

Southern California Edison
WODUP A.13-10-020

DATA REQUEST SET A.13-10-020 WODUP ED-SCE-10

To: ENERGY DIVISION
Prepared by: Scott Lacy, P.E.
Title: Project Engineer
Dated: 12/05/2014

Question ALT-18a:

Follow-up to ALT-14 (Data Request No. 7, regarding the 2005 SCE Proposal for the WOD Upgrades): This request is follow-up to two statements in SCE's responses to ALT-14:

SCE provided a response to a potential alternative in which the existing double-circuit 220 kV structures would be reconducted with double-bundled 1033.5 kcmil conductors and the new double-circuit structures would be strung with the proposed double-bundled 1590 kcmil conductors. SCE noted that such a potential alternative would be infeasible due to physical construction safety and operational hazards. SCE also stated that the double-bundled 1590 kcmil conductor that would satisfy the Project Objectives could not be supported by the existing double circuit 220 kV structures.

SCE's response to ALT-14 states, "As was proposed in the 2005 project, the existing double-circuit towers as they are currently located in the field would only be able to support double-bundled 1033.5 kcmil ACSR as the maximum conductor size." Due to discussion at our October 2014 meeting about changes to SCE's wind loading criterion since 2005, we are uncertain as to whether this previous statement accurately represents SCE's position.

Please answer the following additional questions regarding the capabilities of the existing double-circuit structures.

(A) Please confirm that the existing double-circuit structures would currently support the following conductors, given the 18 pound-per-square-foot wind design condition:

- Double-bundled 1033.5 kcmil ACSR, as in the 2005 SCE Proposal for the WOD Upgrades.
- Single-conductor 1590 kcmil ACSR, not double-bundled per circuit.

If the existing structures would not support these conductors, please explain what modifications would be required to the existing structures to support these conductors conductor.

Response to Question ALT-18a:

To clarify the statement made at the October 2014 meeting, the actual wind loading conditions used for transmission line design purposes for the WOD Upgrade Project vary over the length of the Project, depending on both the historical wind speeds (sustained and gusting) and typical

wind angle from normal to the line. A Project-specific meteorological study was performed in 2011 and resulted in design wind conditions ranging from a minimum of 12 pounds-per-square-foot (PSF) to a maximum of 18 PSF that are applied on the conductor as appropriate to different segments of the Project. Please refer to the attachment titled “WOD Wind Map.pdf” that identifies the design wind condition applicable to each segment for this Project.

For the purpose of responding to this data request question, two separate lengths of the existing double-circuit towers were evaluated as ‘representative spans’ – an approximately 13.5-mile segment from the west side of the West of Devers-Interim reactor station to Malki Road and an approximately 5-mile segment from the San Bernardino Junction to Vista Substation. The two applicable wind-loading design conditions (12 PSF and 18 PSF, respectively) were then applied to the existing towers in the study areas for each of the two requested conductor configurations to compare the possible results. The eastern study area is representative of the typical SCE tower family (W-series) found in Segments 3 through 6, while the western study area is representative of the typical SCE tower family (N-O-P-Q-series) found in Segments 1 and 2. The summarized results of the ‘representative structures’ in the two study areas were then extrapolated to obtain approximated results for the approximately 30 miles of line remaining across the length of the Project. And while the text of this data request question specifically referenced issues related to structure capacities, the analysis also includes the evaluation of conductor sag at emergency-rated temperature to determine if there would be any ground clearance issues that would have to be addressed as well. Please refer to the attachment titled “Summary Conductor Evaluations.pdf” that includes the full analysis.

For the double-bundled 1033.5 kcmil ACSR option, approximately 80 spans, or 49% of the 165 spans that make up the full line length, would violate SCE ground clearance design requirements (32 feet total, which includes the 30-foot requirement identified in General Order (GO) 95, Table 1, Column F, Cases 3 and 4, plus a 2 foot design buffer). The most likely solutions for these situations range from structure replacements with taller structures or intersetting structures somewhere in between the existing structures, if possible. From a structure loading perspective, approximately 93 (56%) of the structures would be overloaded in some form or another, primarily the angle (89%) and deadend (82%) types, with approximately 46% of the tangent structures experiencing overload conditions. Typical solutions for these conditions could range from the simple (i.e., adding redundant members to the tower design) to the very complex (i.e., complete tower replacement).

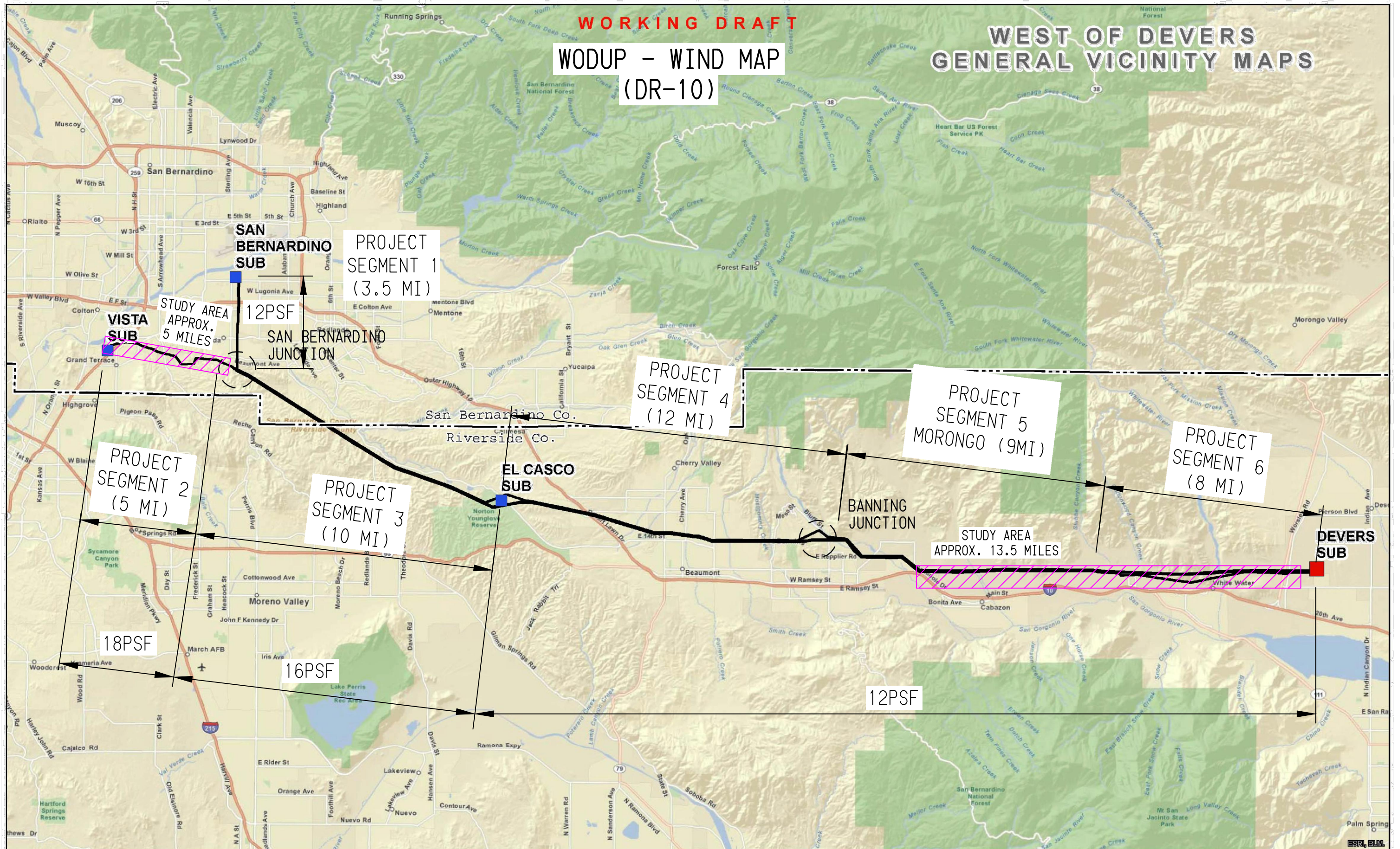
For the single-conductor 1590 kcmil ACSR option, approximately 96 spans (58%) of the 165 spans would violate the SCE ground clearance design requirements, with similar solutions as described above. From a structure loading perspective, approximately 49 (30%) of the structures would be overloaded in some form or another, primarily the deadend (71%) and tangent (20%) types, with approximately 11% of the angle structures experiencing overload conditions. Typical solutions for these conditions would be similar to those described above.

CONDUCTOR TYPE																	
Double-bundled 1033.5 kcmil ACSR		Single-conductor 1590 kcmil ACSR		Single-conductor Drake 795 ACCR		Single-conductor Bittern 1272 ACCR		Double-bundled Dove 557 ACCR		Double-bundled Drake 795 ACCR		Double-bundled Curlew 1033 ACCR		Existing Single 1033.5 kcmil ACSR			
STUDY AREAS = 13.5 MILES (12PSF WIND) & 5 MILES (18PSF WIND)																	
EVALUATED/STUDIED		OPERATING TEMPERATURE															
SPANS ENCROACHING BELOW 32'-VERTICAL GROUND CLEARANCE	# OF SPANS	275 DEG F		275 DEG F		464 DEG F		464 DEG F		464 DEG F		464 DEG F		275 DEG F			
		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS			
		COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%
	72	35	49%	42	58%	4	6%	31	43%	7	10%	6	8%	32	44%	31	43%
STRUCTURE TYPES	# OF STR.	STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD			
		COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%		
		TANGENT (WC/NE/O)	46	21	46%	9	20%	8	17%	9	20%	10	22%	14	30%	21	46%
ANGLE (WB/WF)	9	8	89%	1	11%	3	33%	3	33%	3	33%	7	78%	8	89%	0	0%
DEADEND (WY/P/Q)	17	14	82%	12	71%	12	71%	12	71%	12	71%	14	82%	14	82%	7	41%
Total	72	43	60%	22	31%	23	32%	24	33%	25	35%	35	49%	43	60%	10	14%
EXISTING TRANSMISSION LINE = 45 MILES OF DOUBLE-CIRCUIT 220KV STEEL LATTICE TOWER																	
ANTICIPATED/POTENTIAL		OPERATING TEMPERATURE															
SPANS ENCROACHING BELOW 32'-VERTICAL GROUND CLEARANCE	# OF SPANS	275 DEG F		275 DEG F		464 DEG F		464 DEG F		464 DEG F		464 DEG F		275 DEG F			
		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS		VIOLATIONS			
		COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%
	165	80	49%	96	58%	9	6%	71	43%	16	10%	14	8%	73	44%	71	43%
STRUCTURE TYPES	# OF STR.	STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD		STRUCTURE OVERLOAD			
		COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%	COUNT	%		
		TANGENT (WC/NE/O)	119	54	46%	23	20%	21	17%	23	20%	26	22%	36	30%	54	46%
ANGLE (WB/WF)	11	10	89%	1	11%	4	33%	4	33%	4	33%	9	78%	10	89%	0	0%
DEADEND (WY/P/Q)	35	29	82%	25	71%	25	71%	25	71%	25	71%	29	82%	29	82%	14	41%
Total	165	93	56%	49	30%	50	30%	52	31%	55	33%	74	45%	93	56%	22	13%

WORKING DRAFT

WODUP - WIND MAP (DR-10)

WEST OF DEVERS GENERAL VICINITY MAPS



West Of Devers PROJECT
Devers Sub to SanBern/Vista Sub

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WOD_VM20110524V1, Date: 5/24/2011

Southern California Edison
WODUP A.13-10-020

DATA REQUEST SET A.13-10-020 WODUP ED-SCE-10

To: ENERGY DIVISION
Prepared by: Scott Lacy, P.E.
Title: Project Engineer
Dated: 12/05/2014

Question ALT-18b:

Follow-up to ALT-14 (Data Request No. 7, regarding the 2005 SCE Proposal for the WOD Upgrades): This request is follow-up to two statements in SCE's responses to ALT-14:

SCE provided a response to a potential alternative in which the existing double-circuit 220 kV structures would be reconducted with double-bundled 1033.5 kcmil conductors and the new double-circuit structures would be strung with the proposed double-bundled 1590 kcmil conductors. SCE noted that such a potential alternative would be infeasible due to physical construction safety and operational hazards. SCE also stated that the double-bundled 1590 kcmil conductor that would satisfy the Project Objectives could not be supported by the existing double circuit 220 kV structures.

SCE's response to ALT-14 states, "As was proposed in the 2005 project, the existing double-circuit towers as they are currently located in the field would only be able to support double-bundled 1033.5 kcmil ACSR as the maximum conductor size." Due to discussion at our October 2014 meeting about changes to SCE's wind loading criterion since 2005, we are uncertain as to whether this previous statement accurately represents SCE's position.

Please answer the following additional questions regarding the capabilities of the existing double-circuit structures.

(B) After responding to part (A), please also specifically address the capacity of tangent structures, angle structures, and deadend structures. Address each structure type separately.

Response to Question ALT-18b:

Please refer to the attachment provided in SCE's response to Data Request Question No. ALT-18.A that provides the information requested identified by structure type – tangent, angle, and deadend.

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To: ENERGY DIVISION
Prepared by: Scott Lacy, P.E.
Title: Project Engineer
Dated: 12/05/2014

Question ALT-18c:

Follow-up to ALT-14 (Data Request No. 7, regarding the 2005 SCE Proposal for the WOD Upgrades): This request is follow-up to two statements in SCE's responses to ALT-14:

SCE provided a response to a potential alternative in which the existing double-circuit 220 kV structures would be reconducted with double-bundled 1033.5 kcmil conductors and the new double-circuit structures would be strung with the proposed double-bundled 1590 kcmil conductors. SCE noted that such a potential alternative would be infeasible due to physical construction safety and operational hazards. SCE also stated that the double-bundled 1590 kcmil conductor that would satisfy the Project Objectives could not be supported by the existing double circuit 220 kV structures.

SCE's response to ALT-14 states, "As was proposed in the 2005 project, the existing double-circuit towers as they are currently located in the field would only be able to support double-bundled 1033.5 kcmil ACSR as the maximum conductor size." Due to discussion at our October 2014 meeting about changes to SCE's wind loading criterion since 2005, we are uncertain as to whether this previous statement accurately represents SCE's position.

Please answer the following additional questions regarding the capabilities of the existing double-circuit structures.

(C) Please provide a line sag and tension characteristics (Sag/Ten) table for each of the two conductor configurations listed above for spans representative of the existing double-circuit tower line.

Response to Question ALT-18c:

Please see the two attachments that contain the Sag/Ten reports for the two requested conductor types.

Note: These reports include the information for 33 separate ruling spans that cover the full extent of the existing lines from just west of the West of Devers-Interim reactor station to Vista Substation (i.e., Segments 2 through 6), which is more than just the two study areas described in SCE's response to Data Request Question No. ALT-18.A, but do not include the spans from the San Bernardino Junction to San Bernardino Substation (i.e., Segment 1).



1/27/2015

SCE

DATA REQUEST 10-ALT18
SAG/TENSION TABLE - CURLEW 1033.5 kcmil ACSR

Conductor: 1033.5 Kcmil 54/ 7 Stranding ACSR "CURLEW"

Area = 0.9163 Sq. in Diameter = 1.244 in Weight = 1.330 lb/ft RTS = 36600 lb
Data from Chart No. 1-838
English Units
Limits and Outputs in Average Tensions.

Span = 1165.0 Feet Special Load Zone
Creep is NOT a Factor Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	22.19	12000	22.19	12000*
25.0	0.00	0.00	0.00	1.330	20.71	10909	20.37	11091
60.0	0.00	0.00	0.00	1.330	23.39	9663	22.49	10050
275.0	0.00	0.00	0.00	1.330	38.70	5856	36.49	6208

* Design Condition

Span = 1428.0 Feet Special Load Zone
Creep is NOT a Factor Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	33.37	12000	33.37	12000*
25.0	0.00	0.00	0.00	1.330	31.66	10730	31.18	10895
60.0	0.00	0.00	0.00	1.330	34.73	9785	33.71	10078
275.0	0.00	0.00	0.00	1.330	51.85	6573	49.47	6886

* Design Condition

Span = 4119.0 Feet Special Load Zone
Creep IS a Factor Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	283.65	11941	282.21	12000*
25.0	0.00	0.00	0.00	1.330	281.39	10211	278.96	10297
60.0	0.00	0.00	0.00	1.330	285.48	10071	282.72	10165
275.0	0.00	0.00	0.00	1.330	309.59	9317	305.45	9438

* Design Condition

Span = 1656.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	44.91	12000	44.91	12000*
25.0	0.00	0.00	0.00	1.330	43.05	10618	42.47	10763
60.0	0.00	0.00	0.00	1.330	46.37	9862	45.29	10097
275.0	0.00	0.00	0.00	1.330	64.77	7082	62.30	7360

* Design Condition

Span = 1384.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	31.34	12000	31.34	12000*
25.0	0.00	0.00	0.00	1.330	29.66	10756	29.20	10924
60.0	0.00	0.00	0.00	1.330	32.68	9767	31.68	10074
275.0	0.00	0.00	0.00	1.330	49.52	6464	47.17	6783

* Design Condition

Span = 1263.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	26.09	12000	26.09	12000*
25.0	0.00	0.00	0.00	1.330	24.51	10835	24.12	11012
60.0	0.00	0.00	0.00	1.330	27.35	9713	26.40	10061
275.0	0.00	0.00	0.00	1.330	43.38	6142	41.10	6479

* Design Condition

Span = 1434.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	33.65	12000	33.65	12000*
25.0	0.00	0.00	0.00	1.330	31.93	10727	31.45	10891
60.0	0.00	0.00	0.00	1.330	35.01	9787	34.00	10079
275.0	0.00	0.00	0.00	1.330	52.17	6588	49.79	6900

* Design Condition

Span = 1630.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	43.50	12000	43.50	12000*
25.0	0.00	0.00	0.00	1.330	41.67	10629	41.09	10776
60.0	0.00	0.00	0.00	1.330	44.96	9855	43.88	10095
275.0	0.00	0.00	0.00	1.330	63.23	7028	60.76	7310

* Design Condition

Span = 1596.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	41.70	12000	41.70	12000*
25.0	0.00	0.00	0.00	1.330	39.88	10644	39.33	10795
60.0	0.00	0.00	0.00	1.330	43.14	9844	42.08	10093
275.0	0.00	0.00	0.00	1.330	61.23	6957	58.78	7244

* Design Condition

Span = 1568.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	40.25	12000	40.25	12000*
25.0	0.00	0.00	0.00	1.330	38.45	10657	37.90	10810
60.0	0.00	0.00	0.00	1.330	41.68	9835	40.62	10090
275.0	0.00	0.00	0.00	1.330	59.61	6897	57.17	7188

* Design Condition

Span = 1286.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	27.05	12000	27.05	12000*
25.0	0.00	0.00	0.00	1.330	25.45	10819	25.04	10995
60.0	0.00	0.00	0.00	1.330	28.33	9724	27.37	10064
275.0	0.00	0.00	0.00	1.330	44.52	6205	42.22	6539

* Design Condition

Span = 1328.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points

Final

Initial

Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	28.85	12000	28.85	12000*
25.0	0.00	0.00	0.00	1.330	27.22	10791	26.79	10964
60.0	0.00	0.00	0.00	1.330	30.15	9743	29.18	10068
275.0	0.00	0.00	0.00	1.330	46.63	6319	44.31	6646

* Design Condition

Span = 1557.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	39.68	12000	39.68	12000*
25.0	0.00	0.00	0.00	1.330	37.89	10663	37.35	10816
60.0	0.00	0.00	0.00	1.330	41.11	9832	40.05	10090
275.0	0.00	0.00	0.00	1.330	58.98	6872	56.54	7165

* Design Condition

Span = 1544.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	39.02	12000	39.02	12000*
25.0	0.00	0.00	0.00	1.330	37.23	10669	36.70	10824
60.0	0.00	0.00	0.00	1.330	40.44	9827	39.39	10088
275.0	0.00	0.00	0.00	1.330	58.24	6844	55.81	7139

* Design Condition

Span = 1823.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	54.45	12000	54.45	12000*
25.0	0.00	0.00	0.00	1.330	52.52	10554	51.88	10685
60.0	0.00	0.00	0.00	1.330	55.98	9907	54.86	10108
275.0	0.00	0.00	0.00	1.330	75.19	7398	72.65	7653

* Design Condition

Span = 1792.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	52.61	12000	52.61	12000*
25.0	0.00	0.00	0.00	1.330	50.69	10565	50.06	10698

60.0	0.00	0.00	0.00	1.330	54.13	9899	53.01	10107
275.0	0.00	0.00	0.00	1.330	73.19	7343	70.66	7602

* Design Condition

Span = 1868.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	57.19	12000	57.19	12000*
25.0	0.00	0.00	0.00	1.330	55.24	10539	54.58	10666
60.0	0.00	0.00	0.00	1.330	58.73	9917	57.59	10111
275.0	0.00	0.00	0.00	1.330	78.13	7477	75.58	7726

* Design Condition

Span = 1874.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	57.55	12000	57.55	12000*
25.0	0.00	0.00	0.00	1.330	55.60	10537	54.94	10664
60.0	0.00	0.00	0.00	1.330	59.10	9919	57.96	10111
275.0	0.00	0.00	0.00	1.330	78.53	7487	75.98	7735

* Design Condition

Span = 1609.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	42.39	12000	42.39	12000*
25.0	0.00	0.00	0.00	1.330	40.56	10638	40.00	10787
60.0	0.00	0.00	0.00	1.330	43.83	9848	42.76	10094
275.0	0.00	0.00	0.00	1.330	61.99	6984	59.53	7270

* Design Condition

Span = 527.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	4.54	11998	4.54	11998
25.0	0.00	0.00	0.00	1.330	3.98	11601	3.94	11712*
60.0	0.00	0.00	0.00	1.330	5.05	9141	4.64	9945
275.0	0.00	0.00	0.00	1.330	12.39	3735	12.35	3748

* Design Condition

Span = 1477.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	35.70	12000	35.70	12000*
25.0	0.00	0.00	0.00	1.330	33.96	10703	33.45	10864
60.0	0.00	0.00	0.00	1.330	37.09	9804	36.06	10083
275.0	0.00	0.00	0.00	1.330	54.50	6691	52.10	6996

* Design Condition

Span = 853.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	11.89	12000	11.89	12000*
25.0	0.00	0.00	0.00	1.330	10.80	11208	10.63	11384
60.0	0.00	0.00	0.00	1.330	12.81	9453	12.10	10005
275.0	0.00	0.00	0.00	1.330	24.57	4939	23.49	5165

* Design Condition

Span = 1199.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	23.51	12000	23.51	12000*
25.0	0.00	0.00	0.00	1.330	21.99	10882	21.63	11063
60.0	0.00	0.00	0.00	1.330	24.73	9681	23.81	10054
275.0	0.00	0.00	0.00	1.330	40.30	5958	38.06	6305

* Design Condition

Span = 2222.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	81.04	12000	81.04	12000*
25.0	0.00	0.00	0.00	1.330	78.98	10446	78.22	10546
60.0	0.00	0.00	0.00	1.330	82.67	9984	81.48	10128
275.0	0.00	0.00	0.00	1.330	103.42	8005	100.79	8211

* Design Condition

Span = 1045.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp	Ice	Wind	K	Weight	Sag	Tension	Sag	Tension
°F	in	psf	lb/ft	lb/ft	Ft	lb	Ft	lb
25.0	0.00	8.00	0.00	1.567	17.85	12000	17.85	12000*
25.0	0.00	0.00	0.00	1.330	16.50	11012	16.23	11197
60.0	0.00	0.00	0.00	1.330	18.95	9592	18.12	10034
275.0	0.00	0.00	0.00	1.330	33.08	5510	31.19	5842

* Design Condition

Span = 1313.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp	Ice	Wind	K	Weight	Sag	Tension	Sag	Tension
°F	in	psf	lb/ft	lb/ft	Ft	lb	Ft	lb
25.0	0.00	8.00	0.00	1.567	28.20	12000	28.20	12000*
25.0	0.00	0.00	0.00	1.330	26.58	10801	26.16	10975
60.0	0.00	0.00	0.00	1.330	29.50	9737	28.52	10067
275.0	0.00	0.00	0.00	1.330	45.87	6279	43.56	6609

* Design Condition

Span = 665.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp	Ice	Wind	K	Weight	Sag	Tension	Sag	Tension
°F	in	psf	lb/ft	lb/ft	Ft	lb	Ft	lb
25.0	0.00	8.00	0.00	1.567	7.22	12000	7.22	12000*
25.0	0.00	0.00	0.00	1.330	6.43	11431	6.35	11577
60.0	0.00	0.00	0.00	1.330	7.92	9285	7.38	9972
275.0	0.00	0.00	0.00	1.330	17.19	4287	16.85	4375

* Design Condition

Span = 1145.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp	Ice	Wind	K	Weight	Sag	Tension	Sag	Tension
°F	in	psf	lb/ft	lb/ft	Ft	lb	Ft	lb
25.0	0.00	8.00	0.00	1.567	21.43	12000	21.43	12000*
25.0	0.00	0.00	0.00	1.330	19.97	10925	19.64	11108
60.0	0.00	0.00	0.00	1.330	22.62	9652	21.72	10047
275.0	0.00	0.00	0.00	1.330	37.78	5795	35.58	6150

* Design Condition

Span = 972.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp	Ice	Wind	K	Weight	Sag	Tension	Sag	Tension
°F	in	psf	lb/ft	lb/ft	Ft	lb	Ft	lb
25.0	0.00	8.00	0.00	1.567	15.44	12000	15.44	12000*

25.0	0.00	0.00	0.00	1.330	14.19	11082	13.95	11265
60.0	0.00	0.00	0.00	1.330	16.48	9543	15.69	10023
275.0	0.00	0.00	0.00	1.330	29.73	5303	28.15	5598

* Design Condition

Span = 972.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	15.44	12000	15.44	12000*
25.0	0.00	0.00	0.00	1.330	14.19	11082	13.95	11265
60.0	0.00	0.00	0.00	1.330	16.48	9543	15.69	10023
275.0	0.00	0.00	0.00	1.330	29.73	5303	28.15	5598

* Design Condition

Span = 962.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	15.12	12000	15.12	12000*
25.0	0.00	0.00	0.00	1.330	13.88	11092	13.66	11275
60.0	0.00	0.00	0.00	1.330	16.15	9536	15.37	10022
275.0	0.00	0.00	0.00	1.330	29.28	5274	27.74	5564

* Design Condition

Span = 674.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	7.42	12000	7.42	12000*
25.0	0.00	0.00	0.00	1.330	6.62	11420	6.53	11568
60.0	0.00	0.00	0.00	1.330	8.13	9294	7.58	9974
275.0	0.00	0.00	0.00	1.330	17.53	4321	17.15	4416

* Design Condition

Span = 356.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	1.567	2.09	11856	2.09	11856
25.0	0.00	0.00	0.00	1.330	1.81	11650	1.80	11712*
60.0	0.00	0.00	0.00	1.330	2.39	8824	2.16	9770
275.0	0.00	0.00	0.00	1.330	7.25	2911	7.19	2934

* Design Condition

Certain information such as the data, opinions or recommendations set forth herein or given by Southwire representatives, is intended as a general guide only. Each installation of overhead electrical conductor, underground electrical conductor, and/or conductor accessories involves special conditions creating problems that require individual solutions and, therefore, the recipient of this information has the sole responsibility in connection with the use of the information. Southwire does not assume any liability in connection with such information.



1/27/2015

SCE

DATA REQUEST 10-ALT18
SAG/TENSION TABLE - LAPWING 1590 kcmil ACSR

Conductor: 1590.0 Kcmil 45/ 7 Stranding ACSR "LAPWING"

Area = 1.3350 Sq. in Diameter = 1.504 in Weight = 1.792 lb/ft RTS = 42200 lb
Data from Chart No. 1-1019
English Units
Limits and Outputs in Average Tensions.

Span = 1165.0 Feet Special Load Zone
Creep is NOT a Factor Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	23.99	14545	23.99	14545
25.0	0.00	0.00	0.00	1.792	22.91	13292	22.55	13504*
60.0	0.00	0.00	0.00	1.792	25.88	11772	24.93	12216
275.0	0.00	0.00	0.00	1.792	41.93	7289	39.43	7745

* Design Condition

Span = 1428.0 Feet Special Load Zone
Creep IS a Factor Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	36.50	14378	35.62	14731
25.0	0.00	0.00	0.00	1.792	35.30	12971	33.90	13504*
60.0	0.00	0.00	0.00	1.792	38.60	11870	36.68	12487
275.0	0.00	0.00	0.00	1.792	56.33	8159	52.99	8668

* Design Condition

Span = 4119.0 Feet Special Load Zone
Creep IS a Factor Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	307.40	14483	301.16	14770*
25.0	0.00	0.00	0.00	1.792	305.90	12698	298.73	12990
60.0	0.00	0.00	0.00	1.792	310.03	12536	302.63	12829
275.0	0.00	0.00	0.00	1.792	334.45	11663	325.96	11952

* Design Condition

Span = 1656.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	49.50	14271	47.82	14770*
25.0	0.00	0.00	0.00	1.792	48.24	12777	45.93	13417
60.0	0.00	0.00	0.00	1.792	51.72	11923	48.96	12590
275.0	0.00	0.00	0.00	1.792	70.62	8762	66.55	9290

* Design Condition

Span = 1384.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	34.24	14396	33.52	14703
25.0	0.00	0.00	0.00	1.792	33.06	13010	31.84	13504*
60.0	0.00	0.00	0.00	1.792	36.30	11852	34.56	12447
275.0	0.00	0.00	0.00	1.792	53.78	8026	50.59	8527

* Design Condition

Span = 1263.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	28.34	14479	28.06	14620
25.0	0.00	0.00	0.00	1.792	27.20	13160	26.51	13504*
60.0	0.00	0.00	0.00	1.792	30.31	11817	29.05	12326
275.0	0.00	0.00	0.00	1.792	47.04	7638	44.27	8112

* Design Condition

Span = 1434.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	36.81	14376	35.91	14735
25.0	0.00	0.00	0.00	1.792	35.61	12966	34.19	13504*
60.0	0.00	0.00	0.00	1.792	38.91	11872	36.97	12492
275.0	0.00	0.00	0.00	1.792	56.69	8177	53.32	8687

* Design Condition

Span = 1630.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	47.92	14282	46.32	14770*
25.0	0.00	0.00	0.00	1.792	46.66	12796	44.45	13430
60.0	0.00	0.00	0.00	1.792	50.13	11918	47.46	12583
275.0	0.00	0.00	0.00	1.792	68.90	8699	64.92	9226

* Design Condition

Span = 1596.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	45.88	14297	44.40	14770*
25.0	0.00	0.00	0.00	1.792	44.64	12823	42.55	13447
60.0	0.00	0.00	0.00	1.792	48.07	11912	45.53	12574
275.0	0.00	0.00	0.00	1.792	66.69	8615	62.81	9141

* Design Condition

Span = 1568.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	44.23	14312	42.85	14770*
25.0	0.00	0.00	0.00	1.792	43.00	12847	41.02	13462
60.0	0.00	0.00	0.00	1.792	46.41	11908	43.97	12566
275.0	0.00	0.00	0.00	1.792	64.89	8545	61.10	9069

* Design Condition

Span = 1286.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	29.42	14459	29.06	14636
25.0	0.00	0.00	0.00	1.792	28.28	13126	27.48	13504*
60.0	0.00	0.00	0.00	1.792	31.41	11821	30.06	12350
275.0	0.00	0.00	0.00	1.792	48.29	7714	45.44	8194

* Design Condition

Span = 1328.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points

Final

Initial

Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	31.45	14427	30.93	14666
25.0	0.00	0.00	0.00	1.792	30.29	13071	29.31	13504*
60.0	0.00	0.00	0.00	1.792	33.47	11832	31.95	12393
275.0	0.00	0.00	0.00	1.792	50.61	7850	47.61	8340

* Design Condition

Span = 1557.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	43.59	14318	42.25	14770*
25.0	0.00	0.00	0.00	1.792	42.36	12857	40.43	13468
60.0	0.00	0.00	0.00	1.792	45.77	11906	43.36	12563
275.0	0.00	0.00	0.00	1.792	64.20	8517	60.43	9040

* Design Condition

Span = 1544.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	42.84	14326	41.55	14770*
25.0	0.00	0.00	0.00	1.792	41.61	12870	39.73	13475
60.0	0.00	0.00	0.00	1.792	45.01	11904	42.65	12559
275.0	0.00	0.00	0.00	1.792	63.37	8483	59.65	9006

* Design Condition

Span = 1823.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	60.21	14229	57.99	14770*
25.0	0.00	0.00	0.00	1.792	58.92	12687	56.00	13343
60.0	0.00	0.00	0.00	1.792	62.50	11966	59.19	12630
275.0	0.00	0.00	0.00	1.792	82.12	9138	77.57	9666

* Design Condition

Span = 1792.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	58.15	14234	56.02	14770*
25.0	0.00	0.00	0.00	1.792	56.87	12700	54.05	13356

60.0	0.00	0.00	0.00	1.792	60.43	11957	57.21	12624
275.0	0.00	0.00	0.00	1.792	79.92	9072	75.46	9600

* Design Condition

Span = 1868.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	63.26	14223	60.90	14770*
25.0	0.00	0.00	0.00	1.792	61.96	12670	58.89	13326
60.0	0.00	0.00	0.00	1.792	65.57	11979	62.11	12640
275.0	0.00	0.00	0.00	1.792	85.37	9233	80.69	9759

* Design Condition

Span = 1874.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	63.67	14223	61.29	14770*
25.0	0.00	0.00	0.00	1.792	62.37	12668	59.28	13324
60.0	0.00	0.00	0.00	1.792	65.98	11981	62.51	12641
275.0	0.00	0.00	0.00	1.792	85.80	9245	81.11	9771

* Design Condition

Span = 1609.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	46.65	14291	45.13	14770*
25.0	0.00	0.00	0.00	1.792	45.41	12812	43.27	13440
60.0	0.00	0.00	0.00	1.792	48.85	11914	46.26	12578
275.0	0.00	0.00	0.00	1.792	67.53	8648	63.61	9174

* Design Condition

Span = 527.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	5.13	13893	5.13	13893
25.0	0.00	0.00	0.00	1.792	4.66	13341	4.61	13504*
60.0	0.00	0.00	0.00	1.792	6.13	10158	5.57	11167
275.0	0.00	0.00	0.00	1.792	14.93	4180	13.93	4479

* Design Condition

Span = 1477.0 Feet
 Creep IS a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	39.09	14364	38.04	14761
25.0	0.00	0.00	0.00	1.792	37.88	12934	36.27	13504*
60.0	0.00	0.00	0.00	1.792	41.22	11892	39.11	12529
275.0	0.00	0.00	0.00	1.792	59.24	8303	55.72	8819

* Design Condition

Span = 853.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	13.11	14257	13.11	14257
25.0	0.00	0.00	0.00	1.792	12.28	13285	12.08	13504*
60.0	0.00	0.00	0.00	1.792	14.65	11137	13.85	11777
275.0	0.00	0.00	0.00	1.792	27.93	5859	25.71	6361

* Design Condition

Span = 1199.0 Feet
 Creep IS a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	25.41	14550	25.37	14571
25.0	0.00	0.00	0.00	1.792	24.30	13273	23.88	13504*
60.0	0.00	0.00	0.00	1.792	27.32	11811	26.33	12255
275.0	0.00	0.00	0.00	1.792	43.63	7420	41.08	7875

* Design Condition

Span = 2222.0 Feet
 Creep IS a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	89.66	14226	86.32	14770*
25.0	0.00	0.00	0.00	1.792	88.31	12603	84.17	13215
60.0	0.00	0.00	0.00	1.792	92.07	12094	87.62	12701
275.0	0.00	0.00	0.00	1.792	113.10	9880	107.53	10382

* Design Condition

Span = 1045.0 Feet
 Creep is NOT a Factor

Special Load Zone
 Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	19.43	14443	19.43	14443
25.0	0.00	0.00	0.00	1.792	18.44	13285	18.14	13504*
60.0	0.00	0.00	0.00	1.792	21.20	11557	20.31	12064
275.0	0.00	0.00	0.00	1.792	36.27	6778	33.86	7254

* Design Condition

Span = 1313.0 Feet
Creep IS a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	30.72	14438	30.26	14655
25.0	0.00	0.00	0.00	1.792	29.56	13090	28.65	13504*
60.0	0.00	0.00	0.00	1.792	32.73	11828	31.27	12378
275.0	0.00	0.00	0.00	1.792	49.78	7802	46.83	8288

* Design Condition

Span = 665.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	8.08	14052	8.08	14052
25.0	0.00	0.00	0.00	1.792	7.45	13306	7.34	13504*
60.0	0.00	0.00	0.00	1.792	9.34	10619	8.66	11442
275.0	0.00	0.00	0.00	1.792	20.52	4846	18.61	5339

* Design Condition

Span = 1145.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	23.20	14528	23.20	14528
25.0	0.00	0.00	0.00	1.792	22.13	13291	21.78	13504*
60.0	0.00	0.00	0.00	1.792	25.07	11739	24.13	12192
275.0	0.00	0.00	0.00	1.792	40.96	7207	38.48	7666

* Design Condition

Span = 972.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	16.89	14376	16.89	14376

25.0	0.00	0.00	0.00	1.792	15.95	13283	15.69	13504*
60.0	0.00	0.00	0.00	1.792	18.58	11409	17.72	11961
275.0	0.00	0.00	0.00	1.792	33.00	6444	30.66	6931

* Design Condition

Span = 972.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	16.89	14376	16.89	14376
25.0	0.00	0.00	0.00	1.792	15.95	13283	15.69	13504*
60.0	0.00	0.00	0.00	1.792	18.58	11409	17.72	11961
275.0	0.00	0.00	0.00	1.792	33.00	6444	30.66	6931

* Design Condition

Span = 962.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	16.55	14366	16.55	14366
25.0	0.00	0.00	0.00	1.792	15.62	13283	15.37	13504*
60.0	0.00	0.00	0.00	1.792	18.23	11387	17.38	11946
275.0	0.00	0.00	0.00	1.792	32.56	6396	30.23	6885

* Design Condition

Span = 674.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	8.30	14062	8.30	14062
25.0	0.00	0.00	0.00	1.792	7.65	13304	7.54	13504*
60.0	0.00	0.00	0.00	1.792	9.57	10646	8.89	11459
275.0	0.00	0.00	0.00	1.792	20.91	4886	18.93	5392

* Design Condition

Span = 356.0 Feet
Creep is NOT a Factor

Special Load Zone
Rolled Rod

Design Points				Final			Initial	
Temp °F	Ice in	Wind psf	K lb/ft	Weight lb/ft	Sag Ft	Tension lb	Sag Ft	Tension lb
25.0	0.00	8.00	0.00	2.053	2.37	13707	2.37	13707
25.0	0.00	0.00	0.00	1.792	2.12	13404	2.10	13504*
60.0	0.00	0.00	0.00	1.792	2.99	9496	2.63	10817
275.0	0.00	0.00	0.00	1.792	8.81	3231	8.72	3263

* Design Condition

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