

Project Description:		Double Circuit 46kV Post with 636AAC/954AAC												
Design Criteria	NESC Loading Zone	Medium (Heavy, Medium or Light)												
	Wind, psf	4												
	Radial Ice, radius in inches	0.25												
	NESC Construction Grade	B												
	NESC 253-1 Overload Factor	Vertical Loads	Transverse Wind	Transverse Wire Tension	Longitudinal Loads In General	Longitudinal Loads At Deadends	Longitudinal Loads At Deadends (for guys)							
NESC 261-1 Strength Factor (SF)	1.5	2.5	1.65	1.1	1.65	1.65								
Maximum Fiber Stress	Wood	Metal and Prestressed-Concrete Structures	Wood and Reinforced-Concrete Structures	Support Hardware	Guy Wire	Guy Anchor and Foundation								
	8000	1	0.65	1	0.9	1								
Pole Data	Pole Height	50	55	60	65	70	75	80	85	90	95	100	105	
	Pole Class	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	H1	
	Diameter 6' from Butt of Pole (in)	15.12	15.76	16.23	16.71	17.19	17.67	18.14	18.62	18.94	19.42	19.74	20.05	
	Diameter at Top of Pole (in)	9.23	9.23	9.23	9.23	9.23	9.23	9.23	9.23	9.23	9.23	9.23	9.23	
	Diameter at Groundline (in)	14.99	15.56	15.97	16.39	16.82	17.24	17.66	18.09	18.36	18.79	19.06	19.34	
	Section Modulus at Groundline (in ³)	330.41	369.61	400.20	432.59	466.82	502.90	540.89	580.82	607.75	651.03	680.29	710.51	
	Ultimate Resisting Moment (ft-lbs)	220,270	246,406	266,800	288,395	311,211	335,269	360,596	387,217	405,170	434,021	453,524	473,671	
	Allowable Loading w/SF (ft-lbs)	143,176	160,164	173,420	187,457	202,287	217,925	234,387	251,691	263,360	282,114	294,791	307,886	
	Transverse Wind Loading	Moment at the Ground due to Wind on the Pole (ft-lbs)	4,975	6,214	7,573	9,089	10,769	12,618	14,642	16,846	19,134	21,706	24,347	27,165
		Allowable Loading Less Moment due to Wind on Pole (ft-lbs)	138,200	153,950	165,847	178,368	191,518	205,307	219,746	234,844	244,226	260,408	270,444	280,721
Total Conductor Loading for 1ft. Span w/ OLF (ft-lbs)		270.53	310.35	350.17	389.99	429.81	469.64	509.46	549.28	589.10	628.92	668.74	708.56	
Maximum Span Limited by Transverse Wind Load (feet)		511	496	474	457	446	437	431	428	415	414	404	396	
Max Unguyed Span @ Line Angle		Line Angle (degrees)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Total Tension due to Conductor Angle	331	331	331	331	331	331	331	331	331	331	331	331	
	Total Moment at Ground due to Conductor													
	Angular Tensions w/ OLF (ft-lbs)	19,354	21,810	24,266	26,722	29,178	31,634	34,090	36,546	39,002	41,458	43,914	46,370	
	Tension at Top of Pole (ft-lbs)	450	459	467	473	478	483	487	491	494	496	499	501	
	Deflection at Top of Pole (Inches)	7.5	9.2	11.4	13.7	16.1	18.7	21.4	24.2	27.8	30.8	34.7	38.7	
	Deflection Angle Slope (Degrees)	1.54	1.75	2.00	2.24	2.48	2.71	2.94	3.16	3.44	3.65	3.93	4.21	
	Total Conductor Loading for 1ft. Span @ Line Angle w/ OLF (lbs)	270.51	310.32	350.14	389.96	429.78	469.60	509.41	549.23	589.05	628.87	668.68	708.50	
Max Span at angle (feet)	439	426	404	389	378	370	364	361	348	348	339	331		
Insulator Swing	No. of Insulators in String	0												
	Weight of Insulator String @ 13.5lbs/insulator (lbs)	0												
	Additional Weight (lbs.)	0												
	Conductor Tension @30° Initial (lbs)	1660												
	Wind Span (feet)	234												
	Critical Swing Angle (degrees)	48												
	Conductor Swing @ Line Angle, Max Span & No Wind (degrees)	11.7												
	Conductor Swing @ Line Angle & Max Span w/Wind (degrees)	32.1												
	Min Weight Span @ Line Angle, Critical Swing Angle & Wind Span (feet)	132.07												
	Vertical Loading	E (modulus of elasticity psi)	1,800,000											
Overload Factor		1.5												
Ku		0.7 For running angle or multiple deadends Ku=0.7; for single deadend Ku=2												
Distance from Top of Pole to Bottom Guy (ft)		19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	
Area at Critical Point (in ²)		137.80	150.12	160.35	170.78	181.44	192.34	203.48	214.89	223.23	235.05	243.62	252.26	
Critical Buckling Load Pcr (lbs)		667,045	791,624	903,168	1,024,527	1,156,399	1,299,481	1,454,465	1,622,055	1,750,444	1,940,709	2,084,743	2,235,341	
Moment on Pole at the Ground Line due to Wind (ft-lbs)		4,975	6,214	7,573	9,089	10,769	12,618	14,642	16,846	19,134	21,706	24,347	27,165	
Height of lowest Transmission Guy (ft)		23.0	27.5	32.0	36.5	41.0	45.5	50.0	54.5	59.0	63.5	68.0	72.5	
Using Dist Calc		131.38	135.09	137.01	139.12	141.38	143.77	146.27	148.86	149.90	152.67	153.91	155.24	
da		435,834	322,330	244,855	194,042	158,831	133,367	114,314	99,656	86,224	77,210	68,425	61,239	
dg		11.91	11.89	11.82	11.77	11.72	11.68	11.64	11.61	11.54	11.52	11.47	11.42	
IA		14.99	15.56	15.97	16.39	16.82	17.24	17.66	18.09	18.36	18.79	19.06	19.34	
Pcr		987	983	960	941	925	912	901	891	871	865	848	834	
Allowable Vertical Load w/SF		364,538	274,175	211,011	169,156	139,873	118,504	102,378	89,870	78,144	70,351	62,581	56,193	
Attachment Height		236,950	178,214	137,157	109,951	90,917	77,028	66,546	58,416	50,794	45,728	40,678	36,525	
Attachment Height		23.5	28	32.5	37	41.5	46	50.5	55	59.5	64	68.5	73	
Wind Force at Guy Attachment		211.7	221.9	233.0	245.7	259.5	274.3	289.9	306.3	321.6	339.2	355.4	372.1	
Total Tension and Wind		25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	25,270	
Additional Load		-	-	-	-	-	-	-	-	-	-	-	-	
Overload Factor		1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	
Tension with Overload	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696		
Vertical Component based on 1:1 lead	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696	41,696		
Vertical Component based on 3:2 lead	62,543	62,543	62,543	62,543	62,543	62,543	62,543	62,543	62,543	62,543	62,543	62,543		
Vertical Component based on 2:1 lead	83,391	83,391	83,391	83,391	83,391	83,391	83,391	83,391	83,391	83,391	83,391	83,391		
Miscellaneous Transmission Guying	Transmission Loading	13,300												
	Number of Guys	2												
	Guy Strand Rated Strength	16,000												
	Table 261-1A Strength Factor	0.9												
	Guy Strand Allowable Strength	14,400												
	Anchor Rated Strength	23,000												
	Minimum Guy Lead Limited by Guy	1.92:1												
	Minimum Guy Lead Limited by Anchor	3.5:1												
		12.93												
	Line Angle	30												
	Ruling Span	228												
	Transverse Wind on Conductors	780												
	Tension due to Wind on Pole (@90% out of ground)	129												
	Conductor Tension	6885												
	Transverse Wind on Conductors OLF from 253-1	2.5												
Transverse Wire tension OLF for 253-1	1.65													
Total Tension from Wire & Wind w/OLF	13,630													
Guy Strand Rated Strength	16,000													
Table 261-1A Strength Factor	0.9													
Guy Strand Allowable Strength	14,400													
Anchor Rated Strength	23,000													
Number of Guys	4													
Minimum Guy Lead Limited by Guy	4.11:1													
Minimum Guy Lead Limited by Anchor	6.68:1													
Miscellaneous Distribution Guying	Distribution Loading	11,970												
	Number of Guys	2												
	Guy Strand Rated Strength	16,000												
	Table 261-1A Strength Factor	0.9												
	Guy Strand Allowable Strength	14,400												
	Anchor Rated Strength	23,000												
	Minimum Guy Lead Limited by Guy	2.19:1												
	Minimum Guy Lead Limited by Anchor	5.66:1												
		2.48												
	Line Angle	30												
	Ruling Span	228												
	Transverse Wind on Conductors	0												
	Tension due to Wind on Pole (@90% out of ground)	17236												
	Conductor Tension	6196												
	Transverse Wind on Conductors OLF from 253-1	2.5												
Transverse Wire tension OLF for 253-1	1.65													
Total Tension from Wire & Wind w/OLF	53,314													
Guy Strand Rated Strength	16,000													
Table 261-1A Strength Factor	0.9													
Guy Strand Allowable Strength	14,400													
Anchor Rated Strength	23,000													
Number of Guys	4													
Minimum Guy Lead Limited by Guy	0.41:1													
Minimum Guy Lead Limited by Anchor	1.41:1													