NB+C Engineering Services

Existing Wood Pole Antenna Installation

Prepared for Crown Castle Fiber, LLC

SITE INFORMATION

Address	2 Concord Street Malden, MA 02148 Middlesex County Latitude: 42.430236º Longitude: -71.067350º
Crown Castle Node Number	ODAS_2F-27
NB+C Project Number	100723
Date	November 9, 2023

TABLE OF CONTENTS

1.0 INTRODUCTION

The structure is an existing class 3-45 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 2, 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
38.83	**(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**		
10.75	**(1) PTS90526 AC Load Center**		
9.50	(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 2, 2023, the existing pole was assumed to be a class 3-45 ft Southern Pine wood pole with an embedment of 8.92 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 proposed T-Mobile telecommunication equipment and is in compliance with building codes and standards listed here in this report. **The wood pole was calculated to be stressed to a maximum of 71.7% of its theoretical design capacity. NB+C recommends that the pole owner perform a condition assessment and evaluate the need for a pole replacement due to condition, maintenance and serviceability.** 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.

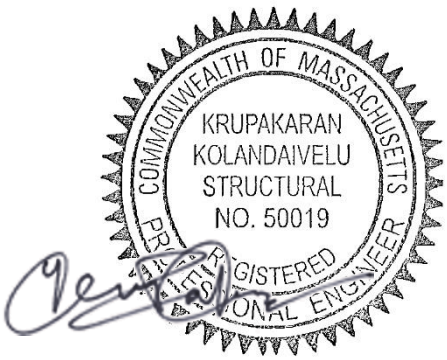
The conclusions reached by **NB+C ES** in this report are only applicable for the previously mentioned existing and proposed structural members supporting the T-Mobile telecommunication antennas. Further, no structural qualification is made or implied by this report for existing structural members not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

NB+C ENGINEERING SERVICES, LLC

Prepared by: Hitesh Pandey, P.E.

Respectfully Submitted by:

Krupakaran Kolandaivelu, P.E.
Vice President of Engineering
MA PE License # 50019

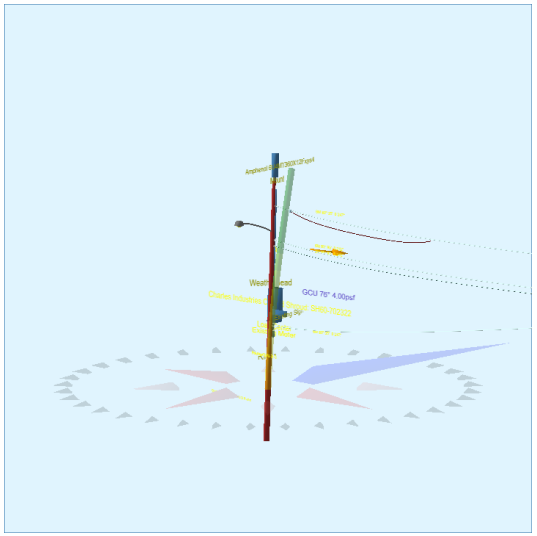


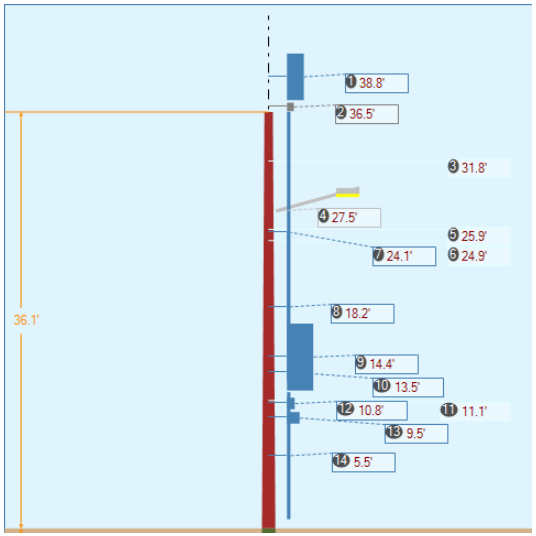
11/9/23

APPENDIX A

CALCULATIONS

Pole Num:	**ODAS-2F-27**	Pole Length / Class:	**45 / 3**	Code:	**NESC**	Structure Type:	**Angle**
Aux Data 1	**Unset**	Species:	**SOUTHERN PINE**	NESC Rule:	**Rule 250B**	Status	**Unguyed**
Aux Data 2	**Unset**	Setting Depth (ft):	**8.92**	Construction Grade:	**C**	Pole Strength Factor:	**0.85**
Aux Data 3	**Unset**	G/L Circumference (in):	**36.41**	Loading District:	**Heavy**	Transverse Wind LF:	**1.75**
Aux Data 4	**Unset**	G/L Fiber Stress (psi):	**8,000**	Ice Thickness (in):	**0.50**	Wire Tension LF:	**1.30**
Aux Data 5	**Unset**	Allowable Stress (psi):	**6,800**	Wind Speed (mph):	**39.53**	Vertical LF:	**1.90**
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	**71.7**	0.0	76.3
Groundline	**71.7**	0.0	76.3
Vertical	**8.4**	18.7	76.3

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**61,662**	86.5	76.3
Groundline	**61,662**	86.5	76.3
GL Allowable	**86,636**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 86.5°

	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	658	25.8	**21,277**	34.5	**24.6**	**1,649**	146	1	**1,650**	**24.3**
Comms	1,330	52.0	**29,850**	48.4	**34.5**	**2,313**	205	2	**2,315**	**34.0**
GenericEquipments	278	10.9	**5,161**	8.4	**6.0**	**400**	1,295	12	**412**	**6.1**
Pole	267	10.4	**4,821**	7.8	**5.6**	**374**	2,039	19	**393**	**5.8**
Streetlights	22	0.9	**501**	0.8	**0.6**	**39**	114	1	**40**	**0.6**
Insulators	1	0.1	**53**	0.1	**0.1**	**4**	38	0	**4**	**0.1**
Pole Load	2,556	100.0	**61,662**	100.0	**71.2**	**4,778**	3,837	36	**4,814**	**70.8**
Pole Reserve Capacity			**24,974**		**28.8**	**2,022**			**1,986**	**29.2**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 86.5°

	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>	2,285	89.4	**56,670**	91.9	**65.4**	**4,391**	1,741	17	**4,407**	**64.8**
Crown Castle	5	0.2	**171**	0.3	**0.2**	**13**	57	1	**14**	**0.2**
Pole	267	10.4	**4,821**	7.8	**5.6**	**374**	2,039	19	**393**	**5.8**
Totals:	2,556	100.0	**61,662**	100.0	**71.2**	**4,778**	3,837	36	**4,814**	**70.8**

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		31.81	6.60	0.3500		0.140	95.0	80.0	95.2			19	-2	57
Secondary	TRIPLEX 1/0		31.35	42.44	0.3500	1.47	0.140	28.0	14.0	28.3	38	436	7	283	740
Secondary	TRIPLEX 1/0		31.35	42.44	0.3500	1.47	0.140	28.0	14.0	28.3	38	436	7	283	740
Secondary	TRIPLEX 1/0		31.81	6.26	0.3500		0.140	95.0	80.0	95.2			18	-2	56
Overlashed Bundle	6M		31.83	6.41	0.2420	2.53	0.104	95.0	80.0	95.2	471	19,367	17	-8	19,411
											Totals:	**20,239**	**69**	**554**	**21,004**

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		25.92	6.76	0.2420	2.54	0.104	95.0	80.0	95.2	343	11,468	21	-7	11,517

CATV	CATV .25	25.90	6.73	0.2500		0.100	95.0	80.0	95.2			21	-1	53
Overlashed Bundle	6M	24.92	6.82	0.2420	2.53	0.104	95.0	80.0	95.2	445	14,320	26	-7	14,378
CATV	CATV .50	24.89	6.83	0.5000		0.200	95.0	80.0	95.2			31	-2	75
Overlashed Bundle	6M	11.08	7.64	0.2420	2.29	0.104	95.0	80.0	95.2	239	3,385	38	-3	3,443
										Totals:	**29,173**	**136**	**-20**	**29,467**

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		38.83	1.80	90.0	0.0	42.00	48.20	--	14.60	--	12	1,307	1,427
Cylinder	Mount	Crown Castle	36.46	0.64	90.0	0.0	30.00	9.00	--	6.00	--	3	94	169
Cylinder	Riser		24.13	5.87	18.0	0.0	100.00	251.00	--	3.00	--	34	869	1,062
Cylinder	Weatherhead		18.25	5.97	311.0	0.0	100.00	156.00	--	2.50	--	-67	341	393
Box	Charles Industries Curved Shroud: SH60-702322		14.42	15.67	351.0	0.0	250.00	69.50	21.45	--	22.73	-60	1,645	1,822
Box	Existing Sign		13.50	23.00	80.0	0.0	10.00	12.00	36.00	--	0.50	36	3	48
Box	Load Center		10.75	7.82	351.0	0.0	40.00	12.00	5.33	--	6.70	-5	53	76
Box	Existing Meter		9.50	7.66	351.0	0.0	10.00	12.00	4.86	--	11.00	-1	42	47
Cylinder	Riser		5.50	6.97	301.0	0.0	100.00	132.00	--	3.00	--	-91	104	49
											Totals:	**-139**	**4,457**	**5,094**

Streetlight		**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)**
General	Streetlight - 6 ft. Arm		27.50	4.17	188.0	188.0	60.00	24.00	20.00	3.00	72.00	-108	495	495
											Totals:	**-108**	**495**	**495**

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		31.83	0.00	80.0	80.0	5.00	3.00	0.00	5	0	16
Bolt	Single Bolt		25.92	0.00	80.0	80.0	5.00	3.00	0.00	5	0	14
Bolt	Single Bolt		24.92	0.00	80.0	80.0	5.00	3.00	0.00	5	0	14
Bolt	Single Bolt		11.08	0.00	80.0	80.0	5.00	3.00	0.00	6	0	10
									Totals:	**22**	**0**	**53**

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	18.70	32.86	10.86	14.00	7.32	11.60	1.60e+6	60.00	57.00	36.08	45,577	**456.82**	**11.90**

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.

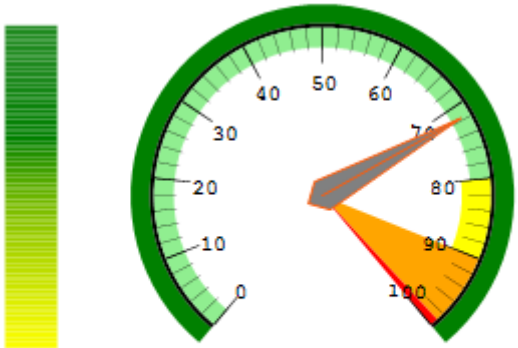
If any of these assumptions is not valid or has been made in error, this analysis may be affected, and NB+C ES sould be allowed to review any new information to determine its effect on the structural integrity of the tower.

O-Calc® Pro Capacity Summary Info

Pole Identification: ODAS-2F-27

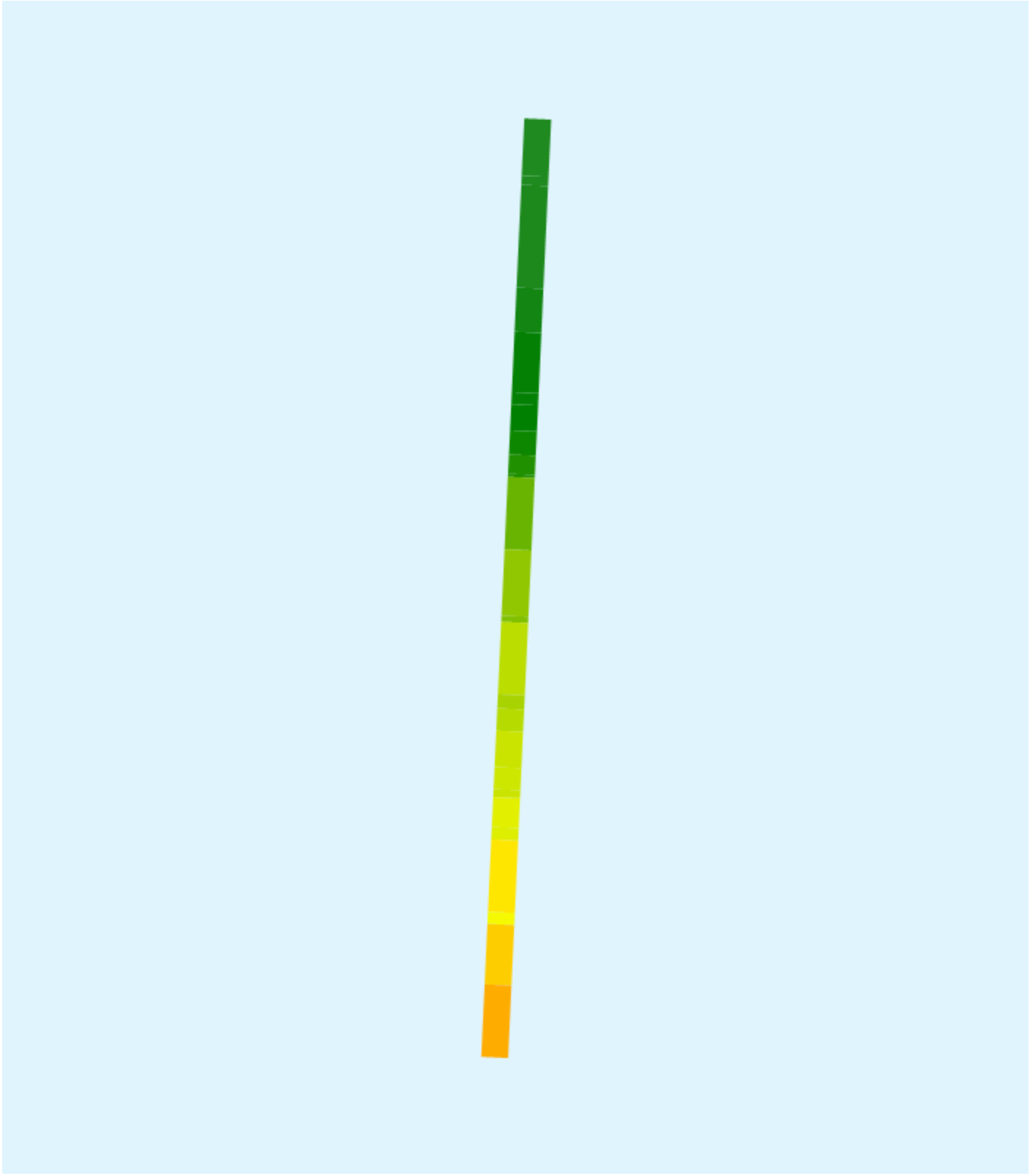
Report Created: 11/9/2023

File: ODAS_2F-27.pplx



O-Calc® Pro Heat Map View

Report Created: 11/9/2023

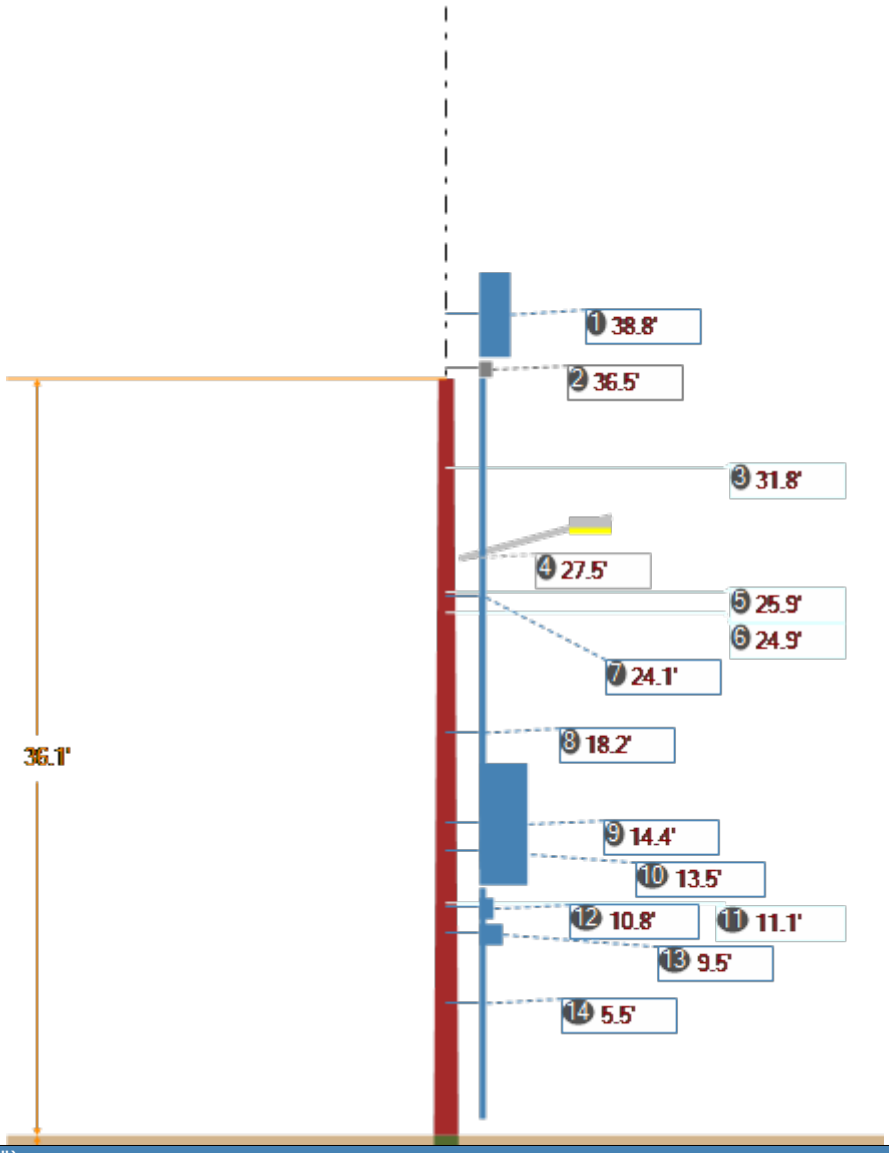


O-Calc® Pro Schematic View

Pole Identification: ODAS-2F-27

Report Created: 11/9/2023

File: ODAS_2F-27.pplx



1 - 38.8' (466") Amphenol 6U4MT360X12Fxys4
2 - 36.5' (437.5") Mount
3 - 31.8' (382") 6M 80° 95' Msgr:0.242"
4 - 27.5' (330") Streetlight - 6 ft. Arm 6.0 ft arm
5 - 25.9' (311") 6M 80° 95' Msgr:0.242"
6 - 24.9' (299") 6M 80° 95' Msgr:0.242"
7 - 24.1' (289.5") Riser

8 - 18.2' (219")
Weatherhead

9 - 14.4' (173")
CHARLES SH60-702322 Shroud

10 - 13.5' (162")
Existing Sign

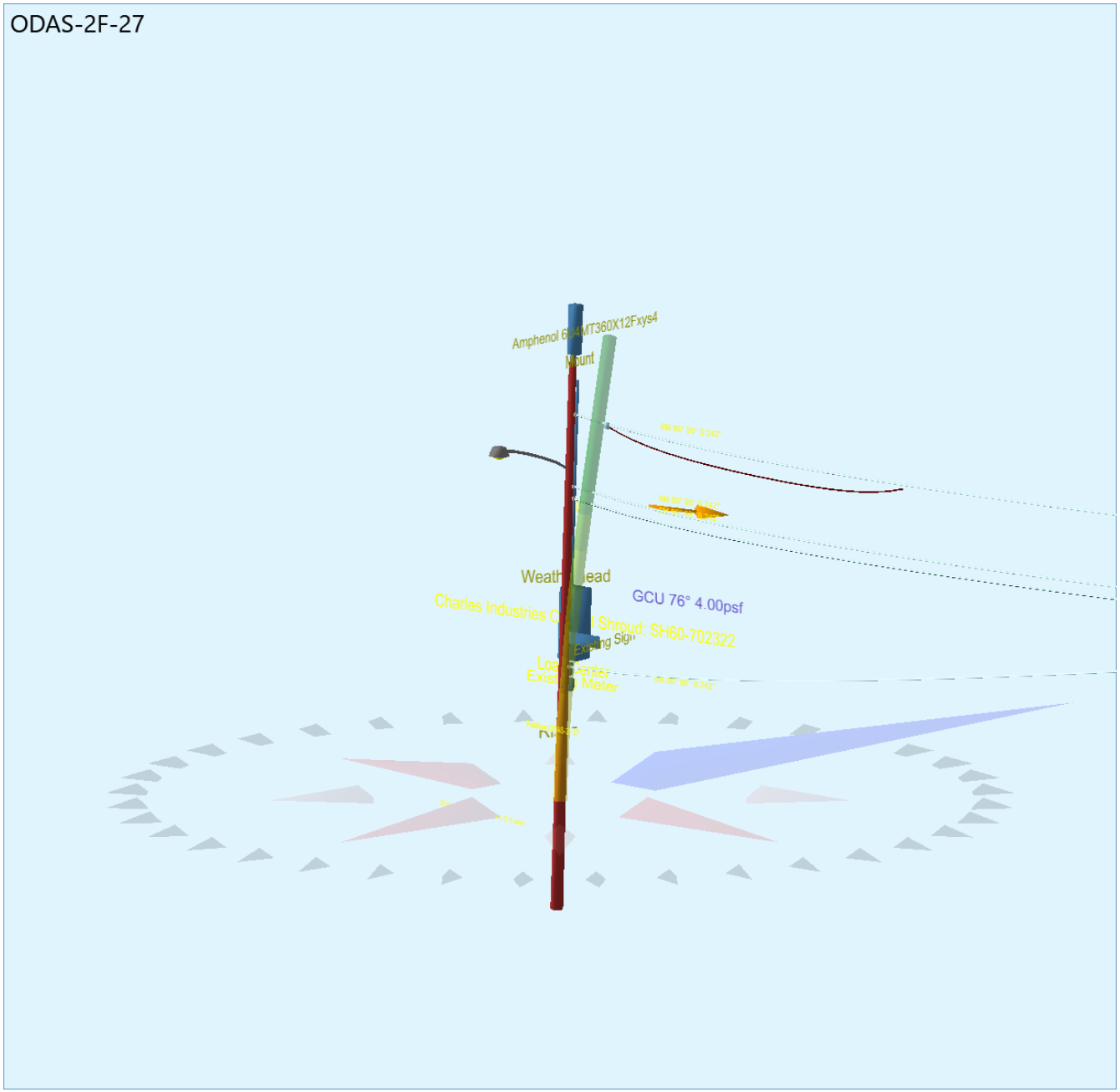
11 - 11.1' (133")
6M 80° 95' Msgr:0.242"

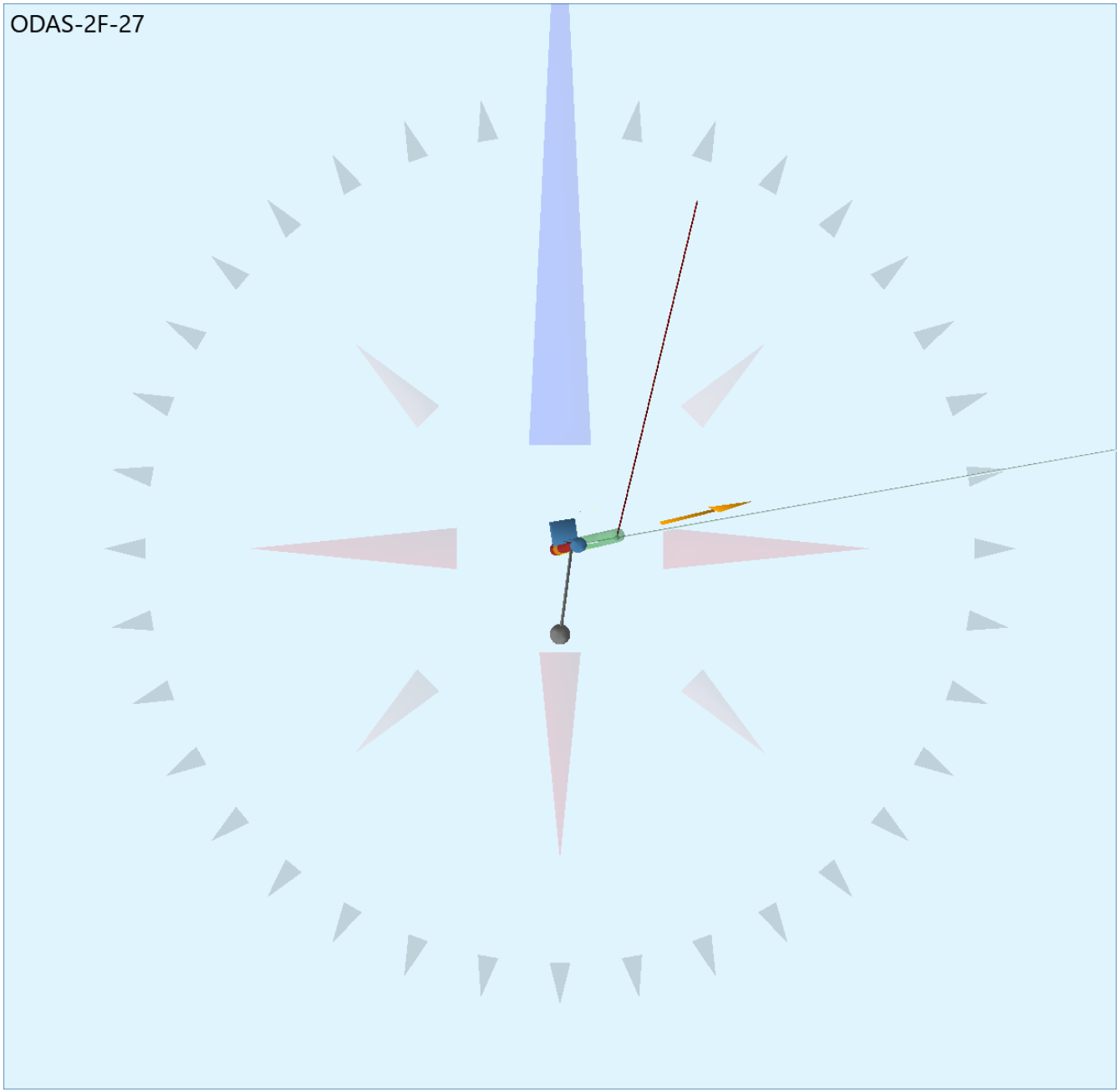
12 - 10.8' (129")
Load Center PTS90526

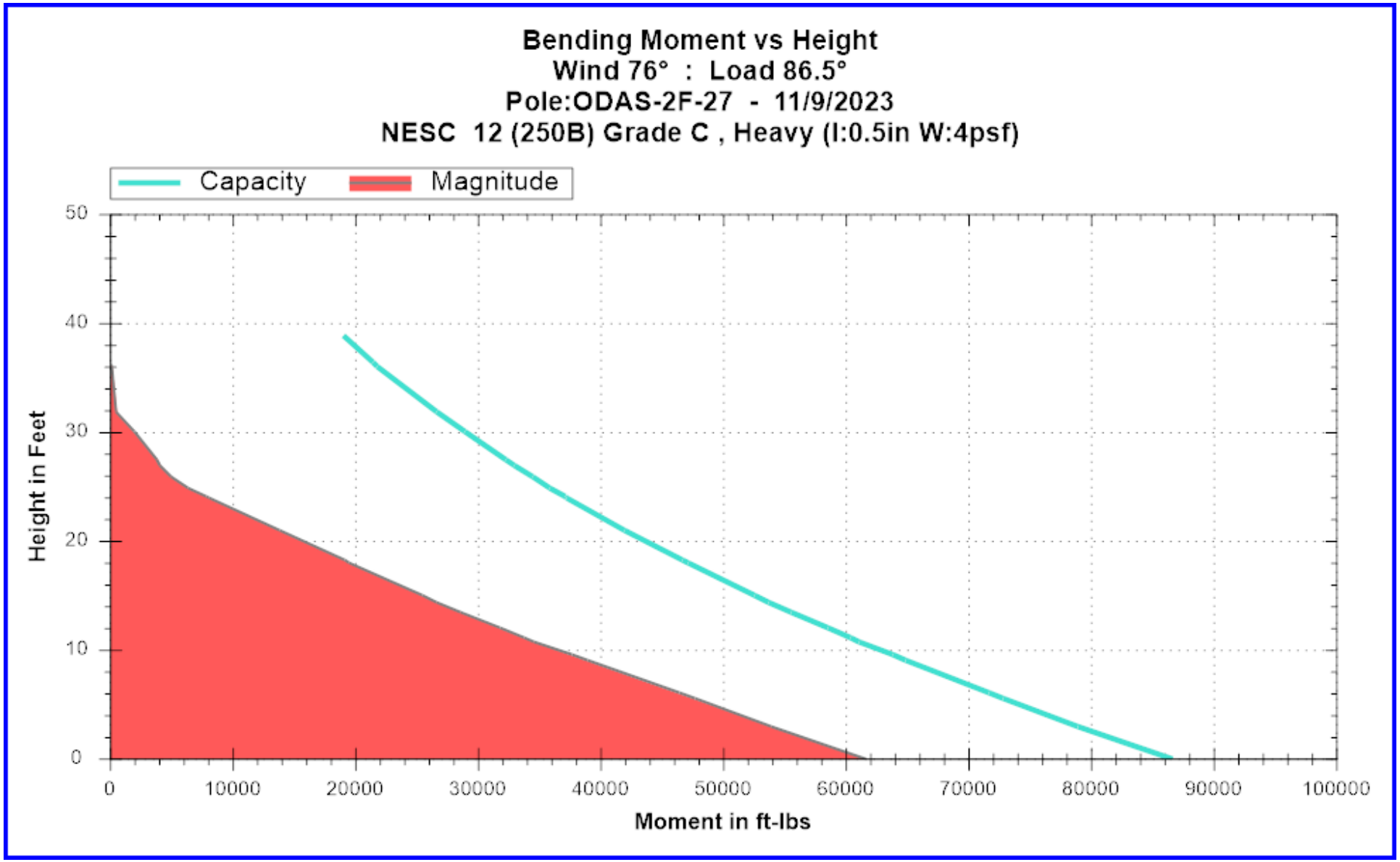
13 - 9.5' (114")
Meter

14 - 5.5' (66")
Riser

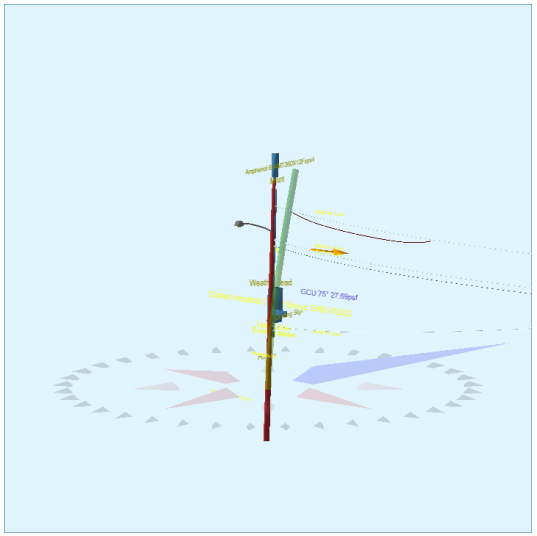
ODAS-2F-27

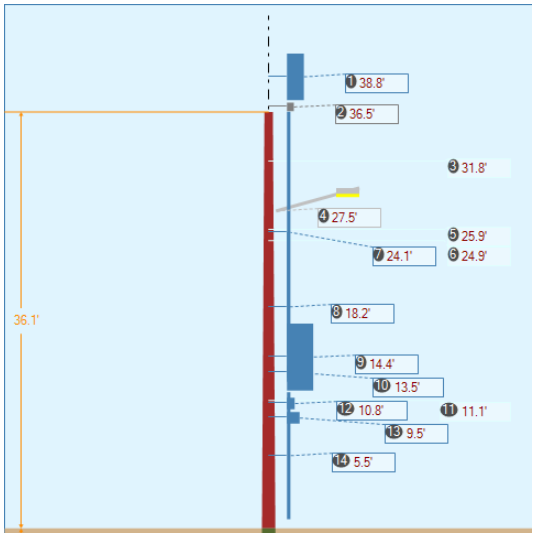

Amphenol 6
MT360X12Fxys4
Mount
Weath
Lead
Charles Industries C
GCU 76° 4.00psf
Shroud: SH60-702322
Existing Sign
Existing Meter


ODAS-2F-27


Bending Moment vs Height
Wind 76° : Load 86.5°
Pole:ODAS-2F-27 - 11/9/2023
NESC 12 (250B) Grade C , 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
90000
100000
Moment in ft-lbs

Pole Num:	**ODAS-2F-27**	Pole Length / Class:	**45 / 3**	Code:	**NESC**	Structure Type:	**Angle**
Aux Data 1	**Unset**	Species:	**SOUTHERN PINE**	NESC Rule:	**Rule 250C**	Status	**Unguyed**
Aux Data 2	**Unset**	Setting Depth (ft):	**8.92**	Construction Grade:	**C**	Pole Strength Factor:	**0.75**
Aux Data 3	**Unset**	G/L Circumference (in):	**36.41**	Loading District:	**Special**	Transverse Wind LF:	**0.75**
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)	**175.64**
Latitude:	**0.000000 Deg**	Longitude:	**0.000000 Deg**			Elevation:	**0 Feet**





Pole Capacity Utilization (%)		Height (ft)	Wind Angle (deg)
Maximum	**51.2**	0.0	75.5
Groundline	**51.2**	0.0	75.5
Vertical	**4.3**	18.0	75.5

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**38,892**	85.7	75.5
Groundline	**38,892**	85.7	75.5
GL Allowable	**76,443**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 85.7°

	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	211	12.1	**7,188**	18.5	**9.4**	**528**	25	0	**529**	**8.8**
Comms	307	17.6	**7,509**	19.3	**9.8**	**552**	25	0	**552**	**9.2**
GenericEquipments	614	35.2	**12,829**	33.0	**16.8**	**943**	682	6	**949**	**15.8**
Pole	557	32.0	**9,868**	25.4	**12.9**	**725**	1,073	10	**736**	**12.3**
Streetlights	52	3.0	**1,468**	3.8	**1.9**	**108**	60	1	**108**	**1.8**
Insulators	1	0.0	**30**	0.1	**0.0**	**2**	20	0	**2**	**0.0**
Pole Load	1,742	100.0	**38,892**	100.0	**50.9**	**2,859**	1,885	18	**2,877**	**47.9**
Pole Reserve Capacity			**37,551**		**49.1**	**3,141**			**3,123**	**52.1**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 85.7°

	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>	1,176	67.5	**28,691**	73.8	**37.5**	**2,109**	782	7	**2,116**	**35.3**
Crown Castle	9	0.5	**333**	0.9	**0.4**	**25**	30	0	**25**	**0.4**
Pole	557	32.0	**9,868**	25.4	**12.9**	**725**	1,073	10	**736**	**12.3**
Totals:	1,742	100.0	**38,892**	100.0	**50.9**	**2,859**	1,885	18	**2,877**	**47.9**

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		31.81	6.60	0.3500		0.140	95.0	80.0	95.2			4	-4	7
Secondary	TRIPLEX 1/0		31.35	42.44	0.3500	1.51	0.140	28.0	14.0	28.3	11	100	1	198	301
Secondary	TRIPLEX 1/0		31.35	42.44	0.3500	1.51	0.140	28.0	14.0	28.3	11	100	1	198	301
Secondary	TRIPLEX 1/0		31.81	6.26	0.3500		0.140	95.0	80.0	95.2			3	-4	7
Overlashed Bundle	6M		31.83	6.41	0.2420	2.53	0.104	95.0	80.0	95.2	193	6,112	3	-4	6,116
											Totals:	**6,313**	**13**	**383**	**6,732**

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		25.92	6.76	0.2420	2.54	0.104	95.0	80.0	95.2	102	2,640	3	-4	2,643

CATV	CATV .25	25.90	6.73	0.2500		0.100	95.0	80.0	95.2			3	-4	3
Overlashed Bundle	6M	24.92	6.82	0.2420	2.53	0.104	95.0	80.0	95.2	153	3,788	3	-5	3,789
CATV	CATV .50	24.89	6.83	0.5000		0.200	95.0	80.0	95.2			5	-5	8
Overlashed Bundle	6M	11.08	7.64	0.2420	2.29	0.104	95.0	80.0	95.2	54	584	4	-2	588
										Totals:	**7,011**	**17**	**-19**	**7,032**

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		38.83	1.80	90.0	0.0	42.00	48.20	--	14.60	--	6	3,808	3,871
Cylinder	Mount	Crown Castle	36.46	0.64	90.0	0.0	30.00	9.00	--	6.00	--	2	272	312
Cylinder	Riser		24.13	5.87	18.0	0.0	100.00	251.00	--	3.00	--	19	2,304	2,407
Cylinder	Weatherhead		18.25	5.97	311.0	0.0	100.00	156.00	--	2.50	--	-35	851	880
Box	Charles Industries Curved Shroud: SH60-702322		14.42	15.67	351.0	0.0	250.00	69.50	21.45	--	22.73	-26	3,951	4,050
Box	Existing Sign		13.50	23.00	80.0	0.0	10.00	12.00	36.00	--	0.50	19	7	30
Box	Load Center		10.75	7.82	351.0	0.0	40.00	12.00	5.33	--	6.70	-2	126	139
Box	Existing Meter		9.50	7.66	351.0	0.0	10.00	12.00	4.86	--	11.00	-1	101	104
Cylinder	Riser		5.50	6.97	301.0	0.0	100.00	132.00	--	3.00	--	-47	250	222
											Totals:	**-66**	**11,671**	**12,014**

Streetlight		**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)**
General	Streetlight - 6 ft. Arm		27.50	4.17	188.0	188.0	60.00	24.00	20.00	3.00	72.00	-61	1,379	1,375
											Totals:	**-61**	**1,379**	**1,375**

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		31.83	0.00	80.0	80.0	5.00	3.00	0.00	3	0	8
Bolt	Single Bolt		25.92	0.00	80.0	80.0	5.00	3.00	0.00	3	0	7
Bolt	Single Bolt		24.92	0.00	80.0	80.0	5.00	3.00	0.00	3	0	7
Bolt	Single Bolt		11.08	0.00	80.0	80.0	5.00	3.00	0.00	3	0	5
									Totals:	**11**	**0**	**28**

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	17.97	32.75	10.89	9.82	7.32	11.60	1.60e+6	60.00	57.00	36.08	44,055	**438.26**	**23.26**

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.

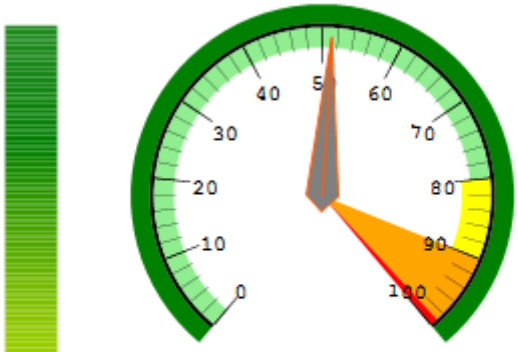
If any of these assumptions is not valid or has been made in error, this analysis may be affected, and NB+C ES sould be allowed to review any new information to determine its effect on the structural integrity of the tower.

O-Calc® Pro Capacity Summary Info

Pole Identification: ODAS-2F-27

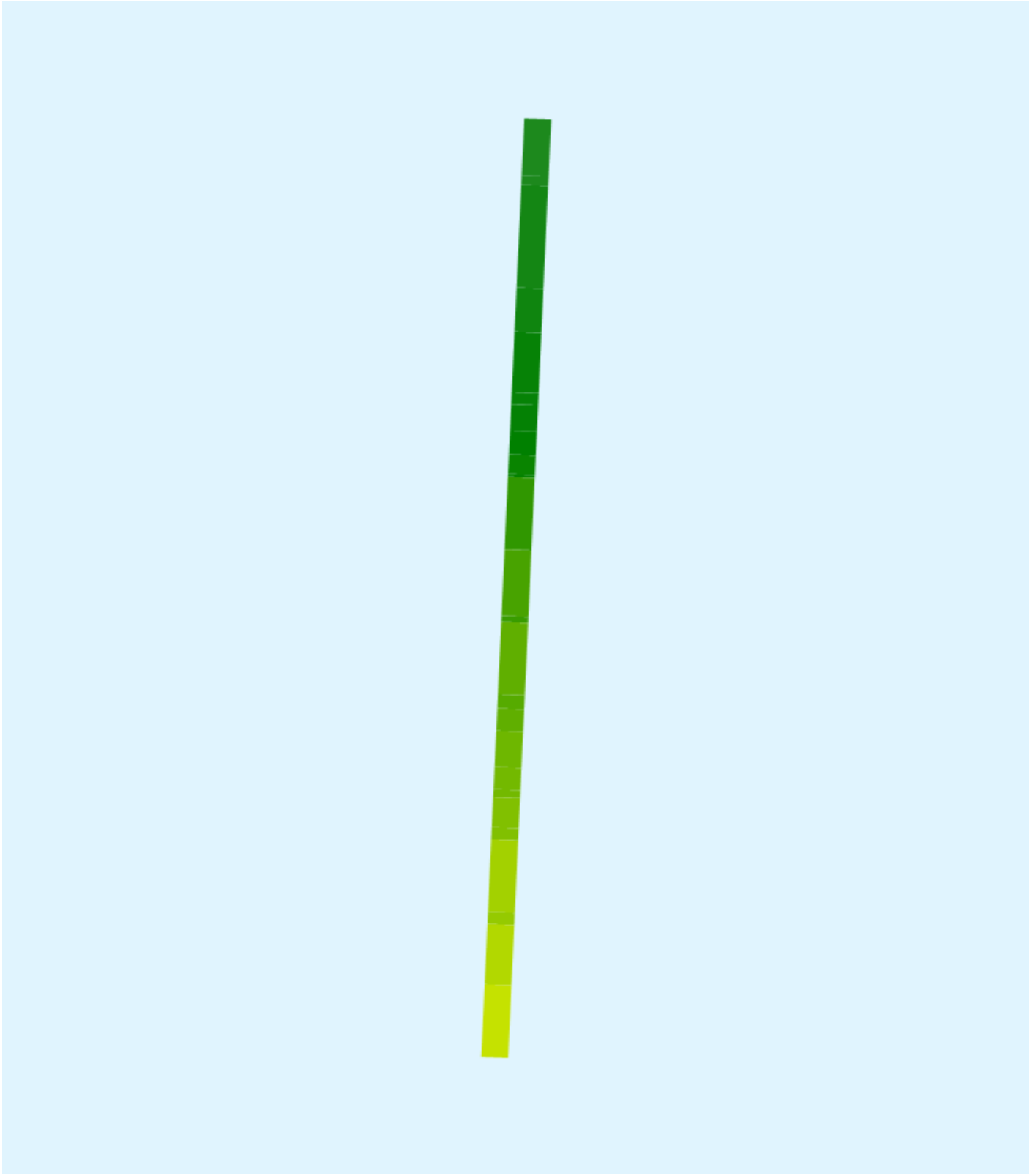
Report Created: 11/9/2023

File: ODAS_2F-27.pplx



O-Calc® Pro Heat Map View

Report Created: 11/9/2023

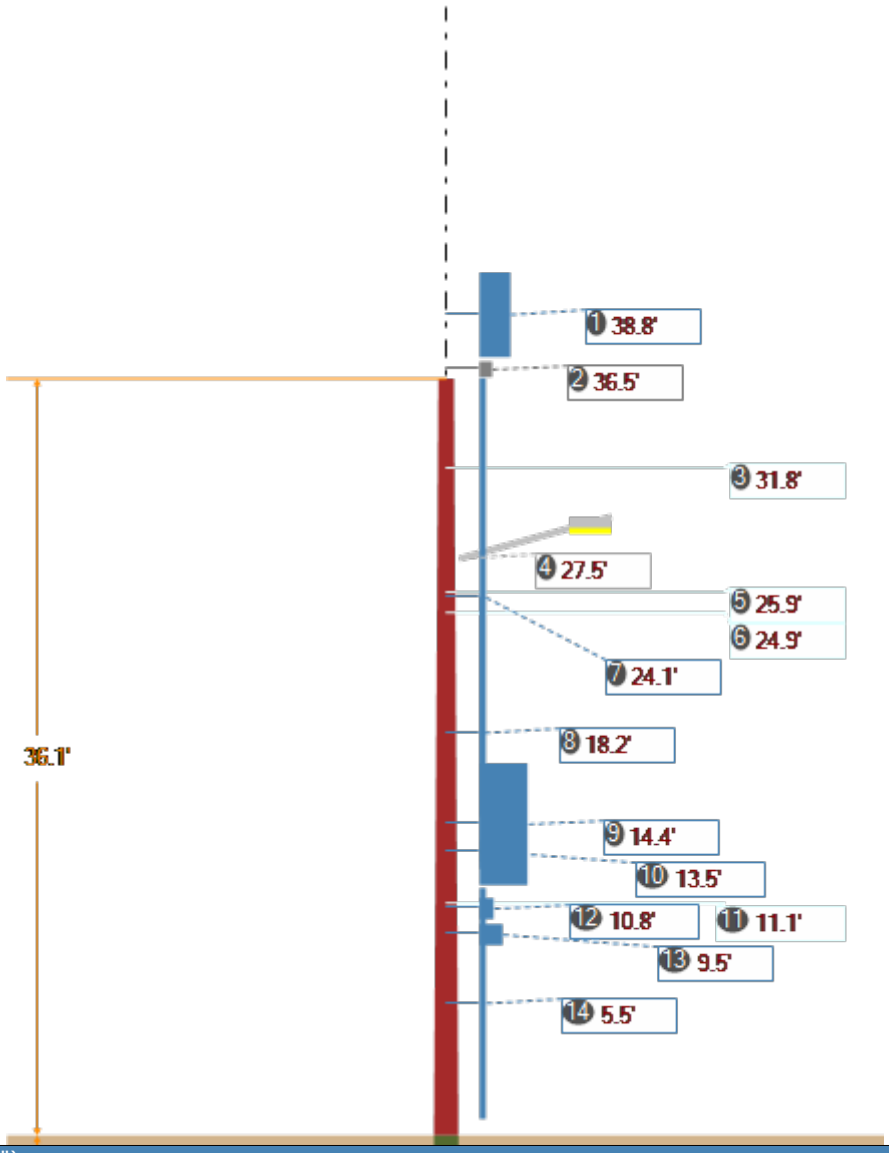


O-Calc® Pro Schematic View

Pole Identification: ODAS-2F-27

Report Created: 11/9/2023

File: ODAS_2F-27.pplx



1 - 38.8' (466") Amphenol 6U4MT360X12Fxys4
2 - 36.5' (437.5") Mount
3 - 31.8' (382") 6M 80° 95' Msgr:0.242"
4 - 27.5' (330") Streetlight - 6 ft. Arm 6.0 ft arm
5 - 25.9' (311") 6M 80° 95' Msgr:0.242"
6 - 24.9' (299") 6M 80° 95' Msgr:0.242"
7 - 24.1' (289.5") Riser

8 - 18.2' (219")
Weatherhead

9 - 14.4' (173")
CHARLES SH60-702322 Shroud

10 - 13.5' (162")
Existing Sign

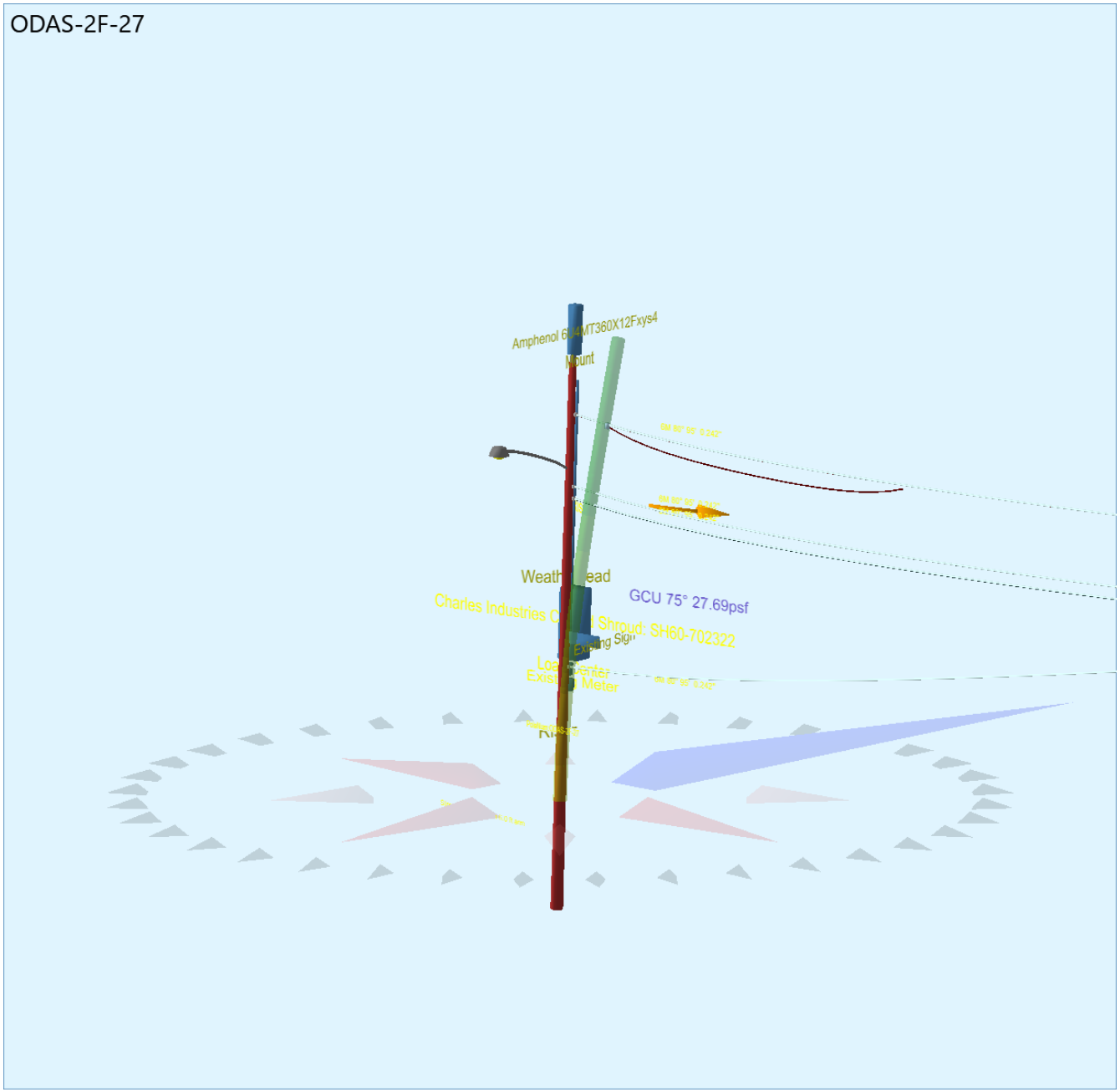
11 - 11.1' (133")
6M 80° 95' Msgr:0.242"

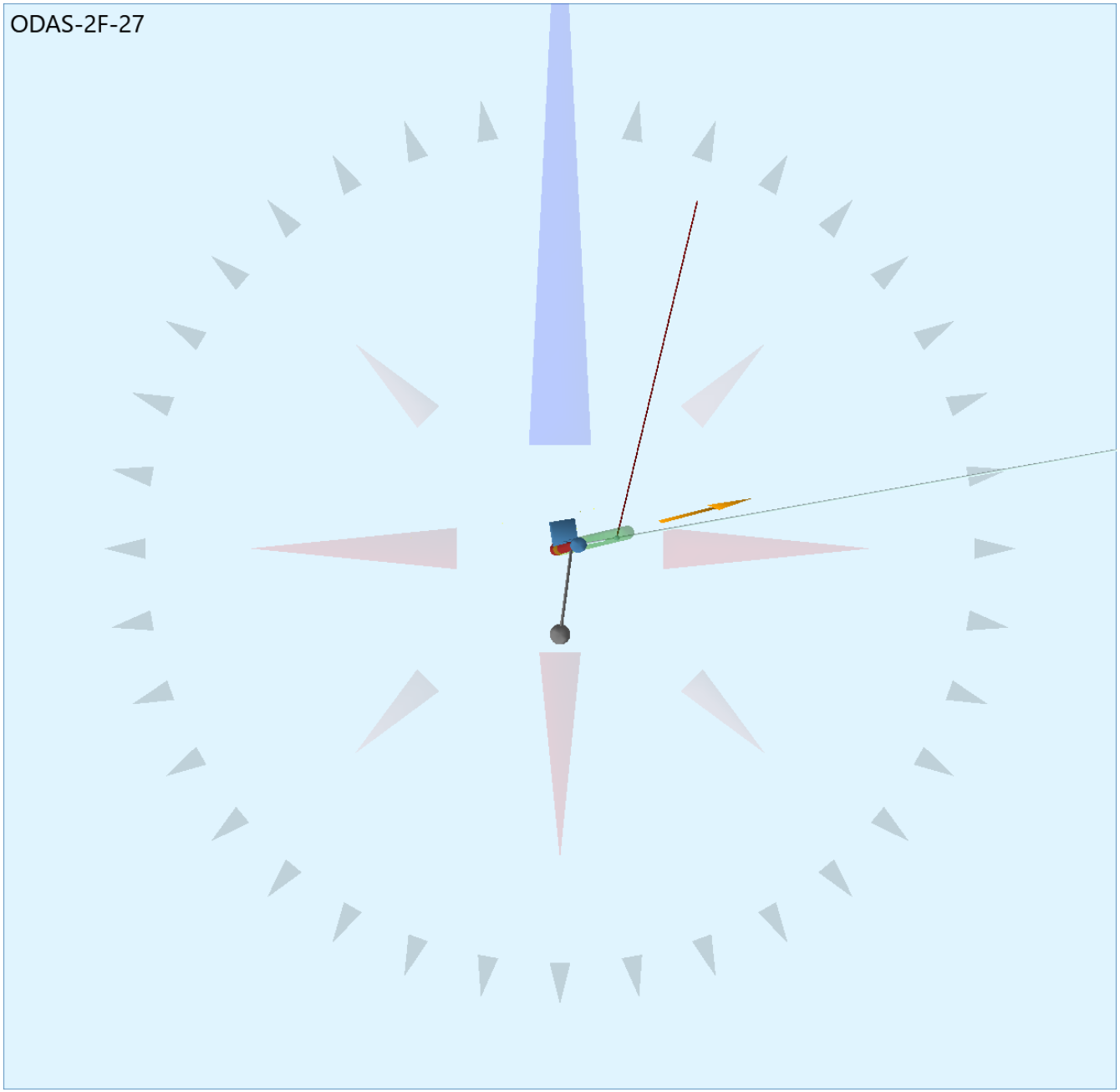
12 - 10.8' (129")
Load Center PTS90526

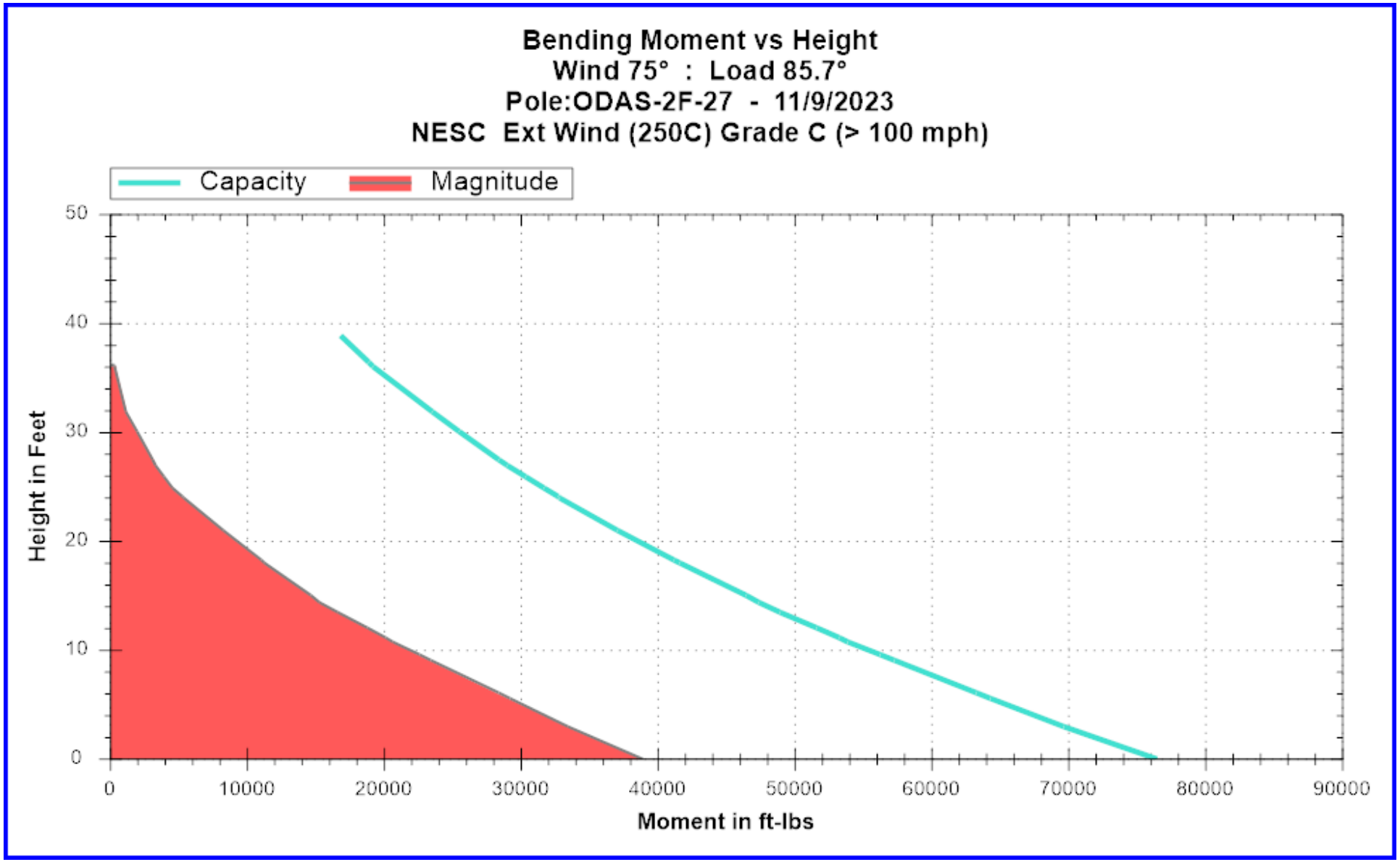
13 - 9.5' (114")
Meter

14 - 5.5' (66")
Riser

ODAS-2F-27


Amphenol 6
MT360X12Fxys4
Mount
GCU 75° 27.69psf
Shroud: SH60-702322


ODAS-2F-27


Bending Moment vs Height
Wind 75° : Load 85.7°
Pole:ODAS-2F-27 - 11/9/2023
NESC Ext Wind (250C) Grade C (> 100 mph)
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.

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

Hazards by Location

Search Information

Coordinates: 42.430236, -71.06735

Elevation: 41 ft

Timestamp: 2023-11-07T08:08:36.454Z

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.

Please note that the ATC Hazards by Location website will not be updated to support ASCE 7-22. Find out why.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.