.500									
	333	Stainless	85.668	39.706	A	0.13	0.202	7.169	9.636	2.930	5.538
		P6.875x0.500									
					A		Sum:	14.338	19.272	5.860	11.077
					B			14.338	19.272	5.860	11.077
					C			14.338	19.272	5.860	11.077
T12	358	Stainless	82.687	38	C	0.127	0.195	7.169	9.554	2.919	5.480
37.500-25.000		P6.875x0.500									
	358	Stainless	82.687	38	A	0.127	0.195	7.169	9.554	2.919	5.480
		P6.875x0.500									
	359	Stainless	82.687	38	C	0.127	0.195	7.169	9.554	2.919	5.480
		P6.875x0.500									
	359	Stainless	82.687	38	B	0.127	0.195	7.169	9.554	2.919	5.480
		P6.875x0.500									
	360	Stainless	82.687	38	B	0.127	0.195	7.169	9.554	2.919	5.480
		P6.875x0.500									
	360	Stainless	82.687	38	A	0.127	0.195	7.169	9.554	2.919	5.480
		P6.875x0.500									
					A		Sum:	14.338	19.109	5.839	10.960
					B			14.338	19.109	5.839	10.960
					C			14.338	19.109	5.839	10.960
T13	385	Stainless	78.358	35.563	C	0.124	0.187	7.169	9.436	2.910	5.401
25.000-12.500		P6.875x0.500									
	385	Stainless	78.358	35.563	A	0.124	0.187	7.169	9.436	2.910	5.401
		P6.875x0.500									
	386	Stainless	78.358	35.563	C	0.124	0.187	7.169	9.436	2.910	5.401
		P6.875x0.500									
	386	Stainless	78.358	35.563	B	0.124	0.187	7.169	9.436	2.910	5.401
		P6.875x0.500									
	387	Stainless	78.358	35.563	B	0.124	0.187	7.169	9.436	2.910	5.401
		P6.875x0.500									
	387	Stainless	78.358	35.563	A	0.124	0.187	7.169	9.436	2.910	5.401
		P6.875x0.500									
					A		Sum:	14.338	18.871	5.819	10.802
					B			14.338	18.871	5.819	10.802
					C			14.338	18.871	5.819	10.802
T14	412	Stainless	76.589	33.891	C	0.121	0.177	7.169	9.200	2.942	5.252
12.500-0.000		P6.875x0.500									
	412	Stainless	76.589	33.891	A	0.121	0.177	7.169	9.200	2.942	5.252
		P6.875x0.500									
	413	Stainless	76.589	33.891	C	0.121	0.177	7.169	9.200	2.942	5.252
		P6.875x0.500									
	413	Stainless	76.589	33.891	B	0.121	0.177	7.169	9.200	2.942	5.252
		P6.875x0.500									
	414	Stainless	76.589	33.891	B	0.121	0.177	7.169	9.200	2.942	5.252
		P6.875x0.500									
	414	Stainless	76.589	33.891	A	0.121	0.177	7.169	9.200	2.942	5.252
		P6.875x0.500									
					A		Sum:	14.338	18.400	5.885	10.504
					B			14.338	18.400	5.885	10.504
					C			14.338	18.400	5.885	10.504

222-H Section Verification Tables - No Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
T1 180.000-175.000	177.500		1.428	1	1		0.065	A	0.173	1.883
								B	0.173	1.883
								C	0.173	1.883
T2 175.000-166.667	170.833		1.417	1	1		0.065	A	0.135	3.028
								B	0.135	3.028
								C	0.135	3.028
T3 166.667-158.333	162.500		1.402	1	1		0.064	A	0.13	3.023
								B	0.13	3.023
								C	0.13	3.023
T4 158.333-150.000	154.167		1.386	1	1		0.063	A	0.126	3.022
								B	0.126	3.022
								C	0.126	3.022
T5 150.000-125.000	137.500		1.353	1	1		0.062	A	0.145	9.303
								B	0.145	9.303
								C	0.145	9.303
T6 125.000-100.000	112.500		1.297	1	1		0.059	A	0.142	9.397
								B	0.142	9.397
								C	0.142	9.397
T7 100.000-91.667	95.833		1.254	1	1		0.057	A	0.137	3.149
								B	0.137	3.149
								C	0.137	3.149
T8 91.667-83.333	87.500		1.231	1	1		0.056	A	0.137	0.000
								B	0.137	0.000
								C	0.137	0.000
T9 83.333-75.000	79.167		1.205	1	1		0.055	A	0.135	0.000
								B	0.135	0.000
								C	0.135	0.000
T10 75.000-50.000	62.500		1.146	1	1		0.052	A	0.135	11.798
								B	0.135	11.798
								C	0.135	11.798
T11 50.000-37.500	43.750		1.063	1	1		0.049	A	0.13	5.860
								B	0.13	5.860
								C	0.13	5.860
T12 37.500-25.000	31.250		0.991	1	1		0.045	A	0.127	5.839
								B	0.127	5.839
								C	0.127	5.839
T13 25.000-12.500	18.750		0.89	1	1		0.041	A	0.124	5.819
								B	0.124	5.819
								C	0.124	5.819
T14 12.500-0.000	6.250		0.85	1	1		0.039	A	0.121	5.885
								B	0.121	5.885
								C	0.121	5.885

222-H Section Verification Tables - Ice

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
T1 180.000-175.000	177.500	177.500	1.428	1	1	1.361	0.008	A	0.306	7.207
								B	0.306	7.207
								C	0.306	7.207
T2 175.000-166.667	170.833	170.833	1.417	1	1	1.356	0.008	A	0.239	10.217
								B	0.239	10.217
								C	0.239	10.217
T3 166.667-158.333	162.500	162.500	1.402	1	1	1.349	0.008	A	0.23	10.294
								B	0.23	10.294

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
								C	0.23	10.294
T4 158.333-150.000	154.167	154.167	1.386	1	1	1.342	0.008	A	0.222	10.373
								B	0.222	10.373
								C	0.222	10.373
T5 150.000-125.000	137.500	137.500	1.353	1	1	1.326	0.007	A	0.265	38.684
								B	0.265	38.684
								C	0.265	38.684
T6 125.000-100.000	112.500	112.500	1.297	1	1	1.300	0.007	A	0.254	39.908
								B	0.254	39.908
								C	0.254	39.908
T7 100.000-91.667	95.833	95.833	1.254	1	1	1.279	0.007	A	0.244	13.529
								B	0.244	13.529
								C	0.244	13.529
T8 91.667-83.333	87.500	87.500	1.231	1	1	1.268	0.007	A	0.234	7.516
								B	0.234	7.516
								C	0.234	7.516
T9 83.333-75.000	79.167	79.167	1.205	1	1	1.255	0.007	A	0.229	7.642
								B	0.229	7.642
								C	0.229	7.642
T10 75.000-50.000	62.500	62.500	1.146	1	1	1.226	0.006	A	0.212	39.956
								B	0.212	39.956
								C	0.212	39.956
T11 50.000-37.500	43.750	43.750	1.063	1	1	1.183	0.006	A	0.202	19.902
								B	0.202	19.902
								C	0.202	19.902
T12 37.500-25.000	31.250	31.250	0.991	1	1	1.144	0.005	A	0.195	19.754
								B	0.195	19.754
								C	0.195	19.754
T13 25.000-12.500	18.750	18.750	0.89	1	1	1.087	0.005	A	0.187	19.404
								B	0.187	19.404
								C	0.187	19.404
T14 12.500-0.000	6.250	6.250	0.85	1	1	0.974	0.005	A	0.177	18.429
								B	0.177	18.429
								C	0.177	18.429

222-H Section Verification Tables - Service

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
T1 180.000-175.000	177.500		1.428	1	1		0.011	A	0.173	1.883
								B	0.173	1.883
								C	0.173	1.883
T2 175.000-166.667	170.833		1.417	1	1		0.011	A	0.135	3.028
								B	0.135	3.028
								C	0.135	3.028
T3 166.667-158.333	162.500		1.402	1	1		0.011	A	0.13	3.023
								B	0.13	3.023
								C	0.13	3.023
T4 158.333-150.000	154.167		1.386	1	1		0.011	A	0.126	3.022
								B	0.126	3.022
								C	0.126	3.022
T5 150.000-125.000	137.500		1.353	1	1		0.011	A	0.145	9.303
								B	0.145	9.303
								C	0.145	9.303
T6 125.000-100.000	112.500		1.297	1	1		0.010	A	0.142	9.397

Section Elevation ft	z_{wind} ft	z_{ice} ft	K_z	K_h	K_{zt}	t_z in	q_z ksf	Face	e	A_rR_r ft²
								B	0.142	9.397
								C	0.142	9.397
T7 100.000-91.667	95.833		1.254	1	1		0.010	A	0.137	3.149
								B	0.137	3.149
								C	0.137	3.149
T8 91.667-83.333	87.500		1.231	1	1		0.010	A	0.137	0.000
								B	0.137	0.000
								C	0.137	0.000
T9 83.333-75.000	79.167		1.205	1	1		0.009	A	0.135	0.000
								B	0.135	0.000
								C	0.135	0.000
T10 75.000-50.000	62.500		1.146	1	1		0.009	A	0.135	11.798
								B	0.135	11.798
								C	0.135	11.798
T11 50.000-37.500	43.750		1.063	1	1		0.008	A	0.13	5.860
								B	0.13	5.860
								C	0.13	5.860
T12 37.500-25.000	31.250		0.991	1	1		0.008	A	0.127	5.839
								B	0.127	5.839
								C	0.127	5.839
T13 25.000-12.500	18.750		0.89	1	1		0.007	A	0.124	5.819
								B	0.124	5.819
								C	0.124	5.819
T14 12.500-0.000	6.250		0.85	1	1		0.007	A	0.121	5.885
								B	0.121	5.885
								C	0.121	5.885

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	177.500	1.428	0.065	56.082	A	5.526	4.171	4.171	43.02	6.027	0.000
180.000-175.0					B	5.526	4.171		43.02	0.000	0.000
00					C	5.526	4.171		43.02	1.708	0.000
T2	170.833	1.417	0.065	97.919	A	6.293	6.952	6.952	52.49	15.103	0.000
175.000-166.6					B	6.293	6.952		52.49	0.000	0.000
67					C	6.293	6.952		52.49	3.108	0.000
T3	162.500	1.402	0.064	103.475	A	6.518	6.952	6.952	51.61	18.612	0.000
166.667-158.3					B	6.518	6.952		51.61	0.000	0.000
33					C	6.518	6.952		51.61	3.512	0.000
T4	154.167	1.386	0.063	109.031	A	6.746	6.952	6.952	50.75	23.331	0.000
158.333-150.0					B	6.746	6.952		50.75	0.000	0.000
00					C	6.746	6.952		50.75	4.025	0.000
T5	137.500	1.353	0.062	360.425	A	31.437	20.856	20.856	39.88	76.895	0.000
150.000-125.0					B	31.437	20.856		39.88	0.000	0.000
00					C	31.437	20.856		39.88	72.660	0.000
T6	112.500	1.297	0.059	410.425	A	37.501	20.856	20.856	35.74	83.524	0.000
125.000-100.0					B	37.501	20.856		35.74	0.000	0.000
00					C	37.501	20.856		35.74	113.524	0.000
T7	95.833	1.254	0.057	147.919	A	13.268	6.952	6.952	34.38	28.423	0.000
100.000-91.66					B	13.268	6.952		34.38	0.000	0.000
7					C	13.268	6.952		34.38	37.878	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T8	87.500	1.231	0.056	154.157	A	21.130	0.000	7.473	35.37	28.423	0.000
91.667-83.333					B	21.130	0.000		35.37	0.000	0.000
					C	21.130	0.000		35.37	37.878	0.000
T9	79.167	1.205	0.055	159.712	A	21.520	0.000	7.473	34.73	29.571	0.000
83.333-75.000					B	21.520	0.000		34.73	0.000	0.000
					C	21.520	0.000		34.73	37.878	0.000
T10	62.500	1.146	0.052	514.334	A	40.966	28.676	28.676	41.18	94.593	0.000
75.000-50.000					B	40.966	28.676		41.18	0.000	0.000
					C	40.966	28.676		41.18	113.634	0.000
T11	43.750	1.063	0.049	275.917	A	21.483	14.338	14.338	40.03	47.297	0.000
50.000-37.500					B	21.483	14.338		40.03	0.000	0.000
					C	21.483	14.338		40.03	56.817	0.000
T12	31.250	0.991	0.045	288.417	A	22.193	14.338	14.338	39.25	48.147	0.000
37.500-25.000					B	22.193	14.338		39.25	0.000	0.000
					C	22.193	14.338		39.25	56.817	0.000
T13	18.750	0.89	0.041	300.917	A	22.909	14.338	14.338	38.49	49.628	0.000
25.000-12.500					B	22.909	14.338		38.49	0.000	0.000
					C	22.909	14.338		38.49	56.817	0.000
T14	6.250	0.85	0.039	313.417	A	23.630	14.338	14.338	37.76	18.161	0.000
12.500-0.000					B	23.630	14.338		37.76	0.000	0.000
					C	23.630	14.338		37.76	20.454	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	177.500	1.428	0.008	1.361	57.217	A	5.526	11.995	6.441	36.77	17.321	0.000
180.000-175.000						B	5.526	11.995		36.77	0.000	0.000
						C	5.526	11.995		36.77	5.109	0.000
T2	170.833	1.417	0.008	1.356	99.804	A	6.293	17.545	10.721	44.98	41.220	0.000
175.000-166.667						B	6.293	17.545		44.98	0.000	0.000
						C	6.293	17.545		44.98	9.886	0.000
T3	162.500	1.402	0.008	1.349	105.350	A	6.518	17.735	10.702	44.13	52.106	0.000
166.667-158.333						B	6.518	17.735		44.13	0.000	0.000
						C	6.518	17.735		44.13	11.245	0.000
T4	154.167	1.386	0.008	1.342	110.895	A	6.746	17.923	10.683	43.30	65.460	0.000
158.333-150.000						B	6.746	17.923		43.30	0.000	0.000
						C	6.746	17.923		43.30	12.969	0.000
T5	137.500	1.353	0.007	1.326	365.956	A	31.437	65.685	31.921	32.87	215.903	0.000
150.000-125.000						B	31.437	65.685		32.87	0.000	0.000
						C	31.437	65.685		32.87	209.345	0.000
T6	112.500	1.297	0.007	1.300	415.846	A	37.501	68.105	31.701	30.02	235.371	0.000
125.000-100.000						B	37.501	68.105		30.02	0.000	0.000
						C	37.501	68.105		30.02	291.024	0.000
T7	95.833	1.254	0.007	1.279	149.698	A	13.268	23.188	10.509	28.83	79.598	0.000
100.000-91.667						B	13.268	23.188		28.83	0.000	0.000
						C	13.268	23.188		28.83	96.650	0.000
T8	87.500	1.231	0.007	1.268	155.919	A	23.480	12.933	9.823	26.98	79.134	0.000
91.667-83.333						B	23.480	12.933		26.98	0.000	0.000
						C	23.480	12.933		26.98	96.380	0.000
T9	79.167	1.205	0.007	1.255	161.457	A	23.847	13.171	9.800	26.47	81.786	0.000
83.333-75.000						B	23.847	13.171		26.47	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	23.847	13.171		26.47	96.086	0.000
T10	62.500	1.146	0.006	1.226	519.446	A	40.966	69.279	38.903	35.29	260.082	0.000
75.000-50.000						B	40.966	69.279		35.29	0.000	0.000
						C	40.966	69.279		35.29	286.212	0.000
T11	43.750	1.063	0.006	1.183	278.384	A	21.483	34.627	19.272	34.35	127.142	0.000
50.000-37.500						B	21.483	34.627		34.35	0.000	0.000
						C	21.483	34.627		34.35	141.609	0.000
T12	31.250	0.991	0.005	1.144	290.802	A	22.193	34.439	19.109	33.74	128.439	0.000
37.500-25.000						B	22.193	34.439		33.74	0.000	0.000
						C	22.193	34.439		33.74	140.245	0.000
T13	18.750	0.89	0.005	1.087	303.183	A	22.909	33.900	18.871	33.22	131.028	0.000
25.000-12.500						B	22.909	33.900		33.22	0.000	0.000
						C	22.909	33.900		33.22	138.263	0.000
T14	6.250	0.85	0.005	0.974	315.447	A	23.630	32.283	18.400	32.91	45.328	0.000
12.500-0.000						B	23.630	32.283		32.91	0.000	0.000
						C	23.630	32.283		32.91	48.361	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	177.500	1.428	0.011	56.082	A	5.526	4.171	4.171	43.02	6.027	0.000
180.000-175.0					B	5.526	4.171		43.02	0.000	0.000
00					C	5.526	4.171		43.02	1.708	0.000
T2	170.833	1.417	0.011	97.919	A	6.293	6.952	6.952	52.49	15.103	0.000
175.000-166.6					B	6.293	6.952		52.49	0.000	0.000
67					C	6.293	6.952		52.49	3.108	0.000
T3	162.500	1.402	0.011	103.475	A	6.518	6.952	6.952	51.61	18.612	0.000
166.667-158.3					B	6.518	6.952		51.61	0.000	0.000
33					C	6.518	6.952		51.61	3.512	0.000
T4	154.167	1.386	0.011	109.031	A	6.746	6.952	6.952	50.75	23.331	0.000
158.333-150.0					B	6.746	6.952		50.75	0.000	0.000
00					C	6.746	6.952		50.75	4.025	0.000
T5	137.500	1.353	0.011	360.425	A	31.437	20.856	20.856	39.88	76.895	0.000
150.000-125.0					B	31.437	20.856		39.88	0.000	0.000
00					C	31.437	20.856		39.88	72.660	0.000
T6	112.500	1.297	0.010	410.425	A	37.501	20.856	20.856	35.74	83.524	0.000
125.000-100.0					B	37.501	20.856		35.74	0.000	0.000
00					C	37.501	20.856		35.74	113.524	0.000
T7	95.833	1.254	0.010	147.919	A	13.268	6.952	6.952	34.38	28.423	0.000
100.000-91.66					B	13.268	6.952		34.38	0.000	0.000
7					C	13.268	6.952		34.38	37.878	0.000
T8	87.500	1.231	0.010	154.157	A	21.130	0.000	7.473	35.37	28.423	0.000
91.667-83.333					B	21.130	0.000		35.37	0.000	0.000
					C	21.130	0.000		35.37	37.878	0.000
T9	79.167	1.205	0.009	159.712	A	21.520	0.000	7.473	34.73	29.571	0.000
83.333-75.000					B	21.520	0.000		34.73	0.000	0.000
					C	21.520	0.000		34.73	37.878	0.000
T10	62.500	1.146	0.009	514.334	A	40.966	28.676	28.676	41.18	94.593	0.000
75.000-50.000					B	40.966	28.676		41.18	0.000	0.000
					C	40.966	28.676		41.18	113.634	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T11	43.750	1.063	0.008	275.917	A	21.483	14.338	14.338	40.03	47.297	0.000
50.000-37.500					B	21.483	14.338		40.03	0.000	0.000
					C	21.483	14.338		40.03	56.817	0.000
T12	31.250	0.991	0.008	288.417	A	22.193	14.338	14.338	39.25	48.147	0.000
37.500-25.000					B	22.193	14.338		39.25	0.000	0.000
					C	22.193	14.338		39.25	56.817	0.000
T13	18.750	0.89	0.007	300.917	A	22.909	14.338	14.338	38.49	49.628	0.000
25.000-12.500					B	22.909	14.338		38.49	0.000	0.000
					C	22.909	14.338		38.49	56.817	0.000
T14	6.250	0.85	0.007	313.417	A	23.630	14.338	14.338	37.76	18.161	0.000
12.500-0.000					B	23.630	14.338		37.76	0.000	0.000
					C	23.630	14.338		37.76	20.454	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.065	1	1	7.409	1364.143	272.829	C
180.000-175.0			B	0.173	2.689		1	1	7.409			
00			C	0.173	2.689		1	1	7.409			
T2	58.310	755.494	A	0.135	2.826	0.065	1	1	9.320	2053.303	246.396	C
175.000-166.6			B	0.135	2.826		1	1	9.320			
67			C	0.135	2.826		1	1	9.320			
T3	72.052	768.073	A	0.13	2.846	0.064	1	1	9.542	2203.865	264.464	C
166.667-158.3			B	0.13	2.846		1	1	9.542			
33			C	0.13	2.846		1	1	9.542			
T4	91.713	780.881	A	0.126	2.863	0.063	1	1	9.768	2392.677	287.121	C
158.333-150.0			B	0.126	2.863		1	1	9.768			
00			C	0.126	2.863		1	1	9.768			
T5	604.690	3994.805	A	0.145	2.79	0.062	1	1	40.739	10704.016	428.161	C
150.000-125.0			B	0.145	2.79		1	1	40.739			
00			C	0.145	2.79		1	1	40.739			
T6	822.940	4822.083	A	0.142	2.8	0.059	1	1	46.898	12591.311	503.652	C
125.000-100.0			B	0.142	2.8		1	1	46.898			
00			C	0.142	2.8		1	1	46.898			
T7	276.250	1971.333	A	0.137	2.821	0.057	1	1	16.417	4199.499	503.940	C
100.000-91.66			B	0.137	2.821		1	1	16.417			
7			C	0.137	2.821		1	1	16.417			
T8	276.250	2177.704	A	0.137	2.82	0.056	1	1	21.130	4754.615	570.554	C
91.667-83.333			B	0.137	2.82		1	1	21.130			
			C	0.137	2.82		1	1	21.130			
T9	280.870	2217.593	A	0.135	2.828	0.055	1	1	21.520	4748.197	569.784	C
83.333-75.000			B	0.135	2.828		1	1	21.520			
			C	0.135	2.828		1	1	21.520			
T10	861.750	6256.463	A	0.135	2.826	0.052	1	1	52.764	12217.011	488.680	C
75.000-50.000			B	0.135	2.826		1	1	52.764			
			C	0.135	2.826		1	1	52.764			
T11	430.875	3351.672	A	0.13	2.847	0.049	1	1	27.344	5802.954	464.236	C
50.000-37.500			B	0.13	2.847		1	1	27.344			
			C	0.13	2.847		1	1	27.344			
T12	432.900	3953.241	A	0.127	2.859	0.045	1	1	28.032	5514.386	441.151	C
37.500-25.000			B	0.127	2.859		1	1	28.032			
			C	0.127	2.859		1	1	28.032			
T13	436.425	3857.953	A	0.124	2.87	0.041	1	1	28.728	5062.747	405.020	C
25.000-12.500			B	0.124	2.87		1	1	28.728			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.124	2.87		1	1	28.728			
T14	157.815	4407.341	A	0.121	2.881	0.039	1	1	29.514	3576.046	286.084	C
12.500-0.000			B	0.121	2.881		1	1	29.514			
			C	0.121	2.881		1	1	29.514			
Sum Weight:	4829.130	39906.941						OTM	6709.655 kip-ft	77184.770		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.065	0.825	1	6.442	1219.733	243.947	C
180.000-175.0			B	0.173	2.689		0.825	1	6.442			
00			C	0.173	2.689		0.825	1	6.442			
T2	58.310	755.494	A	0.135	2.826	0.065	0.825	1	8.219	1881.828	225.819	C
175.000-166.6			B	0.135	2.826		0.825	1	8.219			
67			C	0.135	2.826		0.825	1	8.219			
T3	72.052	768.073	A	0.13	2.846	0.064	0.825	1	8.401	2026.906	243.229	C
166.667-158.3			B	0.13	2.846		0.825	1	8.401			
33			C	0.13	2.846		0.825	1	8.401			
T4	91.713	780.881	A	0.126	2.863	0.063	0.825	1	8.587	2210.448	265.254	C
158.333-150.0			B	0.126	2.863		0.825	1	8.587			
00			C	0.126	2.863		0.825	1	8.587			
T5	604.690	3994.805	A	0.145	2.79	0.062	0.825	1	35.238	9896.295	395.852	C
150.000-125.0			B	0.145	2.79		0.825	1	35.238			
00			C	0.145	2.79		0.825	1	35.238			
T6	822.940	4822.083	A	0.142	2.8	0.059	0.825	1	40.336	11664.051	466.562	C
125.000-100.0			B	0.142	2.8		0.825	1	40.336			
00			C	0.142	2.8		0.825	1	40.336			
T7	276.250	1971.333	A	0.137	2.821	0.057	0.825	1	14.095	3879.986	465.598	C
100.000-91.66			B	0.137	2.821		0.825	1	14.095			
7			C	0.137	2.821		0.825	1	14.095			
T8	276.250	2177.704	A	0.137	2.82	0.056	0.825	1	17.432	4255.690	510.683	C
91.667-83.333			B	0.137	2.82		0.825	1	17.432			
			C	0.137	2.82		0.825	1	17.432			
T9	280.870	2217.593	A	0.135	2.828	0.055	0.825	1	17.754	4249.097	509.892	C
83.333-75.000			B	0.135	2.828		0.825	1	17.754			
			C	0.135	2.828		0.825	1	17.754			
T10	861.750	6256.463	A	0.135	2.826	0.052	0.825	1	45.595	11313.848	452.554	C
75.000-50.000			B	0.135	2.826		0.825	1	45.595			
			C	0.135	2.826		0.825	1	45.595			
T11	430.875	3351.672	A	0.13	2.847	0.049	0.825	1	23.584	5360.288	428.823	C
50.000-37.500			B	0.13	2.847		0.825	1	23.584			
			C	0.13	2.847		0.825	1	23.584			
T12	432.900	3953.241	A	0.127	2.859	0.045	0.825	1	24.148	5086.546	406.924	C
37.500-25.000			B	0.127	2.859		0.825	1	24.148			
			C	0.127	2.859		0.825	1	24.148			
T13	436.425	3857.953	A	0.124	2.87	0.041	0.825	1	24.719	4664.603	373.168	C
25.000-12.500			B	0.124	2.87		0.825	1	24.719			
			C	0.124	2.87		0.825	1	24.719			
T14	157.815	4407.341	A	0.121	2.881	0.039	0.825	1	25.379	3182.315	254.585	C
12.500-0.000			B	0.121	2.881		0.825	1	25.379			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	4829.130	39906.941	C	0.121	2.881		0.825	1 OTM	25.379 6169.603 kip-ft	70891.633		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.065	0.8	1	6.304	1199.103	239.821	C
180.000-175.0			B	0.173	2.689		0.8	1	6.304			
00			C	0.173	2.689		0.8	1	6.304			
T2	58.310	755.494	A	0.135	2.826	0.065	0.8	1	8.062	1857.332	222.880	C
175.000-166.6			B	0.135	2.826		0.8	1	8.062			
67			C	0.135	2.826		0.8	1	8.062			
T3	72.052	768.073	A	0.13	2.846	0.064	0.8	1	8.238	2001.627	240.195	C
166.667-158.3			B	0.13	2.846		0.8	1	8.238			
33			C	0.13	2.846		0.8	1	8.238			
T4	91.713	780.881	A	0.126	2.863	0.063	0.8	1	8.418	2184.415	262.130	C
158.333-150.0			B	0.126	2.863		0.8	1	8.418			
00			C	0.126	2.863		0.8	1	8.418			
T5	604.690	3994.805	A	0.145	2.79	0.062	0.8	1	34.452	9780.906	391.236	C
150.000-125.0			B	0.145	2.79		0.8	1	34.452			
00			C	0.145	2.79		0.8	1	34.452			
T6	822.940	4822.083	A	0.142	2.8	0.059	0.8	1	39.398	11531.585	461.263	C
125.000-100.0			B	0.142	2.8		0.8	1	39.398			
00			C	0.142	2.8		0.8	1	39.398			
T7	276.250	1971.333	A	0.137	2.821	0.057	0.8	1	13.763	3834.341	460.121	C
100.000-91.66			B	0.137	2.821		0.8	1	13.763			
7			C	0.137	2.821		0.8	1	13.763			
T8	276.250	2177.704	A	0.137	2.82	0.056	0.8	1	16.904	4184.415	502.130	C
91.667-83.333			B	0.137	2.82		0.8	1	16.904			
			C	0.137	2.82		0.8	1	16.904			
T9	280.870	2217.593	A	0.135	2.828	0.055	0.8	1	17.216	4177.797	501.336	C
83.333-75.000			B	0.135	2.828		0.8	1	17.216			
			C	0.135	2.828		0.8	1	17.216			
T10	861.750	6256.463	A	0.135	2.826	0.052	0.8	1	44.571	11184.824	447.393	C
75.000-50.000			B	0.135	2.826		0.8	1	44.571			
			C	0.135	2.826		0.8	1	44.571			
T11	430.875	3351.672	A	0.13	2.847	0.049	0.8	1	23.047	5297.050	423.764	C
50.000-37.500			B	0.13	2.847		0.8	1	23.047			
			C	0.13	2.847		0.8	1	23.047			
T12	432.900	3953.241	A	0.127	2.859	0.045	0.8	1	23.593	5025.426	402.034	C
37.500-25.000			B	0.127	2.859		0.8	1	23.593			
			C	0.127	2.859		0.8	1	23.593			
T13	436.425	3857.953	A	0.124	2.87	0.041	0.8	1	24.146	4607.725	368.618	C
25.000-12.500			B	0.124	2.87		0.8	1	24.146			
			C	0.124	2.87		0.8	1	24.146			
T14	157.815	4407.341	A	0.121	2.881	0.039	0.8	1	24.788	3126.068	250.085	C
12.500-0.000			B	0.121	2.881		0.8	1	24.788			
			C	0.121	2.881		0.8	1	24.788			
Sum Weight:	4829.130	39906.941						OTM	6092.452 kip-ft	69992.613		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.065	0.85	1	6.580	1240.363	248.073	C
180.000-175.0			B	0.173	2.689		0.85	1	6.580			
00			C	0.173	2.689		0.85	1	6.580			
T2	58.310	755.494	A	0.135	2.826	0.065	0.85	1	8.377	1906.324	228.759	C
175.000-166.6			B	0.135	2.826		0.85	1	8.377			
67			C	0.135	2.826		0.85	1	8.377			
T3	72.052	768.073	A	0.13	2.846	0.064	0.85	1	8.564	2052.186	246.262	C
166.667-158.3			B	0.13	2.846		0.85	1	8.564			
33			C	0.13	2.846		0.85	1	8.564			
T4	91.713	780.881	A	0.126	2.863	0.063	0.85	1	8.756	2236.481	268.378	C
158.333-150.0			B	0.126	2.863		0.85	1	8.756			
00			C	0.126	2.863		0.85	1	8.756			
T5	604.690	3994.805	A	0.145	2.79	0.062	0.85	1	36.024	10011.683	400.467	C
150.000-125.0			B	0.145	2.79		0.85	1	36.024			
00			C	0.145	2.79		0.85	1	36.024			
T6	822.940	4822.083	A	0.142	2.8	0.059	0.85	1	41.273	11796.517	471.861	C
125.000-100.0			B	0.142	2.8		0.85	1	41.273			
00			C	0.142	2.8		0.85	1	41.273			
T7	276.250	1971.333	A	0.137	2.821	0.057	0.85	1	14.427	3925.631	471.076	C
100.000-91.66			B	0.137	2.821		0.85	1	14.427			
7			C	0.137	2.821		0.85	1	14.427			
T8	276.250	2177.704	A	0.137	2.82	0.056	0.85	1	17.960	4326.965	519.236	C
91.667-83.333			B	0.137	2.82		0.85	1	17.960			
			C	0.137	2.82		0.85	1	17.960			
T9	280.870	2217.593	A	0.135	2.828	0.055	0.85	1	18.292	4320.397	518.448	C
83.333-75.000			B	0.135	2.828		0.85	1	18.292			
			C	0.135	2.828		0.85	1	18.292			
T10	861.750	6256.463	A	0.135	2.826	0.052	0.85	1	46.619	11442.871	457.715	C
75.000-50.000			B	0.135	2.826		0.85	1	46.619			
			C	0.135	2.826		0.85	1	46.619			
T11	430.875	3351.672	A	0.13	2.847	0.049	0.85	1	24.121	5423.526	433.882	C
50.000-37.500			B	0.13	2.847		0.85	1	24.121			
			C	0.13	2.847		0.85	1	24.121			
T12	432.900	3953.241	A	0.127	2.859	0.045	0.85	1	24.703	5147.666	411.813	C
37.500-25.000			B	0.127	2.859		0.85	1	24.703			
			C	0.127	2.859		0.85	1	24.703			
T13	436.425	3857.953	A	0.124	2.87	0.041	0.85	1	25.292	4721.480	377.718	C
25.000-12.500			B	0.124	2.87		0.85	1	25.292			
			C	0.124	2.87		0.85	1	25.292			
T14	157.815	4407.341	A	0.121	2.881	0.039	0.85	1	25.970	3238.562	259.085	C
12.500-0.000			B	0.121	2.881		0.85	1	25.970			
			C	0.121	2.881		0.85	1	25.970			
Sum Weight:	4829.130	39906.941						OTM	6246.753 kip-ft	71790.652		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	272.154	1546.735	A	0.306	2.28	0.008	1	1	12.733	280.553	56.111	C
180.000-175.0			B	0.306	2.28		1	1	12.733			
00			C	0.306	2.28		1	1	12.733			
T2	612.048	1966.608	A	0.239	2.471	0.008	1	1	16.510	468.148	56.178	C
175.000-166.6			B	0.239	2.471		1	1	16.510			
67			C	0.239	2.471		1	1	16.510			
T3	756.106	2000.859	A	0.23	2.498	0.008	1	1	16.812	518.627	62.235	C
166.667-158.3			B	0.23	2.498		1	1	16.812			
33			C	0.23	2.498		1	1	16.812			
T4	938.607	2035.084	A	0.222	2.523	0.008	1	1	17.119	578.522	69.423	C
158.333-150.0			B	0.222	2.523		1	1	17.119			
00			C	0.222	2.523		1	1	17.119			
T5	5063.026	9462.489	A	0.265	2.392	0.007	1	1	70.121	2646.433	105.857	C
150.000-125.0			B	0.265	2.392		1	1	70.121			
00			C	0.265	2.392		1	1	70.121			
T6	6387.572	11003.845	A	0.254	2.426	0.007	1	1	77.410	3021.223	120.849	C
125.000-100.0			B	0.254	2.426		1	1	77.410			
00			C	0.254	2.426		1	1	77.410			
T7	2116.666	4236.211	A	0.244	2.457	0.007	1	1	26.797	995.226	119.427	C
100.000-91.66			B	0.244	2.457		1	1	26.797			
7			C	0.244	2.457		1	1	26.797			
T8	2096.643	4598.810	A	0.234	2.488	0.007	1	1	30.996	1037.970	124.556	C
91.667-83.333			B	0.234	2.488		1	1	30.996			
			C	0.234	2.488		1	1	30.996			
T9	2112.557	4667.719	A	0.229	2.501	0.007	1	1	31.489	1033.386	124.006	C
83.333-75.000			B	0.229	2.501		1	1	31.489			
			C	0.229	2.501		1	1	31.489			
T10	6385.224	12372.440	A	0.212	2.556	0.006	1	1	80.921	2833.757	113.350	C
75.000-50.000			B	0.212	2.556		1	1	80.921			
			C	0.212	2.556		1	1	80.921			
T11	3077.297	6404.445	A	0.202	2.591	0.006	1	1	41.386	1320.189	105.615	C
50.000-37.500			B	0.202	2.591		1	1	41.386			
			C	0.202	2.591		1	1	41.386			
T12	3009.589	7182.294	A	0.195	2.614	0.005	1	1	41.947	1240.776	99.262	C
37.500-25.000			B	0.195	2.614		1	1	41.947			
			C	0.195	2.614		1	1	41.947			
T13	2917.030	6803.376	A	0.187	2.639	0.005	1	1	42.313	1124.065	89.925	C
25.000-12.500			B	0.187	2.639		1	1	42.313			
			C	0.187	2.639		1	1	42.313			
T14	953.841	7269.947	A	0.177	2.674	0.005	1	1	42.059	662.932	53.035	C
12.500-0.000			B	0.177	2.674		1	1	42.059			
			C	0.177	2.674		1	1	42.059			
Sum Weight:	36698.361	81550.861						OTM	1573.881 kip-ft	17761.809		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	272.154	1546.735	A	0.306	2.28	0.008	0.825	1	11.766	265.996	53.199	C
180.000-175.0			B	0.306	2.28		0.825	1	11.766			
00			C	0.306	2.28		0.825	1	11.766			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T2	612.048	1966.608	A	0.239	2.471	0.008	0.825	1	15.409	450.321	54.038	C
175.000-166.6			B	0.239	2.471		0.825	1	15.409			
67			C	0.239	2.471		0.825	1	15.409			
T3	756.106	2000.859	A	0.23	2.498	0.008	0.825	1	15.672	500.156	60.019	C
166.667-158.3			B	0.23	2.498		0.825	1	15.672			
33			C	0.23	2.498		0.825	1	15.672			
T4	938.607	2035.084	A	0.222	2.523	0.008	0.825	1	15.939	559.430	67.132	C
158.333-150.0			B	0.222	2.523		0.825	1	15.939			
00			C	0.222	2.523		0.825	1	15.939			
T5	5063.026	9462.489	A	0.265	2.392	0.007	0.825	1	64.619	2564.077	102.563	C
150.000-125.0			B	0.265	2.392		0.825	1	64.619			
00			C	0.265	2.392		0.825	1	64.619			
T6	6387.572	11003.845	A	0.254	2.426	0.007	0.825	1	70.847	2925.722	117.029	C
125.000-100.0			B	0.254	2.426		0.825	1	70.847			
00			C	0.254	2.426		0.825	1	70.847			
T7	2116.666	4236.211	A	0.244	2.457	0.007	0.825	1	24.475	962.136	115.456	C
100.000-91.66			B	0.244	2.457		0.825	1	24.475			
7			C	0.244	2.457		0.825	1	24.475			
T8	2096.643	4598.810	A	0.234	2.488	0.007	0.825	1	26.887	979.805	117.577	C
91.667-83.333			B	0.234	2.488		0.825	1	26.887			
			C	0.234	2.488		0.825	1	26.887			
T9	2112.557	4667.719	A	0.229	2.501	0.007	0.825	1	27.316	975.233	117.028	C
83.333-75.000			B	0.229	2.501		0.825	1	27.316			
			C	0.229	2.501		0.825	1	27.316			
T10	6385.224	12372.440	A	0.212	2.556	0.006	0.825	1	73.752	2736.638	109.466	C
75.000-50.000			B	0.212	2.556		0.825	1	73.752			
			C	0.212	2.556		0.825	1	73.752			
T11	3077.297	6404.445	A	0.202	2.591	0.006	0.825	1	37.626	1272.292	101.783	C
50.000-37.500			B	0.202	2.591		0.825	1	37.626			
			C	0.202	2.591		0.825	1	37.626			
T12	3009.589	7182.294	A	0.195	2.614	0.005	0.825	1	38.063	1194.273	95.542	C
37.500-25.000			B	0.195	2.614		0.825	1	38.063			
			C	0.195	2.614		0.825	1	38.063			
T13	2917.030	6803.376	A	0.187	2.639	0.005	0.825	1	38.304	1080.543	86.443	C
25.000-12.500			B	0.187	2.639		0.825	1	38.304			
			C	0.187	2.639		0.825	1	38.304			
T14	953.841	7269.947	A	0.177	2.674	0.005	0.825	1	37.924	619.476	49.558	C
12.500-0.000			B	0.177	2.674		0.825	1	37.924			
			C	0.177	2.674		0.825	1	37.924			
Sum Weight:	36698.361	81550.861						OTM	1516.668 kip-ft	17086.098		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	272.154	1546.735	A	0.306	2.28	0.008	0.8	1	11.628	263.917	52.783	C
180.000-175.0			B	0.306	2.28		0.8	1	11.628			
00			C	0.306	2.28		0.8	1	11.628			
T2	612.048	1966.608	A	0.239	2.471	0.008	0.8	1	15.252	447.774	53.733	C
175.000-166.6			B	0.239	2.471		0.8	1	15.252			
67			C	0.239	2.471		0.8	1	15.252			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T3	756.106	2000.859	A	0.23	2.498	0.008	0.8	1	15.509	497.517	59.702	C
166.667-158.3			B	0.23	2.498		0.8	1	15.509			
33			C	0.23	2.498		0.8	1	15.509			
T4	938.607	2035.084	A	0.222	2.523	0.008	0.8	1	15.770	556.703	66.804	C
158.333-150.0			B	0.222	2.523		0.8	1	15.770			
00			C	0.222	2.523		0.8	1	15.770			
T5	5063.026	9462.489	A	0.265	2.392	0.007	0.8	1	63.833	2552.312	102.092	C
150.000-125.0			B	0.265	2.392		0.8	1	63.833			
00			C	0.265	2.392		0.8	1	63.833			
T6	6387.572	11003.845	A	0.254	2.426	0.007	0.8	1	69.910	2912.079	116.483	C
125.000-100.0			B	0.254	2.426		0.8	1	69.910			
00			C	0.254	2.426		0.8	1	69.910			
T7	2116.666	4236.211	A	0.244	2.457	0.007	0.8	1	24.143	957.409	114.889	C
100.000-91.66			B	0.244	2.457		0.8	1	24.143			
7			C	0.244	2.457		0.8	1	24.143			
T8	2096.643	4598.810	A	0.234	2.488	0.007	0.8	1	26.300	971.495	116.579	C
91.667-83.333			B	0.234	2.488		0.8	1	26.300			
			C	0.234	2.488		0.8	1	26.300			
T9	2112.557	4667.719	A	0.229	2.501	0.007	0.8	1	26.720	966.926	116.031	C
83.333-75.000			B	0.229	2.501		0.8	1	26.720			
			C	0.229	2.501		0.8	1	26.720			
T10	6385.224	12372.440	A	0.212	2.556	0.006	0.8	1	72.728	2722.764	108.911	C
75.000-50.000			B	0.212	2.556		0.8	1	72.728			
			C	0.212	2.556		0.8	1	72.728			
T11	3077.297	6404.445	A	0.202	2.591	0.006	0.8	1	37.089	1265.449	101.236	C
50.000-37.500			B	0.202	2.591		0.8	1	37.089			
			C	0.202	2.591		0.8	1	37.089			
T12	3009.589	7182.294	A	0.195	2.614	0.005	0.8	1	37.508	1187.630	95.010	C
37.500-25.000			B	0.195	2.614		0.8	1	37.508			
			C	0.195	2.614		0.8	1	37.508			
T13	2917.030	6803.376	A	0.187	2.639	0.005	0.8	1	37.731	1074.326	85.946	C
25.000-12.500			B	0.187	2.639		0.8	1	37.731			
			C	0.187	2.639		0.8	1	37.731			
T14	953.841	7269.947	A	0.177	2.674	0.005	0.8	1	37.333	613.268	49.061	C
12.500-0.000			B	0.177	2.674		0.8	1	37.333			
			C	0.177	2.674		0.8	1	37.333			
Sum Weight:	36698.361	81550.861						OTM	1508.495 kip-ft	16989.568		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	272.154	1546.735	A	0.306	2.28	0.008	0.85	1	11.904	268.076	53.615	C
180.000-175.0			B	0.306	2.28		0.85	1	11.904			
00			C	0.306	2.28		0.85	1	11.904			
T2	612.048	1966.608	A	0.239	2.471	0.008	0.85	1	15.566	452.867	54.344	C
175.000-166.6			B	0.239	2.471		0.85	1	15.566			
67			C	0.239	2.471		0.85	1	15.566			
T3	756.106	2000.859	A	0.23	2.498	0.008	0.85	1	15.834	502.795	60.335	C
166.667-158.3			B	0.23	2.498		0.85	1	15.834			
33			C	0.23	2.498		0.85	1	15.834			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T4	938.607	2035.084	A	0.222	2.523	0.008	0.85	1	16.107	562.158	67.459	C
158.333-150.0			B	0.222	2.523		0.85	1	16.107			
00			C	0.222	2.523		0.85	1	16.107			
T5	5063.026	9462.489	A	0.265	2.392	0.007	0.85	1	65.405	2575.842	103.034	C
150.000-125.0			B	0.265	2.392		0.85	1	65.405			
00			C	0.265	2.392		0.85	1	65.405			
T6	6387.572	11003.845	A	0.254	2.426	0.007	0.85	1	71.785	2939.365	117.575	C
125.000-100.0			B	0.254	2.426		0.85	1	71.785			
00			C	0.254	2.426		0.85	1	71.785			
T7	2116.666	4236.211	A	0.244	2.457	0.007	0.85	1	24.807	966.863	116.024	C
100.000-91.66			B	0.244	2.457		0.85	1	24.807			
7			C	0.244	2.457		0.85	1	24.807			
T8	2096.643	4598.810	A	0.234	2.488	0.007	0.85	1	27.474	988.114	118.574	C
91.667-83.333			B	0.234	2.488		0.85	1	27.474			
			C	0.234	2.488		0.85	1	27.474			
T9	2112.557	4667.719	A	0.229	2.501	0.007	0.85	1	27.912	983.541	118.025	C
83.333-75.000			B	0.229	2.501		0.85	1	27.912			
			C	0.229	2.501		0.85	1	27.912			
T10	6385.224	12372.440	A	0.212	2.556	0.006	0.85	1	74.776	2750.512	110.020	C
75.000-50.000			B	0.212	2.556		0.85	1	74.776			
			C	0.212	2.556		0.85	1	74.776			
T11	3077.297	6404.445	A	0.202	2.591	0.006	0.85	1	38.163	1279.134	102.331	C
50.000-37.500			B	0.202	2.591		0.85	1	38.163			
			C	0.202	2.591		0.85	1	38.163			
T12	3009.589	7182.294	A	0.195	2.614	0.005	0.85	1	38.618	1200.917	96.073	C
37.500-25.000			B	0.195	2.614		0.85	1	38.618			
			C	0.195	2.614		0.85	1	38.618			
T13	2917.030	6803.376	A	0.187	2.639	0.005	0.85	1	38.877	1086.761	86.941	C
25.000-12.500			B	0.187	2.639		0.85	1	38.877			
			C	0.187	2.639		0.85	1	38.877			
T14	953.841	7269.947	A	0.177	2.674	0.005	0.85	1	38.514	625.684	50.055	C
12.500-0.000			B	0.177	2.674		0.85	1	38.514			
			C	0.177	2.674		0.85	1	38.514			
Sum Weight:	36698.361	81550.861						OTM	1524.842 kip-ft	17182.628		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.011	1	1	7.409	233.575	46.715	C
180.000-175.0			B	0.173	2.689		1	1	7.409			
00			C	0.173	2.689		1	1	7.409			
T2	58.310	755.494	A	0.135	2.826	0.011	1	1	9.320	351.576	42.189	C
175.000-166.6			B	0.135	2.826		1	1	9.320			
67			C	0.135	2.826		1	1	9.320			
T3	72.052	768.073	A	0.13	2.846	0.011	1	1	9.542	377.356	45.283	C
166.667-158.3			B	0.13	2.846		1	1	9.542			
33			C	0.13	2.846		1	1	9.542			
T4	91.713	780.881	A	0.126	2.863	0.011	1	1	9.768	409.686	49.162	C
158.333-150.0			B	0.126	2.863		1	1	9.768			
00			C	0.126	2.863		1	1	9.768			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T5	604.690	3994.805	A	0.145	2.79	0.011	1	1	40.739	1832.792	73.312	C
150.000-125.0			B	0.145	2.79		1	1	40.739			
00			C	0.145	2.79		1	1	40.739			
T6	822.940	4822.083	A	0.142	2.8	0.010	1	1	46.898	2155.944	86.238	C
125.000-100.0			B	0.142	2.8		1	1	46.898			
00			C	0.142	2.8		1	1	46.898			
T7	276.250	1971.333	A	0.137	2.821	0.010	1	1	16.417	719.058	86.287	C
100.000-91.66			B	0.137	2.821		1	1	16.417			
7			C	0.137	2.821		1	1	16.417			
T8	276.250	2177.704	A	0.137	2.82	0.010	1	1	21.130	814.108	97.693	C
91.667-83.333			B	0.137	2.82		1	1	21.130			
			C	0.137	2.82		1	1	21.130			
T9	280.870	2217.593	A	0.135	2.828	0.009	1	1	21.520	813.009	97.561	C
83.333-75.000			B	0.135	2.828		1	1	21.520			
			C	0.135	2.828		1	1	21.520			
T10	861.750	6256.463	A	0.135	2.826	0.009	1	1	52.764	2091.854	83.674	C
75.000-50.000			B	0.135	2.826		1	1	52.764			
			C	0.135	2.826		1	1	52.764			
T11	430.875	3351.672	A	0.13	2.847	0.008	1	1	27.344	993.609	79.489	C
50.000-37.500			B	0.13	2.847		1	1	27.344			
			C	0.13	2.847		1	1	27.344			
T12	432.900	3953.241	A	0.127	2.859	0.008	1	1	28.032	944.199	75.536	C
37.500-25.000			B	0.127	2.859		1	1	28.032			
			C	0.127	2.859		1	1	28.032			
T13	436.425	3857.953	A	0.124	2.87	0.007	1	1	28.728	866.867	69.349	C
25.000-12.500			B	0.124	2.87		1	1	28.728			
			C	0.124	2.87		1	1	28.728			
T14	157.815	4407.341	A	0.121	2.881	0.007	1	1	29.514	612.307	48.985	C
12.500-0.000			B	0.121	2.881		1	1	29.514			
			C	0.121	2.881		1	1	29.514			
Sum Weight:	4829.130	39906.941						OTM	1148.859 kip-ft	13215.942		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.011	0.825	1	6.442	208.848	41.770	C
180.000-175.0			B	0.173	2.689		0.825	1	6.442			
00			C	0.173	2.689		0.825	1	6.442			
T2	58.310	755.494	A	0.135	2.826	0.011	0.825	1	8.219	322.215	38.666	C
175.000-166.6			B	0.135	2.826		0.825	1	8.219			
67			C	0.135	2.826		0.825	1	8.219			
T3	72.052	768.073	A	0.13	2.846	0.011	0.825	1	8.401	347.057	41.647	C
166.667-158.3			B	0.13	2.846		0.825	1	8.401			
33			C	0.13	2.846		0.825	1	8.401			
T4	91.713	780.881	A	0.126	2.863	0.011	0.825	1	8.587	378.483	45.418	C
158.333-150.0			B	0.126	2.863		0.825	1	8.587			
00			C	0.126	2.863		0.825	1	8.587			
T5	604.690	3994.805	A	0.145	2.79	0.011	0.825	1	35.238	1694.490	67.780	C
150.000-125.0			B	0.145	2.79		0.825	1	35.238			
00			C	0.145	2.79		0.825	1	35.238			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	822.940	4822.083	A	0.142	2.8	0.010	0.825	1	40.336	1997.174	79.887	C
125.000-100.0			B	0.142	2.8		0.825	1	40.336			
00			C	0.142	2.8		0.825	1	40.336			
T7	276.250	1971.333	A	0.137	2.821	0.010	0.825	1	14.095	664.350	79.722	C
100.000-91.66			B	0.137	2.821		0.825	1	14.095			
7			C	0.137	2.821		0.825	1	14.095			
T8	276.250	2177.704	A	0.137	2.82	0.010	0.825	1	17.432	728.679	87.442	C
91.667-83.333			B	0.137	2.82		0.825	1	17.432			
			C	0.137	2.82		0.825	1	17.432			
T9	280.870	2217.593	A	0.135	2.828	0.009	0.825	1	17.754	727.550	87.306	C
83.333-75.000			B	0.135	2.828		0.825	1	17.754			
			C	0.135	2.828		0.825	1	17.754			
T10	861.750	6256.463	A	0.135	2.826	0.009	0.825	1	45.595	1937.211	77.488	C
75.000-50.000			B	0.135	2.826		0.825	1	45.595			
			C	0.135	2.826		0.825	1	45.595			
T11	430.875	3351.672	A	0.13	2.847	0.008	0.825	1	23.584	917.814	73.425	C
50.000-37.500			B	0.13	2.847		0.825	1	23.584			
			C	0.13	2.847		0.825	1	23.584			
T12	432.900	3953.241	A	0.127	2.859	0.008	0.825	1	24.148	870.942	69.675	C
37.500-25.000			B	0.127	2.859		0.825	1	24.148			
			C	0.127	2.859		0.825	1	24.148			
T13	436.425	3857.953	A	0.124	2.87	0.007	0.825	1	24.719	798.695	63.896	C
25.000-12.500			B	0.124	2.87		0.825	1	24.719			
			C	0.124	2.87		0.825	1	24.719			
T14	157.815	4407.341	A	0.121	2.881	0.007	0.825	1	25.379	544.891	43.591	C
12.500-0.000			B	0.121	2.881		0.825	1	25.379			
			C	0.121	2.881		0.825	1	25.379			
Sum Weight:	4829.130	39906.941						OTM	1056.389 kip-ft	12138.401		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.011	0.8	1	6.304	205.316	41.063	C
180.000-175.0			B	0.173	2.689		0.8	1	6.304			
00			C	0.173	2.689		0.8	1	6.304			
T2	58.310	755.494	A	0.135	2.826	0.011	0.8	1	8.062	318.021	38.163	C
175.000-166.6			B	0.135	2.826		0.8	1	8.062			
67			C	0.135	2.826		0.8	1	8.062			
T3	72.052	768.073	A	0.13	2.846	0.011	0.8	1	8.238	342.728	41.127	C
166.667-158.3			B	0.13	2.846		0.8	1	8.238			
33			C	0.13	2.846		0.8	1	8.238			
T4	91.713	780.881	A	0.126	2.863	0.011	0.8	1	8.418	374.026	44.883	C
158.333-150.0			B	0.126	2.863		0.8	1	8.418			
00			C	0.126	2.863		0.8	1	8.418			
T5	604.690	3994.805	A	0.145	2.79	0.011	0.8	1	34.452	1674.733	66.989	C
150.000-125.0			B	0.145	2.79		0.8	1	34.452			
00			C	0.145	2.79		0.8	1	34.452			
T6	822.940	4822.083	A	0.142	2.8	0.010	0.8	1	39.398	1974.493	78.980	C
125.000-100.0			B	0.142	2.8		0.8	1	39.398			
00			C	0.142	2.8		0.8	1	39.398			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T7	276.250	1971.333	A	0.137	2.821	0.010	0.8	1	13.763	656.534	78.784	C
100.000-91.66			B	0.137	2.821		0.8	1	13.763			
7			C	0.137	2.821		0.8	1	13.763			
T8	276.250	2177.704	A	0.137	2.82	0.010	0.8	1	16.904	716.475	85.977	C
91.667-83.333			B	0.137	2.82		0.8	1	16.904			
			C	0.137	2.82		0.8	1	16.904			
T9	280.870	2217.593	A	0.135	2.828	0.009	0.8	1	17.216	715.342	85.841	C
83.333-75.000			B	0.135	2.828		0.8	1	17.216			
			C	0.135	2.828		0.8	1	17.216			
T10	861.750	6256.463	A	0.135	2.826	0.009	0.8	1	44.571	1915.119	76.605	C
75.000-50.000			B	0.135	2.826		0.8	1	44.571			
			C	0.135	2.826		0.8	1	44.571			
T11	430.875	3351.672	A	0.13	2.847	0.008	0.8	1	23.047	906.986	72.559	C
50.000-37.500			B	0.13	2.847		0.8	1	23.047			
			C	0.13	2.847		0.8	1	23.047			
T12	432.900	3953.241	A	0.127	2.859	0.008	0.8	1	23.593	860.477	68.838	C
37.500-25.000			B	0.127	2.859		0.8	1	23.593			
			C	0.127	2.859		0.8	1	23.593			
T13	436.425	3857.953	A	0.124	2.87	0.007	0.8	1	24.146	788.956	63.117	C
25.000-12.500			B	0.124	2.87		0.8	1	24.146			
			C	0.124	2.87		0.8	1	24.146			
T14	157.815	4407.341	A	0.121	2.881	0.007	0.8	1	24.788	535.260	42.821	C
12.500-0.000			B	0.121	2.881		0.8	1	24.788			
			C	0.121	2.881		0.8	1	24.788			
Sum Weight:	4829.130	39906.941						OTM	1043.179 kip-ft	11984.466		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.290	592.305	A	0.173	2.689	0.011	0.85	1	6.580	212.381	42.476	C
180.000-175.0			B	0.173	2.689		0.85	1	6.580			
00			C	0.173	2.689		0.85	1	6.580			
T2	58.310	755.494	A	0.135	2.826	0.011	0.85	1	8.377	326.410	39.169	C
175.000-166.6			B	0.135	2.826		0.85	1	8.377			
67			C	0.135	2.826		0.85	1	8.377			
T3	72.052	768.073	A	0.13	2.846	0.011	0.85	1	8.564	351.385	42.166	C
166.667-158.3			B	0.13	2.846		0.85	1	8.564			
33			C	0.13	2.846		0.85	1	8.564			
T4	91.713	780.881	A	0.126	2.863	0.011	0.85	1	8.756	382.941	45.953	C
158.333-150.0			B	0.126	2.863		0.85	1	8.756			
00			C	0.126	2.863		0.85	1	8.756			
T5	604.690	3994.805	A	0.145	2.79	0.011	0.85	1	36.024	1714.248	68.570	C
150.000-125.0			B	0.145	2.79		0.85	1	36.024			
00			C	0.145	2.79		0.85	1	36.024			
T6	822.940	4822.083	A	0.142	2.8	0.010	0.85	1	41.273	2019.855	80.794	C
125.000-100.0			B	0.142	2.8		0.85	1	41.273			
00			C	0.142	2.8		0.85	1	41.273			
T7	276.250	1971.333	A	0.137	2.821	0.010	0.85	1	14.427	672.165	80.660	C
100.000-91.66			B	0.137	2.821		0.85	1	14.427			
7			C	0.137	2.821		0.85	1	14.427			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T8	276.250	2177.704	A	0.137	2.82	0.010	0.85	1	17.960	740.883	88.906	C
91.667-83.333			B	0.137	2.82		0.85	1	17.960			
			C	0.137	2.82		0.85	1	17.960			
T9	280.870	2217.593	A	0.135	2.828	0.009	0.85	1	18.292	739.759	88.771	C
83.333-75.000			B	0.135	2.828		0.85	1	18.292			
			C	0.135	2.828		0.85	1	18.292			
T10	861.750	6256.463	A	0.135	2.826	0.009	0.85	1	46.619	1959.303	78.372	C
75.000-50.000			B	0.135	2.826		0.85	1	46.619			
			C	0.135	2.826		0.85	1	46.619			
T11	430.875	3351.672	A	0.13	2.847	0.008	0.85	1	24.121	928.642	74.291	C
50.000-37.500			B	0.13	2.847		0.85	1	24.121			
			C	0.13	2.847		0.85	1	24.121			
T12	432.900	3953.241	A	0.127	2.859	0.008	0.85	1	24.703	881.408	70.513	C
37.500-25.000			B	0.127	2.859		0.85	1	24.703			
			C	0.127	2.859		0.85	1	24.703			
T13	436.425	3857.953	A	0.124	2.87	0.007	0.85	1	25.292	808.434	64.675	C
25.000-12.500			B	0.124	2.87		0.85	1	25.292			
			C	0.124	2.87		0.85	1	25.292			
T14	157.815	4407.341	A	0.121	2.881	0.007	0.85	1	25.970	554.522	44.362	C
12.500-0.000			B	0.121	2.881		0.85	1	25.970			
			C	0.121	2.881		0.85	1	25.970			
Sum Weight:	4829.130	39906.941						OTM	1069.599 kip-ft	12292.335		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	13087.082					
Bracing Weight	26819.858					
Total Member Self-Weight	39906.941			0.240	0.016	
Total Weight	53892.577			0.240	0.016	
Wind 0 deg - No Ice		-90.776	-104761.157	-10835.648	19.276	27.977
Wind 30 deg - No Ice		49753.599	-86016.585	-8972.355	-5194.140	15.755
Wind 45 deg - No Ice		69789.295	-69635.477	-7275.997	-7301.874	8.091
Wind 60 deg - No Ice		84875.185	-48724.543	-5093.490	-8906.926	-1.369
Wind 90 deg - No Ice		99957.300	137.061	27.032	-10468.227	-21.246
Wind 120 deg - No Ice		91193.657	52662.764	5471.508	-9462.850	-35.277
Wind 135 deg - No Ice		72458.395	72567.250	7572.725	-7547.922	-37.254
Wind 150 deg - No Ice		49785.004	86544.782	9076.027	-5204.623	-37.192
Wind 180 deg - No Ice		-112.955	98408.047	10367.989	18.002	-31.130
Wind 210 deg - No Ice		-50008.732	86813.404	9114.307	5239.563	-18.439
Wind 225 deg - No Ice		-69966.732	70205.267	7378.656	7334.401	-9.960
Wind 240 deg - No Ice		-91127.652	52771.069	5484.549	9447.110	-0.919
Wind 270 deg - No Ice		-99974.561	47.003	8.356	10470.717	17.029
Wind 300 deg - No Ice		-85068.409	-48908.467	-5132.324	8946.403	31.715
Wind 315 deg - No Ice		-70090.968	-69700.321	-7294.981	7362.777	34.849
Wind 330 deg - No Ice		-49975.659	-86144.773	-9001.997	5241.825	34.789
Member Ice	41643.920					
Total Weight Ice	139505.667			-17.907	-14.970	
Wind 0 deg - Ice		-2.807	-23338.692	-2431.278	-13.517	4.875
Wind 30 deg - Ice		11367.127	-19715.152	-2065.176	-1194.558	0.716

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 45 deg - Ice		16089.472	-15988.099	-1677.136	-1690.261	-2.170
Wind 60 deg - Ice		19709.506	-11196.149	-1177.013	-2073.251	-4.948
Wind 90 deg - Ice		22903.918	122.220	1.788	-2401.745	-8.677
Wind 120 deg - Ice		20334.266	11764.536	1205.128	-2124.642	-10.358
Wind 135 deg - Ice		16426.393	16366.735	1684.515	-1724.133	-10.006
Wind 150 deg - Ice		11477.778	19788.012	2044.352	-1213.237	-9.492
Wind 180 deg - Ice		-14.326	22768.229	2361.871	-18.565	-7.611
Wind 210 deg - Ice		-11464.783	19842.834	2051.411	1176.250	-1.838
Wind 225 deg - Ice		-16158.115	16092.395	1658.830	1668.160	1.164
Wind 240 deg - Ice		-20340.725	11739.744	1198.639	2092.060	3.328
Wind 270 deg - Ice		-22900.177	91.579	-7.173	2368.995	6.571
Wind 300 deg - Ice		-19732.624	-11216.679	-1186.105	2044.316	8.034
Wind 315 deg - Ice		-16174.554	-15989.460	-1681.372	1672.157	8.328
Wind 330 deg - Ice		-11416.438	-19716.967	-2067.847	1174.360	8.199
Total Weight	53892.577			0.240	0.016	
Wind 0 deg - Service		-15.543	-17937.701	-1858.915	4.764	4.790
Wind 30 deg - Service		8519.047	-14728.167	-1539.873	-887.902	2.698
Wind 45 deg - Service		11949.653	-11923.316	-1249.415	-1248.798	1.385
Wind 60 deg - Service		14532.731	-8342.847	-875.716	-1523.623	-0.234
Wind 90 deg - Service		17115.162	23.468	1.044	-1790.956	-3.638
Wind 120 deg - Service		15614.610	9017.168	933.273	-1618.811	-6.040
Wind 135 deg - Service		12406.669	12425.308	1293.054	-1290.927	-6.379
Wind 150 deg - Service		8524.424	14818.607	1550.456	-889.697	-6.368
Wind 180 deg - Service		-19.341	16849.891	1771.672	4.546	-5.330
Wind 210 deg - Service		-8562.732	14864.602	1557.010	898.606	-3.157
Wind 225 deg - Service		-11980.035	12020.878	1259.824	1257.294	-1.705
Wind 240 deg - Service		-15603.308	9035.712	935.506	1619.042	-0.157
Wind 270 deg - Service		-17118.118	8.048	-2.154	1794.309	2.916
Wind 300 deg - Service		-14565.816	-8374.339	-882.365	1533.309	5.430
Wind 315 deg - Service		-12001.307	-11934.419	-1252.665	1262.153	5.967
Wind 330 deg - Service		-8557.069	-14750.116	-1544.949	898.993	5.957

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 45 deg - No Ice
7	0.9 Dead+1.0 Wind 45 deg - No Ice
8	1.2 Dead+1.0 Wind 60 deg - No Ice
9	0.9 Dead+1.0 Wind 60 deg - No Ice
10	1.2 Dead+1.0 Wind 90 deg - No Ice
11	0.9 Dead+1.0 Wind 90 deg - No Ice
12	1.2 Dead+1.0 Wind 120 deg - No Ice
13	0.9 Dead+1.0 Wind 120 deg - No Ice
14	1.2 Dead+1.0 Wind 135 deg - No Ice
15	0.9 Dead+1.0 Wind 135 deg - No Ice
16	1.2 Dead+1.0 Wind 150 deg - No Ice
17	0.9 Dead+1.0 Wind 150 deg - No Ice
18	1.2 Dead+1.0 Wind 180 deg - No Ice
19	0.9 Dead+1.0 Wind 180 deg - No Ice
20	1.2 Dead+1.0 Wind 210 deg - No Ice

Comb. No.	Description
21	0.9 Dead+1.0 Wind 210 deg - No Ice
22	1.2 Dead+1.0 Wind 225 deg - No Ice
23	0.9 Dead+1.0 Wind 225 deg - No Ice
24	1.2 Dead+1.0 Wind 240 deg - No Ice
25	0.9 Dead+1.0 Wind 240 deg - No Ice
26	1.2 Dead+1.0 Wind 270 deg - No Ice
27	0.9 Dead+1.0 Wind 270 deg - No Ice
28	1.2 Dead+1.0 Wind 300 deg - No Ice
29	0.9 Dead+1.0 Wind 300 deg - No Ice
30	1.2 Dead+1.0 Wind 315 deg - No Ice
31	0.9 Dead+1.0 Wind 315 deg - No Ice
32	1.2 Dead+1.0 Wind 330 deg - No Ice
33	0.9 Dead+1.0 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 175	Leg	Max Tension	9	544.161	-0.893	-0.099
			Max. Compression	35	-2696.608	0.178	0.046
			Max. Mx	18	-181.930	1.683	-0.100
			Max. My	20	-1045.209	-0.003	-1.908
			Max. Vy	18	-1508.982	0.000	0.000
			Max. Vx	11	1952.330	0.000	0.000
		Diagonal	Max Tension	15	2355.908	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-2478.030	0.000	0.000
			Max. Mx	34	-151.411	0.091	0.000
			Max. My	34	-123.536	0.000	-0.003
			Max. Vy	34	48.972	0.000	0.000
			Max. Vx	34	1.533	0.000	0.000
		Top Girt	Max Tension	9	2039.689	0.012	0.004
			Max. Compression	12	-2181.565	0.024	0.005
			Max. Mx	48	-332.675	0.055	0.013
			Max. My	48	-332.675	0.055	0.013
			Max. Vy	48	50.636	0.055	0.013
			Max. Vx	48	3.398	0.000	0.000
T2	175 - 166.667	Leg	Max Tension	9	2514.823	-0.893	-0.099
			Max. Compression	12	-4683.706	0.304	-0.280
			Max. Mx	18	1958.212	-0.960	-0.100
			Max. My	32	-806.463	-0.003	1.031
			Max. Vy	13	343.219	0.920	-0.153
			Max. Vx	16	471.533	-0.020	-0.634
		Diagonal	Max Tension	17	6193.211	0.000	0.000
			Max. Compression	16	-6299.900	0.000	0.000
			Max. Mx	34	-96.879	0.132	0.000
			Max. My	34	-82.253	0.000	-0.005
			Max. Vy	34	-51.790	0.000	0.000
			Max. Vx	34	2.086	0.000	0.000
		Horizontal	Max Tension	18	3646.219	0.014	0.006
			Max. Compression	13	-3755.408	0.012	0.004
			Max. Mx	48	-115.810	0.047	0.016
			Max. My	48	-115.810	0.047	0.016
			Max. Vy	48	40.919	0.047	0.016
			Max. Vx	35	-3.583	0.000	0.000
T3	166.667 - 158.333	Leg	Max Tension	19	10454.419	-0.283	-0.234
			Max. Compression	12	-13240.103	0.436	0.205
			Max. Mx	12	-13240.103	0.436	0.205
			Max. My	16	-1638.940	-0.020	-0.634
			Max. Vy	13	-333.848	0.435	0.205
			Max. Vx	2	-407.315	-0.186	0.319
		Diagonal	Max Tension	21	6821.501	0.000	0.000
			Max. Compression	20	-6932.935	0.000	0.000
			Max. Mx	34	-86.727	0.141	0.000
			Max. My	34	-75.703	0.000	-0.005
			Max. Vy	34	-54.543	0.000	0.000
			Max. Vx	34	2.118	0.000	0.000
		Top Girt	Max Tension	20	4091.924	0.000	0.000
			Max. Compression	21	-4056.243	0.000	0.000
			Max. Mx	48	-125.957	0.054	0.017
			Max. My	46	203.245	0.051	0.017
			Max. Vy	48	-43.390	0.054	0.017
			Max. Vx	35	3.698	0.000	0.000
T4	158.333 - 150	Leg	Max Tension	19	19549.872	-0.396	-0.032
			Max. Compression	24	-23055.993	0.735	-0.230
			Max. Mx	28	18174.244	-0.841	-0.202
			Max. My	11	-1596.111	-0.049	1.427
			Max. Vy	12	363.558	0.436	0.205
			Max. Vx	11	594.844	-0.015	0.572
		Diagonal	Max Tension	21	8412.357	0.000	0.000
			Max. Compression	20	-8529.358	0.000	0.000
			Max. Mx	34	-131.881	0.151	0.000
			Max. My	34	-65.085	0.000	-0.006
			Max. Vy	34	57.265	0.000	0.000
			Max. Vx	34	2.151	0.000	0.000
		Top Girt	Max Tension	20	5209.666	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	21	-5174.561	0.000	0.000
			Max. Mx	48	-91.701	0.061	0.018
			Max. My	38	145.768	0.060	0.018
			Max. Vy	48	45.866	0.061	0.018
			Max. Vx	40	-3.814	0.000	0.000
T5	150 - 125	Leg	Max Tension	19	61070.753	0.055	0.022
			Max. Compression	12	-72255.476	-0.899	0.011
			Max. Mx	8	25684.634	1.601	-0.082
			Max. My	20	-2685.461	-0.045	-1.935
			Max. Vy	24	2276.480	1.064	0.039
			Max. Vx	11	1635.972	-0.049	1.427
		Diagonal	Max Tension	17	18071.490	-0.011	0.004
			Max. Compression	16	-18421.052	0.000	0.000
			Max. Mx	12	-718.361	-0.074	-0.005
			Max. My	40	-405.250	-0.048	-0.011
			Max. Vy	35	49.017	-0.048	0.011
			Max. Vx	38	-3.292	0.000	0.000
		Horizontal	Max Tension	20	12044.921	0.000	0.000
			Max. Compression	15	-12235.885	0.037	0.005
			Max. Mx	48	-343.708	0.107	0.002
			Max. My	12	2045.147	0.009	-0.023
			Max. Vy	48	64.474	0.107	0.002
			Max. Vx	12	-3.695	0.009	-0.023
		Redund Horz 1 Bracing	Max Tension	10	1950.308	0.000	0.000
			Max. Compression	32	-1955.928	0.000	0.000
			Max. Mx	34	253.765	-0.015	0.000
			Max. My	34	251.215	0.000	0.000
			Max. Vy	34	17.290	0.000	0.000
			Max. Vx	34	0.399	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	32	1505.246	0.000	0.000
			Max. Compression	10	-1502.632	0.000	0.000
			Max. Mx	34	190.829	-0.022	0.000
			Max. My	34	188.911	0.000	-0.001
			Max. Vy	34	16.485	0.000	0.000
			Max. Vx	34	0.601	0.000	0.000
		Inner Bracing	Max Tension	13	5.161	0.000	0.000
			Max. Compression	18	-9.731	0.000	0.000
			Max. Mx	34	-6.475	-0.068	0.000
			Max. Vy	34	-38.130	0.000	0.000
T6	125 - 100	Leg	Max Tension	19	128996.292	1.096	0.085
			Max. Compression	12	-146707.452	-1.593	0.068
			Max. Mx	12	-146669.061	2.248	-0.029
			Max. My	20	-8968.649	-0.219	1.646
			Max. Vy	24	1005.658	1.930	0.029
			Max. Vx	20	-807.490	-0.219	1.585
		Diagonal	Max Tension	17	20695.103	-0.051	0.004
			Max. Compression	16	-21124.368	0.000	0.000
			Max. Mx	14	5751.108	-0.123	-0.005
			Max. My	35	-302.836	-0.066	0.013
			Max. Vy	41	59.996	-0.067	-0.013
			Max. Vx	35	3.688	0.000	0.000
		Horizontal	Max Tension	16	14753.998	0.065	-0.001
			Max. Compression	15	-14695.947	0.061	0.007
			Max. Mx	48	-131.134	0.156	0.004
			Max. My	24	1012.617	0.019	-0.035
			Max. Vy	48	-84.770	0.156	0.004
			Max. Vx	12	-5.103	0.019	-0.034

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Redund Horz 1 Bracing	Max Tension	12	2544.352	0.000	0.000
			Max. Compression	12	-2544.352	0.000	0.000
			Max. Mx	34	349.009	-0.020	0.000
			Max. My	34	361.359	0.000	0.000
			Max. Vy	34	-19.344	0.000	0.000
			Max. Vx	34	0.447	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	1864.644	0.000	0.000
			Max. Compression	12	-1864.644	0.000	0.000
			Max. Mx	34	251.289	-0.027	0.000
			Max. My	34	253.069	0.000	-0.001
			Max. Vy	34	18.554	0.000	0.000
			Max. Vx	34	0.626	0.000	0.000
		Inner Bracing	Max Tension	13	7.622	0.000	0.000
			Max. Compression	18	-12.620	0.000	0.000
			Max. Mx	34	-7.593	-0.087	0.000
			Max. Vy	34	42.685	0.000	0.000
T7	100 - 91.6667	Leg	Max Tension	19	152747.901	1.221	0.050
			Max. Compression	12	-173056.365	-1.627	0.075
			Max. Mx	12	-172999.475	2.282	-0.046
			Max. My	20	-9870.402	-0.214	1.669
			Max. Vy	12	998.663	2.282	-0.046
			Max. Vx	20	-711.141	-0.214	1.669
		Diagonal	Max Tension	17	21414.799	-0.060	0.004
			Max. Compression	14	-21916.102	0.000	0.000
			Max. Mx	16	10785.737	-0.118	-0.006
			Max. My	38	-683.499	-0.036	0.013
			Max. Vy	50	-62.169	-0.073	0.013
			Max. Vx	40	3.727	0.000	0.000
		Horizontal	Max Tension	16	15613.647	-0.112	0.003
			Max. Compression	15	-15521.922	-0.102	-0.014
			Max. Mx	48	-126.953	-0.240	-0.008
			Max. My	24	762.937	-0.044	0.064
			Max. Vy	48	-126.556	-0.240	-0.008
			Max. Vx	24	8.690	-0.044	0.064
		Redund Horz 1 Bracing	Max Tension	12	3001.157	0.000	0.000
			Max. Compression	12	-3001.157	0.000	0.000
			Max. Mx	34	396.671	-0.021	0.000
			Max. My	34	397.505	0.000	0.000
			Max. Vy	34	19.843	0.000	0.000
			Max. Vx	34	-0.458	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	2060.108	0.000	0.000
			Max. Compression	12	-2060.108	0.000	0.000
			Max. Mx	34	272.290	-0.028	0.000
			Max. My	34	272.862	0.000	-0.001
			Max. Vy	34	19.065	0.000	0.000
			Max. Vx	34	-0.629	0.000	0.000
		Inner Bracing	Max Tension	25	13.709	0.000	0.000
			Max. Compression	18	-19.857	0.000	0.000
			Max. Mx	34	-8.785	-0.093	0.000
			Max. Vy	34	43.806	0.000	0.000
T8	91.6667 - 83.3333	Leg	Max Tension	19	176812.953	1.262	0.059
			Max. Compression	12	-200009.691	-1.491	0.077
			Max. Mx	12	-199916.83	2.168	-0.058

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
					4		
			Max. My	11	-6652.723	-0.144	1.969
			Max. Vy	12	-1022.953	2.168	-0.058
			Max. Vx	20	-823.992	-0.215	1.955
		Diagonal	Max Tension	17	22182.837	-0.036	0.004
			Max. Compression	14	-22720.751	0.000	0.000
			Max. Mx	14	4942.980	-0.102	-0.006
			Max. My	40	-229.167	-0.076	0.013
			Max. Vy	41	64.215	-0.077	-0.013
			Max. Vx	38	-3.785	0.000	0.000
		Horizontal	Max Tension	16	16499.479	-0.119	0.003
			Max. Compression	15	-16361.817	-0.104	-0.014
			Max. Mx	48	-94.714	-0.249	-0.008
			Max. My	24	788.947	-0.062	0.065
			Max. Vy	48	129.857	-0.249	-0.008
			Max. Vx	24	-8.591	-0.062	0.065
		Redund Horz 1 Bracing	Max Tension	12	3468.341	0.000	0.000
			Max. Compression	12	-3468.341	0.000	0.000
			Max. Mx	34	437.114	-0.023	0.000
			Max. My	34	437.114	0.000	0.001
			Max. Vy	34	-20.453	0.000	0.000
			Max. Vx	34	0.472	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	2337.224	0.000	0.000
			Max. Compression	12	-2337.224	0.000	0.000
			Max. Mx	34	297.346	-0.029	0.000
			Max. My	34	294.560	0.000	-0.001
			Max. Vy	34	19.681	0.000	0.000
			Max. Vx	34	-0.637	0.000	0.000
		Inner Bracing	Max Tension	25	13.296	0.000	0.000
			Max. Compression	18	-19.577	0.000	0.000
			Max. Mx	34	-8.966	-0.100	0.000
			Max. Vy	34	45.165	0.000	0.000
T9	83.3333 - 75	Leg	Max Tension	19	200824.918	1.127	0.049
			Max. Compression	12	-227040.658	-2.911	0.102
			Max. Mx	12	-227040.658	-2.911	0.102
			Max. My	20	-11903.745	-0.367	3.355
			Max. Vy	12	1397.864	2.591	-0.064
			Max. Vx	20	-1187.720	-0.367	3.355
		Diagonal	Max Tension	17	23171.911	-0.042	0.005
			Max. Compression	14	-23892.509	0.000	0.000
			Max. Mx	14	6511.714	-0.107	-0.006
			Max. My	38	-1201.598	-0.051	-0.014
			Max. Vy	41	-66.232	-0.082	-0.014
			Max. Vx	40	3.839	0.000	0.000
		Horizontal	Max Tension	16	17553.994	-0.128	0.003
			Max. Compression	15	-17412.376	-0.112	-0.014
			Max. Mx	48	-67.086	-0.266	-0.008
			Max. My	24	941.881	-0.067	0.067
			Max. Vy	48	133.895	-0.266	-0.008
			Max. Vx	24	-8.534	-0.067	0.067
		Redund Horz 1 Bracing	Max Tension	12	3937.291	0.000	0.000
			Max. Compression	12	-3937.291	0.000	0.000
			Max. Mx	34	475.773	-0.024	0.000
			Max. My	34	478.217	0.000	0.001
			Max. Vy	34	21.036	0.000	0.000
			Max. Vx	34	-0.486	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Redund Diag 1 Bracing	Max Tension	12	2608.349	0.000	0.000
			Max. Compression	12	-2608.349	0.000	0.000
			Max. Mx	34	321.934	-0.031	0.000
			Max. My	34	315.187	0.000	0.001
			Max. Vy	34	-20.271	0.000	0.000
			Max. Vx	34	-0.644	0.000	0.000
		Inner Bracing	Max Tension	25	12.969	0.000	0.000
			Max. Compression	18	-19.355	0.000	0.000
			Max. Mx	34	-9.166	-0.106	0.000
			Max. Vy	34	-46.464	0.000	0.000
T10	75 - 50	Leg	Max Tension	19	260792.988	5.373	0.102
			Max. Compression	12	-295188.277	-7.309	0.113
			Max. Mx	12	-295184.231	8.978	-0.080
			Max. My	20	-13039.237	-0.576	3.789
			Max. Vy	12	2712.000	8.978	-0.080
			Max. Vx	20	1030.519	-0.576	3.789
		Diagonal	Max Tension	17	31502.079	-0.286	0.012
			Max. Compression	14	-32596.007	0.000	0.000
			Max. Mx	30	19668.289	-0.405	0.015
			Max. My	40	-587.868	-0.156	-0.030
			Max. Vy	49	-100.239	-0.177	0.030
			Max. Vx	43	-6.448	0.000	0.000
		Horizontal	Max Tension	16	19654.316	0.110	-0.003
			Max. Compression	15	-19718.759	0.118	0.015
			Max. Mx	38	-307.346	0.287	0.009
			Max. My	24	1371.724	-0.025	-0.069
			Max. Vy	38	-119.823	0.287	0.009
			Max. Vx	24	-8.060	-0.029	-0.068
		Redund Horz 1 Bracing	Max Tension	12	5120.673	0.000	0.000
			Max. Compression	12	-5120.673	0.000	0.000
			Max. Mx	34	580.162	-0.034	0.000
			Max. My	34	572.699	0.000	0.001
			Max. Vy	34	27.028	0.000	0.000
			Max. Vx	34	-0.624	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	4151.956	0.000	0.000
			Max. Compression	12	-4151.956	0.000	0.000
			Max. Mx	34	460.516	-0.050	0.000
			Max. My	34	449.654	0.000	-0.002
			Max. Vy	34	25.676	0.000	0.000
			Max. Vx	34	0.980	0.000	0.000
		Inner Bracing	Max Tension	25	11.830	0.000	0.000
			Max. Compression	18	-20.713	0.000	0.000
			Max. Mx	34	-11.977	-0.135	0.000
			Max. Vy	34	54.070	0.000	0.000
T11	50 - 37.5	Leg	Max Tension	19	298556.046	6.091	0.110
			Max. Compression	12	-338214.668	-6.648	0.161
			Max. Mx	12	-338161.876	8.910	-0.101
			Max. My	20	-16083.603	-0.606	4.740
			Max. Vy	12	-2693.306	8.910	-0.101
			Max. Vx	20	-1214.455	-0.606	4.740
		Diagonal	Max Tension	17	31965.750	-0.209	0.011
			Max. Compression	14	-33078.385	0.000	0.000
			Max. Mx	30	19988.359	-0.322	0.015
			Max. My	38	-1587.143	-0.073	-0.029

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	49	97.952	-0.171	0.029
			Max. Vx	40	6.219	0.000	0.000
		Horizontal	Max Tension	16	20609.497	0.118	-0.003
			Max. Compression	15	-20598.363	0.118	0.015
			Max. Mx	38	21.461	0.294	0.008
			Max. My	24	1004.497	0.005	-0.069
			Max. Vy	38	-121.436	0.294	0.008
			Max. Vx	24	7.521	0.005	-0.069
		Redund Horz 1 Bracing	Max Tension	12	5866.504	0.000	0.000
			Max. Compression	12	-5866.504	0.000	0.000
			Max. Mx	34	643.149	-0.036	0.000
			Max. My	34	631.056	0.000	0.001
			Max. Vy	34	27.561	0.000	0.000
			Max. Vx	34	-0.636	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	4472.626	0.000	0.000
			Max. Compression	12	-4472.626	0.000	0.000
			Max. Mx	34	493.612	-0.053	0.000
			Max. My	34	481.117	0.000	-0.002
			Max. Vy	34	26.248	0.000	0.000
			Max. Vx	34	-0.971	0.000	0.000
		Inner Bracing	Max Tension	25	10.274	0.000	0.000
			Max. Compression	18	-19.331	0.000	0.000
			Max. Mx	34	-11.798	-0.145	0.000
			Max. Vy	34	55.136	0.000	0.000
T12	37.5 - 25	Leg	Max Tension	19	335814.439	5.442	0.153
			Max. Compression	12	-380960.850	-7.966	0.154
			Max. Mx	12	-380686.470	9.679	-0.101
			Max. My	20	-17196.905	-0.606	4.740
			Max. Vy	12	2933.775	9.679	-0.101
			Max. Vx	20	1207.272	-0.606	4.740
		Diagonal	Max Tension	17	32864.142	-0.304	0.013
			Max. Compression	14	-34191.336	0.000	0.000
			Max. Mx	30	22790.511	-0.406	0.017
			Max. My	38	-1744.597	-0.080	-0.031
			Max. Vy	49	106.677	-0.199	0.031
			Max. Vx	40	6.488	0.000	0.000
		Top Girt	Max Tension	16	21728.212	-0.258	0.006
			Max. Compression	15	-21743.709	-0.253	-0.024
			Max. Mx	38	-231.185	-0.531	-0.013
			Max. My	24	1327.493	-0.024	0.118
			Max. Vy	38	-205.612	-0.531	-0.013
			Max. Vx	24	12.754	-0.024	0.118
		Redund Horz 1 Bracing	Max Tension	12	6607.725	0.000	0.000
			Max. Compression	12	-6607.725	0.000	0.000
			Max. Mx	34	706.035	-0.039	0.000
			Max. My	34	689.756	0.000	0.001
			Max. Vy	34	28.102	0.000	0.000
			Max. Vx	34	-0.649	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	4903.947	0.000	0.000
			Max. Compression	12	-4903.947	0.000	0.000
			Max. Mx	34	529.786	-0.055	0.000
			Max. My	34	511.905	0.000	-0.002
			Max. Vy	34	-26.825	0.000	0.000
			Max. Vx	34	0.963	0.000	0.000
		Inner Bracing	Max Tension	15	371.661	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-385.130	0.000	0.000
			Max. Mx	34	-14.380	-0.155	0.000
			Max. Vy	34	56.220	0.000	0.000
T13	25 - 12.5	Leg	Max Tension	19	373129.068	6.594	0.114
			Max. Compression	12	-424176.931	-7.886	0.175
			Max. Mx	12	-423903.305	10.410	-0.126
			Max. My	10	-17487.846	-0.610	4.902
			Max. Vy	12	3055.950	10.410	-0.126
			Max. Vx	10	-1242.868	-0.610	4.902
		Diagonal	Max Tension	17	33504.836	-0.300	0.013
			Max. Compression	14	-34874.843	0.000	0.000
			Max. Mx	30	23040.384	-0.416	0.017
			Max. My	40	-249.859	-0.182	0.031
			Max. Vy	49	-108.646	-0.206	0.031
			Max. Vx	48	6.460	0.000	0.000
		Horizontal	Max Tension	16	22648.636	0.206	-0.005
			Max. Compression	15	-22533.462	0.198	0.012
			Max. Mx	38	-135.699	0.413	0.005
			Max. My	24	1167.860	0.036	-0.067
			Max. Vy	38	-154.485	0.413	0.005
			Max. Vx	24	7.375	0.036	-0.067
		Redund Horz 1 Bracing	Max Tension	12	7357.205	0.000	0.000
			Max. Compression	12	-7357.205	0.000	0.000
			Max. Mx	34	770.505	-0.041	0.000
			Max. My	34	750.406	0.000	0.001
			Max. Vy	34	-28.227	0.000	0.000
			Max. Vx	34	0.652	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	5327.041	0.000	0.000
			Max. Compression	12	-5327.041	0.000	0.000
			Max. Mx	34	566.983	-0.056	0.000
			Max. My	34	543.338	0.000	-0.002
			Max. Vy	34	26.999	0.000	0.000
			Max. Vx	34	-0.944	0.000	0.000
		Inner Bracing	Max Tension	25	6.958	0.000	0.000
			Max. Compression	18	-19.080	0.000	0.000
			Max. Mx	34	-13.445	-0.214	0.000
			Max. Vy	34	74.498	0.000	0.000
T14	12.5 - 0	Leg	Max Tension	19	411146.899	6.492	0.130
			Max. Compression	12	-468554.999	0.000	-0.000
			Max. Mx	12	-468468.287	9.277	-0.103
			Max. My	10	-18822.464	-0.610	4.902
			Max. Vy	12	-2825.620	9.277	-0.103
			Max. Vx	10	1135.638	-0.610	4.902
		Diagonal	Max Tension	17	33459.893	-0.357	0.014
			Max. Compression	14	-34716.804	0.000	0.000
			Max. Mx	30	22336.348	-0.472	0.018
			Max. My	43	-1619.508	-0.080	-0.031
			Max. Vy	37	108.882	-0.217	-0.031
			Max. Vx	46	6.268	0.000	0.000
		Top Girt	Max Tension	16	23324.039	-0.376	0.009
			Max. Compression	15	-23406.840	-0.357	-0.021
			Max. Mx	38	-13.402	-0.668	-0.009
			Max. My	24	1542.918	-0.081	0.119
			Max. Vy	38	-237.274	-0.668	-0.009
			Max. Vx	24	12.649	-0.081	0.119

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Redund Horz 1 Bracing	Max Tension	12	8125.267	0.000	0.000
			Max. Compression	12	-8125.267	0.000	0.000
			Max. Mx	34	848.724	-0.041	0.000
			Max. My	34	815.758	0.000	0.001
			Max. Vy	34	27.135	0.000	0.000
			Max. Vx	34	-0.627	0.000	0.000
		Redund Diag 1 Bracing	Max Tension	12	5751.248	0.000	0.000
			Max. Compression	12	-5751.248	0.000	0.000
			Max. Mx	34	600.746	-0.055	0.000
			Max. My	34	577.412	0.000	-0.002
			Max. Vy	34	26.005	0.000	0.000
			Max. Vx	34	0.887	0.000	0.000
		Inner Bracing	Max Tension	15	399.612	0.000	0.000
			Max. Compression	14	-415.895	0.000	0.000
			Max. Mx	34	-15.414	-0.218	0.000
			Max. Vy	34	-72.513	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	24	512338.026	51858.836	-29925.226
	Max. H_x	24	512338.026	51858.836	-29925.226
	Max. H_z	7	-431492.595	-43336.483	28112.586
	Min. Vert	9	-444978.249	-45936.411	26539.638
	Min. H_x	9	-444978.249	-45936.411	26539.638
	Min. H_z	24	512338.026	51858.836	-29925.226
Leg B	Max. Vert	12	512666.203	-51450.738	-30643.190
	Max. H_x	29	-447454.033	45723.804	27228.978
	Max. H_z	31	-434366.974	43002.726	29056.082
	Min. Vert	29	-447454.033	45723.804	27228.978
	Min. H_x	12	512666.203	-51450.738	-30643.190
	Min. H_z	14	485427.349	-46950.564	-31561.897
Leg A	Max. Vert	2	508267.094	650.131	59551.364
	Max. H_x	27	15782.937	11636.982	1168.452
	Max. H_z	2	508267.094	650.131	59551.364
	Min. Vert	19	-449947.304	-710.479	-53384.678
	Min. H_x	10	20306.262	-11732.976	1511.543
	Min. H_z	19	-449947.304	-710.479	-53384.678

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	53892.577	0.000	-0.000	0.241	0.016	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	64671.092	-90.776	-104761.159	-10537.582	19.279	27.978
0.9 Dead+1.0 Wind 0 deg - No Ice	48503.319	-90.776	-104761.159	-10537.654	19.274	27.978

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 30 deg - No Ice	64671.092	49753.599	-86016.587	-8728.337	-5053.281	15.756
0.9 Dead+1.0 Wind 30 deg - No Ice	48503.319	49753.599	-86016.587	-8728.409	-5053.285	15.756
1.2 Dead+1.0 Wind 45 deg - No Ice	64671.092	69789.295	-69635.478	-7078.669	-7104.591	8.091
0.9 Dead+1.0 Wind 45 deg - No Ice	48503.319	69789.295	-69635.478	-7078.741	-7104.596	8.091
1.2 Dead+1.0 Wind 60 deg - No Ice	64671.092	84875.185	-48724.544	-4955.303	-8667.659	-1.368
0.9 Dead+1.0 Wind 60 deg - No Ice	48503.319	84875.185	-48724.544	-4955.375	-8667.664	-1.368
1.2 Dead+1.0 Wind 90 deg - No Ice	64671.092	99957.301	137.061	27.080	-10186.511	-21.246
0.9 Dead+1.0 Wind 90 deg - No Ice	48503.319	99957.301	137.061	27.008	-10186.516	-21.246
1.2 Dead+1.0 Wind 120 deg - No Ice	64671.092	91193.658	52662.765	5322.547	-9204.755	-35.277
0.9 Dead+1.0 Wind 120 deg - No Ice	48503.319	91193.658	52662.765	5322.475	-9204.760	-35.277
1.2 Dead+1.0 Wind 135 deg - No Ice	64671.092	72458.395	72567.251	7367.807	-7342.953	-37.255
0.9 Dead+1.0 Wind 135 deg - No Ice	48503.319	72458.395	72567.251	7367.735	-7342.957	-37.255
1.2 Dead+1.0 Wind 150 deg - No Ice	64671.092	49785.004	86544.784	8832.105	-5063.763	-37.192
0.9 Dead+1.0 Wind 150 deg - No Ice	48503.319	49785.004	86544.784	8832.033	-5063.768	-37.192
1.2 Dead+1.0 Wind 180 deg - No Ice	64671.092	-112.955	98408.048	10091.760	18.005	-31.130
0.9 Dead+1.0 Wind 180 deg - No Ice	48503.319	-112.955	98408.048	10091.687	18.000	-31.130
1.2 Dead+1.0 Wind 210 deg - No Ice	64671.092	-50008.732	86813.405	8870.384	5098.710	-18.439
0.9 Dead+1.0 Wind 210 deg - No Ice	48503.319	-50008.732	86813.405	8870.312	5098.705	-18.439
1.2 Dead+1.0 Wind 225 deg - No Ice	64671.092	-69966.732	70205.268	7181.425	7137.125	-9.960
0.9 Dead+1.0 Wind 225 deg - No Ice	48503.319	-69966.732	70205.268	7181.353	7137.120	-9.960
1.2 Dead+1.0 Wind 240 deg - No Ice	64671.092	-91127.653	52771.070	5335.588	9189.022	-0.920
0.9 Dead+1.0 Wind 240 deg - No Ice	48503.319	-91127.653	52771.070	5335.516	9189.017	-0.920
1.2 Dead+1.0 Wind 270 deg - No Ice	64671.092	-99974.562	47.003	8.404	10189.007	17.028
0.9 Dead+1.0 Wind 270 deg - No Ice	48503.319	-99974.562	47.003	8.332	10189.002	17.028
1.2 Dead+1.0 Wind 300 deg - No Ice	64671.092	-85068.409	-48908.467	-4994.137	8707.142	31.715
0.9 Dead+1.0 Wind 300 deg - No Ice	48503.319	-85068.409	-48908.467	-4994.209	8707.137	31.715
1.2 Dead+1.0 Wind 315 deg - No Ice	64671.092	-70090.969	-69700.322	-7097.653	7165.500	34.849
0.9 Dead+1.0 Wind 315 deg - No Ice	48503.319	-70090.969	-69700.322	-7097.725	7165.495	34.849
1.2 Dead+1.0 Wind 330 deg - No Ice	64671.092	-49975.659	-86144.775	-8757.978	5100.971	34.789
0.9 Dead+1.0 Wind 330 deg - No Ice	48503.319	-49975.659	-86144.775	-8758.050	5100.966	34.789
1.2 Dead+1.0 Ice	150284.182	0.000	0.000	-17.858	-14.968	0.000

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	150284.182	-2.807	-23338.692	-2355.159	-13.514	4.875
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	150284.182	11367.127	-19715.153	-2000.926	-1157.489	0.716
1.2 Dead+1.0 Wind 45 deg+1.0 Ice	150284.182	16089.472	-15988.099	-1624.895	-1638.066	-2.169
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	150284.182	19709.506	-11196.149	-1140.221	-2009.606	-4.948
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	150284.182	22903.918	122.220	1.836	-2327.609	-8.677
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	150284.182	20334.266	11764.536	1167.140	-2058.760	-10.358
1.2 Dead+1.0 Wind 135 deg+1.0 Ice	150284.182	16426.393	16366.735	1631.458	-1671.025	-10.006
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	150284.182	11477.778	19788.012	1980.199	-1176.167	-9.492
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	150284.182	-14.326	22768.230	2288.431	-18.563	-7.611
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	150284.182	-11464.783	19842.834	1987.257	1139.185	-1.838
1.2 Dead+1.0 Wind 225 deg+1.0 Ice	150284.182	-16158.115	16092.395	1606.686	1615.970	1.164
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	150284.182	-20340.725	11739.744	1160.652	2026.183	3.328
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	150284.182	-22900.177	91.579	-7.125	2294.863	6.571
1.2 Dead+1.0 Wind 300 deg+1.0 Ice	150284.182	-19732.624	-11216.679	-1149.312	1980.675	8.034
1.2 Dead+1.0 Wind 315 deg+1.0 Ice	150284.182	-16174.554	-15989.461	-1629.132	1619.966	8.328
1.2 Dead+1.0 Wind 330 deg+1.0 Ice	150284.182	-11416.438	-19716.967	-2003.597	1137.295	8.199
Dead+Wind 0 deg - Service	53892.577	-15.543	-17937.701	-1804.104	3.314	4.791
Dead+Wind 30 deg - Service	53892.577	8519.047	-14728.167	-1494.316	-865.234	2.698
Dead+Wind 45 deg - Service	53892.577	11949.653	-11923.316	-1211.852	-1216.469	1.385
Dead+Wind 60 deg - Service	53892.577	14532.731	-8342.847	-848.279	-1484.105	-0.234
Dead+Wind 90 deg - Service	53892.577	17115.162	23.468	4.828	-1744.170	-3.638
Dead+Wind 120 deg - Service	53892.577	15614.610	9017.168	911.543	-1576.069	-6.040
Dead+Wind 135 deg - Service	53892.577	12406.669	12425.308	1261.742	-1257.282	-6.379
Dead+Wind 150 deg - Service	53892.577	8524.424	14818.607	1512.466	-867.029	-6.368
Dead+Wind 180 deg - Service	53892.577	-19.341	16849.892	1728.150	3.096	-5.330
Dead+Wind 210 deg - Service	53892.577	-8562.732	14864.602	1519.020	873.038	-3.157
Dead+Wind 225 deg - Service	53892.577	-11980.035	12020.878	1229.829	1222.065	-1.705
Dead+Wind 240 deg - Service	53892.577	-15603.308	9035.712	913.776	1573.401	-0.157
Dead+Wind 270 deg - Service	53892.577	-17118.118	8.048	1.630	1744.623	2.916
Dead+Wind 300 deg - Service	53892.577	-14565.816	-8374.339	-854.929	1490.891	5.430
Dead+Wind 315 deg - Service	53892.577	-12001.307	-11934.419	-1215.103	1226.924	5.967
Dead+Wind 330 deg - Service	53892.577	-8557.069	-14750.116	-1499.391	873.425	5.957

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.000	-53892.577	0.000	-0.000	53892.577	0.000	0.000%
2	-90.776	-64671.092	-104761.157	90.776	64671.092	104761.159	0.000%
3	-90.776	-48503.319	-104761.157	90.776	48503.319	104761.159	0.000%
4	49753.599	-64671.092	-86016.585	-49753.599	64671.092	86016.587	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
5	49753.599	-48503.319	-86016.585	-49753.599	48503.319	86016.587	0.000%
6	69789.295	-64671.092	-69635.477	-69789.295	64671.092	69635.478	0.000%
7	69789.295	-48503.319	-69635.477	-69789.295	48503.319	69635.478	0.000%
8	84875.185	-64671.092	-48724.543	-84875.185	64671.092	48724.544	0.000%
9	84875.185	-48503.319	-48724.543	-84875.185	48503.319	48724.544	0.000%
10	99957.300	-64671.092	137.061	-99957.301	64671.092	-137.061	0.000%
11	99957.300	-48503.319	137.061	-99957.301	48503.319	-137.061	0.000%
12	91193.657	-64671.092	52662.764	-91193.658	64671.092	-52662.765	0.000%
13	91193.657	-48503.319	52662.764	-91193.658	48503.319	-52662.765	0.000%
14	72458.395	-64671.092	72567.250	-72458.395	64671.092	-72567.251	0.000%
15	72458.395	-48503.319	72567.250	-72458.395	48503.319	-72567.251	0.000%
16	49785.004	-64671.092	86544.782	-49785.004	64671.092	-86544.784	0.000%
17	49785.004	-48503.319	86544.782	-49785.004	48503.319	-86544.784	0.000%
18	-112.955	-64671.092	98408.047	112.955	64671.092	-98408.048	0.000%
19	-112.955	-48503.319	98408.047	112.955	48503.319	-98408.048	0.000%
20	-50008.732	-64671.092	86813.404	50008.732	64671.092	-86813.405	0.000%
21	-50008.732	-48503.319	86813.404	50008.732	48503.319	-86813.405	0.000%
22	-69966.732	-64671.092	70205.267	69966.732	64671.092	-70205.268	0.000%
23	-69966.732	-48503.319	70205.267	69966.732	48503.319	-70205.268	0.000%
24	-91127.652	-64671.092	52771.069	91127.653	64671.092	-52771.070	0.000%
25	-91127.652	-48503.319	52771.069	91127.653	48503.319	-52771.070	0.000%
26	-99974.561	-64671.092	47.003	99974.562	64671.092	-47.003	0.000%
27	-99974.561	-48503.319	47.003	99974.562	48503.319	-47.003	0.000%
28	-85068.409	-64671.092	-48908.467	85068.409	64671.092	48908.467	0.000%
29	-85068.409	-48503.319	-48908.467	85068.409	48503.319	48908.467	0.000%
30	-70090.968	-64671.092	-69700.321	70090.969	64671.092	69700.322	0.000%
31	-70090.968	-48503.319	-69700.321	70090.969	48503.319	69700.322	0.000%
32	-49975.659	-64671.092	-86144.773	49975.659	64671.092	86144.775	0.000%
33	-49975.659	-48503.319	-86144.773	49975.659	48503.319	86144.775	0.000%
34	0.000	-150284.182	0.000	-0.000	150284.182	-0.000	0.000%
35	-2.807	-150284.182	-23338.692	2.807	150284.182	23338.692	0.000%
36	11367.127	-150284.182	-19715.152	-11367.127	150284.182	19715.153	0.000%
37	16089.472	-150284.182	-15988.099	-16089.472	150284.182	15988.099	0.000%
38	19709.506	-150284.182	-11196.149	-19709.506	150284.182	11196.149	0.000%
39	22903.918	-150284.182	122.220	-22903.918	150284.182	-122.220	0.000%
40	20334.266	-150284.182	11764.536	-20334.266	150284.182	-11764.536	0.000%
41	16426.393	-150284.182	16366.735	-16426.393	150284.182	-16366.735	0.000%
42	11477.778	-150284.182	19788.012	-11477.778	150284.182	-19788.012	0.000%
43	-14.326	-150284.182	22768.229	14.326	150284.182	-22768.230	0.000%
44	-11464.783	-150284.182	19842.834	11464.783	150284.182	-19842.834	0.000%
45	-16158.115	-150284.182	16092.395	16158.115	150284.182	-16092.395	0.000%
46	-20340.725	-150284.182	11739.744	20340.725	150284.182	-11739.744	0.000%
47	-22900.177	-150284.182	91.579	22900.177	150284.182	-91.579	0.000%
48	-19732.624	-150284.182	-11216.679	19732.624	150284.182	11216.679	0.000%
49	-16174.554	-150284.182	-15989.460	16174.554	150284.182	15989.461	0.000%
50	-11416.438	-150284.182	-19716.967	11416.438	150284.182	19716.967	0.000%
51	-15.543	-53892.577	-17937.701	15.543	53892.577	17937.701	0.000%
52	8519.047	-53892.577	-14728.167	-8519.047	53892.577	14728.167	0.000%
53	11949.653	-53892.577	-11923.316	-11949.653	53892.577	11923.316	0.000%
54	14532.731	-53892.577	-8342.847	-14532.731	53892.577	8342.847	0.000%
55	17115.162	-53892.577	23.468	-17115.162	53892.577	-23.468	0.000%
56	15614.610	-53892.577	9017.168	-15614.610	53892.577	-9017.168	0.000%
57	12406.669	-53892.577	12425.308	-12406.669	53892.577	-12425.308	0.000%
58	8524.424	-53892.577	14818.607	-8524.424	53892.577	-14818.607	0.000%
59	-19.341	-53892.577	16849.891	19.341	53892.577	-16849.892	0.000%
60	-8562.732	-53892.577	14864.602	8562.732	53892.577	-14864.602	0.000%
61	-11980.035	-53892.577	12020.878	11980.035	53892.577	-12020.878	0.000%
62	-15603.308	-53892.577	9035.712	15603.308	53892.577	-9035.712	0.000%
63	-17118.118	-53892.577	8.048	17118.118	53892.577	-8.048	0.000%
64	-14565.816	-53892.577	-8374.339	14565.816	53892.577	8374.339	0.000%
65	-12001.307	-53892.577	-11934.419	12001.307	53892.577	11934.419	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
66	-8557.069	-53892.577	-14750.116	8557.069	53892.577	14750.116	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	2.996	62	0.1208	0.0092
T2	175 - 166.667	2.869	62	0.1209	0.0086
T3	166.667 - 158.333	2.652	62	0.1208	0.0076
T4	158.333 - 150	2.436	56	0.1198	0.0073
T5	150 - 125	2.223	56	0.1178	0.0067
T6	125 - 100	1.606	56	0.1074	0.0050
T7	100 - 91.6667	1.061	56	0.0900	0.0041
T8	91.6667 - 83.3333	0.902	56	0.0836	0.0038
T9	83.3333 - 75	0.751	56	0.0781	0.0034
T10	75 - 50	0.611	56	0.0720	0.0031
T11	50 - 37.5	0.283	56	0.0487	0.0020
T12	37.5 - 25	0.161	56	0.0378	0.0015
T13	25 - 12.5	0.075	56	0.0260	0.0010
T14	12.5 - 0	0.019	62	0.0134	0.0005

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	62	2.996	0.1208	0.0092	131709
186.000	2" Dia 10' Omni	62	2.996	0.1208	0.0092	131709
185.500	3" Dia 20' Omni	62	2.996	0.1208	0.0092	131709
185.000	2" Dia 10' Omni	62	2.996	0.1208	0.0092	131709
182.500	1" Dia 8' Omni	62	2.996	0.1208	0.0092	131709
181.000	1 Bay Dipole ANT400D	62	2.996	0.1208	0.0092	131709
179.000	6' Side-Arm(1)	62	2.971	0.1208	0.0091	131709
178.000	6' w/Radome	62	2.946	0.1209	0.0089	131709
177.500	Pirod 6' Side Mount Standoff (1)	62	2.933	0.1209	0.0089	131709
176.000	6' w/Radome	62	2.895	0.1209	0.0087	131709
173.000	(inverted) 2" Dia 10' Omni	62	2.817	0.1209	0.0083	151396
170.000	(Inverted) 3" Dia 20' Omni	62	2.739	0.1209	0.0079	464454
166.500	Telewave 150F2 Omni	62	2.648	0.1208	0.0076	390385
164.000	Pirod 4' Side Mount Standoff (1)	56	2.583	0.1206	0.0075	305437
162.000	Telewave ANT220F2 - Omni Antenna	56	2.531	0.1204	0.0074	331592
161.000	ANT450F6	56	2.505	0.1202	0.0074	353788
160.000	3" Dia 9' Omni	56	2.479	0.1201	0.0074	373986
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	56	2.453	0.1199	0.0074	388476
157.000	2' Sidearm	56	2.402	0.1195	0.0073	386940
156.000	4' Paraflector [PRF-950]	56	2.376	0.1193	0.0072	372583
151.000	1 Bay Dipole ANT400D	56	2.248	0.1181	0.0068	278937
149.000	2" Dia 14' Omni (inverted)	56	2.197	0.1175	0.0066	250581
148.000	13' Sector Mount (1)	56	2.172	0.1172	0.0065	238059

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.000	Pirod 12' PCS T-Frame (1) 104569	56	1.896	0.1133	0.0056	150155
130.000	2' Sidearm	56	1.725	0.1100	0.0052	121395
125.000	Decibel DB210-C Dipole (Single)	56	1.606	0.1074	0.0050	106497
124.000	Comprod 871F-70 Dipole	56	1.583	0.1068	0.0049	103806
123.000	19.5"x19.5" Panel Antenna	56	1.559	0.1062	0.0049	101197
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	56	1.513	0.1050	0.0048	96265
111.000	4' Paraflector [PRF-950]	56	1.289	0.0983	0.0044	77244
102.000	1' Side Arm	56	1.101	0.0915	0.0042	66221
89.500	20' 4-Bay Dipole	56	0.862	0.0821	0.0037	101873
82.500	1' Side Arm	56	0.737	0.0775	0.0034	86464
81.000	GPS	56	0.711	0.0765	0.0033	74880
34.000	1.5" Dia 3' Omni	56	0.134	0.0346	0.0013	51025
30.500	1.5" Dia 3' Omni	56	0.109	0.0313	0.0012	59737
29.500	1.5" Dia 3' Omni (inverted)	56	0.102	0.0304	0.0012	62838
27.000	1.5" Dia 3' Omni	56	0.086	0.0279	0.0011	70417
26.000	4' Side Mount Standoff (1)	56	0.080	0.0270	0.0011	72129
19.500	1.5" Dia 3' Omni	56	0.046	0.0205	0.0008	53831
18.000	4' Side Mount Standoff (1)	56	0.039	0.0190	0.0007	49215
17.500	3' Yagi	56	0.037	0.0185	0.0007	47847

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	17.506	13	0.7070	0.0535
T2	175 - 166.667	16.759	13	0.7070	0.0502
T3	166.667 - 158.333	15.492	13	0.7058	0.0442
T4	158.333 - 150	14.230	13	0.6996	0.0429
T5	150 - 125	12.981	12	0.6883	0.0389
T6	125 - 100	9.379	12	0.6269	0.0290
T7	100 - 91.6667	6.193	12	0.5254	0.0239
T8	91.6667 - 83.3333	5.265	12	0.4882	0.0221
T9	83.3333 - 75	4.388	12	0.4559	0.0201
T10	75 - 50	3.569	12	0.4204	0.0179
T11	50 - 37.5	1.654	12	0.2841	0.0120
T12	37.5 - 25	0.942	12	0.2207	0.0086
T13	25 - 12.5	0.436	13	0.1517	0.0059
T14	12.5 - 0	0.109	25	0.0782	0.0028

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	13	17.506	0.7070	0.0535	23570
186.000	2" Dia 10' Omni	13	17.506	0.7070	0.0535	23570
185.500	3" Dia 20' Omni	13	17.506	0.7070	0.0535	23570
185.000	2" Dia 10' Omni	13	17.506	0.7070	0.0535	23570
182.500	1" Dia 8' Omni	13	17.506	0.7070	0.0535	23570
181.000	1 Bay Dipole ANT400D	13	17.506	0.7070	0.0535	23570

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
179.000	6' Side-Arm(1)	13	17.357	0.7070	0.0529	23570
178.000	6' w/Radome	13	17.208	0.7070	0.0523	23570
177.500	Pirod 6' Side Mount Standoff (1)	13	17.133	0.7070	0.0519	23570
176.000	6' w/Radome	13	16.909	0.7070	0.0509	23570
173.000	(inverted) 2" Dia 10' Omni	13	16.456	0.7070	0.0486	27151
170.000	(Inverted) 3" Dia 20' Omni	13	16.000	0.7067	0.0462	86364
166.500	Telewave 150F2 Omni	13	15.466	0.7057	0.0442	68134
164.000	Pirod 4' Side Mount Standoff (1)	13	15.086	0.7044	0.0435	52738
162.000	Telewave ANT220F2 - Omni Antenna	13	14.784	0.7030	0.0434	56614
161.000	ANT450F6	13	14.632	0.7022	0.0433	59939
160.000	3" Dia 9' Omni	13	14.481	0.7013	0.0432	62869
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	13	14.331	0.7003	0.0430	64847
157.000	2' Sidearm	13	14.029	0.6981	0.0425	64059
156.000	4' Paraflector [PRF-950]	13	13.879	0.6969	0.0421	61623
151.000	1 Bay Dipole ANT400D	13	13.130	0.6899	0.0395	46840
149.000	2" Dia 14' Omni (inverted)	12	12.832	0.6866	0.0383	42209
148.000	13' Sector Mount (1)	12	12.683	0.6849	0.0378	40130
137.000	Pirod 12' PCS T-Frame (1) 104569	12	11.072	0.6617	0.0329	25620
130.000	2' Sidearm	12	10.074	0.6427	0.0305	20781
125.000	Decibel DB210-C Dipole (Single)	12	9.379	0.6269	0.0290	18254
124.000	Comprod 871F-70 Dipole	12	9.242	0.6236	0.0287	17793
123.000	19.5"x19.5" Panel Antenna	12	9.105	0.6201	0.0284	17345
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	12	8.835	0.6130	0.0279	16497
111.000	4' Paraflector [PRF-950]	12	7.527	0.5739	0.0259	13223
102.000	1' Side Arm	12	6.427	0.5345	0.0242	11349
89.500	20' 4-Bay Dipole	12	5.032	0.4795	0.0216	17447
82.500	1' Side Arm	12	4.303	0.4526	0.0198	14808
81.000	GPS	12	4.151	0.4466	0.0194	12824
34.000	1.5" Dia 3' Omni	12	0.780	0.2021	0.0078	8740
30.500	1.5" Dia 3' Omni	13	0.635	0.1828	0.0071	10231
29.500	1.5" Dia 3' Omni (inverted)	13	0.597	0.1773	0.0069	10762
27.000	1.5" Dia 3' Omni	13	0.505	0.1631	0.0064	12058
26.000	4' Side Mount Standoff (1)	13	0.470	0.1574	0.0061	12351
19.500	1.5" Dia 3' Omni	13	0.266	0.1199	0.0046	9217
18.000	4' Side Mount Standoff (1)	13	0.227	0.1111	0.0042	8427
17.500	3' Yagi	25	0.214	0.1082	0.0040	8193

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325X	0.750	1	2355.910	17943.801	0.131 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	1019.840	10263.300	0.099 ✔	1	Member Block Shear
T2	175	Leg	A325X	0.750	6	419.137	30101.400	0.014 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	6193.210	17943.801	0.345 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	1823.110	7187.700	0.254 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T3	166.667	Diagonal	A325X	0.750	1	6821.500	17943.801	0.380 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	2045.960	7187.700	0.285 ✔	1	Member Block Shear
T4	158.333	Diagonal	A325X	0.750	1	8412.360	17943.801	0.469 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	2604.830	7187.700	0.362 ✔	1	Member Block Shear
T5	150	Leg	A325X	0.750	6	4740.340	30101.400	0.157 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	18071.500	29906.301	0.604 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	6022.460	10263.300	0.587 ✔	1	Member Block Shear
T6	125	Leg	A325X	0.750	6	13849.500	30101.400	0.460 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	20695.100	25230.000	0.820 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	7377.000	12829.100	0.575 ✔	1	Member Block Shear
T7	100	Leg	A325X	1.000	6	25458.000	54517.000	0.467 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	21414.801	25230.000	0.849 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	7806.820	20526.600	0.380 ✔	1	Member Block Shear
T8	91.6667	Diagonal	A325X	0.750	1	22182.801	25230.000	0.879 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	8249.740	20526.600	0.402 ✔	1	Member Block Shear
T9	83.3333	Diagonal	A325X	0.750	1	23171.900	25230.000	0.918 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	8777.000	20526.600	0.428 ✔	1	Member Block Shear
T10	75	Leg	A325X	1.000	8	27982.100	54517.000	0.513 ✔	1	Bolt Tension
		Diagonal	A325X	0.750	1	31502.100	31537.500	0.999 ✔	1	Member Bearing
		Horizontal	A325X	0.625	2	9827.160	11622.700	0.846 ✔	1	Member Block Shear
T11	50	Leg	A325X	1.000	8	37319.500	54517.000	0.685 ✔	1	Bolt Tension
		Diagonal	A325X	1.000	1	31965.801	40675.801	0.786 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	10304.700	11622.700	0.887 ✔	1	Member Block Shear
T12	37.5	Diagonal	A325X	1.000	1	32864.102	45703.102	0.719 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	10864.100	23245.301	0.467 ✔	1	Member Block Shear
T13	25	Leg	A325X	1.000	8	46641.102	54517.000	0.856 ✔	1	Bolt Tension
		Diagonal	A325X	1.000	1	33504.801	45703.102	0.733 ✔	1	Member Block Shear
		Horizontal	A325X	0.625	2	11324.300	17257.301	0.656 ✔	1	Bolt Shear
T14	12.5	Diagonal	A325X	1.000	1	33459.898	45703.102	0.732 ✔	1	Member Block Shear
		Top Girt	A325X	0.625	2	11662.000	29056.600	0.401 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	Stainless P5x0.250	5.005	5.005	35.7 K=1.00	3.731	-2696.610	152928.000	0.018 [1] ✔
T2	175 - 166.667	Stainless P5x0.250	8.342	8.342	59.5 K=1.00	3.731	-4683.710	129561.000	0.036 [1] ✔
T3	166.667 - 158.333	Stainless P5x0.250	8.342	8.342	59.5 K=1.00	3.731	-13240.100	129561.000	0.102 [1] ✔
T4	158.333 - 150	Stainless P5x0.250	8.342	8.342	59.5 K=1.00	3.731	-23056.000	129561.000	0.178 [1] ✔
T5	150 - 125	Stainless P5x0.300	25.027	4.171	30.1 K=1.00	4.430	-72255.500	186589.000	0.387 [1] ✔
T6	125 - 100	Stainless P5x0.400	25.027	4.171	30.7 K=1.00	5.781	-146707.000	242845.000	0.604 [1] ✔
T7	100 - 91.6667	Stainless P5x0.500	8.342	4.171	31.3 K=1.00	7.069	-173056.000	296141.000	0.584 [1] ✔
T8	91.6667 - 83.3333	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1 K=1.00	9.027	-200010.000	320254.000	0.625 [1] ✔
T9	83.3333 - 75	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1 K=1.00	9.027	-227041.000	320254.000	0.709 [1] ✔
T10	75 - 50	Stainless P6.875x0.400	25.027	6.257	32.7 K=1.00	8.137	-295188.000	399956.000	0.738 [1] ✔
T11	50 - 37.5	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-338215.000	490874.000	0.689 [1] ✔
T12	37.5 - 25	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-380961.000	490874.000	0.776 [1] ✔
T13	25 - 12.5	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-424177.000	490874.000	0.864 [1] ✔
T14	12.5 - 0	Stainless P6.875x0.500	12.513	6.257	33.2 K=1.00	10.014	-468555.000	490874.000	0.955 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	2L2 1/2x2x3/16x3/8	7.434	6.882	113.4 K=1.00	1.620	-2478.030	33721.398	0.073 [1] ✔
T2	175 - 166.667	2L2 1/2x2x3/16x3/8	10.174	9.540	156.4 K=1.00	1.620	-6299.900	18552.301	0.340 [1] ✔
T3	166.667 - 158.333	2L2 1/2x2x3/16x3/8	10.369	9.748	159.7 K=1.00	1.620	-6932.940	17819.699	0.389 [1] ✔
T4	158.333 - 150	2L2 1/2x2x3/16x3/8	10.570	9.961	163.0	1.620	-8529.360	17110.900	0.498 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	2L2 1/2x2x5/16x3/8	11.213	10.631	156.4 K=1.00	2.620	-18421.100	30440.699	0.605 [1] ✔
T6	125 - 100	2L3x2 1/2x1/4x3/8	11.905	11.343	150.5 K=1.00	2.630	-21124.400	32664.500	0.647 [1] ✔
T7	100 - 91.6667	2L3x2 1/2x1/4x3/8	12.145	11.588	153.7 K=1.00	2.630	-21916.100	31351.199	0.699 [1] ✔
T8	91.6667 - 83.3333	2L3x2 1/2x1/4x3/8	12.390	11.838	144.1 K=1.00	2.630	-22720.801	35569.602	0.639 [1] ✔
T9	83.3333 - 75	2L3x2 1/2x1/4x3/8	12.639	12.091	147.1 K=1.00	2.630	-23892.500	34145.102	0.700 [1] ✔
T10	75 - 50	2L3 1/2x3 1/2x5/16x3/8	16.327	15.611	150.6 K=1.00	4.180	-32596.000	52113.000	0.625 [1] ✔
T11	50 - 37.5	2L 'a' > 60.591 in - 291 2L3 1/2x3x5/16x3/8	16.653	15.887	146.7 K=1.00	3.870	-33078.398	50651.398	0.653 [1] ✔
T12	37.5 - 25	2L3 1/2x3 1/2x5/16x3/8	16.988	16.231	156.6 K=1.00	4.180	-34191.301	48228.102	0.709 [1] ✔
T13	25 - 12.5	2L 'a' > 62.998 in - 370 2L3 1/2x3 1/2x5/16x3/8	17.330	16.583	145.4 K=1.00	4.180	-34874.801	55807.000	0.625 [1] ✔
T14	12.5 - 0	2L3 1/2x3 1/2x5/16x3/8	17.680	16.942	148.5 K=1.00	4.180	-34716.801	53542.602	0.648 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	175 - 166.667	L2 1/2x2 1/2x3/16	11.000	5.094	122.7 K=0.99	0.902	-3755.410	17100.699	0.220 [1] ✔
T5	150 - 125	L3x2 1/2x1/4	14.333	6.760	145.7 K=0.95	1.310	-12235.900	17667.699	0.693 [1] ✔
T6	125 - 100	L3x3x5/16	16.333	7.760	149.1 K=0.94	1.780	-14695.900	22924.199	0.641 [1] ✔
T7	100 - 91.6667	2L3x3x1/4	17.000	8.094	104.4 K=1.00	2.880	-15521.900	68122.102	0.228 [1] ✔
T8	91.6667 - 83.3333	2L3x3x1/4	17.667	8.427	108.7 K=1.00	2.880	-16361.800	65133.000	0.251 [1] ✔
T9	83.3333 - 75	2L3x3x1/4	18.333	8.760	113.0 K=1.00	2.880	-17412.400	62023.199	0.281 [1] ✔
T10	75 - 50	L4x4x1/4	20.000	9.516	138.0 K=0.96	1.940	-19718.801	29136.801	0.677 [1] ✔
T11	50 - 37.5	L4x4x1/4	21.000	10.016	143.8 K=0.95	1.940	-20598.400	26852.801	0.767 [1] ✔
T13	25 - 12.5	L4x4x3/8	23.000	11.016	156.4 K=0.93	2.860	-22533.500	33453.801	0.674 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	L3x3x1/4	10.599	4.893	109.6 K=1.10	1.440	-2181.560	32261.500	0.068 [1] ✔
T3	166.667 - 158.333	L2 1/2x2 1/2x3/16	11.667	5.427	128.9 K=0.98	0.902	-4056.240	15549.400	0.261 [1] ✔
T4	158.333 - 150	L2 1/2x2 1/2x3/16	12.333	5.760	135.0 K=0.97	0.902	-5174.560	14163.400	0.365 [1] ✔
T12	37.5 - 25	2L4x4x1/4	22.000	10.516	100.9 K=1.00	3.880	-21743.699	93170.602	0.233 [1] ✔
T14	12.5 - 0	2L4x4x5/16	24.000	11.516	111.4 K=1.00	4.800	-23406.801	105319.000	0.222 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	3.417	3.208	108.9 K=1.11	0.715	-1955.930	16148.800	0.121 [1] ✔
T6	125 - 100	L2x2x3/16	4.083	3.875	119.0 K=1.01	0.715	-2544.350	14276.400	0.178 [1] ✔
T7	100 - 91.6667	L2x2x3/16	4.250	4.042	123.1 K=1.00	0.715	-3001.160	13475.700	0.223 [1] ✔
T8	91.6667 - 83.3333	L2x2x3/16	4.417	4.208	128.2 K=1.00	0.715	-3468.340	12457.000	0.278 [1] ✔
T9	83.3333 - 75	L2x2x3/16	4.583	4.375	133.2 K=1.00	0.715	-3937.290	11526.000	0.342 [1] ✔
T10	75 - 50	L2 1/2x2 1/2x3/16	5.000	4.714	117.1 K=1.03	0.902	-5120.670	18462.600	0.277 [1] ✔
T11	50 - 37.5	L2 1/2x2 1/2x3/16	5.250	4.964	120.3 K=1.00	0.902	-5866.500	17688.100	0.332 [1] ✔
T12	37.5 - 25	L2 1/2x2 1/2x3/16	5.500	5.214	126.4 K=1.00	0.902	-6607.730	16161.700	0.409 [1] ✔
T13	25 - 12.5	L2 1/2x2 1/2x3/16	5.750	5.464	132.4 K=1.00	0.902	-7357.200	14716.500	0.500 [1] ✔
T14	12.5 - 0	L2 1/2x2 1/2x3/16	6.000	5.714	138.5 K=1.00	0.902	-8125.270	13456.800	0.604 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	5.285	4.957	151.0 K=1.00	0.715	-1502.630	8979.520	0.167 [1] ✔
T6	125 - 100	L2x2x3/16	5.719	5.415	164.9 K=1.00	0.715	-1781.870	7523.250	0.237 [1] ✔
T7	100 - 91.6667	L2x2x3/16	5.835	5.537	168.6 K=1.00	0.715	-2060.110	7195.600	0.286 [1] ✔
T8	91.6667 - 83.3333	L2x2x3/16	5.953	5.661	172.4 K=1.00	0.715	-2337.220	6884.510	0.339 [1] ✔
T9	83.3333 - 75	L2x2x3/16	6.073	5.786	176.2 K=1.00	0.715	-2608.350	6589.210	0.396 [1] ✔
T10	75 - 50	L2 1/2x2 1/2x3/16	7.851	7.378	178.9 K=1.00	0.902	-4020.490	8069.580	0.498 [1] ✔
T11	50 - 37.5	L2 1/2x2 1/2x3/16	8.005	7.547	183.0 K=1.00	0.902	-4472.630	7713.130	0.580 [1] ✔
T12	37.5 - 25	L2 1/2x2 1/2x3/16	8.164	7.718	187.1 K=1.00	0.902	-4903.950	7373.870	0.665 [1] ✔
T13	25 - 12.5	L2 1/2x2 1/2x3/16	8.327	7.893	191.3 K=1.00	0.902	-5327.040	7051.040	0.755 [1] ✔
T14	12.5 - 0	L2 1/2x2 1/2x3/16	8.494	8.071	195.7 K=1.00	0.902	-5751.250	6743.940	0.853 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2 1/2x2x3/16	7.167	7.167	201.4 K=1.00	0.809	-9.731	5708.280	0.002 [1] ✔
T6	125 - 100	L2 1/2x2x3/16	8.167	8.167	229.5 K=1.00	0.809	-12.271	4395.920	0.003 [1] ✔
T7	100 - 91.6667	L2 1/2x2x3/16	8.500	8.500	238.9 K=1.00	0.809	-19.857	4057.900	0.005 [1] ✔
T8	91.6667 - 83.3333	L2 1/2x2x3/16	8.833	8.833	248.2 K=1.00	0.809	-19.577	3757.420	0.005 [1] ✔
T9	83.3333 - 75	L2 1/2x2x3/16	9.167	9.167	257.6 K=1.00	0.809	-19.355	3489.130	0.006 [1] ✔
T10	75 - 50	KL/R > 250 (C) - 278 L2 1/2x2 1/2x3/16	10.000	10.000	242.4 K=1.00	0.902	-20.227	4392.910	0.005 [1] ✔
T11	50 - 37.5	L2 1/2x2 1/2x3/16	10.500	10.500	254.5 K=1.00	0.902	-19.331	3984.500	0.005 [1] ✔
T12	37.5 - 25	KL/R > 250 (C) - 356 L2 1/2x2 1/2x3/16	11.000	11.000	266.7 K=1.00	0.902	-385.130	3630.500	0.106 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
		KL/R > 250 (C) - 382							
T13	25 - 12.5	L3x3x1/4	11.500	11.500	233.1 K=1.00	1.440	-19.080	7584.820	0.003 [1] ✔
T14	12.5 - 0	L3x3x1/4	12.000	12.000	243.2 K=1.00	1.440	-415.895	6965.920	0.060 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	Stainless P5x0.250	5.005	5.005	35.7	3.731	544.161	167879.000	0.003 [1] ✔
T2	175 - 166.667	Stainless P5x0.250	8.342	8.342	59.5	3.731	2514.820	167879.000	0.015 [1] ✔
T3	166.667 - 158.333	Stainless P5x0.250	8.342	8.342	59.5	3.731	10454.400	167879.000	0.062 [1] ✔
T4	158.333 - 150	Stainless P5x0.250	8.342	8.342	59.5	3.731	19549.900	167879.000	0.116 [1] ✔
T5	150 - 125	Stainless P5x0.300	25.027	4.171	30.1	4.430	61070.801	199334.000	0.306 [1] ✔
T6	125 - 100	Stainless P5x0.400	25.027	4.171	30.7	5.781	128996.000	260124.000	0.496 [1] ✔
T7	100 - 91.6667	Stainless P5x0.500	8.342	4.171	31.3	7.069	152748.000	318086.000	0.480 [1] ✔
T8	91.6667 - 83.3333	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1	9.027	176813.000	341202.000	0.518 [1] ✔
T9	83.3333 - 75	1/3 Pipe w/ 5"x0.5 Stainless	8.342	4.171	32.1	9.027	200825.000	341202.000	0.589 [1] ✔
T10	75 - 50	Stainless P6.875x0.400	25.027	6.257	32.7	8.137	260793.000	439383.000	0.594 [1] ✔
T11	50 - 37.5	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	298556.000	540747.000	0.552 [1] ✔
T12	37.5 - 25	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	335814.000	540747.000	0.621 [1] ✔
T13	25 - 12.5	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	373129.000	540747.000	0.690 [1] ✔
T14	12.5 - 0	Stainless P6.875x0.500	12.513	6.257	33.2	10.014	411147.000	540747.000	0.760 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	2L2 1/2x2x3/16x3/8	7.434	6.882	108.2	0.969	2355.910	42147.398	0.056 [1] ✔
T2	175 - 166.667	2L2 1/2x2x3/16x3/8	10.174	9.540	148.5	0.969	6193.210	42147.398	0.147 [1] ✔
T3	166.667 - 158.333	2L2 1/2x2x3/16x3/8	10.369	9.748	151.6	0.969	6821.500	42147.398	0.162 [1] ✔
T4	158.333 - 150	2L2 1/2x2x3/16x3/8	10.570	9.961	154.8	0.969	8412.360	42147.398	0.200 [1] ✔
T5	150 - 125	2L2 1/2x2x5/16x3/8	11.213	10.631	138.0	1.555	18071.500	67635.703	0.267 [1] ✔
T6	125 - 100	2L3x2 1/2x1/4x3/8	11.905	11.343	123.3	1.644	20695.100	71530.297	0.289 [1] ✔
T7	100 - 91.6667	2L3x2 1/2x1/4x3/8	12.145	11.588	125.9	1.644	21414.801	71530.297	0.299 [1] ✔
T8	91.6667 - 83.3333	2L3x2 1/2x1/4x3/8	12.390	11.838	128.6	1.644	22182.801	71530.297	0.310 [1] ✔
T9	83.3333 - 75	2L3x2 1/2x1/4x3/8	12.639	12.091	131.3	1.644	23171.900	71530.297	0.324 [1] ✔
T10	75 - 50	2L3 1/2x3 1/2x5/16x3/8	16.327	15.611	119.1	2.725	31502.100	118531.000	0.266 [1] ✔
T11	50 - 37.5	2L 'a' > 60.591 in - 294 2L3 1/2x3x5/16x3/8	16.653	15.887	144.2	2.375	31965.801	103319.000	0.309 [1] ✔
T12	37.5 - 25	2L3 1/2x3 1/2x5/16x3/8	16.988	16.231	124.2	2.608	32864.102	127123.000	0.259 [1] ✔
T13	25 - 12.5	2L 'a' > 62.998 in - 373 2L3 1/2x3 1/2x5/16x3/8	17.330	16.583	126.9	2.608	33504.801	127123.000	0.264 [1] ✔
T14	12.5 - 0	2L3 1/2x3 1/2x5/16x3/8	17.680	16.942	129.6	2.608	33459.898	127123.000	0.263 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	175 - 166.667	L2 1/2x2 1/2x3/16	11.000	5.094	122.4	0.571	3646.220	24839.900	0.147 [1] ✔
T5	150 - 125	L3x2 1/2x1/4	14.333	6.760	111.1	0.842	12044.900	36621.602	0.329 [1] ✔
T6	125 - 100	L3x3x5/16	16.333	7.760	103.6	1.159	14754.000	50426.000	0.293 [1] ✔
T7	100 - 91.6667	2L3x3x1/4	17.000	8.094	107.0	1.879	15613.600	81725.602	0.191 [1] ✔
T8	91.6667 -	2L3x3x1/4	17.667	8.427	111.3	1.879	16499.500	81725.602	0.202 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	83.3333								✔
T9	83.3333 - 75	2L3x3x1/4	18.333	8.760	115.6	1.879	17554.000	81725.602	0.215 [1] ✔
T10	75 - 50	L4x4x1/4	20.000	9.516	93.3	1.314	19654.301	57175.301	0.344 [1] ✔
T11	50 - 37.5	L4x4x1/4	21.000	10.016	98.1	1.314	20609.500	57175.301	0.360 [1] ✔
T13	25 - 12.5	L4x4x3/8	23.000	11.016	109.4	1.934	22648.600	94285.500	0.240 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 175	L3x3x1/4	10.599	4.893	98.5	0.939	2039.690	40862.801	0.050 [1] ✔
T3	166.667 - 158.333	L2 1/2x2 1/2x3/16	11.667	5.427	130.1	0.571	4091.920	24839.900	0.165 [1] ✔
T4	158.333 - 150	L2 1/2x2 1/2x3/16	12.333	5.760	137.9	0.571	5209.670	24839.900	0.210 [1] ✔
T12	37.5 - 25	2L4x4x1/4	22.000	10.516	102.8	2.629	21728.199	114351.000	0.190 [1] ✔
T14	12.5 - 0	2L4x4x5/16	24.000	11.516	113.4	3.248	23324.000	141307.000	0.165 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	3.417	3.208	62.4	0.715	1950.310	23166.000	0.084 [1] ✔
T6	125 - 100	L2x2x3/16	4.083	3.875	75.4	0.715	2544.350	23166.000	0.110 [1] ✔
T7	100 - 91.6667	L2x2x3/16	4.250	4.042	78.6	0.715	3001.160	23166.000	0.130 [1] ✔
T8	91.6667 - 83.3333	L2x2x3/16	4.417	4.208	81.8	0.715	3468.340	23166.000	0.150 [1] ✔
T9	83.3333 - 75	L2x2x3/16	4.583	4.375	85.1	0.715	3937.290	23166.000	0.170 [1] ✔
T10	75 - 50	L2 1/2x2 1/2x3/16	5.000	4.714	72.7	0.902	5120.670	29224.801	0.175 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T11	50 - 37.5	L2 1/2x2 1/2x3/16	5.250	4.964	76.6	0.902	5866.500	29224.801	0.201 [1]
T12	37.5 - 25	L2 1/2x2 1/2x3/16	5.500	5.214	80.4	0.902	6607.730	29224.801	0.226 [1]
T13	25 - 12.5	L2 1/2x2 1/2x3/16	5.750	5.464	84.3	0.902	7357.200	29224.801	0.252 [1]
T14	12.5 - 0	L2 1/2x2 1/2x3/16	6.000	5.714	88.1	0.902	8125.270	29224.801	0.278 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2x2x3/16	5.285	4.957	96.4	0.715	1505.250	23166.000	0.065 [1]
T6	125 - 100	L2x2x3/16	5.496	5.192	101.0	0.715	1864.640	23166.000	0.080 [1]
T7	100 - 91.6667	L2x2x3/16	5.835	5.537	107.7	0.715	2060.110	23166.000	0.089 [1]
T8	91.6667 - 83.3333	L2x2x3/16	5.953	5.661	110.1	0.715	2337.220	23166.000	0.101 [1]
T9	83.3333 - 75	L2x2x3/16	6.073	5.786	112.5	0.715	2608.350	23166.000	0.113 [1]
T10	75 - 50	L2 1/2x2 1/2x3/16	7.703	7.230	111.5	0.902	4151.960	29224.801	0.142 [1]
T11	50 - 37.5	L2 1/2x2 1/2x3/16	8.005	7.547	116.4	0.902	4472.630	29224.801	0.153 [1]
T12	37.5 - 25	L2 1/2x2 1/2x3/16	8.164	7.718	119.1	0.902	4903.950	29224.801	0.168 [1]
T13	25 - 12.5	L2 1/2x2 1/2x3/16	8.327	7.893	121.7	0.902	5327.040	29224.801	0.182 [1]
T14	12.5 - 0	L2 1/2x2 1/2x3/16	8.494	8.071	124.5	0.902	5751.250	29224.801	0.197 [1]

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	150 - 125	L2 1/2x2x3/16	7.167	7.167	143.4	0.809	5.161	26211.600	0.000 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	125 - 100	L2 1/2x2x3/16	7.500	7.500	150.1	0.809	7.622	26211.600	0.000 [1]
T7	100 - 91.6667	L2 1/2x2x3/16	8.500	8.500	170.1	0.809	13.709	26211.600	0.001 [1]
T8	91.6667 - 83.3333	L2 1/2x2x3/16	8.833	8.833	176.7	0.809	13.296	26211.600	0.001 [1]
T9	83.3333 - 75	L2 1/2x2x3/16	9.167	9.167	183.4	0.809	12.969	26211.600	0.000 [1]
T10	75 - 50	L2 1/2x2 1/2x3/16	9.500	9.500	146.5	0.902	11.830	29224.801	0.000 [1]
T11	50 - 37.5	L2 1/2x2 1/2x3/16	10.500	10.500	162.0	0.902	10.274	29224.801	0.000 [1]
T12	37.5 - 25	L2 1/2x2 1/2x3/16	11.000	11.000	169.7	0.902	371.661	29224.801	0.013 [1]
T13	25 - 12.5	L3x3x1/4	11.500	11.500	148.4	1.440	6.958	46656.000	0.000 [1]
T14	12.5 - 0	L3x3x1/4	12.000	12.000	154.8	1.440	399.612	46656.000	0.009 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 175	Leg	Stainless P5x0.250	1	-1822.460	152928.000	3.2	Pass
		Leg	Stainless P5x0.250	2	-2052.800	152928.000	3.5	Pass
		Leg	Stainless P5x0.250	3	-2696.610	152928.000	3.9	Pass
T2	175 - 166.667	Leg	Stainless P5x0.250	13	-4399.630	129561.000	3.4	Pass
		Leg	Stainless P5x0.250	14	-4683.710	129561.000	3.6	Pass
		Leg	Stainless P5x0.250	15	-4591.370	129561.000	3.5	Pass
T3	166.667 - 158.333	Leg	Stainless P5x0.250	25	-13235.300	129561.000	10.2	Pass
		Leg	Stainless P5x0.250	26	-13240.100	129561.000	10.2	Pass
		Leg	Stainless P5x0.250	27	-12733.400	129561.000	9.8	Pass
T4	158.333 - 150	Leg	Stainless P5x0.250	37	-23056.000	129561.000	17.8	Pass
		Leg	Stainless P5x0.250	38	-22922.400	129561.000	17.7	Pass
		Leg	Stainless P5x0.250	39	-22546.301	129561.000	17.4	Pass
T5	150 - 125	Leg	Stainless P5x0.300	49	-71954.203	186589.000	38.6	Pass
		Leg	Stainless P5x0.300	50	-72255.500	186589.000	38.7	Pass
		Leg	Stainless P5x0.300	51	-70556.398	186589.000	37.8	Pass
T6	125 - 100	Leg	Stainless P5x0.400	124	-146316.000	242845.000	60.3	Pass
		Leg	Stainless P5x0.400	125	-146707.000	242845.000	60.4	Pass
		Leg	Stainless P5x0.400	126	-144108.000	242845.000	59.3	Pass
T7	100 - 91.6667	Leg	Stainless P5x0.500	199	-172663.000	296141.000	58.3	Pass
		Leg	Stainless P5x0.500	200	-173056.000	296141.000	58.4	Pass
		Leg	Stainless P5x0.500	201	-170203.000	296141.000	57.5	Pass
T8	91.6667 - 83.3333	Leg	1/3 Pipe w/ 5"x0.5 Stainless	226	-199613.000	320254.000	62.3	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	227	-200010.000	320254.000	62.5	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	228	-196984.000	320254.000	61.5	Pass
T9	83.3333 - 75	Leg	1/3 Pipe w/ 5"x0.5 Stainless	253	-226723.000	320254.000	70.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	254	-227041.000	320254.000	70.9	Pass
		Leg	1/3 Pipe w/ 5"x0.5 Stainless	255	-223911.000	320254.000	69.9	Pass
T10	75 - 50	Leg	Stainless P6.875x0.400	280	-294863.000	399956.000	73.7	Pass
		Leg	Stainless P6.875x0.400	281	-295188.000	399956.000	73.8	Pass
		Leg	Stainless P6.875x0.400	282	-291602.000	399956.000	72.9	Pass
T11	50 - 37.5	Leg	Stainless P6.875x0.500	331	-337880.000	490874.000	68.8	Pass
		Leg	Stainless P6.875x0.500	332	-338215.000	490874.000	68.9	Pass
		Leg	Stainless P6.875x0.500	333	-334347.000	490874.000	68.1	Pass
							68.5 (b)	
T12	37.5 - 25	Leg	Stainless P6.875x0.500	358	-380621.000	490874.000	77.5	Pass
		Leg	Stainless P6.875x0.500	359	-380961.000	490874.000	77.6	Pass
		Leg	Stainless P6.875x0.500	360	-376990.000	490874.000	76.8	Pass
T13	25 - 12.5	Leg	Stainless P6.875x0.500	385	-423833.000	490874.000	86.3	Pass
		Leg	Stainless P6.875x0.500	386	-424177.000	490874.000	86.4	Pass
		Leg	Stainless P6.875x0.500	387	-420134.000	490874.000	85.6	Pass
T14	12.5 - 0	Leg	Stainless P6.875x0.500	412	-468217.000	490874.000	95.4	Pass
		Leg	Stainless P6.875x0.500	413	-468555.000	490874.000	95.5	Pass
		Leg	Stainless P6.875x0.500	414	-464322.000	490874.000	94.6	Pass
T1	180 - 175	Diagonal	2L2 1/2x2x3/16x3/8	7	-1380.020	33721.398	4.1	Pass
							6.9 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	8	-1363.450	33721.398	4.0	Pass
							7.0 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	9	-2478.030	33721.398	7.3	Pass
							12.3 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	10	-2329.890	33721.398	6.9	Pass
							13.1 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	11	-2382.430	33721.398	7.1	Pass
							12.8 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	12	-2418.880	33721.398	7.2	Pass
							12.6 (b)	
T2	175 - 166.667	Diagonal	2L2 1/2x2x3/16x3/8	17	-5696.120	18552.301	30.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	18	-5251.150	18552.301	28.3	Pass
							31.1 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	20	-6299.900	18552.301	34.0	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	21	-5800.850	18552.301	31.3	Pass
							34.5 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	23	-5652.600	18552.301	30.5	Pass
							32.2 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	24	-5878.940	18552.301	31.7	Pass
T3	166.667 - 158.333	Diagonal	2L2 1/2x2x3/16x3/8	31	-6905.490	17819.699	38.8	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	32	-6521.380	17819.699	36.6	Pass
							37.9 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	33	-6687.780	17819.699	37.5	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	34	-6256.550	17819.699	35.1	Pass
							36.7 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	35	-6756.140	17819.699	37.9	Pass
							38.0 (b)	
		Diagonal	2L2 1/2x2x3/16x3/8	36	-6932.940	17819.699	38.9	Pass
T4	158.333 - 150	Diagonal	2L2 1/2x2x3/16x3/8	43	-7507.480	17110.900	43.9	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	44	-7168.230	17110.900	41.9	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	45	-7975.980	17110.900	46.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	46	-7539.960	17110.900	44.1	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	47	-8344.080	17110.900	48.8	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	48	-8529.360	17110.900	49.8	Pass
T5	150 - 125	Diagonal	2L2 1/2x2x5/16x3/8	53	-17734.199	30440.699	58.3	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	56	-17473.699	30440.699	57.4	Pass
							58.1 (b)	
		Diagonal	2L2 1/2x2x5/16x3/8	60	-18421.100	30440.699	60.5	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	63	-18139.100	30440.699	59.6	Pass
							60.4 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	2L2 1/2x2x5/16x3/8	67	-18223.400	30440.699	59.9 60.3 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	70	-18390.100	30440.699	60.4	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	77	-15490.200	31386.301	49.4 49.9 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	80	-15214.800	31386.301	48.5 50.8 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	84	-16344.100	31386.301	52.1 52.7 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	87	-16030.500	31386.301	51.1 53.7 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	91	-16617.600	31386.301	52.9 55.2 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	94	-16797.400	31386.301	53.5 54.6 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	101	-12036.500	32344.199	37.2 38.3 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	104	-11741.200	32344.199	36.3 39.4 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	108	-12733.300	32344.199	39.4 40.6 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	111	-12394.700	32344.199	38.3 41.7 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	115	-13163.700	32344.199	40.7 43.8 (b)	Pass
		Diagonal	2L2 1/2x2x5/16x3/8	118	-13351.300	32344.199	41.3 43.1 (b)	Pass
T6	125 - 100	Diagonal	2L3x2 1/2x1/4x3/8	128	-20705.801	32664.500	63.4 79.5 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	131	-20506.801	32664.500	62.8 80.3 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	135	-21124.400	32664.500	64.7 81.3 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	138	-20932.100	32664.500	64.1 82.0 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	142	-20499.500	32664.500	62.8 80.1 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	145	-20634.900	32664.500	63.2 79.5 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	152	-19792.900	33531.602	59.0 75.9 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	155	-19583.699	33531.602	58.4 76.8 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	159	-20187.301	33531.602	60.2 77.5 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	162	-19964.699	33531.602	59.5 78.4 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	166	-19871.000	33531.602	59.3 77.7 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	169	-20005.600	33531.602	59.7 77.1 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	176	-18670.801	34407.602	54.3 71.4 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	179	-18438.400	34407.602	53.6 72.4 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	183	-19138.699	34407.602	55.6 73.3 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	186	-18872.000	34407.602	54.8 74.3 (b)	Pass
		Diagonal	2L3x2 1/2x1/4x3/8	190	-19190.400	34407.602	55.8 75.1 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	2L3x2 1/2x1/4x3/8	193	-19338.500	34407.602	56.2	Pass
							74.5 (b)	
T7	100 - 91.6667	Diagonal	2L3x2 1/2x1/4x3/8	203	-21403.801	31351.199	68.3	Pass
							82.0 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	206	-21216.699	31351.199	67.7	Pass
							82.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	210	-21916.100	31351.199	69.9	Pass
							84.2 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	213	-21735.000	31351.199	69.3	Pass
							84.9 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	217	-21143.199	31351.199	67.4	Pass
							82.3 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	220	-21269.801	31351.199	67.8	Pass
							81.8 (b)	
T8	91.6667 - 83.3333	Diagonal	2L3x2 1/2x1/4x3/8	230	-22002.699	35569.602	61.9	Pass
							84.4 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	233	-21825.900	35569.602	61.4	Pass
							85.1 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	237	-22720.801	35569.602	63.9	Pass
							87.3 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	240	-22526.199	35569.602	63.3	Pass
							87.9 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	244	-21786.500	35569.602	61.3	Pass
							84.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	247	-21906.600	35569.602	61.6	Pass
							84.3 (b)	
T9	83.3333 - 75	Diagonal	2L3x2 1/2x1/4x3/8	257	-22960.600	34145.102	67.2	Pass
							88.0 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	260	-22797.500	34145.102	66.8	Pass
							88.7 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	264	-23892.500	34145.102	70.0	Pass
							91.2 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	267	-23573.801	34145.102	69.0	Pass
							91.8 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	271	-22834.199	34145.102	66.9	Pass
							88.7 (b)	
		Diagonal	2L3x2 1/2x1/4x3/8	274	-22950.600	34145.102	67.2	Pass
							88.2 (b)	
T10	75 - 50	Diagonal	2L3 1/2x3 1/2x5/16x3/8	284	-31070.801	52113.000	59.6	Pass
							95.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	287	-30891.400	52113.000	59.3	Pass
							96.0 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	291	-32596.000	52113.000	62.5	Pass
							99.3 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	294	-32079.600	52113.000	61.6	Pass
							99.9 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	298	-30763.301	52113.000	59.0	Pass
							95.6 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	301	-30902.000	52113.000	59.3	Pass
							95.1 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	308	-30037.801	53393.398	56.3	Pass
							92.3 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	311	-29843.699	53393.398	55.9	Pass
							93.0 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	315	-31406.699	53393.398	58.8	Pass
							95.9 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	318	-30934.301	53393.398	57.9	Pass
							96.5 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	322	-29795.100	53393.398	55.8	Pass
							92.7 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	325	-29941.199	53393.398	56.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							92.2 (b)	
T11	50 - 37.5	Diagonal	2L3 1/2x3x5/16x3/8	335	-31472.400	50651.398	62.1	Pass
							75.0 (b)	
		Diagonal	2L3 1/2x3x5/16x3/8	338	-31307.600	50651.398	61.8	Pass
							75.5 (b)	
		Diagonal	2L3 1/2x3x5/16x3/8	342	-33078.398	50651.398	65.3	Pass
							78.2 (b)	
		Diagonal	2L3 1/2x3x5/16x3/8	345	-32555.900	50651.398	64.3	Pass
							78.6 (b)	
		Diagonal	2L3 1/2x3x5/16x3/8	349	-31116.199	50651.398	61.4	Pass
							74.9 (b)	
		Diagonal	2L3 1/2x3x5/16x3/8	352	-31242.500	50651.398	61.7	Pass
							74.6 (b)	
T12	37.5 - 25	Diagonal	2L3 1/2x3 1/2x5/16x3/8	364	-32415.801	48228.102	67.2	Pass
							68.5 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	367	-32259.699	48228.102	66.9	Pass
							68.8 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	370	-34191.301	48228.102	70.9	Pass
							71.6 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	373	-33649.398	48228.102	69.8	Pass
							71.9 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	376	-32072.199	48228.102	66.5	Pass
							68.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	379	-32192.000	48228.102	66.7	Pass
							68.1 (b)	
T13	25 - 12.5	Diagonal	2L3 1/2x3 1/2x5/16x3/8	389	-32781.898	55807.000	58.7	Pass
							69.3 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	392	-32636.100	55807.000	58.5	Pass
							69.6 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	396	-34874.801	55807.000	62.5	Pass
							73.0 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	399	-34295.898	55807.000	61.5	Pass
							73.3 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	403	-32634.699	55807.000	58.5	Pass
							69.6 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	406	-32752.699	55807.000	58.7	Pass
							69.3 (b)	
T14	12.5 - 0	Diagonal	2L3 1/2x3 1/2x5/16x3/8	418	-32751.400	53542.602	61.2	Pass
							69.1 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	421	-32608.900	53542.602	60.9	Pass
							69.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	424	-34716.801	53542.602	64.8	Pass
							72.9 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	427	-34347.301	53542.602	64.1	Pass
							73.2 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	430	-32645.199	53542.602	61.0	Pass
							69.4 (b)	
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	433	-32743.301	53542.602	61.2	Pass
							69.2 (b)	
T2	175 - 166.667	Horizontal	L2 1/2x2 1/2x3/16	16	-3406.800	17100.699	19.9	Pass
							22.5 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	19	-3755.410	17100.699	22.0	Pass
							25.4 (b)	
		Horizontal	L2 1/2x2 1/2x3/16	22	-3424.080	17100.699	20.0	Pass
							23.8 (b)	
T5	150 - 125	Horizontal	L3x2 1/2x1/4	52	-11424.700	17667.699	64.7	Pass
		Horizontal	L3x2 1/2x1/4	59	-12235.900	17667.699	69.3	Pass
		Horizontal	L3x2 1/2x1/4	66	-12026.600	17667.699	68.1	Pass
		Horizontal	L3x2 1/2x1/4	76	-9009.690	19155.801	47.0	Pass
		Horizontal	L3x2 1/2x1/4	83	-9914.800	19155.801	51.8	Pass
		Horizontal	L3x2 1/2x1/4	90	-9907.490	19155.801	51.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Horizontal	L3x2 1/2x1/4	100	-6895.110	20840.100	33.1	Pass
							33.5 (b)	
		Horizontal	L3x2 1/2x1/4	107	-7819.040	20840.100	37.5	Pass
		Horizontal	L3x2 1/2x1/4	114	-7936.270	20840.100	38.1	Pass
							38.1 (b)	
T6	125 - 100	Horizontal	L3x3x5/16	127	-14388.800	22924.199	62.8	Pass
		Horizontal	L3x3x5/16	134	-14695.900	22924.199	64.1	Pass
		Horizontal	L3x3x5/16	141	-14316.700	22924.199	62.5	Pass
		Horizontal	L3x3x5/16	151	-13390.100	24602.600	54.4	Pass
		Horizontal	L3x3x5/16	158	-13758.700	24602.600	55.9	Pass
		Horizontal	L3x3x5/16	165	-13673.300	24602.600	55.6	Pass
		Horizontal	L3x3x5/16	175	-12427.700	26472.301	46.9	Pass
							48.6 (b)	
		Horizontal	L3x3x5/16	182	-12905.100	26472.301	48.7	Pass
							50.2 (b)	
		Horizontal	L3x3x5/16	189	-12914.200	26472.301	48.8	Pass
							50.5 (b)	
T7	100 - 91.6667	Horizontal	2L3x3x1/4	202	-15122.500	68122.102	22.2	Pass
							37.1 (b)	
		Horizontal	2L3x3x1/4	209	-15521.900	68122.102	22.8	Pass
							38.0 (b)	
		Horizontal	2L3x3x1/4	216	-15038.900	68122.102	22.1	Pass
							36.9 (b)	
T8	91.6667 - 83.3333	Horizontal	2L3x3x1/4	229	-15836.300	65133.000	24.3	Pass
							38.9 (b)	
		Horizontal	2L3x3x1/4	236	-16361.800	65133.000	25.1	Pass
							40.2 (b)	
		Horizontal	2L3x3x1/4	243	-15752.700	65133.000	24.2	Pass
							38.7 (b)	
T9	83.3333 - 75	Horizontal	2L3x3x1/4	256	-16759.400	62023.199	27.0	Pass
							41.2 (b)	
		Horizontal	2L3x3x1/4	263	-17412.400	62023.199	28.1	Pass
							42.8 (b)	
		Horizontal	2L3x3x1/4	270	-16741.900	62023.199	27.0	Pass
							41.2 (b)	
T10	75 - 50	Horizontal	L4x4x1/4	283	-18783.199	29136.801	64.5	Pass
							81.2 (b)	
		Horizontal	L4x4x1/4	290	-19718.801	29136.801	67.7	Pass
							84.6 (b)	
		Horizontal	L4x4x1/4	297	-18677.100	29136.801	64.1	Pass
							80.7 (b)	
		Horizontal	L4x4x1/4	307	-17844.000	31725.000	56.2	Pass
							77.4 (b)	
		Horizontal	L4x4x1/4	314	-18638.600	31725.000	58.8	Pass
							80.4 (b)	
		Horizontal	L4x4x1/4	321	-17790.199	31725.000	56.1	Pass
							77.1 (b)	
T11	50 - 37.5	Horizontal	L4x4x1/4	334	-19632.801	26852.801	73.1	Pass
							85.0 (b)	
		Horizontal	L4x4x1/4	341	-20598.400	26852.801	76.7	Pass
							88.7 (b)	
		Horizontal	L4x4x1/4	348	-19480.600	26852.801	72.5	Pass
							84.3 (b)	
T13	25 - 12.5	Horizontal	L4x4x3/8	388	-21279.500	33453.801	63.6	Pass
		Horizontal	L4x4x3/8	395	-22533.500	33453.801	67.4	Pass
		Horizontal	L4x4x3/8	402	-21222.199	33453.801	63.4	Pass
T1	180 - 175	Top Girt	L3x3x1/4	4	-1359.110	32261.500	4.2	Pass
							6.5 (b)	
		Top Girt	L3x3x1/4	5	-2181.560	32261.500	6.8	Pass
							9.8 (b)	
		Top Girt	L3x3x1/4	6	-2049.060	32261.500	6.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							9.9 (b)	
T3	166.667 - 158.333	Top Girt	L2 1/2x2 1/2x3/16	28	-4041.010	15549.400	26.0	Pass
							28.3 (b)	
		Top Girt	L2 1/2x2 1/2x3/16	29	-3982.560	15549.400	25.6	Pass
							27.5 (b)	
		Top Girt	L2 1/2x2 1/2x3/16	30	-4056.240	15549.400	26.1	Pass
							28.5 (b)	
T4	158.333 - 150	Top Girt	L2 1/2x2 1/2x3/16	40	-4531.070	14163.400	32.0	Pass
		Top Girt	L2 1/2x2 1/2x3/16	41	-4982.880	14163.400	35.2	Pass
		Top Girt	L2 1/2x2 1/2x3/16	42	-5174.560	14163.400	36.5	Pass
T12	37.5 - 25	Top Girt	2L4x4x1/4	361	-20661.900	93170.602	22.2	Pass
							44.7 (b)	
		Top Girt	2L4x4x1/4	362	-21743.699	93170.602	23.3	Pass
							46.7 (b)	
		Top Girt	2L4x4x1/4	363	-20491.301	93170.602	22.0	Pass
							44.3 (b)	
T14	12.5 - 0	Top Girt	2L4x4x5/16	415	-21895.900	105319.000	20.8	Pass
							38.0 (b)	
		Top Girt	2L4x4x5/16	416	-23406.801	105319.000	22.2	Pass
							40.1 (b)	
		Top Girt	2L4x4x5/16	417	-21892.301	105319.000	20.8	Pass
							37.9 (b)	
T5	150 - 125	Redund Horz 1 Bracing	L2x2x3/16	54	-1248.220	15696.300	8.0	Pass
		Redund Horz 1 Bracing	L2x2x3/16	57	-1253.440	15696.300	8.0	Pass
		Redund Horz 1 Bracing	L2x2x3/16	61	-1253.440	15696.300	8.0	Pass
		Redund Horz 1 Bracing	L2x2x3/16	64	-1223.960	15696.300	7.8	Pass
		Redund Horz 1 Bracing	L2x2x3/16	68	-1223.960	15696.300	7.8	Pass
		Redund Horz 1 Bracing	L2x2x3/16	71	-1248.220	15696.300	8.0	Pass
		Redund Horz 1 Bracing	L2x2x3/16	78	-1937.260	16148.800	12.0	Pass
		Redund Horz 1 Bracing	L2x2x3/16	81	-1924.020	16148.800	11.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	85	-1955.930	16148.800	12.1	Pass
		Redund Horz 1 Bracing	L2x2x3/16	88	-1947.920	16148.800	12.1	Pass
		Redund Horz 1 Bracing	L2x2x3/16	92	-1904.280	16148.800	11.8	Pass
		Redund Horz 1 Bracing	L2x2x3/16	95	-1877.140	16148.800	11.6	Pass
		Redund Horz 1 Bracing	L2x2x3/16	102	-1321.370	16590.801	8.0	Pass
		Redund Horz 1 Bracing	L2x2x3/16	105	-1310.470	16590.801	7.9	Pass
		Redund Horz 1 Bracing	L2x2x3/16	109	-1253.440	16590.801	7.6	Pass
		Redund Horz 1 Bracing	L2x2x3/16	112	-1223.960	16590.801	7.4	Pass
		Redund Horz 1 Bracing	L2x2x3/16	116	-1223.960	16590.801	7.4	Pass
		Redund Horz 1 Bracing	L2x2x3/16	119	-1248.220	16590.801	7.5	Pass
T6	125 - 100	Redund Horz 1 Bracing	L2x2x3/16	129	-2537.550	14276.400	17.8	Pass
		Redund Horz 1	L2x2x3/16	132	-2544.350	14276.400	17.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bracing Redund Horz 1	L2x2x3/16	136	-2544.350	14276.400	17.8	Pass
		Bracing Redund Horz 1	L2x2x3/16	139	-2499.260	14276.400	17.5	Pass
		Bracing Redund Horz 1	L2x2x3/16	143	-2499.260	14276.400	17.5	Pass
		Bracing Redund Horz 1	L2x2x3/16	146	-2537.550	14276.400	17.8	Pass
		Bracing Redund Horz 1	L2x2x3/16	153	-2537.550	14760.100	17.2	Pass
		Bracing Redund Horz 1	L2x2x3/16	156	-2544.350	14760.100	17.2	Pass
		Bracing Redund Horz 1	L2x2x3/16	160	-2544.350	14760.100	17.2	Pass
		Bracing Redund Horz 1	L2x2x3/16	163	-2499.260	14760.100	16.9	Pass
		Bracing Redund Horz 1	L2x2x3/16	167	-2499.260	14760.100	16.9	Pass
		Bracing Redund Horz 1	L2x2x3/16	170	-2537.550	14760.100	17.2	Pass
		Bracing Redund Horz 1	L2x2x3/16	177	-2537.550	15233.500	16.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	180	-2544.350	15233.500	16.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	184	-2544.350	15233.500	16.7	Pass
		Bracing Redund Horz 1	L2x2x3/16	187	-2499.260	15233.500	16.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	191	-2499.260	15233.500	16.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	194	-2537.550	15233.500	16.7	Pass
T7	100 - 91.6667	Bracing Redund Horz 1	L2x2x3/16	204	-2994.330	13475.700	22.2	Pass
		Bracing Redund Horz 1	L2x2x3/16	207	-3001.160	13475.700	22.3	Pass
		Bracing Redund Horz 1	L2x2x3/16	211	-3001.160	13475.700	22.3	Pass
		Bracing Redund Horz 1	L2x2x3/16	214	-2951.660	13475.700	21.9	Pass
		Bracing Redund Horz 1	L2x2x3/16	218	-2951.660	13475.700	21.9	Pass
		Bracing Redund Horz 1	L2x2x3/16	221	-2994.330	13475.700	22.2	Pass
T8	91.6667 - 83.3333	Bracing Redund Horz 1	L2x2x3/16	231	-3461.470	12457.000	27.8	Pass
		Bracing Redund Horz 1	L2x2x3/16	234	-3468.340	12457.000	27.8	Pass
		Bracing Redund Horz 1	L2x2x3/16	238	-3468.340	12457.000	27.8	Pass
		Bracing Redund Horz 1	L2x2x3/16	241	-3415.870	12457.000	27.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	245	-3415.870	12457.000	27.4	Pass
		Bracing Redund Horz 1	L2x2x3/16	248	-3461.470	12457.000	27.8	Pass
T9	83.3333 - 75	Bracing Redund Horz 1	L2x2x3/16	258	-3931.780	11526.000	34.1	Pass
		Bracing Redund Horz 1	L2x2x3/16	261	-3937.290	11526.000	34.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Redund Horz 1 Bracing	L2x2x3/16	265	-3937.290	11526.000	34.2	Pass
		Redund Horz 1 Bracing	L2x2x3/16	268	-3883.000	11526.000	33.7	Pass
		Redund Horz 1 Bracing	L2x2x3/16	272	-3883.000	11526.000	33.7	Pass
		Redund Horz 1 Bracing	L2x2x3/16	275	-3931.780	11526.000	34.1	Pass
T10	75 - 50	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	285	-5114.950	18462.600	27.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	288	-5120.670	18462.600	27.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	292	-5120.670	18462.600	27.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	295	-5058.110	18462.600	27.4	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	299	-5058.110	18462.600	27.4	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	302	-5114.950	18462.600	27.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	309	-5114.950	19178.100	26.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	312	-5120.670	19178.100	26.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	316	-5120.670	19178.100	26.7	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	319	-5058.110	19178.100	26.4	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	323	-5058.110	19178.100	26.4	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	326	-5114.950	19178.100	26.7	Pass
T11	50 - 37.5	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	336	-5860.700	17688.100	33.1	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	339	-5866.500	17688.100	33.2	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	343	-5866.500	17688.100	33.2	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	346	-5799.410	17688.100	32.8	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	350	-5799.410	17688.100	32.8	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	353	-5860.700	17688.100	33.1	Pass
T12	37.5 - 25	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	365	-6601.840	16161.700	40.8	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	368	-6607.730	16161.700	40.9	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	371	-6607.730	16161.700	40.9	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	374	-6538.840	16161.700	40.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	377	-6538.840	16161.700	40.5	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	380	-6601.840	16161.700	40.8	Pass
T13	25 - 12.5	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	390	-7351.240	14716.500	50.0	Pass
		Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	393	-7357.200	14716.500	50.0	Pass
		Redund Horz 1	L2 1/2x2 1/2x3/16	397	-7357.200	14716.500	50.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	400	-7287.070	14716.500	49.5	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	404	-7287.070	14716.500	49.5	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	407	-7351.240	14716.500	50.0	Pass
T14	12.5 - 0	Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	419	-8119.400	13456.800	60.3	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	422	-8125.270	13456.800	60.4	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	425	-8125.270	13456.800	60.4	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	428	-8051.850	13456.800	59.8	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	431	-8051.850	13456.800	59.8	Pass
		Bracing Redund Horz 1	L2 1/2x2 1/2x3/16	434	-8119.400	13456.800	60.3	Pass
T5	150 - 125	Bracing Redund Diag 1	L2x2x3/16	55	-938.644	8613.930	10.9	Pass
		Bracing Redund Diag 1	L2x2x3/16	58	-942.574	8613.930	10.9	Pass
		Bracing Redund Diag 1	L2x2x3/16	62	-942.574	8613.930	10.9	Pass
		Bracing Redund Diag 1	L2x2x3/16	65	-920.406	8613.930	10.7	Pass
		Bracing Redund Diag 1	L2x2x3/16	69	-920.406	8613.930	10.7	Pass
		Bracing Redund Diag 1	L2x2x3/16	72	-938.644	8613.930	10.9	Pass
		Bracing Redund Diag 1	L2x2x3/16	79	-1485.060	8979.520	16.5	Pass
		Bracing Redund Diag 1	L2x2x3/16	82	-1502.630	8979.520	16.7	Pass
		Bracing Redund Diag 1	L2x2x3/16	86	-1486.050	8979.520	16.5	Pass
		Bracing Redund Diag 1	L2x2x3/16	89	-1492.160	8979.520	16.6	Pass
		Bracing Redund Diag 1	L2x2x3/16	93	-1439.890	8979.520	16.0	Pass
		Bracing Redund Diag 1	L2x2x3/16	96	-1455.860	8979.520	16.2	Pass
		Bracing Redund Diag 1	L2x2x3/16	103	-1038.330	9356.280	11.1	Pass
		Bracing Redund Diag 1	L2x2x3/16	106	-1058.140	9356.280	11.3	Pass
		Bracing Redund Diag 1	L2x2x3/16	110	-999.734	9356.280	10.7	Pass
		Bracing Redund Diag 1	L2x2x3/16	113	-976.221	9356.280	10.4	Pass
		Bracing Redund Diag 1	L2x2x3/16	117	-976.221	9356.280	10.4	Pass
		Bracing Redund Diag 1	L2x2x3/16	120	-995.565	9356.280	10.6	Pass
T6	125 - 100	Bracing Redund Diag 1	L2x2x3/16	130	-1777.110	7523.250	23.6	Pass
		Bracing Redund Diag 1	L2x2x3/16	133	-1781.870	7523.250	23.7	Pass
		Bracing Redund Diag 1	L2x2x3/16	137	-1781.870	7523.250	23.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Redund Diag 1 Bracing	L2x2x3/16	140	-1750.290	7523.250	23.3	Pass
		Redund Diag 1 Bracing	L2x2x3/16	144	-1750.290	7523.250	23.3	Pass
		Redund Diag 1 Bracing	L2x2x3/16	147	-1777.110	7523.250	23.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	154	-1816.190	7846.800	23.1	Pass
		Redund Diag 1 Bracing	L2x2x3/16	157	-1821.050	7846.800	23.2	Pass
		Redund Diag 1 Bracing	L2x2x3/16	161	-1821.050	7846.800	23.2	Pass
		Redund Diag 1 Bracing	L2x2x3/16	164	-1788.780	7846.800	22.8	Pass
		Redund Diag 1 Bracing	L2x2x3/16	168	-1788.780	7846.800	22.8	Pass
		Redund Diag 1 Bracing	L2x2x3/16	171	-1816.190	7846.800	23.1	Pass
		Redund Diag 1 Bracing	L2x2x3/16	178	-1859.660	8183.050	22.7	Pass
		Redund Diag 1 Bracing	L2x2x3/16	181	-1864.640	8183.050	22.8	Pass
		Redund Diag 1 Bracing	L2x2x3/16	185	-1864.640	8183.050	22.8	Pass
		Redund Diag 1 Bracing	L2x2x3/16	188	-1831.600	8183.050	22.4	Pass
		Redund Diag 1 Bracing	L2x2x3/16	192	-1831.600	8183.050	22.4	Pass
		Redund Diag 1 Bracing	L2x2x3/16	195	-1859.660	8183.050	22.7	Pass
T7	100 - 91.6667	Redund Diag 1 Bracing	L2x2x3/16	205	-2055.420	7195.600	28.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	208	-2060.110	7195.600	28.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	212	-2060.110	7195.600	28.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	215	-2026.130	7195.600	28.2	Pass
		Redund Diag 1 Bracing	L2x2x3/16	219	-2026.130	7195.600	28.2	Pass
		Redund Diag 1 Bracing	L2x2x3/16	222	-2055.420	7195.600	28.6	Pass
T8	91.6667 - 83.3333	Redund Diag 1 Bracing	L2x2x3/16	232	-2332.590	6884.510	33.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	235	-2337.220	6884.510	33.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	239	-2337.220	6884.510	33.9	Pass
		Redund Diag 1 Bracing	L2x2x3/16	242	-2301.870	6884.510	33.4	Pass
		Redund Diag 1 Bracing	L2x2x3/16	246	-2301.870	6884.510	33.4	Pass
		Redund Diag 1 Bracing	L2x2x3/16	249	-2332.590	6884.510	33.9	Pass
T9	83.3333 - 75	Redund Diag 1 Bracing	L2x2x3/16	259	-2604.700	6589.210	39.5	Pass
		Redund Diag 1 Bracing	L2x2x3/16	262	-2608.350	6589.210	39.6	Pass
		Redund Diag 1 Bracing	L2x2x3/16	266	-2608.350	6589.210	39.6	Pass
		Redund Diag 1	L2x2x3/16	269	-2572.380	6589.210	39.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bracing Redund Diag 1	L2x2x3/16	273	-2572.380	6589.210	39.0	Pass
		Bracing Redund Diag 1	L2x2x3/16	276	-2604.700	6589.210	39.5	Pass
T10	75 - 50	Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	286	-4016.000	8069.580	49.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	289	-4020.490	8069.580	49.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	293	-4020.490	8069.580	49.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	296	-3971.370	8069.580	49.2	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	300	-3971.370	8069.580	49.2	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	303	-4016.000	8069.580	49.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	310	-4147.320	8404.890	49.3	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	313	-4151.960	8404.890	49.4	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	317	-4151.960	8404.890	49.4	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	320	-4101.230	8404.890	48.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	324	-4101.230	8404.890	48.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	327	-4147.320	8404.890	49.3	Pass
T11	50 - 37.5	Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	337	-4468.200	7713.130	57.9	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	340	-4472.630	7713.130	58.0	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	344	-4472.630	7713.130	58.0	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	347	-4421.470	7713.130	57.3	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	351	-4421.470	7713.130	57.3	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	354	-4468.200	7713.130	57.9	Pass
T12	37.5 - 25	Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	366	-4899.580	7373.870	66.4	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	369	-4903.950	7373.870	66.5	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	372	-4903.950	7373.870	66.5	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	375	-4852.830	7373.870	65.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	378	-4852.830	7373.870	65.8	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	381	-4899.580	7373.870	66.4	Pass
T13	25 - 12.5	Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	391	-5322.730	7051.040	75.5	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	394	-5327.040	7051.040	75.5	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	398	-5327.040	7051.040	75.5	Pass
		Bracing Redund Diag 1	L2 1/2x2 1/2x3/16	401	-5276.260	7051.040	74.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	405	-5276.260	7051.040	74.8	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	408	-5322.730	7051.040	75.5	Pass
T14	12.5 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	420	-5747.100	6743.940	85.2	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	423	-5751.250	6743.940	85.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	426	-5751.250	6743.940	85.3	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	429	-5699.280	6743.940	84.5	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	432	-5699.280	6743.940	84.5	Pass
		Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	435	-5747.100	6743.940	85.2	Pass
T5	150 - 125	Inner Bracing	L2 1/2x2x3/16	73	-9.696	5708.280	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	74	-9.731	5708.280	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	75	-9.636	5708.280	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	97	-8.976	6278.770	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	98	-9.021	6278.770	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	99	-8.909	6278.770	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	121	-8.242	6939.250	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	122	-8.281	6939.250	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	123	-8.146	6939.250	0.5	Pass
T6	125 - 100	Inner Bracing	L2 1/2x2x3/16	148	-12.241	4395.920	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	149	-12.271	4395.920	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	150	-12.240	4395.920	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	172	-12.413	4778.000	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	173	-12.450	4778.000	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	174	-12.366	4778.000	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	196	-12.577	5212.150	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	197	-12.620	5212.150	0.5	Pass
		Inner Bracing	L2 1/2x2x3/16	198	-12.498	5212.150	0.5	Pass
T7	100 - 91.6667	Inner Bracing	L2 1/2x2x3/16	223	-19.812	4057.900	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	224	-19.857	4057.900	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	225	-19.776	4057.900	0.6	Pass
T8	91.6667 - 83.3333	Inner Bracing	L2 1/2x2x3/16	250	-19.536	3757.420	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	251	-19.577	3757.420	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	252	-19.504	3757.420	0.6	Pass
T9	83.3333 - 75	Inner Bracing	L2 1/2x2x3/16	277	-19.319	3489.130	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	278	-19.355	3489.130	0.6	Pass
		Inner Bracing	L2 1/2x2x3/16	279	-19.292	3489.130	0.6	Pass
T10	75 - 50	Inner Bracing	L2 1/2x2 1/2x3/16	304	-20.198	4392.910	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	305	-20.227	4392.910	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	306	-20.177	4392.910	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	328	-20.678	4867.490	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	329	-20.713	4867.490	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	330	-20.652	4867.490	0.6	Pass
T11	50 - 37.5	Inner Bracing	L2 1/2x2 1/2x3/16	355	-19.307	3984.500	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	356	-19.331	3984.500	0.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	357	-19.289	3984.500	0.6	Pass
T12	37.5 - 25	Inner Bracing	L2 1/2x2 1/2x3/16	382	-385.130	3630.500	10.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	383	-385.125	3630.500	10.6	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	384	-366.367	3630.500	10.1	Pass
T13	25 - 12.5	Inner Bracing	L3x3x1/4	409	-19.064	7584.820	0.5	Pass
		Inner Bracing	L3x3x1/4	410	-19.080	7584.820	0.5	Pass
		Inner Bracing	L3x3x1/4	411	-19.052	7584.820	0.5	Pass
T14	12.5 - 0	Inner Bracing	L3x3x1/4	436	-415.895	6965.920	6.0	Pass
		Inner Bracing	L3x3x1/4	437	-415.894	6965.920	6.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Inner Bracing	L3x3x1/4	438	-389.735	6965.920	5.6	Pass
							Summary	
							Leg (T14)	95.5	Pass
							Diagonal (T10)	99.9	Pass
							Horizontal (T11)	88.7	Pass
							Top Girt (T12)	46.7	Pass
							Redund Horz 1 Bracing (T14)	60.4	Pass
							Redund Diag 1 Bracing (T14)	85.3	Pass
							Inner Bracing (T12)	10.6	Pass
							Bolt Checks	99.9	Pass
							RATING =	**99.9**	**Pass**

ANCHOR BOLT EVALUATION

ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift:	$Uplift := 449.947kips$	*user input*	
Shear:	$Shear := 59.885kips$	*user input*	
Compression:	$Compression := 512.666kips$	*user input*	

Anchor Bolt Data:

Use ASTM A36 - Refer to Assumption Note (below)

Number of Anchor Bolts = N	$N := 9$	*user input*	*Number of anchors are considering the exisitng and previously modified anchors; previously installed at this site as a modification. (conservative consideration for all anchor bolts = A36 material.);Per Annex R (TIA-222-H, Existing anchors are assumed to have been installed with ASTM A572 Grade 50 anchors for structures built during/after 1985 and are within tension capacity limits previously addressed.*
Bolt Ultimate Strength:	$F_u := 58 \cdot ksi$	*user input*	
Bolt Yield Strength:	$Fy := 36 \cdot ksi$	*user input*	
Bolt Modulus:	$E := 29000ksi$	*user input*	
Thickness of Anchor Bolts	$D := 1.75in$	*user input*	
Threads per Inch:	$n := 5$	*user input*	
Coefficient of Friction:	$\mu := 0.55$	*user input*	(for baseplate with grout ASCE 10-15)
Length from top of pier to bottom of leveling nut:	$L_{ar} := 0in$	*user input*	
Bolt Modulus:	$E := 29000ksi$	*user input*	

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 2.41\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 1.9\cdot in^2$$

Net Diameter:

$$D_n := D - \frac{0.9743 in}{n} \qquad D_n = 1.56\cdot in$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \qquad r = 0.39\cdot in$$

Plastic Section Modulus of Bolt:

$$Z_x := \frac{D_n^3}{6} \qquad Z_x = 0.63\cdot in^3$$

Forces:

Tension Force:

$$T_u := \frac{Uplift}{N}$$

$T_u = 49.99\cdot kip$ $\quad T_{ub} := T_u$

Compression Force:

$$P_{uc} := \frac{Compression}{N}$$

$P_{uc} = 56.96\cdot kip$ $\quad P_{ucb} := P_{uc}$

Shear Force:

$$V_u := \frac{Shear}{N}$$

$V_u = 6.65\cdot kip$ $\quad V_{ub} := V_u$

Resistance Factor for Flexure (TIA-222-H 4.9.9):

$\phi_f := 0.9$

Resistance Factor for Anchor Bolt (Compression) (TIA-222-H 4.9.9 Addendum 1):

$\phi_c := 0.90$

Resistance Factor for Tension (TIA-222-H 4.9.9):

$\phi_t := 0.75$

Resistance Factor for Shear (TIA-222-H 4.9.9):

$\phi_v := 0.75$

TIA-222-H 4.9.9 Calculate Equation Variables Strength Design:

Design Tensile Strength, Rnt:

$R_{nt} := F_u \cdot A_n$

$R_{nt} = 110.17 \cdot kip$

$\phi_t \cdot R_{nt} = 82.63 \cdot kip$

Design Compression Strength, Rnc:

$R_{nc} := Fy \cdot A_g$

$R_{nc} = 86.59 \cdot ft \cdot kip$

$\phi_c \cdot R_{nc} = 77.93 \cdot ft \cdot kip$

Design Shear Strength (Tension), Rnv:

$R_{nv} := 0.5 \cdot F_u \cdot A_g$

$R_{nv} = 69.75 \cdot ft \cdot kip$

$\phi_v \cdot R_{nv} = 52.31 \cdot ft \cdot kip$

Design Shear Strength (Compression), Rnvc:

$R_{nvc} := 0.6 \cdot Fy \cdot A_g \cdot 0.75$

$R_{nvc} = 38.97 \cdot ft \cdot kip$

$\phi_c \cdot R_{nvc} = 35.07 \cdot ft \cdot kip$

NOTE: Per TIA-222-H The determination of capacity formulas are based on the exising constructed condition of exposed anchor rod from the top of the foundation to the bottom of the (base) leveling nut., Therefore the following equations next page), reflects for this tower site, the first formula shall be applied:

lar = 3" - 1.75" (nut height) = 1.25" < 1.75" Bolt Diameter

TIA-222-H 4.9.9 Combined Shear and Tension:

$$\left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 + \left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 \le 1$$

$$\left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 + \left(\frac{V_{ub}}{\phi_v \cdot R_{nv}}\right)^2 = 0.3823$$

TIA-222-H 4.9.9 Combined Shear and Compression:

$$\left[\frac{P_{ucb}}{(\phi_c \cdot R_{nc})}\right] + \left(\frac{V_{ub}}{\phi_c \cdot R_{nvc}}\right)^2 \le 1$$

$$\left[\frac{P_{ucb}}{(\phi_c \cdot R_{nc})}\right] + \left(\frac{V_{ub}}{\phi_c \cdot R_{nvc}}\right)^2 = 0.767$$

NOTE: Larger ratio number shown above Governs design Capacity.

Combined Shear and Tension/Compression Check:

$$\text{ShearAndTensionCheck} := \text{if}\left[\max\left[\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2, \left[\frac{P_{ucb}}{(\phi_c \cdot R_{nc})}\right] + \left(\frac{V_{ub}}{\phi_c \cdot R_{nvc}}\right)^2\right] \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

ShearAndTensionCheck = "OK"

NOTE: Previous modification calculations applied a design uplift force of 11,316.48 lbf (per anchor) (under TIA-222-G designs) for existing and previous anchorage bolts. Application of the TIA-222-H Addendum 1 standards (along with the application of Annex R for existing anchor bolts (un-documented) have determined the uplift forces for the 3 previously installed anchors will have enough capacity for the proposed conditions. The following is an adhesive anchor capacity check previously applied to determine anchorage capacity limits. HILTI factors are considering ACI 318 design reduction factors and are applying polynomial interpolation to determine design factors for implementation.

FOUNDATION ANALYSIS

AECOM

				Page	of
Job	180' Stainless Lattice Tower - Westbrook, CT	Project No.	EVS-018 Rev. 3 (b)	Sheet 1	of 4
Description	Pier and Square Mat Foundation Analysis	Computed by	MCD	Date	07/31/20
	TIA-222-H - Addendum 1	Checked by		Date	

DEFINE VARIABLES

$f'_c := 3 \cdot ksi$

$f_y := 60 \cdot ksi$

Max Compressive Force of Tower: $P_{Tower} := 512.666\,kip$

Max Uplift Force of Tower: $Uplift := 449.947\,kip$

Max Shear at Base of Tower: $Shear := 59.885\,kip$

Diameter of Pier: $Pier\phi := 4 \cdot ft + 0ft$

Length of Pier: $L_c := 11 \cdot ft - 0ft$

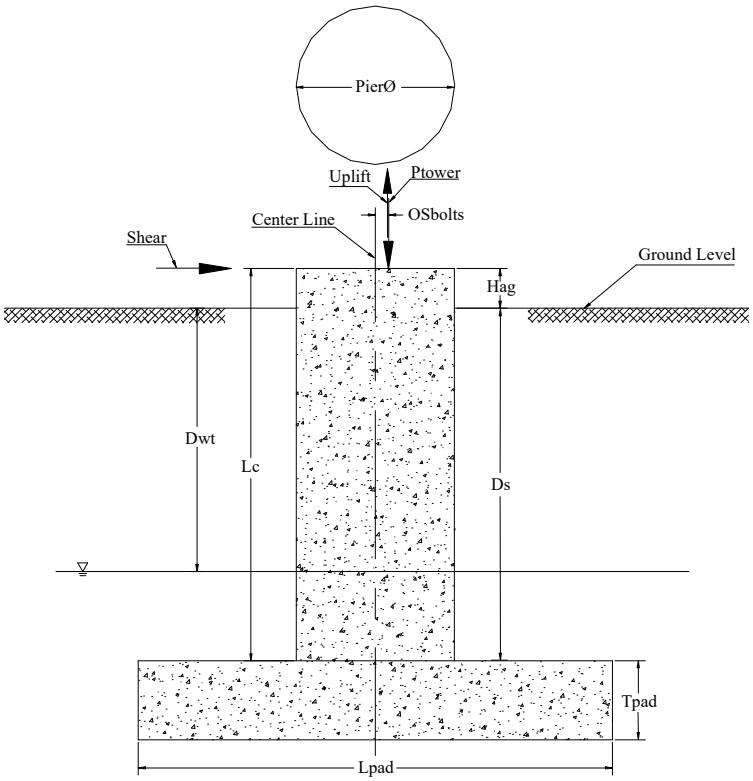
Height of Pier Above Grade: $H_{ag} := 1.0 \cdot ft$

Length of Pad: $L_{Pad} := 16.25 \cdot ft$

Thickness of Pad: $T_{Pad} := 2.0 \cdot ft + 0ft$

Distance to Water Table: $D_{wt} := 999 \cdot ft$

NOTE: SET Dwt TO A VALUE GREATER THAN TOTAL DEPTH OF PAD IF WATER TABLE DOES NOT AFFECT FOOTING



NOTE: Previous Foundation Modifications (from project 6064308 / TWM-012) and considered constructed for this analysis.

Eccentricity of Anchor Bolts from Center Line of Pier: $OS_{bolts} := 9 \cdot in$

Diameter of Reinforcing Bars in Pad: $d_{bar} := 1.00 \cdot in$

Soil Internal Friction Angle: $\phi := 34 \cdot deg$

Ultimate Soil Pressure: $q_u := 6.0 \cdot ksf$

$\gamma_s := 110 \cdot \frac{lb}{ft^3}$ $\gamma_c := 150 \cdot \frac{lb}{ft^3}$ $\gamma_w := 62.4 \cdot \frac{lb}{ft^3}$

Active Pressure of Soil Acting along Length of Pier: $K_a := \frac{1 - \sin(\phi)}{1 + \sin(\phi)}$ $P_{Active} := \frac{1}{2} \cdot (L_c + T_{Pad})^2 \cdot Pier\phi \cdot \gamma_s \cdot K_a$ $P_{Active} = 10.51 \cdot kip$

Passive Pressure of Soil Acting along Length of Pier: $K_p := \frac{1 + \sin(\phi)}{1 - \sin(\phi)}$ $P_{Passive} := \frac{1}{2} \cdot (L_c + T_{Pad})^2 \cdot Pier\phi \cdot \gamma_s \cdot K_p$ $P_{Passive} = 131.51 \cdot kip$

Distance from Grade to Bottom of Pier: $D_s := L_c - H_{ag}$ $D_s = 10\,ft$

Area and Volume of Pier: $A_c := \frac{\pi \cdot Pier\phi^2}{4}$ $V_c := A_c \cdot L_c$ $V_c = 138.23\,ft^3$

Area and Volume of Pad: $A_p := L_{Pad}^2$ $V_p := T_{Pad} \cdot A_p$ $V_p = 528.13\,ft^3$

ULTIMATE SOIL PRESSURE

Assume water table is below bottom of footing

$D_{wtp} := if\left[\left(D_s + T_{Pad}\right) > D_{wt}, T_{Pad}, 0\cdot ft\right]$ $D_{wtp} = 0\,ft$

$W_p := \left(V_p\cdot\gamma_c\right) - D_{wtp}\cdot A_p\cdot\gamma_w$ $W_p = 79.22\cdot kip$

$D_{wtc} := if\left[D_s < D_{wt}, 0\cdot ft, \left(D_s - D_{wt}\right)\right]$ $D_{wtc} = 0\,ft$

$W_c := \left(V_c\cdot\gamma_c\right) - D_{wtc}\cdot A_c\cdot\gamma_w$ $W_c = 20.73\cdot kip$

$W_s := \left[\left(D_s\right)\cdot\left(A_p - A_c\right)\cdot\gamma_s\right]$ $W_s = 276.65\cdot kip$

$P_{Total} := 1.2W_p + 1.2W_c + 1.2W_s + P_{Tower}$ $P_{Total} = 964.58\cdot kip$

$q_{gr} := \frac{P_{Total}}{A_p}$ $q_{gr} = 3.65\cdot ksf$

$q_n := q_{gr} - \left(D_s + T_{Pad}\right)\cdot\gamma_s$ $q_n = 2.33\cdot ksf$

$SoilPressure := if\left(q_n < q_u\cdot 0.75, \text{"Okay"}, \text{"No Good"}\right)$

TIA-222-H Reduction Factor
(Section 9.4.1(c)) (0.75 - Bearing)

$SoilPressure = \text{"Okay"}$

PUNCHING SHEAR

Critical section is located at a distance d/2 from the face of Pier

$$p_u := \left(\frac{P_{Tower} + 1.2V_c\cdot\gamma_c}{L_{Pad}^{\,2}}\right) + \left[\frac{Shear\cdot\left(L_c + T_{Pad}\right) + P_{Tower}\cdot OS_{bolts} + \left(P_{Active} - P_{Passive}\right)\cdot\frac{L_c + T_{Pad}}{3}}{\frac{1}{6}\cdot L_{Pad}^{\,3}}\right]$$

$p_u = 2.93\cdot ksf$

$d := T_{Pad} - \left(3\cdot in + d_{bar}\right)$ $d = 20\cdot in$

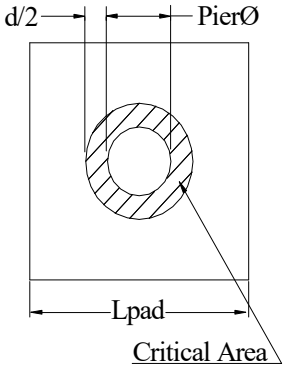
$b_o := \left(Pier\phi + d\right)\cdot\pi$ $b_o = 17.8\,ft$

$$Aout_{bo} := L_{Pad}^{\,2} - \frac{\pi\cdot\left(Pier\phi + d\right)^2}{4}$$

$Aout_{bo} = 238.84\,ft^2$

$V_u := Aout_{bo}\cdot p_u$ $V_u = 699.5\cdot kip$

$$\phi V_c := 0.75\cdot 4\cdot\sqrt{f'_c\cdot\frac{lb}{in^2}}\cdot b_o\cdot d \quad \phi V_c = 702.05\cdot kip$$



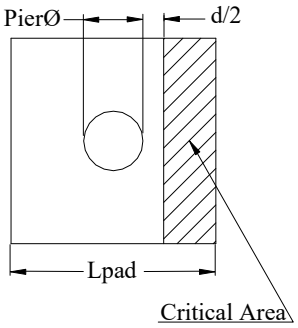
$PunchingShear := if\left(V_u < \phi V_c, \text{"Okay"}, \text{"No Good "}\right)$ $PunchingShear = \text{"Okay"}$

BEAM SHEAR

Critical section is located at a distance d/2 from the face of the Pier

$$V_u := p_u \cdot L_{Pad} \cdot \left(\frac{L_{Pad} - Pier\phi}{2} - \frac{d}{2} \right) \qquad V_u = 251.84 \cdot kip$$

$$\phi V_c := 0.75 \cdot 2 \cdot \sqrt{f'_c \cdot \frac{lb}{in^2}} \cdot L_{Pad} \cdot d \qquad \phi V_c = 320.42 \cdot kip$$



$$BeamShear := if\left(V_u < \phi V_c, "Okay", "No\ Good"\right)$$

$$BeamShear = "Okay"$$

ACI 2011 Reduction Factor (0.75) for Beam Shear and Punching Shear - Permissible by TIA-222-H Standard Section 9.

BENDING

Critical section extends across width of footing at the face of Pier

$$A_{bar} := 0.785 \cdot in^2 \qquad NoOfBar := 20$$

$$As_{provided} := NoOfBar \cdot A_{bar} \qquad As_{provided} = 15.7 \cdot in^2$$

$$M_{Req} := p_u \cdot L_{Pad} \cdot \left(\frac{L_{Pad} - Pier\phi}{2} \right)^2 \cdot \frac{1}{2}$$

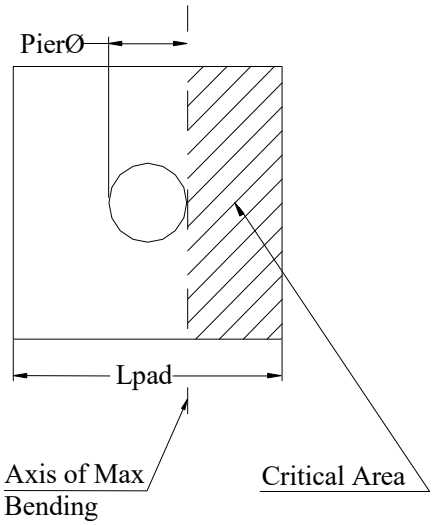
$$M_{Req} = 892.72 \cdot kip \cdot ft$$

$$a := \frac{As_{provided} \cdot f_y}{0.85 \cdot f'_c \cdot L_{Pad}}$$

$$a = 1.89 \cdot in$$

$$M_{Avail} := 0.9 \left[As_{provided} \cdot f_y \cdot \left(d - \frac{a}{2} \right) \right]$$

$$M_{Avail} = 1346.08 \cdot kip \cdot ft$$



$$Bending := if\left(M_{Avail} > M_{Req}, "Okay", "No\ Good"\right)$$

$$Bending = "Okay"$$

ACI 2011 Reduction Factor (0.90) for Concrete Bending Moment) - Permissible by TIA-222-H Standard Section 9. Considering Tension Control within concrete

UPLIFT

$$Soil_1 := \left[\left(D_s\right)\cdot\left(L_{Pad}{}^2 - A_c\right)\cdot\gamma_s\right]$$

$$Soil_2 := 4\cdot\left[\left(D_s + T_{Pad}\right)^2\cdot L_{Pad}\cdot\frac{\tan(\phi)}{2}\right]\cdot\gamma_s$$

$$Soil_3 := 4\cdot\left[\left(D_s + T_{Pad}\right)^3\cdot\frac{\tan(\phi)^2}{3}\right]\cdot\gamma_s$$

$$WT_{soil} := Soil_1 + Soil_2 + Soil_3 \qquad WT_{soil} = 739.19\cdot kip$$

$$WT_{conc} := W_p + W_c \qquad WT_{conc} = 99.95\cdot kip$$

$$Uplift_{Res} := \left(0.9WT_{soil} + 0.9WT_{conc}\right)\cdot 0.75 \qquad Uplift_{Res} = 566.42\cdot kip$$

TIA-222-G Reduction Factor (0.75) (Section 9)

$$UpLiftCapacity_{Ult} := \frac{Uplift}{Uplift_{Res}} \qquad UpLiftCapacity_{Ult} = 0.794$$

$$UpliftCheck := if\left(Uplift < Uplift_{Res}, "Okay", "No Good"\right)$$

$UpliftCheck = "Okay"$

CHECK OVERTURNING MOMENT - FACTORED LOAD CONDITIONS

$$OTM := Shear\cdot\left(L_c + T_{Pad}\right) + Uplift\cdot\left(\frac{L_{Pad}}{2} - OS_{bolts}\right) + 1.2P_{Active}\cdot\frac{L_c + T_{Pad}}{3}$$

$$OTM = 4.15\times 10^3\cdot kip\cdot ft$$

$$RM := P_{Tower}\cdot\left(\frac{L_{Pad}}{2} - OS_{bolts}\right) + \left[0.9WT_{conc} + (0.9Soil)_1\right]\cdot\frac{L_{Pad}}{2} + 0.9P_{Passive}\cdot\frac{L_c + T_{Pad}}{3}$$

$$RM = 7.05\times 10^3\cdot kip\cdot ft$$

$$Foundation_{OT} := \frac{OTM}{RM\cdot 0.75}$$

ANSI/TIA-222-G Reduction Factor (0.75) (Section 9.4.1(c))

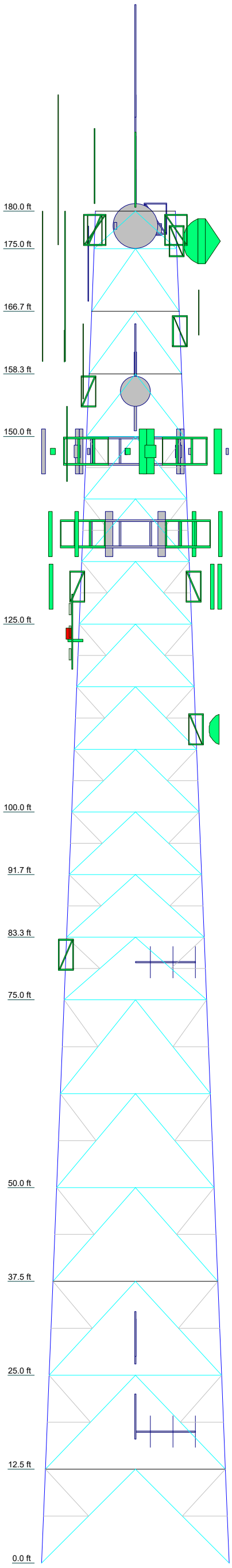
$Foundation_{OT} = 0.79$

$$OTMCheck := if\left(Foundation_{OT} < 1.0, "Okay", "No Good"\right)$$

$OTMCheck = "Okay"$

ANALYSIS UNDER TIA-222-F DESIGN CRITERIA (DESPP / CSP)

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14		
Legs		Stainless P5x0.250				Stainless P5x0.300	Stainless P5x0.400			1/3 Pipe w/ 5"x0.5 Stainless	Stainless P6.875x0.400						
Leg Grade		A513-50							A500-42				A572-60				
Diagonals		2L2 1/2x2x3/16x3/8				2L2 1/2x2x5/16x3/8		2L3x2 1/2x1/4x3/8			2L3 1/2x3 1/2x5/16x3/8			2L3 1/2x3 1/2x5/16x3/8			
Diagonal Grade		A36												A529-50			
Top Girts		L2 1/2x2 1/2x3/16	N.A.			L3x2 1/2x1/4		L3x3x5/16		2L3x3x1/4	L4x4x1/4		L2 1/2x2 1/2x3/16	N.A.	2L4x4x5/16		
Horizontals	L3x3x1/4	N.A.	B	N.A.			L2x2x3/16							L4x4x3/8	N.A.		
Red. Horizontals	N.A.												L2 1/2x2 1/2x3/16				
Red. Diagonals	N.A.						L2x2x3/16						L2 1/2x2 1/2x3/16				
Inner Bracing	N.A.							L2 1/2x2 1/2x3/16					L3x3x1/4				
Face Width (ft)	10.599	11	11.6667	12.3333	13	15		17	17.6667	18.3333	19	21	22	23	24	25	
# Panels @ (ft)	1 @ 5	12 @ 8.33333											6 @ 12.5				
Weight (lb)	592.3	755.5	768.1	780.9	3994.8		4822.1	1971.3	2177.7	2217.6	6256.5	3351.7	3953.2	3858.0	4407.3	39906.9	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15' (DNK-56 (L.R.))	200	Raycap RVZDC-6627-PF-48 (ATT)	148
2" Dia 10' Omni (DNK-52 (St# 10))	186	(2) 7770.00 panel antenna (ATT)	148
3" Dia 20' Omni (DNK-59 (St# 13))	185.5	AM-X-CD-16-65-00T Panels (ATT)	148
3" Dia 12' Omni (DNK-48 (St# 8))	185.5	(2) TMAT1921xB68-21A TMA Units (ATT)	148
3" Dia 20' Omni (DNK-57 (St# 6))	185.5	Ericsson RRUS-11 RRH Unit (ATT)	148
2" Dia 10' Omni (DNK-53 (St# 3))	185	Ericsson RRUS-12 RRH Unit (ATT)	148
10' - 2 Bay Dipole (DNK-54 (St# 2))	185	Raycap RVZDC-6627-PF-48 (ATT)	148
1" Dia 8' Omni (DNK-58 (St# 5))	182.5	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
1 Bay Dipole ANT400D (DNK-51 (St# 11))	181	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
20' 4-Bay Dipole (DNK-55 (St# 1))	181	Pirod 12' PCS T-Frame (1) 104569 (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	APXVTM14-C-120 Panel Antenna (Sprint)	137
6' Side-Arm(1) (Mts for St# 4-1 Antennas)	179	APXVTM14-C-120 Panel Antenna (Sprint)	137
11"x8"x12" Junction Box ((St# 16))	178	APXVTM14-C-120 Panel Antenna (Sprint)	137
6' w/Radome (DNK-45 (St# 17))	178	NNVV-65B-R4 Panel Antenna (Sprint)	137
Pirod 6' Side Mount Standoff (1) (DNK-38,39 (St# 13,14,15,16))	177.5	NNVV-65B-R4 Panel Antenna (Sprint)	137
		NNVV-65B-R4 Panel Antenna (Sprint)	137
432E-83I-01T TTA Unit (DNK-47 (St# 9))	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	ALU TD-RRH-8x20-25 (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
6' Side-Arm(1) (Mts for St# 5-12 Antennas)	177.5	(2) ALU 800MHz 2x50W (Sprint)	137
1' Side Arm (DNK-44 (St# 18))	176	(2) ALU 800MHz 2x50W (Sprint)	137
1' Side Arm (DNK-45 (St# 17))	176	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
6' w/Radome (DNK-44 (St# 18))	176	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
(inverted) 2" Dia 10' Omni (DNK-42 (St# 4))	173	ALU 4x45-1900 MHz RRH Unit (Sprint)	137
(Inverted) 3" Dia 20' Omni (DNK-38 (St# 15))	170	Commscope DBXNH-6565A-A2M Panel (T-Mobile DNK-11,12,13)	130
(Inverted) 3" Dia 20' Omni (DNK-39 (St# 14))	170		
(inverted) 10' 8 Bay Di-Pole (DNK-41 (St# 12))	170	Commscope DBXNH-6565A-A2M Panel (T-Mobile DNK-11,12,13)	130
(inverted) 10' 8 Bay Di-Pole (DNK-40 (St# 7))	170		
Telewave 150F2 Omni ((St # 20))	166.5	(2) Ericsson TMA Unit (T-Mobile DNK-11,12,13)	130
Pirod 4' Side Mount Standoff (1) ((St # 20))	164	Commscope DBXNH-6565A-A2M Panel (T-Mobile DNK-11,12,13)	130
Telewave ANT220F2 - Omni Antenna (Eversource - Proposed)	162	2' Sidearm (T-Mobile DNK-11,12,13)	130
ANT450F6 (DNK-35 (St# 21))	161	2' Sidearm (T-Mobile DNK-11,12,13)	130
3" Dia 9' Omni (DNK-33 (St# 24))	160	2' Sidearm (T-Mobile DNK-11,12,13)	130
Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource - Proposed)	159	(2) Ericsson TMA Unit (T-Mobile DNK-11,12,13)	130
		(2) Ericsson TMA Unit (T-Mobile DNK-11,12,13)	130
2' Sidearm (DNK-35 (St# 21))	157	1' Side Arm (DNK-9 (St# 45))	125
1' Side Arm (DNK-37 (St# 23))	156	Decibel DB210-C Dipole (Single) (DNK-9 (St# 45))	125
Pirod 4' Side Mount Standoff (1) (DNK-32, 33 (St# 24,25))	156	Comprod 871F-70 Dipole (Eversource - Proposed)	124
		19.5"x19.5" Panel Antenna (DNK-10 (St# 46))	123
10'6"x4" Pipe Mount (DNK-34 (St# 22))	156	1' Side Arm (DNK-10 (St# 46))	123
4' Paraflector [PRF-950] (DNK-37 (St# 23))	156	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed) (Eversource - Proposed)	121
1 Bay Dipole ANT400D (DNK-34 (St# 22))	151		
2" Dia 14' Omni (inverted) (DNK-32 (St# 25))	149	2' Sidearm (DNK-8 (St# 47))	111
13' Sector Mount (1) (ATT)	148	4' Paraflector [PRF-950] (DNK-8 (St# 47))	111
13' Sector Mount (1) (ATT)	148	1' Side Arm (Un-used Mount)	102
13' Sector Mount (1) (ATT)	148	20' 4-Bay Dipole (DNK-7 (St# 48))	89.5
(2) 7770.00 panel antenna (ATT)	148	1' Side Arm (DNK-6,7 (St# 48,49))	82.5
AM-X-CD-16-65-00T Panels (ATT)	148	1' Side Arm (DNK-5 (St# 50))	81
(2) TMAT1921xB68-21A TMA Units (ATT)	148	3' Yagi (DNK-6 (St# 49))	81
Ericsson RRUS-11 RRH Unit (ATT)	148	GPS (DNK-5 (St# 50))	81
Ericsson RRUS-12 RRH Unit (ATT)	148	1.5" Dia 3' Omni (DNK-4 (St# 51))	34 - 27
Raycap RVZDC-6627-PF-48 (ATT)	148	1.5" Dia 3' Omni (inverted) (DNK-3 (St# 52))	29.5
(2) 7770.00 panel antenna (ATT)	148	4' Side Mount Standoff (1) (DNK-3,4 (St# 51,52))	26
AM-X-CD-16-65-00T Panels (ATT)	148	1.5" Dia 3' Omni (DNK-2 (St# 53))	19.5
(2) TMAT1921xB68-21A TMA Units (ATT)	148	4' Side Mount Standoff (1) (DNK 1,2 (St# 53,54))	18
Ericsson RRUS-11 RRH Unit (ATT)	148	3' Yagi (DNK-1 (St# 54))	17.5
Ericsson RRUS-12 RRH Unit (ATT)	148		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Stainless P5x0.500	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A513-50	50 ksi	66 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi	A529-50	50 ksi	65 ksi
A500-42	42 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. MODification Note: Tower Leg for 0'-25' is using factored (0.9) ratio of combined stress based on average of individual members (60ksi leg _46 ksi tube) to apply 50 ksi at legs at this region.
5. Previous MODification note: Top Girt Horizontals @ 12.5' _37.5' were previous MODifications from Project SAI-063 (06/2011) and considered constructed.
6. Appurtenance Reference # based on Tower Inventory/Mapping Report from Stainless Inc.
7. Carrier Centerlines (ATT/T-Mobile/Sprint) are based on Carrier RFDS Centerlines from previously obtained information listed in Section 1 of this S.A. report.
8. UPDATE!! - 06/09/2020 - Removal of (3) Wind-Load Dishes per CSP request.

MAX. CORNER REACTIONS AT BASE:
DOWN: 422421 lb
SHEAR: 46756 lb

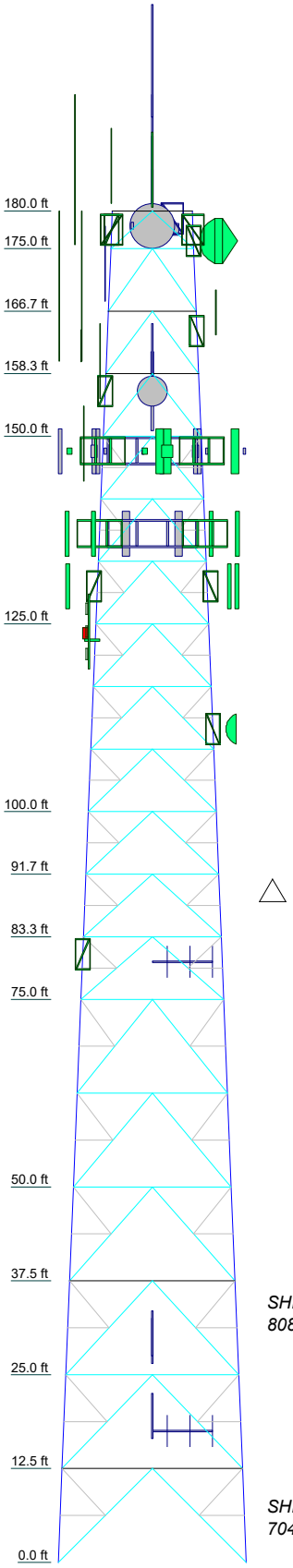
UPLIFT: -357819 lb
SHEAR: 41791 lb

AXIAL
82554 lb
SHEAR 80870 lb
MOMENT 8550 kip-ft
TORQUE 44 kip-ft
90 mph WIND - 0.500 in ICE

AXIAL
53893 lb
SHEAR 70435 lb
MOMENT 7406 kip-ft
TORQUE 30 kip-ft
REACTIONS - 95 mph WIND

AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-263-5800
FAX: 860-812-2094

Job:	***Analysis - 180' Lattice Tower (CSP #36)***		
Project:	***Westbrook, Connecticut - S. Analysis - Rev.3 (b) w/ EVS E***		
Client: Eversource / EVS-018 / DESPP/CSP		Drawn by: MCD	App'd:
Code: TIA/EIA-222-F		Date: 07/31/20	Scale: NTS
Path:			Dwg No. E-1



Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Legs			Stainless P5x0.250			Stainless P5x0.300	Stainless P5x0.400				Stainless P6.875x0.400			Stainless P6.875x0.500	
Leg Grade						A513-50		A	B				A572-60		
Diagonals			2L2 1/2x2x3/16x3/8			2L2 1/2x2x5/16x3/8		2L3x2 1/2x1/4x3/8			2L3 1/2x3 1/2x5/16x3/8	C		2L3 1/2x3 1/2x5/16x3/8	
Diagonal Grade							A36							A529-50	
Top Girts		D	N.A.	L2 1/2x2 1/2x3/16				N.A.					2L4x4x1/4	N.A.	2L4x4x5/16
Horizontals		N.A.	E	N.A.		L3x2 1/2x1/4	L3x3x5/16		2L3x3x1/4		L4x4x1/4		N.A.	L4x4x3/8	N.A.
Red. Horizontals			N.A.				L2x2x3/16						L2 1/2x2 1/2x3/16		
Red. Diagonals			N.A.				L2x2x3/16						L2 1/2x2 1/2x3/16		
Inner Bracing			N.A.				L2 1/2x2 1/2x3/16							L3x3x1/4	
Face Width (ft)	25	11	10.599	11.6667	12.3333	13	15	17	17.6667	18.3333	19	21	22	23	24
# Panels @ (ft)		1 @ 5				12 @ 8.33333						6 @ 12.5			
Weight (lb)	39906.9	592.3	755.5	768.1	780.9	3994.8	4822.1	1971.3	2177.7	2217.6	6256.5	3351.7	3863.2	3858.0	4407.3

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Stainless P5x0.500	D	L3x3x1/4
B	1/3 Pipe w/ 5"x0.5 Stainless	E	L2 1/2x2 1/2x3/16
C	2L3 1/2x3x5/16x3/8		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A513-50	50 ksi	66 ksi	A572-60	60 ksi	75 ksi
A36	36 ksi	58 ksi	A529-50	50 ksi	65 ksi
A500-42	42 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 95 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. MODification Note: Tower Leg for 0'-25' is using factored (0.9) ratio of combined stress based on average of individual members (60ksi leg _46 ksi tube) to apply 50 ksi at legs at this region.
5. Previous MODification note: Top Girt Horizontals @ 12.5' _37.5' were previous MODifications from Project SAI-063 (06/2011) and considered constructed.
6. Appurtenance Reference # based on Tower Inventory/Mapping Report from Stainless Inc.
7. Carrier Centerlines (ATT/T-Mobile/Sprint) are based on Carrier RFDS Centerlines from previously obtained information listed in Section 1 of this S.A. report.
8. UPDATE!! - 06/09/2020 - Removal of (3) Wind-Load Dishes per CSP request.

MAX. CORNER REACTIONS AT BASE:

DOWN: 422421 lb
SHEAR: 46756 lb

UPLIFT: -357819 lb
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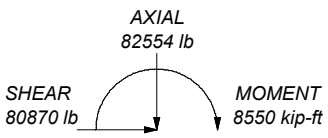
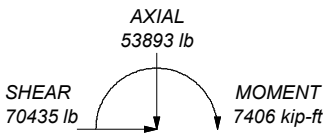


TORQUE 44 kip-ft
90 mph WIND - 0.500 in ICE



TORQUE 30 kip-ft
REACTIONS - 95 mph WIND

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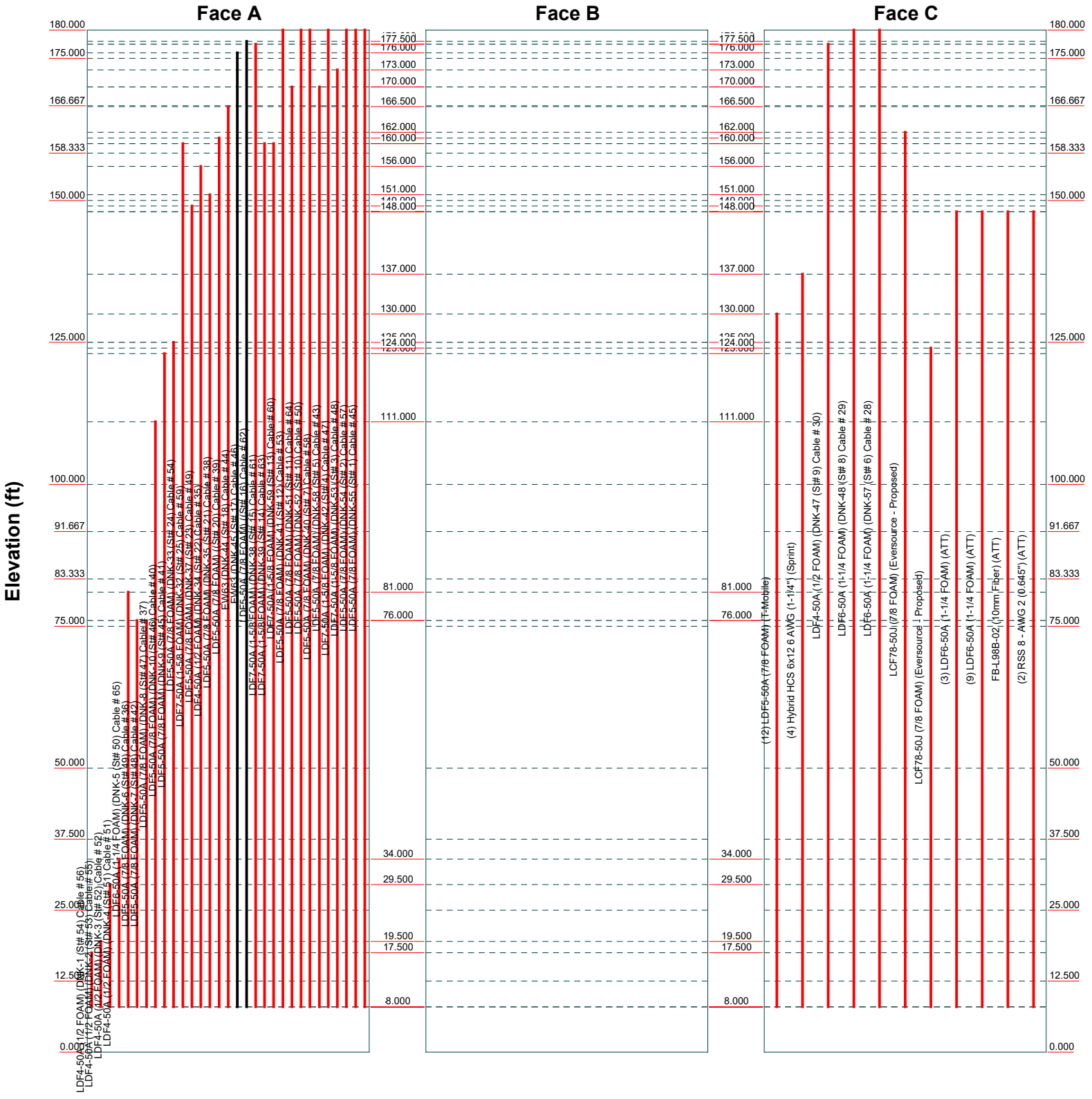
Job:	***Analysis - 180' Lattice Tower (CSP #36)***		
Project:	***Westbrook, Connecticut - S. Analysis - Rev.3 (b) w/ EVS Ec***		
Client:	Eversource / EVS-018 / DESPP/CSP	Drawn by: MCD	App'd:
Code:	TIA/EIA-222-F	Date: 07/31/20	Scale: NTS
Path:			Dwg No. E-1

Feed Line Distribution Chart
0' - 180'

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



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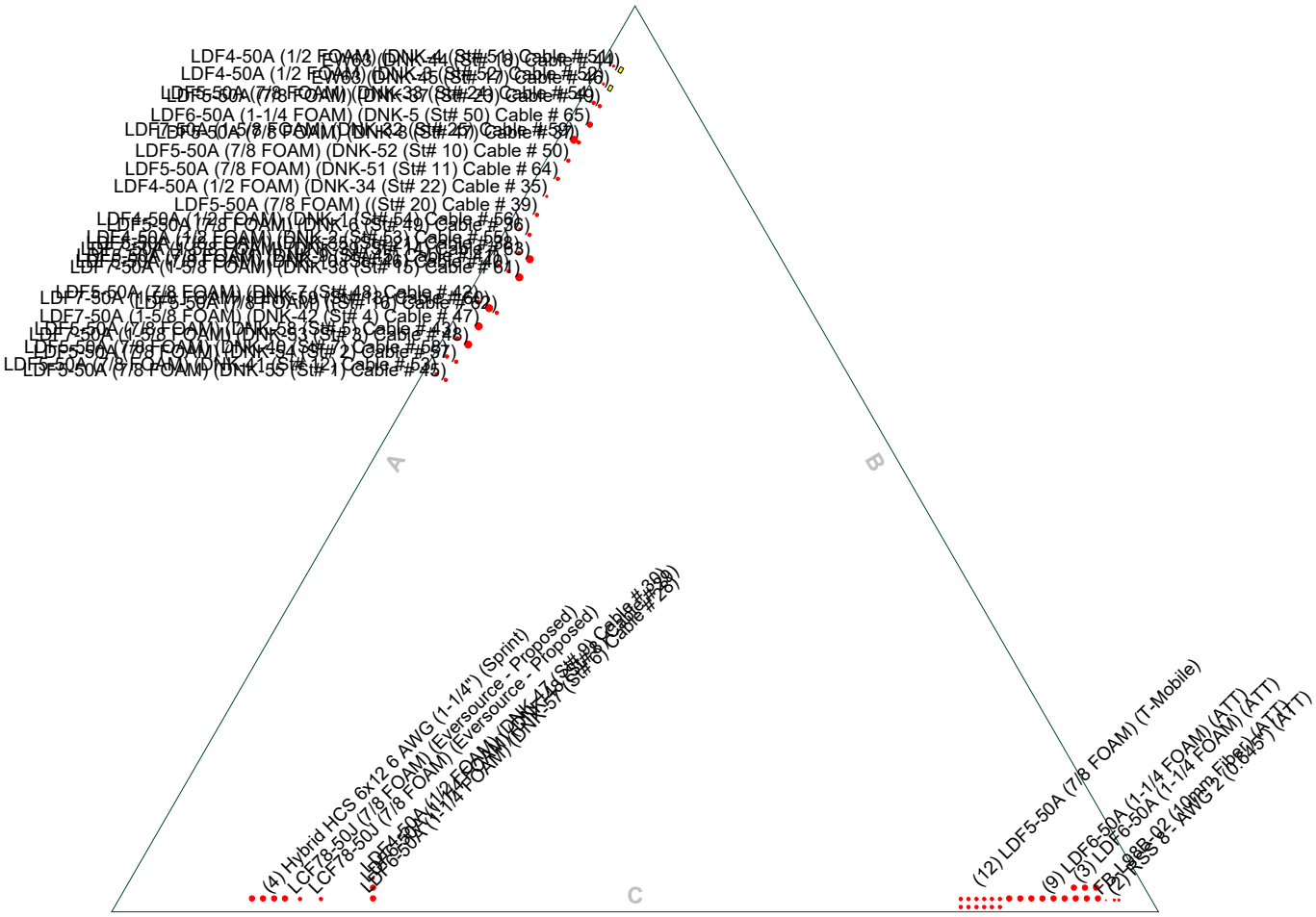
Job: ***Analysis - 180' Lattice Tower (CSP #36)***			
Project: ***Westbrook, Connecticut - S. Analysis - Rev.3 (b) w/ EVS Eq***			
Client: Eversource / EVS-018 / DESPP/CSP		Drawn by: MCD	App'd:
Code: TIA/EIA-222-F		Date: 07/31/20	Scale: NTS
Path:			Dwg No. E-7

Feed Line Plan

Round Flat App In Face App Out Face



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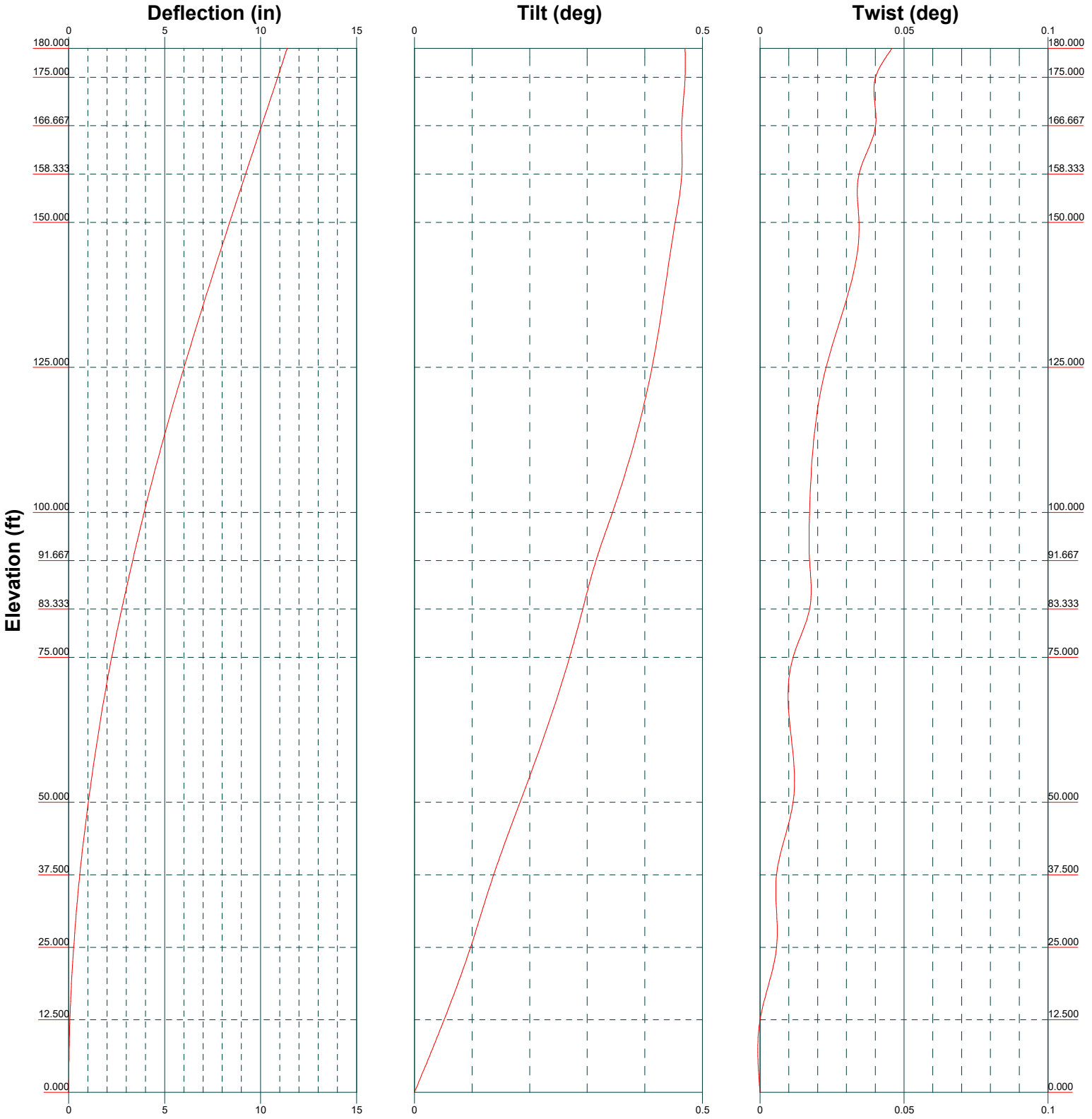
Project:	***Westbrook, Connecticut - S. Analysis - Rev.3 (b) w/ EVS Eq***		
Client: Eversource / EVS-018 / DESPP/CSP		Drawn by: MCD	App'd:
Code: TIA/EIA-222-F		Date: 07/31/20	Scale: NTS
Path:			Dwg No. E-7

TIA/EIA-222-F - Service - 90 mph

Maximum Values



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Phone: 860-263-5800
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Job: ***Analysis - 180' Lattice Tower (CSP #36)***			
Project: ***Westbrook, Connecticut - S. Analysis - Rev.3 (b) w/ EVS Eq***			
Client: Eversource / EVS-018 / DESPP/CSP	Drawn by: MCD	App'd:	
Code: TIA/EIA-222-F	Date: 07/31/20	Scale: NTS	
Path:		Dwg No. E-5	

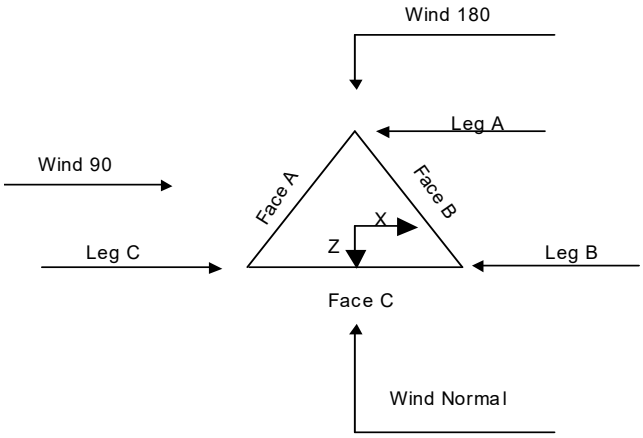
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 10.599 ft at the top and 25.000 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 95 mph.
Nominal ice thickness of 0.500 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Deflections calculated using a wind speed of 90 mph.
MODification Note: Tower Leg for 0'-25' is using factored (0.9) ratio of combined stress based on average of individual members (60ksi leg & 46 ksi tube) to apply 50 ksi at legs at this region..
Previous MODification note: Top Girt Horizontals @ 12.5' & 37.5' were previous MODifications from Project SAI-063 (06/2011) and considered constructed..
Appurtenance Reference # based on Tower Inventory/Mapping Report from Stainless Inc..
Carrier Centerlines (AT&T/T-Mobile/Sprint) are based on Carrier RFDS Centerlines from previously obtained information listed in Section 1 of this S.A. report..
UPDATE!! - 06/09/2020 - Removal of (3) Wind-Load Dishes per CSP request..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.000-175.000			10.599	1	5.000
T2	175.000-166.667			11.000	1	8.333
T3	166.667-158.333			11.667	1	8.333
T4	158.333-150.000			12.333	1	8.333
T5	150.000-125.000			13.000	1	25.000
T6	125.000-100.000			15.000	1	25.000
T7	100.000-91.667			17.000	1	8.333
T8	91.667-83.333			17.667	1	8.333
T9	83.333-75.000			18.333	1	8.333
T10	75.000-50.000			19.000	1	25.000
T11	50.000-37.500			21.000	1	12.500
T12	37.500-25.000			22.000	1	12.500
T13	25.000-12.500			23.000	1	12.500
T14	12.500-0.000			24.000	1	12.500

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	180.000-175.000	5.000	K Brace Down	No	Yes	0.000	0.000

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
T2	175.000-166.667	8.333	K Brace Down	No	Yes	0.000	0.000
T3	166.667-158.333	8.333	K Brace Down	No	Yes	0.000	0.000
T4	158.333-150.000	8.333	K Brace Down	No	Yes	0.000	0.000
T5	150.000-125.000	8.333	K1 Down	No	Yes	0.000	0.000
T6	125.000-100.000	8.333	K1 Down	No	Yes	0.000	0.000
T7	100.000-91.667	8.333	K1 Down	No	Yes	0.000	0.000
T8	91.667-83.333	8.333	K1 Down	No	Yes	0.000	0.000
T9	83.333-75.000	8.333	K1 Down	No	Yes	0.000	0.000
T10	75.000-50.000	12.500	K1 Down	No	Yes	0.000	0.000
T11	50.000-37.500	12.500	K1 Down	No	Yes	0.000	0.000
T12	37.500-25.000	12.500	K1 Down	No	Yes	0.000	0.000
T13	25.000-12.500	12.500	K1 Down	No	Yes	0.000	0.000
T14	12.500-0.000	12.500	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-175.000	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 175.000-166.667	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 166.667-158.333	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 158.333-150.000	Pipe	Stainless P5x0.250	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T5 150.000-125.000	Pipe	Stainless P5x0.300	A513-50 (50 ksi)	Double Angle	2L2 1/2x2x5/16x3/8	A36 (36 ksi)
T6 125.000-100.000	Pipe	Stainless P5x0.400	A513-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T7 100.000-91.667	Pipe	Stainless P5x0.500	A513-50 (50 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T8 91.667-83.333	Arbitrary Shape	1/3 Pipe w/ 5"x0.5 Stainless	A500-42 (42 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T9 83.333-75.000	Arbitrary Shape	1/3 Pipe w/ 5"x0.5 Stainless	A500-42 (42 ksi)	Double Angle	2L3x2 1/2x1/4x3/8	A36 (36 ksi)
T10 75.000-50.000	Pipe	Stainless P6.875x0.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T11 50.000-37.500	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3x5/16x3/8	A36 (36 ksi)
T12 37.500-25.000	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)
T13 25.000-12.500	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (50 ksi)
T14 12.500-0.000	Pipe	Stainless P6.875x0.500	A572-60 (60 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A529-50 (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 180.000-175.000	Single Angle	L3x3x1/4	A36 (36 ksi)	Pipe		A36 (36 ksi)
T3 166.667-158.333	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Pipe		A36 (36 ksi)
T4 158.333-150.000	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Pipe		A36 (36 ksi)
T12 37.500-25.000	Double Equal Angle	2L4x4x1/4	A36 (36 ksi)	Pipe		A36 (36 ksi)
T14 12.500-0.000	Double Equal Angle	2L4x4x5/16	A36 (36 ksi)	Pipe		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
T1 180.000-175.000	None	Pipe		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T2 175.000-166.667	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 166.667-158.333	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 158.333-150.000	None	Pipe		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 150.000-125.000	None	Pipe		A36 (36 ksi)	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)
T6 125.000-100.000	None	Pipe		A36 (36 ksi)	Single Angle	L3x3x5/16	A36 (36 ksi)
T7 100.000-91.667	None	Pipe		A36 (36 ksi)	Double Equal Angle	2L3x3x1/4	A36 (36 ksi)
T8 91.667-83.333	None	Pipe		A36 (36 ksi)	Double Angle	2L3x3x1/4	A36 (36 ksi)
T9 83.333-75.000	None	Pipe		A36 (36 ksi)	Double Angle	2L3x3x1/4	A36 (36 ksi)
T10 75.000-50.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T11 50.000-37.500	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T12 37.500-25.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T13 25.000-12.500	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x3/8	A529-50 (50 ksi)
T14 12.500-0.000	None	Pipe		A36 (36 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T5 150.000-125.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 125.000-100.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 100.000-91.667	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 91.667-83.333	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 83.333-75.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T10 75.000-50.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T11 50.000-37.500	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T12 37.500-25.000	Solid Round		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T13 25.000-12.500	Solid Round		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T14 12.500-0.000	Solid Round		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T5 150.000-125.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T6 125.000-100.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T7 100.000-91.667	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T8 91.667-83.333	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T9 83.333-75.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1
T10 75.000-50.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T11 50.000-37.500	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T12 37.500-25.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T13 25.000-12.500	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T14 12.500-0.000	A36 (36 ksi)	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
		Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.000-175.000	0.000	0.000	A36 (36 ksi)	1	1	1	29.736	Third-Pt	Third-Pt
T2 175.000-166.667	0.000	0.000	A36 (36 ksi)	1	1	1	40.696	Third-Pt	Third-Pt
T3 166.667-158.333	0.000	0.000	A36 (36 ksi)	1	1	1	41.476	Third-Pt	Third-Pt
T4 158.333-150.000	0.000	0.000	A36 (36 ksi)	1	1	1	42.280	Third-Pt	Third-Pt
T5 150.000-125.000	0.000	0.000	A36 (36 ksi)	1	1	1	33.639	Third-Pt	Third-Pt
T6 125.000-100.000	0.000	0.000	A36 (36 ksi)	1	1	1	47.620	Third-Pt	Third-Pt
T7 100.000-91.667	0.000	0.000	A36 (36 ksi)	1	1	1	48.580	Third-Pt	Third-Pt
T8 91.667-83.333	0.000	0.000	A36 (36 ksi)	1	1	1	37.170	Third-Pt	Third-Pt
T9 83.333-75.000	0.000	0.000	A36 (36 ksi)	1	1	1	37.917	Third-Pt	Third-Pt
T10 75.000-50.000	0.000	0.000	A36 (36 ksi)	1	1	1	65.308	Third-Pt	Third-Pt
T11 50.000-37.500	0.000	0.000	A36 (36 ksi)	1	1	1	24.980	Third-Pt	Third-Pt
T12 37.500-25.000	0.000	0.000	A36 (36 ksi)	1	1	1	67.952	Third-Pt	Third-Pt
T13 25.000-12.500	0.000	0.000	A36 (36 ksi)	1	1	1	51.990	Third-Pt	Third-Pt
T14 12.500-0.000	0.000	0.000	A36 (36 ksi)	1	1	1	53.040	Mid-Pt	Third-Pt

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 180.000-175.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 175.000-166.667	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 166.667-158.333	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 158.333-150.0	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
00															
T5	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
150.000-125.0				1	1	1	1	1	1	1	1	1	1	1	1
00															
T6	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
125.000-100.0				1	1	1	1	1	1	1	1	1	1	1	1
00															
T7	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
100.000-91.66				1	1	1	1	1	1	1	1	1	1	1	1
7															
T8	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
91.667-83.333				1	1	1	1	1	1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
83.333-75.000				1	1	1	1	1	1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
75.000-50.000				1	1	1	1	1	1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
50.000-37.500				1	1	1	1	1	1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
37.500-25.000				1	1	1	1	1	1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
25.000-12.500				1	1	1	1	1	1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1
12.500-0.000				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
180.000-175.0														
00														
T2	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
175.000-166.6														
67														
T3	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
166.667-158.3														
33														
T4	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
158.333-150.0														
00														
T5	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
150.000-125.0														
00														
T6	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
125.000-100.0														
00														

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
T7 100.000-91.667	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 91.667-83.333	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 83.333-75.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 75.000-50.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 50.000-37.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T12 37.500-25.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 25.000-12.500	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 12.500-0.000	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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 180.000-175.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T2 175.000-166.667	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T3 166.667-158.333	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T4 158.333-150.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325X	2	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T5 150.000-125.000	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T6 125.000-100.000	Flange	0.750 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T7 100.000-91.667	Flange	1.000 A325X	6	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T8 91.667-83.333	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T9 83.333-75.000	Flange	0.750 A325X	0	0.750 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T10 75.000-50.000	Flange	1.000 A325X	8	0.750 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T11 50.000-37.500	Flange	1.000 A325X	8	1.000 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T12 37.500-25.000	Flange	1.000 A325X	0	1.000 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T13 25.000-12.500	Flange	1.000 A325X	8	1.000 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0
T14 12.500-0.000	Flange	1.000 A325X	0	1.000 A325X	1	0.625 A325X	2	0.000 A325N	0	0.625 A325N	0	0.625 A325X	2	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
* Stainless Inc. Tower Mapping (12/11/2019)													
LDF4-50A (1/2 FOAM) (DNK-1 (St# 54) Cable # 56)	A	Yes	No	Ar (CfAe)	17.500 - 8.000	-3.000	0.26	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-2 (St# 53) Cable # 55)	A	Yes	No	Ar (CfAe)	19.500 - 8.000	-3.000	0.24	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-3 (St# 52) Cable # 52)	A	Yes	No	Ar (CfAe)	29.500 - 8.000	-3.000	0.42	1	1	0.630	0.630		0.150
LDF4-50A (1/2 FOAM) (DNK-4 (St# 51) Cable # 51)	A	Yes	No	Ar (CfAe)	34.000 - 8.000	-3.000	0.44	1	1	0.630	0.630		0.150
LDF6-50A (1-1/4 FOAM) (DNK-5 (St# 50) Cable # 65)	A	Yes	No	Ar (CfAe)	81.000 - 8.000	-5.000	0.38	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-6 (St# 49) Cable # 36)	A	Yes	No	Ar (CfAe)	76.000 - 8.000	-6.000	0.26	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-7 (St# 48) Cable # 42)	A	Yes	No	Ar (CfAe)	76.000 - 8.000	-3.000	0.18	1	1	1.090	1.090		0.330

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
LDF5-50A (7/8 FOAM) (DNK-8 (St# 47) Cable # 37)	A	Yes	No	Ar (CfAe)	111.000 - 8.000	-5.000	0.36	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-10 (St# 46) Cable # 40)	A	Yes	No	Ar (CfAe)	123.000 - 8.000	-6.000	0.22	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-9 (St# 45) Cable # 41) * TMW Proposed 5-1-2019	A	Yes	No	Ar (CfAe)	125.000 - 8.000	-3.000	0.22	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (T-Mobile) * TMW Proposed 5-1-2019 * Sprint	C	Yes	No	Ar (CfAe)	130.000 - 8.000	-3.000	-0.33	12	6	1.090	1.090		0.330
Hybrid HCS 6x12 6 AWG (1-1/4") (Sprint) * Sprint *AT&T *AT&T * Stainless Inc. Tower Mapping (12/11/2019)	C	Yes	No	Ar (CfAe)	137.000 - 8.000	-3.000	0.35	4	4	1.540	1.540		1.700
LDF5-50A (7/8 FOAM) (DNK-33 (St# 24) Cable # 54)	A	Yes	No	Ar (CfAe)	160.000 - 8.000	-3.000	0.4	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-32 (St# 25) Cable # 59)	A	Yes	No	Ar (CfAe)	149.000 - 8.000	-3.000	0.36	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-37 (St# 23) Cable # 49)	A	Yes	No	Ar (CfAe)	156.000 - 8.000	-5.000	0.4	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM) (DNK-34 (St# 22) Cable # 35)	A	Yes	No	Ar (CfAe)	151.000 - 8.000	-5.000	0.3	1	1	0.630	0.630		0.150
LDF5-50A (7/8 FOAM) (DNK-35 (St# 21) Cable #	A	Yes	No	Ar (CfAe)	161.000 - 8.000	-6.000	0.24	1	1	1.090	1.090		0.330

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
38)													
LDF5-50A (7/8 FOAM) ((St# 20) Cable # 39)	A	Yes	No	Ar (CfAe)	166.500 - 8.000	-5.000	0.28	1	1	1.090	1.090		0.330
EW63 (DNK-44 (St# 18) Cable # 44)	A	Yes	No	Af (CfAe)	176.000 - 8.000	-5.000	0.44	1	1	1.574	1.574	5.067	0.510
EW63 (DNK-45 (St# 17) Cable # 46)	A	Yes	No	Af (CfAe)	178.000 - 8.000	-5.000	0.42	1	1	1.574	1.574	5.067	0.510
LDF5-50A (7/8 FOAM) ((St# 16) Cable # 62)	A	Yes	No	Ar (CfAe)	177.500 - 8.000	-9.000	0.18	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-38 (St# 15) Cable # 61)	A	Yes	No	Ar (CfAe)	160.000 - 8.000	-9.000	0.22	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-39 (St# 14) Cable # 63)	A	Yes	No	Ar (CfAe)	160.000 - 8.000	-9.000	0.24	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-59 (St# 13) Cable # 60)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-6.000	0.18	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-41 (St# 12) Cable # 53)	A	Yes	No	Ar (CfAe)	170.000 - 8.000	-3.000	0.1	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-51 (St# 11) Cable # 64)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-5.000	0.32	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-52 (St# 10) Cable # 50)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-5.000	0.34	1	1	1.090	1.090		0.330
LDF4-50A (1/2 FOAM) (DNK-47 (St# 9) Cable # 30)	C	Yes	No	Ar (CfAe)	177.500 - 8.000	-9.000	0.25	1	1	0.630	0.630		0.150
LDF6-50A (1-1/4 FOAM) (DNK-48 (St# 8) Cable # 29)	C	Yes	No	Ar (CfAe)	180.000 - 8.000	-6.000	0.25	1	1	1.550	1.550		0.660
LDF5-50A (7/8 FOAM) (DNK-40 (St# 7) Cable # 58)	A	Yes	No	Ar (CfAe)	170.000 - 8.000	-3.000	0.12	1	1	1.090	1.090		0.330
LDF6-50A	C	Yes	No	Ar (CfAe)	180.000 -	-3.000	0.25	1	1	1.550	1.550		0.660

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
(1-1/4 FOAM) (DNK-57 (St# 6) Cable # 28)					8.000								
LDF5-50A (7/8 FOAM) (DNK-58 (St# 5) Cable # 43)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-3.000	0.14	1	1	1.090	1.090		0.330
LDF7-50A (1-5/8 FOAM) (DNK-42 (St# 4) Cable # 47)	A	Yes	No	Ar (CfAe)	173.000 - 8.000	-6.000	0.16	1	1	1.980	1.980		0.820
LDF7-50A (1-5/8 FOAM) (DNK-53 (St# 3) Cable # 48)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-6.000	0.14	1	1	1.980	1.980		0.820
LDF5-50A (7/8 FOAM) (DNK-54 (St# 2) Cable # 57)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-6.000	0.12	1	1	1.090	1.090		0.330
LDF5-50A (7/8 FOAM) (DNK-55 (St# 1) Cable # 45) * Stainless Inc. Tower Mapping (12/11/2019) * Eversource Proposed (4/20/2020)	A	Yes	No	Ar (CfAe)	180.000 - 8.000	-6.000	0.1	1	1	1.090	1.090		0.330
LCF78-50J (7/8 FOAM) (Eversource - Proposed)	C	Yes	No	Ar (CfAe)	162.000 - 8.000	-3.000	0.32	1	1	1.100	1.100		0.530
LCF78-50J (7/8 FOAM) (Eversource - Proposed) *AT&T	C	Yes	No	Ar (CfAe)	124.000 - 8.000	-3.000	0.3	1	1	1.100	1.100		0.530
LDF6-50A (1-1/4 FOAM) (ATT)	C	Yes	No	Ar (CfAe)	148.000 - 8.000	-6.000	-0.43	3	3	1.550	1.550		0.660
LDF6-50A (1-1/4 FOAM) (ATT)	C	Yes	No	Ar (CfAe)	148.000 - 8.000	-3.000	-0.4	9	9	1.550	1.550		0.660
FB-L98B-02 (10mm Fiber) (ATT)	C	Yes	No	Ar (CfAe)	148.000 - 8.000	-3.000	-0.45	1	1	0.394	0.394		0.300
RSS 8 - AWG 2 (0.645") (ATT) *AT&T	C	Yes	No	Ar (CfAe)	148.000 - 8.000	-3.000	-0.46	2	2	0.645	0.645		0.300

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement* *ft*	*Total Number*	*C_AA_A* *ft^2/ft*	*Weight* *plf*
* TMW Proposed 5-1-2019								
* Sprint								
*AT&T								
* Stainless Inc. Tower Mapping (12/11/2019)								
*AT&T								

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* *lb*
T1	180.000-175.000	A	4.148	0.525	0.000	0.000	19.315
		B	0.000	0.000	0.000	0.000	0.000
		C	1.423	0.000	0.000	0.000	6.975
T2	175.000-166.667	A	8.942	2.186	0.000	0.000	46.060
		B	0.000	0.000	0.000	0.000	0.000
		C	2.590	0.000	0.000	0.000	12.250
T3	166.667-158.333	A	11.866	2.186	0.000	0.000	57.858
		B	0.000	0.000	0.000	0.000	0.000
		C	2.926	0.000	0.000	0.000	14.193
T4	158.333-150.000	A	15.799	2.186	0.000	0.000	75.047
		B	0.000	0.000	0.000	0.000	0.000
		C	3.354	0.000	0.000	0.000	16.667
T5	150.000-125.000	A	53.147	6.559	0.000	0.000	250.430
		B	0.000	0.000	0.000	0.000	0.000
		C	57.825	0.000	0.000	0.000	354.260
T6	125.000-100.000	A	58.672	6.559	0.000	0.000	270.720
		B	0.000	0.000	0.000	0.000	0.000
		C	80.979	0.000	0.000	0.000	552.220
T7	100.000-91.667	A	20.042	2.186	0.000	0.000	92.000
		B	0.000	0.000	0.000	0.000	0.000
		C	27.023	0.000	0.000	0.000	184.250
T8	91.667-83.333	A	20.042	2.186	0.000	0.000	92.000
		B	0.000	0.000	0.000	0.000	0.000
		C	27.023	0.000	0.000	0.000	184.250
T9	83.333-75.000	A	20.998	2.186	0.000	0.000	96.620
		B	0.000	0.000	0.000	0.000	0.000
		C	27.023	0.000	0.000	0.000	184.250
T10	75.000-50.000	A	67.896	6.559	0.000	0.000	309.000
		B	0.000	0.000	0.000	0.000	0.000
		C	81.070	0.000	0.000	0.000	552.750
T11	50.000-37.500	A	33.948	3.280	0.000	0.000	154.500
		B	0.000	0.000	0.000	0.000	0.000
		C	40.535	0.000	0.000	0.000	276.375
T12	37.500-25.000	A	34.657	3.280	0.000	0.000	156.525
		B	0.000	0.000	0.000	0.000	0.000
		C	40.535	0.000	0.000	0.000	276.375
T13	25.000-12.500	A	35.890	3.280	0.000	0.000	160.050
		B	0.000	0.000	0.000	0.000	0.000
		C	40.535	0.000	0.000	0.000	276.375
T14	12.500-0.000	A	13.166	1.181	0.000	0.000	58.320

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 lb
		B	0.000	0.000	0.000	0.000	0.000
		C	14.593	0.000	0.000	0.000	99.495

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 lb
T1	180.000-175.000	A	0.500	7.273	0.747	0.000	0.000	66.587
		B		0.000	0.000	0.000	0.000	0.000
		C		2.465	0.000	0.000	0.000	21.223
T2	175.000-166.667	A	0.500	15.581	3.112	0.000	0.000	158.497
		B		0.000	0.000	0.000	0.000	0.000
		C		4.674	0.000	0.000	0.000	38.874
T3	166.667-158.333	A	0.500	20.824	3.112	0.000	0.000	200.228
		B		0.000	0.000	0.000	0.000	0.000
		C		5.315	0.000	0.000	0.000	44.401
T4	158.333-150.000	A	0.500	27.493	3.112	0.000	0.000	256.275
		B		0.000	0.000	0.000	0.000	0.000
		C		6.132	0.000	0.000	0.000	51.435
T5	150.000-125.000	A	0.500	92.647	9.337	0.000	0.000	852.458
		B		0.000	0.000	0.000	0.000	0.000
		C		98.255	2.472	0.000	0.000	966.987
T6	125.000-100.000	A	0.500	103.172	9.337	0.000	0.000	931.568
		B		0.000	0.000	0.000	0.000	0.000
		C		139.968	2.688	0.000	0.000	1520.252
T7	100.000-91.667	A	0.500	35.319	3.112	0.000	0.000	317.463
		B		0.000	0.000	0.000	0.000	0.000
		C		46.714	0.896	0.000	0.000	507.253
T8	91.667-83.333	A	0.500	35.319	3.112	0.000	0.000	317.463
		B		0.000	0.000	0.000	0.000	0.000
		C		46.714	0.896	0.000	0.000	507.253
T9	83.333-75.000	A	0.500	36.943	3.112	0.000	0.000	331.539
		B		0.000	0.000	0.000	0.000	0.000
		C		46.714	0.896	0.000	0.000	507.253
T10	75.000-50.000	A	0.500	119.979	9.337	0.000	0.000	1065.259
		B		0.000	0.000	0.000	0.000	0.000
		C		140.143	2.688	0.000	0.000	1521.760
T11	50.000-37.500	A	0.500	59.990	4.668	0.000	0.000	532.630
		B		0.000	0.000	0.000	0.000	0.000
		C		70.072	1.344	0.000	0.000	760.880
T12	37.500-25.000	A	0.500	61.823	4.668	0.000	0.000	543.973
		B		0.000	0.000	0.000	0.000	0.000
		C		70.072	1.344	0.000	0.000	760.880
T13	25.000-12.500	A	0.500	65.015	4.668	0.000	0.000	563.720
		B		0.000	0.000	0.000	0.000	0.000
		C		70.072	1.344	0.000	0.000	760.880
T14	12.500-0.000	A	0.500	24.041	1.681	0.000	0.000	206.872
		B		0.000	0.000	0.000	0.000	0.000
		C		25.226	0.484	0.000	0.000	273.917

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	180.000-175.000	A	0.000	0.319	0.497	0.864
		B	0.000	0.000	0.000	0.000
		C	0.000	0.097	0.151	0.262
T2	175.000-166.667	A	0.000	0.525	0.763	1.314
		B	0.000	0.000	0.000	0.000
		C	0.000	0.128	0.178	0.321
T3	166.667-158.333	A	0.000	0.654	0.942	1.635
		B	0.000	0.000	0.000	0.000
		C	0.000	0.142	0.196	0.356
T4	158.333-150.000	A	0.000	0.816	1.181	2.039
		B	0.000	0.000	0.000	0.000
		C	0.000	0.161	0.220	0.402
T5	150.000-125.000	A	0.000	5.337	7.220	12.500
		B	0.000	0.000	0.000	0.000
		C	0.000	5.200	6.992	12.180
T6	125.000-100.000	A	0.000	5.610	8.011	13.987
		B	0.000	0.000	0.000	0.000
		C	0.000	7.026	9.944	17.519
T7	100.000-91.667	A	0.000	1.868	2.663	4.660
		B	0.000	0.000	0.000	0.000
		C	0.000	2.287	3.238	5.704
T8	91.667-83.333	A	0.000	1.848	2.635	4.611
		B	0.000	0.000	0.000	0.000
		C	0.000	2.262	3.203	5.644
T9	83.333-75.000	A	0.000	1.906	2.722	4.757
		B	0.000	0.000	0.000	0.000
		C	0.000	2.240	3.172	5.589
T10	75.000-50.000	A	0.000	4.582	8.053	14.138
		B	0.000	0.000	0.000	0.000
		C	0.000	5.008	8.769	15.449
T11	50.000-37.500	A	0.000	2.228	3.921	6.883
		B	0.000	0.000	0.000	0.000
		C	0.000	2.435	4.269	7.521
T12	37.500-25.000	A	0.000	2.253	3.934	6.967
		B	0.000	0.000	0.000	0.000
		C	0.000	2.395	4.203	7.406
T13	25.000-12.500	A	0.000	2.326	4.005	7.196
		B	0.000	0.000	0.000	0.000
		C	0.000	2.360	4.144	7.302
T14	12.500-0.000	A	0.000	0.847	1.448	2.622
		B	0.000	0.000	0.000	0.000
		C	0.000	0.838	1.473	2.595

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.000-175.000	-4.267	-6.058	-6.085	-8.214
T2	175.000-166.667	-6.873	-12.513	-9.770	-15.963
T3	166.667-158.333	-8.870	-16.324	-12.650	-21.198
T4	158.333-150.000	-10.712	-22.474	-15.146	-29.310
T5	150.000-125.000	5.683	-4.523	6.068	-5.641
T6	125.000-100.000	6.279	-0.591	7.004	-0.705
T7	100.000-91.667	6.334	-1.092	7.131	-1.391
T8	91.667-83.333	5.814	-1.024	6.826	-1.354
T9	83.333-75.000	5.749	-2.127	6.753	-2.722

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T10	75.000-50.000	5.934	-3.940	6.817	-5.164
T11	50.000-37.500	6.066	-4.081	7.009	-5.384
T12	37.500-25.000	6.115	-4.924	7.061	-6.968
T13	25.000-12.500	6.012	-6.142	6.815	-9.279
T14	12.500-0.000	2.575	-3.037	3.055	-5.000

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 lb
* Stainless Inc. Tower Mapping (12/11/2019)									
3' Yagi (DNK-1 (St# 54))	A	From Leg	4.000 0.000 0.000	0.0000	17.500	No Ice 1/2" Ice	2.083 3.787	2.083 3.787	30.950 52.866
1.5" Dia 3' Omni (DNK-2 (St# 53))	A	From Leg	4.000 0.000 0.000	0.0000	19.500	No Ice 1/2" Ice	0.944 1.393	0.944 1.393	22.300 32.810
4' Side Mount Standoff (1) (DNK 1,2 (St# 53,54))	A	From Leg	0.000 0.000 0.000	0.0000	18.000	No Ice 1/2" Ice	2.720 4.910	2.720 4.910	50.000 89.000
1.5" Dia 3' Omni (inverted) (DNK-3 (St# 52))	A	From Leg	4.000 0.000 0.000	0.0000	29.500	No Ice 1/2" Ice	0.944 1.393	0.944 1.393	22.300 32.810
1.5" Dia 3' Omni (DNK-4 (St# 51))	A	From Leg	4.000 0.000 0.000	0.0000	27.000 - 34.000	No Ice 1/2" Ice	0.944 1.393	0.944 1.393	22.300 32.810
4' Side Mount Standoff (1) (DNK-3,4 (St# 51,52))	A	From Leg	0.000 0.000 0.000	0.0000	26.000	No Ice 1/2" Ice	2.720 4.910	2.720 4.910	50.000 89.000
GPS (DNK-5 (St# 50))	C	From Leg	1.000 0.000 0.000	0.0000	81.000	No Ice 1/2" Ice	1.000 1.500	1.000 1.500	10.000 15.000
1' Side Arm (DNK-5 (St# 50))	C	From Leg	0.000 0.000 0.000	0.0000	81.000	No Ice 1/2" Ice	2.500 3.363	2.500 3.363	55.000 73.000
3' Yagi (DNK-6 (St# 49))	A	From Leg	1.000 0.000 -1.000	0.0000	81.000	No Ice 1/2" Ice	2.083 3.787	2.083 3.787	30.950 52.866
20' 4-Bay Dipole (DNK-7 (St# 48))	A	From Leg	0.000 0.000 1.000	0.0000	89.500	No Ice 1/2" Ice	4.000 6.000	4.000 6.000	55.000 100.000
1' Side Arm (DNK-6,7 (St# 48,49))	A	From Leg	0.500 0.000 0.000	0.0000	82.500	No Ice 1/2" Ice	2.500 3.363	2.500 3.363	55.000 73.000
1' Side Arm (Un-used Mount)	A	From Leg	0.000 0.000 0.000	0.0000	102.000	No Ice 1/2" Ice	2.500 3.363	2.500 3.363	55.000 73.000
19.5"x19.5" Panel Antenna (DNK-10 (St# 46))	C	From Leg	1.500 0.000 0.000	0.0000	123.000	No Ice 1/2" Ice	1.200 1.337	0.131 0.208	10.000 16.287

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 lb
1' Side Arm	C	From Leg	0.500	0.0000	123.000	No Ice	2.500	2.500	55.000
(DNK-10 (St# 46))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000						
2' Sidearm	B	From Leg	0.000	0.0000	111.000	No Ice	3.900	3.900	87.000
(DNK-8 (St# 47))			0.000			1/2" Ice	4.400	4.400	97.000
			0.000						
Decibel DB210-C Dipole	A	From Leg	1.500	0.0000	125.000	No Ice	0.800	0.800	5.500
(Single)			0.000			1/2" Ice	1.440	1.440	7.150
(DNK-9 (St# 45))			0.000						
1' Side Arm	A	From Leg	0.500	0.0000	125.000	No Ice	2.500	2.500	55.000
(DNK-9 (St# 45))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000						
* Stainless Inc. Tower Mapping (12/11/2019)									
* T-Mobile Equipment (Reverted - see below)									
* T-Mobile Equipment (Reverted - see below)									
* Sprint Inventory (moved below)									
* Sprint Inventory (moved below)									
* AT&T Carrier Antennas @ 148' (moved below)									
* AT&T Carrier Antennas @ 148' (moved below)									
* Stainless Inc. Tower Mapping (12/11/2019)									
2" Dia 14' Omni (inverted)	C	From Leg	3.000	0.0000	149.000	No Ice	2.000	2.000	10.000
(DNK-32 (St# 25))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000						
Pirod 4' Side Mount Standoff	C	From Leg	0.000	0.0000	156.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(DNK-32, 33 (St# 24,25))			0.000						
3" Dia 9' Omni	C	From Leg	1.000	0.0000	160.000	No Ice	4.000	4.000	55.000
(DNK-33 (St# 24))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000						
1' Side Arm	A	From Leg	0.000	0.0000	156.000	No Ice	2.500	2.500	55.000
(DNK-37 (St# 23))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000						
1 Bay Dipole ANT400D	A	From Leg	0.000	0.0000	151.000	No Ice	1.879	0.518	13.300
(DNK-34 (St# 22))			0.000			1/2" Ice	2.093	0.742	27.514
			0.000						
10'6"x4" Pipe Mount	A	From Leg	0.000	0.0000	156.000	No Ice	4.725	4.725	114.000
(DNK-34 (St# 22))			0.000			1/2" Ice	5.615	5.615	146.840
			0.000						
ANT450F6	A	From Leg	0.000	0.0000	161.000	No Ice	1.900	1.900	8.000
(DNK-35 (St# 21))			0.000			1/2" Ice	2.728	2.728	22.340
			0.000						
2' Sidearm	A	From Leg	0.000	0.0000	157.000	No Ice	3.900	3.900	87.000
(DNK-35 (St# 21))			0.000			1/2" Ice	4.400	4.400	97.000
			0.000						
Telewave 150F2 Omni	B	From Leg	3.000	0.0000	166.500	No Ice	1.294	1.294	16.000
((St # 20))			0.000			1/2" Ice	1.598	1.598	26.284
			0.000						
Pirod 4' Side Mount Standoff	B	From Leg	0.000	0.0000	164.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000

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 lb
((St # 20))			0.000						
1' Side Arm	B	From Leg	0.000	0.0000	176.000	No Ice	2.500	2.500	55.000
(DNK-44 (St# 18))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000						
1' Side Arm	A	From Leg	0.000	0.0000	176.000	No Ice	2.500	2.500	55.000
(DNK-45 (St# 17))			0.000			1/2" Ice	3.363	3.363	73.000
			0.000						
11"x8"x12" Junction Box	A	From Face	0.000	0.0000	178.000	No Ice	0.856	1.283	25.000
((St# 16))			0.000			1/2" Ice	0.983	1.437	36.278
			0.000						
(Inverted) 3" Dia 20' Omni	C	From Leg	6.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-38 (St# 15))			-3.000			1/2" Ice	6.000	6.000	100.000
			0.000						
(Inverted) 3" Dia 20' Omni	C	From Leg	6.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-39 (St# 14))			3.000			1/2" Ice	6.000	6.000	100.000
			0.000						
Pirod 6' Side Mount Standoff	C	From Leg	0.000	0.0000	177.500	No Ice	4.970	4.970	70.000
(1)			0.000			1/2" Ice	6.120	6.120	130.000
(DNK-38,39 (St# 13,14,15,16))			0.000						
3" Dia 20' Omni	C	From Leg	6.000	0.0000	185.500	No Ice	4.000	4.000	55.000
(DNK-59 (St# 13))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000						
(inverted) 10' 8 Bay Di-Pole	C	From Face	4.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-41 (St# 12))			-6.000			1/2" Ice	6.000	6.000	100.000
			0.000						
1 Bay Dipole ANT400D	C	From Leg	1.000	0.0000	181.000	No Ice	1.879	0.518	13.300
(DNK-51 (St# 11))			0.000			1/2" Ice	2.093	0.742	27.514
			0.000						
2" Dia 10' Omni	C	From Leg	0.500	0.0000	186.000	No Ice	2.000	2.000	10.000
(DNK-52 (St# 10))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000						
432E-83I-01T TTA Unit	B	From Face	0.500	0.0000	177.500	No Ice	3.325	1.108	25.000
(DNK-47 (St# 9))			0.000			1/2" Ice	3.569	1.275	44.704
			0.000						
3" Dia 12' Omni	C	From Face	0.500	0.0000	185.500	No Ice	2.000	2.000	10.000
(DNK-48 (St# 8))			0.000			1/2" Ice	3.030	3.030	25.000
			0.000						
(inverted) 10' 8 Bay Di-Pole	C	From Face	4.000	0.0000	170.000	No Ice	4.000	4.000	55.000
(DNK-40 (St# 7))			6.000			1/2" Ice	6.000	6.000	100.000
			0.000						
3" Dia 20' Omni	A	From Leg	6.000	0.0000	185.500	No Ice	4.000	4.000	55.000
(DNK-57 (St# 6))			0.000			1/2" Ice	6.000	6.000	100.000
			0.000						
1" Dia 8' Omni	A	From Leg	2.000	0.0000	182.500	No Ice	2.000	2.000	5.000
(DNK-58 (St# 5))			0.000			1/2" Ice	3.030	3.030	18.000
			0.000						
6' Side-Arm(1)	B	From Leg	0.000	0.0000	177.500	No Ice	10.600	10.600	140.000
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000						
6' Side-Arm(1)	C	From Leg	0.000	0.0000	177.500	No Ice	10.600	10.600	140.000
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000						
6' Side-Arm(1)	C	From Face	0.000	-45.0000	177.500	No Ice	10.600	10.600	140.000
(Mts for St# 5-12 Antennas)			0.000			1/2" Ice	15.400	15.400	212.000
			0.000						
6' Side-Arm(1)	C	From Face	0.000	45.0000	177.500	No Ice	10.600	10.600	140.000

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 lb
(Mts for St# 5-12 Antennas)			0.000 0.000			1/2" Ice	15.400	15.400	212.000
(inverted) 2" Dia 10' Omni	A	From Face	4.000	0.0000	173.000	No Ice	2.000	2.000	10.000
(DNK-42 (St# 4))			0.000 0.000			1/2" Ice	3.030	3.030	25.000
2" Dia 10' Omni	A	From Leg	0.500	0.0000	185.000	No Ice	2.000	2.000	10.000
(DNK-53 (St# 3))			0.000 0.000			1/2" Ice	3.030	3.030	25.000
10' - 2 Bay Dipole	A	From Leg	0.500	0.0000	185.000	No Ice	1.408	1.408	10.000
(DNK-54 (St# 2))			0.000 0.000			1/2" Ice	1.556	1.556	27.727
20' 4-Bay Dipole	A	From Leg	0.500	0.0000	181.000	No Ice	4.000	4.000	55.000
(DNK-55 (St# 1))			0.000 0.000			1/2" Ice	6.000	6.000	100.000
Lightning Rod 2"x15'	A	From Leg	0.000	0.0000	200.000	No Ice	3.000	3.000	80.000
(DNK-56 (L.R.))			0.000 0.000			1/2" Ice	4.525	4.525	103.137
6' Side-Arm(1)	A	From Leg	0.000	0.0000	179.000	No Ice	10.600	10.600	140.000
(Mts for St# 4-1 Antennas)			0.000 0.000			1/2" Ice	15.400	15.400	212.000
6' Side-Arm(1)	B	From Face	0.000	45.0000	179.000	No Ice	10.600	10.600	140.000
(Mts for St# 4-1 Antennas)			0.000 0.000			1/2" Ice	15.400	15.400	212.000
* Everesource Proposed Eq (4/20/2020)									
Telewave ANT220F2 - Omni	C	From Leg	4.000	0.0000	162.000	No Ice	1.029	1.029	14.000
Antenna			0.000			1/2" Ice	1.290	1.290	22.796
(Eversource - Proposed)			0.000						
Sitepro1 USF-4U Mount	C	From Leg	0.000	0.0000	159.000	No Ice	2.483	5.145	165.000
Assembly (Ca = 1.4 assumed)			0.000			1/2" Ice	3.247	6.910	318.000
(Eversource - Proposed)			0.000						
Comprod 871F-70 Dipole	C	From Leg	1.000	0.0000	124.000	No Ice	1.700	0.468	13.000
(Eversource - Proposed)			0.000 0.000			1/2" Ice	1.894	0.672	26.826
Sitepro1 USF-4U Mount	C	From Leg	0.000	0.0000	121.000	No Ice	2.483	5.145	165.000
Assembly (Ca = 1.4 assumed)			0.000			1/2" Ice	3.247	6.910	318.000
(Eversource - Proposed)			0.000						
*** Reverted T-Mobile									
2' Sidearm	A	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	87.000
(T-Mobile DNK-11,12,13)			0.000 0.000			1/2" Ice	4.400	4.400	97.000
2' Sidearm	B	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	87.000
(T-Mobile DNK-11,12,13)			0.000 0.000			1/2" Ice	4.400	4.400	97.000
2' Sidearm	C	From Leg	0.500	0.0000	130.000	No Ice	3.900	3.900	87.000
(T-Mobile DNK-11,12,13)			0.000 0.000			1/2" Ice	4.400	4.400	97.000
(2) Ericsson TMA Unit	A	From Leg	1.000	0.0000	130.000	No Ice	0.591	0.591	19.473
(T-Mobile DNK-11,12,13)			0.000 0.000			1/2" Ice	0.698	0.761	28.287
(2) Ericsson TMA Unit	B	From Leg	1.000	0.0000	130.000	No Ice	0.591	0.591	19.473
(T-Mobile DNK-11,12,13)			0.000 0.000			1/2" Ice	0.698	0.761	28.287
(2) Ericsson TMA Unit	C	From Leg	1.000	0.0000	130.000	No Ice	0.591	0.591	19.473
(T-Mobile DNK-11,12,13)			0.000 0.000			1/2" Ice	0.698	0.761	28.287
Commscope	B	From Leg	4.000	0.0000	130.000	No Ice	5.277	3.840	76.090

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 lb
DBXNH-6565A-A2M Panel			1.000			1/2" Ice	5.686	4.430	119.812
(T-Mobile DNK-11,12,13)			0.000						
Commscope	B	From Leg	4.000	0.0000	130.000	No Ice	5.277	3.840	76.090
DBXNH-6565A-A2M Panel			-1.000			1/2" Ice	5.686	4.430	119.812
(T-Mobile DNK-11,12,13)			0.000						
Commscope	C	From Leg	4.000	0.0000	130.000	No Ice	5.277	3.840	76.090
DBXNH-6565A-A2M Panel			1.000			1/2" Ice	5.686	4.430	119.812
(T-Mobile DNK-11,12,13)			0.000						
*** Reverted T-Mobile									
*** Sprint (after ASM-009)									
@ 137'									
Pirod 12' PCS T-Frame (1)	A	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	565.000
104569			0.000			1/2" Ice	18.973	10.444	588.000
(Sprint)			0.000						
Pirod 12' PCS T-Frame (1)	B	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	565.000
104569			0.000			1/2" Ice	18.973	10.444	588.000
(Sprint)			0.000						
Pirod 12' PCS T-Frame (1)	C	From Leg	0.000	0.0000	137.000	No Ice	12.293	7.486	565.000
104569			0.000			1/2" Ice	18.973	10.444	588.000
(Sprint)			0.000						
APXVTM14-C-120 Panel	A	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	72.000
Antenna			-3.500			1/2" Ice	6.716	3.967	111.526
(Sprint)			0.000						
APXVTM14-C-120 Panel	B	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	72.000
Antenna			-3.500			1/2" Ice	6.716	3.967	111.526
(Sprint)			0.000						
APXVTM14-C-120 Panel	C	From Leg	3.000	0.0000	137.000	No Ice	6.342	3.607	72.000
Antenna			-3.500			1/2" Ice	6.716	3.967	111.526
(Sprint)			0.000						
NNVV-65B-R4 Panel	A	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	85.000
Antenna			3.500			1/2" Ice	12.766	6.207	157.141
(Sprint)			0.000						
NNVV-65B-R4 Panel	B	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	85.000
Antenna			3.500			1/2" Ice	12.766	6.207	157.141
(Sprint)			0.000						
NNVV-65B-R4 Panel	C	From Leg	3.000	0.0000	137.000	No Ice	12.271	5.750	85.000
Antenna			3.500			1/2" Ice	12.766	6.207	157.141
(Sprint)			0.000						
ALU TD-RRH-8x20-25	A	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	76.200
(Sprint)			3.500			1/2" Ice	4.281	1.705	103.251
			0.000						
ALU TD-RRH-8x20-25	B	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	76.200
(Sprint)			3.500			1/2" Ice	4.281	1.705	103.251
			0.000						
ALU TD-RRH-8x20-25	C	From Leg	3.000	0.0000	137.000	No Ice	4.030	1.526	76.200
(Sprint)			3.500			1/2" Ice	4.281	1.705	103.251
			0.000						
(2) ALU 800MHz 2x50W	A	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	64.000
(Sprint)			3.500			1/2" Ice	2.240	2.109	86.121
			0.000						
(2) ALU 800MHz 2x50W	B	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	64.000
(Sprint)			3.500			1/2" Ice	2.240	2.109	86.121
			0.000						
(2) ALU 800MHz 2x50W	C	From Leg	3.000	0.0000	137.000	No Ice	2.058	1.932	64.000
(Sprint)			3.500			1/2" Ice	2.240	2.109	86.121
			0.000						
ALU 4x45-1900 MHz RRH	A	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	69.500

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 lb
Unit			-3.500			1/2" Ice	2.709	2.709	95.231
(Sprint)			0.000						
ALU 4x45-1900 MHz RRH	B	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	69.500
Unit			-3.500			1/2" Ice	2.709	2.709	95.231
(Sprint)			0.000						
ALU 4x45-1900 MHz RRH	C	From Leg	3.000	0.0000	137.000	No Ice	2.500	2.500	69.500
Unit			-3.500			1/2" Ice	2.709	2.709	95.231
(Sprint)			0.000						
*** Sprint (after ASM-009) @ 137'									
* AT&T Carrier Antennas @ 148' (HudsonGrp. Mount Analysis)									
13' Sector Mount (1)	A	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	220.000
(ATT)			0.000			1/2" Ice	16.100	16.100	420.000
			0.000						
13' Sector Mount (1)	B	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	220.000
(ATT)			0.000			1/2" Ice	16.100	16.100	420.000
			0.000						
13' Sector Mount (1)	C	From Leg	0.000	0.0000	148.000	No Ice	12.000	12.000	220.000
(ATT)			0.000			1/2" Ice	16.100	16.100	420.000
			0.000						
(2) 7770.00 panel antenna	A	From Face	4.000	0.0000	148.000	No Ice	5.901	4.007	52.033
(ATT)			-6.000			1/2" Ice	6.338	4.635	97.080
			0.000						
AM-X-CD-16-65-00T Panels	A	From Face	4.000	0.0000	148.000	No Ice	8.260	4.642	48.500
(ATT)			-2.000			1/2" Ice	8.807	5.088	94.996
			0.000						
(2) TMAT1921xB68-21A	A	From Face	4.000	0.0000	148.000	No Ice	0.770	0.363	17.600
TMA Units			6.000			1/2" Ice	0.889	0.453	23.273
(ATT)			0.000						
Ericsson RRUS-11 RRH Unit	A	From Face	4.000	0.0000	148.000	No Ice	2.790	1.190	50.700
(ATT)			2.000			1/2" Ice	3.000	1.340	71.570
			0.000						
Ericsson RRUS-12 RRH Unit	A	From Face	4.000	0.0000	148.000	No Ice	3.669	1.488	58.000
(ATT)			-2.000			1/2" Ice	3.926	1.673	81.222
			0.000						
Raycap RVZDC-6627-PF-48	A	From Leg	0.000	0.0000	148.000	No Ice	2.510	3.780	32.000
(ATT)			0.000			1/2" Ice	2.720	4.030	64.000
			0.000						
(2) 7770.00 panel antenna	B	From Face	4.000	0.0000	148.000	No Ice	5.901	4.007	52.033
(ATT)			-6.000			1/2" Ice	6.338	4.635	97.080
			0.000						
AM-X-CD-16-65-00T Panels	B	From Face	4.000	0.0000	148.000	No Ice	8.260	4.642	48.500
(ATT)			-2.000			1/2" Ice	8.807	5.088	94.996
			0.000						
(2) TMAT1921xB68-21A	B	From Face	4.000	0.0000	148.000	No Ice	0.770	0.363	17.600
TMA Units			6.000			1/2" Ice	0.889	0.453	23.273
(ATT)			0.000						
Ericsson RRUS-11 RRH Unit	B	From Face	4.000	0.0000	148.000	No Ice	2.790	1.190	50.700
(ATT)			2.000			1/2" Ice	3.000	1.340	71.570
			0.000						
Ericsson RRUS-12 RRH Unit	B	From Face	4.000	0.0000	148.000	No Ice	3.669	1.488	58.000
(ATT)			-2.000			1/2" Ice	3.926	1.673	81.222
			0.000						
Raycap RVZDC-6627-PF-48	B	From Leg	0.000	0.0000	148.000	No Ice	2.510	3.780	32.000
(ATT)			0.000			1/2" Ice	2.720	4.030	64.000

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 lb
			0.000						
(2) 7770.00 panel antenna (ATT)	C	From Face	4.000 -6.000 0.000	0.0000	148.000	No Ice 1/2" Ice	5.901 6.338	4.007 4.635	52.033 97.080
AM-X-CD-16-65-00T Panels (ATT)	C	From Face	4.000 -2.000 0.000	0.0000	148.000	No Ice 1/2" Ice	8.260 8.807	4.642 5.088	48.500 94.996
(2) TMAT1921xB68-21A TMA Units (ATT)	C	From Face	4.000 6.000 0.000	0.0000	148.000	No Ice 1/2" Ice	0.770 0.889	0.363 0.453	17.600 23.273
Ericsson RRUS-11 RRH Unit (ATT)	C	From Face	4.000 2.000 0.000	0.0000	148.000	No Ice 1/2" Ice	2.790 3.000	1.190 1.340	50.700 71.570
Ericsson RRUS-12 RRH Unit (ATT)	C	From Face	4.000 -2.000 0.000	0.0000	148.000	No Ice 1/2" Ice	3.669 3.926	1.488 1.673	58.000 81.222
Raycap RVZDC-6627-PF-48 (ATT)	C	From Leg	0.000 0.000 0.000	0.0000	148.000	No Ice 1/2" Ice	2.510 2.720	3.780 4.030	32.000 64.000
* AT&T Carrier Antennas @ 148' (HudsonGrp. Mount Analysis)									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
6' w/Radome (DNK-45 (St# 17))	A	Paraboloid w/Radome	From Leg	0.500 0.000 0.000	-30.0000		178.000	6.000	No Ice 1/2" Ice	28.274 29.065	380.000 450.000
6' w/Radome (DNK-44 (St# 18))	B	Paraboloid w/Radome	From Leg	1.000 0.000 0.000	-60.0000		176.000	6.000	No Ice 1/2" Ice	28.274 29.065	380.000 450.000
4' Paraflector [PRF-950] (DNK-8 (St# 47))	B	Grid	From Leg	2.000 0.000 0.000	-60.0000		111.000	4.000	No Ice 1/2" Ice	16.000 16.674	34.000 48.000
4' Paraflector [PRF-950] (DNK-37 (St# 23))	A	Grid	From Leg	2.000 0.000 0.000	-52.3000		156.000	4.000	No Ice 1/2" Ice	16.000 16.674	34.000 48.000

Load Combinations

Comb. No.	Description
1	Dead Only

Comb. No.	Description
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice
19	Dead+Wind 0 deg+Ice
20	Dead+Wind 30 deg+Ice
21	Dead+Wind 45 deg+Ice
22	Dead+Wind 60 deg+Ice
23	Dead+Wind 90 deg+Ice
24	Dead+Wind 120 deg+Ice
25	Dead+Wind 135 deg+Ice
26	Dead+Wind 150 deg+Ice
27	Dead+Wind 180 deg+Ice
28	Dead+Wind 210 deg+Ice
29	Dead+Wind 225 deg+Ice
30	Dead+Wind 240 deg+Ice
31	Dead+Wind 270 deg+Ice
32	Dead+Wind 300 deg+Ice
33	Dead+Wind 315 deg+Ice
34	Dead+Wind 330 deg+Ice
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	11.381	40	0.4672	0.0447
T2	175 - 166.667	10.888	40	0.4672	0.0425
T3	166.667 - 158.333	10.050	40	0.4664	0.0385
T4	158.333 - 150	9.215	40	0.4621	0.0372

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T5	150 - 125	8.388	40	0.4544	0.0331
T6	125 - 100	6.012	40	0.4114	0.0242
T7	100 - 91.6667	3.933	40	0.3415	0.0185
T8	91.6667 - 83.3333	3.333	40	0.3163	0.0169
T9	83.3333 - 75	2.768	40	0.2946	0.0152
T10	75 - 50	2.242	40	0.2709	0.0134
T11	50 - 37.5	1.026	40	0.1813	0.0087
T12	37.5 - 25	0.579	40	0.1402	0.0062
T13	25 - 12.5	0.264	40	0.0960	0.0043
T14	12.5 - 0	0.064	46	0.0493	0.0020

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	40	11.381	0.4672	0.0447	34272
186.000	2" Dia 10' Omni	40	11.381	0.4672	0.0447	34272
185.500	3" Dia 20' Omni	40	11.381	0.4672	0.0447	34272
185.000	2" Dia 10' Omni	40	11.381	0.4672	0.0447	34272
182.500	1" Dia 8' Omni	40	11.381	0.4672	0.0447	34272
181.000	1 Bay Dipole ANT400D	40	11.381	0.4672	0.0447	34272
179.000	6' Side-Arm(1)	40	11.283	0.4672	0.0443	34272
178.000	6' w/Radome	40	11.184	0.4672	0.0439	34272
177.500	Pirod 6' Side Mount Standoff (1)	40	11.135	0.4672	0.0437	34272
176.000	6' w/Radome	40	10.987	0.4672	0.0430	34272
173.000	(inverted) 2" Dia 10' Omni	40	10.688	0.4671	0.0414	39280
170.000	(Inverted) 3" Dia 20' Omni	40	10.386	0.4670	0.0396	119237
166.500	Telewave 150F2 Omni	40	10.033	0.4663	0.0385	106716
164.000	Pirod 4' Side Mount Standoff (1)	40	9.782	0.4654	0.0382	82449
162.000	Telewave ANT220F2 - Omni Antenna	40	9.581	0.4645	0.0380	89866
161.000	ANT450F6	40	9.481	0.4639	0.0378	96004
160.000	3" Dia 9' Omni	40	9.381	0.4633	0.0377	101293
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	40	9.281	0.4626	0.0374	104489
157.000	2' Sidearm	40	9.082	0.4611	0.0366	100752
156.000	4' Paraflector [PRF-950]	40	8.982	0.4603	0.0361	94924
151.000	1 Bay Dipole ANT400D	40	8.486	0.4555	0.0336	65927
149.000	2" Dia 14' Omni (inverted)	40	8.289	0.4532	0.0326	58559
148.000	13' Sector Mount (1)	40	8.191	0.4520	0.0321	55495
137.000	Pirod 12' PCS T-Frame (1) 104569	40	7.126	0.4358	0.0277	35311
130.000	2' Sidearm	40	6.469	0.4224	0.0255	28631
125.000	Decibel DB210-C Dipole (Single)	40	6.012	0.4114	0.0242	25224
124.000	Comprod 871F-70 Dipole	40	5.922	0.4091	0.0239	24639
123.000	19.5"x19.5" Panel Antenna	40	5.832	0.4067	0.0236	24080
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	40	5.655	0.4018	0.0231	23036
111.000	4' Paraflector [PRF-950]	40	4.800	0.3747	0.0208	18932
102.000	1' Side Arm	40	4.084	0.3477	0.0189	16500
89.500	20' 4-Bay Dipole	40	3.183	0.3104	0.0165	25228
82.500	1' Side Arm	40	2.713	0.2924	0.0150	21572
81.000	GPS	40	2.616	0.2884	0.0147	18878
34.000	1.5" Dia 3' Omni	40	0.478	0.1283	0.0056	13732
30.500	1.5" Dia 3' Omni	40	0.388	0.1160	0.0051	15924
29.500	1.5" Dia 3' Omni (inverted)	40	0.364	0.1124	0.0050	16694
27.000	1.5" Dia 3' Omni	40	0.307	0.1033	0.0046	18557

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
26.000	4' Side Mount Standoff (1)	40	0.285	0.0997	0.0044	18976
19.500	1.5" Dia 3' Omni	40	0.159	0.0758	0.0033	14487
18.000	4' Side Mount Standoff (1)	40	0.135	0.0702	0.0030	13319
17.500	3' Yagi	40	0.127	0.0683	0.0029	12970

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 175	14.681	24	0.6041	0.0776
T2	175 - 166.667	14.042	24	0.6040	0.0743
T3	166.667 - 158.333	12.959	24	0.6029	0.0709
T4	158.333 - 150	11.879	24	0.5974	0.0681
T5	150 - 125	10.808	24	0.5873	0.0585
T6	125 - 100	7.742	24	0.5307	0.0391
T7	100 - 91.6667	5.064	24	0.4402	0.0296
T8	91.6667 - 83.3333	4.290	24	0.4077	0.0270
T9	83.3333 - 75	3.563	24	0.3797	0.0243
T10	75 - 50	2.885	24	0.3492	0.0214
T11	50 - 37.5	1.319	24	0.2336	0.0139
T12	37.5 - 25	0.744	24	0.1806	0.0100
T13	25 - 12.5	0.339	24	0.1237	0.0069
T14	12.5 - 0	0.082	30	0.0635	0.0033

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
200.000	Lightning Rod 2"x15'	24	14.681	0.6041	0.0776	27565
186.000	2" Dia 10' Omni	24	14.681	0.6041	0.0776	27565
185.500	3" Dia 20' Omni	24	14.681	0.6041	0.0776	27565
185.000	2" Dia 10' Omni	24	14.681	0.6041	0.0776	27565
182.500	1" Dia 8' Omni	24	14.681	0.6041	0.0776	27565
181.000	1 Bay Dipole ANT400D	24	14.681	0.6041	0.0776	27565
179.000	6' Side-Arm(1)	24	14.554	0.6041	0.0769	27565
178.000	6' w/Radome	24	14.426	0.6040	0.0762	27565
177.500	Pirod 6' Side Mount Standoff (1)	24	14.363	0.6040	0.0759	27565
176.000	6' w/Radome	24	14.171	0.6040	0.0749	27565
173.000	(inverted) 2" Dia 10' Omni	24	13.784	0.6040	0.0732	31683
170.000	(Inverted) 3" Dia 20' Omni	24	13.393	0.6037	0.0719	101100
166.500	Telewave 150F2 Omni	24	12.937	0.6029	0.0709	80710
164.000	Pirod 4' Side Mount Standoff (1)	24	12.612	0.6017	0.0705	65950
162.000	Telewave ANT220F2 - Omni Antenna	24	12.353	0.6004	0.0701	73414
161.000	ANT450F6	24	12.224	0.5997	0.0697	79200
160.000	3" Dia 9' Omni	24	12.095	0.5989	0.0692	83946
159.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	24	11.965	0.5980	0.0686	86119
157.000	2' Sidearm	24	11.707	0.5961	0.0668	79397
156.000	4' Paraflector [PRF-950]	24	11.578	0.5950	0.0656	72390

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
151.000	1 Bay Dipole ANT400D	24	10.936	0.5888	0.0597	44925
149.000	2" Dia 14' Omni (inverted)	24	10.680	0.5858	0.0573	39352
148.000	13' Sector Mount (1)	24	10.553	0.5842	0.0562	37381
137.000	Pirod 12' PCS T-Frame (1) 104569	24	9.178	0.5628	0.0465	25931
130.000	2' Sidearm	24	8.331	0.5452	0.0419	21783
125.000	Decibel DB210-C Dipole (Single)	24	7.742	0.5307	0.0391	19502
124.000	Comprod 871F-70 Dipole	24	7.626	0.5277	0.0385	19078
123.000	19.5"x19.5" Panel Antenna	24	7.511	0.5245	0.0380	18664
121.000	Sitepro1 USF-4U Mount Assembly (Ca = 1.4 assumed)	24	7.282	0.5181	0.0371	17873
111.000	4' Paraflector [PRF-950]	24	6.181	0.4830	0.0334	14718
102.000	1' Side Arm	24	5.259	0.4482	0.0303	12842
89.500	20' 4-Bay Dipole	24	4.097	0.4001	0.0263	19581
82.500	1' Side Arm	24	3.492	0.3769	0.0240	16713
81.000	GPS	24	3.366	0.3717	0.0234	14620
34.000	1.5" Dia 3' Omni	24	0.614	0.1652	0.0091	10660
30.500	1.5" Dia 3' Omni	24	0.498	0.1493	0.0083	12363
29.500	1.5" Dia 3' Omni (inverted)	24	0.467	0.1447	0.0080	12961
27.000	1.5" Dia 3' Omni	24	0.394	0.1331	0.0074	14409
26.000	4' Side Mount Standoff (1)	24	0.366	0.1284	0.0072	14735
19.500	1.5" Dia 3' Omni	24	0.204	0.0976	0.0053	11246
18.000	4' Side Mount Standoff (1)	24	0.173	0.0904	0.0049	10338
17.500	3' Yagi	24	0.163	0.0879	0.0047	10067

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

More information on AECOM and its services can be found at www.aecom.com.

500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
860-529-8882
Fax: 860-529-3991

ATTACHMENT F – PROOF OF DELIVERY OF NOTICE

Ref: ES-009 WESTBROOK Date: 07Jan21
Dep: BL GRAPHICS Wgt: 2.60 LBS

DV:

SHIPPING:	0.00
SPECIAL:	0.00
HANDLING:	0.00
0.00 TOTAL:	0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3347 0010

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 07JAN21
ACTWGT: 2.60 LB
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO **HONORABLE NOEL BISHOP**
TOWN OF WESTBROOK
866 BOSTON POST RD

WESTBROOK CT 06498
REF: ES-009 WESTBROOK

DEPT: BL GRAPHICS

56DC1/1136/05A2

FedEx Express

J20101911060101uv

TRK# 0201 **9151 3347 0010**

FRI - 08 JAN 12:00P
PRIORITY OVERNIGHT

00 RSPA

06498
CT-US **BDL**

Part # 156148-434 RIT EXP 09/21 ea

Ref: ES-009 WESTBROOK Date: 07Jan21
Dep: BL GRAPHICS Wgt: 2.60 LBS

DV: 0.00

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3347 0021

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 07JAN21
ACTWGT: 2.60 LB MAN
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO **ERIC KNAPP P&Z COORDINATOR**
TOWN OF WESTBROOK
866 BOSTON POST RD

WESTBROOK CT 06498
REF: ES-009 WESTBROOK

DEPT: BL GRAPHICS

56DC1/1136/0502

FedEx Express

J2010191106010v

TRK# 0201 **9151 3347 0021**

FRI - 08 JAN 12:00P
PRIORITY OVERNIGHT

00 RSPA

06498
CT-US **BDL**

Part # 156148-434 RIT EXP 09/21

Ref: ES-009 WESTBROOK Date: 07Jan21
Dep: BL GRAPHICS Wgt: 2.60 LBS
DV:

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
0.00 TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3347 0032

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 07JAN21
ACTWGT: 2.60 LB MAN
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO **BRIAN BENITO**
DEPT OF EMERGENCY SERVICES
1111 COUNTRY CLUB ROAD

MIDDLETOWN CT 06457
REF: ES-009 WESTBROOK

DEPT: BL GRAPHICS

56DC1/1136/0582

FedEx Express

J2010191106010v

TRK# 0201 **9151 3347 0032**

FRI - 08 JAN 10:30A
PRIORITY OVERNIGHT

00 BDLA

06457
CT-US **BDL**

Part # 156148-434 RIT EXP 03/21 **

Ref: ES-009 WESTBROOK Date: 07Jan21
Dep: BL GRAPHICS Wgt: 2.60 LBS

DV: 0.00

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3347 0043

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 07JAN21
ACTWGT: 2.60 LB MAN
CAD: 0765627/CAFE3407

BILL THIRD PARTY

TO

CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051

REF: ES-009 WESTBROOK

DEPT: BL GRAPHICS

56DC1/1136/05A2

FedEx Express

J2010191106011w

TRK# 0201 **9151 3347 0043**

FRI - 08 JAN 10:30A
PRIORITY OVERNIGHT

00 BDLA

06051
CT-US **BDL**

Part # 156140-434 RIT EXP 09/21 **

ATTACHMENT G - POWER DENSITY REPORT

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

ES-009 – Westbrook Troop F CSP

315 Spencer Plains Road

Westbrook, CT 06498

November 23, 2020

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Eversource installation on the self-support tower off of Spencer Plains Road in Westbrook, CT. Eversource is proposing to install two omnidirectional antennas – one transmit and one receive-only antenna – as part of its 220 MHz communications system.

This report considers the proposed antenna configuration as detailed by Eversource along with % MPE (Maximum Permissible Exposure) measurements around the existing tower to determine FCC compliance of the facility.

Figure 1: View of ES-009 Westbrook

Site Address	Spencer Plains Road
Latitude	41° 17' 32.79" N
Longitude	72° 25' 49.33" W
Site Elevation AMSL	98’
Survey Engineer	Marc Salas
Survey Date/Time	6/24/2020; 10:30 AM – 11:00 AM

Table 1: Survey Information

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached “FCC Limits for Maximum Permissible Exposure (MPE)” in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. Power Density Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power = 1.64 x ERP

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and full power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the calculated power density and corresponding % MPE levels reported below are much higher than the actual levels will be from the final installation.

4. Proposed Antenna Configuration

Table 2 below lists the technical details of the proposed Eversource installation. These parameters are applied to the above calculation methods in order to calculate the % MPE values of the proposed equipment. Any proposed receive-only antennas have not been included in the table as they are irrelevant in terms of the % MPE calculations.

Operator	Antenna Model	TX Freq. (MHz)	Ant Gain (dBd)	Power per Channel (ERP -Watts)	Number of Channels	Vertical Beamwidth	Length (ft)	Antenna Centerline Height (ft)
Eversource	Comprod 871F-70	217	2.5	69.7	4	20°	5.5	124

Table 2: Eversource Antenna Configuration (Proposed)[1] [2]

[1] Transmit power assumes 0 dB of cable loss.

[2] Transmit antenna height is based on the AECOM Detailed Structural Analysis Report dated July 31, 2020.

5. Measurement Procedure

Frequencies from 300 KHz to 50 GHz were measured using the Narda Probe EA 5091, E-Field, shaped, FCC probe in conjunction with the NBM550 survey meter. The EA 5091 probe is “shaped” such that in a mixed signal environment (i.e.: more than one frequency band is used in a particular location), it accurately measures the percent of MPE.

From FCC OET Bulletin No. 65 - Edition 97-01 – “A useful characteristic of broadband probes used in multiple-frequency RF environments is a frequency-dependent response that corresponds to the variation in MPE limits with frequency. Broadband probes having such a "shaped" response permit direct assessment of compliance at sites where RF fields result from antennas transmitting over a wide range of frequencies. Such probes can express the composite RF field as a percentage of the applicable MPEs”.

Probe Description - As suggested in FCC OET Bulletin No. 65 - Edition 97-01, the response of the measurement instrument should be essentially isotropic, (i.e., independent of orientation or rotation angle of the probe). For this reason, the Narda EA 5091 probe was used for these measurements.

Sampling Description - At each measurement location, a spatially averaged measurement is collected over the height of an average human body. The NBM550 survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 20 cm to 200 cm (about 6 feet) above ground level. The results recorded at each measurement location include average values over the spatial distance.

Instrumentation Information - A summary of specifications for the equipment used is provided in the table below.

Manufacturer	Narda Microwave			
Probe	EA 5091, Serial# 0116			
Calibration Date	May 2020			
Calibration Interval	24 Months			
Meter	NBM550, Serial# E-1069			
Calibration Date	May 2020			
Calibration Interval	24 Months			
Probe Specifications	**Frequency Range**	**Field Measured**	**Standard**	**Measurement Range**
	300 KHz-50 GHz	Electric Field	U.S. FCC 1997 Occupational/Controlled	0.2 – 600 % of Standard

Table 3: Instrumentation Information

Instrument Measurement Uncertainty - The total measurement uncertainty of the NARDA measurement probe and meter is no greater than ±3 dB (0.5% to 6%), ±1 dB (6% to 100%), ±2 dB (100% to 600%). The factors which contribute to this include the probe’s frequency response deviation, calibration uncertainty, ellipse ratio, and isotropic response[3]. Every effort is taken to reduce the overall uncertainty during measurement collection including pointing the probe directly at the likely highest source of emissions.

[3] For further details, please refer to Narda Safety Test Solutions NBM550 Probe Specifications, pg. 64
http://www.narda-sts.us/pdf_files/DataSheets/NBM-Probes_DataSheet.pdf

6. Surveyed and Calculated % MPE Results

Measured and calculated results and a description of each survey location are detailed in the table below. Measurements were recorded on June 24, 2020 between 10:30 AM and 11:00 AM. The calculated % MPE contribution from the proposed equipment was then added to the measured % MPE values in the "Composite % MPE" column. These calculated values incorporate the antenna pattern of the antenna model specified by Eversource to determine the "Off Beam Loss" factor shown in the power density formula from Section 3. All % MPE values are in reference to the FCC Uncontrolled/General Population exposure limit.

Table 4 below lists 14 measurements recorded in the vicinity of the tower. The highest spatially averaged measurement was 7.06% (Average Uncontrolled/General Population MPE) and was recorded at Location 7, southwest of the tower by the south parking lot/entrance. The highest composite (measured + calculated) % MPE value is calculated to be 7.57% (Average Uncontrolled/General Population) and is calculated to occur at Locations 7 and 9.

Meas. Location	Location Description	Latitude	Longitude	Dist. From Site (feet)	Measured % MPE (Uncontrolled / General)	Calculated % MPE (Eversource Proposed)	Composite % MPE (Uncontrolled / General)
1	Compound Gate	41.29237	-72.43060	69	3.39%	2.52%	5.92%
2	Compound Gate 2	41.29231	-72.43049	58	2.94%	2.25%	5.19%
3	Southeast corner of compound	41.29221	-72.43032	84	3.14%	2.32%	5.46%
4	Southeast side of compound (parking lot)	41.29196	-72.43044	175	2.68%	1.34%	4.02%
5	South of compound (parking lot)	41.29198	-72.43081	208	4.35%	1.10%	5.45%
6	Southwest of compound (parking lot)	41.29204	-72.43107	243	6.21%	0.90%	7.11%
7	**Southwest of compound (parking lot near entrance)**	**41.29165**	**-72.43113**	**358**	**7.06%**	**0.51%**	**7.57%**
8	South of compound (front of State Police building)	41.29150	-72.43084	367	6.12%	0.49%	6.60%
9	**South of compound (sidewalk east of State Police building)**	**41.29167**	**-72.43050**	**284**	**6.86%**	**0.71%**	**7.57%**
10	Northeast of tower (Spencer Plain Rd/State Police entrance)	41.29254	-72.42984	150	2.83%	1.46%	4.29%
11	Northwest of tower (Spencer Plain Rd/Cold Spring Dr.)	41.29375	-72.43194	646	1.47%	0.19%	1.66%
12	North of tower compound (Cold Spring Dr./Winterberry Cir.)	41.29545	-72.43018	1101	1.18%	0.07%	1.25%
13	Northeast of tower compound (end of Winterberry Cir.)	41.29464	-72.42754	1116	2.34%	0.07%	2.41%
14	East of tower compound (Spencer Plain Rd. / BJM Pumps)	41.29291	-72.42468	1571	2.58%	0.03%	2.62%

Table 4: Measured and Calculated % MPE Results [4] [5]

[4] Due to measurement uncertainty at low levels (See Table 3), any readings outside the measurement range of the probe (< 1.00 % FCC General Population/Uncontrolled MPE) are noted as such.

[5] Measured and calculated % MPE values listed are rounded to two decimal points and the composite % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total composite value reflected in the table.

Figures 2 and 3 below are aerial views[6] of the tower location and the surrounding area, along with the measurement locations listed in Table 4.

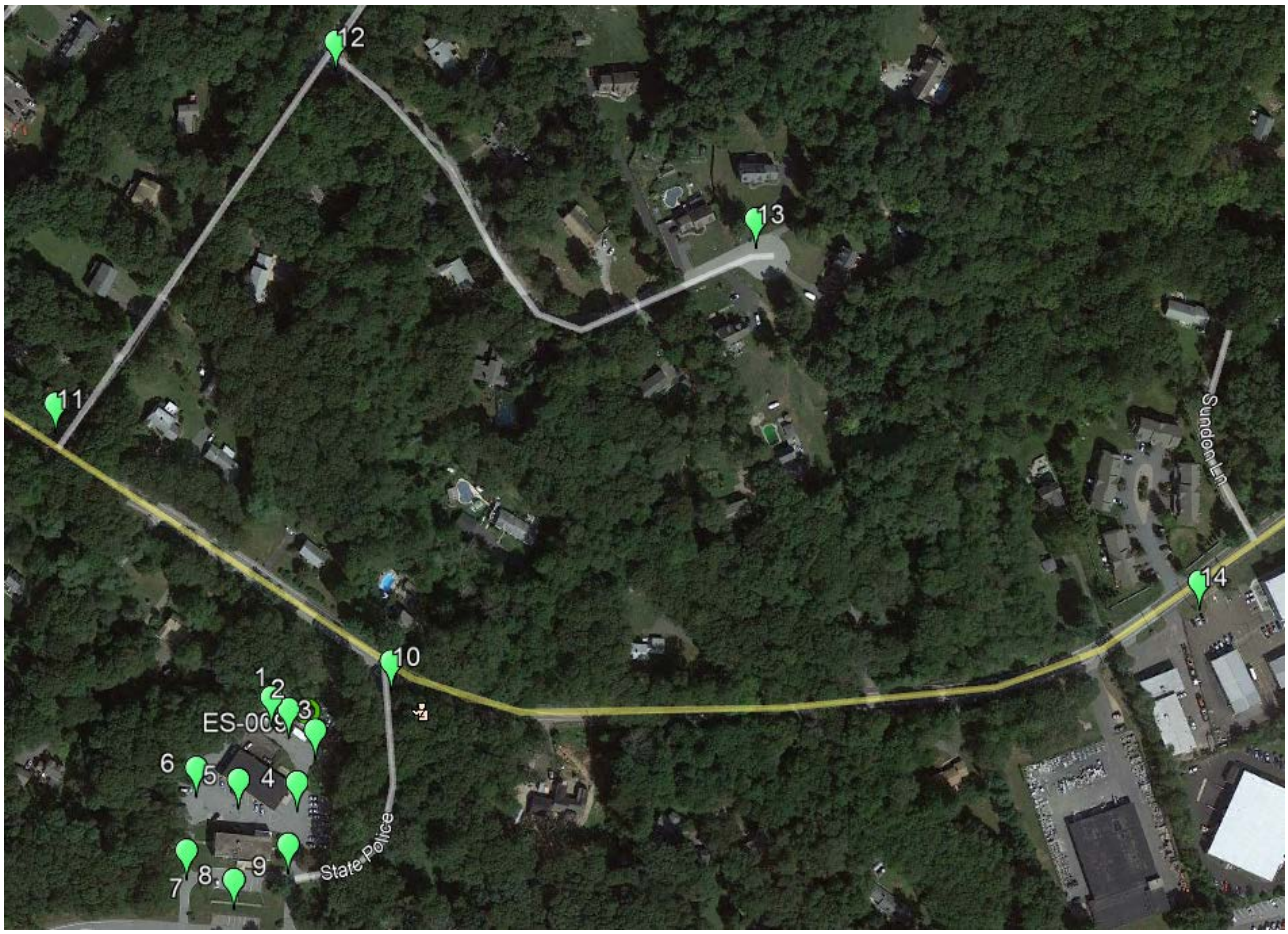


Figure 2: All Measurement Points

[6] Map showing location of telecommunications facility and the surrounding area. *Google Earth*, https://earth.google.com/web/.

Figure 3: Measurement Points – Zoom In

7. Conclusion

A number of accessible areas around the tower off of Spencer Plains Road in Westbrook, CT were surveyed and found to be well within the mandated General Population/Uncontrolled limits for Maximum Permissible Exposure, as delineated in the Federal Communications Commission's Radio Frequency exposure rules published in 47 CFR 1.1307(b)(1)-(b)(3).

The highest spatially averaged % MPE measurement of all surveyed points based on the 1997 FCC standard for exposure to the general population is 7.06% MPE. This measurement was recorded at Location 7, southwest of the tower by the south parking lot/entrance.

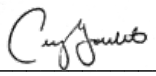
The highest composite (measured + calculated) power density is **7.57% of the FCC General Population MPE limit** with the proposed Eversource equipment and is calculated to occur at Locations 7 (described above) and 9 (sidewalk to the east of the State Police building).

The above analysis concludes that RF exposure at ground level around the tower, both currently and with the proposed antenna installation, will be below the maximum power density limits as outlined by the FCC in the OET Bulletin 65 Ed. 97-01.

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual levels will be from the finished installation.

8. Statement of Certification

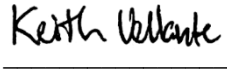
I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, IEEE Std. C95.1, and IEEE Std. C95.3.



November 23, 2020

Report Prepared By: Cory Goulet
Associate RF Engineer
C Squared Systems, LLC

Date



November 23, 2020

Reviewed/Approved By: Keith Vellante
Director of RF Services
C Squared Systems, LLC

Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[7]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[8]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 5: FCC Limits for Maximum Permissible Exposure (MPE)

[7] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[8] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

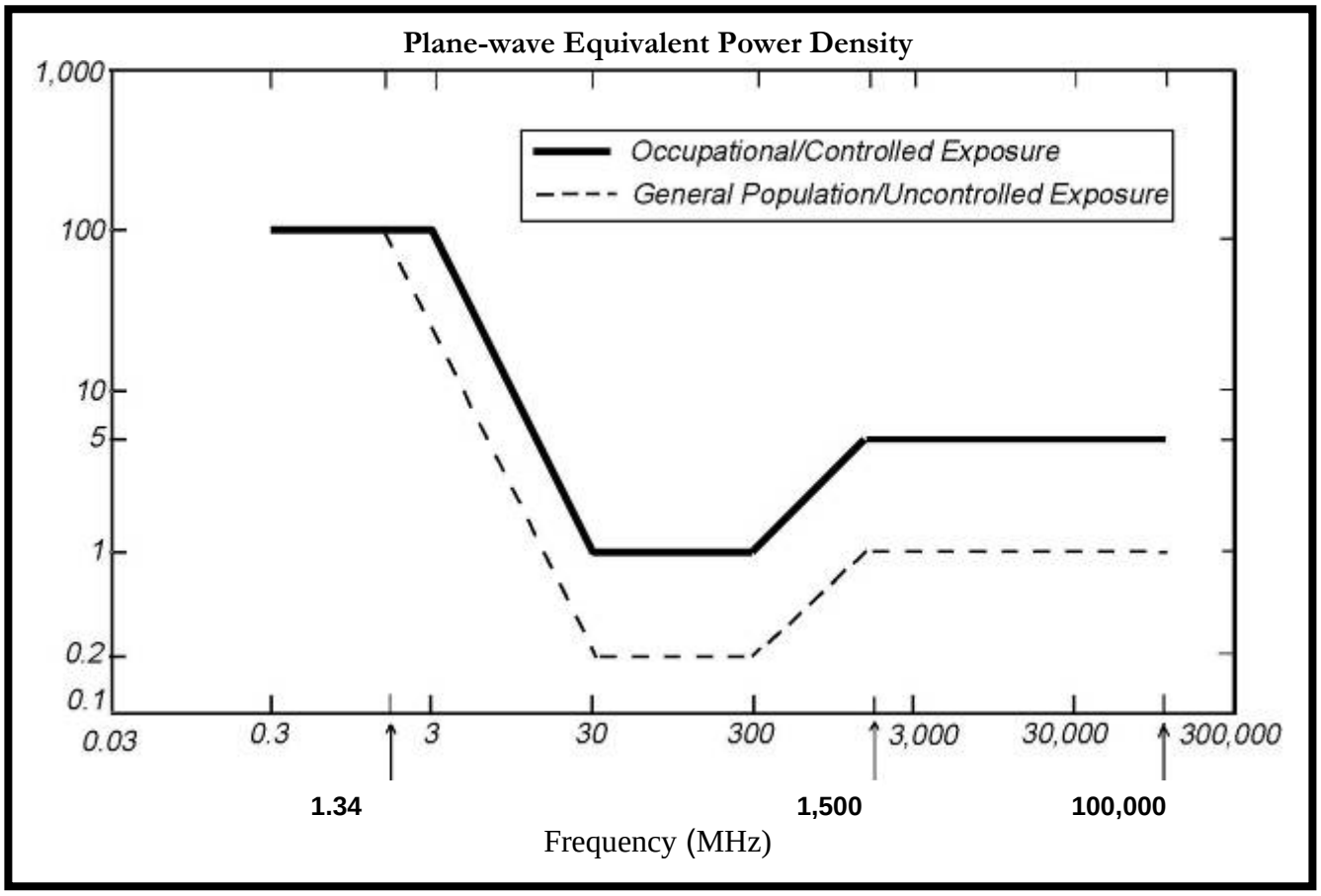
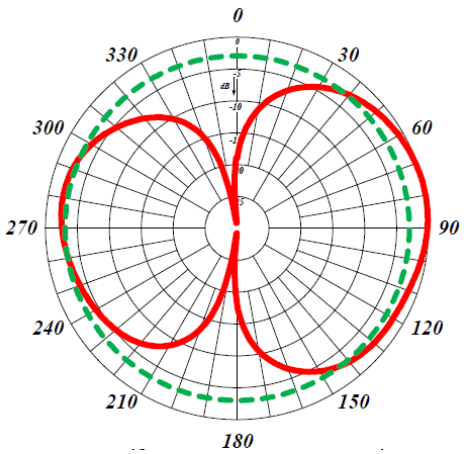


Figure 4: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Eversource Antenna Data Sheet and Electrical Patterns[9]

217 MHz

Manufacturer:	Comprod
Model #:	871F-70
Frequency Band:	215-225 MHz
Gain:	2.5 dBd
Vertical Beamwidth:	~110°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	5.5’



[9] In the case where pattern data was unavailable from the manufacturer, vertical patterns shown are for antennas with similar specifications.