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Span Wire Signal Support Design

PROJECT DETAIL

Project Date:	12/20/2018	**Author:**	GRS
Last Revision Date:	02/20/2020	**Filename:**	180228 Kessler - Cowlesville.xml

Comments:

- 12 INCH LENSES
- POLYCARBONATE SIGNAL HEADS WITH BACKPLATES, TETHERED
- CHECKED, NAU 2/20/20

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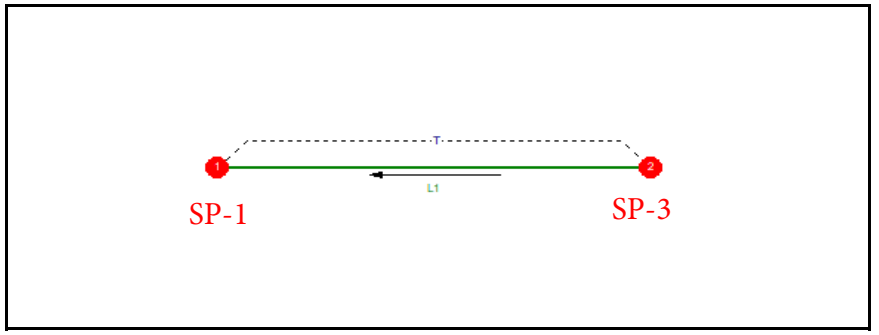
Span Wire Signal Support Design

INPUT VALUES

Sequence #: 1

Configuration Type: Simple

Problem Identification: West



Angles (Degrees)

Span Lengths (ft)

[L 1]
95.00

Elevation Differences (ft)

[T]
0.00

Base Elevations (ft)

[Pavement]	[Pole 1]	[Pole 2]
927.07	927.19	927.37

Signals and Signs

{Distance (ft) / Weight (lbs)}

Span 1 (26.00/49.30), (36.00/73.00), [43.00/19.00]

Wire Weights (lbs)

(Assumed)

142.50 **Span 1**

Design Data

Min. SAG (ft):	2.85	**Max. SAG (ft):**	4.75	**Minimum Clearance (ft):**	22.00	**Wire Weight (lbs/ft):**	1.50
Sum of Loads (lbs):	141.30	**Sum of Areas (ft):**	11.35	**Wind Pressure (psf):**	42.00		

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RESULT OF FINAL CALCULATION [MAX SAG]

Sequence #: 1 **Configuration Type:** Simple **Problem Identification:** West

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-121.01
Distance from end to low point (ft)	59.00
SAG below end of span (ft)	4.75

Pole Results

	[POLE 1] SP-1	[POLE 2] SP-3
Stringing Tension (lbs):	925.39	925.39
Attachment Height above pole base (ft)	26.63	26.45
Attachment Elevation (ft)	953.82	953.82
Base Moment (ft/lbs)	95384.36	94739.63

Other information

Calculated Design Factor :	3.87
Distance between Highest and Lowest Point (ft) :	4.75
Max. Wire Load (lbs):	3636.84

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.72), (0.00), [0.14]

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RESULT OF FINAL CALCULATION [MIN SAG]

Sequence #: 1 **Configuration Type:** Simple **Problem Identification:** West

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-121.01
Distance from end to low point (ft)	59.00
SAG below end of span (ft)	2.85

Pole Results

	[POLE 1]	[POLE 2]
Stringing Tension (lbs):	1542.31	1542.31
Attachment Height above pole base (ft)	24.73	24.55
Attachment Elevation (ft)	951.92	951.92
Base Moment (ft/lbs)	147631.	146556.

Other information

Calculated Design Factor :	3.87
Distance between Highest and Lowest Point (ft) :	2.85
Max. Wire Load (lbs):	6002.89

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.43), (0.00), [0.09]

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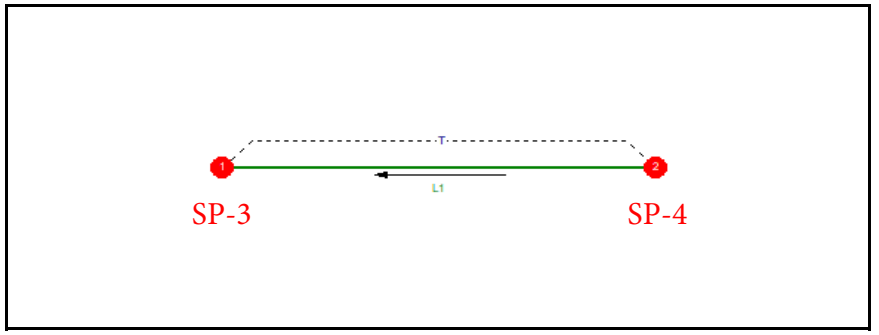
INPUT VALUES

Sequence #: 2

Configuration Type: Simple

Problem Identification: North



Angles (Degrees)

Span Lengths (ft)

[L 1]
95.00

Elevation Differences (ft)

[T]
0.00

Base Elevations (ft)

[Pavement] **[Pole 1]** **[Pole 2]**
927.75 927.37 926.92

Signals and Signs

{Distance (ft) / Weight (lbs)}

Span 1 (27.00/49.30), (39.00/49.30), [46.00/19.00]

Wire Weights (lbs)

(Assumed)

142.50 **Span 1**

Design Data

Min. SAG (ft):	2.85	**Max. SAG (ft):**	4.75	**Minimum Clearance (ft):**	22.00	**Wire Weight (lbs/ft):**	1.50
Sum of Loads (lbs):	117.60	**Sum of Areas (ft):**	8.95	**Wind Pressure (psf):**	42.00		

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RESULT OF FINAL CALCULATION [MAX SAG]

Sequence #: 2 **Configuration Type:** Simple **Problem Identification:** North

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-114.70
Distance from end to low point (ft)	56.00
SAG below end of span (ft)	4.75

Pole Results

	[POLE 1] SP-3	[POLE 2] SP-4
Stringing Tension (lbs):	829.10	829.10
Attachment Height above pole base (ft)	27.13	27.58
Attachment Elevation (ft)	954.50	954.50
Base Moment (ft/lbs)	82868.84	84243.37

Other information

Calculated Design Factor : 3.68

Distance between Highest and Lowest Point (ft) : 4.75

Max. Wire Load (lbs): 3101.12

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.67), (0.00), [0.14]

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RESULT OF FINAL CALCULATION [MIN SAG]

Sequence #: 2 **Configuration Type:** Simple **Problem Identification:** North

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-114.70
Distance from end to low point (ft)	56.00
SAG below end of span (ft)	2.85

Pole Results

	[POLE 1]	[POLE 2]
Stringing Tension (lbs):	1381.83	1381.83
Attachment Height above pole base (ft)	25.23	25.68
Attachment Elevation (ft)	952.60	952.60
Base Moment (ft/lbs)	128442.	130733.

Other information

Calculated Design Factor :	3.68
Distance between Highest and Lowest Point (ft) :	2.85
Max. Wire Load (lbs):	5118.95

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.40), (0.00), [0.09]

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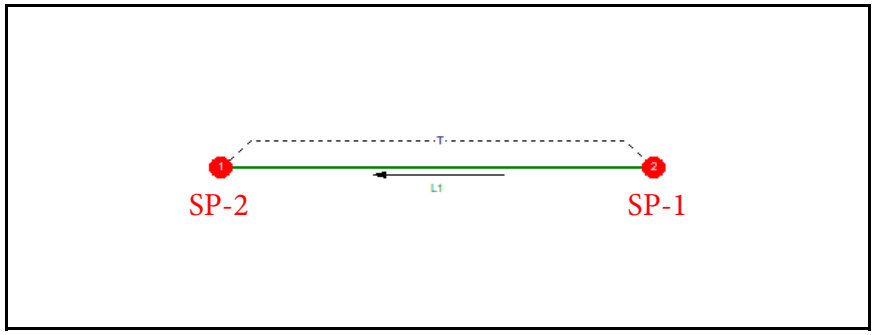
Span Wire Signal Support Design

INPUT VALUES

Sequence #: 3

Configuration Type: Simple

Problem Identification: South



Angles (Degrees)

Span Lengths (ft)

[L 1]
96.00

Elevation Differences (ft)

[T]
0.00

Base Elevations (ft)

[Pavement]	[Pole 1]	[Pole 2]
927.10	926.11	927.19

Signals and Signs

{Distance (ft) / Weight (lbs)}

Span 1 (29.00/49.30), (40.00/49.30), [48.00/19.00]

Wire Weights (lbs)

(Assumed)

144.00 **Span 1**

Design Data

Min. SAG (ft):	2.88	**Max. SAG (ft):**	4.80	**Minimum Clearance (ft):**	22.00	**Wire Weight (lbs/ft):**	1.50
Sum of Loads (lbs):	117.60	**Sum of Areas (ft):**	8.95	**Wind Pressure (psf):**	42.00		

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Span Wire Signal Support Design

RESULT OF FINAL CALCULATION [MAX SAG]

Sequence #: 3 **Configuration Type:** Simple **Problem Identification:** South

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-116.93
Distance from end to low point (ft)	56.00
SAG below end of span (ft)	4.80

Pole Results

	[POLE 1] SP-2	[POLE 2] SP-1
Stringing Tension (lbs):	842.57	842.57
Attachment Height above pole base (ft)	27.79	26.71
Attachment Elevation (ft)	953.90	953.90
Base Moment (ft/lbs)	86263.57	82911.12

Other information

Calculated Design Factor :	3.68
Distance between Highest and Lowest Point (ft) :	4.80
Max. Wire Load (lbs):	3149.54

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.57), (0.00), [0.19]

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RESULT OF FINAL CALCULATION [MIN SAG]

Sequence #: 3 **Configuration Type:** Simple **Problem Identification:** South

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-116.93
Distance from end to low point (ft)	56.00
SAG below end of span (ft)	2.88

Pole Results

	[POLE 1]	[POLE 2]
Stringing Tension (lbs):	1404.28	1404.28
Attachment Height above pole base (ft)	25.87	24.79
Attachment Elevation (ft)	951.98	951.98
Base Moment (ft/lbs)	133839.	128252.

Other information

Calculated Design Factor :	3.68
Distance between Highest and Lowest Point (ft) :	2.88
Max. Wire Load (lbs):	5200.92

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.34), (0.00), [0.11]

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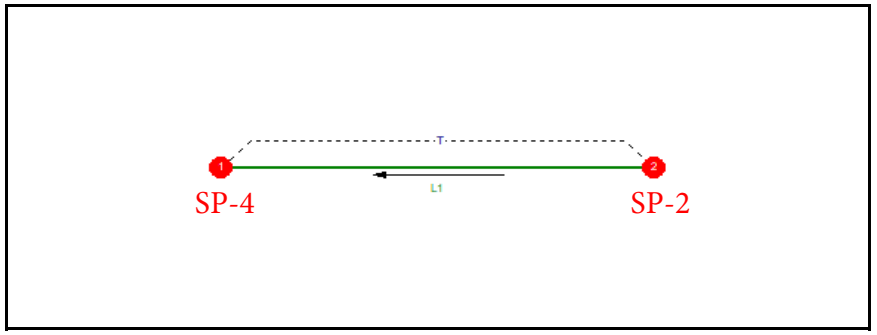
INPUT VALUES

Sequence #: 4

Configuration Type: Simple

Problem Identification: East



Angles (Degrees)

Span Lengths (ft)

[L 1]
102.00

Elevation Differences (ft)

[T]
0.00

Base Elevations (ft)

[Pavement]	[Pole 1]	[Pole 2]
926.39	926.92	926.11

Signals and Signs
{Distance (ft) / Weight (lbs)}

Span 1 (36.00/49.30), (45.00/49.30), [51.00/19.00]

Wire Weights (lbs)
(Assumed)

153.00 **Span 1**

Design Data

Min. SAG (ft):	3.06	**Max. SAG (ft):**	5.10	**Minimum Clearance (ft):**	22.00	**Wire Weight (lbs/ft):**	1.50
Sum of Loads (lbs):	117.60	**Sum of Areas (ft):**	8.95	**Wind Pressure (psf):**	42.00		

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Span Wire Signal Support Design

RESULT OF FINAL CALCULATION [MAX SAG]

Sequence #: 4 **Configuration Type:** Simple **Problem Identification:** East

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-125.15
Distance from end to low point (ft)	57.00
SAG below end of span (ft)	5.10

Pole Results

	[POLE 1] SP-4	[POLE 2] SP-2
Stringing Tension (lbs):	898.59	898.59
Attachment Height above pole base (ft)	26.57	27.38
Attachment Elevation (ft)	953.49	953.49
Base Moment (ft/lbs)	87960.23	90641.74

Other information

Calculated Design Factor :	3.68
Distance between Highest and Lowest Point (ft) :	5.10
Max. Wire Load (lbs):	3353.60

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.35), (0.00), [0.17]

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RESULT OF FINAL CALCULATION [MIN SAG]

Sequence #: 4 **Configuration Type:** Simple **Problem Identification:** East

Span Results

[SPAN 1]

Tension Relations:	1.00000
Elevation Differences (ft)	0.00
Reaction at the end of the span (lbs)	-125.15
Distance from end to low point (ft)	57.00
SAG below end of span (ft)	3.06

Pole Results

	[POLE 1]	[POLE 2]
Stringing Tension (lbs):	1497.65	1497.65
Attachment Height above pole base (ft)	24.53	25.34
Attachment Elevation (ft)	951.45	951.45
Base Moment (ft/lbs)	135344.	139813.

Other information

Calculated Design Factor :	3.68
Distance between Highest and Lowest Point (ft) :	3.06
Max. Wire Load (lbs):	5543.47

Height of each signal or sign attachment point above the lowest (ft)

Span 1 (0.21), (0.00), [0.10]

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RESULT OF COMBINATION CALCULATION

	FIRST POLE [Pole #]	[Sequence #]	SECOND POLE [Pole #]	[Sequence #]	ANGLE (degree)	MAX SAG BASE MOMENT (ft*lbs)	MAX SAG ANGLE OF RESULTANT (Span to 2nd Pole)	MIN SAG BASE MOMENT (ft*lbs)	MIN SAG ANGLE OF RESULTANT (Span to 2nd Pole)
SP-1	2	3	1	1	92.00	124179.02	41.86	192151.10	41.84
SP-3	2	1	1	2	93.00	122560.46	50.53	189752.34	50.47
SP-4	1	4	2	2	88.00	122955.71	44.79	189860.03	44.52
SP-2	1	3	2	4	87.00	128357.96	42.15	198543.65	42.31