

Vertical Bridge CUP Application

US-OR-5156 TANSY

ATTCH 5, TOWER DESIGN

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	42.000	18	0.1875	5.000	23.0990	32.2000	2.3	
2	42.000	18	0.2500	6.000	30.7415	39.8425	4.0	
3	42.000	18	0.3125	7.000	38.0424	47.1434	6.0	A572-65
4	42.000	18	0.3750	45.0016	54.1026		8.4	
							20.7	

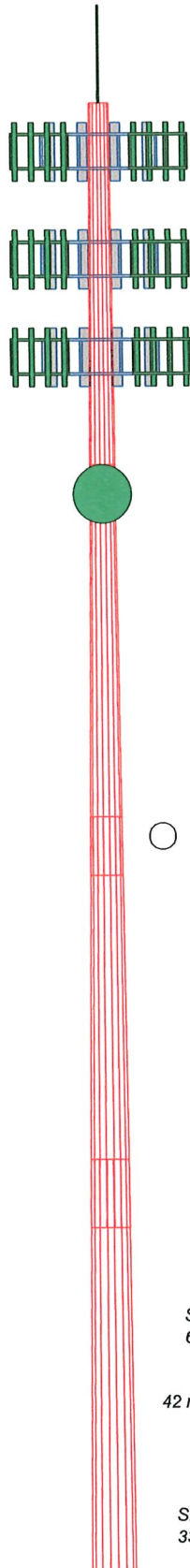
150.0 ft

108.0 ft

71.0 ft

35.0 ft

0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	155	Platform w/handrails (10,000 sqin)	134
Platform w/handrails (14,000 sqin)	145	Platform w/handrails (10,000 sqin)	124
Platform w/handrails (14,000 sqin)	145	Platform w/handrails (10,000 sqin)	124
Platform w/handrails (14,000 sqin)	145	Platform w/handrails (10,000 sqin)	124
Platform w/handrails (10,000 sqin)	134	6 FT DISH	110
Platform w/handrails (10,000 sqin)	134		

MATERIAL STRENGTH

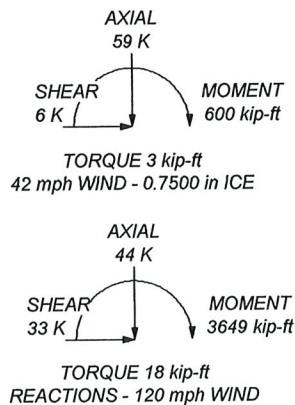
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Clatsop County, Oregon.
2. Tower designed for Exposure D to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 42 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 91.5%

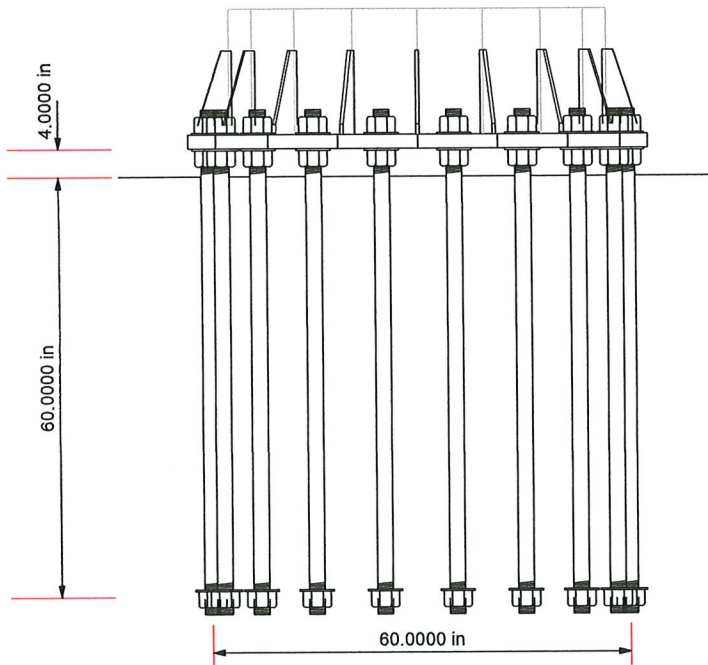
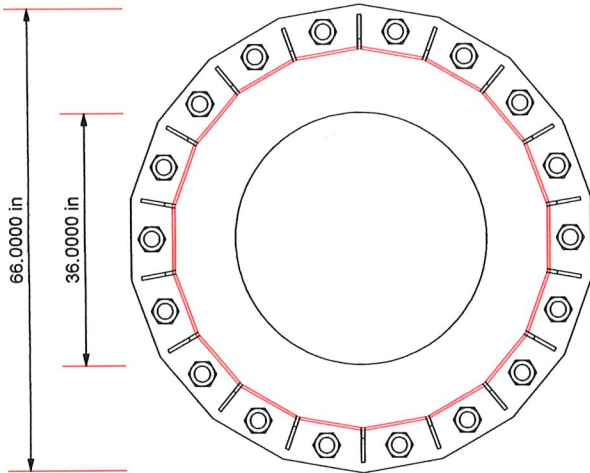


4/30/2025

Mansour
ShirvaniDigitally signed by
Mansour Shirvani
Date: 2025.04.30
11:21:48 -05'00'ALL REACTIONS
ARE FACTORED

	Job: 150' MP Extendable to 175' - Tans			
	Project: US-OR-5156			
	Client: ALMVOY	Drawn by: MS	App'd:	
	Code: TIA-222-H	Date: 04/30/25	Scale: NTS	
	Path:		Dwg No. E-1	

Aria Services, Inc.
10006 Lynbrook Dr.
Houston, TX 77042
www.aria-corp.com Phone: (281) 797-4387
FAX:



FOUNDATION NOTES

1. Plate thickness is 2.0000 in.
2. Plate grade is A572-50.
3. Anchor bolt grade is A615-75.
4. f_c is 4 ksi.

 Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 www.aria-corp.com Phone: (281) 797-4387 FAX:	Job: 150' MP Extendable to 175' - Tans		
	Project: US-OR-5156		
	Client: ALMVOY	Drawn by: MS	App'd:
	Code: TIA-222-H	Date: 04/30/25	Scale: NTS
	Path:		Dwg No. F-1

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	1 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in Clatsop County, Oregon.

Tower base elevation above sea level: 17.000 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category D.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 42 mph is used in combination with ice.

Deflections calculated using a wind speed of 60 mph.

Non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Options

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

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	
L1	150.000-108.000	42.000	5.000	18	23.0990	32.2000	0.1875	0.7500	A572-65 (65 ksi)
	0								
L2	108.000-71.000	42.000	6.000	18	30.7415	39.8425	0.2500	1.0000	A572-65

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	2 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	71.000-35.000	42.000	7.000	18	38.0424	47.1434	0.3125	1.2500	(65 ksi) A572-65
L4	35.000-0.000	42.000		18	45.0016	54.1026	0.3750	1.5000	(65 ksi) A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	Iu/Q in ²	w in	w/t
L1	23.4264	13.6352	904.2868	8.1336	11.7343	77.0636	1809.7636	6.8189	3.7354	19.922
	32.6678	19.0514	2466.6323	11.3644	16.3576	150.7943	4936.5103	9.5275	5.3372	28.465
L2	32.2774	24.1950	2841.9916	10.8245	15.6167	181.9841	5687.7227	12.0998	4.9705	19.882
	40.4186	31.4167	6221.9243	14.0554	20.2400	307.4071	12452.0356	15.7113	6.5723	26.289
L3	39.9013	37.4233	6730.5650	13.3941	19.3255	348.2730	13469.9862	18.7152	6.1455	19.665
	47.8225	46.4504	12870.3998	16.6250	23.9488	537.4120	25757.7349	23.2296	7.7472	24.791
L4	47.1782	53.1168	13364.6074	15.8424	22.8608	584.6081	26746.8004	26.5634	7.2603	19.361
	54.8793	63.9492	23322.0795	19.0733	27.4841	848.5660	46674.8467	31.9807	8.8621	23.632

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontal	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in
L1 150.000-108.000				1	1	1			
L2 108.000-71.000				1	1	1			
L3 71.000-35.000				1	1	1			
L4 35.000-0.000				1	1	1			

Monopole Base Plate Data

Base Plate Data

Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	18
Embedment length	60.0000 in
f _c	4.0000 ksi
Grout space	4.0000 in
Base plate grade	A572-50
Base plate thickness	2.0000 in
Bolt circle diameter	60.0000 in
Outer diameter	66.0000 in
Inner diameter	36.0000 in
Base plate type	Stiffened Plate



4/30/2025

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	3 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Base Plate Data	
Bolts per stiffener	1
Stiffener thickness	0.5000 in
Stiffener height	12.0000 in

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight klf
* Verizon Cable *									
1-5/8	A	No	No	Inside Pole	145.000 - 6.000	18	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
1-5/8	B	No	No	Inside Pole	134.000 - 6.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
1-5/8	C	No	No	Inside Pole	124.000 - 6.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
1-5/8	C	No	No	Inside Pole	110.000 - 6.000	4	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
Safety Wire	A	No	No	CaAa (Out Of Face)	150.000 - 0.000	1	No Ice	0.035	0.000
							1/2" Ice	0.135	0.001
							1" Ice	0.235	0.002
Climbing Rung	A	No	No	CaAa (Out Of Face)	150.000 - 6.000	1	No Ice	0.035	0.000
							1/2" Ice	0.135	0.001
							1" Ice	0.235	0.002

Feed Line/Linear Appurtenances Section Areas

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
L1	150.000-108.000	A	0.000	0.000	0.000	2.940	0.551
		B	0.000	0.000	0.000	0.000	0.256
		C	0.000	0.000	0.000	0.000	0.164
L2	108.000-71.000	A	0.000	0.000	0.000	2.590	0.551
		B	0.000	0.000	0.000	0.000	0.364
		C	0.000	0.000	0.000	0.000	0.485
L3	71.000-35.000	A	0.000	0.000	0.000	2.520	0.536
		B	0.000	0.000	0.000	0.000	0.354
		C	0.000	0.000	0.000	0.000	0.472
L4	35.000-0.000	A	0.000	0.000	0.000	2.240	0.432
		B	0.000	0.000	0.000	0.000	0.285
		C	0.000	0.000	0.000	0.000	0.380



Feed Line/Linear Appurtenances Section Areas - With Ice

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page 4 of 13
	Project	US-OR-5156	Date 11:08:58 04/30/25
	Client	ALMVOY	Designed by MS

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	150.000-108.000	A	0.859	0.000	0.000	0.000	17.369	0.663
		B		0.000	0.000	0.000	0.000	0.256
		C		0.000	0.000	0.000	0.000	0.164
L2	108.000-71.000	A	0.828	0.000	0.000	0.000	15.301	0.649
		B		0.000	0.000	0.000	0.000	0.364
		C		0.000	0.000	0.000	0.000	0.485
L3	71.000-35.000	A	0.786	0.000	0.000	0.000	14.446	0.626
		B		0.000	0.000	0.000	0.000	0.354
		C		0.000	0.000	0.000	0.000	0.472
L4	35.000-0.000	A	0.704	0.000	0.000	0.000	12.301	0.506
		B		0.000	0.000	0.000	0.000	0.285
		C		0.000	0.000	0.000	0.000	0.380

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-108.000	0.0000	-0.5448	0.0000	-1.6865
L2	108.000-71.000	0.0000	-0.5498	0.0000	-1.7583
L3	71.000-35.000	0.0000	-0.5527	0.0000	-1.7547
L4	35.000-0.000	0.0000	-0.5052	0.0000	-1.5708

Note: For pole sections, center of pressure calculations do not consider feed line shielding.



Antenna Pole Forces

Length of Pole ft	I_x in ⁴	I_y in ⁴	Modulus E ksi	Antenna Pole C_{AA} ft ² /ft	Antenna Pole Weight klf	Length of Beacon ft	Beacon C_{AA} ft ²	Beacon Weight K
0.000	1000.0000	1000.0000	1000.000	No Ice With Ice	0.000 0.000	0.000	0.000 0.000	0.000 0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_{AA} Front ft ²	C_{AA} Side ft ²	Weight K
Lightning Rod	C	From Face	0.000	0.000	155.000	No Ice	1.600	0.100
			0.000			1/2" Ice	2.500	0.120
			0.000			1" Ice	3.330	0.200
Platform w/handrails (14,000	A	From Face	3.000	0.000	145.000	No Ice	97.220	1.300

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job 150' MP Extendable to 175' - Tansy	Page 5 of 13
	Project US-OR-5156	Date 11:08:58 04/30/25
	Client ALMVOY	Designed by MS

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
sqin)			0.000		1/2" Ice	99.000	33.000	1.900
			0.000		1" Ice	106.000	35.333	2.300
Platform w/handrails (14,000 sqin)	B	From Face	3.000	0.000	145.000	No Ice	97.220	1.300
			0.000		1/2" Ice	99.000	33.000	1.900
			0.000		1" Ice	106.000	35.333	2.300
Platform w/handrails (14,000 sqin)	C	From Face	3.000	0.000	145.000	No Ice	97.220	1.300
			0.000		1/2" Ice	99.000	33.000	1.900
			0.000		1" Ice	106.000	35.333	2.300
Platform w/handrails (10,000 sqin)	A	From Face	3.000	0.000	134.000	No Ice	69.330	1.200
			0.000		1/2" Ice	74.000	24.667	1.800
			0.000		1" Ice	78.000	26.000	2.000
Platform w/handrails (10,000 sqin)	B	From Face	3.000	0.000	134.000	No Ice	69.330	1.200
			0.000		1/2" Ice	74.000	24.667	1.800
			0.000		1" Ice	78.000	26.000	2.000
Platform w/handrails (10,000 sqin)	C	From Face	3.000	0.000	134.000	No Ice	69.330	1.200
			0.000		1/2" Ice	74.000	24.667	1.800
			0.000		1" Ice	78.000	26.000	2.000
Platform w/handrails (10,000 sqin)	A	From Face	3.000	0.000	124.000	No Ice	69.330	1.200
			0.000		1/2" Ice	74.000	24.667	1.800
			0.000		1" Ice	78.000	26.000	2.000
Platform w/handrails (10,000 sqin)	B	From Face	3.000	0.000	124.000	No Ice	69.330	1.200
			0.000		1/2" Ice	74.000	24.667	1.800
			0.000		1" Ice	78.000	26.000	2.000
Platform w/handrails (10,000 sqin)	C	From Face	3.000	0.000	124.000	No Ice	69.330	1.200
			0.000		1/2" Ice	74.000	24.667	1.800
			0.000		1" Ice	78.000	26.000	2.000

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft²	Weight K
6 FT DISH	C	Paraboloid w/Radome	From Face	1.000 0.000 0.000	0.000		110.000	6.000	No Ice 1/2" Ice 1" Ice	28.270 29.050 29.831
										0.143 0.292 0.441

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice



tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	6 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Comb. No.	Description
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice
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	150 - 108	Pole	Max Tension	2	0.000	0.000	-0.000
			Max. Compression	26	-25.334	0.000	-0.073
			Max. Mx	8	-14.748	-484.511	-1.176
			Max. My	14	-14.728	0.000	-484.895
			Max. Vy	8	21.930	-484.511	-1.176
			Max. Vx	2	-21.951	0.000	484.818
			Max. Torque	9			17.689
			Max Tension	1	0.000	0.000	0.000
L2	108 - 71	Pole	Max. Compression	26	-33.294	0.000	-0.912

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	7 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	71 - 35	Pole	Max. Mx	8	-21.392	-1348.510	4.843
			Max. My	2	-21.328	0.000	1367.676
			Max. Vy	8	25.613	-1348.510	4.843
			Max. Vx	2	-26.197	0.000	1367.676
			Max. Torque	13			-18.738
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-43.335	0.000	-0.747
			Max. Mx	8	-30.323	-2301.787	10.953
			Max. My	2	-30.289	0.000	2341.276
			Max. Vy	8	28.773	-2301.787	10.953
L4	35 - 0	Pole	Max. Vx	2	-29.351	0.000	2341.276
			Max. Torque	13			-18.569
			Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-58.568	0.000	-0.549
			Max. Mx	8	-44.188	-3584.952	17.905
			Max. My	2	-44.188	0.000	3648.396
			Max. Vy	8	32.136	-3584.952	17.905
			Max. Vx	2	-32.697	0.000	3648.396
			Max. Torque	13			-18.431

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	58.568	0.000	5.654
	Max. H _x	21	33.158	32.105	0.163
	Max. H _z	2	44.211	0.000	32.665
	Max. M _x	2	3648.396	0.000	32.665
	Max. M _z	8	3584.952	-32.105	0.163
	Max. Torsion	17	18.340	16.139	-28.009
	Min. Vert	11	33.158	-27.798	-16.005
	Min. H _x	9	33.158	-32.105	0.163
	Min. H _z	14	44.211	0.000	-32.454
	Min. M _x	14	-3625.369	0.000	-32.454
	Min. M _z	20	-3584.952	32.105	0.163
	Min. Torsion	13	-18.340	-16.139	-28.009



Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	36.843	0.000	0.000	0.400	0.000	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	44.211	0.000	-32.665	-3648.396	0.000	0.000
0.9 Dead+1.0 Wind 0 deg - No Ice	33.158	0.000	-32.665	-3603.758	0.000	0.000
1.2 Dead+1.0 Wind 30 deg - No Ice	44.211	16.306	-28.306	-3161.674	-1821.222	17.548
0.9 Dead+1.0 Wind 30 deg - No Ice	33.158	16.306	-28.306	-3122.957	-1798.920	17.560
1.2 Dead+1.0 Wind 60 deg - No Ice	44.211	27.985	-16.316	-1822.098	-3125.375	0.907

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	8 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

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
Ice						
0.9 Dead+1.0 Wind 60 deg - No Ice	33.158	27.985	-16.316	-1799.853	-3086.958	0.908
Ice						
1.2 Dead+1.0 Wind 90 deg - No Ice	44.211	32.105	-0.163	-17.902	-3584.952	-15.794
Ice						
0.9 Dead+1.0 Wind 90 deg - No Ice	33.158	32.105	-0.163	-17.902	-3540.848	-15.803
Ice						
1.2 Dead+1.0 Wind 120 deg - No Ice	44.211	27.798	16.005	1787.494	-3104.094	1.630
0.9 Dead+1.0 Wind 120 deg - No Ice	33.158	27.798	16.005	1765.369	-3065.902	1.632
Ice						
1.2 Dead+1.0 Wind 150 deg - No Ice	44.211	16.139	28.009	3128.530	-1802.550	18.328
0.9 Dead+1.0 Wind 150 deg - No Ice	33.158	16.139	28.009	3089.979	-1780.325	18.340
Ice						
1.2 Dead+1.0 Wind 180 deg - No Ice	44.211	0.000	32.454	3625.369	0.000	0.000
0.9 Dead+1.0 Wind 180 deg - No Ice	33.158	0.000	32.454	3580.715	0.000	0.000
Ice						
1.2 Dead+1.0 Wind 210 deg - No Ice	44.211	-16.139	28.009	3128.530	1802.550	-18.328
0.9 Dead+1.0 Wind 210 deg - No Ice	33.158	-16.139	28.009	3089.979	1780.325	-18.340
Ice						
1.2 Dead+1.0 Wind 240 deg - No Ice	44.211	-27.798	16.005	1787.494	3104.094	-1.630
0.9 Dead+1.0 Wind 240 deg - No Ice	33.158	-27.798	16.005	1765.369	3065.902	-1.632
Ice						
1.2 Dead+1.0 Wind 270 deg - No Ice	44.211	-32.105	-0.163	-17.902	3584.952	15.794
0.9 Dead+1.0 Wind 270 deg - No Ice	33.158	-32.105	-0.163	-17.902	3540.848	15.803
Ice						
1.2 Dead+1.0 Wind 300 deg - No Ice	44.211	-27.985	-16.316	-1822.098	3125.375	-0.907
0.9 Dead+1.0 Wind 300 deg - No Ice	33.158	-27.985	-16.316	-1799.853	3086.958	-0.908
Ice						
1.2 Dead+1.0 Wind 330 deg - No Ice	44.211	-16.306	-28.306	-3161.674	1821.222	-17.548
0.9 Dead+1.0 Wind 330 deg - No Ice	33.158	-16.306	-28.306	-3122.957	1798.920	-17.560
Ice						
1.2 Dead+1.0 Ice	58.568	0.000	0.000	0.549	0.000	0.000
Ice						
1.2 Dead+1.0 Wind 0 deg+1.0 Ice	58.568	0.000	-5.654	-600.050	0.000	0.000
Ice						
1.2 Dead+1.0 Wind 30 deg+1.0 Ice	58.568	2.824	-4.899	-519.860	-299.968	2.211
Ice						
1.2 Dead+1.0 Wind 60 deg+1.0 Ice	58.568	4.858	-2.825	-299.442	-515.670	-0.194
Ice						
1.2 Dead+1.0 Wind 90 deg+1.0 Ice	58.568	5.582	-0.021	-1.776	-592.292	-2.523
Ice						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice	58.568	4.834	2.785	296.088	-512.863	-0.100
Ice						
1.2 Dead+1.0 Wind 150 deg+1.0 Ice	58.568	2.802	4.861	516.687	-297.449	2.312
Ice						
1.2 Dead+1.0 Wind 180 deg+1.0 Ice	58.568	0.000	5.627	598.207	0.000	0.000
Ice						
1.2 Dead+1.0 Wind 210 deg+1.0 Ice	58.568	-2.802	4.861	516.687	297.449	
Ice						
1.2 Dead+1.0 Wind 240 deg+1.0 Ice	58.568	-4.834	2.785	296.088	512.863	
Ice						
1.2 Dead+1.0 Wind 270 deg+1.0 Ice	58.568	-5.582	-0.021	-1.776	592.292	
Ice						
1.2 Dead+1.0 Wind 300	58.568	-4.858	-2.825	-299.442	515.670	



tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	9 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

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
deg+1.0 Ice						
1.2 Dead+1.0 Wind 330	58.568	-2.824	-4.899	-519.860	299.968	-2.211
deg+1.0 Ice						
Dead+Wind 0 deg - Service	36.843	0.000	-7.307	-810.681	0.000	0.000
Dead+Wind 30 deg - Service	36.843	3.647	-6.332	-702.463	-404.878	3.993
Dead+Wind 60 deg - Service	36.843	6.260	-3.650	-404.699	-694.708	0.207
Dead+Wind 90 deg - Service	36.843	7.181	-0.036	-3.708	-796.839	-3.592
Dead+Wind 120 deg - Service	36.843	6.218	3.580	397.628	-689.949	0.371
Dead+Wind 150 deg - Service	36.843	3.610	6.265	695.749	-400.626	4.169
Dead+Wind 180 deg - Service	36.843	0.000	7.259	806.175	0.000	0.000
Dead+Wind 210 deg - Service	36.843	-3.610	6.265	695.749	400.626	-4.169
Dead+Wind 240 deg - Service	36.843	-6.218	3.580	397.628	689.949	-0.371
Dead+Wind 270 deg - Service	36.843	-7.181	-0.036	-3.708	796.839	3.592
Dead+Wind 300 deg - Service	36.843	-6.260	-3.650	-404.699	694.708	-0.207
Dead+Wind 330 deg - Service	36.843	-3.647	-6.332	-702.463	404.878	-3.993

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	-36.843	0.000	0.000	36.843	0.000	0.000%
2	0.000	-44.211	-32.665	0.000	44.211	32.665	0.000%
3	0.000	-33.158	-32.665	0.000	33.158	32.665	0.000%
4	16.306	-44.211	-28.306	-16.306	44.211	28.306	0.000%
5	16.306	-33.158	-28.306	-16.306	33.158	28.306	0.000%
6	27.985	-44.211	-16.316	-27.985	44.211	16.316	0.000%
7	27.985	-33.158	-16.316	-27.985	33.158	16.316	0.000%
8	32.105	-44.211	-0.163	-32.105	44.211	0.163	0.000%
9	32.105	-33.158	-0.163	-32.105	33.158	0.163	0.000%
10	27.798	-44.211	16.005	-27.798	44.211	-16.005	0.000%
11	27.798	-33.158	16.005	-27.798	33.158	-16.005	0.000%
12	16.139	-44.211	28.009	-16.139	44.211	-28.009	0.000%
13	16.139	-33.158	28.009	-16.139	33.158	-28.009	0.000%
14	0.000	-44.211	32.454	0.000	44.211	-32.454	0.000%
15	0.000	-33.158	32.454	0.000	33.158	-32.454	0.000%
16	-16.139	-44.211	28.009	16.139	44.211	-28.009	0.000%
17	-16.139	-33.158	28.009	16.139	33.158	-28.009	0.000%
18	-27.798	-44.211	16.005	27.798	44.211	-16.005	0.000%
19	-27.798	-33.158	16.005	27.798	33.158	-16.005	0.000%
20	-32.105	-44.211	-0.163	32.105	44.211	0.163	0.000%
21	-32.105	-33.158	-0.163	32.105	33.158	0.163	0.000%
22	-27.985	-44.211	-16.316	27.985	44.211	16.316	0.000%
23	-27.985	-33.158	-16.316	27.985	33.158	16.316	0.000%
24	-16.306	-44.211	-28.306	16.306	44.211	28.306	0.000%
25	-16.306	-33.158	-28.306	16.306	33.158	28.306	0.000%
26	0.000	-58.568	0.000	0.000	58.568	0.000	0.000%
27	0.000	-58.568	-5.654	0.000	58.568	5.654	0.000%
28	2.824	-58.568	-4.899	-2.824	58.568	4.899	0.000%
29	4.857	-58.568	-2.825	-4.858	58.568	2.825	0.000%
30	5.582	-58.568	-0.021	-5.582	58.568	0.021	0.000%
31	4.834	-58.568	2.785	-4.834	58.568	-2.785	0.000%
32	2.802	-58.568	4.861	-2.802	58.568	-4.861	0.000%
33	0.000	-58.568	5.627	0.000	58.568	-5.627	0.000%
34	-2.802	-58.568	4.861	2.802	58.568	-4.861	0.000%
35	-4.834	-58.568	2.785	4.834	58.568	-2.785	0.000%
36	-5.582	-58.568	-0.021	5.582	58.568	0.021	0.000%
37	-4.857	-58.568	-2.825	4.858	58.568	2.825	0.000%



tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	10 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
38	-2.824	-58.568	-4.899	2.824	58.568	4.899	0.000%
39	0.000	-36.843	-7.307	0.000	36.843	7.307	0.000%
40	3.647	-36.843	-6.332	-3.647	36.843	6.332	0.000%
41	6.260	-36.843	-3.650	-6.260	36.843	3.650	0.000%
42	7.181	-36.843	-0.036	-7.181	36.843	0.036	0.000%
43	6.218	-36.843	3.580	-6.218	36.843	-3.580	0.000%
44	3.610	-36.843	6.265	-3.610	36.843	-6.265	0.000%
45	0.000	-36.843	7.259	0.000	36.843	-7.259	0.000%
46	-3.610	-36.843	6.265	3.610	36.843	-6.265	0.000%
47	-6.218	-36.843	3.580	6.218	36.843	-3.580	0.000%
48	-7.181	-36.843	-0.036	7.181	36.843	0.036	0.000%
49	-6.260	-36.843	-3.650	6.260	36.843	3.650	0.000%
50	-3.647	-36.843	-6.332	3.647	36.843	6.332	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	4	0.00000001	0.00075632
3	Yes	4	0.00000001	0.00025740
4	Yes	6	0.00000001	0.00019269
5	Yes	6	0.00000001	0.00006020
6	Yes	6	0.00000001	0.00014044
7	Yes	6	0.00000001	0.00004213
8	Yes	6	0.00000001	0.00005953
9	Yes	5	0.00000001	0.00046916
10	Yes	6	0.00000001	0.00014374
11	Yes	6	0.00000001	0.00004361
12	Yes	6	0.00000001	0.00012240
13	Yes	5	0.00000001	0.00094444
14	Yes	4	0.00000001	0.00075362
15	Yes	4	0.00000001	0.00025718
16	Yes	6	0.00000001	0.00012240
17	Yes	5	0.00000001	0.00094444
18	Yes	6	0.00000001	0.00014374
19	Yes	6	0.00000001	0.00004361
20	Yes	6	0.00000001	0.00005953
21	Yes	5	0.00000001	0.00046916
22	Yes	6	0.00000001	0.00014044
23	Yes	6	0.00000001	0.00004213
24	Yes	6	0.00000001	0.00019269
25	Yes	6	0.00000001	0.00006020
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00022988
28	Yes	5	0.00000001	0.00012209
29	Yes	4	0.00000001	0.00061207
30	Yes	4	0.00000001	0.00094095
31	Yes	4	0.00000001	0.00060984
32	Yes	4	0.00000001	0.00091594
33	Yes	4	0.00000001	0.00023042
34	Yes	4	0.00000001	0.00091594
35	Yes	4	0.00000001	0.00060984
36	Yes	4	0.00000001	0.00094095
37	Yes	4	0.00000001	0.00061207
38	Yes	5	0.00000001	0.00012209



4/30/2025

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page 11 of 13
	Project	US-OR-5156	Date 11:08:58 04/30/25
	Client	ALMVOY	Designed by MS

39	Yes	4	0.00000001	0.00009971
40	Yes	5	0.00000001	0.00009210
41	Yes	4	0.00000001	0.00070981
42	Yes	5	0.00000001	0.00005900
43	Yes	4	0.00000001	0.00077647
44	Yes	5	0.00000001	0.00006178
45	Yes	4	0.00000001	0.00009938
46	Yes	5	0.00000001	0.00006178
47	Yes	4	0.00000001	0.00077647
48	Yes	5	0.00000001	0.00005900
49	Yes	4	0.00000001	0.00070981
50	Yes	5	0.00000001	0.00009210



Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	25.8318	40	1.513	0.042
L2	113 - 71	14.6121	40	1.290	0.022
L3	77 - 35	6.4754	40	0.821	0.009
L4	42 - 0	1.8783	40	0.405	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
155.000	Lightning Rod	40	25.8318	1.513	0.042	35254
145.000	Platform w/handrails (14,000 sqin)	40	24.2396	1.492	0.039	35254
134.000	Platform w/handrails (10,000 sqin)	40	20.7785	1.442	0.033	11016
124.000	Platform w/handrails (10,000 sqin)	40	17.7438	1.382	0.027	6779
110.000	6 FT DISH	40	13.8066	1.259	0.020	4745

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 108	116.3177	2	6.824	0.186
L2	113 - 71	65.8124	2	5.818	0.096
L3	77 - 35	29.1649	2	3.700	0.039
L4	42 - 0	8.4573	4	1.826	0.015

Critical Deflections and Radius of Curvature - Design Wind

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	12 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft						
155.000	Lightning Rod	2	116.3177	6.824	0.186	8034
145.000	Platform w/handrails (14,000 sqin)	2	109.1511	6.731	0.173	8034
134.000	Platform w/handrails (10,000 sqin)	2	93.5726	6.503	0.145	2508
124.000	Platform w/handrails (10,000 sqin)	2	79.9118	6.233	0.120	1541
110.000	6 FT DISH	2	62.1856	5.677	0.090	1074

Base Plate Design Data

Plate Thickness	Number of Anchor Bolts	Anchor Bolt Size	Actual Allowable Ratio Bolt Tension K	Actual Allowable Ratio Bolt Compression K	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
in		in						
2.0000	18	2.2500	157.246	162.156	24.777	17.946	Bolt T	0.65
			243.576	404.336	45.000	45.000		✓
			0.65	0.40	0.55	0.40		



4/30/2025

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 P _u /φP _n
L1	150 - 108 (1)	TP32.2x23.099x0.1875	42.000	0.000	0.0	18.4066	-14.717	1076.790	0.014
L2	108 - 71 (2)	TP39.8425x30.7415x0.25	42.000	0.000	0.0	30.3850	-21.327	1777.520	0.012
L3	71 - 35 (3)	TP47.1434x38.0424x0.3125	42.000	0.000	0.0	44.9459	-30.289	2629.330	0.012
L4	35 - 0 (4)	TP54.1026x45.0016x0.375	42.000	0.000	0.0	63.9492	-44.188	3741.030	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio M _{ux} /φM _{ux}	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio M _{uy} /φM _{uy}
L1	150 - 108 (1)	TP32.2x23.099x0.1875	484.841	718.594	0.675	0.000	718.594	0.000
L2	108 - 71 (2)	TP39.8425x30.7415x0.25	1367.825	1520.558	0.900	0.000	1520.558	0.000
L3	71 - 35 (3)	TP47.1434x38.0424x0.3125	2341.500	2724.467	0.859	0.000	2724.467	0.000
L4	35 - 0 (4)	TP54.1026x45.0016x0.375	3648.700	4618.542	0.790	0.000	4618.542	0.000

Pole Shear Design Data

tnxTower Aria Services, Inc. 10006 Lynbrook Dr. Houston, TX 77042 Phone: (281) 797-4387 FAX:	Job	150' MP Extendable to 175' - Tansy	Page	13 of 13
	Project	US-OR-5156	Date	11:08:58 04/30/25
	Client	ALMVOY	Designed by	MS

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio V_u ϕV_n	Actual T_u kip-ft	ϕT_n kip-ft	Ratio T_u ϕT_n
L1	150 - 108 (1)	TP32.2x23.099x0.1875	21.951	323.037	0.068	17.611	874.983	0.020
L2	108 - 71 (2)	TP39.8425x30.7415x0.25	26.198	533.257	0.049	17.807	1788.258	0.010
L3	71 - 35 (3)	TP47.1434x38.0424x0.3125	29.352	788.800	0.037	17.667	3130.258	0.006
L4	35 - 0 (4)	TP54.1026x45.0016x0.375	32.698	1122.310	0.029	17.552	5280.675	0.003

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 108 (1)	0.014	0.675	0.000	0.068	0.020	0.696 ✓	1.000	✓
L2	108 - 71 (2)	0.012	0.900	0.000	0.049	0.010	0.915 ✓	1.000	✓
L3	71 - 35 (3)	0.012	0.859	0.000	0.037	0.006	0.873 ✓	1.000	✓
L4	35 - 0 (4)	0.012	0.790	0.000	0.029	0.003	0.803 ✓	1.000	✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	150 - 108	Pole	TP32.2x23.099x0.1875	1	-14.717	1076.790	69.6	Pass
L2	108 - 71	Pole	TP39.8425x30.7415x0.25	2	-21.327	1777.520	91.5	Pass
L3	71 - 35	Pole	TP47.1434x38.0424x0.3125	3	-30.289	2629.330	87.3	Pass
L4	35 - 0	Pole	TP54.1026x45.0016x0.375	4	-44.188	3741.030	80.3	Pass
Summary								
Pole (L2)							91.5	Pass
Base Plate							64.6	Pass
RATING =							91.5	Pass

Program Version 8.3.1.2 - 12/11/2024 File:C:/Users/Mansour/Aria Services, Inc. Dropbox/Structural/Almvoy/Tansy (US-OR-5156)/SA_Rev1 (Apr 2025)/150' Model/Tansy_Rev1_150'.eri



4/30/2025

2022 Oregon Structural Specialty Code (OSSC) Amendments

Design wind speeds in special wind regions

Effective: Oct. 1, 2023

Amendment summary:

The following amendments are adopted to update the design wind speeds in special wind regions based on the information from an independent study conducted by CPP Wind Engineering Consultants.

These amendments became effective Oct. 1, 2023.

The changes are denoted as follows:

Blue/underline: Added code language
~~Red/strikethrough:~~ Deleted code language

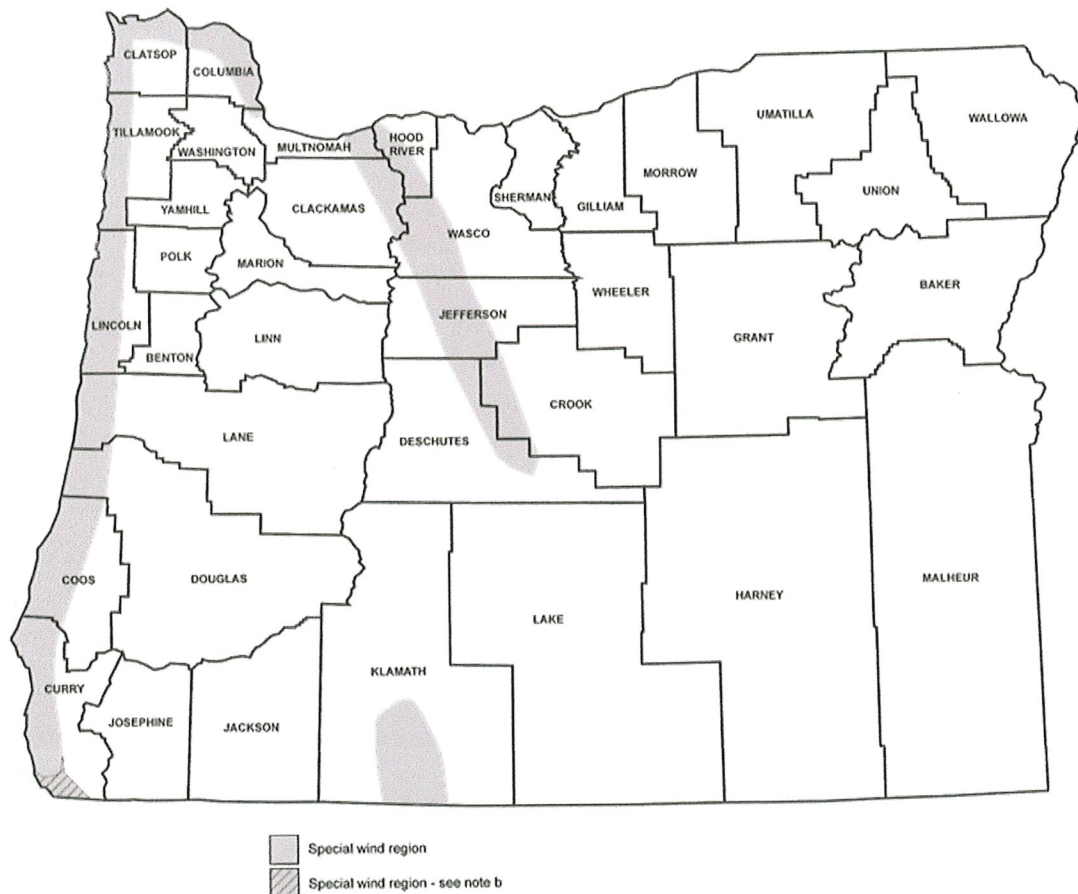


FIGURE 1609.3
SPECIAL WIND REGIONS – OREGON ^{a, b}

- Sites on the ~~perimeter~~ periphery of the identified special wind regions shall be verified using <https://hazards.ateouncil.org>, the ASCE 7 Hazard Tool: <https://asce7hazardtool.online>.
- ~~Basic design wind speeds shall be obtained from Table 1609.3; see Notes b, c and d for buildings and structures with full exposure (wind exposure category D) to Ocean or Columbia River Gorge winds.~~
- This portion of the special wind region in Curry County extends 15 miles inland from the Pacific Coast and is not identified on the ASCE 7 Hazard Tool.

TABLE 1609.3
BASIC DESIGN WIND SPEED, V, FOR RISK CATEGORY I, II, III AND IV BUILDINGS AND OTHER STRUCTURES

COUNTY	RISK CATEGORY I BASIC DESIGN WIND SPEED, V (MPH)	RISK CATEGORY II BASIC DESIGN WIND SPEED, V (MPH)	RISK CATEGORY III BASIC DESIGN WIND SPEED, V (MPH)	RISK CATEGORY IV BASIC DESIGN WIND SPEED, V (MPH)
Baker	97	103	110	114
Benton	90	96	102	107
Clackamas	92	98	105	109
Clackamas special wind region ^a	115 <u>92</u>	120 <u>98</u>	130 <u>105</u>	130 <u>109</u>
Clatsop	91	96	102	107
Clatsop special wind region ^a	125 <u>115</u>	135 <u>120</u>	145 <u>130</u>	145 <u>135</u>
Columbia	91	97	103	107
Columbia special wind region ^a	115 <u>91</u>	120 <u>97</u>	130 <u>103</u>	130 <u>107</u>
Coos	89	95	101	106
Coos special wind region ^{a,b}	115 ^b	120 ^b	130 ^b	130 ^b <u>135</u>
Crook	93	100	106	111
Crook special wind region ^a	100 <u>93</u>	110 <u>100</u>	115 <u>106</u>	115 <u>111</u>
Curry	88	94	101	105
Curry special wind region ^a	125 <u>115</u>	135 <u>120</u>	145 <u>130</u>	145 <u>135</u>
Deschutes	93	99	106	110
Deschutes special wind region ^a	100 <u>93</u>	110 <u>99</u>	115 <u>106</u>	115 <u>110</u>
Douglas	91	97	103	108
Douglas special wind region ^{a,b}	115 ^b	120 ^b	130 ^b	130 ^b <u>135</u>
Gilliam ^d	94 ^d	100 ^d	107 ^d	111 ^d
Grant	95	101	108	113
Harney	94	101	108	112
Hood River ^e	92 ^e	98 ^e	105 ^e	109 ^e
Hood River special wind region ^a	<u>92</u>	<u>98</u>	<u>105</u>	<u>109</u>
Hood River N.45.5° special wind region ^{a,e}	115 ^e	120 ^e	130 ^e	130 ^e
Hood River S.45.5° special wind region ^a	100	110	115	115
Jackson	90	96	103	107
Jefferson	93	99	106	110
Jefferson special wind region ^a	100 <u>93</u>	110 <u>99</u>	115 <u>106</u>	115 <u>110</u>
Josephine	89	95	102	106
Klamath	91	98	104	108
Klamath special wind region ^a	115 <u>91</u>	120 <u>98</u>	130 <u>104</u>	130 <u>108</u>
Lake	93	99	106	111
Lane	91	98	105	110
Lane special wind region ^{a,b}	115 ^b	120 ^b	130 ^b	130 ^b <u>135</u>
Lincoln	90	96	102	106
Lincoln special wind region ^a	125 <u>115</u>	135 <u>120</u>	145 <u>130</u>	145 <u>135</u>
Linn	92	98	104	108
Malheur	96	102	109	113
Marion	92	98	104	108
Morrow ^d	94 ^d	101 ^d	108 ^d	112 ^d
Multnomah ^e	92 ^e	98 ^e	105 ^e	110 ^e
Multnomah special wind region ^{a,e}	115 ^e <u>92</u>	120 ^e <u>98</u>	130 ^e <u>105</u>	130 ^e <u>110</u>
Polk	90	97	103	107
Sherman ^d	93 ^d	99 ^d	106 ^d	111 ^d
Tillamook	91	96	102	107
Tillamook special wind region ^a	125 <u>115</u>	135 <u>120</u>	145 <u>130</u>	145 <u>135</u>
Umatilla ^e	95 ^e	102 ^e	109 ^e	113 ^e
Union	96	102	109	113
Wallowa ^a	97	103	110	115
Wasco ^d	93 ^d	99 ^d	106 ^d	110 ^d
Wasco special wind region ^a	100 <u>93</u>	110 <u>99</u>	115 <u>106</u>	115 <u>110</u>

TABLE 1609.3—continued
BASIC DESIGN WIND SPEED, V, FOR RISK CATEGORY I, II, III AND IV BUILDINGS AND OTHER STRUCTURES

COUNTY	RISK CATEGORY I BASIC DESIGN WIND SPEED, V (MPH)	RISK CATEGORY II BASIC DESIGN WIND SPEED, V (MPH)	RISK CATEGORY III BASIC DESIGN WIND SPEED, V (MPH)	RISK CATEGORY IV BASIC DESIGN WIND SPEED, V (MPH)
Washington	91	97	103	107
Wheeler	94	100	107	111
Yamhill	91	97	103	107

For SI: 1 mile per hour = 0.45 m/s.

a. Refer to Figure 1609.3 for mapped special wind regions.

~~b. The basic design wind speed for buildings and structures in this region with full exposure (wind exposure category D) to Ocean winds shall be 125 mph for Risk Category I, 135 mph for Risk Category II, and 145 mph for Risk Categories III and IV.~~

~~c. The basic design wind speed for buildings and structures in this region with full exposure (wind exposure category D) to Columbia River Gorge winds shall be 125 mph for Risk Category I, 135 mph for Risk Category II, and 145 mph for Risk Categories III and IV.~~

~~d. The basic design wind speed for buildings and structures in this region with full exposure (wind exposure category D) to Columbia River Gorge winds shall be 115 mph for Risk Category I, 120 mph for Risk Category II, and 130 mph for Risk Categories III and IV.~~