NB+C Engineering Services

Existing Wood Pole Antenna Installation

Prepared for Crown Castle Fiber, LLC

SITE INFORMATION

Address	290 Eastern Avenue Malden, MA 02148 Middlesex County Latitude: 42.427091º Longitude: -71.060592º
Crown Castle Node Number	ODAS_2F-22
NB+C Project Number	100723
Date	November 9, 2023

100 Apollo Drive | Suite 303 | Chelmsford, MA| 01824| 978.856.8308

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1.0 INTRODUCTION

The structure is an existing class 2-40 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 07, 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 of below.

Table 1 – Final Antenna and Cable Information

Center Line Elevation (ft)	Antenna Model	Carrier	Feed Lines
40.08	**(1) Amphenol 4U4VT360X06Fxys4 antenna**	T-Mobile	(4) 1/2" Coax Cable
14.92	**(1) Charles Industries Curved Shroud SH60-702322 w/ (1) Ericsson Radio 4455 B2/B25, (1) Radio 8863 B41**		
11.0	**(1) PTS90526 AC Load Center**		
9.46	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.

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 pole will be stressed to a maximum 91.6% 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.

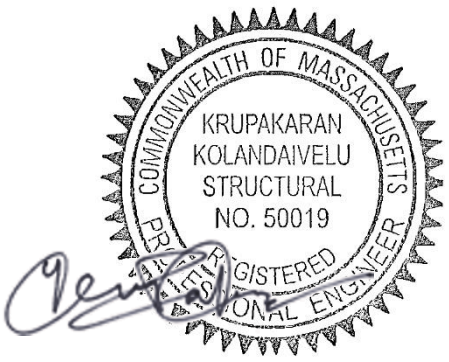
The conclusions reached by **NB+C ES** in this report are only applicable for the previously mentioned existing and proposed structural members supporting the T-Mobile telecommunication antennas. Further, no structural qualification is made or implied by this report for existing structural members not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

NB+C ENGINEERING SERVICES, LLC

Prepared by: Hitesh Pandey, P.E.

Respectfully Submitted by:

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

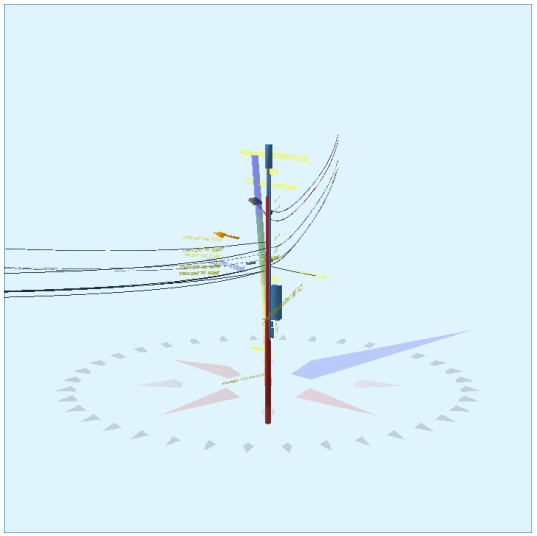


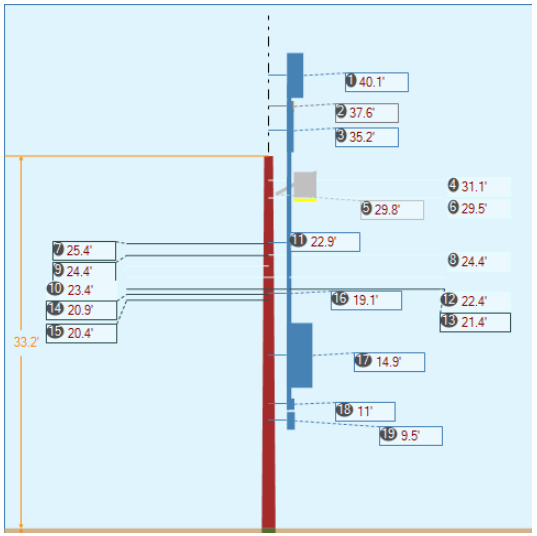
11/9/23

APPENDIX A

CALCULATIONS

Pole Num:	**ODAS-2F-22**	Pole Length / Class:	**40 / 2**	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):	**6.75**	Construction Grade:	**C**	Pole Strength Factor:	**0.85**
Aux Data 3	**Unset**	G/L Circumference (in):	**38.20**	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:	**1.00**
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	91.6	0.0	276.3
Groundline	91.6	0.0	276.3
Vertical	11.0	20.7	276.3

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**91,025**	279.0	276.3
Groundline	**91,025**	279.0	276.3
GL Allowable	**100,033**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 279.0°

	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	275	7.4	**8,234**	9.1	**8.2**	**554**	119	1	**555**	**8.2**
Comms	2,908	78.4	**72,185**	79.3	**72.2**	**4,857**	1,206	10	**4,867**	**71.6**
GenericEquipments	277	7.5	**5,372**	5.9	**5.4**	**362**	1,178	10	**372**	**5.5**
Pole	195	5.3	**3,345**	3.7	**3.3**	**225**	2,122	18	**243**	**3.6**
Streetlights	55	1.5	**1,850**	2.0	**1.9**	**125**	86	1	**125**	**1.8**
Insulators	0	0.0	**39**	0.0	**0.0**	**3**	86	1	**3**	**0.0**
Pole Load	3,710	100.0	**91,025**	100.0	**91.0**	**6,125**	4,796	41	**6,166**	**90.7**
Pole Reserve Capacity			**9,008**		**9.0**	**676**			**634**	**9.3**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 279.0°

	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>	3,511	94.7	**87,547**	96.2	**87.5**	**5,891**	2,617	23	**5,913**	**87.0**
Crown Castle	4	0.1	**133**	0.2	**0.1**	**9**	57	0	**9**	**0.1**
Pole	195	5.3	**3,345**	3.7	**3.3**	**225**	2,122	18	**243**	**3.6**
Totals:	3,710	100.0	**91,025**	100.0	**91.0**	**6,125**	4,796	41	**6,166**	**90.7**

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		29.49	6.76	0.2500		0.097	130.0	323.0	130.7			16	107	123
Secondary	TRIPLEX 1/0		29.48	6.70	0.2500		0.097	130.0	323.0	130.7			16	107	122
Overlashed Bundle	6M		29.50	6.72	0.2420	5.26	0.104	130.0	323.0	130.7	340	7,217	16	671	7,905
											Totals:	**7,217**	**48**	**885**	**8,150**

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		31.08	6.62	0.2420	5.26	0.104	130.0	323.0	130.7	482	10,786	16	707	11,509
CATV	CATV .25		31.07	6.66	0.2500		0.263	130.0	323.0	130.7			24	234	259
CATV	CATV .25		31.06	6.60	0.2500		0.263	130.0	323.0	130.7			23	112	136

CATV	CATV .25	25.42	6.97	0.5700	4.40	0.600	146.0	242.0	146.4	800	16,232	81	577	16,890
Overlashed Bundle	6M	24.42	7.04	0.2420	4.31	0.104	130.0	323.0	130.4	440	7,732	21	582	8,335
CATV	CATV .25	24.40	7.04	0.2500		0.263	130.0	323.0	130.4			30	114	144
CATV	CATV .25	24.37	7.04	0.2500	3.15	0.263	76.0	215.0	76.4	154	1,642	22	533	2,197
Overlashed Bundle	6M	23.42	7.10	0.2420	5.79	0.104	146.0	242.0	146.7	329	6,148	27	425	6,600
Telco	TELE 0.25	23.40	7.11	0.2500		0.100	146.0	242.0	146.7			27	86	113
Overlashed Bundle	6M	22.42	7.16	0.2420	4.79	0.104	130.0	242.0	130.6	318	5,683	24	360	6,068
Telco	TELE 0.25	22.40	7.16	0.2500		0.100	130.0	242.0	130.6			24	109	133
Overlashed Bundle	6M	22.42	7.16	0.2420	4.79	0.104	130.0	323.0	130.6	316	5,100	22	534	5,656
Telco	TELE 0.25	22.40	7.16	0.2500		0.100	130.0	323.0	130.6			22	187	209
CATV	CATV .25	21.37	7.23	0.2500	3.15	0.263	76.0	215.0	76.4	154	1,440	32	467	1,939
CATV	CATV .25	21.37	7.23	0.2500	3.34	0.263	76.0	215.0	76.5	144	1,345	32	467	1,844
CATV	CATV .25	21.37	7.23	0.2500	4.32	0.263	130.0	323.0	130.4	334	5,145	54	511	5,710
Telco	TELE 0.25	21.34	7.23	0.2500	4.44	0.100	130.0	323.0	130.4	241	3,708	42	511	4,261
CATV	CATV .25	20.89	29.70	0.2500	0.18	0.263	12.0	93.0	12.0	243	-4,977	3	1	-4,974
CATV	CATV .25	20.37	7.29	0.2500	3.15	0.263	76.0	215.0	76.4	154	1,372	23	445	1,841
CATV	CATV .25	20.37	7.29	0.2500	2.21	0.263	76.0	215.0	76.2	237	2,111	23	445	2,579
										Totals:	**63,466**	**573**	**7,408**	**71,448**

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		40.08	1.85	0.0	0.0	42.00	48.20	--	14.60	--	2	1,370	1,371
Cylinder	Skirt	Crown Castle	37.58	0.71	0.0	0.0	30.00	12.00	--	6.00	--	1	131	132
Cylinder	Existing Extension		35.17	0.86	0.0	0.0	80.00	46.00	--	6.00	--	2	471	473
Cylinder	Riser		22.88	6.63	100.0	0.0	100.00	340.96	--	4.00	--	-105	1,515	1,410
Cylinder	Riser		19.09	5.87	0.0	0.0	100.00	249.96	--	2.00	--	15	463	478
Box	Charles Industries Curved Shroud: SH60-702322		14.92	15.86	59.0	0.0	250.00	69.50	21.45	--	22.73	-481	1,791	1,310
Box	Load Center		11.00	8.05	48.0	0.0	9.00	12.00	5.33	--	6.70	-7	61	53
Box	Existing Meter		9.46	8.98	48.0	0.0	9.00	18.96	7.00	--	7.00	-8	98	89
											Totals:	**-582**	**5,900**	**5,317**

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)**
Flood Light	Streetlight - 3 ft. Arm		29.83	4.19	275.0	275.0	45.00	24.00	20.00	3.00	36.00	190	1,641	1,831
											Totals:	**190**	**1,641**	**1,831**

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		31.08	0.00	323.0	323.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		29.50	0.00	323.0	323.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		25.42	0.00	242.0	242.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		24.42	0.00	323.0	323.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		23.42	0.00	242.0	242.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		22.42	0.00	242.0	242.0	5.00	3.00	0.00	5	0	5
Bolt	Single Bolt		22.42	0.00	323.0	323.0	5.00	3.00	0.00	4	0	4
Bolt	Single Bolt		21.42	0.00	280.0	280.0	5.00	3.00	0.00	6	0	6
Bolt	Single Bolt		20.42	0.00	235.0	235.0	5.00	3.00	0.00	4	0	4
									Totals:	**39**	**0**	**39**

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	20.66	33.22	11.29	16.14	7.96	12.17	1.60e+6	60.00	57.00	33.25	43,576	**436.00**	**9.09**

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-22

Report Created: 11/9/2023

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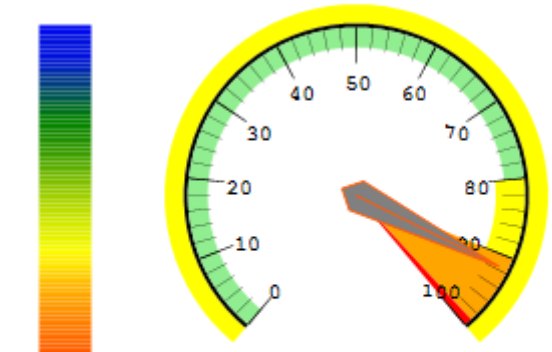


91.6% of Allowed MCU

Unguyed

O-Calc® Pro Heat Map View

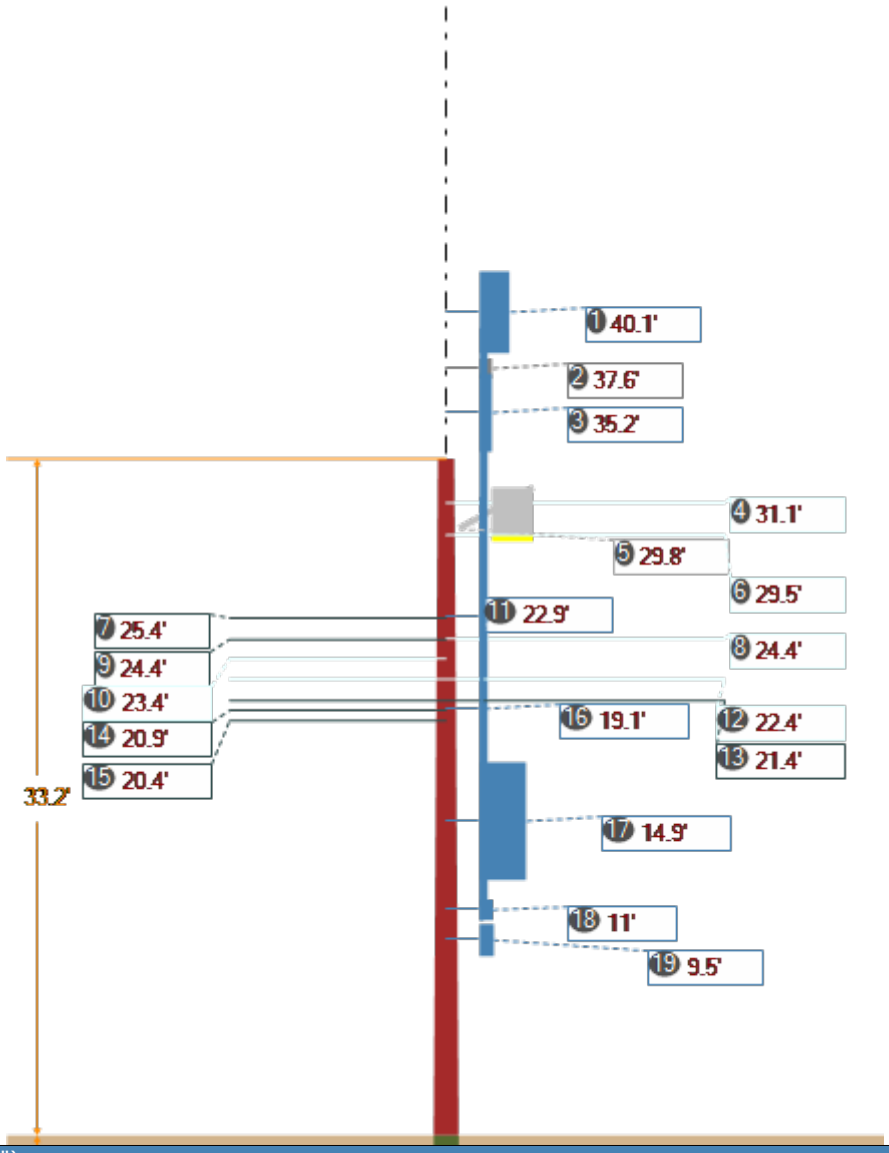
Report Created: 11/9/2023

O-Calc® Pro Schematic View

Pole Identification: ODAS-2F-22

Report Created: 11/9/2023

File: ODAS_2F-22.pplx



1 - 40.1' (481")
Amphenol 6U4MT360X12Fxys4

2 - 37.6' (451")
Skirt

3 - 35.2' (422")
Existing Extension

4 - 31.1' (373")
6M 323° 130' Msgr:0.242"

5 - 29.8' (358")
Streetlight - 3 ft. Arm 3.0 ft arm

6 - 29.5' (354")
6M 323° 130' Msgr:0.242"

7 - 25.4' (305")
CATV 242° 146' 0.570" (CATV .25)

8 - 24.4' (293")
6M 323° 130' Msgr:0.242"

9 - 24.4' (292.5")
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)

10 - 23.4' (281")
6M 242° 146' Msgr:0.242"

11 - 22.9' (274.6")
Riser

12 - 22.4' (269")
6M 242° 130' Msgr:0.242"
6M 323° 130' Msgr:0.242"

13 - 21.4' (256.5")
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)
CATV 323° 130' 0.250" Voff=-0.6 (CATV .25)
Telco 323° 130' 0.250" Voff=-1.0 (TELE 0.25)

14 - 20.9' (250.6")
CATV 93° 12' 0.250" Voff=-0.6 (CATV .25)

15 - 20.4' (244.5")
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)

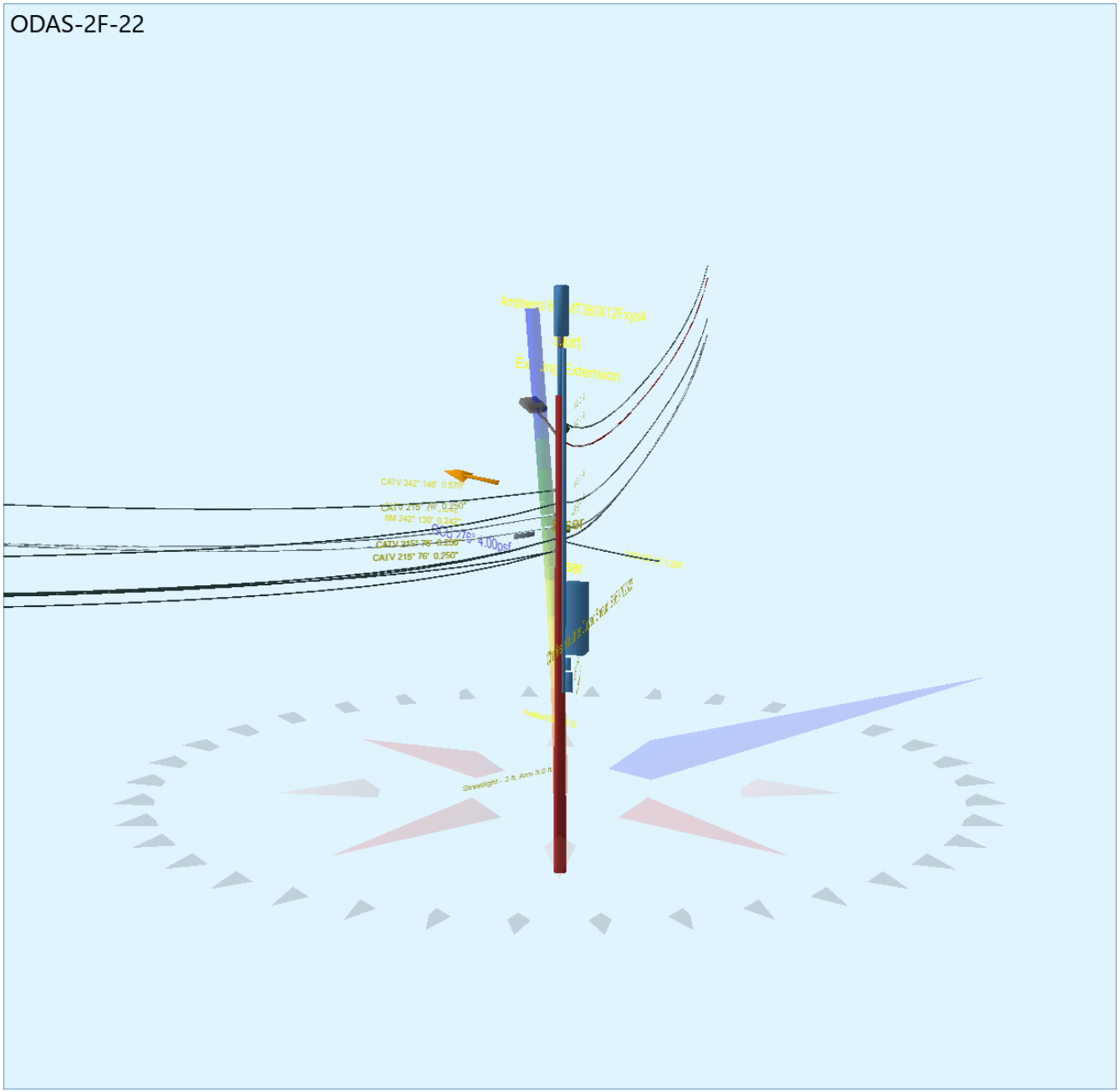
16 - 19.1' (229")
Riser

17 - 14.9' (179")
CHARLES SH60-702322 Shroud

18 - 11' (132")
Load Center

19 - 9.5' (113.5")
Existing Meter

ODAS-2F-22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MT360X12Fxys4
Skirt
Ex Jng Extension
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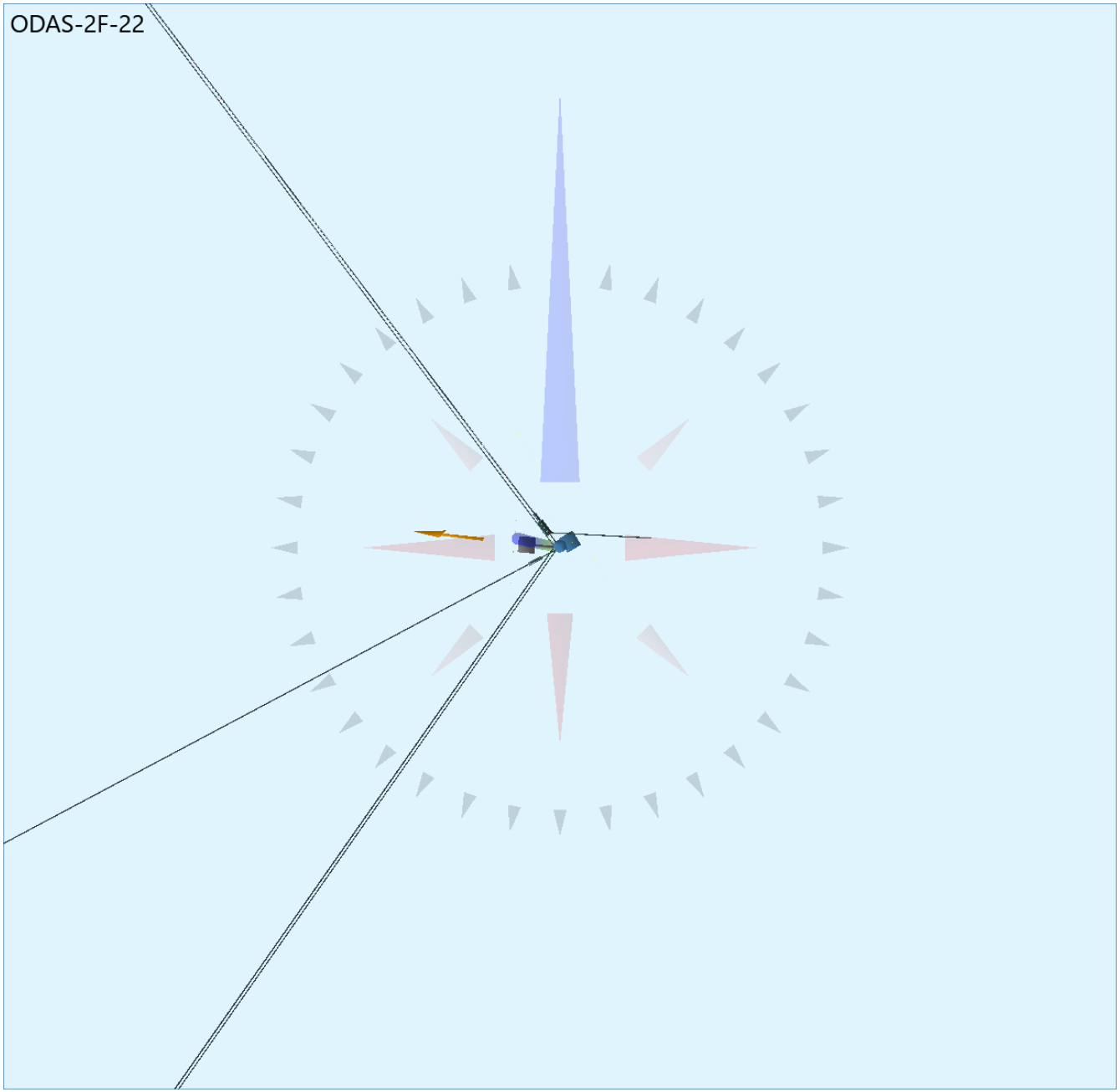
CATV 215° 76' 0.250"
6M 242° 139' 0.242"
CATV 215° 76' 0.250"
CATV 215° 76' 0.250"
Ser
Ser
Streetlight - 3 ft. Arm 8.0 ft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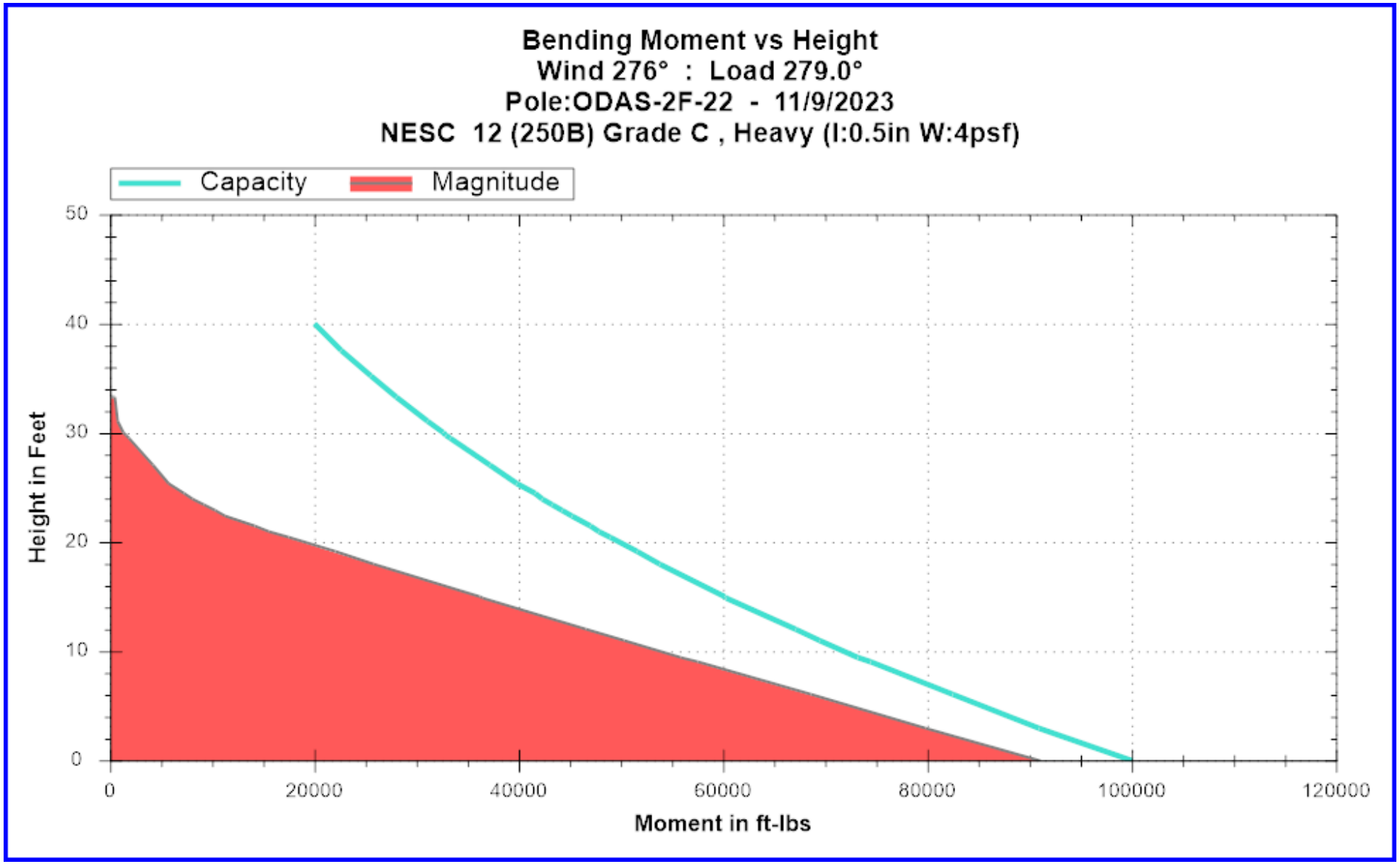
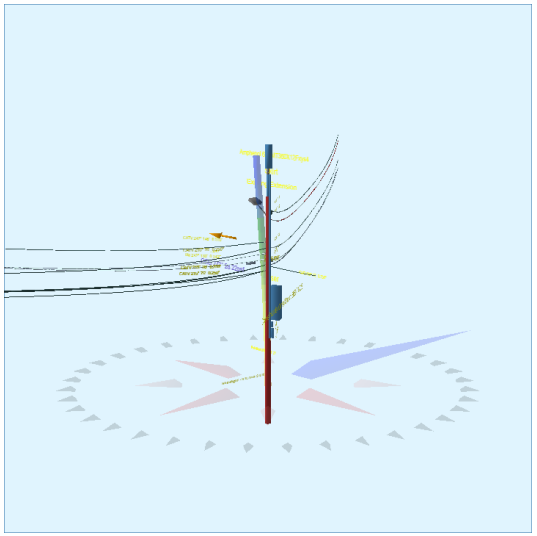
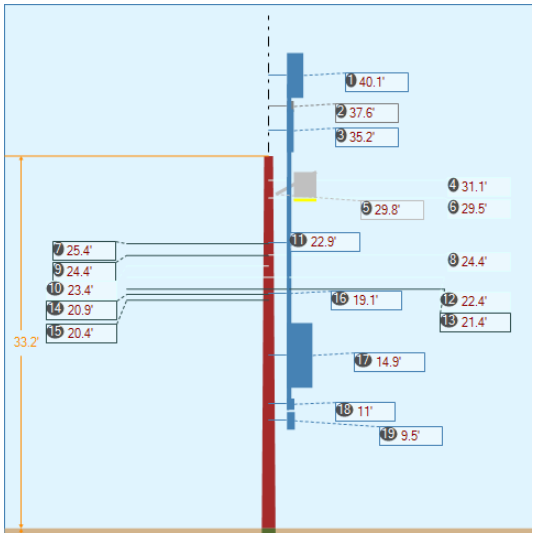

Bending Moment vs Height
Wind 276° : Load 279.0°
Pole:ODAS-2F-22 - 11/9/2023
NESC 12 (250B) Grade C , Heavy (I:0.5in W:4psf)
Capacity
Magnitude
Height in Feet
0
10
20
30
40
50
0
20000
40000
60000
80000
100000
120000
Moment in ft-lbs

Pole Num:	**ODAS-2F-22**	Pole Length / Class:	**40 / 2**	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):	**6.75**	Construction Grade:	**C**	Pole Strength Factor:	**0.75**
Aux Data 3	**Unset**	G/L Circumference (in):	**38.20**	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):	**105.00**	Vertical LF:	**1.00**
Aux Data 6	**Unset**	Fiber Stress Ht. Reduc:	**No**	Wind Pressure (psf):	**28.22**	Max 250C Wind (mph)	**133.83**
Latitude:	**0.000000 Deg**	Longitude:		**0.000000 Deg**		Elevation:	**0 Feet**





Pole Capacity Utilization (%)		Height (ft)	Wind Angle (deg)
Maximum	**79.1**	0.0	272.7
Groundline	**79.1**	0.0	272.7
Vertical	**4.8**	19.7	272.7

Pole Moments (ft-lb)		Load Angle (deg)	Wind Angle (deg)
Max Cap Util	**69,519**	275.2	272.7
Groundline	**69,519**	275.2	272.7
GL Allowable	**88,264**		

Groundline Load Summary - Reporting Angle Mode: Load - Reporting Angle: 275.2°

	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	118	4.1	**3,691**	5.3	**4.2**	**238**	19	0	**238**	**4.0**
Comms	1,370	47.3	**35,754**	51.4	**40.5**	**2,306**	225	2	**2,308**	**38.5**
GenericEquipments	729	25.2	**16,477**	23.7	**18.7**	**1,063**	620	5	**1,068**	**17.8**
Pole	522	18.0	**8,504**	12.2	**9.6**	**548**	1,117	10	**558**	**9.3**
Streetlights	158	5.5	**5,073**	7.3	**5.8**	**327**	45	0	**328**	**5.5**
Insulators	0	0.0	**22**	0.0	**0.0**	**1**	45	0	**2**	**0.0**
Pole Load	2,896	100.0	**69,519**	100.0	**78.8**	**4,483**	2,072	18	**4,501**	**75.0**
Pole Reserve Capacity			**18,745**		**21.2**	**1,517**			**1,499**	**25.0**

Load Summary by Owner - Reporting Angle Mode: Load - Reporting Angle: 275.2°

	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>	2,365	81.6	**60,605**	87.2	**68.7**	**3,908**	925	8	**3,916**	**65.3**
Crown Castle	10	0.4	**410**	0.6	**0.5**	**26**	30	0	**27**	**0.4**
Pole	522	18.0	**8,504**	12.2	**9.6**	**548**	1,117	10	**558**	**9.3**
Totals:	2,896	100.0	**69,519**	100.0	**78.8**	**4,483**	2,072	18	**4,501**	**75.0**

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		29.49	6.76	0.2500		0.097	130.0	323.0	130.7			2	311	313
Secondary	TRIPLEX 1/0		29.48	6.70	0.2500		0.097	130.0	323.0	130.7			2	311	313
Overlashed Bundle	6M		29.50	6.72	0.2420	5.26	0.104	130.0	323.0	130.7	129	2,562	3	311	2,875
											Totals:	**2,562**	**7**	**932**	**3,501**

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		31.08	6.62	0.2420	5.25	0.104	130.0	323.0	130.7	268	5,602	3	330	5,935
CATV	CATV .25		31.07	6.66	0.2500		0.263	130.0	323.0	130.7			7	688	695
CATV	CATV .25		31.06	6.60	0.2500		0.263	130.0	323.0	130.7			6	330	336

CATV	CATV .25	25.42	6.97	0.5700	4.40	0.600	146.0	242.0	146.4	401	8,525	21	431	8,978
Overlashed Bundle	6M	24.42	7.04	0.2420	4.31	0.104	130.0	323.0	130.4	196	3,223	3	324	3,549
CATV	CATV .25	24.40	7.04	0.2500		0.263	130.0	323.0	130.4			7	323	330
CATV	CATV .25	24.37	7.04	0.2500	3.15	0.263	76.0	215.0	76.4	64	776	4	257	1,037
Overlashed Bundle	6M	23.42	7.10	0.2420	5.78	0.104	146.0	242.0	146.7	100	1,960	4	174	2,138
Telco	TELE 0.25	23.40	7.11	0.2500		0.100	146.0	242.0	146.7			4	174	178
Overlashed Bundle	6M	22.42	7.16	0.2420	4.78	0.104	130.0	242.0	130.6	97	1,818	3	146	1,967
Telco	TELE 0.25	22.40	7.16	0.2500		0.100	130.0	242.0	130.6			3	221	224
Overlashed Bundle	6M	22.42	7.16	0.2420	4.78	0.104	130.0	323.0	130.6	100	1,500	3	294	1,796
Telco	TELE 0.25	22.40	7.16	0.2500		0.100	130.0	323.0	130.6			3	524	527
CATV	CATV .25	21.37	7.23	0.2500	3.15	0.263	76.0	215.0	76.4	64	681	6	221	907
CATV	CATV .25	21.37	7.23	0.2500	3.32	0.263	76.0	215.0	76.5	60	639	6	221	866
CATV	CATV .25	21.37	7.23	0.2500	4.32	0.263	130.0	323.0	130.4	140	2,013	10	284	2,308
Telco	TELE 0.25	21.34	7.23	0.2500	4.44	0.100	130.0	323.0	130.4	55	789	4	284	1,077
CATV	CATV .25	20.89	29.70	0.2500	0.18	0.263	12.0	93.0	12.0	48	-979	0	0	-979
CATV	CATV .25	20.37	7.29	0.2500	3.15	0.263	76.0	215.0	76.4	64	649	5	209	862
CATV	CATV .25	20.37	7.29	0.2500	2.21	0.263	76.0	215.0	76.2	96	973	5	209	1,187
										Totals:	**28,168**	**105**	**5,644**	**33,917**

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		40.08	1.85	0.0	0.0	42.00	48.20	--	14.60	--	1	4,083	4,084
Cylinder	Skirt	Crown Castle	37.58	0.71	0.0	0.0	30.00	12.00	--	6.00	--	0	389	389
Cylinder	Existing Extension		35.17	0.86	0.0	0.0	80.00	46.00	--	6.00	--	1	1,382	1,382
Cylinder	Riser		22.88	6.63	100.0	0.0	100.00	340.96	--	4.00	--	-55	4,078	4,023
Cylinder	Riser		19.09	5.87	0.0	0.0	100.00	249.96	--	2.00	--	4	1,200	1,205
Box	Charles Industries Curved Shroud: SH60-702322		14.92	15.86	59.0	0.0	250.00	69.50	21.45	--	22.73	-267	4,432	4,165
Box	Load Center		11.00	8.05	48.0	0.0	9.00	12.00	5.33	--	6.70	-4	152	147
Box	Existing Meter		9.46	8.98	48.0	0.0	9.00	18.96	7.00	--	7.00	-5	241	236
											Totals:	**-325**	**15,955**	**15,630**

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)**
Flood Light	Streetlight - 3 ft. Arm		29.83	4.19	275.0	275.0	45.00	24.00	20.00	3.00	36.00	100	4,712	4,812
											Totals:	**100**	**4,712**	**4,812**

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		31.08	0.00	323.0	323.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		29.50	0.00	323.0	323.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		25.42	0.00	242.0	242.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		24.42	0.00	323.0	323.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		23.42	0.00	242.0	242.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		22.42	0.00	242.0	242.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		22.42	0.00	323.0	323.0	5.00	3.00	0.00	2	0	2
Bolt	Single Bolt		21.42	0.00	280.0	280.0	5.00	3.00	0.00	3	0	3
Bolt	Single Bolt		20.42	0.00	235.0	235.0	5.00	3.00	0.00	2	0	2
									Totals:	**20**	**0**	**20**

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	19.75	33.08	11.33	10.66	7.96	12.17	1.60e+6	60.00	57.00	33.25	42,728	**431.58**	**20.83**

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.

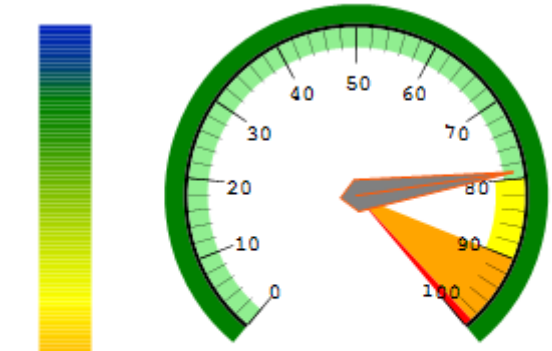
If any of these assumptions is not valid or has been made in error, this analysis may be affected, and NB+C ES sould be allowed to review any new information to determine its effect on the structural integrity of the tower.

O-Calc® Pro Capacity Summary Info

Pole Identification: ODAS-2F-22

Report Created: 11/9/2023

File: ODAS_2F-22.pplx



79.1% of Allowed MCU

Unguyed

O-Calc® Pro Heat Map View

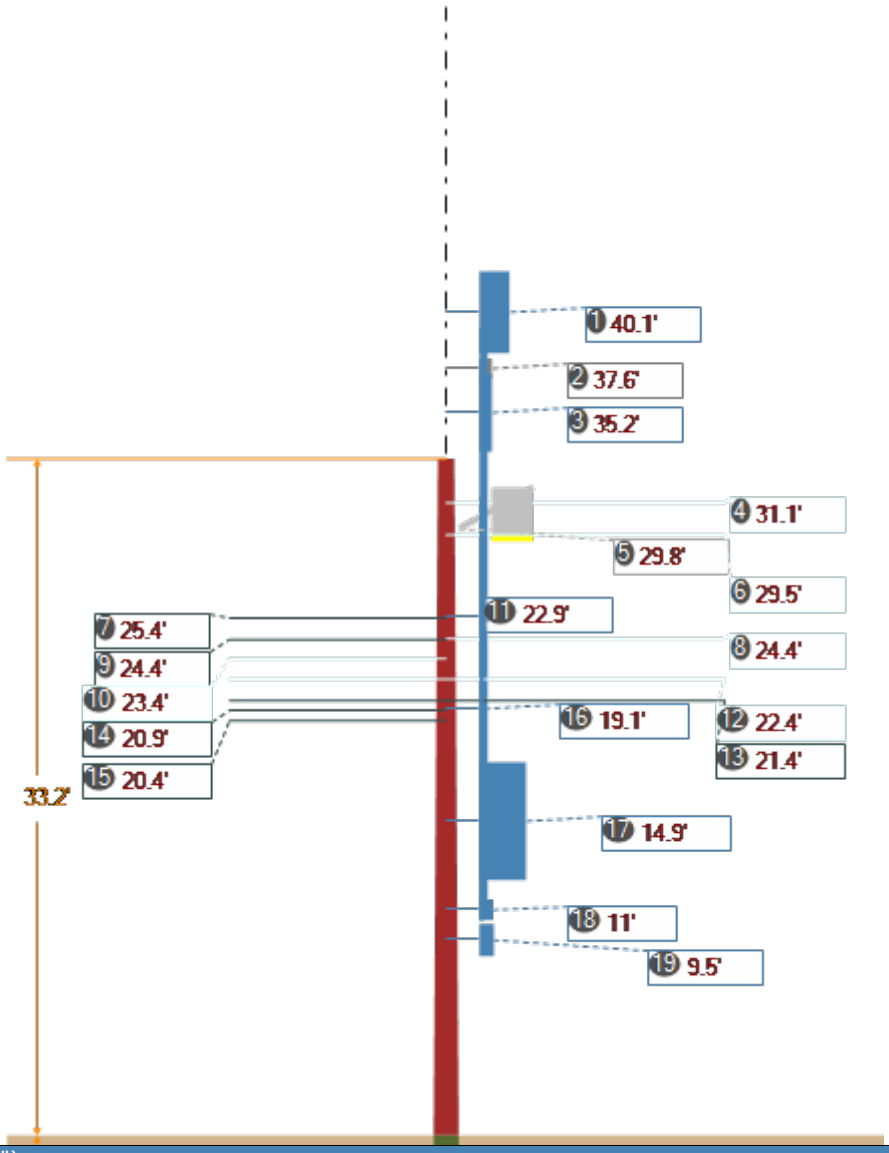
Report Created: 11/9/2023

O-Calc® Pro Schematic View

Pole Identification: ODAS-2F-22

Report Created: 11/9/2023

File: ODAS_2F-22.pplx



1 - 40.1' (481")
Amphenol 6U4MT360X12Fxys4

2 - 37.6' (451")
Skirt

3 - 35.2' (422")
Existing Extension

4 - 31.1' (373")
6M 323° 130' Msgr:0.242"

5 - 29.8' (358")
Streetlight - 3 ft. Arm 3.0 ft arm

6 - 29.5' (354")
6M 323° 130' Msgr:0.242"

7 - 25.4' (305")
CATV 242° 146' 0.570" (CATV .25)

8 - 24.4' (293")
6M 323° 130' Msgr:0.242"

9 - 24.4' (292.5")
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)

10 - 23.4' (281")
6M 242° 146' Msgr:0.242"

11 - 22.9' (274.6")
Riser

12 - 22.4' (269")
6M 242° 130' Msgr:0.242"
6M 323° 130' Msgr:0.242"

13 - 21.4' (256.5")
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)
CATV 323° 130' 0.250" Voff=-0.6 (CATV .25)
Telco 323° 130' 0.250" Voff=-1.0 (TELE 0.25)

14 - 20.9' (250.6")
CATV 93° 12' 0.250" Voff=-0.6 (CATV .25)

15 - 20.4' (244.5")
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)
CATV 215° 76' 0.250" Voff=-0.6 (CATV .25)

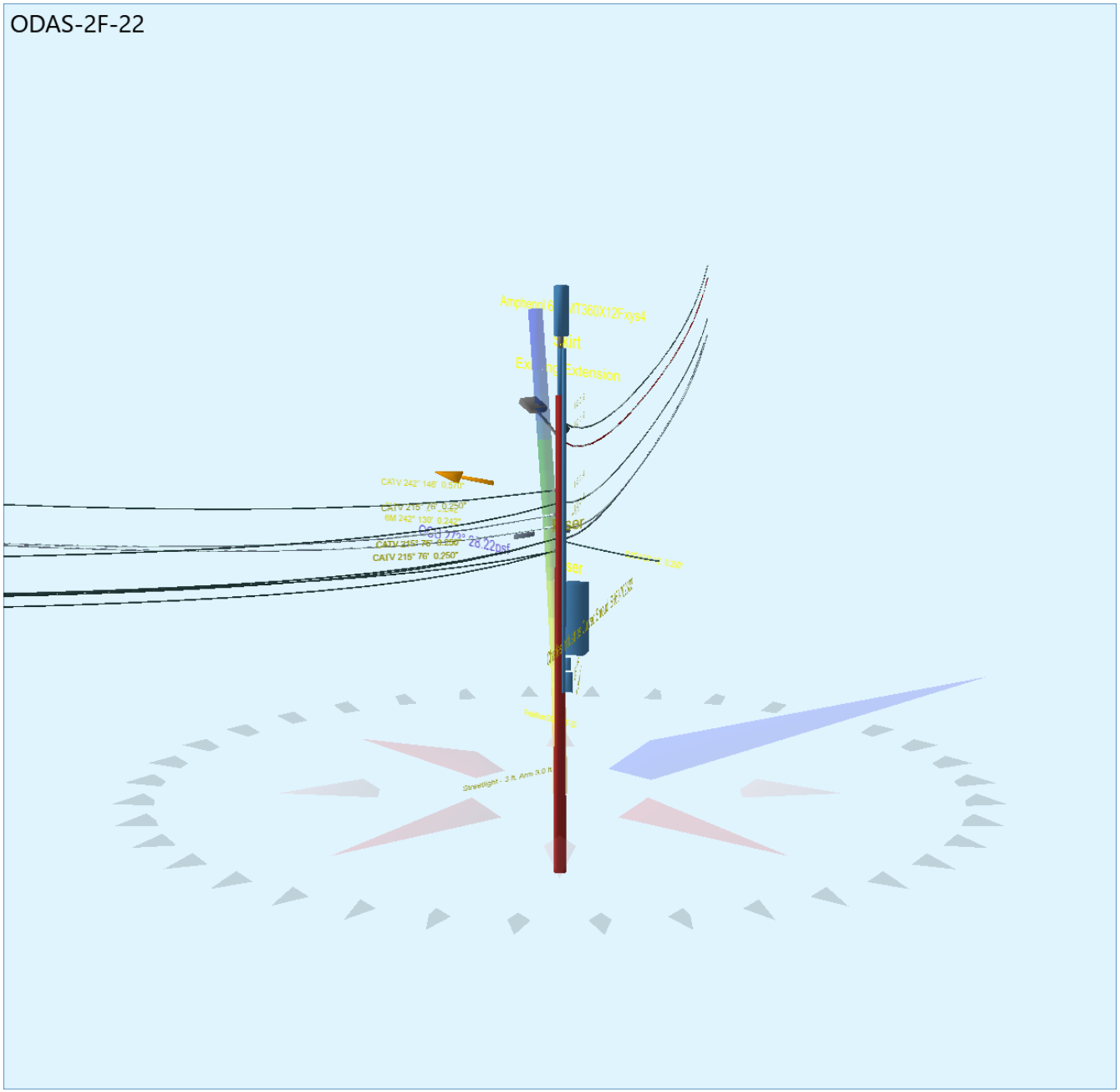
16 - 19.1' (229")
Riser

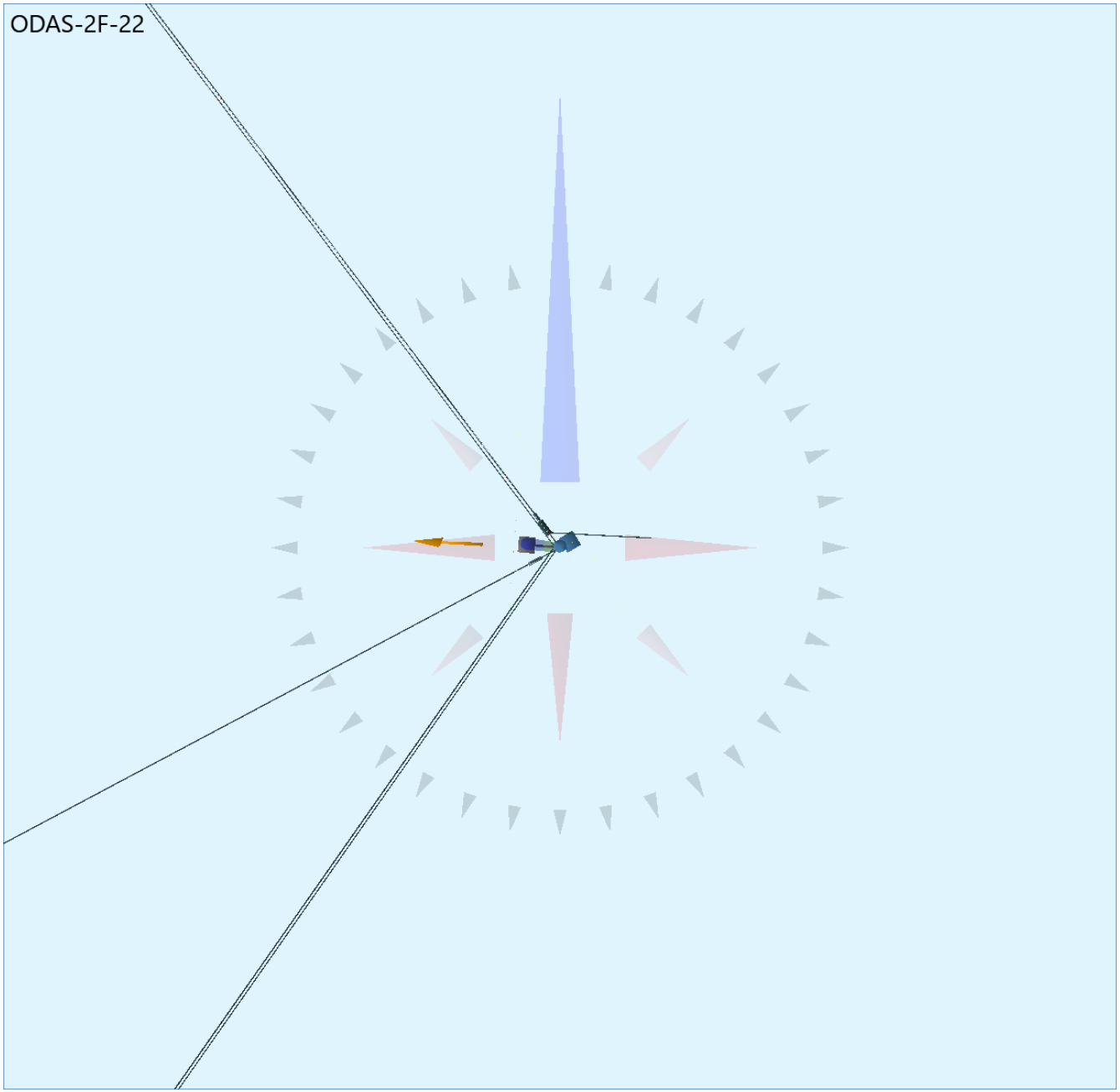
17 - 14.9' (179")
CHARLES SH60-702322 Shroud

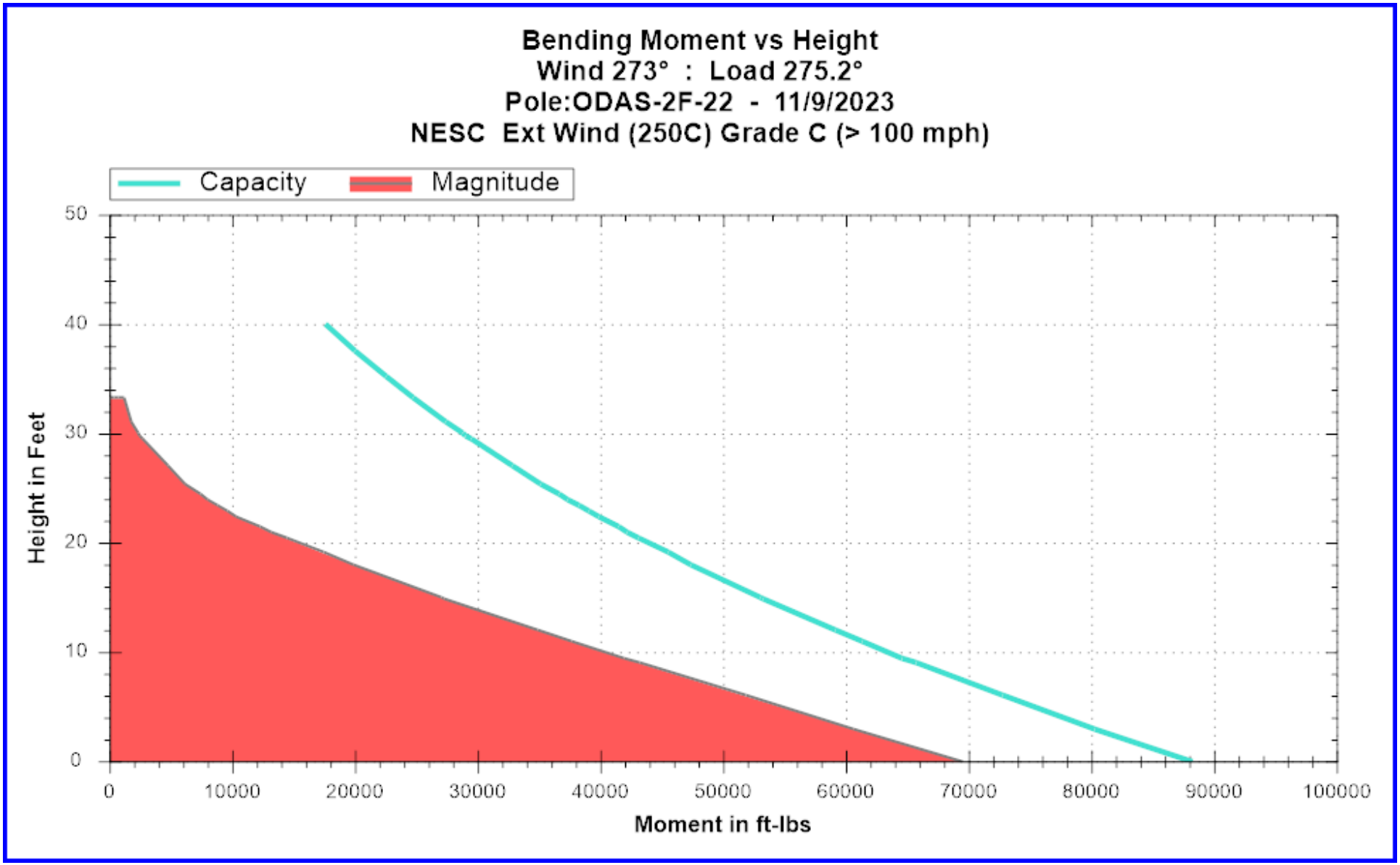
18 - 11' (132")
Load Center

19 - 9.5' (113.5")
Existing Meter

ODAS-2F-22


Skirt
Extension
CATV 242° 146' 0.570"
CATV 215° 76' 0.250"
6M 242° 139' 0.242"
CATV 215° 76' 0.250"
CATV 215° 76' 0.250"


ODAS-2F-22


Bending Moment vs Height
Wind 273° : Load 275.2°
Pole:ODAS-2F-22 - 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
100000
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

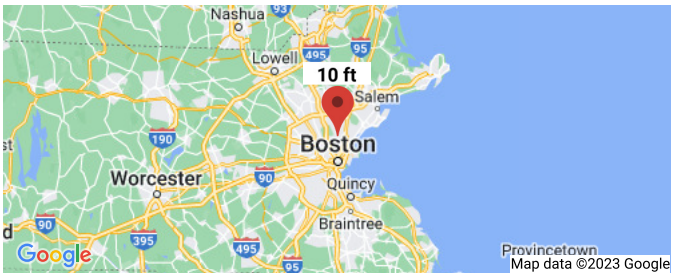
Search Information

Coordinates: 42.427091, -71.060592

Elevation: 10 ft

Timestamp: 2023-11-07T10:29:48.396Z

Hazard Type: Wind



ASCE 7-16

MRI 10-Year	75 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	128 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	105 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.

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