NB+C Engineering Services

Existing Wood Pole Antenna Installation

Prepared for Crown Castle Fiber, LLC

SITE INFORMATION

Address	48 Washington Street S Malden, MA 02148 Middlesex County Latitude: 42.428840º Longitude: -71.071069º
Crown Castle Node Number	ODAS_2F-25
NB+C Project Number	100723
Date	November 8, 2023

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1.0 INTRODUCTION

The structure is an existing class 3-40 ft. wood pole located in Malden, MA. As per your request **NB+C ES** performed a structural analysis and design for the existing wood pole to verify that the structure can support the new loads and are in compliance with the applicable codes and standards. Information we have received and used for this analysis includes:

- Final Construction Drawings prepared by **NB+C ES**, dated November 7, 2023
- Field Notes and Photos by **NB+C ES** personnel dated October 02, 2023

2.0 APPURTENANCES LOADING

As per the information provided to us, the final antenna configuration is shown in Table 1 below.

Table 1 – Final Antenna and Cable Information

Center Line Elevation (ft)	Antenna Model	Carrier	Feed Lines
38.58	**(1) Amphenol 6U4MT360X12Fxys4 antenna**	T-Mobile	(4) 1/2" Coax Cable
14.42	**(1) Charles Industries Curved Shroud SH60-702322 w/ (1) Ericsson Radio 4455 B2/B25, (1) Radio 8863 B41**		
10.50	**(1) PTS90526 AC Load Center**		
8.83	(1) Existing Meter		

Note: Proposed Equipment marked in bold

3.0 ASSUMPTIONS

This report is based on the theoretical capacity of the existing/proposed structural elements and is not an assessment of the overall suitability of the existing structure or its components for any particular use other than specified here in this report:

- This report makes no warranties, expressed and/or implied, and disclaims any liability arising from material, fabrication and erection of the existing structure and any other existing or proposed components or appurtenances.
- All proposed and existing antennas, mounts, coaxial cables, and appurtenances are assumed to be properly installed and configured according to manufacturer requirements.
- All existing structural elements are assumed to be in place and in good condition and were previously designed and constructed in accordance with applicable codes and standards.
- All antennas and equipment are conservatively assumed to be normal to the wind for all load combinations considered.
- Contractor to verify existing site condition including the existing soil type. In the event the existing site conditions are different than the assumptions made in this report, this has to

be brought to the structural engineer's attention before proceeding any further with bidding, fabrication and/or erection.

- Based on the photos taken by **NB+C ES** personnel dated October 1, 2023, the existing pole was assumed to be a class 3-40 ft Southern Pine wood pole with an embedment of 4.17 ft into the ground.

4.0 ANALYSIS

Calculations for this analysis are provided in Appendix A of this report.

5.0 CONCLUSIONS & RECOMMENDATIONS

Based on the performed analysis of this structure for applied gravity and lateral loads, the existing wood pole structure was calculated to have ***adequate*** structural capacity to support the existing T-Mobile telecommunication equipment and is in compliance with building codes and standards listed here in this report. **The pole will be stressed to a maximum 95.0% of its design capacity.** Refer to the construction drawings prepared by **NB+C ES** for the proposed location of the appurtenances.

The results in Appendix A of the report show that the additional forces imparted to the existing wood pole due to the proposed telecommunications antenna and mount are within acceptable limits considering the overall configuration of the support structure.

The conclusions reached by **NB+C ES** in this report are only applicable for the previously mentioned existing and proposed structural members supporting the T-Mobile telecommunication antennas. Further, no structural qualification is made or implied by this report for existing structural members not supporting the T-Mobile equipment.

NB+C ENGINEERING SERVICES, LLC

Prepared by: Hitesh Pandey, P.E.

Respectfully Submitted by:

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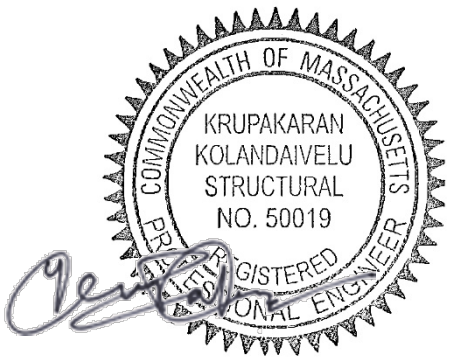
Vice President of Engineering
MA PE License # 50019

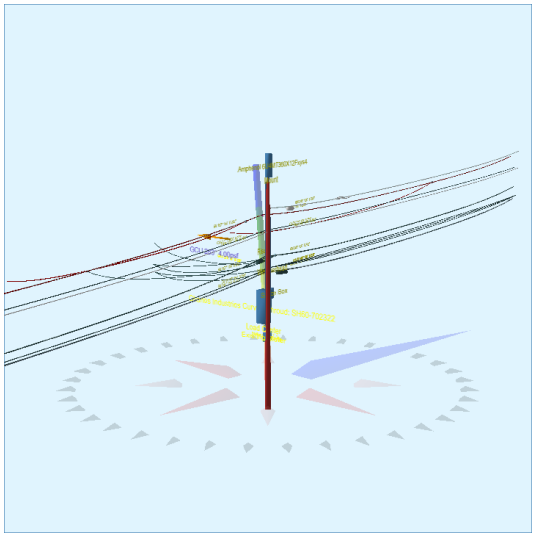


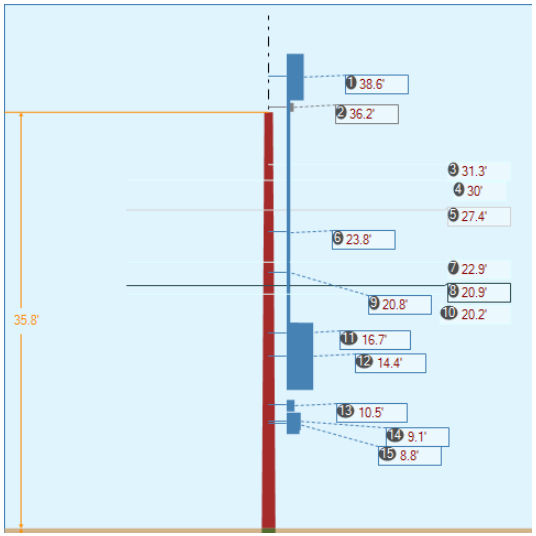
11/8/23

APPENDIX A

CALCULATIONS

Pole Num:	**ODAS-2F-25**	Pole Length / Class:	**40 / 3**	Code:	**NESC**	Structure Type:	**Unguyed Tangent**
Aux Data 1	**Unset**	Species:	**SOUTHERN PINE**	NESC Rule:	**Rule 250B**	Status	**Unguyed**
Aux Data 2	**Unset**	Setting Depth (ft):	**4.17**	Construction Grade:	**B**	Pole Strength Factor:	**0.65**
Aux Data 3	**Unset**	G/L Circumference (in):	**36.70**	Loading District:	**Heavy**	Transverse Wind LF:	**2.50**
Aux Data 4	**Unset**	G/L Fiber Stress (psi):	**8,000**	Ice Thickness (in):	**0.50**	Wire Tension LF:	**1.10**
Aux Data 5	**Unset**	Allowable Stress (psi):	**5,200**	Wind Speed (mph):	**39.53**	Vertical LF:	**1.50**
Aux Data 6	**Unset**	Fiber Stress Ht. Reduc:	**No**	Wind Pressure (psf):	**4.00**		
Latitude:	**0.000000 Deg**	Longitude:	**0.000000 Deg**	Elevation:	**0 Feet**		





Pole Capacity Utilization (%)		Height (ft)	Wind Angle (deg)
Maximum	**95.0**	0.0	262.7
Groundline	**95.0**	0.0	262.7
Vertical	**21.6**	21.6	262.7

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**63,732**	271.7	262.7
Groundline	**63,732**	271.7	262.7
GL Allowable	**67,820**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 271.7°

	Shear Load* (lbs)	Applied Load (%)	Bending Moment (ft-lb)	Applied Moment (%)	Pole Capacity (%)	Bending Stress (+/- psi)	Vertical Load (lbs)	Vertical Stress (psi)	Total Stress (psi)	Pole Capacity (%)
Powers	232	8.9	**7,381**	11.6	**10.9**	**558**	431	4	**562**	**10.8**
Comms	1,746	66.6	**43,837**	68.8	**64.6**	**3,316**	2,435	23	**3,339**	**64.2**
GenericEquipments	360	13.7	**7,094**	11.1	**10.5**	**537**	888	8	**545**	**10.5**
Pole	280	10.7	**5,163**	8.1	**7.6**	**391**	1,616	15	**406**	**7.8**
SpanAdditions	1	0.0	**30**	0.1	**0.0**	**2**	8	0	**2**	**0.0**
Insulators	3	0.1	**226**	0.4	**0.3**	**17**	135	1	**18**	**0.4**
Pole Load	2,621	100.0	**63,732**	100.0	**94.0**	**4,821**	5,513	51	**4,873**	**93.7**
Pole Reserve Capacity			**4,088**		**6.0**	**379**			**327**	**6.3**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 271.7°

	Shear Load* (lbs)	Applied Load (%)	Bending Moment (ft-lb)	Applied Moment (%)	Pole Capacity (%)	Bending Stress (+/- psi)	Vertical Load (lbs)	Vertical Stress (psi)	Total Stress (psi)	Pole Capacity (%)
<Undefined>	2,337	89.2	**58,435**	91.7	**86.2**	**4,421**	3,852	36	**4,457**	**85.7**
Crown Castle	4	0.1	**133**	0.2	**0.2**	**10**	45	0	**11**	**0.2**
Pole	280	10.7	**5,163**	8.1	**7.6**	**391**	1,616	15	**406**	**7.8**
Totals:	2,621	100.0	**63,732**	100.0	**94.0**	**4,821**	5,513	51	**4,873**	**93.7**

Detailed Load Components:

Power		Owner	Height (ft)	Horiz. Offset (in)	Cable Diameter (in)	Sag at Max Temp (ft)	Cable Weight (lbs/ft)	Lead/Span Length (ft)	Span Angle (deg)	Wire Length (ft)	Tension (lbs)	Tension Moment* (ft-lb)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Secondary	TRIPLEX 1/0		29.95	18.96	0.2500		0.263	154.0	167.0	154.1			80	283	363
Secondary	TRIPLEX 1/0		29.95	18.65	0.2500		0.263	154.0	167.0	154.1			78	283	361
Secondary	TRIPLEX 1/0		29.50	58.42	0.2500	1.80	0.263	45.0	242.0	45.3	94	2,467	1	117	2,584
Secondary	TRIPLEX 1/0		29.50	58.42	0.2500	1.75	0.263	45.0	242.0	45.2	97	2,538	1	117	2,656
Secondary	TRIPLEX 1/0		29.94	18.80	0.2500		0.263	154.0	167.0	154.1			79	283	362
Secondary	TRIPLEX 1/0		29.95	19.00	0.2500		0.263	106.0	348.0	106.1			56	208	264
Secondary	TRIPLEX 1/0		28.33	783.88	0.2500	2.51	0.263	45.0	243.0	45.5	68	690	1	42	733
Secondary	TRIPLEX 1/0		28.33	783.88	0.2500	2.51	0.263	45.0	243.0	45.5	68	690	1	42	733
Secondary	TRIPLEX 1/0		29.95	18.65	0.2500		0.263	106.0	348.0	106.1			55	208	263
Secondary	TRIPLEX 1/0		29.94	18.81	0.2500		0.263	106.0	348.0	106.1			55	208	263
Overlashed Bundle	6M		29.97	18.80	0.2420	2.47	0.104	154.0	167.0	154.1	1,627	-13,626	50	2,134	-11,441

Overlashed Bundle	6M	29.97	18.80	0.2420	1.94	0.104	106.0	348.0	106.1	1,103	8,618	35	1,490	10,143
										Totals:	**1,378**	**491**	**5,414**	**7,283**

Comm		Owner	Height (ft)	Horiz. Offset (in)	Cable Diameter (in)	Sag at Max Temp (ft)	Cable Weight (lbs/ft)	Lead/Span Length (ft)	Span Angle (deg)	Wire Length (ft)	Tension (lbs)	Tension Moment* (ft-lb)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Overlashed Bundle	6M		31.33	6.43	0.2420	1.68	0.104	106.0	348.0	106.1	988	8,072	-20	1,843	9,894
Fiber	Fiber 0.45		31.31	6.17	0.4500		0.474	106.0	348.0	106.1			-34	840	805
Fiber	Fiber		27.42	6.67	0.4000	2.46	0.600	154.0	167.0	154.1	1,684	-12,904	-74	2,371	-10,608
Fiber	Fiber		27.42	6.67	0.4000	1.47	0.600	106.0	348.0	106.0	1,545	11,050	-51	1,642	12,641
CATV	CATV 0.25		27.42	6.17	0.2500	1.96	0.375	154.0	167.0	154.1	1,141	-8,739	50	2,117	-6,572
CATV	CATV 0.25		27.42	6.17	0.2500	0.91	0.375	106.0	348.0	106.0	1,165	8,330	34	1,466	9,830
Overlashed Bundle	6M		22.92	6.95	0.2420	3.07	0.104	154.0	167.0	154.2	3,570	-22,864	18	1,671	-21,175
CATV	CATV 0.35		22.93	6.67	0.3500		0.600	154.0	167.0	154.2			49	256	305
CATV	CATV 0.35		22.92	7.22	0.3500		0.600	154.0	167.0	154.2			53	256	309
CATV	CATV 0.35		22.90	6.72	0.3500		0.600	154.0	167.0	154.2			49	439	489
CATV	CATV 0.35		22.90	7.22	0.3500		0.600	154.0	167.0	154.2			53	256	309
CATV	CATV 0.35		22.88	6.96	0.3500		0.600	154.0	167.0	154.2			51	255	307
Overlashed Bundle	6M		22.92	6.95	0.2420	1.87	0.104	106.0	348.0	106.1	3,319	19,837	12	1,141	20,989
CATV	CATV 0.35		22.91	7.17	0.3500		0.600	106.0	348.0	106.1			35	160	196
CATV	CATV 0.35		22.90	6.73	0.3500		0.600	106.0	348.0	106.1			33	160	194
CATV	CATV 0.35		22.88	6.95	0.3500		0.600	106.0	348.0	106.1			34	160	194
CATV	CATV 0.35		22.88	6.64	0.3500		0.600	106.0	348.0	106.1			33	160	193
CATV	CATV 0.35		22.87	7.25	0.3500		0.600	106.0	348.0	106.1			36	160	196
CATV	CATV .25		22.56	38.06	0.2500	2.52	0.600	40.0	253.0	40.6	79	1,788	6	25	1,818
CATV	CATV .25		22.56	38.06	0.2500	1.01	0.600	35.0	273.0	35.1	152	3,611	8	2	3,620
CATV	CATV .25		22.56	38.06	0.2500	2.26	0.600	35.0	273.0	35.5	68	1,611	5	2	1,618
CATV	CATV .35		22.56	38.06	0.2500	2.70	0.600	55.0	288.0	55.5	140	3,215	8	75	3,298
CATV	CATV 0.35		22.85	6.94	0.3500		0.600	106.0	348.0	106.1			34	160	194
CATV	CATV 0.25		20.92	7.07	0.2500	2.36	0.375	154.0	167.0	154.1	995	-5,818	13	1,615	-4,189
CATV	CATV 0.25		20.92	7.07	0.2500	2.00	0.375	34.0	275.0	34.4	55	1,246	4	5	1,254
CATV	CATV 0.25		20.92	7.07	0.2500	1.01	0.375	34.0	275.0	34.1	109	2,475	5	5	2,484
CATV	CATV 0.25		20.92	7.07	0.2500	0.91	0.375	106.0	348.0	106.0	1,165	6,355	9	1,118	7,483
CATV	CATV 0.25		20.92	7.07	0.2500	1.38	0.375	106.0	348.0	106.0	880	4,802	9	1,118	5,929
CATV	CATV 0.25		20.92	7.07	0.2500	1.76	0.375	106.0	348.0	106.1	718	3,919	9	1,118	5,047
Overlashed Bundle	6M		20.17	7.11	0.2420	1.89	0.104	154.0	167.0	154.1	3,315	-18,683	27	1,683	-16,973
CATV	CATV 0.35		20.17	6.82	0.3500		0.600	154.0	167.0	154.1			59	437	496
CATV	CATV 0.35		20.16	7.45	0.3500		0.600	154.0	167.0	154.1			64	437	502
Telco	TELE 1.0		20.12	7.09	1.0000		0.400	154.0	167.0	154.1			47	436	484
Overlashed Bundle	6M		20.17	7.11	0.2420	2.07	0.104	106.0	348.0	106.1	1,719	9,041	19	1,181	10,241

CATV	CATV 0.35	20.16	7.34	0.3500	0.600	106.0	348.0	106.1		44	697	741
CATV	CATV 0.35	20.15	6.90	0.3500	0.600	106.0	348.0	106.1		41	318	359
Telco	TELE 1.0	20.10	7.13	1.0000	0.400	106.0	348.0	106.1		33	317	350
									Totals:	**16,344**	**808**	**26,102**	**43,253**

GenericEquipment		**Owner**	**Height (ft)**	**Horiz. Offset (in)**	**Offset Angle (deg)**	**Rotate Angle (deg)**	**Unit Weight (lbs)**	**Unit Height (in)**	**Unit Depth (in)**	**Unit Diameter (in)**	**Unit Length (in)**	**Offset Moment* (ft-lb)**	**Wind Moment* (ft-lb)**	**Moment at GL* (ft-lb)**
Cylinder	Amphenol 6U4MT360X12Fxys4		38.58	1.79	90.0	0.0	42.00	48.20	--	14.60	--	-9	1,862	1,852
Cylinder	Mount	Crown Castle	36.21	0.64	90.0	0.0	30.00	9.00	--	6.00	--	-2	134	132
Cylinder	Riser		23.82	5.89	255.0	0.0	100.00	285.24	--	3.00	--	71	1,398	1,468
Cylinder	Weatherhead		20.78	5.83	90.0	0.0	100.00	217.00	--	2.50	--	-73	773	700
Box	Splice Box		16.67	9.96	90.0	0.0	10.00	21.96	5.13	--	10.00	-12	402	390
Box	Charles Industries Curved Shroud: SH60-702322		14.42	15.69	168.0	0.0	250.00	69.50	21.45	--	22.73	-116	2,362	2,245
Box	Load Center		10.50	7.87	168.0	0.0	40.00	11.88	5.33	--	6.70	-9	73	64
Box	Existing Sign		9.11	5.41	27.0	0.0	10.00	18.00	0.25	--	12.00	-3	56	53
Box	Existing Meter		8.83	7.73	168.0	0.0	10.00	20.04	4.86	--	11.00	-2	97	94
											Totals:	**-157**	**7,157**	**6,999**

SpanAddition		**Owner**	**Height (ft)**	**Horiz. Offset (in)**	**Offset Angle (deg)**	**Rotate Angle (deg)**	**Unit Weight (lbs)**	**Unit Height (in)**	**Unit Depth (in)**	**Unit Diameter (in)**	**Unit Length (in)**	**Offset Moment* (ft-lb)**	**Wind Moment* (ft-lb)**	**Moment at GL* (ft-lb)**
Maintenance Loop	Span Addition		30.18	300.00	348.0	348.0	7.00	20.00	20.00	20.00	20.00	0	30	30
											Totals:	**0**	**30**	**30**

Insulator		**Owner**	**Height (ft)**	**Horiz. Offset (in)**	**Offset Angle (deg)**	**Rotate Angle (deg)**	**Unit Weight (lbs)**	**Unit Diameter (in)**	**Unit Length (in)**	**Offset Moment* (ft-lb)**	**Wind Moment* (ft-lb)**	**Moment at GL* (ft-lb)**
Bolt	Single Bolt		31.33	0.00	78.3	438.3	5.00	3.00	0.00	-4	0	-4
Davit	Insulator, 15 kV		29.75	0.00	270.0	270.0	60.00	2.50	15.00	141	77	217
Bolt	Single Bolt		27.42	0.00	90.0	90.0	5.00	3.00	0.00	-4	0	-4
J-Hook	J-Hook		27.42	0.00	270.0	270.0	5.00	2.00	0.00	4	0	4
Bolt	Three Bolt		22.92	0.00	270.0	270.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		20.92	0.00	348.3	348.3	5.00	3.00	0.00	1	0	1
Bolt	Three Bolt		20.17	0.00	270.0	270.0	5.00	3.00	0.00	4	0	4
									Totals:	**147**	**77**	**223**

Pole Buckling

Buckling Constant	Buckling Column Height* (ft)	Buckling Section Height (% Buckling Col. Hgt.)	Buckling Section Diameter (in)	Minimum Buckling Diameter at GL (in)	Diameter at Tip (in)	Diameter at GL (in)	Modulus of Elasticity (psi)	Pole Density (pcf)	Ice Density (pcf)	Pole Tip Height (ft)	Buckling Load Capacity at Height (lbs)	Buckling Load Applied at Height (lbs)	Buckling Load Factor of Safety
2.00	21.63	33.38	10.80	18.76	7.32	11.69	1.60e+6	60.00	57.00	35.83	25,465	**255.23**	**4.63**

Notes

Date	Author	Description
12/7/2015	bmesfin	Assumptions

ASSUMPTIONS :

The analysis contained within this report is based on the pole capacity as prescriberd in the governing codes. The validitiy and accuracy of the analysis within is limited by the accuracy of the infromation it is based on. The structural analysis is based on the following assumptions.

1. The pole was built and maintained in accordance with the manufacturer's specifications. The structure is assumed to be plumb, in good condition and essentially as erected.
2. The member size dimensions and sections are accurate as supplied.
3. The wood pole evaluated is Southern pine with capacity of 8000psi.
4. The soil at this locations have normal (average) soil properties.
5. All wire types, sizes, heights and wind spans were determined from photos obtained during a site visit.

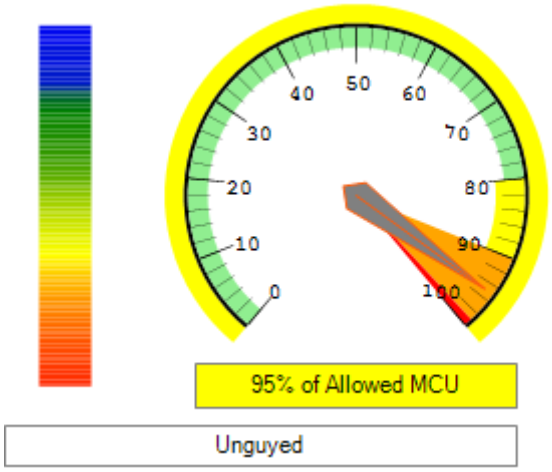
If any of these assumptions is not valid or has been made in error, this analysis may be affected, and NB+C ES sould be allowed to review any new information to determine its effect on the structural integrity of the tower.

O-Calc® Pro Capacity Summary Info

Pole Identification: ODAS-2F-25

Report Created: 11/8/2023

File: ODAS_2F-25.pplx



O-Calc® Pro Heat Map View

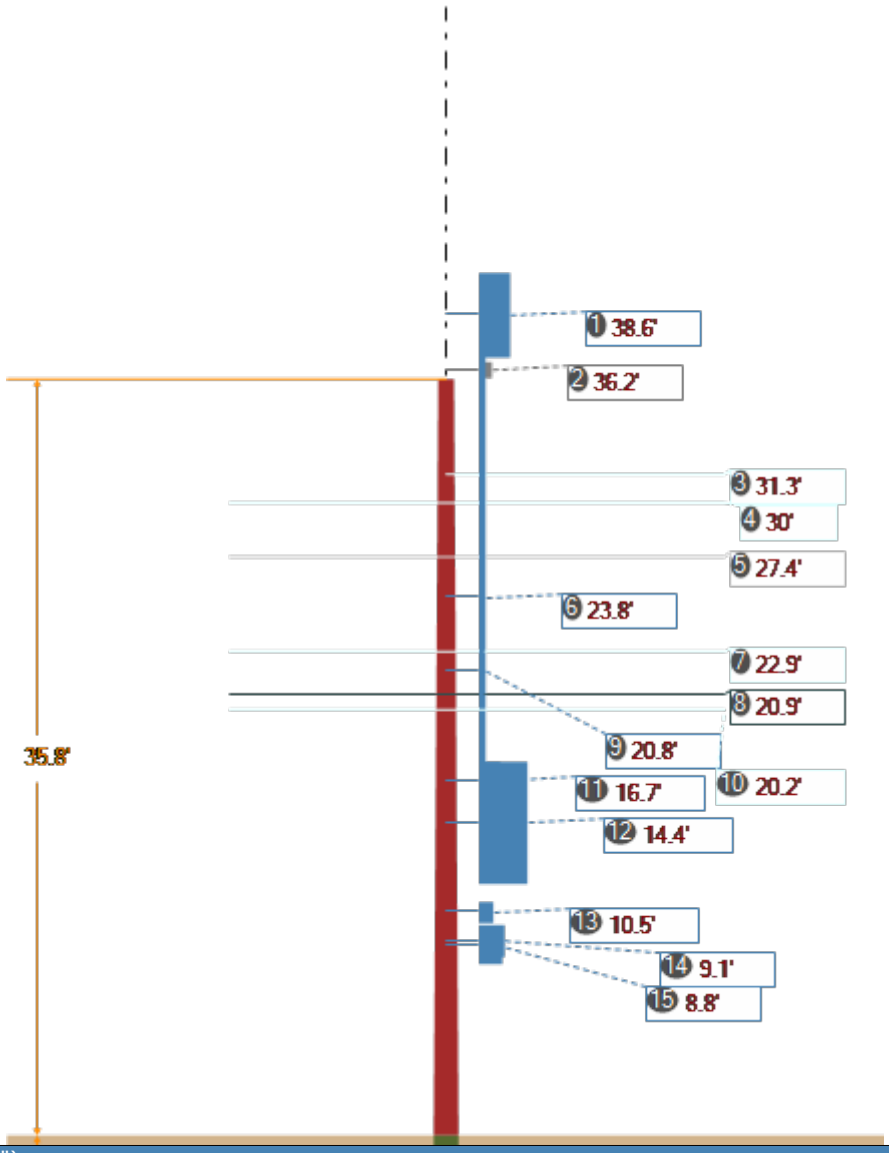
Report Created: 11/8/2023

O-Calc® Pro Schematic View

Pole Identification: ODAS-2F-25

Report Created: 11/8/2023

File: ODAS_2F-25.pplx



1 - 38.6' (463")
Amphenol 6U4MT360X12Fxys4

2 - 36.2' (434.5")
Mount

3 - 31.3' (376")
6M 348° 106' Msgr:0.242"

4 - 30' (359.6")
6M 167° 154' Msgr:0.242"
6M 348° 106' Msgr:0.242"

5 - 27.4' (329")
Fiber 167° 154' 0.400" (Fiber)
Fiber 348° 106' 0.400" (Fiber)
CATV 167° 154' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)

6 - 23.8' (285.8")
Riser

7 - 22.9' (275")
6M 167° 154' Msgr:0.242"
6M 348° 106' Msgr:0.242"

8 - 20.9' (251")
CATV 167° 154' 0.250" (CATV 0.25)
CATV 275° 34' 0.250" (CATV 0.25)
CATV 275° 34' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)

9 - 20.8' (249.4")
Weatherhead

10 - 20.2' (242")
6M 167° 154' Msgr:0.242"
6M 348° 106' Msgr:0.242"

11 - 16.7' (200")
Splice Box

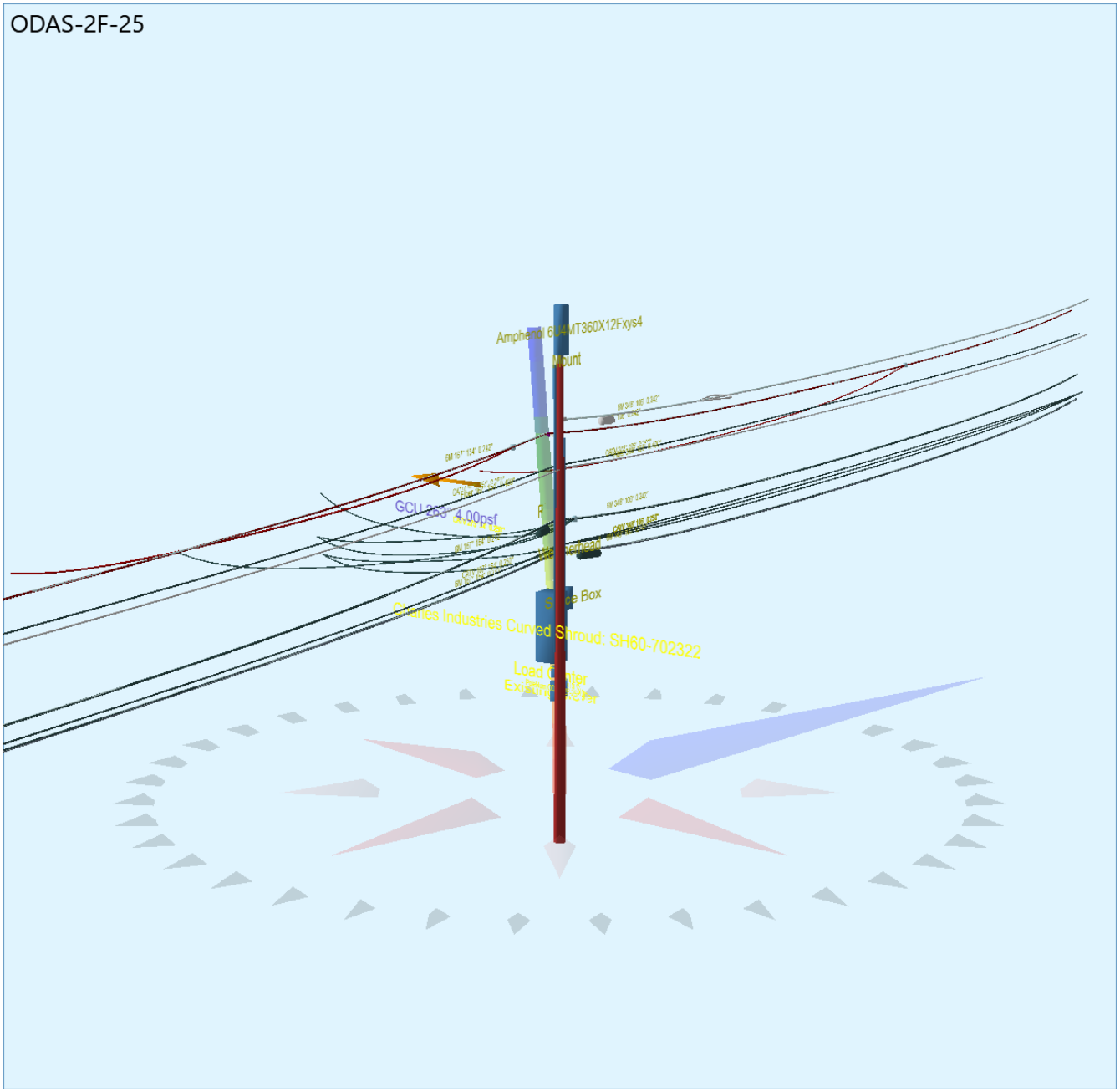
12 - 14.4' (173")
CHARLES SH60-702322 Shroud

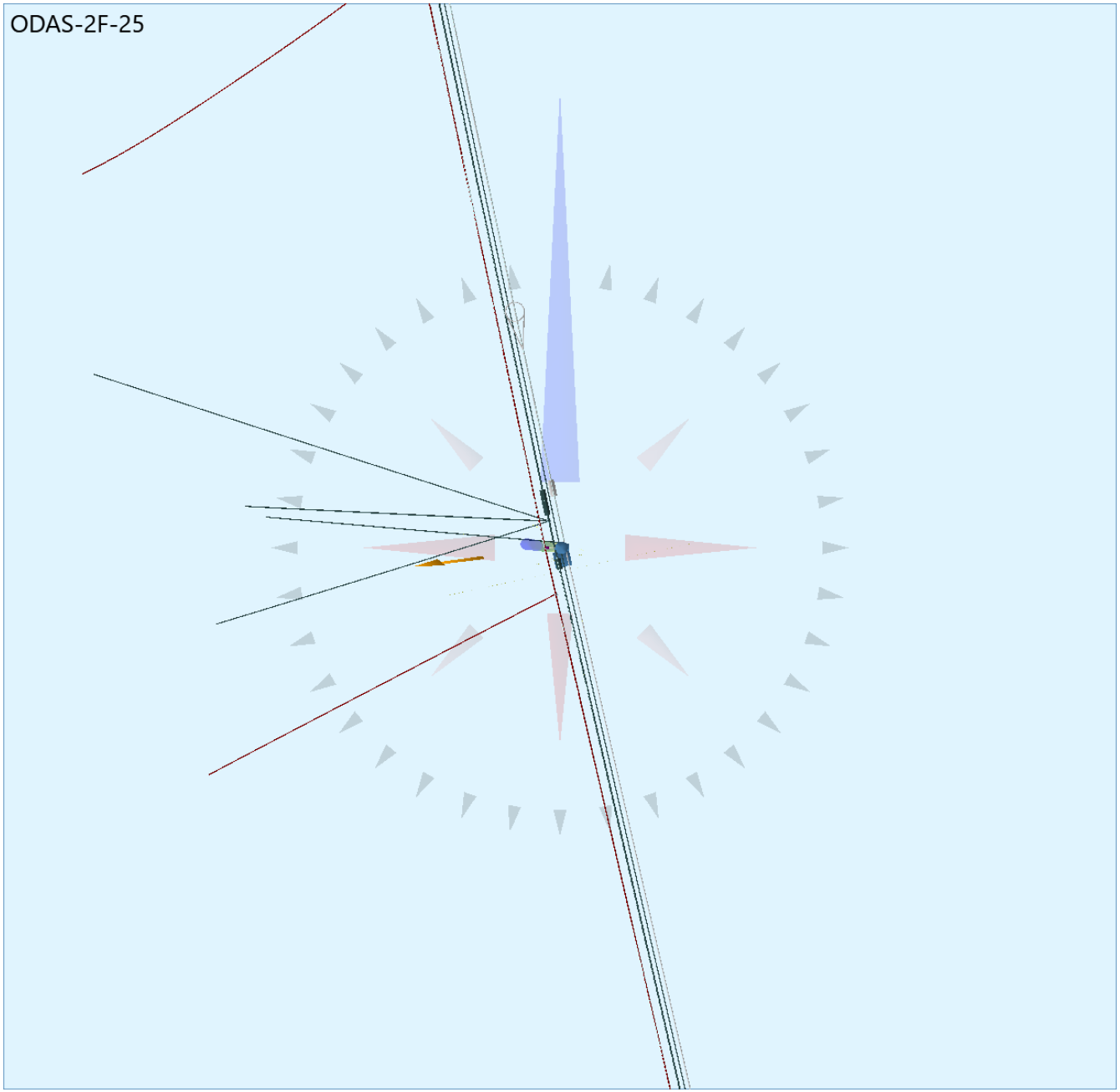
13 - 10.5' (126")
Load Center PTS90526

14 - 9.1' (109.3")
Existing Sign

15 - 8.8' (106")
Meter

ODAS-2F-25


Amphenol 6
4MT360X12Fxys4
Mount
GCU 263 4.00psf
Curries Industries Curved Shroud: SH60-702322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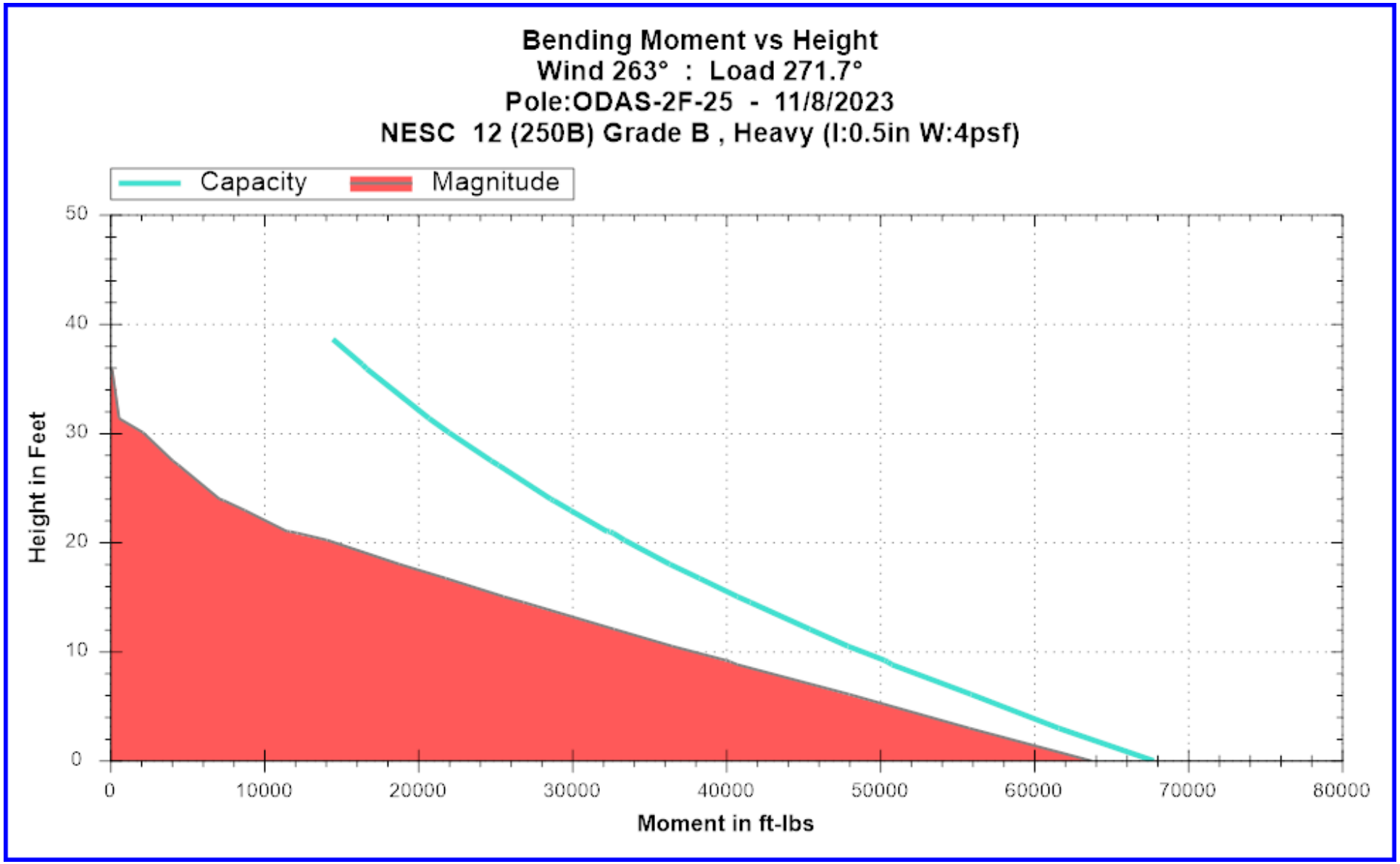
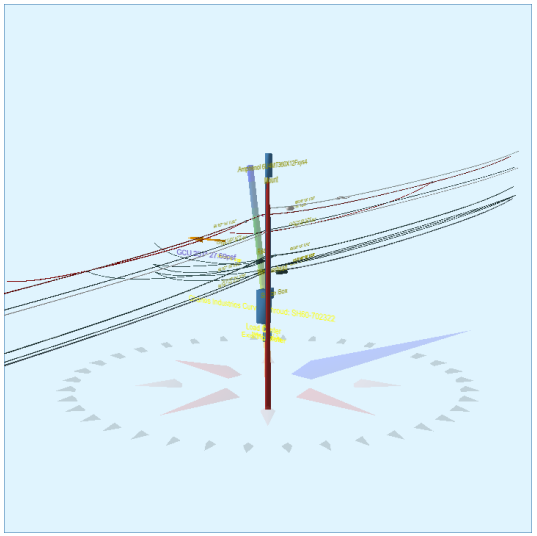
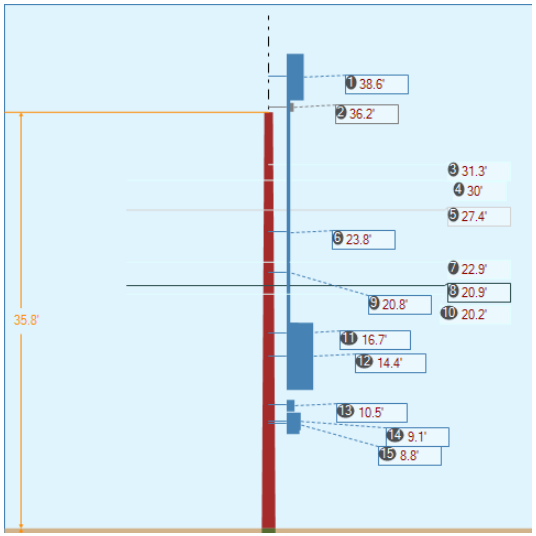

Bending Moment vs Height
Wind 263° : Load 271.7°
Pole:ODAS-2F-25 - 11/8/2023
NESC 12 (250B) Grade B , Heavy (I:0.5in W:4psf)
Capacity
Magnitude
Height in Feet
0
10
20
30
40
50
0
10000
20000
30000
40000
50000
60000
70000
80000
Moment in ft-lbs

Pole Num:	**ODAS-2F-25**	Pole Length / Class:	**40 / 3**	Code:	**NESC**	Structure Type:	**Unguyed Tangent**
Aux Data 1	**Unset**	Species:	**SOUTHERN PINE**	NESC Rule:	**Rule 250C**	Status	**Unguyed**
Aux Data 2	**Unset**	Setting Depth (ft):	**4.17**	Construction Grade:	**B**	Pole Strength Factor:	**0.75**
Aux Data 3	**Unset**	G/L Circumference (in):	**36.70**	Loading District:	**Special**	Transverse Wind LF:	**1.00**
Aux Data 4	**Unset**	G/L Fiber Stress (psi):	**8,000**	Ice Thickness (in):	**0.00**	Wire Tension LF:	**1.00**
Aux Data 5	**Unset**	Allowable Stress (psi):	**6,000**	Wind Speed (mph):	**104.00**	Vertical LF:	**1.00**
Aux Data 6	**Unset**	Fiber Stress Ht. Reduc:	**No**	Wind Pressure (psf):	**27.69**	Max 250C Wind (mph)	**113.39**
Latitude:	**0.000000 Deg**	Longitude:	**0.000000 Deg**			Elevation:	**0 Feet**





Pole Capacity Utilization (%)		Height (ft)	Wind Angle (deg)
Maximum	89.2	0.0	251.2
Groundline	89.2	0.0	251.2
Vertical	9.0	20.7	251.2

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**69,415**	247.1	251.2
Groundline	**69,415**	247.1	251.2
GL Allowable	**78,254**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 247.1°

	Shear Load* (lbs)	Applied Load (%)	Bending Moment (ft-lb)	Applied Moment (%)	Pole Capacity (%)	Bending Stress (+/- psi)	Vertical Load (lbs)	Vertical Stress (psi)	Total Stress (psi)	Pole Capacity (%)
Powers	323	10.3	**10,146**	14.6	**13.0**	**749**	152	1	**750**	**12.5**
Comms	1,233	39.3	**28,398**	40.9	**36.3**	**2,096**	1,002	9	**2,105**	**35.1**
GenericEquipments	873	27.8	**18,457**	26.6	**23.6**	**1,362**	592	6	**1,368**	**22.8**
Pole	700	22.3	**12,028**	17.3	**15.4**	**888**	1,077	10	**898**	**15.0**
SpanAdditions	3	0.1	**82**	0.1	**0.1**	**6**	5	0	**6**	**0.1**
Insulators	7	0.2	**303**	0.4	**0.4**	**22**	90	1	**23**	**0.4**
Pole Load	3,138	100.0	**69,415**	100.0	**88.7**	**5,124**	2,918	27	**5,151**	**85.8**
Pole Reserve Capacity			**8,839**		**11.3**	**876**			**849**	**14.2**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 247.1°

	Shear Load* (lbs)	Applied Load (%)	Bending Moment (ft-lb)	Applied Moment (%)	Pole Capacity (%)	Bending Stress (+/- psi)	Vertical Load (lbs)	Vertical Stress (psi)	Total Stress (psi)	Pole Capacity (%)
<Undefined>	2,428	77.4	**57,009**	82.1	**72.9**	**4,208**	1,811	17	**4,225**	**70.4**
Crown Castle	10	0.3	**378**	0.5	**0.5**	**28**	30	0	**28**	**0.5**
Pole	700	22.3	**12,028**	17.3	**15.4**	**888**	1,077	10	**898**	**15.0**
Totals:	3,138	100.0	**69,415**	100.0	**88.7**	**5,124**	2,918	27	**5,151**	**85.8**

Detailed Load Components:

Power		Owner	Height (ft)	Horiz. Offset (in)	Cable Diameter (in)	Sag at Max Temp (ft)	Cable Weight (lbs/ft)	Lead/Span Length (ft)	Span Angle (deg)	Wire Length (ft)	Tension (lbs)	Tension Moment* (ft-lb)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Secondary	TRIPLEX 1/0		29.95	18.96	0.2500		0.263	154.0	167.0	154.1			30	673	703
Secondary	TRIPLEX 1/0		29.95	18.65	0.2500		0.263	154.0	167.0	154.1			29	673	702
Secondary	TRIPLEX 1/0		29.50	58.42	0.2500	1.80	0.263	45.0	242.0	45.3	40	1,099	2	5	1,106
Secondary	TRIPLEX 1/0		29.50	58.42	0.2500	1.75	0.263	45.0	242.0	45.2	41	1,131	2	5	1,138
Secondary	TRIPLEX 1/0		29.94	18.80	0.2500		0.263	154.0	167.0	154.1			29	673	702
Secondary	TRIPLEX 1/0		29.95	19.00	0.2500		0.263	106.0	348.0	106.1			20	502	523
Secondary	TRIPLEX 1/0		28.33	783.88	0.2500	2.51	0.263	45.0	243.0	45.5	29	304	0	1	305
Secondary	TRIPLEX 1/0		28.33	783.88	0.2500	2.51	0.263	45.0	243.0	45.5	29	304	0	1	305
Secondary	TRIPLEX 1/0		29.95	18.65	0.2500		0.263	106.0	348.0	106.1			20	502	522
Secondary	TRIPLEX 1/0		29.94	18.81	0.2500		0.263	106.0	348.0	106.1			20	502	522
Overlashed Bundle	6M		29.97	18.80	0.2420	2.48	0.104	154.0	167.0	154.1	1,238	6,377	12	674	7,062

Overlashed Bundle	6M	29.97	18.80	0.2420	1.94	0.104	106.0	348.0	106.1	764	-4,332	8	502	-3,822
										Totals:	**4,881**	**172**	**4,714**	**9,768**

Comm		Owner	Height (ft)	Horiz. Offset (in)	Cable Diameter (in)	Sag at Max Temp (ft)	Cable Weight (lbs/ft)	Lead/Span Length (ft)	Span Angle (deg)	Wire Length (ft)	Tension (lbs)	Tension Moment* (ft-lb)	Offset Moment* (ft-lb)	Wind Moment* (ft-lb)	Moment at GL* (ft-lb)
Overlashed Bundle	6M		31.33	6.43	0.2420	1.70	0.104	106.0	348.0	106.1	610	-3,613	-3	1,224	-2,392
Fiber	Fiber 0.45		31.31	6.17	0.4500		0.474	106.0	348.0	106.1			-13	2,043	2,030
Fiber	Fiber		27.42	6.67	0.4000	2.47	0.600	154.0	167.0	154.1	966	4,556	-24	1,592	6,124
Fiber	Fiber		27.42	6.67	0.4000	1.48	0.600	106.0	348.0	106.0	846	-4,389	-16	1,119	-3,287
CATV	CATV 0.25		27.42	6.17	0.2500	1.97	0.375	154.0	167.0	154.1	744	3,507	14	995	4,515
CATV	CATV 0.25		27.42	6.17	0.2500	0.91	0.375	106.0	348.0	106.0	812	-4,211	9	699	-3,503
Overlashed Bundle	6M		22.92	6.95	0.2420	3.07	0.104	154.0	167.0	154.2	3,189	12,568	4	586	13,158
CATV	CATV 0.35		22.93	6.67	0.3500		0.600	154.0	167.0	154.2			23	586	609
CATV	CATV 0.35		22.92	7.22	0.3500		0.600	154.0	167.0	154.2			26	586	611
CATV	CATV 0.35		22.90	6.72	0.3500		0.600	154.0	167.0	154.2			24	1,005	1,029
CATV	CATV 0.35		22.90	7.22	0.3500		0.600	154.0	167.0	154.2			26	585	611
CATV	CATV 0.35		22.88	6.96	0.3500		0.600	154.0	167.0	154.2			25	585	609
Overlashed Bundle	6M		22.92	6.95	0.2420	1.87	0.104	106.0	348.0	106.1	2,985	-12,938	3	373	-12,562
CATV	CATV 0.35		22.91	7.17	0.3500		0.600	106.0	348.0	106.1			18	372	390
CATV	CATV 0.35		22.90	6.73	0.3500		0.600	106.0	348.0	106.1			16	372	389
CATV	CATV 0.35		22.88	6.95	0.3500		0.600	106.0	348.0	106.1			17	372	389
CATV	CATV 0.35		22.88	6.64	0.3500		0.600	106.0	348.0	106.1			16	372	388
CATV	CATV 0.35		22.87	7.25	0.3500		0.600	106.0	348.0	106.1			18	372	390
CATV	CATV .25		22.56	38.06	0.2500	2.52	0.600	40.0	253.0	40.6	50	1,068	0	1	1,068
CATV	CATV .25		22.56	38.06	0.2500	1.01	0.600	35.0	273.0	35.1	95	1,848	0	31	1,879
CATV	CATV .25		22.56	38.06	0.2500	2.27	0.600	35.0	273.0	35.5	43	826	0	31	857
CATV	CATV .35		22.56	38.06	0.2500	2.69	0.600	55.0	288.0	55.5	87	1,433	0	117	1,551
CATV	CATV 0.35		22.85	6.94	0.3500		0.600	106.0	348.0	106.1			17	372	389
CATV	CATV 0.25		20.92	7.07	0.2500	2.37	0.375	154.0	167.0	154.1	604	2,172	-3	729	2,898
CATV	CATV 0.25		20.92	7.07	0.2500	2.00	0.375	34.0	275.0	34.4	28	512	-1	33	544
CATV	CATV 0.25		20.92	7.07	0.2500	1.01	0.375	34.0	275.0	34.1	56	1,024	-2	33	1,056
CATV	CATV 0.25		20.92	7.07	0.2500	0.91	0.375	106.0	348.0	106.0	812	-3,213	-2	513	-2,702
CATV	CATV 0.25		20.92	7.07	0.2500	1.39	0.375	106.0	348.0	106.0	529	-2,091	-2	513	-1,580
CATV	CATV 0.25		20.92	7.07	0.2500	1.76	0.375	106.0	348.0	106.1	392	-1,552	-2	513	-1,041
Overlashed Bundle	6M		20.17	7.11	0.2420	1.91	0.104	154.0	167.0	154.1	2,904	10,071	4	982	11,058
CATV	CATV 0.35		20.17	6.82	0.3500		0.600	154.0	167.0	154.1			24	982	1,006
CATV	CATV 0.35		20.16	7.45	0.3500		0.600	154.0	167.0	154.1			27	982	1,009
Telco	TELE 1.0		20.12	7.09	1.0000		0.400	154.0	167.0	154.1			17	980	997
Overlashed Bundle	6M		20.17	7.11	0.2420	2.08	0.104	106.0	348.0	106.1	1,301	-4,963	3	725	-4,235

CATV	CATV 0.35	20.16	7.34	0.3500	0.600	106.0	348.0	106.1			18	1,590	1,608
CATV	CATV 0.35	20.15	6.90	0.3500	0.600	106.0	348.0	106.1			17	725	741
Telco	TELE 1.0	20.10	7.13	1.0000	0.400	106.0	348.0	106.1			12	723	734
										Totals:	**2,616**	**308**	**24,414**	**27,338**

GenericEquipment		**Owner**	**Height (ft)**	**Horiz. Offset (in)**	**Offset Angle (deg)**	**Rotate Angle (deg)**	**Unit Weight (lbs)**	**Unit Height (in)**	**Unit Depth (in)**	**Unit Diameter (in)**	**Unit Length (in)**	**Offset Moment* (ft-lb)**	**Wind Moment* (ft-lb)**	**Moment at GL* (ft-lb)**
Cylinder	Amphenol 6U4MT360X12Fxys4		38.58	1.79	90.0	0.0	42.00	48.20	--	14.60	--	-6	5,108	5,102
Cylinder	Mount	Crown Castle	36.21	0.64	90.0	0.0	30.00	9.00	--	6.00	--	-1	365	363
Cylinder	Riser		23.82	5.89	255.0	0.0	100.00	285.24	--	3.00	--	49	3,485	3,534
Cylinder	Weatherhead		20.78	5.83	90.0	0.0	100.00	217.00	--	2.50	--	-45	1,874	1,829
Box	Splice Box		16.67	9.96	90.0	0.0	10.00	21.96	5.13	--	10.00	-8	873	865
Box	Charles Industries Curved Shroud: SH60-702322		14.42	15.69	168.0	0.0	250.00	69.50	21.45	--	22.73	62	5,351	5,413
Box	Load Center		10.50	7.87	168.0	0.0	40.00	11.88	5.33	--	6.70	5	166	171
Box	Existing Sign		9.11	5.41	27.0	0.0	10.00	18.00	0.25	--	12.00	-3	273	270
Box	Existing Meter		8.83	7.73	168.0	0.0	10.00	20.04	4.86	--	11.00	1	220	221
											Totals:	**54**	**17,715**	**17,769**

SpanAddition		**Owner**	**Height (ft)**	**Horiz. Offset (in)**	**Offset Angle (deg)**	**Rotate Angle (deg)**	**Unit Weight (lbs)**	**Unit Height (in)**	**Unit Depth (in)**	**Unit Diameter (in)**	**Unit Length (in)**	**Offset Moment* (ft-lb)**	**Wind Moment* (ft-lb)**	**Moment at GL* (ft-lb)**
Maintenance Loop	Span Addition		30.18	300.00	348.0	348.0	7.00	20.00	20.00	20.00	20.00	0	79	79
											Totals:	**0**	**79**	**79**

Insulator		**Owner**	**Height (ft)**	**Horiz. Offset (in)**	**Offset Angle (deg)**	**Rotate Angle (deg)**	**Unit Weight (lbs)**	**Unit Diameter (in)**	**Unit Length (in)**	**Offset Moment* (ft-lb)**	**Wind Moment* (ft-lb)**	**Moment at GL* (ft-lb)**
Bolt	Single Bolt		31.33	0.00	78.3	438.3	5.00	3.00	0.00	-3	0	-3
Davit	Insulator, 15 kV		29.75	0.00	270.0	270.0	60.00	2.50	15.00	87	203	290
Bolt	Single Bolt		27.42	0.00	90.0	90.0	5.00	3.00	0.00	-3	0	-3
J-Hook	J-Hook		27.42	0.00	270.0	270.0	5.00	2.00	0.00	2	0	2
Bolt	Three Bolt		22.92	0.00	270.0	270.0	5.00	3.00	0.00	3	0	3
Bolt	Single Bolt		20.92	0.00	348.3	348.3	5.00	3.00	0.00	-1	0	-1
Bolt	Three Bolt		20.17	0.00	270.0	270.0	5.00	3.00	0.00	3	0	3
									Totals:	**89**	**203**	**292**

Pole Buckling

Buckling Constant	Buckling Column Height* (ft)	Buckling Section Height (% Buckling Col. Hgt.)	Buckling Section Diameter (in)	Minimum Buckling Diameter at GL (in)	Diameter at Tip (in)	Diameter at GL (in)	Modulus of Elasticity (psi)	Pole Density (pcf)	Ice Density (pcf)	Pole Tip Height (ft)	Buckling Load Capacity at Height (lbs)	Buckling Load Applied at Height (lbs)	Buckling Load Factor of Safety
2.00	20.74	33.24	10.84	12.86	7.32	11.69	1.60e+6	60.00	57.00	35.83	32,433	**324.26**	**11.11**

Notes

Date	Author	Description
12/7/2015	bmesfin	Assumptions

ASSUMPTIONS :

The analysis contained within this report is based on the pole capacity as prescriberd in the governing codes. The validitiy and accuracy of the analysis within is limited by the accuracy of the infromation it is based on. The structural analysis is based on the following assumptions.

1. The pole was built and maintained in accordance with the manufacturer's specifications. The structure is assumed to be plumb, in good condition and essentially as erected.
2. The member size dimensions and sections are accurate as supplied.
3. The wood pole evaluated is Southern pine with capacity of 8000psi.
4. The soil at this locations have normal (average) soil properties.
5. All wire types, sizes, heights and wind spans were determined from photos obtained during a site visit.

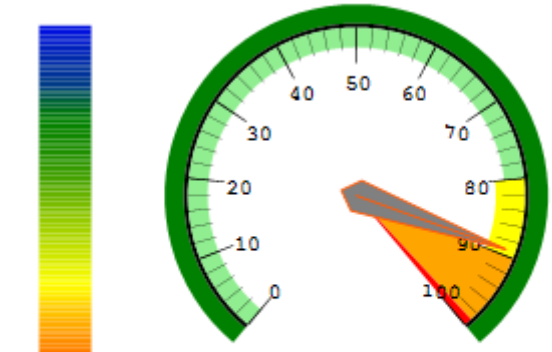
If any of these assumptions is not valid or has been made in error, this analysis may be affected, and NB+C ES sould be allowed to review any new information to determine its effect on the structural integrity of the tower.

O-Calc® Pro Capacity Summary Info

Pole Identification: ODAS-2F-25

Report Created: 11/8/2023

File: ODAS_2F-25.pplx



89.2% of Allowed MCU

Unguyed

O-Calc® Pro Heat Map View

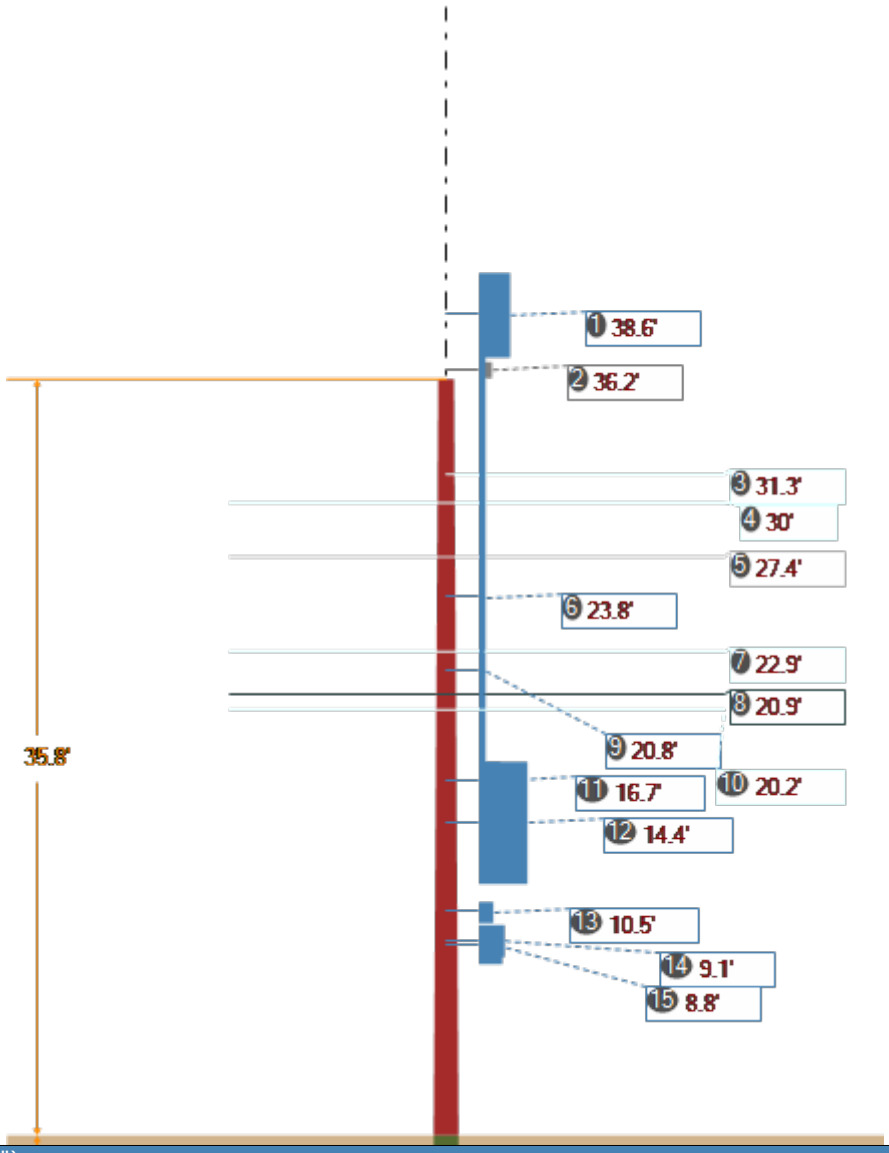
Report Created: 11/8/2023

O-Calc® Pro Schematic View

Pole Identification: ODAS-2F-25

Report Created: 11/8/2023

File: ODAS_2F-25.pplx



1 - 38.6' (463")
Amphenol 6U4MT360X12Fxys4

2 - 36.2' (434.5")
Mount

3 - 31.3' (376")
6M 348° 106' Msgr:0.242"

4 - 30' (359.6")
6M 167° 154' Msgr:0.242"
6M 348° 106' Msgr:0.242"

5 - 27.4' (329")
Fiber 167° 154' 0.400" (Fiber)
Fiber 348° 106' 0.400" (Fiber)
CATV 167° 154' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)

6 - 23.8' (285.8")
Riser

7 - 22.9' (275")
6M 167° 154' Msgr:0.242"
6M 348° 106' Msgr:0.242"

8 - 20.9' (251")
CATV 167° 154' 0.250" (CATV 0.25)
CATV 275° 34' 0.250" (CATV 0.25)
CATV 275° 34' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)
CATV 348° 106' 0.250" (CATV 0.25)

9 - 20.8' (249.4")
Weatherhead

10 - 20.2' (242")
6M 167° 154' Msgr:0.242"
6M 348° 106' Msgr:0.242"

11 - 16.7' (200")
Splice Box

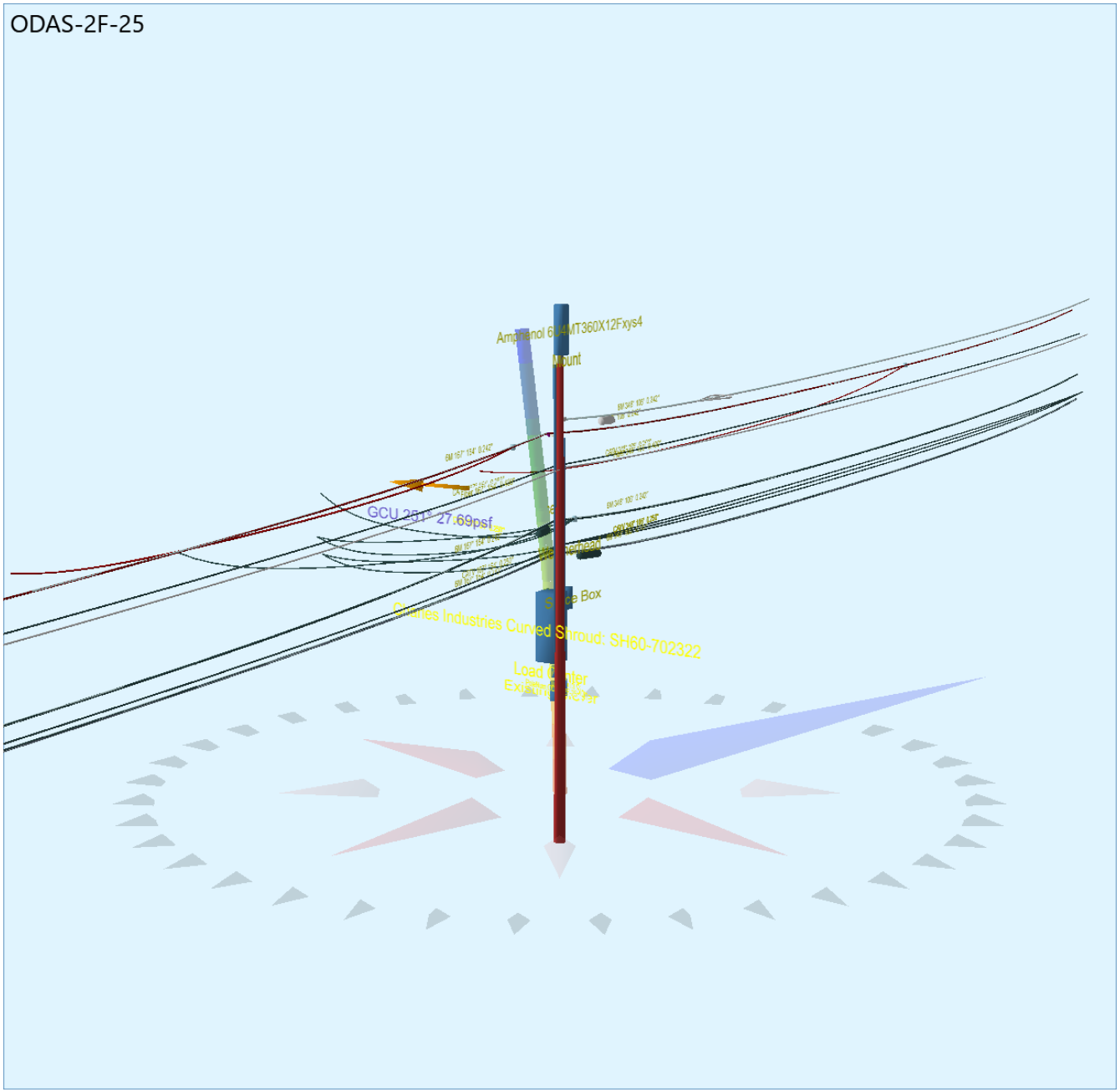
12 - 14.4' (173")
CHARLES SH60-702322 Shroud

13 - 10.5' (126")
Load Center PTS90526

14 - 9.1' (109.3")
Existing Sign

15 - 8.8' (106")
Meter

ODAS-2F-25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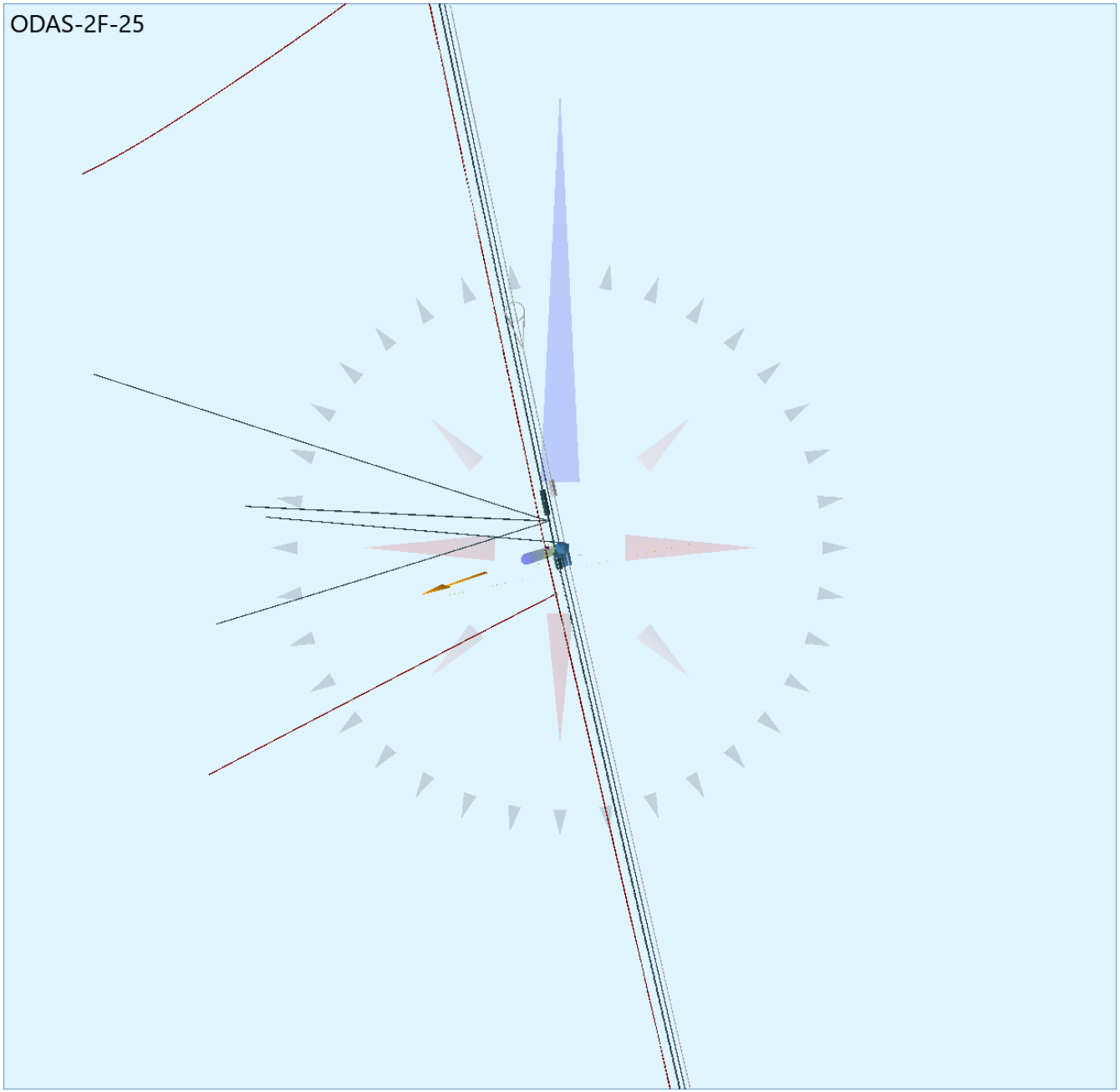
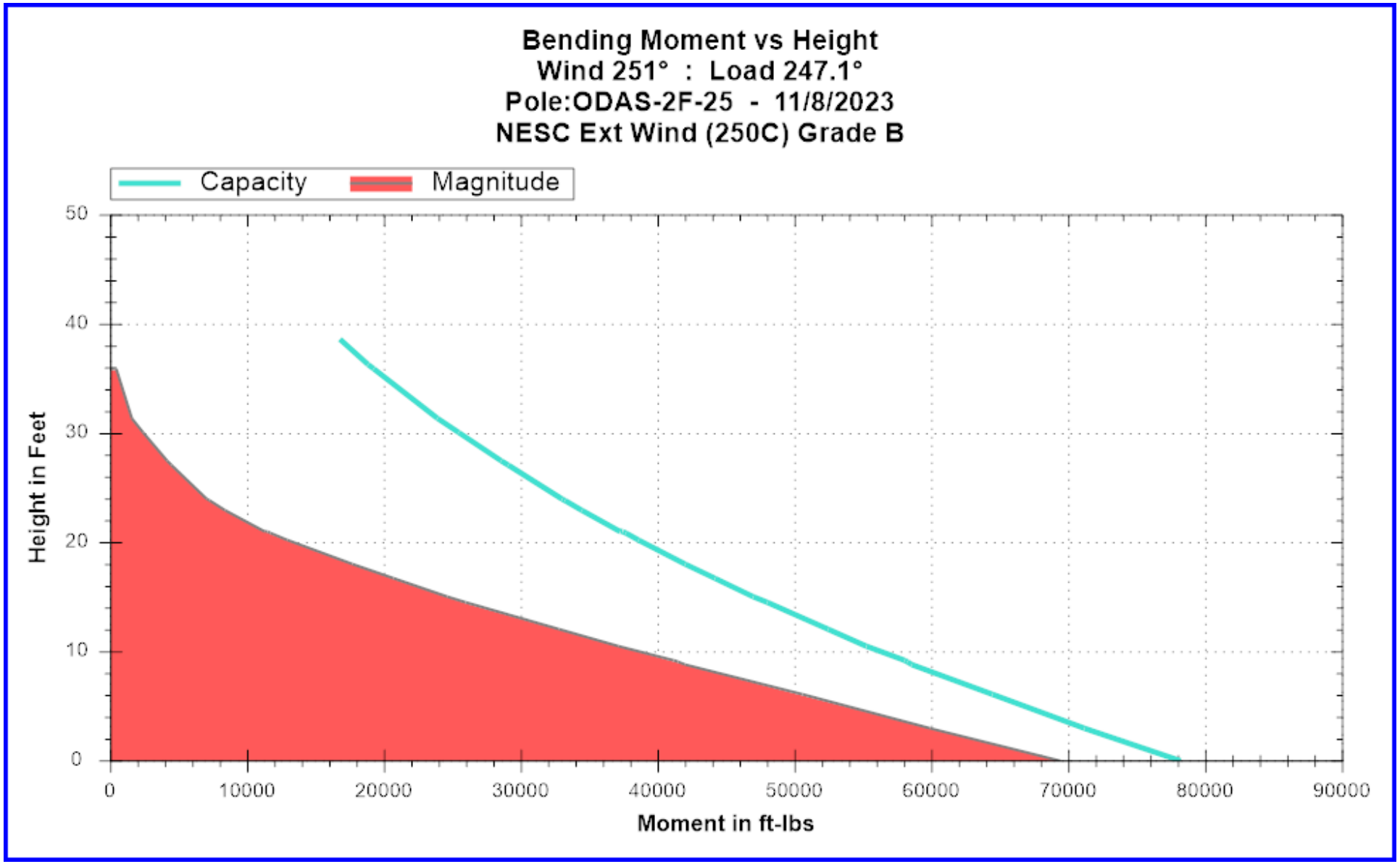
4MT360X12Fxys4
Mount
GCU 2
27.69psf
Service Box
Curries Industries Curved Shroud: SH60-702322


ODAS-2F-25


Bending Moment vs Height
Wind 251° : Load 247.1°
Pole:ODAS-2F-25 - 11/8/2023
NESC Ext Wind (250C) Grade B
Capacity
Magnitude
Height in Feet
0
10
20
30
40
50
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
Moment in ft-lbs

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

ℹ The ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

ATC Hazards by Location

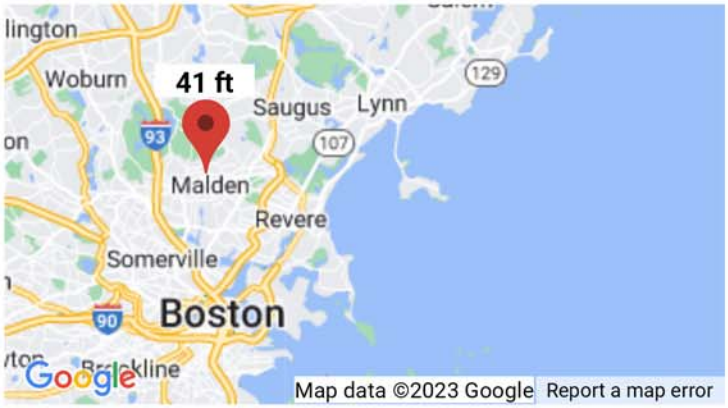
Search Information

Coordinates: 42.42884, -71.071069

Elevation: 41 ft

Timestamp: 2023-11-07T05:08:31.048Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year	74 mph
MRI 25-Year	84 mph
MRI 50-Year	91 mph
MRI 100-Year	98 mph
Risk Category I	109 mph
Risk Category II	119 mph
Risk Category III	127 mph
Risk Category IV	⚠ 132 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	78 mph
MRI 25-Year	88 mph
MRI 50-Year	96 mph
MRI 100-Year	103 mph
Risk Category I	117 mph
Risk Category II	127 mph
Risk Category III-IV	⚠ 138 mph

If the structure under consideration is a healthcare facility and you are also within 1 mile of the coastal mean high water line, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed	104 mph

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

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Disclaimer