



Date: **February 23, 2016**

Timothy Howell
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Subject: Structural Analysis Report

Carrier Designation: **AT&T Mobility Co-Locate**
Carrier Site Number: ME5306
Carrier Site Name: AWE - SPRINT PORTLAND

Crown Castle Designation: **Crown Castle BU Number:** 878782
Crown Castle Site Name: PORTLAND WARREN AVE
Crown Castle JDE Job Number: 353407
Crown Castle Work Order Number: 1198079
Crown Castle Application Number: 316844 Rev. 3

Engineering Firm Designation: **AW Solutions Project Number:** 878782

Site Data: **Warren Ave, Portland, Cumberland County, ME**
Latitude 43° 41' 15.16", Longitude -70° 18' 14.96"
180 Foot - Monopole Tower

Mr. Howell,

AW Solutions is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural ‘Statement of Work’ and the terms of Crown Castle Purchase Order Number 875808, in accordance with application 316844, revision 3.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC4.7: Existing + Proposed for all applicants with proposed modifications **Sufficient Capacity***
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

***The structure has sufficient capacity once the loading changes described in the Recommendations section of this report are completed.**

The analysis has been performed in accordance with the TIA-222-G standard and IBC 2009 based upon a wind speed of 100 mph 3-second gust and exposure category C.

All modifications and equipment proposed in this report shall be installed in accordance with the referenced drawings for the determined available structural capacity to be effective.

We at AW Solutions appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Charles Springer, P.E. CS

Respectfully submitted by:

Alan Lockrem, P.E.
Director of Engineering



02/25/16

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA

Table 1 - Proposed Antenna and Cable Information

Table 2 - Existing and Reserved Antenna and Cable Information

Table 3 - Design Antenna and Cable Information

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

3.1) Analysis Method

3.2) Assumptions

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Table 6 – Tower Components vs. Capacity

4.1) Recommendations

5) APPENDIX A

tnxTower Output

6) APPENDIX B

Base Level Drawing

7) APPENDIX C

Additional Calculations

1) INTRODUCTION

This tower is a 180 ft Monopole tower designed by PITTSBURG MONOPOLE in February of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been modified multiple times in the past to accommodate additional loading. The modifications proposed by Crown Castle in February of 2016 (Ref. Doc. #6110071) were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 100 mph with no ice, 40 mph with 1 inch ice thickness and 60 mph under service loads, exposure category C.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
162.0	162.0	2	cci antennas	HPA-65R-BUU-H6	12 2 4	1-5/8 3/8 5/8	-
		1	cci antennas	HPA-65R-BUU-H8			
		2	cci antennas	OPA-65R-LCUU-H6			
		1	cci antennas	OPA-65R-LCUU-H8			
		3	ericsson	RRUS 11			
		3	ericsson	WCS RRUS-32-B30			
		1	raycap	DC6-48-60-18-8F			
	1	tower mounts	Platform Mount [LP 1301-1]				
	161.0	3	ericsson	RRUS A2			
		4	powerwave technologies	LGP21401			
1		powerwave technologies	TT19-08BP111-001				

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
177.0	179.0	1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	3	1-1/4	1
		2	rfs celwave	APXVSP18-C-A20 w/ Mount Pipe			
		3	rfs celwave	IBC1900BB-1			
		3	rfs celwave	IBC1900HG-2A			
	177.0	1	tower mounts	Platform Mount [LP 714-1]			
175.0	176.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-	1
	175.0	1	tower mounts	Side Arm Mount [SO 102-3]	-	-	-

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
171.0	171.0	6	dapa	58010 w/ Mount Pipe	6	1-5/8	3
		1	tower mounts	Platform Mount [LP 403-1]			
161.0	162.0	3	powerwave technologies	7020.00	1 12 2	3/8 1-5/8 5/8	3
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP2140X			
		2	kmw communications	AM-X-CD-16-65-00T-RET	-	-	1
		3	powerwave technologies	7020.00			
		3	powerwave technologies	7770.00			
		1	powerwave technologies	P65-17-XLH-RR			
	1	raycap	DC6-48-60-18-8F	-	-	3	
	161.0	6	ericsson				RRUS-11
			1	tower mounts	T-Arm Mount [TA 602-3]		
110.0	110.0	3	alcatel lucent	B13 RRH 4X30	2	1-5/8	2
		3	alcatel lucent	B25 RRH4X30			
		3	alcatel lucent	RRH2X60-AWS			
		12	commscope	SBNHH-1D65C w/ Mount Pipe			
		2	rfs celwave	DB-B1-6C-12AB-0Z			
		1	tower mounts	Platform Mount [LP 1301-1]			

- Notes:
 1) Existing Equipment
 2) Reserved Equipment
 3) Equipment To Be Removed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
-						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Gemini Geotechnical Associates	1562092	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pittsburg Monopole Division	1480918	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pittsburg Monopole Division	1451234	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Crown Castle	3160195	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	5755010	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	3360218	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	B+T Group	3671974	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	4138879	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Crown Castle	6110071	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) The existing base plate grout was not considered in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. AW Solutions should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	180 - 175	Pole	TP24x24x0.375	Pole	2.9%	Pass
L2	175 - 170	Pole	TP24x24x0.375	Pole	8.7%	Pass
L3	170 - 165	Pole	TP24x24x0.375	Pole	14.7%	Pass
L4	165 - 160	Pole	TP24x24x0.375	Pole	24.9%	Pass
L5	160 - 155	Pole	TP24x24x0.375	Pole	40.1%	Pass
L6	155 - 150	Pole	TP24x24x0.375	Pole	55.7%	Pass
L7	150 - 145	Pole	TP24x24x0.375	Pole	71.6%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L8	145 - 144.5	Pole	TP24x24x0.375	Pole	73.3%	Pass
L9	144.5 - 144.25	Pole + Reinf.	TP24x24x0.675	Pole	53.4%	Pass
L10	144.25 - 140	Pole + Reinf.	TP24x24x0.675	Pole	63.4%	Pass
L11	140 - 139.75	Pole	TP36x36x0.5	Pole	30.3%	Pass
L12	139.75 - 134.75	Pole	TP36x36x0.5	Pole	36.0%	Pass
L13	134.75 - 129.75	Pole	TP36x36x0.5	Pole	42.0%	Pass
L14	129.75 - 124.75	Pole	TP36x36x0.5	Pole	48.0%	Pass
L15	124.75 - 119.75	Pole	TP36x36x0.5	Pole	54.3%	Pass
L16	119.75 - 114.75	Pole	TP36x36x0.5	Pole	60.7%	Pass
L17	114.75 - 109.75	Pole	TP36x36x0.5	Pole	67.7%	Pass
L18	109.75 - 105.5	Pole	TP36x36x0.5	Pole	76.0%	Pass
L19	105.5 - 105.25	Pole + Reinf.	TP36x36x0.7625	Pole	63.1%	Pass
L20	105.25 - 100.25	Pole + Reinf.	TP36x36x0.7625	Pole	71.3%	Pass
L21	100.25 - 100	Pole + Reinf.	TP36x36x0.7625	Pole	71.7%	Pass
L22	100 - 99.75	Pole	TP42x42x0.5	Pole	65.8%	Pass
L23	99.75 - 94.75	Pole	TP42x42x0.5	Pole	73.4%	Pass
L24	94.75 - 89.75	Pole	TP42x42x0.5	Pole	81.2%	Pass
L25	89.75 - 86.25	Pole	TP42x42x0.5	Pole	86.7%	Pass
L26	86.25 - 86	Pole + Reinf.	TP42x42x0.725	Pole	69.4%	Pass
L27	86 - 81	Pole + Reinf.	TP42x42x0.725	Pole	75.8%	Pass
L28	81 - 77.75	Pole + Reinf.	TP42x42x0.725	Pole	80.0%	Pass
L29	77.75 - 77.5	Pole + Reinf.	TP42x42x0.9125	Pole	67.0%	Pass
L30	77.5 - 72.5	Pole + Reinf.	TP42x42x0.9125	Pole	72.5%	Pass
L31	72.5 - 67.5	Pole + Reinf.	TP42x42x0.9125	Pole	78.0%	Pass
L32	67.5 - 62.5	Pole + Reinf.	TP42x42x0.9125	Pole	83.7%	Pass
L33	62.5 - 60	Pole + Reinf.	TP42x42x0.9125	Pole	86.5%	Pass
L34	60 - 59.75	Pole	TP48x48x0.625	Pole	79.2%	Pass
L35	59.75 - 54.75	Pole	TP48x48x0.625	Pole	84.4%	Pass
L36	54.75 - 49.75	Pole	TP48x48x0.625	Pole	89.7%	Pass
L37	49.75 - 46.25	Pole	TP48x48x0.625	Pole	93.5%	Pass
L38	46.25 - 46	Pole + Reinf.	TP48x48x0.825	Pole	84.5%	Pass
L39	46 - 41	Pole + Reinf.	TP48x48x0.825	Pole	89.4%	Pass
L40	41 - 36	Pole + Reinf.	TP48x48x0.825	Pole	94.3%	Pass
L41	36 - 32.75	Pole + Reinf.	TP48x48x0.825	Pole	97.6%	Pass
L42	32.75 - 32.5	Pole + Reinf.	TP48x48x0.975	Pole	84.8%	Pass
L43	32.5 - 27.5	Pole + Reinf.	TP48x48x0.975	Pole	89.2%	Pass
L44	27.5 - 22.5	Pole + Reinf.	TP48x48x0.975	Pole	93.6%	Pass
L45	22.5 - 20	Pole + Reinf.	TP48x48x0.975	Pole	95.8%	Pass
L46	20 - 19.75	Pole	TP54x54x0.625	Pole	96.9%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L47	19.75 - 14.75	Pole	TP54x54x0.625	Pole	101.4%	Pass ²
L48	14.75 - 11.75	Pole	TP54x54x0.625	Pole	104.1%	Pass ²
L49	11.75 - 11.5	Pole + Reinf.	TP54x54x0.8	Pole	102.4%	Pass ²
	11.5 - 9	Pole + Reinf.	TP54x54x0.8	Pole	104.7%	Pass ²
	9 - 8.75	Pole + Reinf.	TP54x54x0.8875	Pole	94.4%	Pass
	8.75 - 4.5	Pole + Reinf.	TP54x54x0.8875	Pole	97.9%	Pass
	4.5 - 4.25	Pole + Reinf.	TP54x54x0.95	Pole	89.7%	Pass
	4.25 - 1.5	Pole + Reinf.	TP54x54x0.95	Pole	91.7%	Pass
	1.5 - 1.25	Pole + Reinf.	TP54x54x0.8625	Pole	101.2%	Pass ²
	1.25 - 0	Pole + Reinf.	TP54x54x0.8625	Pole	102.2%	Pass ²
					Summary	
				Pole	104.7%	Pass ²
				Reinforcement	74.8%	Pass
					104.7%	Pass ²

Table 6 - Tower Component Stresses vs. Capacity – LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	0	104.6	Pass ²
1	Base Plate	0	43.5	Pass
1	Base Foundation Structural	0	6.8	Pass
1	Base Foundation Soil Interaction	0	55.3	Pass
1	Flange Bolts	140	10.2	Pass
1	Flange Plate		8.5	Pass
1	Bridge Stiffeners		41.1	Pass
1	Flange Bolts	100	38.0	Pass
1	Flange Plate		17.2	Pass
1	Bridge Stiffeners		82.7	Pass
1	Flange Bolts	60	28.0	Pass
1	Flange Plate		13.3	Pass
1	Bridge Stiffeners		77.3	Pass
1	Flange Bolts	20	43.5	Pass
1	Flange Plate		19.3	Pass
1	Bridge Stiffeners		93.1	Pass
1	Rock Anchors	0	78.0	Pass

Structure Rating (max from all components) =	104.7%²
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) Capacities up to 105% are considered acceptable based on analysis methods used.

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads once the modifications proposed by Crown Castle in February of 2016 (Ref. Doc. #6110071) are installed.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

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

The following design criteria apply:

- 1) Tower is located in Cumberland County, Maine.
- 2) Basic wind speed of 100 mph.
- 3) Structure Class II.
- 4) Exposure Category C.
- 5) Topographic Category 1.
- 6) Crest Height 0.000 ft.
- 7) Nominal ice thickness of 1.000 in.
- 8) Ice thickness is considered to increase with height.
- 9) Ice density of 56.000 pcf.
- 10) A wind speed of 40 mph is used in combination with ice.
- 11) Temperature drop of 50.000 °F.
- 12) Deflections calculated using a wind speed of 60 mph.
- 13) A non-linear (P-delta) analysis was used.
- 14) Pressures are calculated at each section.
- 15) Stress ratio used in pole design is 1.
- 16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	180.000-175.000	5.000	P24x0.375	A36 (36 ksi)	
L2	175.000-170.000	5.000	P24x0.375	A36 (36 ksi)	
L3	170.000-165.000	5.000	P24x0.375	A36 (36 ksi)	
L4	165.000-160.000	5.000	P24x0.375	A36 (36 ksi)	
L5	160.000-155.000	5.000	P24x0.375	A36 (36 ksi)	
L6	155.000-150.000	5.000	P24x0.375	A36 (36 ksi)	
L7	150.000-145.000	5.000	P24x0.375	A36 (36 ksi)	
L8	145.000-144.500	0.500	P24x0.375	A36 (36 ksi)	
L9	144.500-144.250	0.250	P24x0.675	A36 (36 ksi)	
L10	144.250-140.000	4.250	P24x0.675	A36 (36 ksi)	
L11	140.000-139.750	0.250	P36x0.5	A36 (36 ksi)	
L12	139.750-134.750	5.000	P36x0.5	A36 (36 ksi)	
L13	134.750-129.750	5.000	P36x0.5	A36 (36 ksi)	
L14	129.750-124.750	5.000	P36x0.5	A36 (36 ksi)	
L15	124.750-119.750	5.000	P36x0.5	A36 (36 ksi)	
L16	119.750-114.750	5.000	P36x0.5	A36 (36 ksi)	
L17	114.750-109.750	5.000	P36x0.5	A36 (36 ksi)	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L18	109.750-105.500	4.250	P36x0.5	A36 (36 ksi)	
L19	105.500-105.250	0.250	P36x0.7625	A36 (36 ksi)	
L20	105.250-100.250	5.000	P36x0.7625	A36 (36 ksi)	
L21	100.250-100.000	0.250	P36x0.7625	A36 (36 ksi)	
L22	100.000-99.750	0.250	P42x0.5	A36 (36 ksi)	
L23	99.750-94.750	5.000	P42x0.5	A36 (36 ksi)	
L24	94.750-89.750	5.000	P42x0.5	A36 (36 ksi)	
L25	89.750-86.250	3.500	P42x0.5	A36 (36 ksi)	
L26	86.250-86.000	0.250	P42x0.725	A36 (36 ksi)	
L27	86.000-81.000	5.000	P42x0.725	A36 (36 ksi)	
L28	81.000-77.750	3.250	P42x0.725	A36 (36 ksi)	
L29	77.750-77.500	0.250	P42x0.9125	A36 (36 ksi)	
L30	77.500-72.500	5.000	P42x0.9125	A36 (36 ksi)	
L31	72.500-67.500	5.000	P42x0.9125	A36 (36 ksi)	
L32	67.500-62.500	5.000	P42x0.9125	A36 (36 ksi)	
L33	62.500-60.000	2.500	P42x0.9125	A36 (36 ksi)	
L34	60.000-59.750	0.250	P48x0.625	A36 (36 ksi)	
L35	59.750-54.750	5.000	P48x0.625	A36 (36 ksi)	
L36	54.750-49.750	5.000	P48x0.625	A36 (36 ksi)	
L37	49.750-46.250	3.500	P48x0.625	A36 (36 ksi)	
L38	46.250-46.000	0.250	P48x0.825	A36 (36 ksi)	
L39	46.000-41.000	5.000	P48x0.825	A36 (36 ksi)	
L40	41.000-36.000	5.000	P48x0.825	A36 (36 ksi)	
L41	36.000-32.750	3.250	P48x0.825	A36 (36 ksi)	
L42	32.750-32.500	0.250	P48x0.975	A36 (36 ksi)	
L43	32.500-27.500	5.000	P48x0.975	A36 (36 ksi)	
L44	27.500-22.500	5.000	P48x0.975	A36 (36 ksi)	
L45	22.500-20.000	2.500	P48x0.975	A36 (36 ksi)	
L46	20.000-19.750	0.250	P54x0.625	A36 (36 ksi)	
L47	19.750-14.750	5.000	P54x0.625	A36 (36 ksi)	
L48	14.750-11.750	3.000	P54x0.625	A36 (36 ksi)	
L49	11.750-11.500	0.250	P54x0.8	A36 (36 ksi)	
L50	11.500-9.000	2.500	P54x0.8	A36 (36 ksi)	
L51	9.000-8.750	0.250	P54x0.8875	A36 (36 ksi)	
L52	8.750-4.500	4.250	P54x0.8875	A36	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L53	4.500-4.250	0.250	P54x0.95	(36 ksi) A36	
L54	4.250-1.500	2.750	P54x0.95	(36 ksi) A36	
L55	1.500-1.250	0.250	P54x0.8625	(36 ksi) A36	
L56	1.250-0.000	1.250	P54x0.8625	(36 ksi) A36	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _r	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
L1 180.000-175.000				1	1	1			
L2 175.000-170.000				1	1	1			
L3 170.000-165.000				1	1	1			
L4 165.000-160.000				1	1	1			
L5 160.000-155.000				1	1	1			
L6 155.000-150.000				1	1	1			
L7 150.000-145.000				1	1	1			
L8 145.000-144.500				1	1	1			
L9 144.500-144.250				1	1	0.926614			
L10 144.250-140.000				1	1	0.926614			
L11 140.000-139.750				1	1	1			
L12 139.750-134.750				1	1	1			
L13 134.750-129.750				1	1	1			
L14 129.750-124.750				1	1	1			
L15 124.750-119.750				1	1	1			
L16 119.750-114.750				1	1	1			
L17 114.750-109.750				1	1	1			
L18 109.750-105.500				1	1	1			
L19 105.500-105.250				1	1	0.949391			
L20 105.250-100.250				1	1	0.949391			
L21 100.250-100.000				1	1	0.949391			
L22 100.000-99.750				1	1	1			
L23 99.750-94.750				1	1	1			
L24 94.750-89.750				1	1	1			
L25 89.750-86.250				1	1	1			
L26 86.250-86.000				1	1	1.03247			

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	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
ft	ft ²	in							
L27 86.000-81.000				1	1	1.03247			
L28 81.000-77.750				1	1	1.03247			
L29 77.750-77.500				1	1	1.03101			
L30 77.500-72.500				1	1	1.03101			
L31 72.500-67.500				1	1	1.03101			
L32 67.500-62.500				1	1	1.03101			
L33 62.500-60.000				1	1	1.03101			
L34 60.000-59.750				1	1	1			
L35 59.750-54.750				1	1	1			
L36 54.750-49.750				1	1	1			
L37 49.750-46.250				1	1	1			
L38 46.250-46.000				1	1	1.02148			
L39 46.000-41.000				1	1	1.02148			
L40 41.000-36.000				1	1	1.02148			
L41 36.000-32.750				1	1	1.02148			
L42 32.750-32.500				1	1	1.03631			
L43 32.500-27.500				1	1	1.03631			
L44 27.500-22.500				1	1	1.03631			
L45 22.500-20.000				1	1	1.03631			
L46 20.000-19.750				1	1	1			
L47 19.750-14.750				1	1	1			
L48 14.750-11.750				1	1	1			
L49 11.750-11.500				1	1	1.02222			
L50 11.500-9.000				1	1	1.02222			
L51 9.000-8.750				1	1	1.01411			
L52 8.750-4.500				1	1	1.01411			
L53 4.500-4.250				1	1	0.936671			
L54 4.250-1.500				1	1	0.936671			
L55 1.500-1.250				1	1	0.936235			
L56 1.250-0.000				1	1	0.936235			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
FB-L98B-034-XXX(3/8)	B	Surface Ar (CaAa)	162.000 - 8.000	1	1	-0.400 -0.400	0.394		0.000
WR-VG82ST-BRDA(5/8")	B	Surface Ar (CaAa)	162.000 - 8.000	2	2	-0.450 -0.430	0.645		0.000
Misc									
Safety Line 5/8	B	Surface Ar (CaAa)	180.000 - 8.000	1	1	0.000 0.000	0.880		0.000
Reinforcement									
Flat Plate 4.5" x 1" (Rev G)	A	Surface Af (CaAa)	10.500 - 0.500	1	1	0.000 0.000	4.500	11.000	0.000
Flat Plate 4.5" x 1" (Rev G)	B	Surface Af (CaAa)	10.500 - 0.500	1	1	0.000 0.000	4.500	11.000	0.000
Flat Plate 4.5" x 1" (Rev G)	C	Surface Af (CaAa)	10.500 - 0.500	1	1	0.000 0.000	4.500	11.000	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	25.500 - 13.500	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	25.500 - 13.500	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	25.500 - 13.500	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 6.5" x 1.25" (Rev G)	A	Surface Af (CaAa)	35.500 - 20.000	1	1	0.000 0.000	6.500	15.500	0.000
Flat Plate 6.5" x 1.25" (Rev G)	B	Surface Af (CaAa)	35.500 - 20.000	1	1	0.000 0.000	6.500	15.500	0.000
Flat Plate 6.5" x 1.25" (Rev G)	C	Surface Af (CaAa)	35.500 - 20.000	1	1	0.000 0.000	6.500	15.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	65.900 - 53.900	1	1	0.200 0.300	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	65.900 - 53.900	1	1	0.200 0.300	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	65.900 - 53.900	1	1	0.200 0.300	8.500	19.500	0.000
Flat Plate 6.5" x 1.25" (Rev G)	A	Surface Af (CaAa)	80.500 - 60.000	1	1	0.000 0.000	6.500	15.500	0.000
Flat Plate 6.5" x 1.25" (Rev G)	B	Surface Af (CaAa)	80.500 - 60.000	1	1	0.000 0.000	6.500	15.500	0.000
Flat Plate 6.5" x 1.25" (Rev G)	C	Surface Af (CaAa)	80.500 - 60.000	1	1	0.000 0.000	6.500	15.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	15.500 - 0.500	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	15.500 - 0.500	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	15.500 - 0.500	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	50.000 - 20.000	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	50.000 - 20.000	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	50.000 - 20.000	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	90.000 - 60.000	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	90.000 - 60.000	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	90.000 - 60.000	1	1	0.300 0.400	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	108.250 - 100.000	1	1	0.000 0.000	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	108.250 - 100.000	1	1	0.000 0.000	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	108.250 - 100.000	1	1	0.000 0.000	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	A	Surface Af (CaAa)	146.500 - 140.000	1	1	0.000 0.000	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	B	Surface Af (CaAa)	146.500 - 140.000	1	1	0.000 0.000	8.500	19.500	0.000
Flat Plate 8.5" x 1.25" (Rev. G)	C	Surface Af (CaAa)	146.500 - 140.000	1	1	0.000 0.000	8.500	19.500	0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight kif
<i>*Level 177*</i>								
HB114-1-08U4-M5J(1 1/4")	C	No	Inside Pole	177.000 - 8.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
<i>*Level 171*</i>								
<i>*Level 162P*</i>								
LDF7-50A(1-5/8)	B	No	Inside Pole	162.000 - 8.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
FB-L98B-034-XXX(3/8)	B	No	Inside Pole	162.000 - 8.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
WR-VG82ST-BRDA(5/8")	B	No	Inside Pole	162.000 - 8.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
<i>*Level 161*</i>								
<i>*Level 110P*</i>								
HB158-1-08U8-S8J18(1-5/8)	C	No	Inside Pole	110.000 - 8.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001

Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	180.000-175.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.440	0.000	0.002
		C	0.000	0.000	0.000	0.000	0.006
L2	175.000-170.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.440	0.000	0.002
		C	0.000	0.000	0.000	0.000	0.016
L3	170.000-165.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.440	0.000	0.002
		C	0.000	0.000	0.000	0.000	0.016
L4	165.000-160.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.777	0.000	0.024
		C	0.000	0.000	0.000	0.000	0.016
L5	160.000-155.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
		C	0.000	0.000	0.000	0.000	0.016
L6	155.000-150.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
		C	0.000	0.000	0.000	0.000	0.016
L7	150.000-145.000	A	0.000	0.000	2.125	0.000	0.000
		B	0.000	0.000	3.407	0.000	0.058
		C	0.000	0.000	2.125	0.000	0.016
L8	145.000-144.500	A	0.000	0.000	0.708	0.000	0.000
		B	0.000	0.000	0.837	0.000	0.006
		C	0.000	0.000	0.708	0.000	0.002
L9	144.500-144.250	A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
		C	0.000	0.000	0.354	0.000	0.001
L10	144.250-140.000	A	0.000	0.000	6.021	0.000	0.000
		B	0.000	0.000	7.110	0.000	0.049
		C	0.000	0.000	6.021	0.000	0.014
L11	140.000-139.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.064	0.000	0.003
		C	0.000	0.000	0.000	0.000	0.001
L12	139.750-134.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L13	134.750-129.750	C	0.000	0.000	0.000	0.000	0.016
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
L14	129.750-124.750	C	0.000	0.000	0.000	0.000	0.016
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
L15	124.750-119.750	C	0.000	0.000	0.000	0.000	0.016
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
L16	119.750-114.750	C	0.000	0.000	0.000	0.000	0.016
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
L17	114.750-109.750	C	0.000	0.000	0.000	0.000	0.016
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
L18	109.750-105.500	C	0.000	0.000	0.000	0.000	0.017
		A	0.000	0.000	3.896	0.000	0.000
		B	0.000	0.000	4.985	0.000	0.049
L19	105.500-105.250	C	0.000	0.000	3.896	0.000	0.025
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L20	105.250-100.250	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	8.365	0.000	0.058
L21	100.250-100.000	C	0.000	0.000	7.083	0.000	0.029
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L22	100.000-99.750	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.064	0.000	0.003
L23	99.750-94.750	C	0.000	0.000	0.000	0.000	0.001
		A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.282	0.000	0.058
L24	94.750-89.750	C	0.000	0.000	0.000	0.000	0.029
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	1.636	0.000	0.058
L25	89.750-86.250	C	0.000	0.000	0.354	0.000	0.029
		A	0.000	0.000	4.958	0.000	0.000
		B	0.000	0.000	5.856	0.000	0.041
L26	86.250-86.000	C	0.000	0.000	4.958	0.000	0.020
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L27	86.000-81.000	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	8.365	0.000	0.058
L28	81.000-77.750	C	0.000	0.000	7.083	0.000	0.029
		A	0.000	0.000	7.583	0.000	0.000
		B	0.000	0.000	8.417	0.000	0.038
L29	77.750-77.500	C	0.000	0.000	7.583	0.000	0.019
		A	0.000	0.000	0.625	0.000	0.000
		B	0.000	0.000	0.689	0.000	0.003
L30	77.500-72.500	C	0.000	0.000	0.625	0.000	0.001
		A	0.000	0.000	12.500	0.000	0.000
		B	0.000	0.000	13.782	0.000	0.058
L31	72.500-67.500	C	0.000	0.000	12.500	0.000	0.029
		A	0.000	0.000	12.500	0.000	0.000
		B	0.000	0.000	13.782	0.000	0.058
L32	67.500-62.500	C	0.000	0.000	12.500	0.000	0.029
		A	0.000	0.000	17.317	0.000	0.000
		B	0.000	0.000	18.599	0.000	0.058
L33	62.500-60.000	C	0.000	0.000	17.317	0.000	0.029
		A	0.000	0.000	9.792	0.000	0.000
		B	0.000	0.000	10.433	0.000	0.029
L34	60.000-59.750	C	0.000	0.000	9.792	0.000	0.015
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L35	59.750-54.750	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	8.365	0.000	0.058

Tower Section	Tower Elevation	Face	A _R	A _F	C _{AA} In Face	C _{AA} Out Face	Weight
n	ft		ft ²	ft ²	ft ²	ft ²	K
L36	54.750-49.750	C	0.000	0.000	7.083	0.000	0.029
		A	0.000	0.000	1.558	0.000	0.000
		B	0.000	0.000	2.840	0.000	0.058
L37	49.750-46.250	C	0.000	0.000	1.558	0.000	0.029
		A	0.000	0.000	4.958	0.000	0.000
		B	0.000	0.000	5.856	0.000	0.041
L38	46.250-46.000	C	0.000	0.000	4.958	0.000	0.020
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L39	46.000-41.000	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	8.365	0.000	0.058
L40	41.000-36.000	C	0.000	0.000	7.083	0.000	0.029
		A	0.000	0.000	7.083	0.000	0.000
		B	0.000	0.000	8.365	0.000	0.058
L41	36.000-32.750	C	0.000	0.000	7.083	0.000	0.029
		A	0.000	0.000	7.583	0.000	0.000
		B	0.000	0.000	8.417	0.000	0.038
L42	32.750-32.500	C	0.000	0.000	7.583	0.000	0.019
		A	0.000	0.000	0.625	0.000	0.000
		B	0.000	0.000	0.689	0.000	0.003
L43	32.500-27.500	C	0.000	0.000	0.625	0.000	0.001
		A	0.000	0.000	12.500	0.000	0.000
		B	0.000	0.000	13.782	0.000	0.058
L44	27.500-22.500	C	0.000	0.000	12.500	0.000	0.029
		A	0.000	0.000	16.750	0.000	0.000
		B	0.000	0.000	18.032	0.000	0.058
L45	22.500-20.000	C	0.000	0.000	16.750	0.000	0.029
		A	0.000	0.000	9.792	0.000	0.000
		B	0.000	0.000	10.433	0.000	0.029
L46	20.000-19.750	C	0.000	0.000	9.792	0.000	0.015
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L47	19.750-14.750	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	8.146	0.000	0.000
		B	0.000	0.000	9.428	0.000	0.058
L48	14.750-11.750	C	0.000	0.000	8.146	0.000	0.029
		A	0.000	0.000	6.021	0.000	0.000
		B	0.000	0.000	6.790	0.000	0.035
L49	11.750-11.500	C	0.000	0.000	6.021	0.000	0.018
		A	0.000	0.000	0.354	0.000	0.000
		B	0.000	0.000	0.418	0.000	0.003
L50	11.500-9.000	C	0.000	0.000	0.354	0.000	0.001
		A	0.000	0.000	4.667	0.000	0.000
		B	0.000	0.000	5.308	0.000	0.029
L51	9.000-8.750	C	0.000	0.000	4.667	0.000	0.015
		A	0.000	0.000	0.542	0.000	0.000
		B	0.000	0.000	0.606	0.000	0.003
L52	8.750-4.500	C	0.000	0.000	0.542	0.000	0.001
		A	0.000	0.000	9.208	0.000	0.000
		B	0.000	0.000	9.401	0.000	0.009
L53	4.500-4.250	C	0.000	0.000	9.208	0.000	0.004
		A	0.000	0.000	0.542	0.000	0.000
		B	0.000	0.000	0.542	0.000	0.000
L54	4.250-1.500	C	0.000	0.000	0.542	0.000	0.000
		A	0.000	0.000	5.958	0.000	0.000
		B	0.000	0.000	5.958	0.000	0.000
L55	1.500-1.250	C	0.000	0.000	5.958	0.000	0.000
		A	0.000	0.000	0.542	0.000	0.000
		B	0.000	0.000	0.542	0.000	0.000
L56	1.250-0.000	C	0.000	0.000	0.542	0.000	0.000
		A	0.000	0.000	1.625	0.000	0.000
		B	0.000	0.000	1.625	0.000	0.000
		C	0.000	0.000	1.625	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{AA} In Face ft ²	C_{AA} Out Face ft ²	Weight K
L1	180.000-175.000	A	2.366	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	2.806	0.000	0.049
		C		0.000	0.000	0.000	0.000	0.006
L2	175.000-170.000	A	2.360	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	2.800	0.000	0.049
		C		0.000	0.000	0.000	0.000	0.016
L3	170.000-165.000	A	2.353	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	2.793	0.000	0.048
		C		0.000	0.000	0.000	0.000	0.016
L4	165.000-160.000	A	2.346	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	5.298	0.000	0.106
		C		0.000	0.000	0.000	0.000	0.016
L5	160.000-155.000	A	2.338	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	9.043	0.000	0.192
		C		0.000	0.000	0.000	0.000	0.016
L6	155.000-150.000	A	2.331	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	9.018	0.000	0.191
		C		0.000	0.000	0.000	0.000	0.016
L7	150.000-145.000	A	2.323	0.000	0.000	1.943	0.000	0.038
		B		0.000	0.000	10.936	0.000	0.228
		C		0.000	0.000	1.943	0.000	0.055
L8	145.000-144.500	A	2.319	0.000	0.000	0.647	0.000	0.013
		B		0.000	0.000	1.545	0.000	0.032
		C		0.000	0.000	0.647	0.000	0.014
L9	144.500-144.250	A	2.318	0.000	0.000	0.324	0.000	0.006
		B		0.000	0.000	0.772	0.000	0.016
		C		0.000	0.000	0.324	0.000	0.007
L10	144.250-140.000	A	2.314	0.000	0.000	5.500	0.000	0.108
		B		0.000	0.000	13.120	0.000	0.269
		C		0.000	0.000	5.500	0.000	0.122
L11	140.000-139.750	A	2.311	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.448	0.000	0.009
		C		0.000	0.000	0.000	0.000	0.001
L12	139.750-134.750	A	2.306	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.939	0.000	0.188
		C		0.000	0.000	0.000	0.000	0.016
L13	134.750-129.750	A	2.298	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.911	0.000	0.188
		C		0.000	0.000	0.000	0.000	0.016
L14	129.750-124.750	A	2.289	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.882	0.000	0.187
		C		0.000	0.000	0.000	0.000	0.016
L15	124.750-119.750	A	2.280	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.853	0.000	0.186
		C		0.000	0.000	0.000	0.000	0.016
L16	119.750-114.750	A	2.270	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.822	0.000	0.185
		C		0.000	0.000	0.000	0.000	0.016
L17	114.750-109.750	A	2.260	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.790	0.000	0.184
		C		0.000	0.000	0.000	0.000	0.017
L18	109.750-105.500	A	2.251	0.000	0.000	3.696	0.000	0.067
		B		0.000	0.000	11.141	0.000	0.223
		C		0.000	0.000	3.696	0.000	0.092
L19	105.500-105.250	A	2.246	0.000	0.000	0.336	0.000	0.006
		B		0.000	0.000	0.773	0.000	0.015
		C		0.000	0.000	0.336	0.000	0.008
L20	105.250-100.250	A	2.241	0.000	0.000	6.714	0.000	0.122
		B		0.000	0.000	15.439	0.000	0.304
		C		0.000	0.000	6.714	0.000	0.151
L21	100.250-100.000	A	2.235	0.000	0.000	0.336	0.000	0.006
		B		0.000	0.000	0.771	0.000	0.015
		C		0.000	0.000	0.336	0.000	0.008
L22	100.000-99.750	A	2.234	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.435	0.000	0.009
		C		0.000	0.000	0.000	0.000	0.001
L23	99.750-94.750	A	2.228	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	8.685	0.000	0.181

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L24	94.750-89.750	C		0.000	0.000	0.000	0.000	0.029
		A	2.217	0.000	0.000	0.465	0.000	0.006
		B		0.000	0.000	9.112	0.000	0.186
		C		0.000	0.000	0.465	0.000	0.035
L25	89.750-86.250	A	2.206	0.000	0.000	6.503	0.000	0.084
		B		0.000	0.000	12.532	0.000	0.209
		C		0.000	0.000	6.503	0.000	0.104
L26	86.250-86.000	A	2.201	0.000	0.000	0.464	0.000	0.006
		B		0.000	0.000	0.894	0.000	0.015
		C		0.000	0.000	0.464	0.000	0.007
L27	86.000-81.000	A	2.195	0.000	0.000	9.278	0.000	0.119
		B		0.000	0.000	17.853	0.000	0.296
		C		0.000	0.000	9.278	0.000	0.148
L28	81.000-77.750	A	2.183	0.000	0.000	10.160	0.000	0.132
		B		0.000	0.000	15.710	0.000	0.247
		C		0.000	0.000	10.160	0.000	0.151
L29	77.750-77.500	A	2.179	0.000	0.000	0.839	0.000	0.011
		B		0.000	0.000	1.265	0.000	0.020
		C		0.000	0.000	0.839	0.000	0.012
L30	77.500-72.500	A	2.171	0.000	0.000	16.765	0.000	0.217
		B		0.000	0.000	25.265	0.000	0.393
		C		0.000	0.000	16.765	0.000	0.246
L31	72.500-67.500	A	2.156	0.000	0.000	16.739	0.000	0.215
		B		0.000	0.000	25.189	0.000	0.389
		C		0.000	0.000	16.739	0.000	0.244
L32	67.500-62.500	A	2.140	0.000	0.000	21.652	0.000	0.291
		B		0.000	0.000	30.051	0.000	0.464
		C		0.000	0.000	21.652	0.000	0.320
L33	62.500-60.000	A	2.128	0.000	0.000	11.974	0.000	0.163
		B		0.000	0.000	16.153	0.000	0.248
		C		0.000	0.000	11.974	0.000	0.177
L34	60.000-59.750	A	2.123	0.000	0.000	0.363	0.000	0.006
		B		0.000	0.000	0.780	0.000	0.014
		C		0.000	0.000	0.363	0.000	0.007
L35	59.750-54.750	A	2.113	0.000	0.000	7.254	0.000	0.113
		B		0.000	0.000	15.565	0.000	0.283
		C		0.000	0.000	7.254	0.000	0.142
L36	54.750-49.750	A	2.094	0.000	0.000	1.690	0.000	0.025
		B		0.000	0.000	9.939	0.000	0.193
		C		0.000	0.000	1.690	0.000	0.054
L37	49.750-46.250	A	2.076	0.000	0.000	6.412	0.000	0.077
		B		0.000	0.000	12.146	0.000	0.194
		C		0.000	0.000	6.412	0.000	0.098
L38	46.250-46.000	A	2.068	0.000	0.000	0.458	0.000	0.005
		B		0.000	0.000	0.866	0.000	0.014
		C		0.000	0.000	0.458	0.000	0.007
L39	46.000-41.000	A	2.056	0.000	0.000	9.139	0.000	0.109
		B		0.000	0.000	17.265	0.000	0.274
		C		0.000	0.000	9.139	0.000	0.138
L40	41.000-36.000	A	2.031	0.000	0.000	9.114	0.000	0.107
		B		0.000	0.000	17.158	0.000	0.270
		C		0.000	0.000	9.114	0.000	0.137
L41	36.000-32.750	A	2.008	0.000	0.000	9.631	0.000	0.118
		B		0.000	0.000	14.811	0.000	0.223
		C		0.000	0.000	9.631	0.000	0.137
L42	32.750-32.500	A	1.998	0.000	0.000	0.792	0.000	0.010
		B		0.000	0.000	1.189	0.000	0.018
		C		0.000	0.000	0.792	0.000	0.011
L43	32.500-27.500	A	1.981	0.000	0.000	15.817	0.000	0.193
		B		0.000	0.000	23.698	0.000	0.351
		C		0.000	0.000	15.817	0.000	0.222
L44	27.500-22.500	A	1.945	0.000	0.000	20.064	0.000	0.249
		B		0.000	0.000	27.829	0.000	0.404
		C		0.000	0.000	20.064	0.000	0.278
L45	22.500-20.000	A	1.914	0.000	0.000	11.433	0.000	0.142
		B		0.000	0.000	15.265	0.000	0.218
		C		0.000	0.000	11.433	0.000	0.156
L46	20.000-19.750	A	1.901	0.000	0.000	0.357	0.000	0.005
		B		0.000	0.000	0.738	0.000	0.013

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L47	19.750-14.750	C		0.000	0.000	0.357	0.000	0.006
		A	1.874	0.000	0.000	8.272	0.000	0.111
		B		0.000	0.000	15.807	0.000	0.261
L48	14.750-11.750	C		0.000	0.000	8.272	0.000	0.141
		A	1.826	0.000	0.000	6.332	0.000	0.080
		B		0.000	0.000	10.758	0.000	0.167
		C		0.000	0.000	6.332	0.000	0.097
L49	11.750-11.500	A	1.802	0.000	0.000	0.379	0.000	0.005
		B		0.000	0.000	0.744	0.000	0.012
		C		0.000	0.000	0.379	0.000	0.006
L50	11.500-9.000	A	1.779	0.000	0.000	5.213	0.000	0.064
		B		0.000	0.000	8.826	0.000	0.135
		C		0.000	0.000	5.213	0.000	0.078
L51	9.000-8.750	A	1.754	0.000	0.000	0.615	0.000	0.007
		B		0.000	0.000	0.972	0.000	0.014
		C		0.000	0.000	0.615	0.000	0.009
L52	8.750-4.500	A	1.703	0.000	0.000	10.415	0.000	0.122
		B		0.000	0.000	11.462	0.000	0.142
		C		0.000	0.000	10.415	0.000	0.127
L53	4.500-4.250	A	1.634	0.000	0.000	0.609	0.000	0.007
		B		0.000	0.000	0.609	0.000	0.007
		C		0.000	0.000	0.609	0.000	0.007
L54	4.250-1.500	A	1.567	0.000	0.000	6.663	0.000	0.071
		B		0.000	0.000	6.663	0.000	0.071
		C		0.000	0.000	6.663	0.000	0.071
L55	1.500-1.250	A	1.455	0.000	0.000	0.600	0.000	0.006
		B		0.000	0.000	0.600	0.000	0.006
		C		0.000	0.000	0.600	0.000	0.006
L56	1.250-0.000	A	1.345	0.000	0.000	1.784	0.000	0.016
		B		0.000	0.000	1.784	0.000	0.016
		C		0.000	0.000	1.784	0.000	0.016

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	180.000-175.000	0.114	-0.066	0.511	-0.295
L2	175.000-170.000	0.114	-0.066	0.511	-0.295
L3	170.000-165.000	0.114	-0.066	0.510	-0.294
L4	165.000-160.000	0.124	-0.158	0.469	-0.642
L5	160.000-155.000	0.138	-0.287	0.433	-0.957
L6	155.000-150.000	0.138	-0.287	0.433	-0.956
L7	150.000-145.000	0.088	-0.184	0.348	-0.770
L8	145.000-144.500	0.048	-0.100	0.240	-0.530
L9	144.500-144.250	0.048	-0.100	0.240	-0.530
L10	144.250-140.000	0.048	-0.100	0.239	-0.529
L11	140.000-139.750	0.142	-0.296	0.531	-1.175
L12	139.750-134.750	0.142	-0.296	0.530	-1.175
L13	134.750-129.750	0.142	-0.296	0.529	-1.173
L14	129.750-124.750	0.142	-0.296	0.528	-1.171
L15	124.750-119.750	0.142	-0.296	0.527	-1.169
L16	119.750-114.750	0.142	-0.296	0.527	-1.167
L17	114.750-109.750	0.142	-0.296	0.526	-1.165
L18	109.750-105.500	0.077	-0.161	0.361	-0.801
L19	105.500-105.250	0.062	-0.128	0.309	-0.684
L20	105.250-100.250	0.062	-0.128	0.308	-0.683
L21	100.250-100.000	0.062	-0.128	0.308	-0.682
L22	100.000-99.750	0.143	-0.299	0.560	-1.241
L23	99.750-94.750	0.143	-0.299	0.559	-1.240
L24	94.750-89.750	0.136	-0.283	0.534	-1.184
L25	89.750-86.250	0.067	-0.140	0.294	-0.651
L26	86.250-86.000	0.067	-0.140	0.293	-0.650
L27	86.000-81.000	0.067	-0.140	0.293	-0.649
L28	81.000-77.750	0.050	-0.104	0.220	-0.489

Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
L29	77.750-77.500	0.048	-0.100	0.211	-0.467
L30	77.500-72.500	0.048	-0.100	0.210	-0.466
L31	72.500-67.500	0.048	-0.100	0.210	-0.465
L32	67.500-62.500	0.038	-0.079	0.176	-0.391
L33	62.500-60.000	0.035	-0.072	0.164	-0.363
L34	60.000-59.750	0.072	-0.150	0.348	-0.772
L35	59.750-54.750	0.072	-0.150	0.347	-0.770
L36	54.750-49.750	0.118	-0.247	0.496	-1.102
L37	49.750-46.250	0.072	-0.150	0.311	-0.690
L38	46.250-46.000	0.072	-0.150	0.310	-0.688
L39	46.000-41.000	0.072	-0.150	0.309	-0.686
L40	41.000-36.000	0.072	-0.150	0.307	-0.682
L41	36.000-32.750	0.055	-0.114	0.237	-0.526
L42	32.750-32.500	0.052	-0.109	0.227	-0.504
L43	32.500-27.500	0.052	-0.109	0.226	-0.502
L44	27.500-22.500	0.043	-0.089	0.192	-0.427
L45	22.500-20.000	0.038	-0.080	0.174	-0.387
L46	20.000-19.750	0.076	-0.160	0.351	-0.779
L47	19.750-14.750	0.071	-0.149	0.327	-0.728
L48	14.750-11.750	0.064	-0.133	0.288	-0.641
L49	11.750-11.500	0.076	-0.160	0.331	-0.736
L50	11.500-9.000	0.067	-0.139	0.285	-0.634
L51	9.000-8.750	0.061	-0.128	0.260	-0.578
L52	8.750-4.500	0.011	-0.023	0.051	-0.113
L53	4.500-4.250	0.000	0.000	0.000	0.000
L54	4.250-1.500	0.000	0.000	0.000	0.000
L55	1.500-1.250	0.000	0.000	0.000	0.000
L56	1.250-0.000	0.000	0.000	0.000	0.000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	18	Safety Line 5/8	175.00 - 180.00	1.0000	1.0000
L2	18	Safety Line 5/8	170.00 - 175.00	1.0000	1.0000
L3	18	Safety Line 5/8	165.00 - 170.00	1.0000	1.0000
L4	8	FB-L98B-034-XXX(3/8)	160.00 - 162.00	1.0000	1.0000
L4	10	WR-VG82ST-BRDA(5/8")	160.00 - 162.00	1.0000	1.0000
L4	18	Safety Line 5/8	160.00 - 165.00	1.0000	1.0000
L5	8	FB-L98B-034-XXX(3/8)	155.00 - 160.00	1.0000	1.0000
L5	10	WR-VG82ST-BRDA(5/8")	155.00 - 160.00	1.0000	1.0000
L5	18	Safety Line 5/8	155.00 - 160.00	1.0000	1.0000
L6	8	FB-L98B-034-XXX(3/8)	150.00 - 155.00	1.0000	1.0000
L6	10	WR-VG82ST-BRDA(5/8")	150.00 - 155.00	1.0000	1.0000
L6	18	Safety Line 5/8	150.00 - 155.00	1.0000	1.0000
L7	8	FB-L98B-034-XXX(3/8)	145.00 - 150.00	1.0000	1.0000
L7	10	WR-VG82ST-BRDA(5/8")	145.00 - 150.00	1.0000	1.0000
L7	18	Safety Line 5/8	145.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			150.00		
L7	47	Flat Plate 8.5" x 1.25" (Rev. G)	145.00 - 146.50	1.0000	1.0000
L7	48	Flat Plate 8.5" x 1.25" (Rev. G)	145.00 - 146.50	1.0000	1.0000
L7	49	Flat Plate 8.5" x 1.25" (Rev. G)	145.00 - 146.50	1.0000	1.0000
L8	8	FB-L98B-034-XXX(3/8)	144.50 - 145.00	1.0000	1.0000
L8	10	WR-VG82ST-BRDA(5/8")	144.50 - 145.00	1.0000	1.0000
L8	18	Safety Line 5/8	144.50 - 145.00	1.0000	1.0000
L8	47	Flat Plate 8.5" x 1.25" (Rev. G)	144.50 - 145.00	1.0000	1.0000
L8	48	Flat Plate 8.5" x 1.25" (Rev. G)	144.50 - 145.00	1.0000	1.0000
L8	49	Flat Plate 8.5" x 1.25" (Rev. G)	144.50 - 145.00	1.0000	1.0000
L9	8	FB-L98B-034-XXX(3/8)	144.25 - 144.50	1.0000	1.0000
L9	10	WR-VG82ST-BRDA(5/8")	144.25 - 144.50	1.0000	1.0000
L9	18	Safety Line 5/8	144.25 - 144.50	1.0000	1.0000
L9	47	Flat Plate 8.5" x 1.25" (Rev. G)	144.25 - 144.50	1.0000	1.0000
L9	48	Flat Plate 8.5" x 1.25" (Rev. G)	144.25 - 144.50	1.0000	1.0000
L9	49	Flat Plate 8.5" x 1.25" (Rev. G)	144.25 - 144.50	1.0000	1.0000
L10	8	FB-L98B-034-XXX(3/8)	140.00 - 144.25	1.0000	1.0000
L10	10	WR-VG82ST-BRDA(5/8")	140.00 - 144.25	1.0000	1.0000
L10	18	Safety Line 5/8	140.00 - 144.25	1.0000	1.0000
L10	47	Flat Plate 8.5" x 1.25" (Rev. G)	140.00 - 144.25	1.0000	1.0000
L10	48	Flat Plate 8.5" x 1.25" (Rev. G)	140.00 - 144.25	1.0000	1.0000
L10	49	Flat Plate 8.5" x 1.25" (Rev. G)	140.00 - 144.25	1.0000	1.0000
L11	8	FB-L98B-034-XXX(3/8)	139.75 - 140.00	1.0000	1.0000
L11	10	WR-VG82ST-BRDA(5/8")	139.75 - 140.00	1.0000	1.0000
L11	18	Safety Line 5/8	139.75 - 140.00	1.0000	1.0000
L12	8	FB-L98B-034-XXX(3/8)	134.75 - 139.75	1.0000	1.0000
L12	10	WR-VG82ST-BRDA(5/8")	134.75 - 139.75	1.0000	1.0000
L12	18	Safety Line 5/8	134.75 - 139.75	1.0000	1.0000
L13	8	FB-L98B-034-XXX(3/8)	129.75 - 134.75	1.0000	1.0000
L13	10	WR-VG82ST-BRDA(5/8")	129.75 - 134.75	1.0000	1.0000
L13	18	Safety Line 5/8	129.75 - 134.75	1.0000	1.0000
L14	8	FB-L98B-034-XXX(3/8)	124.75 - 129.75	1.0000	1.0000
L14	10	WR-VG82ST-BRDA(5/8")	124.75 - 129.75	1.0000	1.0000
L14	18	Safety Line 5/8	124.75 - 129.75	1.0000	1.0000
L15	8	FB-L98B-034-XXX(3/8)	119.75 - 124.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L15	10	WR-VG82ST-BRDA(5/8")	119.75 - 124.75	1.0000	1.0000
L15	18	Safety Line 5/8	119.75 - 124.75	1.0000	1.0000
L16	8	FB-L98B-034-XXX(3/8)	114.75 - 119.75	1.0000	1.0000
L16	10	WR-VG82ST-BRDA(5/8")	114.75 - 119.75	1.0000	1.0000
L16	18	Safety Line 5/8	114.75 - 119.75	1.0000	1.0000
L17	8	FB-L98B-034-XXX(3/8)	109.75 - 114.75	1.0000	1.0000
L17	10	WR-VG82ST-BRDA(5/8")	109.75 - 114.75	1.0000	1.0000
L17	18	Safety Line 5/8	109.75 - 114.75	1.0000	1.0000
L18	8	FB-L98B-034-XXX(3/8)	105.50 - 109.75	1.0000	1.0000
L18	10	WR-VG82ST-BRDA(5/8")	105.50 - 109.75	1.0000	1.0000
L18	18	Safety Line 5/8	105.50 - 109.75	1.0000	1.0000
L18	44	Flat Plate 8.5" x 1.25" (Rev. G)	105.50 - 108.25	1.0000	1.0000
L18	45	Flat Plate 8.5" x 1.25" (Rev. G)	105.50 - 108.25	1.0000	1.0000
L18	46	Flat Plate 8.5" x 1.25" (Rev. G)	105.50 - 108.25	1.0000	1.0000
L19	8	FB-L98B-034-XXX(3/8)	105.25 - 105.50	1.0000	1.0000
L19	10	WR-VG82ST-BRDA(5/8")	105.25 - 105.50	1.0000	1.0000
L19	18	Safety Line 5/8	105.25 - 105.50	1.0000	1.0000
L19	44	Flat Plate 8.5" x 1.25" (Rev. G)	105.25 - 105.50	1.0000	1.0000
L19	45	Flat Plate 8.5" x 1.25" (Rev. G)	105.25 - 105.50	1.0000	1.0000
L19	46	Flat Plate 8.5" x 1.25" (Rev. G)	105.25 - 105.50	1.0000	1.0000
L20	8	FB-L98B-034-XXX(3/8)	100.25 - 105.25	1.0000	1.0000
L20	10	WR-VG82ST-BRDA(5/8")	100.25 - 105.25	1.0000	1.0000
L20	18	Safety Line 5/8	100.25 - 105.25	1.0000	1.0000
L20	44	Flat Plate 8.5" x 1.25" (Rev. G)	100.25 - 105.25	1.0000	1.0000
L20	45	Flat Plate 8.5" x 1.25" (Rev. G)	100.25 - 105.25	1.0000	1.0000
L20	46	Flat Plate 8.5" x 1.25" (Rev. G)	100.25 - 105.25	1.0000	1.0000
L21	8	FB-L98B-034-XXX(3/8)	100.00 - 100.25	1.0000	1.0000
L21	10	WR-VG82ST-BRDA(5/8")	100.00 - 100.25	1.0000	1.0000
L21	18	Safety Line 5/8	100.00 - 100.25	1.0000	1.0000
L21	44	Flat Plate 8.5" x 1.25" (Rev. G)	100.00 - 100.25	1.0000	1.0000
L21	45	Flat Plate 8.5" x 1.25" (Rev. G)	100.00 - 100.25	1.0000	1.0000
L21	46	Flat Plate 8.5" x 1.25" (Rev. G)	100.00 - 100.25	1.0000	1.0000
L22	8	FB-L98B-034-XXX(3/8)	99.75 - 100.00	1.0000	1.0000
L22	10	WR-VG82ST-BRDA(5/8")	99.75 - 100.00	1.0000	1.0000
L22	18	Safety Line 5/8	99.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			100.00		
L23	8	FB-L98B-034-XXX(3/8)	94.75 - 99.75	1.0000	1.0000
L23	10	WR-VG82ST-BRDA(5/8")	94.75 - 99.75	1.0000	1.0000
L23	18	Safety Line 5/8	94.75 - 99.75	1.0000	1.0000
L24	8	FB-L98B-034-XXX(3/8)	89.75 - 94.75	1.0000	1.0000
L24	10	WR-VG82ST-BRDA(5/8")	89.75 - 94.75	1.0000	1.0000
L24	18	Safety Line 5/8	89.75 - 94.75	1.0000	1.0000
L24	41	Flat Plate 8.5" x 1.25" (Rev. G)	89.75 - 90.00	1.0000	1.0000
L24	42	Flat Plate 8.5" x 1.25" (Rev. G)	89.75 - 90.00	1.0000	1.0000
L24	43	Flat Plate 8.5" x 1.25" (Rev. G)	89.75 - 90.00	1.0000	1.0000
L25	8	FB-L98B-034-XXX(3/8)	86.25 - 89.75	1.0000	1.0000
L25	10	WR-VG82ST-BRDA(5/8")	86.25 - 89.75	1.0000	1.0000
L25	18	Safety Line 5/8	86.25 - 89.75	1.0000	1.0000
L25	41	Flat Plate 8.5" x 1.25" (Rev. G)	86.25 - 89.75	1.0000	1.0000
L25	42	Flat Plate 8.5" x 1.25" (Rev. G)	86.25 - 89.75	1.0000	1.0000
L25	43	Flat Plate 8.5" x 1.25" (Rev. G)	86.25 - 89.75	1.0000	1.0000
L26	8	FB-L98B-034-XXX(3/8)	86.00 - 86.25	1.0000	1.0000
L26	10	WR-VG82ST-BRDA(5/8")	86.00 - 86.25	1.0000	1.0000
L26	18	Safety Line 5/8	86.00 - 86.25	1.0000	1.0000
L26	41	Flat Plate 8.5" x 1.25" (Rev. G)	86.00 - 86.25	1.0000	1.0000
L26	42	Flat Plate 8.5" x 1.25" (Rev. G)	86.00 - 86.25	1.0000	1.0000
L26	43	Flat Plate 8.5" x 1.25" (Rev. G)	86.00 - 86.25	1.0000	1.0000
L27	8	FB-L98B-034-XXX(3/8)	81.00 - 86.00	1.0000	1.0000
L27	10	WR-VG82ST-BRDA(5/8")	81.00 - 86.00	1.0000	1.0000
L27	18	Safety Line 5/8	81.00 - 86.00	1.0000	1.0000
L27	41	Flat Plate 8.5" x 1.25" (Rev. G)	81.00 - 86.00	1.0000	1.0000
L27	42	Flat Plate 8.5" x 1.25" (Rev. G)	81.00 - 86.00	1.0000	1.0000
L27	43	Flat Plate 8.5" x 1.25" (Rev. G)	81.00 - 86.00	1.0000	1.0000
L28	8	FB-L98B-034-XXX(3/8)	77.75 - 81.00	1.0000	1.0000
L28	10	WR-VG82ST-BRDA(5/8")	77.75 - 81.00	1.0000	1.0000
L28	18	Safety Line 5/8	77.75 - 81.00	1.0000	1.0000
L28	32	Flat Plate 6.5" x 1.25" (Rev G)	77.75 - 80.50	1.0000	1.0000
L28	33	Flat Plate 6.5" x 1.25" (Rev G)	77.75 - 80.50	1.0000	1.0000
L28	34	Flat Plate 6.5" x 1.25" (Rev G)	77.75 - 80.50	1.0000	1.0000
L28	41	Flat Plate 8.5" x 1.25" (Rev. G)	77.75 - 81.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L28	42	Flat Plate 8.5" x 1.25" (Rev. G)	77.75 - 81.00	1.0000	1.0000
L28	43	Flat Plate 8.5" x 1.25" (Rev. G)	77.75 - 81.00	1.0000	1.0000
L29	8	FB-L98B-034-XXX(3/8)	77.50 - 77.75	1.0000	1.0000
L29	10	WR-VG82ST-BRDA(5/8")	77.50 - 77.75	1.0000	1.0000
L29	18	Safety Line 5/8	77.50 - 77.75	1.0000	1.0000
L29	32	Flat Plate 6.5" x 1.25" (Rev G)	77.50 - 77.75	1.0000	1.0000
L29	33	Flat Plate 6.5" x 1.25" (Rev G)	77.50 - 77.75	1.0000	1.0000
L29	34	Flat Plate 6.5" x 1.25" (Rev G)	77.50 - 77.75	1.0000	1.0000
L29	41	Flat Plate 8.5" x 1.25" (Rev. G)	77.50 - 77.75	1.0000	1.0000
L29	42	Flat Plate 8.5" x 1.25" (Rev. G)	77.50 - 77.75	1.0000	1.0000
L29	43	Flat Plate 8.5" x 1.25" (Rev. G)	77.50 - 77.75	1.0000	1.0000
L30	8	FB-L98B-034-XXX(3/8)	72.50 - 77.50	1.0000	1.0000
L30	10	WR-VG82ST-BRDA(5/8")	72.50 - 77.50	1.0000	1.0000
L30	18	Safety Line 5/8	72.50 - 77.50	1.0000	1.0000
L30	32	Flat Plate 6.5" x 1.25" (Rev G)	72.50 - 77.50	1.0000	1.0000
L30	33	Flat Plate 6.5" x 1.25" (Rev G)	72.50 - 77.50	1.0000	1.0000
L30	34	Flat Plate 6.5" x 1.25" (Rev G)	72.50 - 77.50	1.0000	1.0000
L30	41	Flat Plate 8.5" x 1.25" (Rev. G)	72.50 - 77.50	1.0000	1.0000
L30	42	Flat Plate 8.5" x 1.25" (Rev. G)	72.50 - 77.50	1.0000	1.0000
L30	43	Flat Plate 8.5" x 1.25" (Rev. G)	72.50 - 77.50	1.0000	1.0000
L31	8	FB-L98B-034-XXX(3/8)	67.50 - 72.50	1.0000	1.0000
L31	10	WR-VG82ST-BRDA(5/8")	67.50 - 72.50	1.0000	1.0000
L31	18	Safety Line 5/8	67.50 - 72.50	1.0000	1.0000
L31	32	Flat Plate 6.5" x 1.25" (Rev G)	67.50 - 72.50	1.0000	1.0000
L31	33	Flat Plate 6.5" x 1.25" (Rev G)	67.50 - 72.50	1.0000	1.0000
L31	34	Flat Plate 6.5" x 1.25" (Rev G)	67.50 - 72.50	1.0000	1.0000
L31	41	Flat Plate 8.5" x 1.25" (Rev. G)	67.50 - 72.50	1.0000	1.0000
L31	42	Flat Plate 8.5" x 1.25" (Rev. G)	67.50 - 72.50	1.0000	1.0000
L31	43	Flat Plate 8.5" x 1.25" (Rev. G)	67.50 - 72.50	1.0000	1.0000
L32	8	FB-L98B-034-XXX(3/8)	62.50 - 67.50	1.0000	1.0000
L32	10	WR-VG82ST-BRDA(5/8")	62.50 - 67.50	1.0000	1.0000
L32	18	Safety Line 5/8	62.50 - 67.50	1.0000	1.0000
L32	29	Flat Plate 8.5" x 1.25" (Rev. G)	62.50 - 65.90	1.0000	1.0000
L32	30	Flat Plate 8.5" x 1.25" (Rev. G)	62.50 - 65.90	1.0000	1.0000
L32	31	Flat Plate 8.5" x 1.25"	62.50 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
		(Rev. G)	65.90		
L32	32	Flat Plate 6.5" x 1.25" (Rev G)	62.50 - 67.50	1.0000	1.0000
L32	33	Flat Plate 6.5" x 1.25" (Rev G)	62.50 - 67.50	1.0000	1.0000
L32	34	Flat Plate 6.5" x 1.25" (Rev G)	62.50 - 67.50	1.0000	1.0000
L32	41	Flat Plate 8.5" x 1.25" (Rev. G)	62.50 - 67.50	1.0000	1.0000
L32	42	Flat Plate 8.5" x 1.25" (Rev. G)	62.50 - 67.50	1.0000	1.0000
L32	43	Flat Plate 8.5" x 1.25" (Rev. G)	62.50 - 67.50	1.0000	1.0000
L33	8	FB-L98B-034-XXX(3/8)	60.00 - 62.50	1.0000	1.0000
L33	10	WR-VG82ST-BRDA(5/8")	60.00 - 62.50	1.0000	1.0000
L33	18	Safety Line 5/8	60.00 - 62.50	1.0000	1.0000
L33	29	Flat Plate 8.5" x 1.25" (Rev. G)	60.00 - 62.50	1.0000	1.0000
L33	30	Flat Plate 8.5" x 1.25" (Rev. G)	60.00 - 62.50	1.0000	1.0000
L33	31	Flat Plate 8.5" x 1.25" (Rev. G)	60.00 - 62.50	1.0000	1.0000
L33	32	Flat Plate 6.5" x 1.25" (Rev G)	60.00 - 62.50	1.0000	1.0000
L33	33	Flat Plate 6.5" x 1.25" (Rev G)	60.00 - 62.50	1.0000	1.0000
L33	34	Flat Plate 6.5" x 1.25" (Rev G)	60.00 - 62.50	1.0000	1.0000
L33	41	Flat Plate 8.5" x 1.25" (Rev. G)	60.00 - 62.50	1.0000	1.0000
L33	42	Flat Plate 8.5" x 1.25" (Rev. G)	60.00 - 62.50	1.0000	1.0000
L33	43	Flat Plate 8.5" x 1.25" (Rev. G)	60.00 - 62.50	1.0000	1.0000
L34	8	FB-L98B-034-XXX(3/8)	59.75 - 60.00	1.0000	1.0000
L34	10	WR-VG82ST-BRDA(5/8")	59.75 - 60.00	1.0000	1.0000
L34	18	Safety Line 5/8	59.75 - 60.00	1.0000	1.0000
L34	29	Flat Plate 8.5" x 1.25" (Rev. G)	59.75 - 60.00	1.0000	1.0000
L34	30	Flat Plate 8.5" x 1.25" (Rev. G)	59.75 - 60.00	1.0000	1.0000
L34	31	Flat Plate 8.5" x 1.25" (Rev. G)	59.75 - 60.00	1.0000	1.0000
L35	8	FB-L98B-034-XXX(3/8)	54.75 - 59.75	1.0000	1.0000
L35	10	WR-VG82ST-BRDA(5/8")	54.75 - 59.75	1.0000	1.0000
L35	18	Safety Line 5/8	54.75 - 59.75	1.0000	1.0000
L35	29	Flat Plate 8.5" x 1.25" (Rev. G)	54.75 - 59.75	1.0000	1.0000
L35	30	Flat Plate 8.5" x 1.25" (Rev. G)	54.75 - 59.75	1.0000	1.0000
L35	31	Flat Plate 8.5" x 1.25" (Rev. G)	54.75 - 59.75	1.0000	1.0000
L36	8	FB-L98B-034-XXX(3/8)	49.75 - 54.75	1.0000	1.0000
L36	10	WR-VG82ST-BRDA(5/8")	49.75 - 54.75	1.0000	1.0000
L36	18	Safety Line 5/8	49.75 - 54.75	1.0000	1.0000
L36	29	Flat Plate 8.5" x 1.25" (Rev. G)	53.90 - 54.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L36	30	Flat Plate 8.5" x 1.25" (Rev. G)	53.90 - 54.75	1.0000	1.0000
L36	31	Flat Plate 8.5" x 1.25" (Rev. G)	53.90 - 54.75	1.0000	1.0000
L36	38	Flat Plate 8.5" x 1.25" (Rev. G)	49.75 - 50.00	1.0000	1.0000
L36	39	Flat Plate 8.5" x 1.25" (Rev. G)	49.75 - 50.00	1.0000	1.0000
L36	40	Flat Plate 8.5" x 1.25" (Rev. G)	49.75 - 50.00	1.0000	1.0000
L37	8	FB-L98B-034-XXX(3/8)	46.25 - 49.75	1.0000	1.0000
L37	10	WR-VG82ST-BRDA(5/8")	46.25 - 49.75	1.0000	1.0000
L37	18	Safety Line 5/8	46.25 - 49.75	1.0000	1.0000
L37	38	Flat Plate 8.5" x 1.25" (Rev. G)	46.25 - 49.75	1.0000	1.0000
L37	39	Flat Plate 8.5" x 1.25" (Rev. G)	46.25 - 49.75	1.0000	1.0000
L37	40	Flat Plate 8.5" x 1.25" (Rev. G)	46.25 - 49.75	1.0000	1.0000
L38	8	FB-L98B-034-XXX(3/8)	46.00 - 46.25	1.0000	1.0000
L38	10	WR-VG82ST-BRDA(5/8")	46.00 - 46.25	1.0000	1.0000
L38	18	Safety Line 5/8	46.00 - 46.25	1.0000	1.0000
L38	38	Flat Plate 8.5" x 1.25" (Rev. G)	46.00 - 46.25	1.0000	1.0000
L38	39	Flat Plate 8.5" x 1.25" (Rev. G)	46.00 - 46.25	1.0000	1.0000
L38	40	Flat Plate 8.5" x 1.25" (Rev. G)	46.00 - 46.25	1.0000	1.0000
L39	8	FB-L98B-034-XXX(3/8)	41.00 - 46.00	1.0000	1.0000
L39	10	WR-VG82ST-BRDA(5/8")	41.00 - 46.00	1.0000	1.0000
L39	18	Safety Line 5/8	41.00 - 46.00	1.0000	1.0000
L39	38	Flat Plate 8.5" x 1.25" (Rev. G)	41.00 - 46.00	1.0000	1.0000
L39	39	Flat Plate 8.5" x 1.25" (Rev. G)	41.00 - 46.00	1.0000	1.0000
L39	40	Flat Plate 8.5" x 1.25" (Rev. G)	41.00 - 46.00	1.0000	1.0000
L40	8	FB-L98B-034-XXX(3/8)	36.00 - 41.00	1.0000	1.0000
L40	10	WR-VG82ST-BRDA(5/8")	36.00 - 41.00	1.0000	1.0000
L40	18	Safety Line 5/8	36.00 - 41.00	1.0000	1.0000
L40	38	Flat Plate 8.5" x 1.25" (Rev. G)	36.00 - 41.00	1.0000	1.0000
L40	39	Flat Plate 8.5" x 1.25" (Rev. G)	36.00 - 41.00	1.0000	1.0000
L40	40	Flat Plate 8.5" x 1.25" (Rev. G)	36.00 - 41.00	1.0000	1.0000
L41	8	FB-L98B-034-XXX(3/8)	32.75 - 36.00	1.0000	1.0000
L41	10	WR-VG82ST-BRDA(5/8")	32.75 - 36.00	1.0000	1.0000
L41	18	Safety Line 5/8	32.75 - 36.00	1.0000	1.0000
L41	26	Flat Plate 6.5" x 1.25" (Rev G)	32.75 - 35.50	1.0000	1.0000
L41	27	Flat Plate 6.5" x 1.25" (Rev G)	32.75 - 35.50	1.0000	1.0000
L41	28	Flat Plate 6.5" x 1.25" (Rev	32.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
			35.50		
L41	38	Flat Plate 8.5" x 1.25" (Rev. G)	32.75 - 36.00	1.0000	1.0000
L41	39	Flat Plate 8.5" x 1.25" (Rev. G)	32.75 - 36.00	1.0000	1.0000
L41	40	Flat Plate 8.5" x 1.25" (Rev. G)	32.75 - 36.00	1.0000	1.0000
L42	8	FB-L98B-034-XXX(3/8)	32.50 - 32.75	1.0000	1.0000
L42	10	WR-VG82ST-BRDA(5/8")	32.50 - 32.75	1.0000	1.0000
L42	18	Safety Line 5/8	32.50 - 32.75	1.0000	1.0000
L42	26	Flat Plate 6.5" x 1.25" (Rev G)	32.50 - 32.75	1.0000	1.0000
L42	27	Flat Plate 6.5" x 1.25" (Rev G)	32.50 - 32.75	1.0000	1.0000
L42	28	Flat Plate 6.5" x 1.25" (Rev G)	32.50 - 32.75	1.0000	1.0000
L42	38	Flat Plate 8.5" x 1.25" (Rev. G)	32.50 - 32.75	1.0000	1.0000
L42	39	Flat Plate 8.5" x 1.25" (Rev. G)	32.50 - 32.75	1.0000	1.0000
L42	40	Flat Plate 8.5" x 1.25" (Rev. G)	32.50 - 32.75	1.0000	1.0000
L43	8	FB-L98B-034-XXX(3/8)	27.50 - 32.50	1.0000	1.0000
L43	10	WR-VG82ST-BRDA(5/8")	27.50 - 32.50	1.0000	1.0000
L43	18	Safety Line 5/8	27.50 - 32.50	1.0000	1.0000
L43	26	Flat Plate 6.5" x 1.25" (Rev G)	27.50 - 32.50	1.0000	1.0000
L43	27	Flat Plate 6.5" x 1.25" (Rev G)	27.50 - 32.50	1.0000	1.0000
L43	28	Flat Plate 6.5" x 1.25" (Rev G)	27.50 - 32.50	1.0000	1.0000
L43	38	Flat Plate 8.5" x 1.25" (Rev. G)	27.50 - 32.50	1.0000	1.0000
L43	39	Flat Plate 8.5" x 1.25" (Rev. G)	27.50 - 32.50	1.0000	1.0000
L43	40	Flat Plate 8.5" x 1.25" (Rev. G)	27.50 - 32.50	1.0000	1.0000
L44	8	FB-L98B-034-XXX(3/8)	22.50 - 27.50	1.0000	1.0000
L44	10	WR-VG82ST-BRDA(5/8")	22.50 - 27.50	1.0000	1.0000
L44	18	Safety Line 5/8	22.50 - 27.50	1.0000	1.0000
L44	23	Flat Plate 8.5" x 1.25" (Rev. G)	22.50 - 25.50	1.0000	1.0000
L44	24	Flat Plate 8.5" x 1.25" (Rev. G)	22.50 - 25.50	1.0000	1.0000
L44	25	Flat Plate 8.5" x 1.25" (Rev. G)	22.50 - 25.50	1.0000	1.0000
L44	26	Flat Plate 6.5" x 1.25" (Rev G)	22.50 - 27.50	1.0000	1.0000
L44	27	Flat Plate 6.5" x 1.25" (Rev G)	22.50 - 27.50	1.0000	1.0000
L44	28	Flat Plate 6.5" x 1.25" (Rev G)	22.50 - 27.50	1.0000	1.0000
L44	38	Flat Plate 8.5" x 1.25" (Rev. G)	22.50 - 27.50	1.0000	1.0000
L44	39	Flat Plate 8.5" x 1.25" (Rev. G)	22.50 - 27.50	1.0000	1.0000
L44	40	Flat Plate 8.5" x 1.25" (Rev. G)	22.50 - 27.50	1.0000	1.0000
L45	8	FB-L98B-034-XXX(3/8)	20.00 - 22.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L45	10	WR-VG82ST-BRDA(5/8")	20.00 - 22.50	1.0000	1.0000
L45	18	Safety Line 5/8	20.00 - 22.50	1.0000	1.0000
L45	23	Flat Plate 8.5" x 1.25" (Rev. G)	20.00 - 22.50	1.0000	1.0000
L45	24	Flat Plate 8.5" x 1.25" (Rev. G)	20.00 - 22.50	1.0000	1.0000
L45	25	Flat Plate 8.5" x 1.25" (Rev. G)	20.00 - 22.50	1.0000	1.0000
L45	26	Flat Plate 6.5" x 1.25" (Rev G)	20.00 - 22.50	1.0000	1.0000
L45	27	Flat Plate 6.5" x 1.25" (Rev G)	20.00 - 22.50	1.0000	1.0000
L45	28	Flat Plate 6.5" x 1.25" (Rev G)	20.00 - 22.50	1.0000	1.0000
L45	38	Flat Plate 8.5" x 1.25" (Rev. G)	20.00 - 22.50	1.0000	1.0000
L45	39	Flat Plate 8.5" x 1.25" (Rev. G)	20.00 - 22.50	1.0000	1.0000
L45	40	Flat Plate 8.5" x 1.25" (Rev. G)	20.00 - 22.50	1.0000	1.0000
L46	8	FB-L98B-034-XXX(3/8)	19.75 - 20.00	1.0000	1.0000
L46	10	WR-VG82ST-BRDA(5/8")	19.75 - 20.00	1.0000	1.0000
L46	18	Safety Line 5/8	19.75 - 20.00	1.0000	1.0000
L46	23	Flat Plate 8.5" x 1.25" (Rev. G)	19.75 - 20.00	1.0000	1.0000
L46	24	Flat Plate 8.5" x 1.25" (Rev. G)	19.75 - 20.00	1.0000	1.0000
L46	25	Flat Plate 8.5" x 1.25" (Rev. G)	19.75 - 20.00	1.0000	1.0000
L47	8	FB-L98B-034-XXX(3/8)	14.75 - 19.75	1.0000	1.0000
L47	10	WR-VG82ST-BRDA(5/8")	14.75 - 19.75	1.0000	1.0000
L47	18	Safety Line 5/8	14.75 - 19.75	1.0000	1.0000
L47	23	Flat Plate 8.5" x 1.25" (Rev. G)	14.75 - 19.75	1.0000	1.0000
L47	24	Flat Plate 8.5" x 1.25" (Rev. G)	14.75 - 19.75	1.0000	1.0000
L47	25	Flat Plate 8.5" x 1.25" (Rev. G)	14.75 - 19.75	1.0000	1.0000
L47	35	Flat Plate 8.5" x 1.25" (Rev. G)	14.75 - 15.50	1.0000	1.0000
L47	36	Flat Plate 8.5" x 1.25" (Rev. G)	14.75 - 15.50	1.0000	1.0000
L47	37	Flat Plate 8.5" x 1.25" (Rev. G)	14.75 - 15.50	1.0000	1.0000
L48	8	FB-L98B-034-XXX(3/8)	11.75 - 14.75	1.0000	1.0000
L48	10	WR-VG82ST-BRDA(5/8")	11.75 - 14.75	1.0000	1.0000
L48	18	Safety Line 5/8	11.75 - 14.75	1.0000	1.0000
L48	23	Flat Plate 8.5" x 1.25" (Rev. G)	13.50 - 14.75	1.0000	1.0000
L48	24	Flat Plate 8.5" x 1.25" (Rev. G)	13.50 - 14.75	1.0000	1.0000
L48	25	Flat Plate 8.5" x 1.25" (Rev. G)	13.50 - 14.75	1.0000	1.0000
L48	35	Flat Plate 8.5" x 1.25" (Rev. G)	11.75 - 14.75	1.0000	1.0000
L48	36	Flat Plate 8.5" x 1.25" (Rev. G)	11.75 - 14.75	1.0000	1.0000
L48	37	Flat Plate 8.5" x 1.25"	11.75 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
		(Rev. G)	14.75		
L49	8	FB-L98B-034-XXX(3/8)	11.50 - 11.75	1.0000	1.0000
L49	10	WR-VG82ST-BRDA(5/8")	11.50 - 11.75	1.0000	1.0000
L49	18	Safety Line 5/8	11.50 - 11.75	1.0000	1.0000
L49	35	Flat Plate 8.5" x 1.25"	11.50 - 11.75	1.0000	1.0000
L49	36	Flat Plate 8.5" x 1.25" (Rev. G)	11.50 - 11.75	1.0000	1.0000
L49	37	Flat Plate 8.5" x 1.25" (Rev. G)	11.50 - 11.75	1.0000	1.0000
L50	8	FB-L98B-034-XXX(3/8)	9.00 - 11.50	1.0000	1.0000
L50	10	WR-VG82ST-BRDA(5/8")	9.00 - 11.50	1.0000	1.0000
L50	18	Safety Line 5/8	9.00 - 11.50	1.0000	1.0000
L50	20	Flat Plate 4.5" x 1" (Rev G)	9.00 - 10.50	1.0000	1.0000
L50	21	Flat Plate 4.5" x 1" (Rev G)	9.00 - 10.50	1.0000	1.0000
L50	22	Flat Plate 4.5" x 1" (Rev G)	9.00 - 10.50	1.0000	1.0000
L50	35	Flat Plate 8.5" x 1.25" (Rev. G)	9.00 - 11.50	1.0000	1.0000
L50	36	Flat Plate 8.5" x 1.25" (Rev. G)	9.00 - 11.50	1.0000	1.0000
L50	37	Flat Plate 8.5" x 1.25" (Rev. G)	9.00 - 11.50	1.0000	1.0000
L51	8	FB-L98B-034-XXX(3/8)	8.75 - 9.00	1.0000	1.0000
L51	10	WR-VG82ST-BRDA(5/8")	8.75 - 9.00	1.0000	1.0000
L51	18	Safety Line 5/8	8.75 - 9.00	1.0000	1.0000
L51	20	Flat Plate 4.5" x 1" (Rev G)	8.75 - 9.00	1.0000	1.0000
L51	21	Flat Plate 4.5" x 1" (Rev G)	8.75 - 9.00	1.0000	1.0000
L51	22	Flat Plate 4.5" x 1" (Rev G)	8.75 - 9.00	1.0000	1.0000
L51	35	Flat Plate 8.5" x 1.25" (Rev. G)	8.75 - 9.00	1.0000	1.0000
L51	36	Flat Plate 8.5" x 1.25" (Rev. G)	8.75 - 9.00	1.0000	1.0000
L51	37	Flat Plate 8.5" x 1.25" (Rev. G)	8.75 - 9.00	1.0000	1.0000
L52	8	FB-L98B-034-XXX(3/8)	8.00 - 8.75	1.0000	1.0000
L52	10	WR-VG82ST-BRDA(5/8")	8.00 - 8.75	1.0000	1.0000
L52	18	Safety Line 5/8	8.00 - 8.75	1.0000	1.0000
L52	20	Flat Plate 4.5" x 1" (Rev G)	4.50 - 8.75	1.0000	1.0000
L52	21	Flat Plate 4.5" x 1" (Rev G)	4.50 - 8.75	1.0000	1.0000
L52	22	Flat Plate 4.5" x 1" (Rev G)	4.50 - 8.75	1.0000	1.0000
L52	35	Flat Plate 8.5" x 1.25" (Rev. G)	4.50 - 8.75	1.0000	1.0000
L52	36	Flat Plate 8.5" x 1.25" (Rev. G)	4.50 - 8.75	1.0000	1.0000
L52	37	Flat Plate 8.5" x 1.25" (Rev. G)	4.50 - 8.75	1.0000	1.0000
L53	20	Flat Plate 4.5" x 1" (Rev G)	4.25 - 4.50	1.0000	1.0000
L53	21	Flat Plate 4.5" x 1" (Rev G)	4.25 - 4.50	1.0000	1.0000
L53	22	Flat Plate 4.5" x 1" (Rev G)	4.25 - 4.50	1.0000	1.0000
L53	35	Flat Plate 8.5" x 1.25" (Rev. G)	4.25 - 4.50	1.0000	1.0000
L53	36	Flat Plate 8.5" x 1.25" (Rev. G)	4.25 - 4.50	1.0000	1.0000
L53	37	Flat Plate 8.5" x 1.25" (Rev. G)	4.25 - 4.50	1.0000	1.0000
L54	20	Flat Plate 4.5" x 1" (Rev G)	1.50 - 4.25	1.0000	1.0000
L54	21	Flat Plate 4.5" x 1" (Rev G)	1.50 - 4.25	1.0000	1.0000
L54	22	Flat Plate 4.5" x 1" (Rev G)	1.50 - 4.25	1.0000	1.0000
L54	35	Flat Plate 8.5" x 1.25" (Rev. G)	1.50 - 4.25	1.0000	1.0000
L54	36	Flat Plate 8.5" x 1.25" (Rev. G)	1.50 - 4.25	1.0000	1.0000
L54	37	Flat Plate 8.5" x 1.25" (Rev. G)	1.50 - 4.25	1.0000	1.0000
L55	20	Flat Plate 4.5" x 1" (Rev G)	1.25 - 1.50	1.0000	1.0000
L55	21	Flat Plate 4.5" x 1" (Rev G)	1.25 - 1.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L55	22	Flat Plate 4.5" x 1" (Rev G)	1.25 - 1.50	1.0000	1.0000
L55	35	Flat Plate 8.5" x 1.25" (Rev. G)	1.25 - 1.50	1.0000	1.0000
L55	36	Flat Plate 8.5" x 1.25" (Rev. G)	1.25 - 1.50	1.0000	1.0000
L55	37	Flat Plate 8.5" x 1.25" (Rev. G)	1.25 - 1.50	1.0000	1.0000
L56	20	Flat Plate 4.5" x 1" (Rev G)	0.50 - 1.25	1.0000	1.0000
L56	21	Flat Plate 4.5" x 1" (Rev G)	0.50 - 1.25	1.0000	1.0000
L56	22	Flat Plate 4.5" x 1" (Rev G)	0.50 - 1.25	1.0000	1.0000
L56	35	Flat Plate 8.5" x 1.25" (Rev. G)	0.50 - 1.25	1.0000	1.0000
L56	36	Flat Plate 8.5" x 1.25" (Rev. G)	0.50 - 1.25	1.0000	1.0000
L56	37	Flat Plate 8.5" x 1.25" (Rev. G)	0.50 - 1.25	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	K	
<i>*Level 177*</i>									
APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.000	0.000	177.000	No Ice	8.262	6.946	0.083
			0.000			1/2"	8.822	8.127	0.151
			2.000			Ice	9.346	9.021	0.227
						1" Ice			
IBC1900BB-1	A	From Leg	4.000	0.000	177.000	No Ice	0.966	0.463	0.022
			0.000			1/2"	1.091	0.558	0.030
			2.000			Ice	1.223	0.660	0.039
						1" Ice			
IBC1900HG-2A	A	From Leg	4.000	0.000	177.000	No Ice	0.966	0.463	0.022
			0.000			1/2"	1.091	0.558	0.030
			2.000			Ice	1.223	0.660	0.039
						1" Ice			
APXV9ERR18-C-A20 w/ Mount Pipe	B	From Leg	4.000	0.000	177.000	No Ice	8.262	7.471	0.088
			0.000			1/2"	8.822	8.656	0.158
			2.000			Ice	9.346	9.556	0.237
						1" Ice			
IBC1900BB-1	B	From Leg	4.000	0.000	177.000	No Ice	0.966	0.463	0.022
			0.000			1/2"	1.091	0.558	0.030
			2.000			Ice	1.223	0.660	0.039
						1" Ice			
IBC1900HG-2A	B	From Leg	4.000	0.000	177.000	No Ice	0.966	0.463	0.022
			0.000			1/2"	1.091	0.558	0.030
			2.000			Ice	1.223	0.660	0.039
						1" Ice			
APXVSP18-C-A20 w/ Mount Pipe	C	From Leg	4.000	0.000	177.000	No Ice	8.262	6.946	0.083
			0.000			1/2"	8.822	8.127	0.151
			2.000			Ice	9.346	9.021	0.227
						1" Ice			
IBC1900BB-1	C	From Leg	4.000	0.000	177.000	No Ice	0.966	0.463	0.022
			0.000			1/2"	1.091	0.558	0.030
			2.000			Ice	1.223	0.660	0.039
						1" Ice			
IBC1900HG-2A	C	From Leg	4.000	0.000	177.000	No Ice	0.966	0.463	0.022
			0.000			1/2"	1.091	0.558	0.030
			2.000			Ice	1.223	0.660	0.039
						1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA		Weight	
			Horz	Lateral			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	K	
Platform Mount [LP 714-1]	C	None			0.000	177.000	1" Ice			
							No Ice	37.470	37.470	1.600
							1/2"	44.230	44.230	2.040
							Ice	50.990	50.990	2.480
(3) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	0.000	177.000	1" Ice			
							No Ice	1.425	1.425	0.022
							1/2"	1.925	1.925	0.033
							Ice	2.294	2.294	0.048
(3) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	0.000	177.000	1" Ice			
							No Ice	1.425	1.425	0.022
							1/2"	1.925	1.925	0.033
							Ice	2.294	2.294	0.048
(3) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	0.000	177.000	1" Ice			
							No Ice	1.425	1.425	0.022
							1/2"	1.925	1.925	0.033
							Ice	2.294	2.294	0.048
16' x 2" horizontal mount pipe	A	From Leg	4.000	0.000	0.000	177.000	1" Ice			
							No Ice	1.333	1.333	0.047
							1/2"	2.815	2.815	1.015
							Ice	3.772	3.772	2.002
16' x 2" horizontal mount pipe	B	From Leg	4.000	0.000	0.000	177.000	1" Ice			
							No Ice	1.333	1.333	0.047
							1/2"	2.815	2.815	1.015
							Ice	3.772	3.772	2.002
16' x 2" horizontal mount pipe	C	From Leg	4.000	0.000	0.000	177.000	1" Ice			
							No Ice	1.333	1.333	0.047
							1/2"	2.815	2.815	1.015
							Ice	3.772	3.772	2.002
Level 175 PCS 1900MHz 4x45W-65MHz	A	From Leg	2.000	0.000	0.000	175.000	1" Ice			
							No Ice	2.322	2.238	0.060
							1/2"	2.527	2.441	0.083
							Ice	2.739	2.651	0.110
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.000	0.000	0.000	175.000	1" Ice			
							No Ice	2.322	2.238	0.060
							1/2"	2.527	2.441	0.083
							Ice	2.739	2.651	0.110
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.000	0.000	0.000	175.000	1" Ice			
							No Ice	2.322	2.238	0.060
							1/2"	2.527	2.441	0.083
							Ice	2.739	2.651	0.110
Side Arm Mount [SO 102-3]	C	None			0.000	175.000	1" Ice			
							No Ice	3.000	3.000	0.081
							1/2"	3.480	3.480	0.111
							Ice	3.960	3.960	0.141
Level 171 *Level 161* 7770.00	A	From Leg	4.000	0.000	0.000	161.000	1" Ice			
							No Ice	5.508	2.928	0.035
							1/2"	5.867	3.273	0.068
							Ice	6.233	3.625	0.105
P65-17-XLH-RR	A	From Leg	4.000	0.000	0.000	161.000	1" Ice			
							No Ice	11.467	6.800	0.059
							1/2"	12.083	7.384	0.121
							Ice	12.707	7.976	0.191
7020.00	A	From Leg	4.000	0.000	0.000	161.000	1" Ice			
							No Ice	0.102	0.175	0.002
							1/2"	0.147	0.239	0.005
							Ice	0.199	0.311	0.009
(2) RRUS-11	A	From Leg	4.000	0.000	0.000	161.000	1" Ice			
							No Ice	2.784	1.187	0.048
							1/2"	2.992	1.334	0.068
							Ice	3.207	1.490	0.092
7770.00	B	From Leg	4.000	0.000	0.000	161.000	1" Ice			
							No Ice	5.508	2.928	0.035

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			0.000			1/2"	5.867	3.273	0.068
			1.000			Ice	6.233	3.625	0.105
AM-X-CD-16-65-00T-RET	B	From Leg	4.000	0.000	161.000	1" Ice	8.024	4.642	0.049
			0.000			No Ice	8.480	5.088	0.095
			1.000			1/2"	8.943	5.542	0.147
						Ice			
7020.00	B	From Leg	4.000	0.000	161.000	1" Ice	0.102	0.175	0.002
			0.000			No Ice	0.147	0.239	0.005
			1.000			1/2"	0.199	0.311	0.009
						Ice			
(2) RRUS-11	B	From Leg	4.000	0.000	161.000	1" Ice	2.784	1.187	0.048
			0.000			No Ice	2.992	1.334	0.068
			0.000			1/2"	3.207	1.490	0.092
						Ice			
DC6-48-60-18-8F	B	From Leg	4.000	0.000	161.000	1" Ice	0.791	0.791	0.020
			0.000			No Ice	1.274	1.274	0.035
			1.000			1/2"	1.450	1.450	0.053
						Ice			
7770.00	C	From Leg	4.000	0.000	161.000	1" Ice	5.508	2.928	0.035
			0.000			No Ice	5.867	3.273	0.068
			1.000			1/2"	6.233	3.625	0.105
						Ice			
AM-X-CD-16-65-00T-RET	C	From Leg	4.000	0.000	161.000	1" Ice	8.024	4.642	0.049
			0.000			No Ice	8.480	5.088	0.095
			1.000			1/2"	8.943	5.542	0.147
						Ice			
7020.00	C	From Leg	4.000	0.000	161.000	1" Ice	0.102	0.175	0.002
			0.000			No Ice	0.147	0.239	0.005
			1.000			1/2"	0.199	0.311	0.009
						Ice			
(2) RRUS-11	C	From Leg	4.000	0.000	161.000	1" Ice	2.784	1.187	0.048
			0.000			No Ice	2.992	1.334	0.068
			0.000			1/2"	3.207	1.490	0.092
						Ice			
Level 162R						1" Ice			
HPA-65R-BUU-H8	A	From Leg	4.000	0.000	162.000	No Ice	12.976	7.516	0.068
			0.000			1/2"	13.558	8.087	0.142
			0.000			Ice	14.147	8.666	0.223
						1" Ice			
OPA-65R-LCUU-H8	A	From Leg	4.000	0.000	162.000	No Ice	12.746	7.246	0.088
			0.000			1/2"	13.328	7.817	0.159
			0.000			Ice	13.916	8.396	0.238
						1" Ice			
TT19-08BP111-001	A	From Leg	4.000	0.000	162.000	No Ice	0.553	0.446	0.016
			0.000			1/2"	0.649	0.534	0.022
			-1.000			Ice	0.752	0.630	0.029
						1" Ice			
RRUS A2	A	From Leg	4.000	0.000	162.000	No Ice	2.066	0.498	0.022
			0.000			1/2"	2.245	0.607	0.035
			-1.000			Ice	2.431	0.724	0.050
						1" Ice			
RRUS 11	A	From Leg	4.000	0.000	162.000	No Ice	2.784	1.187	0.051
			0.000			1/2"	2.992	1.334	0.071
			0.000			Ice	3.207	1.490	0.095
						1" Ice			
WCS RRUS-32-B30	A	From Leg	4.000	0.000	162.000	No Ice	3.314	2.424	0.077
			0.000			1/2"	3.558	2.638	0.105
			0.000			Ice	3.809	2.860	0.136
						1" Ice			
HPA-65R-BUU-H6	B	From Leg	4.000	0.000	162.000	No Ice	9.658	6.450	0.051
			0.000			1/2"	10.128	6.913	0.114
			0.000			Ice	10.606	7.384	0.183
						1" Ice			
OPA-65R-LCUU-H6	B	From Leg	4.000	0.000	162.000	No Ice	9.658	5.517	0.073

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight K	
			0.000			1/2"	10.128	5.971	0.131
			0.000			Ice	10.606	6.434	0.196
(2) LGP21401	B	From Leg	4.000	0.000	162.000	1" Ice	1.104	0.207	0.014
			0.000			No Ice	1.239	0.274	0.021
			-1.000			1/2"	1.381	0.348	0.030
						Ice			
RRUS 11	B	From Leg	4.000	0.000	162.000	1" Ice	2.784	1.187	0.051
			0.000			No Ice	2.992	1.334	0.071
			0.000			1/2"	3.207	1.490	0.095
						Ice			
RRUS A2	B	From Leg	4.000	0.000	162.000	1" Ice	2.066	0.498	0.022
			0.000			No Ice	2.245	0.607	0.035
			-1.000			1/2"	2.431	0.724	0.050
						Ice			
DC6-48-60-18-8F	B	From Leg	4.000	0.000	162.000	1" Ice	0.791	0.791	0.020
			0.000			No Ice	1.274	1.274	0.035
			0.000			1/2"	1.450	1.450	0.053
						Ice			
WCS RRUS-32-B30	B	From Leg	4.000	0.000	162.000	1" Ice	3.314	2.424	0.077
			0.000			No Ice	3.558	2.638	0.105
			0.000			1/2"	3.809	2.860	0.136
						Ice			
HPA-65R-BUU-H6	C	From Leg	4.000	0.000	162.000	1" Ice	9.658	6.450	0.051
			0.000			No Ice	10.128	6.913	0.114
			0.000			1/2"	10.606	7.384	0.183
						Ice			
OPA-65R-LCUU-H6	C	From Leg	4.000	0.000	162.000	1" Ice	9.658	5.517	0.073
			0.000			No Ice	10.128	5.971	0.131
			0.000			1/2"	10.606	6.434	0.196
						Ice			
(2) LGP21401	C	From Leg	4.000	0.000	162.000	1" Ice	1.104	0.207	0.014
			0.000			No Ice	1.239	0.274	0.021
			-1.000			1/2"	1.381	0.348	0.030
						Ice			
RRUS A2	C	From Leg	4.000	0.000	162.000	1" Ice	2.066	0.498	0.022
			0.000			No Ice	2.245	0.607	0.035
			-1.000			1/2"	2.431	0.724	0.050
						Ice			
RRUS 11	C	From Leg	4.000	0.000	162.000	1" Ice	2.784	1.187	0.051
			0.000			No Ice	2.992	1.334	0.071
			0.000			1/2"	3.207	1.490	0.095
						Ice			
WCS RRUS-32-B30	C	From Leg	4.000	0.000	162.000	1" Ice	3.314	2.424	0.077
			0.000			No Ice	3.558	2.638	0.105
			0.000			1/2"	3.809	2.860	0.136
						Ice			
Platform Mount [LP 1301-1]	C	None		0.000	162.000	1" Ice	51.700	51.700	2.262
						No Ice	62.700	62.700	2.935
						1/2"	73.700	73.700	3.608
						Ice			
						1" Ice			
Level 110P									
(4) SBNHH-1D65C w/ Mount Pipe	A	From Leg	4.000	0.000	110.000	No Ice	11.626	9.793	0.082
			0.000			1/2"	12.346	11.311	0.172
			0.000			Ice	13.074	12.854	0.271
						1" Ice			
(3) B13 RRH 4X30	A	From Leg	4.000	0.000	110.000	No Ice	2.055	1.320	0.056
			0.000			1/2"	2.241	1.475	0.073
			0.000			Ice	2.433	1.638	0.093
						1" Ice			
(2) DB-B1-6C-12AB-0Z	A	From Leg	4.000	0.000	110.000	No Ice	3.364	2.192	0.021
			0.000			1/2"	3.597	2.395	0.050
			0.000			Ice	3.838	2.606	0.082
						1" Ice			
(4) SBNHH-1D65C w/	B	From Leg	4.000	0.000	110.000	No Ice	11.626	9.793	0.082

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Mount Pipe			0.000 0.000			1/2" Ice 13.074	11.311 12.854	0.172 0.271
(4) SBNHH-1D65C w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	110.000	1" Ice No Ice 1/2" Ice 13.074	9.793 11.311 12.854	0.082 0.172 0.271
(3) RRH2X60-AWS	C	From Leg	4.000 0.000 0.000	0.000	110.000	1" Ice No Ice 1/2" Ice 4.029	1.816 2.052 2.289	0.060 0.083 0.109
(3) B25 RRH4X30	C	From Leg	4.000 0.000 0.000	0.000	110.000	1" Ice No Ice 1/2" Ice 2.593	1.742 1.920 2.106	0.055 0.075 0.099
Platform Mount [LP 1301-1]	C	None		0.000	110.000	1" Ice No Ice 1/2" Ice 73.700	51.700 62.700 73.700	2.262 2.935 3.608
Misc Lightning Rod 5/8" x 8'	C	From Leg	0.000 0.000 4.000	0.000	180.000	1" Ice No Ice 1/2" Ice 2.140	0.500 0.500 1.310 2.140	0.030 0.040 0.050

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	180 - 175	Pole	Max Tension	39	0.000	-0.000	-0.000
			Max. Compression	26	-22.781	-0.026	-0.067
			Max. Mx	20	-2.953	14.209	-0.074
			Max. My	14	-2.948	0.063	-14.300
			Max. Vy	20	-5.386	14.209	-0.074
			Max. Vx	2	-5.403	-0.039	14.236
			Max. Torque	4			-0.131
L2	175 - 170	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-24.685	-0.072	-0.018
			Max. Mx	20	-3.779	45.212	-0.135
			Max. My	14	-3.774	0.128	-45.387
			Max. Vy	20	-6.341	45.212	-0.135
			Max. Vx	2	-6.357	-0.107	45.326
			Max. Torque	4			-0.131
L3	170 - 165	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-25.700	-0.119	0.033
			Max. Mx	8	-4.341	-77.933	0.173
			Max. My	14	-4.335	0.194	-78.193
			Max. Vy	20	-6.749	77.933	-0.196
			Max. Vx	2	-6.766	-0.175	78.136
			Max. Torque	4			-0.131
L4	165 - 160	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-40.707	-1.208	0.510
			Max. Mx	8	-8.719	-130.295	0.227
			Max. My	2	-8.693	-0.424	130.832
			Max. Vy	20	-16.350	129.875	-0.280
			Max. Vx	2	-16.523	-0.424	130.832
			Max. Torque	22			-1.020
L5	160 - 155	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-41.874	-1.268	0.667
			Max. Mx	8	-9.379	-213.018	0.313
			Max. My	2	-9.354	-0.495	214.429
			Max. Vy	20	-16.741	212.596	-0.338
			Max. Vx	2	-16.915	-0.495	214.429
			Max. Torque	22			-1.020
L6	155 - 150	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.039	-1.324	0.823
			Max. Mx	8	-10.059	-297.655	0.399
			Max. My	2	-10.034	-0.566	299.942
			Max. Vy	20	-17.118	297.231	-0.397
			Max. Vx	2	-17.292	-0.566	299.942

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L7	150 - 145	Pole	Max. Torque	22			-1.020
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.317	-1.375	0.978
			Max. Mx	8	-10.761	-384.122	0.483
			Max. My	2	-10.737	-0.635	387.285
			Max. Vy	20	-17.475	383.695	-0.457
			Max. Vx	2	-17.649	-0.635	387.285
L8	145 - 144.5	Pole	Max. Torque	22			-1.020
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.472	-1.380	0.994
			Max. Mx	8	-10.837	-392.865	0.491
			Max. My	2	-10.813	-0.642	396.116
			Max. Vy	20	-17.507	392.439	-0.464
			Max. Vx	2	-17.682	-0.642	396.116
L9	144.5 - 144.25	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-44.567	-1.382	1.003
			Max. Mx	8	-10.892	-397.244	0.496
			Max. My	2	-10.869	-0.646	400.539
			Max. Vy	20	-17.525	396.817	-0.467
			Max. Vx	2	-17.699	-0.646	400.539
L10	144.25 - 140	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.190	-1.423	1.131
			Max. Mx	8	-11.783	-472.422	0.567
			Max. My	2	-11.760	-0.705	476.463
			Max. Vy	20	-17.857	471.995	-0.519
			Max. Vx	2	-18.031	-0.705	476.463
L11	140 - 139.75	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-46.285	-1.425	1.148
			Max. Mx	8	-11.849	-476.889	0.572
			Max. My	2	-11.826	-0.708	480.974
			Max. Vy	20	-17.883	476.461	-0.522
			Max. Vx	2	-18.058	-0.708	480.974
L12	139.75 - 134.75	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-48.183	-1.500	1.351
			Max. Mx	8	-13.062	-567.769	0.660
			Max. My	2	-13.039	-0.780	572.737
			Max. Vy	20	-18.471	567.339	-0.582
			Max. Vx	2	-18.646	-0.780	572.737
L13	134.75 - 129.75	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-50.077	-1.571	1.559
			Max. Mx	8	-14.283	-661.556	0.748
			Max. My	2	-14.261	-0.851	667.409
			Max. Vy	20	-19.047	661.123	-0.643
			Max. Vx	2	-19.223	-0.851	667.409
L14	129.75 - 124.75	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-51.969	-1.640	1.766
			Max. Mx	8	-15.512	-758.190	0.837
			Max. My	2	-15.490	-0.923	764.929
			Max. Vy	20	-19.611	757.754	-0.704
			Max. Vx	2	-19.787	-0.923	764.929
L15	124.75 - 119.75	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-53.857	-1.707	1.972
			Max. Mx	8	-16.749	-857.605	0.927
			Max. My	2	-16.728	-0.995	865.233
			Max. Vy	20	-20.161	857.167	-0.767
			Max. Vx	2	-20.337	-0.995	865.233
			Max. Torque	22			-1.019

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L16	119.75 - 114.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-55.743	-1.771	2.177
			Max. Mx	8	-17.995	-959.728	1.018
			Max. My	2	-17.974	-1.068	968.247
			Max. Vy	20	-20.696	959.289	-0.831
			Max. Vx	2	-20.872	-1.068	968.247
L17	114.75 - 109.75	Pole	Max. Torque	22			-1.019
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-72.680	3.820	4.011
			Max. Mx	20	-23.249	1068.472	-0.721
			Max. My	2	-23.223	0.671	1076.616
			Max. Vy	20	-31.056	1068.472	-0.721
L18	109.75 - 105.5	Pole	Max. Vx	2	-31.293	0.671	1076.616
			Max. Torque	5			2.379
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-74.492	3.772	4.190
			Max. Mx	20	-24.364	1201.313	-1.301
			Max. My	2	-24.339	0.085	1210.474
L19	105.5 - 105.25	Pole	Max. Vy	20	-31.472	1201.313	-1.301
			Max. Vx	2	-31.709	0.085	1210.474
			Max. Torque	5			2.379
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-74.630	3.772	4.207
			Max. Mx	20	-24.462	1209.182	-1.335
L20	105.25 - 100.25	Pole	Max. My	2	-24.437	0.050	1218.403
			Max. Vy	20	-31.493	1209.182	-1.335
			Max. Vx	2	-31.729	0.050	1218.403
			Max. Torque	5			2.379
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-77.384	3.712	4.408
L21	100.25 - 100	Pole	Max. Mx	20	-26.245	1367.938	-2.018
			Max. My	2	-26.221	-0.641	1378.355
			Max. Vy	20	-32.018	1367.938	-2.018
			Max. Vx	2	-32.255	-0.641	1378.355
			Max. Torque	5			2.379
			Max Tension	1	0.000	0.000	0.000
L22	100 - 99.75	Pole	Max. Compression	26	-77.521	3.711	4.424
			Max. Mx	20	-26.341	1375.944	-2.052
			Max. My	2	-26.317	-0.676	1386.421
			Max. Vy	20	-32.039	1375.944	-2.052
			Max. Vx	2	-32.276	-0.676	1386.421
			Max. Torque	5			2.378
L23	99.75 - 94.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-77.629	3.708	4.436
			Max. Mx	20	-26.416	1383.956	-2.086
			Max. My	2	-26.392	-0.710	1394.493
			Max. Vy	20	-32.068	1383.956	-2.086
			Max. Vx	2	-32.305	-0.710	1394.493
L24	94.75 - 89.75	Pole	Max. Torque	5			2.378
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-79.790	3.634	4.660
			Max. Mx	20	-27.898	1545.702	-2.770
			Max. My	2	-27.875	-1.404	1557.438
			Max. Vy	20	-32.640	1545.702	-2.770
L24	89.75 - 89.75	Pole	Max. Vx	2	-32.877	-1.404	1557.438
			Max. Torque	5			2.378
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-81.964	3.560	4.886
			Max. Mx	20	-29.398	1710.228	-3.454
			Max. My	2	-29.376	-2.099	1723.163
L24	89.75 - 89.75	Pole	Max. Vy	20	-33.186	1710.228	-3.454
			Max. Vx	2	-33.423	-2.099	1723.163

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L25	89.75 - 86.25	Pole	Max. Torque	5			2.377
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-83.721	3.504	5.033
			Max. Mx	20	-30.455	1826.990	-3.934
			Max. My	2	-30.434	-2.586	1840.764
			Max. Vy	20	-33.556	1826.990	-3.934
			Max. Vx	2	-33.793	-2.586	1840.764
L26	86.25 - 86	Pole	Max. Torque	5			2.377
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-83.879	3.503	5.050
			Max. Mx	20	-30.572	1835.380	-3.968
			Max. My	2	-30.552	-2.621	1849.214
			Max. Vy	20	-33.576	1835.380	-3.968
			Max. Vx	2	-33.813	-2.621	1849.214
L27	86 - 81	Pole	Max. Torque	5			2.377
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-87.033	3.409	5.226
			Max. Mx	20	-32.707	2004.651	-4.653
			Max. My	2	-32.687	-3.317	2019.683
			Max. Vy	20	-34.143	2004.651	-4.653
			Max. Vx	2	-34.380	-3.317	2019.683
L28	81 - 77.75	Pole	Max. Torque	5			2.377
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-89.246	3.350	5.344
			Max. Mx	20	-34.103	2116.159	-5.099
			Max. My	2	-34.084	-3.770	2131.970
			Max. Vy	20	-34.496	2116.159	-5.099
			Max. Vx	2	-34.733	-3.770	2131.970
L29	77.75 - 77.5	Pole	Max. Torque	5			2.376
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-89.443	3.349	5.361
			Max. Mx	20	-34.243	2124.784	-5.133
			Max. My	2	-34.224	-3.805	2140.655
			Max. Vy	20	-34.518	2124.784	-5.133
			Max. Vx	2	-34.755	-3.805	2140.655
L30	77.5 - 72.5	Pole	Max. Torque	5			2.376
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-93.381	3.257	5.533
			Max. Mx	20	-36.875	2298.753	-5.820
			Max. My	2	-36.857	-4.502	2315.823
			Max. Vy	20	-35.080	2298.753	-5.820
			Max. Vx	2	-35.317	-4.502	2315.823
L31	72.5 - 67.5	Pole	Max. Torque	5			2.376
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-97.308	3.168	5.711
			Max. Mx	20	-39.521	2475.442	-6.507
			Max. My	2	-39.504	-5.200	2493.712
			Max. Vy	20	-35.612	2475.442	-6.507
			Max. Vx	2	-35.850	-5.200	2493.712
L32	67.5 - 62.5	Pole	Max. Torque	5			2.375
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-101.458	3.081	5.886
			Max. Mx	20	-42.177	2654.715	-7.194
			Max. My	2	-42.161	-5.899	2674.185
			Max. Vy	20	-36.116	2654.715	-7.194
			Max. Vx	2	-36.354	-5.899	2674.185
L33	62.5 - 60	Pole	Max. Torque	5			2.375
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-103.581	3.038	5.973
			Max. Mx	20	-43.506	2745.278	-7.538
			Max. My	2	-43.490	-6.249	2765.347
			Max. Vy	20	-36.360	2745.278	-7.538
			Max. Vx	2	-36.597	-6.249	2765.347
L34	60 - 59.75	Pole	Max. Torque	5			2.375
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-103.737	3.035	5.989
			Max. Mx	20	-43.620	2754.367	-7.573
			Max. My	2	-43.605	-6.284	2774.497

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L35	59.75 - 54.75	Pole	Max. Vy	20	-36.376	2754.367	-7.573
			Max. Vx	2	-36.613	-6.284	2774.497
			Max. Torque	5			2.374
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-106.838	2.935	6.179
L36	54.75 - 49.75	Pole	Max. Mx	20	-45.696	2937.522	-8.259
			Max. My	2	-45.682	-6.983	2958.852
			Max. Vy	20	-36.902	2937.522	-8.259
			Max. Vx	2	-37.139	-6.983	2958.852
			Max. Torque	5			2.374
L37	49.75 - 46.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-109.667	2.839	6.373
			Max. Mx	20	-47.790	3123.188	-8.944
			Max. My	2	-47.777	-7.683	3145.714
			Max. Vy	20	-37.390	3123.188	-8.944
L38	46.25 - 46	Pole	Max. Vx	2	-37.626	-7.683	3145.714
			Max. Torque	5			2.374
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-111.822	2.773	6.506
			Max. Mx	20	-49.260	3254.564	-9.424
L39	46 - 41	Pole	Max. My	2	-49.248	-8.172	3277.927
			Max. Vy	20	-37.715	3254.564	-9.424
			Max. Vx	2	-37.950	-8.172	3277.927
			Max. Torque	5			2.374
			Max Tension	1	0.000	0.000	0.000
L40	41 - 36	Pole	Max. Compression	26	-112.008	2.770	6.521
			Max. Mx	20	-49.408	3263.991	-9.458
			Max. My	2	-49.396	-8.207	3287.414
			Max. Vy	20	-37.726	3263.991	-9.458
			Max. Vx	2	-37.962	-8.207	3287.414
L41	36 - 32.75	Pole	Max. Torque	5			2.373
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-115.726	2.675	6.703
			Max. Mx	20	-52.135	3453.805	-10.142
			Max. My	2	-52.125	-8.905	3478.419
L42	32.75 - 32.5	Pole	Max. Vy	20	-38.215	3453.805	-10.142
			Max. Vx	2	-38.450	-8.905	3478.419
			Max. Torque	5			2.373
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-119.428	2.583	6.887
L43	32.5 - 27.5	Pole	Max. Mx	20	-54.877	3645.933	-10.825
			Max. My	2	-54.868	-9.602	3671.737
			Max. Vy	20	-38.662	3645.933	-10.825
			Max. Vx	2	-38.897	-9.602	3671.737
			Max. Torque	5			2.373
L44	32.5 - 27.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-121.974	2.525	7.004
			Max. Mx	20	-56.664	3771.976	-11.268
			Max. My	2	-56.655	-10.055	3798.551
			Max. Vy	20	-38.934	3771.976	-11.268
L45	32.5 - 27.5	Pole	Max. Vx	2	-39.168	-10.055	3798.551
			Max. Torque	5			2.373
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-122.196	2.522	7.017
			Max. Mx	20	-56.835	3781.708	-11.303
L46	32.5 - 27.5	Pole	Max. My	2	-56.826	-10.090	3808.342
			Max. Vy	20	-38.943	3781.708	-11.303
			Max. Vx	2	-39.177	-10.090	3808.342
			Max. Torque	5			2.373
			Max Tension	1	0.000	0.000	0.000
L47	32.5 - 27.5	Pole	Max. Compression	26	-126.631	2.433	7.190
			Max. Mx	20	-60.066	3977.436	-11.984
			Max. My	2	-60.059	-10.786	4005.254
			Max. Vy	20	-39.366	3977.436	-11.984
			Max. Vx	2	-39.599	-10.786	4005.254
L48	32.5 - 27.5	Pole	Max. Torque	5			2.373

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L44	27.5 - 22.5	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-131.221	2.347	7.361
			Max. Mx	20	-63.311	4175.118	-12.663
			Max. My	2	-63.305	-11.480	4204.116
			Max. Vy	20	-39.737	4175.118	-12.663
			Max. Vx	2	-39.969	-11.480	4204.116
L45	22.5 - 20	Pole	Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-133.562	2.306	7.445
			Max. Mx	20	-64.934	4274.626	-13.003
			Max. My	2	-64.929	-11.827	4304.213
			Max. Vy	20	-39.909	4274.626	-13.003
L46	20 - 19.75	Pole	Max. Vx	2	-40.141	-11.827	4304.213
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-133.726	2.302	7.456
			Max. Mx	20	-65.062	4284.600	-13.037
			Max. My	2	-65.057	-11.862	4314.246
L47	19.75 - 14.75	Pole	Max. Vy	20	-39.911	4284.600	-13.037
			Max. Vx	2	-40.143	-11.862	4314.246
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-137.036	2.211	7.635
			Max. Mx	20	-67.410	4484.960	-13.712
L48	14.75 - 11.75	Pole	Max. My	2	-67.406	-12.555	4515.781
			Max. Vy	20	-40.257	4484.960	-13.712
			Max. Vx	2	-40.488	-12.555	4515.781
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-139.047	2.159	7.740
L49	11.75 - 11.5	Pole	Max. Mx	20	-68.827	4605.940	-14.117
			Max. My	2	-68.824	-12.969	4637.462
			Max. Vy	20	-40.438	4605.940	-14.117
			Max. Vx	2	-40.668	-12.969	4637.462
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
L50	11.5 - 9	Pole	Max. Compression	26	-139.241	2.155	7.750
			Max. Mx	20	-68.986	4616.046	-14.150
			Max. My	2	-68.984	-13.004	4647.627
			Max. Vy	20	-40.438	4616.046	-14.150
			Max. Vx	2	-40.668	-13.004	4647.627
			Max. Torque	5			2.372
L51	9 - 8.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-141.224	2.113	7.832
			Max. Mx	20	-70.472	4717.337	-14.486
			Max. My	2	-70.470	-13.349	4749.501
			Max. Vy	20	-40.623	4717.337	-14.486
			Max. Vx	2	-40.852	-13.349	4749.501
L52	8.75 - 4.5	Pole	Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-141.439	2.109	7.841
			Max. Mx	20	-70.646	4727.489	-14.520
			Max. My	2	-70.644	-13.383	4759.712
			Max. Vy	20	-40.622	4727.489	-14.520
L53	4.5 - 4.25	Pole	Max. Vx	2	-40.852	-13.383	4759.712
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-144.932	2.097	7.863
			Max. Mx	20	-73.338	4900.728	-15.098
			Max. My	2	-73.336	-13.964	4933.926
L53	4.5 - 4.25	Pole	Max. Vy	20	-40.922	4900.728	-15.098
			Max. Vx	2	-41.150	-13.964	4933.926
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
L53	4.5 - 4.25	Pole	Max. Compression	26	-145.132	2.097	7.864
			Max. Mx	20	-73.501	4910.956	-15.132
			Max. My	2	-73.500	-13.998	4944.211

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L54	4.25 - 1.5	Pole	Max. Vy	20	-40.925	4910.956	-15.132
			Max. Vx	2	-41.153	-13.998	4944.211
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-147.302	2.097	7.863
			Max. Mx	20	-75.206	5023.739	-15.506
			Max. My	2	-75.205	-14.372	5057.621
			Max. Vy	20	-41.125	5023.739	-15.506
			Max. Vx	2	-41.353	-14.372	5057.621
L55	1.5 - 1.25	Pole	Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-147.482	2.097	7.863
			Max. Mx	20	-75.359	5034.016	-15.540
			Max. My	2	-75.358	-14.406	5067.955
			Max. Vy	20	-41.122	5034.016	-15.540
			Max. Vx	2	-41.350	-14.406	5067.955
			Max. Torque	5			2.372
			Max Tension	1	0.000	0.000	0.000
L56	1.25 - 0	Pole	Max. Compression	26	-148.332	2.097	7.863
			Max. Mx	20	-76.062	5085.461	-15.710
			Max. My	2	-76.062	-14.576	5119.685
			Max. Vy	20	-41.217	5085.461	-15.710
			Max. Vx	2	-41.445	-14.576	5119.685
			Max. Torque	5			2.372

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	148.332	0.000	0.000
	Max. H _x	20	76.074	41.194	-0.136
	Max. H _z	2	76.074	-0.136	41.421
	Max. M _x	2	5119.685	-0.136	41.421
	Max. M _z	8	5082.051	-41.194	0.136
	Max. Torsion	5	2.372	-20.714	35.940
	Min. Vert	11	57.056	-35.607	-20.593
	Min. H _x	8	76.074	-41.194	0.136
	Min. H _z	14	76.074	0.136	-41.421
	Min. M _x	14	-5118.530	0.136	-41.421
	Min. M _z	20	-5085.461	41.194	-0.136
	Min. Torsion	17	-2.364	20.714	-35.940

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturing Moment, M _x kip-ft	Overturing Moment, M _z kip-ft	Torque kip-ft
Dead Only	63.395	0.000	0.000	-0.460	1.353	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	76.074	0.136	-41.421	-5119.685	-14.576	-1.778
0.9 Dead+1.6 Wind 0 deg - No Ice	57.056	0.136	-41.421	-5073.124	-14.888	-1.787
1.2 Dead+1.6 Wind 30 deg - No Ice	76.074	20.714	-35.940	-4441.988	-2554.237	-2.364
0.9 Dead+1.6 Wind 30 deg - No Ice	57.056	20.714	-35.940	-4401.580	-2531.535	-2.372
1.2 Dead+1.6 Wind 60 deg - No Ice	76.074	35.743	-20.828	-2574.239	-4409.065	-2.314
0.9 Dead+1.6 Wind 60 deg - No Ice	57.056	35.743	-20.828	-2550.771	-4369.550	-2.318

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
1.2 Dead+1.6 Wind 90 deg - No Ice	76.074	41.194	-0.136	-16.847	-5082.051	-1.640
0.9 Dead+1.6 Wind 90 deg - No Ice	57.056	41.194	-0.136	-16.569	-5036.430	-1.640
1.2 Dead+1.6 Wind 120 deg - No Ice	76.074	35.607	20.593	2544.924	-4392.817	-0.524
0.9 Dead+1.6 Wind 120 deg - No Ice	57.056	35.607	20.593	2521.978	-4353.433	-0.520
1.2 Dead+1.6 Wind 150 deg - No Ice	76.074	20.480	35.804	4424.598	-2526.056	0.728
0.9 Dead+1.6 Wind 150 deg - No Ice	57.056	20.480	35.804	4384.617	-2503.582	0.735
1.2 Dead+1.6 Wind 180 deg - No Ice	76.074	-0.136	41.421	5118.530	17.981	1.781
0.9 Dead+1.6 Wind 180 deg - No Ice	57.056	-0.136	41.421	5072.268	17.407	1.790
1.2 Dead+1.6 Wind 210 deg - No Ice	76.074	-20.714	35.940	4440.841	2557.636	2.356
0.9 Dead+1.6 Wind 210 deg - No Ice	57.056	-20.714	35.940	4400.730	2534.049	2.364
1.2 Dead+1.6 Wind 240 deg - No Ice	76.074	-35.743	20.828	2573.100	4412.467	2.303
0.9 Dead+1.6 Wind 240 deg - No Ice	57.056	-35.743	20.828	2549.927	4372.067	2.307
1.2 Dead+1.6 Wind 270 deg - No Ice	76.074	-41.194	0.136	15.710	5085.461	1.636
0.9 Dead+1.6 Wind 270 deg - No Ice	57.056	-41.194	0.136	15.727	5038.953	1.637
1.2 Dead+1.6 Wind 300 deg - No Ice	76.074	-35.607	-20.593	-2546.068	4396.234	0.533
0.9 Dead+1.6 Wind 300 deg - No Ice	57.056	-35.607	-20.593	-2522.825	4355.961	0.529
1.2 Dead+1.6 Wind 330 deg - No Ice	76.074	-20.480	-35.804	-4425.750	2529.470	-0.717
0.9 Dead+1.6 Wind 330 deg - No Ice	57.056	-20.480	-35.804	-4385.471	2506.107	-0.724
1.2 Dead+1.0 Ice+1.0 Temp	148.332	-0.000	-0.000	-7.863	2.097	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	148.332	0.015	-7.898	-1034.270	0.375	-0.248
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	148.332	3.951	-6.847	-897.749	-510.623	-0.313
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	148.332	6.828	-3.962	-522.894	-884.198	-0.294
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	148.332	8.157	-0.015	-10.147	-1044.734	-0.195
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	148.332	6.844	3.954	505.236	-886.023	-0.045
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	148.332	4.000	6.961	889.919	-513.496	0.118
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	148.332	-0.015	7.898	1017.721	4.119	0.249
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	148.332	-3.951	6.847	881.199	515.118	0.313
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	148.332	-6.828	3.962	506.344	888.693	0.294
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	148.332	-8.157	0.015	-6.403	1049.229	0.196
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	148.332	-6.844	-3.954	-521.786	890.518	0.045
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	148.332	-4.000	-6.961	-906.469	517.990	-0.117
Dead+Wind 0 deg - Service	63.395	0.027	-8.339	-1025.711	-1.847	-0.361
Dead+Wind 30 deg - Service	63.395	4.170	-7.235	-889.988	-510.480	-0.479
Dead+Wind 60 deg - Service	63.395	7.196	-4.193	-515.920	-881.952	-0.468
Dead+Wind 90 deg - Service	63.395	8.293	-0.027	-3.740	-1016.725	-0.332
Dead+Wind 120 deg - Service	63.395	7.168	4.146	509.314	-878.691	-0.107
Dead+Wind 150 deg - Service	63.395	4.123	7.208	885.769	-504.831	0.147

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 180 deg - Service	63.395	-0.027	8.339	1024.753	4.676	0.361
Dead+Wind 210 deg - Service	63.395	-4.170	7.235	889.030	513.310	0.479
Dead+Wind 240 deg - Service	63.395	-7.196	4.193	514.963	884.782	0.468
Dead+Wind 270 deg - Service	63.395	-8.293	0.027	2.783	1019.555	0.332
Dead+Wind 300 deg - Service	63.395	-7.168	-4.146	-510.271	881.521	0.107
Dead+Wind 330 deg - Service	63.395	-4.123	-7.208	-886.727	507.661	-0.146

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-63.395	0.000	0.000	63.395	0.000	0.000%
2	0.136	-76.074	-41.421	-0.136	76.074	41.421	0.000%
3	0.136	-57.056	-41.421	-0.136	57.056	41.421	0.000%
4	20.714	-76.074	-35.940	-20.714	76.074	35.940	0.000%
5	20.714	-57.056	-35.940	-20.714	57.056	35.940	0.000%
6	35.743	-76.074	-20.828	-35.743	76.074	20.828	0.000%
7	35.743	-57.056	-20.828	-35.743	57.056	20.828	0.000%
8	41.194	-76.074	-0.136	-41.194	76.074	0.136	0.000%
9	41.194	-57.056	-0.136	-41.194	57.056	0.136	0.000%
10	35.607	-76.074	20.593	-35.607	76.074	-20.593	0.000%
11	35.607	-57.056	20.593	-35.607	57.056	-20.593	0.000%
12	20.480	-76.074	35.804	-20.480	76.074	-35.804	0.000%
13	20.480	-57.056	35.804	-20.480	57.056	-35.804	0.000%
14	-0.136	-76.074	41.421	0.136	76.074	-41.421	0.000%
15	-0.136	-57.056	41.421	0.136	57.056	-41.421	0.000%
16	-20.714	-76.074	35.940	20.714	76.074	-35.940	0.000%
17	-20.714	-57.056	35.940	20.714	57.056	-35.940	0.000%
18	-35.743	-76.074	20.828	35.743	76.074	-20.828	0.000%
19	-35.743	-57.056	20.828	35.743	57.056	-20.828	0.000%
20	-41.194	-76.074	0.136	41.194	76.074	-0.136	0.000%
21	-41.194	-57.056	0.136	41.194	57.056	-0.136	0.000%
22	-35.607	-76.074	-20.593	35.607	76.074	20.593	0.000%
23	-35.607	-57.056	-20.593	35.607	57.056	20.593	0.000%
24	-20.480	-76.074	-35.804	20.480	76.074	35.804	0.000%
25	-20.480	-57.056	-35.804	20.480	57.056	35.804	0.000%
26	0.000	-148.332	0.000	0.000	148.332	0.000	0.000%
27	0.015	-148.332	-7.898	-0.015	148.332	7.898	0.000%
28	3.951	-148.332	-6.847	-3.951	148.332	6.847	0.000%
29	6.828	-148.332	-3.962	-6.828	148.332	3.962	0.000%
30	8.157	-148.332	-0.015	-8.157	148.332	0.015	0.000%
31	6.844	-148.332	3.954	-6.844	148.332	-3.954	0.000%
32	4.000	-148.332	6.961	-4.000	148.332	-6.961	0.000%
33	-0.015	-148.332	7.898	0.015	148.332	-7.898	0.000%
34	-3.951	-148.332	6.847	3.951	148.332	-6.847	0.000%
35	-6.828	-148.332	3.962	6.828	148.332	-3.962	0.000%
36	-8.157	-148.332	0.015	8.157	148.332	-0.015	0.000%
37	-6.844	-148.332	-3.954	6.844	148.332	3.954	0.000%
38	-4.000	-148.332	-6.961	4.000	148.332	6.961	0.000%
39	0.027	-63.395	-8.339	-0.027	63.395	8.339	0.000%
40	4.170	-63.395	-7.235	-4.170	63.395	7.235	0.000%
41	7.196	-63.395	-4.193	-7.196	63.395	4.193	0.000%
42	8.293	-63.395	-0.027	-8.293	63.395	0.027	0.000%
43	7.168	-63.395	4.146	-7.168	63.395	-4.146	0.000%
44	4.123	-63.395	7.208	-4.123	63.395	-7.208	0.000%
45	-0.027	-63.395	8.339	0.027	63.395	-8.339	0.000%
46	-4.170	-63.395	7.235	4.170	63.395	-7.235	0.000%
47	-7.196	-63.395	4.193	7.196	63.395	-4.193	0.000%
48	-8.293	-63.395	0.027	8.293	63.395	-0.027	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
49	-7.168	-63.395	-4.146	7.168	63.395	4.146	0.000%
50	-4.123	-63.395	-7.208	4.123	63.395	7.208	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00028975
3	Yes	5	0.00000001	0.00013364
4	Yes	6	0.00000001	0.00037985
5	Yes	6	0.00000001	0.00012524
6	Yes	6	0.00000001	0.00039963
7	Yes	6	0.00000001	0.00013258
8	Yes	5	0.00000001	0.00043016
9	Yes	5	0.00000001	0.00020158
10	Yes	6	0.00000001	0.00038092
11	Yes	6	0.00000001	0.00012617
12	Yes	6	0.00000001	0.00038261
13	Yes	6	0.00000001	0.00012666
14	Yes	5	0.00000001	0.00041662
15	Yes	5	0.00000001	0.00019455
16	Yes	6	0.00000001	0.00040076
17	Yes	6	0.00000001	0.00013280
18	Yes	6	0.00000001	0.00037963
19	Yes	6	0.00000001	0.00012520
20	Yes	5	0.00000001	0.00030054
21	Yes	5	0.00000001	0.00013930
22	Yes	6	0.00000001	0.00038838
23	Yes	6	0.00000001	0.00012875
24	Yes	6	0.00000001	0.00038800
25	Yes	6	0.00000001	0.00012851
26	Yes	4	0.00000001	0.00069248
27	Yes	7	0.00000001	0.00024458
28	Yes	7	0.00000001	0.00026825
29	Yes	7	0.00000001	0.00026780
30	Yes	7	0.00000001	0.00024421
31	Yes	7	0.00000001	0.00026330
32	Yes	7	0.00000001	0.00026445
33	Yes	7	0.00000001	0.00023938
34	Yes	7	0.00000001	0.00026474
35	Yes	7	0.00000001	0.00026439
36	Yes	7	0.00000001	0.00024556
37	Yes	7	0.00000001	0.00026933
38	Yes	7	0.00000001	0.00027124
39	Yes	4	0.00000001	0.00063850
40	Yes	5	0.00000001	0.00008876
41	Yes	5	0.00000001	0.00010367
42	Yes	4	0.00000001	0.00065790
43	Yes	5	0.00000001	0.00009076
44	Yes	5	0.00000001	0.00009168
45	Yes	4	0.00000001	0.00065366
46	Yes	5	0.00000001	0.00010451
47	Yes	5	0.00000001	0.00008913
48	Yes	4	0.00000001	0.00064407
49	Yes	5	0.00000001	0.00009666
50	Yes	5	0.00000001	0.00009616

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	KI/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	180 - 175 (1)	P24x0.375	5.000	0.000	0.0	27.833	-22.758	901.775	0.025
L2	175 - 170 (2)	P24x0.375	5.000	0.000	0.0	27.833	-3.773	901.775	0.004
L3	170 - 165 (3)	P24x0.375	5.000	0.000	0.0	27.833	-4.335	901.775	0.005
L4	165 - 160 (4)	P24x0.375	5.000	0.000	0.0	27.833	-8.696	901.775	0.010
L5	160 - 155 (5)	P24x0.375	5.000	0.000	0.0	27.833	-9.354	901.775	0.010
L6	155 - 150 (6)	P24x0.375	5.000	0.000	0.0	27.833	-10.034	901.775	0.011
L7	150 - 145 (7)	P24x0.375	5.000	0.000	0.0	27.833	-10.737	901.775	0.012
L8	145 - 144.5 (8)	P24x0.375	0.500	0.000	0.0	27.833	-10.813	901.775	0.012
L9	144.5 - 144.25 (9)	P24x0.675	0.250	0.000	0.0	49.462	-10.869	1602.580	0.007
L10	144.25 - 140 (10)	P24x0.675	4.250	0.000	0.0	49.462	-11.760	1602.580	0.007
L11	140 - 139.75 (11)	P36x0.5	0.250	0.000	0.0	55.763	-11.826	1806.730	0.007
L12	139.75 - 134.75 (12)	P36x0.5	5.000	0.000	0.0	55.763	-13.039	1806.730	0.007
L13	134.75 - 129.75 (13)	P36x0.5	5.000	0.000	0.0	55.763	-14.261	1806.730	0.008
L14	129.75 - 124.75 (14)	P36x0.5	5.000	0.000	0.0	55.763	-15.490	1806.730	0.009
L15	124.75 - 119.75 (15)	P36x0.5	5.000	0.000	0.0	55.763	-16.728	1806.730	0.009
L16	119.75 - 114.75 (16)	P36x0.5	5.000	0.000	0.0	55.763	-17.974	1806.730	0.010
L17	114.75 - 109.75 (17)	P36x0.5	5.000	0.000	0.0	55.763	-23.223	1806.730	0.013
L18	109.75 - 105.5 (18)	P36x0.5	4.250	0.000	0.0	55.763	-24.339	1806.730	0.013
L19	105.5 - 105.25 (19)	P36x0.7625	0.250	0.000	0.0	84.410	-24.437	2734.890	0.009
L20	105.25 - 100.25 (20)	P36x0.7625	5.000	0.000	0.0	84.410	-26.221	2734.890	0.010
L21	100.25 - 100 (21)	P36x0.7625	0.250	0.000	0.0	84.410	-26.317	2734.890	0.010
L22	100 - 99.75 (22)	P42x0.5	0.250	0.000	0.0	65.188	-26.392	2112.090	0.012
L23	99.75 - 94.75 (23)	P42x0.5	5.000	0.000	0.0	65.188	-27.875	2112.090	0.013
L24	94.75 - 89.75 (24)	P42x0.5	5.000	0.000	0.0	65.188	-29.376	2112.090	0.014
L25	89.75 - 86.25 (25)	P42x0.5	3.500	0.000	0.0	65.188	-30.430	2112.090	0.014
L26	86.25 - 86 (26)	P42x0.725	0.250	0.000	0.0	94.010	-30.548	3045.930	0.010
L27	86 - 81 (27)	P42x0.725	5.000	0.000	0.0	94.010	-32.684	3045.930	0.011
L28	81 - 77.75 (28)	P42x0.725	3.250	0.000	0.0	94.010	-34.081	3045.930	0.011
L29	77.75 - 77.5 (29)	P42x0.9125	0.250	0.000	0.0	117.78 6	-34.221	3816.260	0.009
L30	77.5 - 72.5 (30)	P42x0.9125	5.000	0.000	0.0	117.78 6	-36.853	3816.260	0.010
L31	72.5 - 67.5 (31)	P42x0.9125	5.000	0.000	0.0	117.78 6	-39.501	3816.260	0.010
L32	67.5 - 62.5 (32)	P42x0.9125	5.000	0.000	0.0	117.78 6	-42.158	3816.260	0.011
L33	62.5 - 60 (33)	P42x0.9125	2.500	0.000	0.0	117.78 6	-43.487	3816.260	0.011
L34	60 - 59.75 (34)	P48x0.625	0.250	0.000	0.0	93.021	-43.602	3013.870	0.014
L35	59.75 - 54.75 (35)	P48x0.625	5.000	0.000	0.0	93.021	-45.680	3013.870	0.015
L36	54.75 - 49.75 (36)	P48x0.625	5.000	0.000	0.0	93.021	-47.775	3013.870	0.016
L37	49.75 - 46.25	P48x0.625	3.500	0.000	0.0	93.021	-49.246	3013.870	0.016

Section No.	Elevation ft	Size	L ft	L _u ft	KI/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
L38	(37) 46.25 - 46	P48x0.825	0.250	0.000	0.0	122.26 9	-49.394	3961.510	0.012
L39	(38) 46 - 41 (39)	P48x0.825	5.000	0.000	0.0	122.26 9	-52.123	3961.510	0.013
L40	(40) 41 - 36 (40)	P48x0.825	5.000	0.000	0.0	122.26 9	-54.866	3961.510	0.014
L41	(41) 36 - 32.75	P48x0.825	3.250	0.000	0.0	122.26 9	-56.654	3961.510	0.014
L42	(42) 32.75 - 32.5	P48x0.975	0.250	0.000	0.0	144.04 0	-56.825	4666.900	0.012
L43	(43) 32.5 - 27.5	P48x0.975	5.000	0.000	0.0	144.04 0	-60.057	4666.900	0.013
L44	(44) 27.5 - 22.5	P48x0.975	5.000	0.000	0.0	144.04 0	-63.304	4666.900	0.014
L45	(45) 22.5 - 20 (45)	P48x0.975	2.500	0.000	0.0	144.04 0	-64.928	4666.900	0.014
L46	(46) 20 - 19.75	P54x0.625	0.250	0.000	0.0	104.80 2	-65.056	3395.570	0.019
L47	(47) 19.75 - 14.75	P54x0.625	5.000	0.000	0.0	104.80 2	-67.405	3395.570	0.020
L48	(48) 14.75 - 11.75	4.8.2 (1.04 CR) - 47 P54x0.625	3.000	0.000	0.0	104.80 2	-68.824	3395.570	0.020
L49	(49) 11.75 - 11.5	4.8.2 (1.06 CR) - 48 P54x0.8	0.250	0.000	0.0	133.70 6	-68.983	4332.080	0.016
L50	(50) 11.5 - 9 (50)	P54x0.8	2.500	0.000	0.0	133.70 6	-70.470	4332.080	0.016
L51	(51) 9 - 8.75 (51)	P54x0.8875	0.250	0.000	0.0	148.08 6	-70.643	4798.000	0.015
L52	(52) 8.75 - 4.5 (52)	P54x0.8875	4.250	0.000	0.0	148.08 6	-73.336	4798.000	0.015
L53	(53) 4.5 - 4.25 (53)	P54x0.95	0.250	0.000	0.0	158.32 8	-73.500	5129.840	0.014
L54	(54) 4.25 - 1.5 (54)	P54x0.95	2.750	0.000	0.0	158.32 8	-75.205	5129.840	0.015
L55	(55) 1.5 - 1.25 (55)	P54x0.8625	0.250	0.000	0.0	143.98 3	-75.358	4665.040	0.016
L56	(56) 1.25 - 0 (56)	P54x0.8625	1.250	0.000	0.0	143.98 3	-76.061	4665.040	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy} kip-ft	φM _{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	180 - 175 (1)	P24x0.375	3.683	550.881	0.007	0.000	550.881	0.000
L2	175 - 170 (2)	P24x0.375	45.448	550.881	0.083	0.000	550.881	0.000
L3	170 - 165 (3)	P24x0.375	78.290	550.881	0.142	0.000	550.881	0.000
L4	165 - 160 (4)	P24x0.375	130.972	550.881	0.238	0.000	550.881	0.000
L5	160 - 155 (5)	P24x0.375	214.429	550.881	0.389	0.000	550.881	0.000
L6	155 - 150 (6)	P24x0.375	299.943	550.881	0.544	0.000	550.881	0.000
L7	150 - 145 (7)	P24x0.375	387.286	550.881	0.703	0.000	550.881	0.000
L8	(8) 145 - 144.5	P24x0.375	396.117	550.881	0.719	0.000	550.881	0.000
L9	144.5 - 144.25 (9)	P24x0.675	400.539	991.817	0.404	0.000	991.817	0.000
L10	144.25 - 140 (10)	P24x0.675	476.464	991.817	0.480	0.000	991.817	0.000
L11	140 - 139.75 (11)	P36x0.5	480.975	1623.158	0.296	0.000	1623.158	0.000
L12	139.75 - 134.75 (12)	P36x0.5	572.737	1623.158	0.353	0.000	1623.158	0.000
L13	134.75 -	P36x0.5	667.409	1623.158	0.411	0.000	1623.158	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L14	129.75 (13)	P36x0.5	764.930	1623.158	0.471	0.000	1623.158	0.000
L15	129.75 - 124.75 (14)	P36x0.5	865.233	1623.158	0.533	0.000	1623.158	0.000
L16	119.75 (15)	P36x0.5	968.250	1623.158	0.597	0.000	1623.158	0.000
L17	119.75 - 114.75 (16)	P36x0.5	1076.617	1623.158	0.663	0.000	1623.158	0.000
L18	109.75 (17)	P36x0.5	1210.475	1623.158	0.746	0.000	1623.158	0.000
L19	109.75 - 105.5 (18)	P36x0.7625	1218.400	2556.708	0.477	0.000	2556.708	0.000
L20	105.25 (19)	P36x0.7625	1378.358	2556.708	0.539	0.000	2556.708	0.000
L21	105.25 - 100.25 (20)	P36x0.7625	1386.425	2556.708	0.542	0.000	2556.708	0.000
L22	100 (21)	P42x0.5	1394.492	2162.842	0.645	0.000	2162.842	0.000
L23	100 - 99.75 (22)	P42x0.5	1557.442	2162.842	0.720	0.000	2162.842	0.000
L24	99.75 - 94.75 (23)	P42x0.5	1723.167	2162.842	0.797	0.000	2162.842	0.000
L25	94.75 - 89.75 (24)	P42x0.5	1840.825	2162.842	0.851	0.000	2162.842	0.000
L26	89.75 - 86.25 (25)	P42x0.725	1849.292	3315.892	0.558	0.000	3315.892	0.000
L27	86.25 - 86 (26)	P42x0.725	2020.050	3315.892	0.609	0.000	3315.892	0.000
L28	86 - 81 (27)	P42x0.725	2132.525	3315.892	0.643	0.000	3315.892	0.000
L29	81 - 77.75 (28)	P42x0.9125	2141.225	4159.942	0.515	0.000	4159.942	0.000
L30	77.75 - 77.5 (29)	P42x0.9125	2316.675	4159.942	0.557	0.000	4159.942	0.000
L31	77.5 - 72.5 (30)	P42x0.9125	2494.858	4159.942	0.600	0.000	4159.942	0.000
L32	72.5 - 67.5 (31)	P42x0.9125	2675.617	4159.942	0.643	0.000	4159.942	0.000
L33	67.5 - 62.5 (32)	P42x0.9125	2766.925	4159.942	0.665	0.000	4159.942	0.000
L34	62.5 - 60 (33)	P48x0.625	2776.092	3573.958	0.777	0.000	3573.958	0.000
L35	60 - 59.75 (34)	P48x0.625	2960.725	3573.958	0.828	0.000	3573.958	0.000
L36	59.75 - 54.75 (35)	P48x0.625	3147.875	3573.958	0.881	0.000	3573.958	0.000
L37	54.75 - 49.75 (36)	P48x0.625	3280.292	3573.958	0.918	0.000	3573.958	0.000
L38	49.75 - 46.25 (37)	P48x0.625	3289.792	4924.692	0.668	0.000	4924.692	0.000
L39	46.25 - 46 (38)	P48x0.825	3481.083	4924.692	0.707	0.000	4924.692	0.000
L40	46 - 41 (39)	P48x0.825	3674.683	4924.692	0.746	0.000	4924.692	0.000
L41	41 - 36 (40)	P48x0.825	3801.683	4924.692	0.772	0.000	4924.692	0.000
L42	36 - 32.75 (41)	P48x0.975	3811.492	5822.217	0.655	0.000	5822.217	0.000
L43	32.75 - 32.5 (42)	P48x0.975	4008.683	5822.217	0.689	0.000	5822.217	0.000
L44	32.5 - 27.5 (43)	P48x0.975	4207.833	5822.217	0.723	0.000	5822.217	0.000
L45	27.5 - 22.5 (44)	P48x0.975	4308.075	5822.217	0.740	0.000	5822.217	0.000
L46	22.5 - 20 (45)	P54x0.625	4318.117	4453.000	0.970	0.000	4453.000	0.000
L47	20 - 19.75 (46)	P54x0.625	4519.933	4453.000	1.015	0.000	4453.000	0.000
L48	19.75 - 14.75 (47)	P54x0.625	4641.783	4453.000	1.042	0.000	4453.000	0.000
L49	14.75 - 11.75 (48)	P54x0.8	4651.958	5900.141	0.788	0.000	5900.141	0.000
L50	11.75 - 11.5 (49)	P54x0.8	4753.975	5900.141	0.806	0.000	5900.141	0.000
L50	11.5 - 9 (50)	P54x0.8	4753.975	5900.141	0.806	0.000	5900.141	0.000

Section No.	Elevation ft	Size	M_{ux}	ϕM_{nx}	Ratio	M_{uy}	ϕM_{ny}	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L51	9 - 8.75 (51)	P54x0.8875	4764.200	6654.700	0.716	0.000	6654.700	0.000
L52	8.75 - 4.5 (52)	P54x0.8875	4938.667	6654.700	0.742	0.000	6654.700	0.000
L53	4.5 - 4.25 (53)	P54x0.95	4948.967	7219.458	0.686	0.000	7219.458	0.000
L54	4.25 - 1.5 (54)	P54x0.95	5062.550	7219.458	0.701	0.000	7219.458	0.000
L55	1.5 - 1.25 (55)	P54x0.8625	5072.900	6437.033	0.788	0.000	6437.033	0.000
L56	1.25 - 0 (56)	P54x0.8625	5124.700	6437.033	0.796	0.000	6437.033	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	ϕV_n	Ratio	Actual	ϕT_n	Ratio
			V_u K	K	$\frac{V_u}{\phi V_n}$	T_u kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	180 - 175 (1)	P24x0.375	1.458	450.887	0.003	0.018	874.033	0.000
L2	175 - 170 (2)	P24x0.375	6.365	450.887	0.014	0.129	874.033	0.000
L3	170 - 165 (3)	P24x0.375	6.773	450.887	0.015	0.129	874.033	0.000
L4	165 - 160 (4)	P24x0.375	16.492	450.887	0.037	0.079	874.033	0.000
L5	160 - 155 (5)	P24x0.375	16.915	450.887	0.038	0.444	874.033	0.001
L6	155 - 150 (6)	P24x0.375	17.292	450.887	0.038	0.444	874.033	0.001
L7	150 - 145 (7)	P24x0.375	17.650	450.887	0.039	0.444	874.033	0.001
L8	145 - 144.5 (8)	P24x0.375	17.682	450.887	0.039	0.444	874.033	0.001
L9	144.5 - 144.25 (9)	P24x0.675	17.700	801.291	0.022	0.444	1514.975	0.000
L10	144.25 - 140 (10)	P24x0.675	18.031	801.291	0.023	0.444	1514.975	0.000
L11	140 - 139.75 (11)	P36x0.5	18.058	903.365	0.020	0.444	2635.858	0.000
L12	139.75 - 134.75 (12)	P36x0.5	18.646	903.365	0.021	0.444	2635.858	0.000
L13	134.75 - 129.75 (13)	P36x0.5	19.223	903.365	0.021	0.444	2635.858	0.000
L14	129.75 - 124.75 (14)	P36x0.5	19.787	903.365	0.022	0.444	2635.858	0.000
L15	124.75 - 119.75 (15)	P36x0.5	20.337	903.365	0.023	0.444	2635.858	0.000
L16	119.75 - 114.75 (16)	P36x0.5	20.872	903.365	0.023	0.445	2635.858	0.000
L17	114.75 - 109.75 (17)	P36x0.5	31.293	903.365	0.035	1.784	2635.858	0.001
L18	109.75 - 105.5 (18)	P36x0.5	31.710	903.365	0.035	1.784	2635.858	0.001
L19	105.5 - 105.25 (19)	P36x0.7625	31.730	1367.440	0.023	1.784	3932.233	0.000
L20	105.25 - 100.25 (20)	P36x0.7625	32.255	1367.440	0.024	1.783	3932.233	0.000
L21	100.25 - 100 (21)	P36x0.7625	32.276	1367.440	0.024	1.783	3932.233	0.000
L22	100 - 99.75 (22)	P42x0.5	32.306	1056.050	0.031	1.783	3609.208	0.000
L23	99.75 - 94.75 (23)	P42x0.5	32.877	1056.050	0.031	1.783	3609.208	0.000
L24	94.75 - 89.75 (24)	P42x0.5	33.423	1056.050	0.032	1.782	3609.208	0.000
L25	89.75 - 86.25 (25)	P42x0.5	33.854	1056.050	0.032	2.361	3609.208	0.001
L26	86.25 - 86 (26)	P42x0.725	33.876	1522.970	0.022	2.361	5149.533	0.000
L27	86 - 81 (27)	P42x0.725	34.441	1522.970	0.023	2.361	5149.533	0.000
L28	81 - 77.75 (28)	P42x0.725	34.795	1522.970	0.023	2.360	5149.533	0.000
L29	77.75 - 77.5 (29)	P42x0.9125	34.818	1908.130	0.018	2.360	6394.558	0.000
L30	77.5 - 72.5 (30)	P42x0.9125	35.379	1908.130	0.019	2.360	6394.558	0.000
L31	72.5 - 67.5	P42x0.9125	35.911	1908.130	0.019	2.360	6394.558	0.000

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L32	(31) 67.5 - 62.5	P42x0.9125	36.415	1908.130	0.019	2.359	6394.558	0.000
L33	(32) 62.5 - 60 (33)	P42x0.9125	36.659	1908.130	0.019	2.359	6394.558	0.000
L34	60 - 59.75	P48x0.625	36.675	1506.930	0.024	2.359	5872.808	0.000
L35	(34) 59.75 - 54.75	P48x0.625	37.200	1506.930	0.025	2.359	5872.808	0.000
L36	(35) 54.75 - 49.75	P48x0.625	37.688	1506.930	0.025	2.358	5872.808	0.000
L37	(36) 49.75 - 46.25	P48x0.625	38.012	1506.930	0.025	2.358	5872.808	0.000
L38	(37) 46.25 - 46	P48x0.825	38.023	1980.750	0.019	2.358	7655.350	0.000
L39	(38) 46 - 41 (39)	P48x0.825	38.512	1980.750	0.019	2.358	7655.350	0.000
L40	41 - 36 (40)	P48x0.825	38.958	1980.750	0.020	2.357	7655.350	0.000
L41	36 - 32.75	P48x0.825	39.230	1980.750	0.020	2.357	7655.350	0.000
L42	(41) 32.75 - 32.5	P48x0.975	39.238	2333.450	0.017	2.357	8962.333	0.000
L43	(42) 32.5 - 27.5	P48x0.975	39.660	2333.450	0.017	2.357	8962.333	0.000
L44	(43) 27.5 - 22.5	P48x0.975	40.031	2333.450	0.017	2.357	8962.333	0.000
L45	(44) 22.5 - 20 (45)	P48x0.975	40.203	2333.450	0.017	2.357	8962.333	0.000
L46	20 - 19.75	P54x0.625	40.203	1697.790	0.024	2.357	7465.225	0.000
L47	(46) 19.75 - 14.75	P54x0.625	40.549	1697.790	0.024	2.356	7465.225	0.000
L48	(47) 14.75 - 11.75	P54x0.625	40.729	1697.790	0.024	2.356	7465.225	0.000
L49	(48) 11.75 - 11.5	P54x0.8	40.729	2166.040	0.019	2.356	9462.667	0.000
L50	(49) 11.5 - 9 (50)	P54x0.8	40.913	2166.040	0.019	2.356	9462.667	0.000
L51	9 - 8.75 (51)	P54x0.8875	40.912	2399.000	0.017	2.356	10446.500	0.000
L52	8.75 - 4.5 (52)	P54x0.8875	41.211	2399.000	0.017	2.356	10446.500	0.000
L53	4.5 - 4.25 (53)	P54x0.95	41.214	2564.920	0.016	2.356	11143.167	0.000
L54	4.25 - 1.5 (54)	P54x0.95	41.414	2564.920	0.016	2.356	11143.167	0.000
L55	1.5 - 1.25 (55)	P54x0.8625	41.411	2332.520	0.018	2.356	10166.417	0.000
L56	1.25 - 0 (56)	P54x0.8625	41.506	2332.520	0.018	2.356	10166.417	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	180 - 175 (1)	0.025	0.007	0.000	0.003	0.000	0.032	1.000	4.8.2 ✓
L2	175 - 170 (2)	0.004	0.083	0.000	0.014	0.000	0.087	1.000	4.8.2 ✓
L3	170 - 165 (3)	0.005	0.142	0.000	0.015	0.000	0.147	1.000	4.8.2 ✓
L4	165 - 160 (4)	0.010	0.238	0.000	0.037	0.000	0.249	1.000	4.8.2 ✓
L5	160 - 155 (5)	0.010	0.389	0.000	0.038	0.001	0.401	1.000	4.8.2 ✓
L6	155 - 150 (6)	0.011	0.544	0.000	0.038	0.001	0.557	1.000	4.8.2 ✓
L7	150 - 145 (7)	0.012	0.703	0.000	0.039	0.001	0.717	1.000	4.8.2 ✓
L8	145 - 144.5	0.012	0.719	0.000	0.039	0.001	0.733	1.000	4.8.2 ✓

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u ϕP_n	M_{ux} ϕM_{nx}	M_{uy} ϕM_{ny}	V_u ϕV_n	T_u ϕT_n			
	(8)						✓		
L9	144.5 - 144.25 (9)	0.007	0.404	0.000	0.022	0.000	0.411	1.000	4.8.2 ✓
L10	144.25 - 140 (10)	0.007	0.480	0.000	0.023	0.000	0.488	1.000	4.8.2 ✓
L11	140 - 139.75 (11)	0.007	0.296	0.000	0.020	0.000	0.303	1.000	4.8.2 ✓
L12	139.75 - 134.75 (12)	0.007	0.353	0.000	0.021	0.000	0.361	1.000	4.8.2 ✓
L13	134.75 - 129.75 (13)	0.008	0.411	0.000	0.021	0.000	0.420	1.000	4.8.2 ✓
L14	129.75 - 124.75 (14)	0.009	0.471	0.000	0.022	0.000	0.480	1.000	4.8.2 ✓
L15	124.75 - 119.75 (15)	0.009	0.533	0.000	0.023	0.000	0.543	1.000	4.8.2 ✓
L16	119.75 - 114.75 (16)	0.010	0.597	0.000	0.023	0.000	0.607	1.000	4.8.2 ✓
L17	114.75 - 109.75 (17)	0.013	0.663	0.000	0.035	0.001	0.677	1.000	4.8.2 ✓
L18	109.75 - 105.5 (18)	0.013	0.746	0.000	0.035	0.001	0.761	1.000	4.8.2 ✓
L19	105.5 - 105.25 (19)	0.009	0.477	0.000	0.023	0.000	0.486	1.000	4.8.2 ✓
L20	105.25 - 100.25 (20)	0.010	0.539	0.000	0.024	0.000	0.549	1.000	4.8.2 ✓
L21	100.25 - 100 (21)	0.010	0.542	0.000	0.024	0.000	0.552	1.000	4.8.2 ✓
L22	100 - 99.75 (22)	0.012	0.645	0.000	0.031	0.000	0.658	1.000	4.8.2 ✓
L23	99.75 - 94.75 (23)	0.013	0.720	0.000	0.031	0.000	0.734	1.000	4.8.2 ✓
L24	94.75 - 89.75 (24)	0.014	0.797	0.000	0.032	0.000	0.812	1.000	4.8.2 ✓
L25	89.75 - 86.25 (25)	0.014	0.851	0.000	0.032	0.001	0.867	1.000	4.8.2 ✓
L26	86.25 - 86 (26)	0.010	0.558	0.000	0.022	0.000	0.568	1.000	4.8.2 ✓
L27	86 - 81 (27)	0.011	0.609	0.000	0.023	0.000	0.620	1.000	4.8.2 ✓
L28	81 - 77.75 (28)	0.011	0.643	0.000	0.023	0.000	0.655	1.000	4.8.2 ✓
L29	77.75 - 77.5 (29)	0.009	0.515	0.000	0.018	0.000	0.524	1.000	4.8.2 ✓
L30	77.5 - 72.5 (30)	0.010	0.557	0.000	0.019	0.000	0.567	1.000	4.8.2 ✓
L31	72.5 - 67.5 (31)	0.010	0.600	0.000	0.019	0.000	0.610	1.000	4.8.2 ✓
L32	67.5 - 62.5 (32)	0.011	0.643	0.000	0.019	0.000	0.655	1.000	4.8.2 ✓
L33	62.5 - 60 (33)	0.011	0.665	0.000	0.019	0.000	0.677	1.000	4.8.2 ✓
L34	60 - 59.75 (34)	0.014	0.777	0.000	0.024	0.000	0.792	1.000	4.8.2 ✓
L35	59.75 - 54.75 (35)	0.015	0.828	0.000	0.025	0.000	0.844	1.000	4.8.2 ✓
L36	54.75 - 49.75 (36)	0.016	0.881	0.000	0.025	0.000	0.897	1.000	4.8.2 ✓
L37	49.75 - 46.25 (37)	0.016	0.918	0.000	0.025	0.000	0.935	1.000	4.8.2 ✓

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		P_u	M_{ux}	M_{uy}	V_u	T_u			
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L38	46.25 - 46 (38)	0.012	0.668	0.000	0.019	0.000	0.681	1.000	4.8.2 ✓
L39	46 - 41 (39)	0.013	0.707	0.000	0.019	0.000	0.720	1.000	4.8.2 ✓
L40	41 - 36 (40)	0.014	0.746	0.000	0.020	0.000	0.760	1.000	4.8.2 ✓
L41	36 - 32.75 (41)	0.014	0.772	0.000	0.020	0.000	0.787	1.000	4.8.2 ✓
L42	32.75 - 32.5 (42)	0.012	0.655	0.000	0.017	0.000	0.667	1.000	4.8.2 ✓
L43	32.5 - 27.5 (43)	0.013	0.689	0.000	0.017	0.000	0.702	1.000	4.8.2 ✓
L44	27.5 - 22.5 (44)	0.014	0.723	0.000	0.017	0.000	0.737	1.000	4.8.2 ✓
L45	22.5 - 20 (45)	0.014	0.740	0.000	0.017	0.000	0.754	1.000	4.8.2 ✓
L46	20 - 19.75 (46)	0.019	0.970	0.000	0.024	0.000	0.989	1.000	4.8.2 ✓
L47	19.75 - 14.75 (47)	0.020	1.015	0.000	0.024	0.000	1.035 ✗	1.000	4.8.2 ✗
L48	14.75 - 11.75 (48)	0.020	1.042	0.000	0.024	0.000	1.063 ✗	1.000	4.8.2 ✗
L49	11.75 - 11.5 (49)	0.016	0.788	0.000	0.019	0.000	0.805	1.000	4.8.2 ✓
L50	11.5 - 9 (50)	0.016	0.806	0.000	0.019	0.000	0.822	1.000	4.8.2 ✓
L51	9 - 8.75 (51)	0.015	0.716	0.000	0.017	0.000	0.731	1.000	4.8.2 ✓
L52	8.75 - 4.5 (52)	0.015	0.742	0.000	0.017	0.000	0.758	1.000	4.8.2 ✓
L53	4.5 - 4.25 (53)	0.014	0.686	0.000	0.016	0.000	0.700	1.000	4.8.2 ✓
L54	4.25 - 1.5 (54)	0.015	0.701	0.000	0.016	0.000	0.716	1.000	4.8.2 ✓
L55	1.5 - 1.25 (55)	0.016	0.788	0.000	0.018	0.000	0.805	1.000	4.8.2 ✓
L56	1.25 - 0 (56)	0.016	0.796	0.000	0.018	0.000	0.813	1.000	4.8.2 ✓

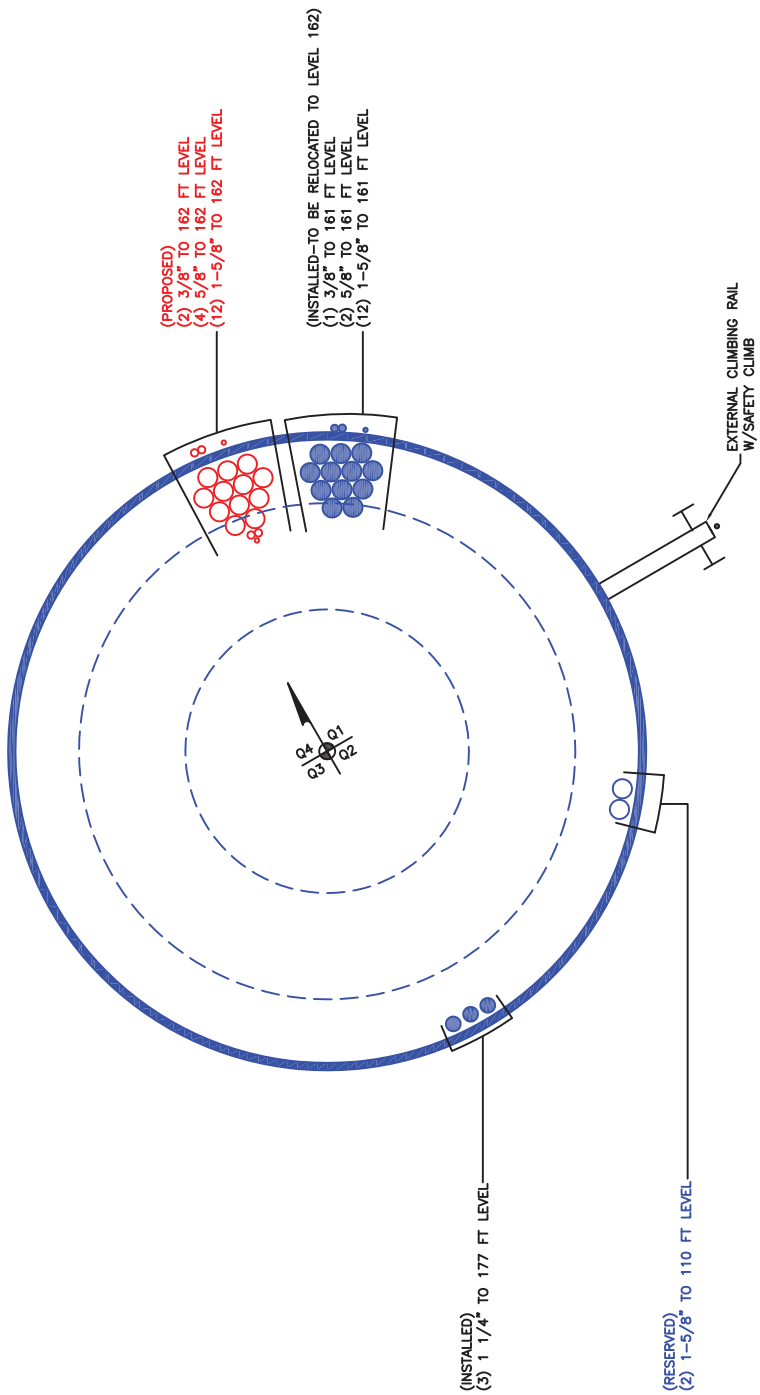
Section Capacity Table

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	180 - 175	Pole	TP24x24x0.375	Pole	2.9%	Pass
L2	175 - 170	Pole	TP24x24x0.375	Pole	8.7%	Pass
L3	170 - 165	Pole	TP24x24x0.375	Pole	14.7%	Pass
L4	165 - 160	Pole	TP24x24x0.375	Pole	24.9%	Pass
L5	160 - 155	Pole	TP24x24x0.375	Pole	40.1%	Pass
L6	155 - 150	Pole	TP24x24x0.375	Pole	55.7%	Pass
L7	150 - 145	Pole	TP24x24x0.375	Pole	71.6%	Pass
L8	145 - 144.5	Pole	TP24x24x0.375	Pole	73.3%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L9	144.5 - 144.25	Pole + Reinf.	TP24x24x0.675	Pole	53.4%	Pass
L10	144.25 - 140	Pole + Reinf.	TP24x24x0.675	Pole	63.4%	Pass
L11	140 - 139.75	Pole	TP36x36x0.5	Pole	30.3%	Pass
L12	139.75 - 134.75	Pole	TP36x36x0.5	Pole	36.0%	Pass
L13	134.75 - 129.75	Pole	TP36x36x0.5	Pole	42.0%	Pass
L14	129.75 - 124.75	Pole	TP36x36x0.5	Pole	48.0%	Pass
L15	124.75 - 119.75	Pole	TP36x36x0.5	Pole	54.3%	Pass
L16	119.75 - 114.75	Pole	TP36x36x0.5	Pole	60.7%	Pass
L17	114.75 - 109.75	Pole	TP36x36x0.5	Pole	67.7%	Pass
L18	109.75 - 105.5	Pole	TP36x36x0.5	Pole	76.0%	Pass
L19	105.5 - 105.25	Pole + Reinf.	TP36x36x0.7625	Pole	63.1%	Pass
L20	105.25 - 100.25	Pole + Reinf.	TP36x36x0.7625	Pole	71.3%	Pass
L21	100.25 - 100	Pole + Reinf.	TP36x36x0.7625	Pole	71.7%	Pass
L22	100 - 99.75	Pole	TP42x42x0.5	Pole	65.8%	Pass
L23	99.75 - 94.75	Pole	TP42x42x0.5	Pole	73.4%	Pass
L24	94.75 - 89.75	Pole	TP42x42x0.5	Pole	81.2%	Pass
L25	89.75 - 86.25	Pole	TP42x42x0.5	Pole	86.7%	Pass
L26	86.25 - 86	Pole + Reinf.	TP42x42x0.725	Pole	69.4%	Pass
L27	86 - 81	Pole + Reinf.	TP42x42x0.725	Pole	75.8%	Pass
L28	81 - 77.75	Pole + Reinf.	TP42x42x0.725	Pole	80.0%	Pass
L29	77.75 - 77.5	Pole + Reinf.	TP42x42x0.9125	Pole	67.0%	Pass
L30	77.5 - 72.5	Pole + Reinf.	TP42x42x0.9125	Pole	72.5%	Pass
L31	72.5 - 67.5	Pole + Reinf.	TP42x42x0.9125	Pole	78.0%	Pass
L32	67.5 - 62.5	Pole + Reinf.	TP42x42x0.9125	Pole	83.7%	Pass
L33	62.5 - 60	Pole + Reinf.	TP42x42x0.9125	Pole	86.5%	Pass
L34	60 - 59.75	Pole	TP48x48x0.625	Pole	79.2%	Pass
L35	59.75 - 54.75	Pole	TP48x48x0.625	Pole	84.4%	Pass
L36	54.75 - 49.75	Pole	TP48x48x0.625	Pole	89.7%	Pass
L37	49.75 - 46.25	Pole	TP48x48x0.625	Pole	93.5%	Pass
L38	46.25 - 46	Pole + Reinf.	TP48x48x0.825	Pole	84.5%	Pass
L39	46 - 41	Pole + Reinf.	TP48x48x0.825	Pole	89.4%	Pass
L40	41 - 36	Pole + Reinf.	TP48x48x0.825	Pole	94.3%	Pass
L41	36 - 32.75	Pole + Reinf.	TP48x48x0.825	Pole	97.6%	Pass
L42	32.75 - 32.5	Pole + Reinf.	TP48x48x0.975	Pole	84.8%	Pass
L43	32.5 - 27.5	Pole + Reinf.	TP48x48x0.975	Pole	89.2%	Pass
L44	27.5 - 22.5	Pole + Reinf.	TP48x48x0.975	Pole	93.6%	Pass
L45	22.5 - 20	Pole + Reinf.	TP48x48x0.975	Pole	95.8%	Pass
L46	20 - 19.75	Pole	TP54x54x0.625	Pole	96.9%	Pass
L47	19.75 - 14.75	Pole	TP54x54x0.625	Pole	101.4%	Pass ²

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L48	14.75 - 11.75	Pole	TP54x54x0.625	Pole	104.1%	Pass ²
L49	11.75 - 11.5	Pole + Reinf.	TP54x54x0.8	Pole	102.4%	Pass ²
	11.5 - 9	Pole + Reinf.	TP54x54x0.8	Pole	104.7%	Pass ²
	9 - 8.75	Pole + Reinf.	TP54x54x0.8875	Pole	94.4%	Pass
	8.75 - 4.5	Pole + Reinf.	TP54x54x0.8875	Pole	97.9%	Pass
	4.5 - 4.25	Pole + Reinf.	TP54x54x0.95	Pole	89.7%	Pass
	4.25 - 1.5	Pole + Reinf.	TP54x54x0.95	Pole	91.7%	Pass
	1.5 - 1.25	Pole + Reinf.	TP54x54x0.8625	Pole	101.2%	Pass ²
	1.25 - 0	Pole + Reinf.	TP54x54x0.8625	Pole	102.2%	Pass ²
					Summary	
				Pole	104.7%	Pass ²
				Reinforcement	74.8%	Pass
					104.7%	Pass ²

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Additional Calculations



Site BU: 878782
Work Order: 1198079



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Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	180	40		0	24	24	0.375	n/a	A36
2	140	40		0	36.00	36	0.5	n/a	A36
3	100	40		0	42.00	42	0.5	n/a	A36
4	60	40		0	48.00	48	0.625	n/a	A36
5	20	20		0	54.00	54	0.625	n/a	A36

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	1.5	9	plate	CCI-SFP-045100	3	90	210	330																
2	11.75	32.75	plate	CCI-SFP-065125	3	55	156	295																
3	60	77.75	plate	CCI-SFP-065125	3	55	156	295																
4																								
5																								
6																								
7	100	105.5	plate	CCI-SFP-065125	3					0	120	240												
8	140	144.5	plate	CCI-SFP-060100	3								55	175	295									
9	4.5	11.75	plate	CCI-SFP-085125	3								55	156	295									
10	20	46.25	plate	CCI-SFP-085125	3															115	225	335		
11	60	86.25	plate	CCI-SFP-085125	3															115	225	335		
12	0	4.5	plate	1.25"x6" Stiffener	4	45	135	225	315															
13																								

Reinforcement Details

	B (in)	H (in)	Gross Area (in ²)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L _u (in)	Net Area (in ²)	Bolt Hole Size (in)	Reinforcement Material
1	4.5	1	4.5	0.5	18,000	18,000	20,000	3,250	1.1875	A572-65
2	6.5	1.25	8.125	0.625	33,000	33,000	19,000	6,563	1.1875	A572-65
3	6.5	1.25	8.125	0.625	33,000	33,000	19,000	6,563	1.1875	A572-65
7	6.5	1.25	8.125	0.625	33,000	33,000	19,000	6,563	1.1875	A572-65
8	6	1	6	0.5	24,000	24,000	16,000	4,750	1.1875	A572-65
9	8.5	1.25	10.625	0.625	45,000	45,000	17,000	9,063	1.1875	A572-65
10	8.5	1.25	10.625	0.625	45,000	45,000	17,000	9,063	1.1875	A572-65
11	8.5	1.25	10.625	0.625	45,000	45,000	17,000	9,063	1.1875	A572-65
12	1.25	6	7.5	3	n/a	n/a	0.000	7,500	0.0000	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	180 - 175	5		0	24.000	24.000	0.375	A36	1.000
2	175 - 170	5		0	24.000	24.000	0.375	A36	1.000
3	170 - 165	5		0	24.000	24.000	0.375	A36	1.000
4	165 - 160	5		0	24.000	24.000	0.375	A36	1.000
5	160 - 155	5		0	24.000	24.000	0.375	A36	1.000
6	155 - 150	5		0	24.000	24.000	0.375	A36	1.000
7	150 - 145	5		0	24.000	24.000	0.375	A36	1.000
8	145 - 144.5	0.5		0	24.000	24.000	0.375	A36	1.000
9	144.5 - 144.25	0.25		0	24.000	24.000	0.675	A36	0.927
10	144.25 - 140	4.25	0	0	24.000	24.000	0.675	A36	0.927
11	140 - 139.75	0.25		0	36.000	36.000	0.5	A36	1.000
12	139.75 - 134.75	5		0	36.000	36.000	0.5	A36	1.000
13	134.75 - 129.75	5		0	36.000	36.000	0.5	A36	1.000
14	129.75 - 124.75	5		0	36.000	36.000	0.5	A36	1.000
15	124.75 - 119.75	5		0	36.000	36.000	0.5	A36	1.000
16	119.75 - 114.75	5		0	36.000	36.000	0.5	A36	1.000
17	114.75 - 109.75	5		0	36.000	36.000	0.5	A36	1.000
18	109.75 - 105.5	4.25		0	36.000	36.000	0.5	A36	1.000
19	105.5 - 105.25	0.25		0	36.000	36.000	0.7625	A36	0.949
20	105.25 - 100.25	5		0	36.000	36.000	0.7625	A36	0.949
21	100.25 - 100	0.25	0	0	36.000	36.000	0.7625	A36	0.949
22	100 - 99.75	0.25		0	42.000	42.000	0.5	A36	1.000
23	99.75 - 94.75	5		0	42.000	42.000	0.5	A36	1.000
24	94.75 - 89.75	5		0	42.000	42.000	0.5	A36	1.000
25	89.75 - 86.25	3.5		0	42.000	42.000	0.5	A36	1.000
26	86.25 - 86	0.25		0	42.000	42.000	0.725	A36	1.032
27	86 - 81	5		0	42.000	42.000	0.725	A36	1.032
28	81 - 77.75	3.25		0	42.000	42.000	0.725	A36	1.032
29	77.75 - 77.5	0.25		0	42.000	42.000	0.9125	A36	1.031
30	77.5 - 72.5	5		0	42.000	42.000	0.9125	A36	1.031
31	72.5 - 67.5	5		0	42.000	42.000	0.9125	A36	1.031
32	67.5 - 62.5	5		0	42.000	42.000	0.9125	A36	1.031
33	62.5 - 60	2.5	0	0	42.000	42.000	0.9125	A36	1.031
34	60 - 59.75	0.25		0	48.000	48.000	0.625	A36	1.000
35	59.75 - 54.75	5		0	48.000	48.000	0.625	A36	1.000
36	54.75 - 49.75	5		0	48.000	48.000	0.625	A36	1.000
37	49.75 - 46.25	3.5		0	48.000	48.000	0.625	A36	1.000
38	46.25 - 46	0.25		0	48.000	48.000	0.825	A36	1.021
39	46 - 41	5		0	48.000	48.000	0.825	A36	1.021
40	41 - 36	5		0	48.000	48.000	0.825	A36	1.021
41	36 - 32.75	3.25		0	48.000	48.000	0.825	A36	1.021
42	32.75 - 32.5	0.25		0	48.000	48.000	0.975	A36	1.036
43	32.5 - 27.5	5		0	48.000	48.000	0.975	A36	1.036
44	27.5 - 22.5	5		0	48.000	48.000	0.975	A36	1.036
45	22.5 - 20	2.5	0	0	48.000	48.000	0.975	A36	1.036
46	20 - 19.75	0.25		0	54.000	54.000	0.625	A36	1.000
47	19.75 - 14.75	5		0	54.000	54.000	0.625	A36	1.000
48	14.75 - 11.75	3		0	54.000	54.000	0.625	A36	1.000
49	11.75 - 11.5	0.25		0	54.000	54.000	0.8	A36	1.022
50	11.5 - 9	2.5		0	54.000	54.000	0.8	A36	1.022
51	9 - 8.75	0.25		0	54.000	54.000	0.8875	A36	1.014
52	8.75 - 4.5	4.25		0	54.000	54.000	0.8875	A36	1.014
53	4.5 - 4.25	0.25		0	54.000	54.000	0.95	A36	0.937
54	4.25 - 1.5	2.75		0	54.000	54.000	0.95	A36	0.937
55	1.5 - 1.25	0.25		0	54.000	54.000	0.8625	A36	0.936
56	1.25 - 0	1.25		0	54.000	54.000	0.8625	A36	0.936

TNX Section Forces

Increment (ft):		TNX Output		
	5	P _u (K)	M _{ux} (kip-ft)	V _u (K)
	Section Height (ft)			
1	180 - 175	2.9472	14.326	5.4098
2	175 - 170	3.773	45.448	6.3647
3	170 - 165	4.3347	78.29	6.7733
4	165 - 160	8.6964	130.97	16.492
5	160 - 155	9.3536	214.43	16.915
6	155 - 150	10.034	299.94	17.292
7	150 - 145	10.737	387.29	17.649
8	145 - 144.5	10.813	396.12	17.682
9	144.5 - 144.25	10.869	400.54	17.699
10	144.25 - 140	11.76	476.46	18.031
11	140 - 139.75	11.826	480.97	18.058
12	139.75 - 134.75	13.039	572.74	18.646
13	134.75 - 129.75	14.261	667.41	19.223
14	129.75 - 124.75	15.49	764.93	19.787
15	124.75 - 119.75	16.728	865.23	20.337
16	119.75 - 114.75	17.974	968.25	20.872
17	114.75 - 109.75	23.223	1076.6	31.293
18	109.75 - 105.5	24.339	1210.5	31.71
19	105.5 - 105.25	24.437	1218.4	31.73
20	105.25 - 100.25	26.221	1378.4	32.255
21	100.25 - 100	26.317	1386.4	32.276
22	100 - 99.75	26.392	1394.5	32.306
23	99.75 - 94.75	27.875	1557.4	32.877
24	94.75 - 89.75	29.376	1723.2	33.423
25	89.75 - 86.25	30.43	1840.8	33.854
26	86.25 - 86	30.548	1849.3	33.876
27	86 - 81	32.684	2020	34.441
28	81 - 77.75	34.081	2132.5	34.795
29	77.75 - 77.5	34.221	2141.2	34.818
30	77.5 - 72.5	36.853	2316.7	35.379
31	72.5 - 67.5	39.501	2494.9	35.911
32	67.5 - 62.5	42.158	2675.6	36.415
33	62.5 - 60	43.487	2766.9	36.659
34	60 - 59.75	43.602	2776.1	36.675
35	59.75 - 54.75	45.68	2960.7	37.2
36	54.75 - 49.75	47.775	3147.9	37.688
37	49.75 - 46.25	49.246	3280.3	38.012
38	46.25 - 46	49.394	3289.8	38.023
39	46 - 41	52.1	3481.1	38.5
40	41 - 36	54.9	3674.7	39.0
41	36 - 32.75	56.7	3801.7	39.2
42	32.75 - 32.5	56.8	3811.5	39.2
43	32.5 - 27.5	60.1	4008.7	39.7
44	27.5 - 22.5	63.3	4207.8	40.0
45	22.5 - 20	64.9	4308.1	40.2
46	20 - 19.75	65.1	4318.1	40.2
47	19.75 - 14.75	67.4	4519.9	40.5
48	14.75 - 11.75	68.8	4641.8	40.7
49	11.75 - 11.5	69.0	4652.0	40.7
50	11.5 - 9	70.5	4754.0	40.9
51	9 - 8.75	70.6	4764.2	40.9
52	8.75 - 4.5	73.3	4938.7	41.2
53	4.5 - 4.25	73.5	4949.0	41.2
54	4.25 - 1.5	75.2	5062.5	41.4
55	1.5 - 1.25	75.4	5072.9	41.4
56	1.25 - 0	76.1	5124.7	41.5

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
180 - 175	Pole	TP24x24x0.375	Pole	2.9%	Pass
175 - 170	Pole	TP24x24x0.375	Pole	8.7%	Pass
170 - 165	Pole	TP24x24x0.375	Pole	14.7%	Pass
165 - 160	Pole	TP24x24x0.375	Pole	24.9%	Pass
160 - 155	Pole	TP24x24x0.375	Pole	40.1%	Pass
155 - 150	Pole	TP24x24x0.375	Pole	55.7%	Pass
150 - 145	Pole	TP24x24x0.375	Pole	71.6%	Pass
145 - 144.5	Pole	TP24x24x0.375	Pole	73.3%	Pass
144.5 - 144.25	Pole + Reinf.	TP24x24x0.675	Pole	53.4%	Pass
144.25 - 140	Pole + Reinf.	TP24x24x0.675	Pole	63.4%	Pass
140 - 139.75	Pole	TP36x36x0.5	Pole	30.3%	Pass
139.75 - 134.75	Pole	TP36x36x0.5	Pole	36.0%	Pass
134.75 - 129.75	Pole	TP36x36x0.5	Pole	42.0%	Pass
129.75 - 124.75	Pole	TP36x36x0.5	Pole	48.0%	Pass
124.75 - 119.75	Pole	TP36x36x0.5	Pole	54.3%	Pass
119.75 - 114.75	Pole	TP36x36x0.5	Pole	60.7%	Pass
114.75 - 109.75	Pole	TP36x36x0.5	Pole	67.7%	Pass
109.75 - 105.5	Pole	TP36x36x0.5	Pole	76.0%	Pass
105.5 - 105.25	Pole + Reinf.	TP36x36x0.7625	Pole	63.1%	Pass
105.25 - 100.25	Pole + Reinf.	TP36x36x0.7625	Pole	71.3%	Pass
100.25 - 100	Pole + Reinf.	TP36x36x0.7625	Pole	71.7%	Pass
100 - 99.75	Pole	TP42x42x0.5	Pole	65.8%	Pass
99.75 - 94.75	Pole	TP42x42x0.5	Pole	73.4%	Pass
94.75 - 89.75	Pole	TP42x42x0.5	Pole	81.2%	Pass
89.75 - 86.25	Pole	TP42x42x0.5	Pole	86.7%	Pass
86.25 - 86	Pole + Reinf.	TP42x42x0.725	Pole	69.4%	Pass
86 - 81	Pole + Reinf.	TP42x42x0.725	Pole	75.8%	Pass
81 - 77.75	Pole + Reinf.	TP42x42x0.725	Pole	80.0%	Pass
77.75 - 77.5	Pole + Reinf.	TP42x42x0.9125	Pole	67.0%	Pass
77.5 - 72.5	Pole + Reinf.	TP42x42x0.9125	Pole	72.5%	Pass
72.5 - 67.5	Pole + Reinf.	TP42x42x0.9125	Pole	78.0%	Pass
67.5 - 62.5	Pole + Reinf.	TP42x42x0.9125	Pole	83.7%	Pass
62.5 - 60	Pole + Reinf.	TP42x42x0.9125	Pole	86.5%	Pass
60 - 59.75	Pole	TP48x48x0.625	Pole	79.2%	Pass
59.75 - 54.75	Pole	TP48x48x0.625	Pole	84.4%	Pass
54.75 - 49.75	Pole	TP48x48x0.625	Pole	89.7%	Pass
49.75 - 46.25	Pole	TP48x48x0.625	Pole	93.5%	Pass
46.25 - 46	Pole + Reinf.	TP48x48x0.825	Pole	84.5%	Pass
46 - 41	Pole + Reinf.	TP48x48x0.825	Pole	89.4%	Pass
41 - 36	Pole + Reinf.	TP48x48x0.825	Pole	94.3%	Pass
36 - 32.75	Pole + Reinf.	TP48x48x0.825	Pole	97.6%	Pass
32.75 - 32.5	Pole + Reinf.	TP48x48x0.975	Pole	84.8%	Pass
32.5 - 27.5	Pole + Reinf.	TP48x48x0.975	Pole	89.2%	Pass
27.5 - 22.5	Pole + Reinf.	TP48x48x0.975	Pole	93.6%	Pass
22.5 - 20	Pole + Reinf.	TP48x48x0.975	Pole	95.8%	Pass
20 - 19.75	Pole	TP54x54x0.625	Pole	96.9%	Pass
19.75 - 14.75	Pole	TP54x54x0.625	Pole	101.4%	Pass
14.75 - 11.75	Pole	TP54x54x0.625	Pole	104.1%	Pass
11.75 - 11.5	Pole + Reinf.	TP54x54x0.8	Pole	102.4%	Pass
11.5 - 9	Pole + Reinf.	TP54x54x0.8	Pole	104.7%	Pass
9 - 8.75	Pole + Reinf.	TP54x54x0.8875	Pole	94.4%	Pass
8.75 - 4.5	Pole + Reinf.	TP54x54x0.8875	Pole	97.9%	Pass
4.5 - 4.25	Pole + Reinf.	TP54x54x0.95	Pole	89.7%	Pass
4.25 - 1.5	Pole + Reinf.	TP54x54x0.95	Pole	91.7%	Pass
1.5 - 1.25	Pole + Reinf.	TP54x54x0.8625	Pole	101.2%	Pass
1.25 - 0	Pole + Reinf.	TP54x54x0.8625	Pole	102.2%	Pass
				Summary	
			Pole	104.7%	Pass
			Reinforcement	74.8%	Pass
				104.7%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in ⁴)			Area (in ²)			% Capacity									
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R7	R8	R9	R10	R11	R12
180 - 175	1942	n/a	1942	27.83	n/a	27.83	2.9%									
175 - 170	1942	n/a	1942	27.83	n/a	27.83	8.7%									
170 - 165	1942	n/a	1942	27.83	n/a	27.83	14.7%									
165 - 160	1942	n/a	1942	27.83	n/a	27.83	24.9%									
160 - 155	1942	n/a	1942	27.83	n/a	27.83	40.1%									
155 - 150	1942	n/a	1942	27.83	n/a	27.83	55.7%									
150 - 145	1942	n/a	1942	27.83	n/a	27.83	71.6%									
145 - 144.5	1942	n/a	1942	27.83	n/a	27.83	73.3%									
144.5 - 144.25	1942	1434	3376	27.83	18.00	45.83	53.4%					38.1%				
144.25 - 140	1942	1434	3376	27.83	18.00	45.83	63.4%					45.3%				
140 - 139.75	8786	n/a	8786	55.76	n/a	55.76	30.3%									
139.75 - 134.75	8786	n/a	8786	55.76	n/a	55.76	36.0%									
134.75 - 129.75	8786	n/a	8786	55.76	n/a	55.76	42.0%									
129.75 - 124.75	8786	n/a	8786	55.76	n/a	55.76	48.0%									
124.75 - 119.75	8786	n/a	8786	55.76	n/a	55.76	54.3%									
119.75 - 114.75	8786	n/a	8786	55.76	n/a	55.76	60.7%									
114.75 - 109.75	8786	n/a	8786	55.76	n/a	55.76	67.7%									
109.75 - 105.5	8786	n/a	8786	55.76	n/a	55.76	76.0%									
105.5 - 105.25	8786	4272	13058	55.76	24.38	80.14	63.1%				43.9%					
105.25 - 100.25	8786	4272	13058	55.76	24.38	80.14	71.3%				49.6%					
100.25 - 100	8786	4272	13058	55.76	24.38	80.14	71.7%				49.9%					
100 - 99.75	14036	n/a	14036	65.19	n/a	65.19	65.8%									
99.75 - 94.75	14036	n/a	14036	65.19	n/a	65.19	73.4%									
94.75 - 89.75	14036	n/a	14036	65.19	n/a	65.19	81.2%									
89.75 - 86.25	14036	n/a	14036	65.19	n/a	65.19	86.7%									
86.25 - 86	14072	6155	20227	65.19	31.88	97.06	69.4%								45.7%	
86 - 81	14072	6155	20227	65.19	31.88	97.06	75.8%								49.9%	
81 - 77.75	14072	6155	20227	65.19	31.88	97.06	80.0%								52.6%	
77.75 - 77.5	14039	10840	24879	65.19	56.25	121.44	67.0%			46.6%					43.9%	
77.5 - 72.5	14039	10840	24879	65.19	56.25	121.44	72.5%			50.4%					47.5%	
72.5 - 67.5	14039	10840	24879	65.19	56.25	121.44	78.0%			54.3%					51.2%	
67.5 - 62.5	14039	10840	24879	65.19	56.25	121.44	83.7%			58.2%					54.9%	
62.5 - 60	14039	10840	24879	65.19	56.25	121.44	86.5%			60.2%					56.7%	
60 - 59.75	26101	n/a	26101	93.02	n/a	93.02	79.2%									
59.75 - 54.75	26101	n/a	26101	93.02	n/a	93.02	84.4%									
54.75 - 49.75	26101	n/a	26101	93.02	n/a	93.02	89.7%									
49.75 - 46.25	26101	n/a	26101	93.02	n/a	93.02	93.5%									
46.25 - 46	26142	7969	34112	93.02	31.88	124.90	84.5%							55.3%		
46 - 41	26142	7969	34112	93.02	31.88	124.90	89.4%							58.6%		
41 - 36	26142	7969	34112	93.02	31.88	124.90	94.3%							61.8%		
36 - 32.75	26142	7969	34112	93.02	31.88	124.90	97.6%							63.9%		
32.75 - 32.5	26105	14009	40113	93.02	56.25	149.27	84.8%	58.7%						55.4%		
32.5 - 27.5	26105	14009	40113	93.02	56.25	149.27	89.2%	61.7%						58.3%		
27.5 - 22.5	26105	14009	40113	93.02	56.25	149.27	93.6%	64.8%						61.2%		
22.5 - 20	26105	14009	40113	93.02	56.25	149.27	95.8%	66.3%						62.6%		
20 - 19.75	37358	n/a	37358	104.80	n/a	104.80	96.9%									
19.75 - 14.75	37358	n/a	37358	104.80	n/a	104.80	101.4%									
14.75 - 11.75	37358	n/a	37358	104.80	n/a	104.80	104.1%									
11.75 - 11.5	37357	9603	46960	104.80	31.88	136.68	102.4%						63.2%			
11.5 - 9	37357	9603	46960	104.80	31.88	136.68	104.7%						64.6%			
9 - 8.75	37351	14729	52080	104.80	45.38	150.18	94.4%	72.1%					58.5%			
8.75 - 4.5	37351	14729	52080	104.80	45.38	150.18	97.9%	74.8%					60.7%			
4.5 - 4.25	37326	18664	55990	104.80	43.50	148.30	89.7%	68.6%							61.1%	
4.25 - 1.5	37326	18664	55990	104.80	43.50	148.30	91.7%	70.2%							62.5%	
1.5 - 1.25	37326	13547	50873	104.80	30.00	134.80	101.2%								69.0%	
1.25 - 0	37326	13547	50873	104.80	30.00	134.80	102.2%								69.7%	

Note: Section capacity checked in 5 degree increments.

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: *Portland Warren Ave*
 App #: 316844 Rev. 3

Reactions		
Mu	52.30	ft-kips
Axial, Pu:	11.80	kips
Shear, Vu:	18.04	kips
Elevation:	140	feet

Bolt Threads:
X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
21.87

Pole Manufacturer:	Other
--------------------	-------

If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

Bolt Data			
Qty:	24		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	29.5		

Flange Bolt Results
 Bolt Tension Capacity, $\phi \cdot T_n, B1$: 30.06 kips
 Adjusted $\phi \cdot T_n$ (due to $V_u = V_u / Q_t$), **B**: 30.04 kips
 Max Bolt directly applied Tu: 3.05 Kips
 Min. PL "tc" for **B** cap. **w/o Pry**: 1.319 in
 Min PL "trq" for actual **T w/ Pry**: 0.319 in
 Min PL "t1" for actual **T w/o Pry**: 0.420 in
 T allowable w/o Prying: 30.06 kips
 Prying Force, q: 0.00 kips
 Total Bolt Tension=Tu+q: 3.05 kips
 Non-Prying Bolt Stress Ratio, Tu/B: 10.2% **Pass**

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

$\alpha' < 0$ case

Plate Data		
Diam:	34.75	in
Thick, t:	1.875	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.14	in

Exterior Flange Plate Results Flexural Check
 Compression Side Plate Stress: 2.0 ksi
 Allowable Plate Stress: 32.4 ksi
 Compression Plate Stress Ratio: 6.1% **Pass**
No Prying
 Tension Side Stress Ratio, $(trq/t)^2$: 2.9% **Pass**

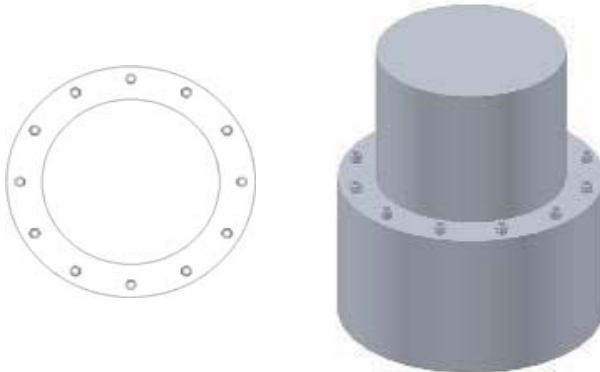
Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length: 17.15

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a
Stiffener Results
 Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results
 Pole Punching Shear Check: n/a

Pole Data		
Diam:	24	in
Thick:	0.375	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: Portland Warren Ave
 App #: 316844 Rev. 3

Manufacturer: Other

Bolt Data

Qty:	24	Bolt Fu:	120
Diam:	0.75	Bolt Fy:	92
Bolt Material:	A325		
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	29.5	in	

Plate Data

Plate Outer Diam:	35	in
Plate Inner Diam:	24.25	in (Hole @ Ctr)
Thick:	1.875	in
Grade:	36	ksi
Effective Width:	4.58	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Pole OuterDiam:	36	in
Thick:	0.5	in
Pole Inner Diam:	35	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi

Reactions

Moment:	52.30	ft-kips
Axial:	11.80	kips
Shear:	18.04	kips
Exterior Flange Run, T+q:	3.05	kips

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 A_b F_u)$
$\phi = 0.75, \phi V_n$ (kips):
21.87

Elevation: 140 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu: 3.1 Kips, Ext. Tu=Interior Tu
 Adjusted ϕT_n (due to $V_u = V_u / Q_t$): 30.0 Kips
 Bolt Stress Ratio: 10.2% **Pass**

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 4.0 Kips, Ext. Cu=Interior Cu
 Plate Stress: 2.8 ksi
 Allowable Plate Stress, ϕF_y : 32.4 ksi
 Plate Stress Ratio: 8.5% **Pass**

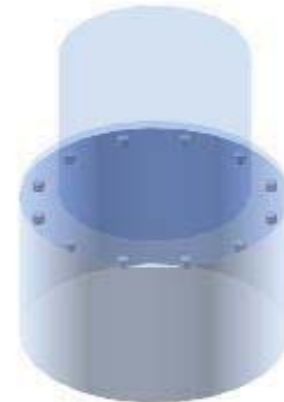
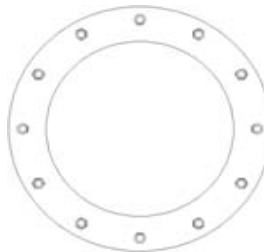
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

**BOLTED FLAT PLATE BRIDGE STIFFNERS - MP
TIA-222-G & AISC LRFD, 3rd Edition**

Loads

Code Version =	Rev G
Moment =	476.5 kip-ft
Axial =	11.8 kips
Shear =	18.0 kips

Geometry & Material Properties

Flange Bolts	Quantity, N_b =	24	in
	Bolt Diameter, d_b =	0.750	in
	Net Tensile Area, A_t =	0.334	in ²
	Bolt Circle, D_b =	29.500	in
	Bolt grade =	A325-N	
	F_{nt} =	90	ksi Table J3.2
	F_{nv} =	54	ksi Table J3.2

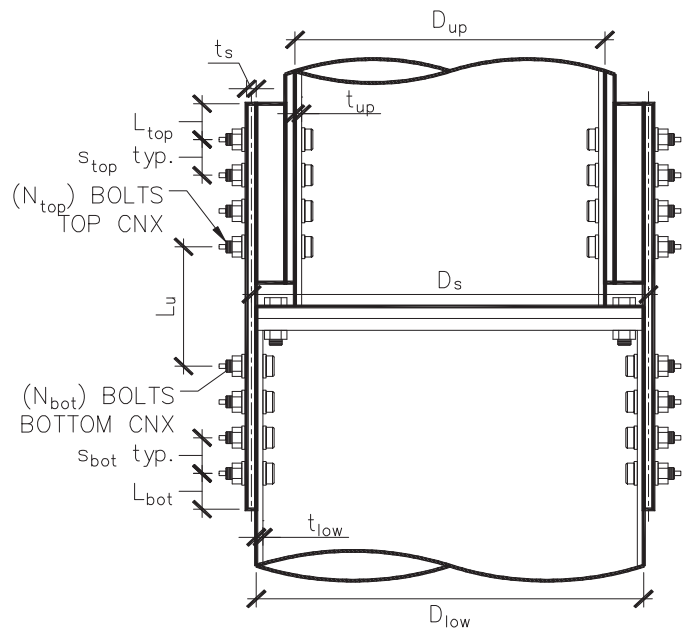
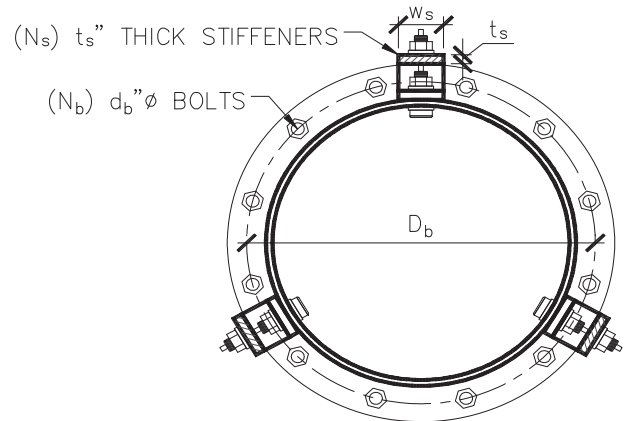
Stiffeners	Stiffener Symmetry =	Yes
	Quantity, N_s =	6
	Stiffener Circle, D_s =	37.000 in
	Width, w_s =	6.000 in
	Thickness, t_s =	1.000 in
	Area, A_s =	6 in ²
	K =	1.00
	Unbraced Length, L_u =	16.000 in
	Material Grade =	A572, Gr. 65
	F_y =	65 ksi
F_u =	80 ksi	

Moments of Inertia

Bolts, I_{bolts} =	872 in ⁴
Stiffeners, I_{stiff} =	7,069 in ⁴
Total, I_{total} =	7,941 in ⁴

Pole	Upper Diameter, D_{up} =	24.000 in
	Upper Thickness, t_{up} =	0.375 in
	Lower Diameter, D_{low} =	36.000 in
	Lower Thickness, t_{low} =	0.500 in
	Material Grade =	A36
	F_y =	36 ksi
F_u =	58 ksi	

Stiffener Bolts	Bolt type =	PC 8.8-M20(120)-N
	Sleeve Diameter, d_{sl} =	1.1417 in
	Bolt Hole Diameter, d_b =	1.1875 in
	Bolt Shear Capacity, $\phi R_{n,b}$ =	41.0 kips
	Top Quantity, N_{top} =	12
	Top Bolt Spacing, s_{top} =	3.000 in
	Top Bolt End Dist., L_{top} =	3.000 in
	Bottom Quantity, N_{bot} =	10
	Bottom Bolt Spacing, s_{bot} =	3.000 in
	Bottom Bolt End Dist., L_{bot} =	3.000 in



Analysis

Stiffener - Compression		
Applied Load, P_u =	79.9 kips	30.5%
Capacity, ϕP_n =	262.1 kips	

Stiffener - Tension		
Applied Load, P_u =	79.9 kips	22.8%
Capacity, ϕP_n =	351.0 kips	

Bolt Connection - Top		
Applied Load, P_u =	79.9 kips	16.2%
Capacity, ϕR_n =	492.0 kips	

Bolt Connection - Bottom		
Applied Load, P_u =	79.9 kips	19.5%
Capacity, ϕR_n =	410.0 kips	

Adjusted Loads for CClplate		
Moment =	52.3	kip-ft
Axial =	11.8	kips
Shear =	18.0	kips

WELDED BRIDGE STIFFENERS - MP
TIA-222-G & AISC LRFD, 3rd Edition

Loads

Code Version =	Rev G	
Moment =	476.5	kip-ft
Axial =	11.8	kips
Shear =	18.0	kips

Geometry & Material Properties

Flange Bolts	Quantity, N_b =	24	in
	Bolt Diameter, d_b =	0.750	in
	Net Tensile Area, A_t =	0.334	in ²
	Bolt Circle, D_b =	29.500	in
	Bolt grade =	A325-N	
	F_{nt} =	90	ksi Table J3.2
	F_{nv} =	54	ksi Table J3.2

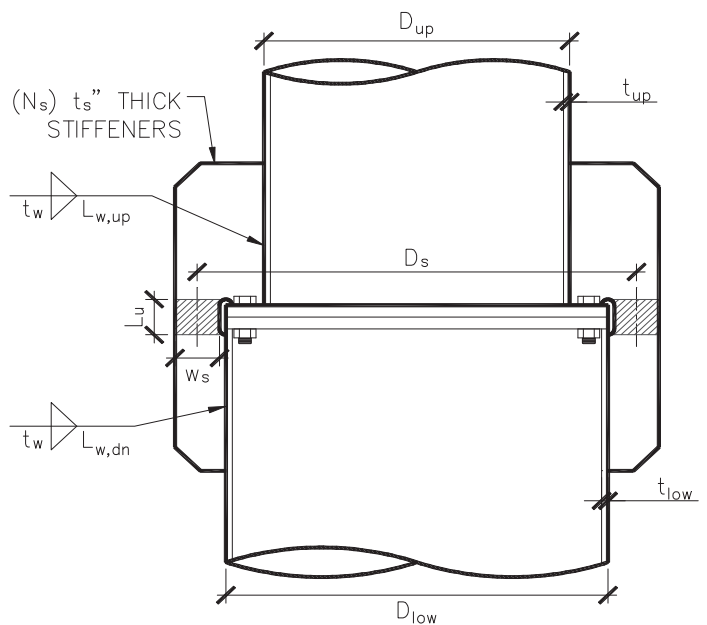
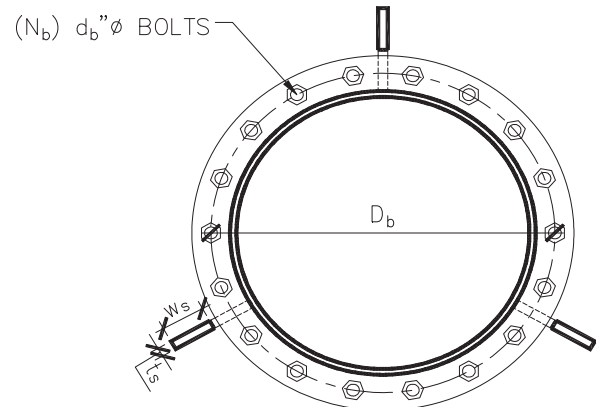
Stiffeners	Stiffener Symmetry =	Yes
	Quantity, N_s =	6
	Stiffener Circle, D_s =	42.000 in
	Width, w_s =	5.000 in
	Thickness, t_s =	1.250 in
	Area, A_s =	6.25 in ²
	K =	1.00
	Unbraced Length, L_u =	8.000 in
	Material Grade =	Other
	F_y =	100
F_u =	110	ksi

Moments of Inertia

Bolts, I_{bolts} =	872	in ⁴
Stiffeners, I_{stiff} =	7,069	in ⁴
Total, I_{total} =	7,941	in ⁴

Pole	Upper Diameter, D_{up} =	24.000	in
	Upper Thickness, t_{up} =	0.375	in
	Lower Diameter, D_{low} =	36.000	in
	Lower Thickness, t_{low} =	0.500	in
	Material Grade =	A36	
	F_y =	36	ksi
F_u =	58	ksi	

Welds	Fillet Weld Size, t_w =	0.375	in	both sides of stiff.
	D =	6.0		# of 1/16" in weld
	Electrode =	E80		
	Strength, F_{exx} =	80	ksi	
	C_1 =	1.030		from Table 8-4
	Upper Length, $L_{w,up}$ =	20.000	in	
	k =	0.063		
	Horiz. Ecc. = e_x =	9.000	in	
	a =	0.450		
	C =	1.86		from Table 8-5
	Lower Length, $L_{w,low}$ =	20.000	in	
	k =	0.063		
	Horiz. Ecc. = e_x =	3.000	in	
	a =	0.150		
	C =	2.75		from Table 8-5



Analysis

Stiffener - Compression			
Applied Load, P_u =	94.5	kips	18.1%
Capacity, ϕP_n =	523.5	kips	

Stiffener - Tension			
Applied Load, P_u =	94.5	kips	18.3%
Capacity, ϕP_n =	515.6	kips	

Weld - Upper			
Applied Load, P_u =	94.5	kips	41.1%
Capacity, ϕR_n =	229.9	kips	

Weld - Lower			
Applied Load, P_u =	94.5	kips	27.8%
Capacity, ϕR_n =	339.9	kips	

Adjusted Loads for CClplate			
Moment =	52.3	kip-ft	
Axial =	11.8	kips	
Shear =	18.0	kips	

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: *Portland Warren Ave*
 App #: 316844 Rev. 3

Pole Manufacturer: **Other**

Bolt Data

Qty:	52		
Diameter (in.):	0.75	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle (in.):	38.5		

Plate Data

Diam:	40.75	in
Thick, t:	2.125	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.17	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	36	in
Thick:	0.5	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu	497.90	ft-kips
Axial, Pu:	26.30	kips
Shear, Vu:	32.27	kips
Elevation:	100	feet

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
21.87

If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, $\phi \cdot T_n, B1$:	30.06 kips
Adjusted $\phi \cdot T_n$ (due to $V_u = V_u / Q_t$), B :	30.05 kips
Max Bolt directly applied Tu:	11.43 Kips
Min. PL "tc" for B cap. w/o Pry :	0.962 in
Min PL "trq" for actual T w/ Pry :	0.465 in
Min PL "t1" for actual T w/o Pry :	0.593 in
T allowable w/o Prying:	30.06 kips
Prying Force, q:	0.00 kips
Total Bolt Tension=Tu+q:	11.43 kips
Non-Prying Bolt Stress Ratio, Tu/B:	38.0% Pass

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

$\alpha' < 0$ case

Exterior Flange Plate Results

Flexural Check	
Compression Side Plate Stress:	4.2 ksi
Allowable Plate Stress:	32.4 ksi
Compression Plate Stress Ratio:	12.9% Pass
No Prying	
Tension Side Stress Ratio, $(trq/t)^2$:	4.8% Pass

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length:
13.65

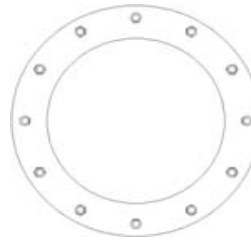
n/a

Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$:	n/a
Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check:	n/a
----------------------------	-----



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: Portland Warren Ave
 App #: 316844 Rev. 3

Manufacturer: Other

Bolt Data

Qty:	52	Bolt Fu:	120
Diam:	0.75	Bolt Fy:	92
Bolt Material:	A325		
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	38.5	in	

Plate Data

Plate Outer Diam:	41	in
Plate Inner Diam:	36.25	in (Hole @ Ctr)
Thick:	2.125	in
Grade:	36	ksi
Effective Width:	2.48	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Pole OuterDiam:	42	in
Thick:	0.5	in
Pole Inner Diam:	41	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi

Reactions

Moment:	497.90	ft-kips
Axial:	26.30	kips
Shear:	32.27	kips
Exterior Flange Run, T+q:	11.43	kips

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 A_b F_u)$
$\phi = 0.75, \phi^* V_n$ (kips):
21.87

Elevation: 100 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu: 11.4 Kips, Ext. Tu=Interior Tu
 Adjusted $\phi^* T_n$ (due to $V_u = V_u / Q_t$): 30.0 Kips
 Bolt Stress Ratio: 38.0% **Pass**

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 12.4 Kips, Ext. Cu=Interior Cu
 Plate Stress: 5.6 ksi
 Allowable Plate Stress, $\phi^* F_y$: 32.4 ksi
 Plate Stress Ratio: 17.2% **Pass**

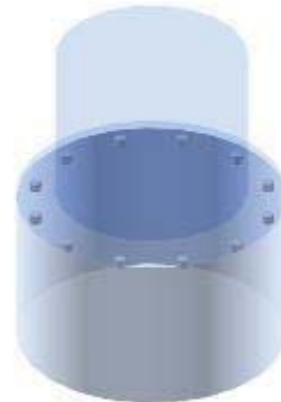
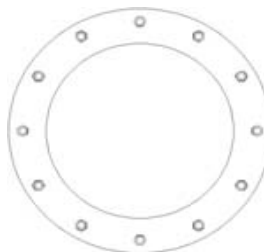
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

BOLTED FLAT PLATE BRIDGE STIFFNERS - MP
TIA-222-G & AISC LRFD, 3rd Edition

Loads

Code Version =	Rev G	
Moment =	1,386.4	kip-ft
Axial =	26.3	kips
Shear =	32.3	kips

Geometry & Material Properties

Flange Bolts	Quantity, N_b =	52	in
	Bolt Diameter, d_b =	0.750	in
	Net Tensile Area, A_t =	0.334	in ²
	Bolt Circle, D_b =	38.500	in
	Bolt grade =	A325-N	
	F_{nt} =	90	ksi Table J3.2
	F_{nv} =	54	ksi Table J3.2

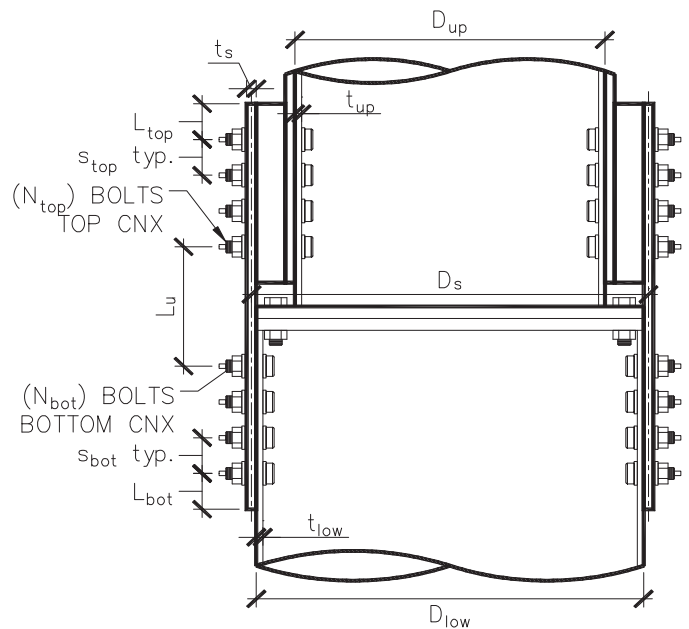
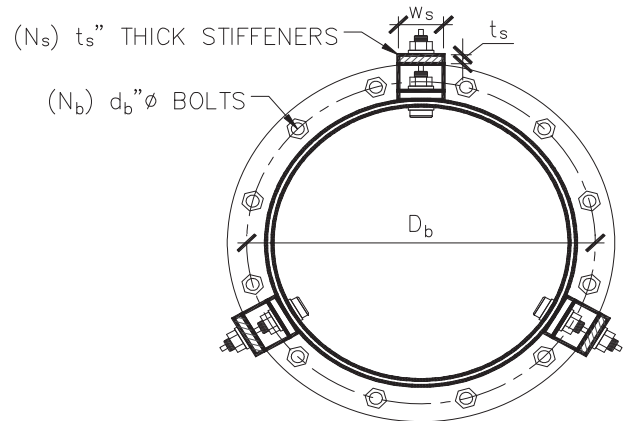
Stiffeners	Stiffener Symmetry =	Yes	
	Quantity, N_s =	3	
	Stiffener Circle, D_s =	43.250	in
	Width, w_s =	6.500	in
	Thickness, t_s =	1.250	in
	Area, A_s =	8.125	in ²
	K =	1.00	
	Unbraced Length, L_u =	16.000	in
	Material Grade =	A572, Gr. 65	
	F_y =	65	ksi
F_u =	80	ksi	

Moments of Inertia

Bolts, I_{bolts} =	3,218	in ⁴
Stiffeners, I_{stiff} =	5,744	in ⁴
Total, I_{total} =	8,962	in ⁴

Pole	Upper Diameter, D_{up} =	36.000	in
	Upper Thickness, t_{up} =	0.500	in
	Lower Diameter, D_{low} =	42.000	in
	Lower Thickness, t_{low} =	0.500	in
	Material Grade =	A36	
	F_y =	36	ksi
F_u =	58	ksi	

Stiffener Bolts	Bolt type =	PC 8.8-M20(120)-N	
	Sleeve Diameter, d_{sl} =	1.1417	in
	Bolt Hole Diameter, d_b =	1.1875	in
	Bolt Shear Capacity, $\phi R_{n,b}$ =	41.0	kips
	Top Quantity, N_{top} =	16	
	Top Bolt Spacing, s_{top} =	3.000	in
	Top Bolt End Dist., L_{top} =	3.000	in
	Bottom Quantity, N_{bot} =	13	
	Bottom Bolt Spacing, s_{bot} =	3.000	in
	Bottom Bolt End Dist., L_{bot} =	3.000	in



Analysis

Stiffener - Compression			
Applied Load, P_u =	326.2	kips	82.7%
Capacity, ϕP_n =	394.3	kips	

Stiffener - Tension			
Applied Load, P_u =	326.2	kips	68.6%
Capacity, ϕP_n =	475.3	kips	

Bolt Connection - Top			
Applied Load, P_u =	326.2	kips	49.7%
Capacity, ϕR_n =	656.0	kips	

Bolt Connection - Bottom			
Applied Load, P_u =	326.2	kips	61.2%
Capacity, ϕR_n =	533.0	kips	

Adjusted Loads for CCLplate			
Moment =	497.9	kip-ft	
Axial =	26.3	kips	
Shear =	32.3	kips	

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: *Portland Warren Ave*
 App #: 316844 Rev. 3

Pole Manufacturer: **Other**

Bolt Data

Qty:	56		
Diameter (in.):	0.75	Bolt Fu:	150
Bolt Material:	A490	Bolt Fy:	130
N/A:	100	<--	Disregard
N/A:	75	<--	Disregard
Circle (in.):	44.375		

Plate Data

Diam:	46.5	in
Thick, t:	2.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.36	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	42	in
Thick:	0.5	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu	584.40	ft-kips
Axial, Pu:	43.50	kips
Shear, Vu:	36.66	kips
Elevation:	60	feet

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
27.34

If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

Flange Bolt Results

Bolt Tension Capacity, $\phi \cdot T_n, B1$: 37.58 kips
 Adjusted $\phi \cdot T_n$ (due to $V_u = V_u / Q_t$), **B**: 37.56 kips
 Max Bolt directly applied Tu: 10.51 Kips
 Min. PL "tc" for **B** cap. **w/o Pry**: 0.996 in
 Min PL "trq" for actual **T w/ Pry**: 0.409 in
 Min PL "t1" for actual **T w/o Pry**: 0.527 in
 T allowable w/o Prying: 37.58 kips
 Prying Force, q: 0.00 kips
 Total Bolt Tension=Tu+q: 10.51 kips
 Non-Prying Bolt Stress Ratio, Tu/B: 28.0% **Pass**

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

$\alpha' < 0$ case

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: 3.3 ksi
 Allowable Plate Stress: 32.4 ksi
 Compression Plate Stress Ratio: 10.2% **Pass**
No Prying
 Tension Side Stress Ratio, $(trq/t)^2$: 3.3% **Pass**

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length: 14.32

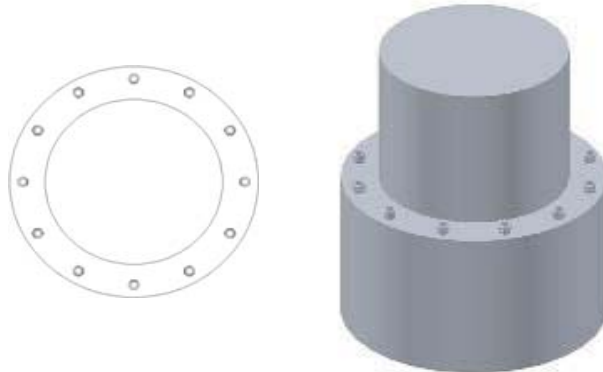
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Stiffener Results

Horizontal Weld: n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: Portland Warren Ave
 App #: 316844 Rev. 3

Manufacturer: Other

Bolt Data

Qty:	56	Bolt Fu:	150
Diam:	0.75	Bolt Fy:	130
Bolt Material:	A490		
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	44.375	in	

Plate Data

Plate Outer Diam:	46.75	in
Plate Inner Diam:	42.25	in (Hole @ Ctr)
Thick:	2.25	in
Grade:	36	ksi
Effective Width:	2.62	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Pole OuterDiam:	48	in
Thick:	0.625	in
Pole Inner Diam:	46.75	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi

Reactions

Moment:	584.40	ft-kips
Axial:	43.50	kips
Shear:	36.66	kips
Exterior Flange Run, T+q:	10.51	kips

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 A_b F_u)$
$\phi = 0.75, \phi^* V_n$ (kips):
27.34

Elevation: 60 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu: 10.5 Kips, Ext. Tu=Interior Tu
 Adjusted $\phi^* T_n$ (due to $V_u = V_u / Q_{ty}$): 37.6 Kips
 Bolt Stress Ratio: 28.0% **Pass**

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 12.1 Kips, Ext. Cu=Interior Cu
 Plate Stress: 4.3 ksi
 Allowable Plate Stress, $\phi^* F_y$: 32.4 ksi
 Plate Stress Ratio: 13.3% **Pass**

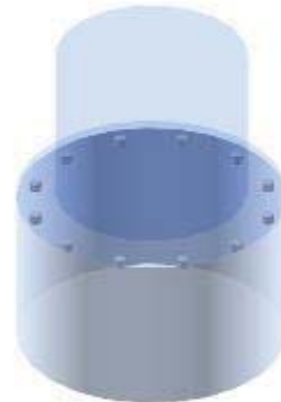
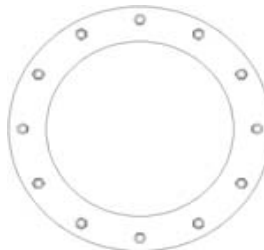
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

BOLTED FLAT PLATE BRIDGE STIFFNERS - MP
TIA-222-G & AISC LRFD, 3rd Edition

Loads

Code Version =	Rev G	
Moment =	2,766.9	kip-ft
Axial =	43.5	kips
Shear =	36.7	kips

Geometry & Material Properties

Flange Bolts	Quantity, N_b =	56	in
	Bolt Diameter, d_b =	0.750	in
	Net Tensile Area, A_t =	0.334	in ²
	Bolt Circle, D_b =	44.375	in
	Bolt grade =	A490-N	
	F_{nt} =	113	ksi Table J3.2
	F_{nv} =	68	ksi Table J3.2

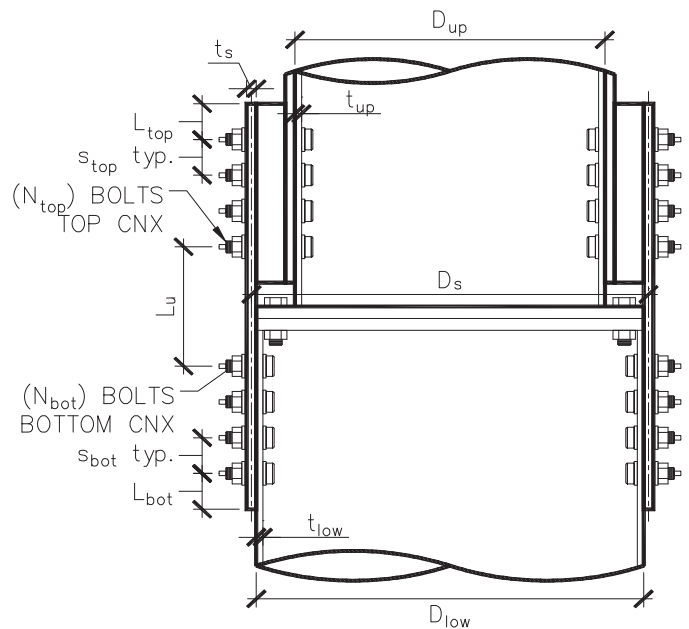
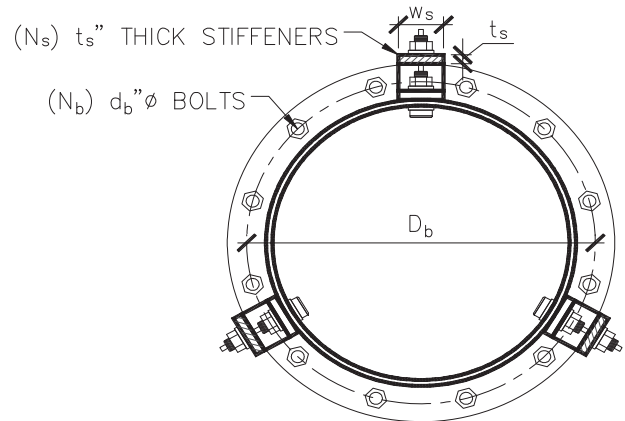
Stiffeners	Stiffener Symmetry =	Yes	
	Quantity, N_s =	6	
	Stiffener Circle, D_s =	49.250	in
	Width, w_s =	6.500	in
	Thickness, t_s =	1.250	in
	Area, A_s =	8.125	in ²
	K =	1.00	
	Unbraced Length, L_u =	16.000	in
	Material Grade =	A572, Gr. 65	
	F_y =	65	ksi
F_u =	80	ksi	

Moments of Inertia

Bolts, I_{bolts} =	4,604	in ⁴
Stiffeners, I_{stiff} =	17,197	in ⁴
Total, I_{total} =	21,801	in ⁴

Pole	Upper Diameter, D_{up} =	42.000	in
	Upper Thickness, t_{up} =	0.500	in
	Lower Diameter, D_{low} =	48.000	in
	Lower Thickness, t_{low} =	0.625	in
	Material Grade =	A36	
	F_y =	36	ksi
F_u =	58	ksi	

Stiffener Bolts	Bolt type =	PC 8.8-M20(120)-N	
	Sleeve Diameter, d_{sl} =	1.1417	in
	Bolt Hole Diameter, d_b =	1.1875	in
	Bolt Shear Capacity, $\phi R_{n,b}$ =	41.0	kips
	Top Quantity, N_{top} =	16	
	Top Bolt Spacing, s_{top} =	3.000	in
	Top Bolt End Dist., L_{top} =	3.000	in
	Bottom Quantity, N_{bot} =	13	
	Bottom Bolt Spacing, s_{bot} =	3.000	in
	Bottom Bolt End Dist., L_{bot} =	3.000	in



Analysis

Stiffener - Compression		
Applied Load, P_u =	304.7	kips
Capacity, ϕP_n =	394.3	kips
		77.3%

Stiffener - Tension		
Applied Load, P_u =	304.7	kips
Capacity, ϕP_n =	475.3	kips
		64.1%

Bolt Connection - Top		
Applied Load, P_u =	304.7	kips
Capacity, ϕR_n =	656.0	kips
		46.5%

Bolt Connection - Bottom		
Applied Load, P_u =	304.7	kips
Capacity, ϕR_n =	533.0	kips
		57.2%

Adjusted Loads for CCLplate		
Moment =	584.4	kip-ft
Axial =	43.5	kips
Shear =	36.7	kips

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: *Portland Warren Ave*
 App #: 316844 Rev. 3

Reactions		
Mu	1362.80	ft-kips
Axial, Pu:	64.90	kips
Shear, Vu:	40.20	kips
Elevation:	20	feet

Bolt Threads:
X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
38.88

Pole Manufacturer:	Other
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If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

Bolt Data		
Qty:	52	
Diameter (in.):	1	Bolt Fu: 120
Bolt Material:	A325	Bolt Fy: 92
N/A:	100	<-- Disregard
N/A:	75	<-- Disregard
Circle (in.):	50.375	

Flange Bolt Results	
Bolt Tension Capacity, $\phi \cdot T_n, B1$:	54.54 kips
Adjusted $\phi \cdot T_n$ (due to $V_u = V_u / Q_t$), B :	54.53 kips
Max Bolt directly applied Tu:	23.72 Kips
Min. PL "tc" for B cap. w/o Pry :	0.995 in
Min PL "trq" for actual T w/ Pry :	0.513 in
Min PL "t1" for actual T w/o Pry :	0.656 in
T allowable w/o Prying:	54.54 kips
Prying Force, q:	0.00 kips
Total Bolt Tension=Tu+q:	23.72 kips
Non-Prying Bolt Stress Ratio, Tu/B:	43.5% Pass

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

Plate Data		
Diam:	52.5	in
Thick, t:	2.5	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	2.90	in

Exterior Flange Plate Results	
Flexural Check	
Compression Side Plate Stress:	4.8 ksi
Allowable Plate Stress:	32.4 ksi
Compression Plate Stress Ratio:	14.8% Pass
No Prying	
Tension Side Stress Ratio, $(trq/t)^2$:	4.2% Pass

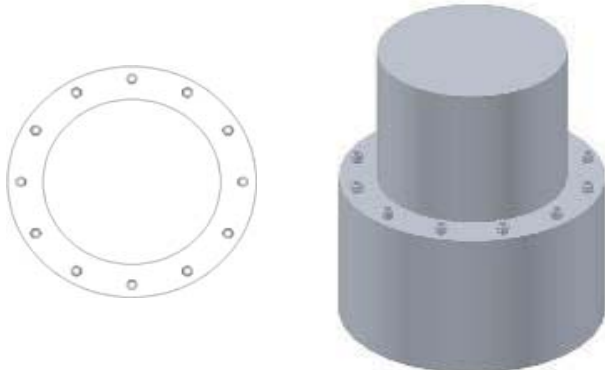
$\alpha < 0$ case

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length:
15.29

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a Stiffener Results	
Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$:	n/a
Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$:	n/a
Plate Comp. (AISC Bracket):	n/a
Pole Results	
Pole Punching Shear Check:	n/a

Pole Data		
Diam:	48	in
Thick:	0.625	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: 878782
 Site Name: Portland Warren Ave
 App #: 316844 Rev. 3

Manufacturer: Other

Bolt Data

Qty:	52		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	100	<-- Disregard	
N/A:	75	<-- Disregard	
Circle:	50.375	in	

Plate Data

Plate Outer Diam:	52.75	in
Plate Inner Diam:	48.25	in (Hole @ Ctr)
Thick:	2.5	in
Grade:	36	ksi
Effective Width:	3.19	in

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Pole OuterDiam:	54	in
Thick:	0.625	in
Pole Inner Diam:	52.75	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi

Reactions

Moment:	1362.80	ft-kips
Axial:	64.90	kips
Shear:	40.20	kips
Exterior Flange Run, T+q:	23.72	kips

Bolt Threads:

X-Excluded
$\phi V_n = \phi(0.55 A_b F_u)$
$\phi = 0.75, \phi^* V_n$ (kips):
38.88

Elevation: 20 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu: 23.7 Kips, Ext. Tu=Interior Tu
 Adjusted $\phi^* T_n$ (due to $V_u = V_u / Q_t$): 54.5 Kips
 Bolt Stress Ratio: 43.5% **Pass**

Interior Flange Plate Results

Flexural Check
 Controlling Bolt Axial Force: 26.2 Kips, Ext. Cu=Interior Cu
 Plate Stress: 6.3 ksi
 Allowable Plate Stress, $\phi^* F_y$: 32.4 ksi
 Plate Stress Ratio: 19.3% **Pass**

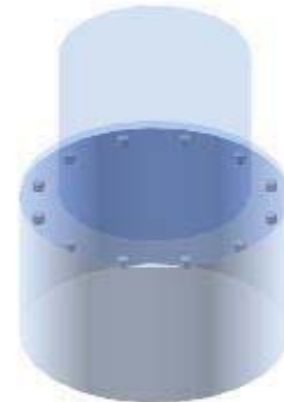
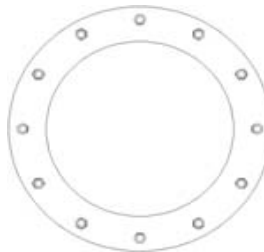
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b / F_b + (f_v / F_v)^2$: n/a
 Plate Tension+Shear, $f_t / F_t + (f_v / F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

**BOLTED FLAT PLATE BRIDGE STIFFNERS - MP
TIA-222-G & AISC LRFD, 3rd Edition**

Loads

Code Version =	Rev G	
Moment =	4,308.1	kip-ft
Axial =	64.9	kips
Shear =	40.2	kips

Geometry & Material Properties

Flange Bolts	Quantity, N_b =	52	in
	Bolt Diameter, d_b =	1.000	in
	Net Tensile Area, A_t =	0.606	in ²
	Bolt Circle, D_b =	50.375	in
	Bolt grade =	A325-N	
	F_{nt} =	90	ksi Table J3.2
	F_{nv} =	54	ksi Table J3.2

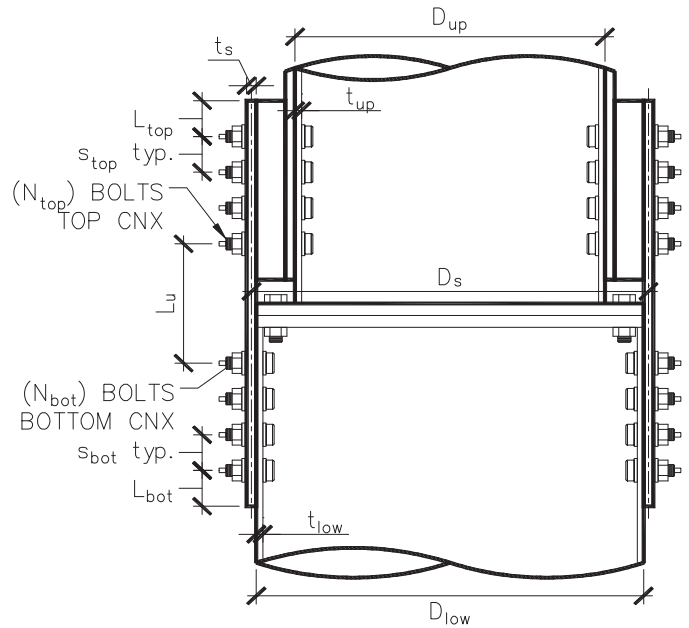
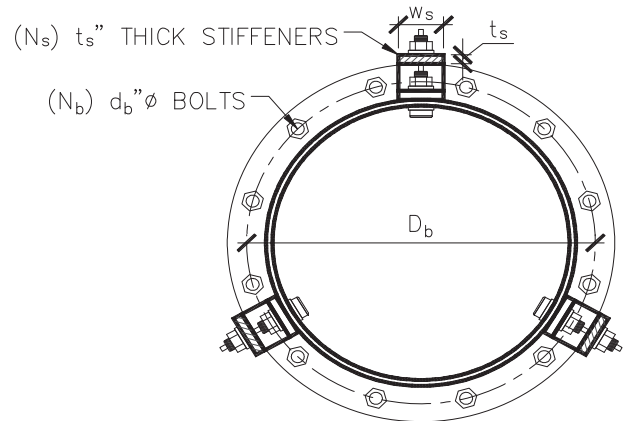
Stiffeners	Stiffener Symmetry =	Yes
	Quantity, N_s =	6
	Stiffener Circle, D_s =	55.250 in
	Width, w_s =	6.500 in
	Thickness, t_s =	1.250 in
	Area, A_s =	8.125 in ²
	K =	1.00
	Unbraced Length, L_u =	16.000 in
	Material Grade =	A572, Gr. 65
	F_y =	65 ksi
F_u =	80 ksi	

Moments of Inertia

Bolts, I_{bolts} =	9,997 in ⁴
Stiffeners, I_{stiff} =	21,606 in ⁴
Total, I_{total} =	31,603 in ⁴

Pole	Upper Diameter, D_{up} =	48.000 in
	Upper Thickness, t_{up} =	0.625 in
	Lower Diameter, D_{low} =	54.000 in
	Lower Thickness, t_{low} =	0.625 in
	Material Grade =	A36
	F_y =	36 ksi
F_u =	58 ksi	

Stiffener Bolts	Bolt type =	PC 8.8-M20(120)-N
	Sleeve Diameter, d_{sl} =	1.1417 in
	Bolt Hole Diameter, d_b =	1.1875 in
	Bolt Shear Capacity, $\phi R_{n,b}$ =	41.0 kips
	Top Quantity, N_{top} =	16
	Top Bolt Spacing, s_{top} =	3.000 in
	Top Bolt End Dist., L_{top} =	3.000 in
	Bottom Quantity, N_{bot} =	13
	Bottom Bolt Spacing, s_{bot} =	3.000 in
	Bottom Bolt End Dist., L_{bot} =	3.000 in



Analysis

Stiffener - Compression		
Applied Load, P_u =	367.2 kips	93.1%
Capacity, ϕP_n =	394.3 kips	

Stiffener - Tension		
Applied Load, P_u =	367.2 kips	77.2%
Capacity, ϕP_n =	475.3 kips	

Bolt Connection - Top		
Applied Load, P_u =	367.2 kips	56.0%
Capacity, ϕR_n =	656.0 kips	

Bolt Connection - Bottom		
Applied Load, P_u =	367.2 kips	68.9%
Capacity, ϕR_n =	533.0 kips	

Adjusted Loads for CCLplate		
Moment =	1362.8	kip-ft
Axial =	64.9	kips
Shear =	40.2	kips

Asymmetric Anchor Rod

Reactions		Anchor Rods	
Moment (k-ft)	5,124.7	Anchor Rods	Original Additional
Axial (k)	76.1	Anchor Rod Grade	28 4
Shear (k)	41.5	Fy (ksi)	A36 A193 Gr B7
Code	G	Fu (ksi)	36 105
Total Anchor Rods	32	Anchor Rod Diameter (in)	58 125
		Anchor Rod Circle (in)	2 2.25
		Base Plate	60.125 71
		ETA Factor, η	Round
			0.5

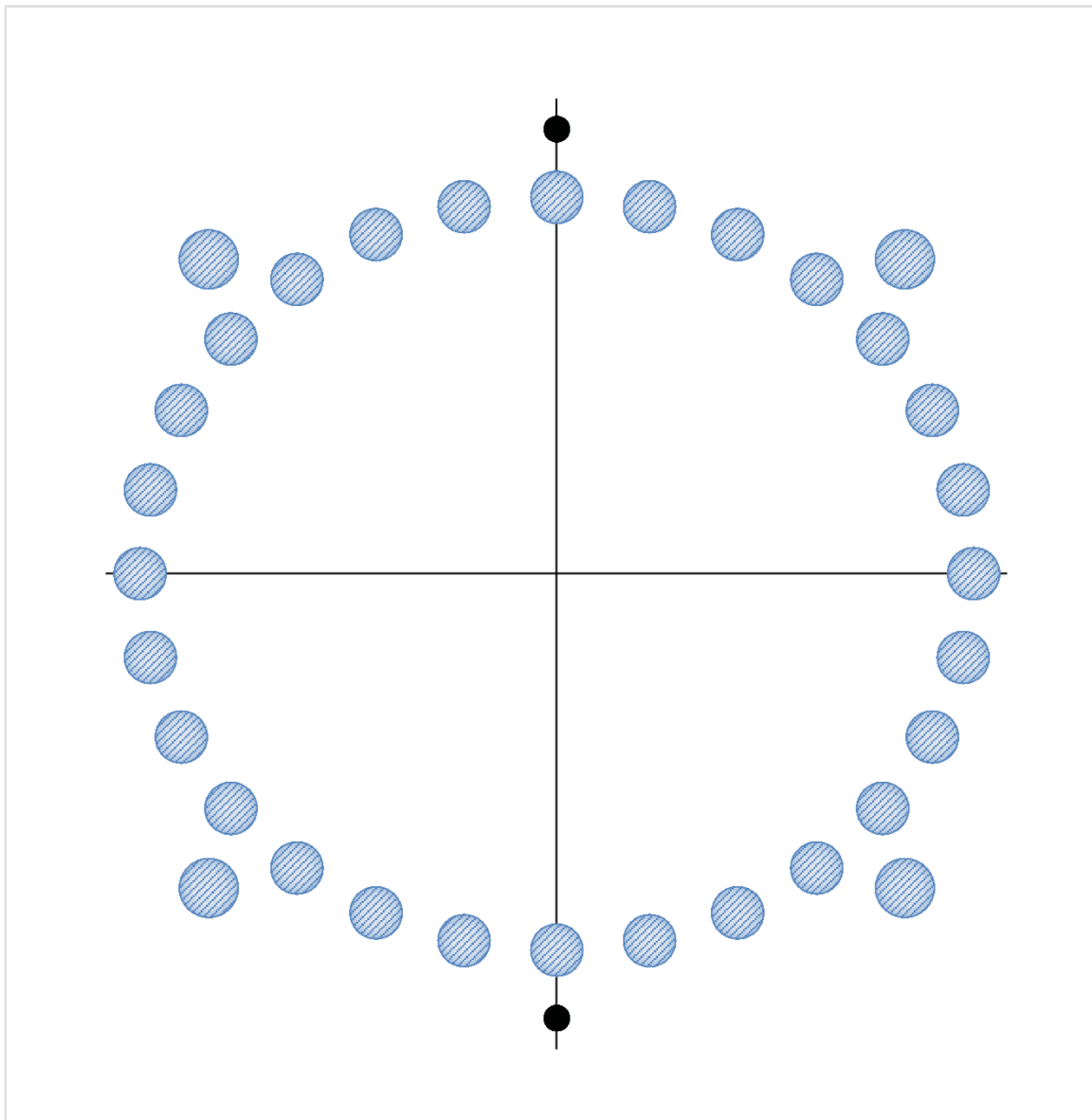
Additional Anchor Rods

Anchor Rod	Anchor Rod Diameter, in	Anchor Rod Circle, in	Location, degrees	Anchor Rod Net Area, in ²	Force, kips	Anchor Rod Stress Ratio	
1	A36	2	60.125	0.0	2.50	121.3	104.6%
2	A36	2	60.125	12.9	2.50	118.4	102.1%
3	A36	2	60.125	25.7	2.50	109.8	94.7%
4	A36	2	60.125	38.6	2.50	96.0	82.8%
5	A36	2	60.125	51.4	2.50	77.6	66.9%
6	A36	2	60.125	64.3	2.50	55.6	47.9%
7	A36	2	60.125	77.1	2.50	31.1	26.8%
8	A36	2	60.125	90.0	2.50	5.3	4.5%
9	A36	2	60.125	102.9	2.50	-31.1	26.8%
10	A36	2	60.125	115.7	2.50	-55.6	47.9%
11	A36	2	60.125	128.6	2.50	-77.6	66.9%
12	A36	2	60.125	141.4	2.50	-96.0	82.8%
13	A36	2	60.125	154.3	2.50	-109.8	94.7%
14	A36	2	60.125	167.1	2.50	-118.4	102.1%
15	A36	2	60.125	180.0	2.50	-121.3	104.6%
16	A36	2	60.125	192.9	2.50	-118.4	102.1%
17	A36	2	60.125	205.7	2.50	-109.8	94.7%
18	A36	2	60.125	218.6	2.50	-96.0	82.8%
19	A36	2	60.125	231.4	2.50	-77.6	66.9%
20	A36	2	60.125	244.3	2.50	-55.6	47.9%
21	A36	2	60.125	257.1	2.50	-31.1	26.8%
22	A36	2	60.125	270.0	2.50	-5.3	4.5%
23	A36	2	60.125	282.9	2.50	31.1	26.8%
24	A36	2	60.125	295.7	2.50	55.6	47.9%
25	A36	2	60.125	308.6	2.50	77.6	66.9%
26	A36	2	60.125	321.4	2.50	96.0	82.8%
27	A36	2	60.125	334.3	2.50	109.8	94.7%
28	A36	2	60.125	347.1	2.50	118.4	102.1%
29	A193 Gr B7	2.25	71	45.0	3.25	131.9	40.6%
30	A193 Gr B7	2.25	71	135.0	3.25	-131.9	40.6%
31	A193 Gr B7	2.25	71	225.0	3.25	-131.9	40.6%
32	A193 Gr B7	2.25	71	315.0	3.25	131.9	40.6%

Adjusted Loads for Base Plate Check

Welded Anchor Brackets?	Yes	
Adjusted Moment	4070.5	k-ft
Adjusted Axial	64.2	kips
Shear	41.5	kips

I_x, in^4	I_y, in^4	I_{xy}, in^4	\bar{x}, in	\bar{y}, in	Φ	c, in
39823.01	39823.01	0.00	0.000	0.000	90.00	30.06



Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: 878782
Site Name: Portland Warren Ave
App #: 316844 Rev. 3
Pole Manufacturer: <i>Other</i>

Anchor Rod Data

Qty:	28	
Diam:	2	in
Rod Material:	Other	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi
Bolt Circle:	60.125	in

Plate Data

Diam:	66	in
Thick:	3.25	in
Grade:	36	ksi
Single-Rod B-eff:	6.06	in

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data

Diam:	54	in
Thick:	0.625	in
Grade:	36	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Reactions

Mu:	4071	ft-kips
Axial, Pu:	64	kips
Shear, Vu:	42	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: **AISC LRFD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Max Rod (Cu+ Vu/η): 121.3 Kips
 Allowable Axial, Φ^*Fu^*Anet : 116.0 Kips
 Anchor Rod Stress Ratio: 104.6% **Pass**

Rigid
AISC LRFD
ϕ^*Tn

Base Plate Results

Base Plate Stress: 14.1 ksi
 Allowable Plate Stress: 32.4 ksi
 Base Plate Stress Ratio: 43.5% **Pass**

Flexural Check

Rigid
AISC LRFD
ϕ^*Fy
Y.L. Length: 26.44

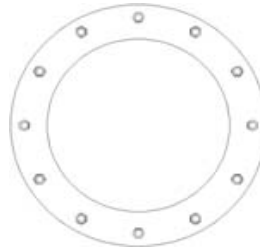
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $fb/Fb+(fv/Fv)^2$: n/a
 Plate Tension+Shear, $ft/Ft+(fv/Fv)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a

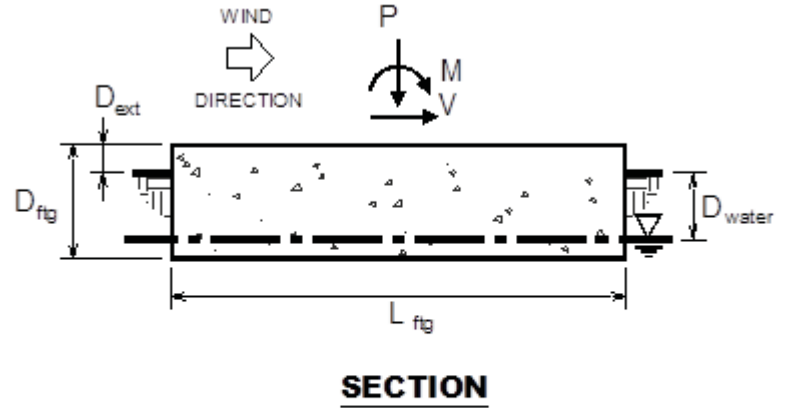


* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

1.0 FOUNDATION GEOMETRY & MATERIALS:

$L_{ftg} = 12 \text{ ft}$ $B_{ftg} = 12 \text{ ft}$
 $D_{ftg} = 5 \text{ ft}$ $D_{ext} = 0.5 \text{ ft}$ $D_{offset} = 0$
 $d = 54 \text{ in}$ $No_rebar = 14$ $Size_rebar = 10$
 $f_y = 60000 \text{ psi}$ $f_c = 4000 \text{ psi}$



2.0 SOIL PARAMETERS:

$\phi = 30 \text{ deg}$ $K_p = 3.00$
 $\gamma_{soil} = 125 \text{ pcf}$ $\mu = 0.6$ $c = 0 \text{ psf}$

Groundwater = 4 ft

$q_{brg_allow} = 20000 \text{ psf}$ $FOS_{brg} = 2$

$q_{brg_ult} = 40000 \text{ psf}$

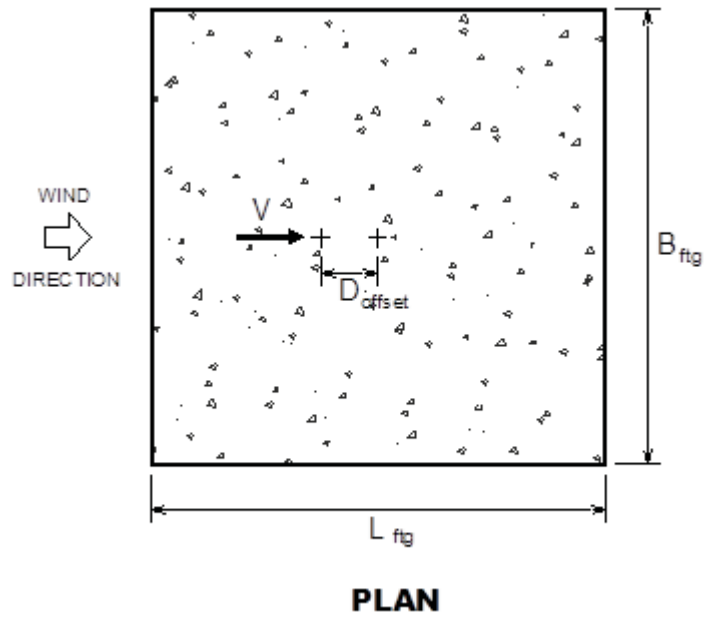
3.0 LOADS:

Load combinations based on TIA-222-G (1.2D + 1.6W):

$P = 0 \text{ kip}$

$V = 41 \text{ kip}$

$M = 0 \text{ kip}\cdot\text{ft}$



4.0 ANALYSIS RESULTS:

		<u>APPLIED</u>	<u>CAPACITY</u>	<u>CHECK</u>
4.1	BEARING:	$B_{app} = 1574 \text{ psf}$	$B_{cap} = 30000 \text{ psf}$	B% = 5.2%
4.2	OVERTURNING:	$M_{app} = 205 \text{ kip}\cdot\text{ft}$	$M_{cap} = 559 \text{ kip}\cdot\text{ft}$	M% = 36.7%
4.3	SLIDING:	$V_{app} = 41 \text{ kip}$	$V_{cap} = 74 \text{ kip}$	V% = 55.3%
5.1	FLEXURAL (ONE-WAY) SHEAR:	$V1_{app} = 27 \text{ kip}$	$V1_{cap} = 738 \text{ kip}$	V1% = 3.6%
5.2	PUNCHING (TWO-WAY) SHEAR:	$V2_{app} = 0 \text{ kip}$	$V2_{cap} = 2213 \text{ kip}$	V2% = 0.0%
5.3	PAD FLEXURE:	$F_{app} = 289 \text{ kip}\cdot\text{ft}$	$F_{cap} = 4223 \text{ kip}\cdot\text{ft}$	F% = 6.8%



JOB NAME	JOB NUMBER
BU 878782	W01198079
CALC. BY CS	DATE 2/23/16
CHK. BY	DATE

ROCK ANCHORS

REFERENCE: CCI FOUNDATION CRITERIA VERSION No. 1.0

TOWER REACTIONS

$$M = 5125 \text{ k-ft}$$

$$P = 76 \text{ k}$$

$$V = 41 \text{ k}$$

WATER LEVEL PER GEOTECH REPORT = 4 ft

WEIGHT OF CONCRETE

$$W_c = (12 \text{ ft} \times 12 \text{ ft} \times 4.5 \text{ ft}) (0.15 \text{ kcf}) + (12 \text{ ft} \times 12 \text{ ft} \times 0.5 \text{ ft}) (0.15 - 0.624 \text{ kcf})$$

$$= 103.5 \text{ k}$$

1. TENSILE STRESS IN STEEL ROD

$$T_{\max} = \frac{MC}{I} (A_n) - \frac{P_t}{N}$$

$$I = \sum y^2 = 4(5.2 \text{ in})^2 + 4(15.7 \text{ in})^2 + 4(26.2 \text{ in})^2 + 4(36.6 \text{ in})^2$$

$$+ 4(47.1 \text{ in})^2 + 4(57.3 \text{ in})^2 + 28(68)^2$$

$$= 160773 \text{ in}^4$$



$$\text{TOTAL MOMENT} = 5125 \text{ k-ft} + (41 \text{ k})(5 \text{ ft})$$

$$= 5330 \text{ k-ft}$$

$$\text{TOTAL AXIAL } P_t = 76 \text{ k} + 103.5 \text{ k}$$

$$= 179.5 \text{ k}$$

$$T_{\max} = \frac{5330 \text{ k-ft} (5.7 \text{ ft}) (144 \text{ in}^2/\text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4} - \frac{179.5 \text{ k}}{56}$$

$$= 24.0 \text{ k}$$

$$\text{ULTIMATE CAPACITY} = 0.75 (f_u) (A_n) = 0.75 (100 \text{ ksi}) (1 \text{ in}^2) = 75 \text{ k}$$

$$\text{TENSILE STRENGTH CAPACITY} = \frac{24.0 \text{ k}}{75 \text{ k}} = \underline{\underline{32.0\% \text{ O.K.}}}$$



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2. STEEL-GROUT BOND

$$R_d = \pi (D_R)(L)(S_b)$$

$$S_b = 11.5(f_c)^{1/2}$$

$$= 11.5(8000 \text{ psi})^{1/2} = 1028.6$$

$$R_d = \pi (1.128 \text{ in})(7.75 \text{ ft})(12 \text{ in/ft})(1028.6 \text{ psi})(0.75)/1000$$

$$= 254.2 \text{ k}$$

CC 18.1

$$\text{STEEL-GROUT CAPACITY} = \frac{24.0 \text{ k}}{254.2 \text{ k}} = \underline{\underline{9.4\% \text{ O.K.}}}$$

3. ROCK-GROUT BOND

$$R_d = \pi (D_H)(L)(S_b)$$

$$= \pi (2.5 \text{ in}) [5 \text{ ft}(12 \text{ in/ft})(75 \text{ psi}) + 2.75 \text{ ft}(12 \text{ in/ft})(150 \text{ psi})] (0.75)/1000$$

$$= 55.7 \text{ k}$$

CC 18.1

$$\text{ROCK-GROUT CAPACITY} = \frac{24.0 \text{ k}}{55.7 \text{ k}} = \underline{\underline{43.1\% \text{ O.K.}}}$$

4. ROCK PULL OUT

ROCK GROUP

$$V = \frac{1}{3} [(A_{\text{top}} + A_{\text{bottom}}) + \sqrt{A_{\text{top}} A_{\text{bottom}}}]$$

$$A_{\text{top}} = (4.62 \text{ ft} + 4.62 \text{ ft})(11.33 \text{ ft} + 4.62 \text{ ft} + 4.62 \text{ ft})$$

$$= 190.0 \text{ ft}^2$$

$$A_{\text{bottom}} = 1.128 \text{ in} / (12 \text{ in/ft}) (11.33 \text{ ft} + 4.62 \text{ ft} + 4.62 \text{ ft})$$

$$= 1.93 \text{ ft}^2$$

$$V = \frac{8 \text{ ft}}{3} [190 \text{ ft}^2 + 1.93 \text{ ft}^2 + \sqrt{190 \text{ ft}^2 \cdot 1.93 \text{ ft}^2}]$$

$$= 548.8 \text{ ft}^3$$



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$$\begin{aligned}\phi R_g &= 0.75(\sqrt{\gamma_{\text{ROCK}}}) \\ &= 0.75(548.8 \text{ ft}^3)(0.160 \text{ kcf}) \\ &= 65.9 \text{ k}\end{aligned}$$

ROCK SHEAR:

$$\phi R_s = \phi(SA)(\text{SHEAR STRENGTH OF ROCK}) \cos(30)$$

ORTHOGONAL DIRECTION

$$SA_0 = A_{\text{FRONT}} + 2A_{\text{SIDE}}$$

DIAGONAL DIRECTION

$$SA_d = 2A_{\text{FRONT}}$$

$$\begin{aligned}A_{\text{FRONT}} &= 12 \text{ ft} (8 \text{ ft} / \cos 30) \\ &= 110.9 \text{ ft}^2\end{aligned}$$

$$\begin{aligned}A_{\text{SIDE}} &= 6 \text{ ft} (8 \text{ ft} / \cos 30) \\ &= 55.4 \text{ ft}^2\end{aligned}$$

$$\begin{aligned}SA_0 &= 110.9 \text{ ft}^2 + 2(55.4 \text{ ft}^2) \\ &= 221.7 \text{ ft}^2\end{aligned}$$

$$\begin{aligned}SA_d &= 2(110.9 \text{ ft}^2) \\ &= 221.7 \text{ ft}^2\end{aligned}$$

CC 8.1

$$\begin{aligned}\phi R_s &= 0.75(221.7 \text{ ft}^2)(4 \text{ ksf}) \cos 30 \\ &= 576 \text{ k}\end{aligned}$$

$$T = \left[\frac{5330 \text{ k} \cdot \text{ft} (5.7 \text{ ft}) (144 \text{ in}^2 / \text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4} - \frac{179.5 \text{ k}}{56} \right] 14 + \left[\frac{5330 \text{ k} \cdot \text{ft} (4.79 \text{ ft}) (144 \text{ in}^2 / \text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4}$$

$$- \frac{179.5 \text{ k}}{56} \right] 2 + \left[\frac{5330 \text{ k} \cdot \text{ft} (3.92 \text{ ft}) (144 \text{ in}^2 / \text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4} - \frac{179.5 \text{ k}}{56} \right] 2 + \left[\frac{5330 \text{ k} \cdot \text{ft} (3.04 \text{ ft}) (144 \text{ in}^2 / \text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4}$$

$$- \frac{179.5 \text{ k}}{56} \right] 2 + \left[\frac{5330 \text{ k} \cdot \text{ft} (2.17 \text{ ft}) (144 \text{ in}^2 / \text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4} - \frac{179.5 \text{ k}}{56} \right] 2 + \left[\frac{5330 \text{ k} \cdot \text{ft} (1.29 \text{ ft}) (144 \text{ in}^2 / \text{ft}^2) (1 \text{ in}^2)}{160773 \text{ in}^4}$$

$$- \frac{179.5 \text{ k}}{56} \right] 2 = 449.3 \text{ k}$$

$$\text{CAPACITY} = \frac{449.3 \text{ k}}{576 \text{ k}} = \underline{\underline{78.0\% \text{ O.K.}}}$$

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