



**NextEra Energy Resources, LLC
Eight Point Wind, LLC**

Electric and Magnetic Field (EMF) Calculation

**Report SL-13139-043-006
Preliminary Not for Construction
Revision C
02/16/2018
Project No.: 13139-043**

Prepared by

Sargent & Lundy^{LLC}



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NextEra Energy Resources, LLC
Preliminary Not for Construction - Eight Point Wind, LLC
115kV Transmission Line and 34.5kV Overhead Collection Line
Electric and Magnetic Field (EMF) Calculation
ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this Electric and Magnetic Field (EMF) Calculation has been prepared, reviewed and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

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EXECUTIVE SUMMARY

NextEra Energy Resources, LLC (Owner) has requested Sargent & Lundy, L.L.C. (S&L) to provide engineering services for the Eight Point Wind, LLC 115kV transmission line, which interconnects the proposed Eight Point Collector substation to the existing New York State Electric & Gas (NYSEG) Bennett substation. The 115kV Transmission line has five (5) distinct segments (segments 1-5), and the 34.5kV Overhead Collection line has one (1) segment (segment 6).

As part of the deliverables, S&L will determine the electric and magnetic fields (EMF) for the Winter Normal ratings per the New York Independent System Operator (NYISO) Tie-line Rating Report. The calculations will be used to determine the maximum electric field (kV/m) and magnetic fields (mG) within and at the edge of the right-of-way (ROW) for all six (6) unique segments.

1.0 PURPOSE AND SCOPE

1.1 DESCRIPTION

The purpose of this calculation will determine the electric and magnetic fields (EMF) for the Winter Normal ratings per the New York Independent System Operator (NYISO) Tie-line Rating Report.

1.2 ELECTRIC AND MAGNETIC FIELD GUIDELINES

New York State Public Service Commission (NYPSC) set forth in Opinion and Order Determining Health and Safety Issues, Imposing Operating Conditions, and Authorizing, in Case 26520, Operation Pursuant to those Conditions No. 78-13 and Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities, NYPSC Cases 26529 and 26559, sets the guidance for electric and magnetic fields, respectively.

These opinions and cases set forth the requirement of the minimum electric and magnetic fields at the edge of the ROW. For electric fields, 1.6 kV/m will be utilized and measured, one meter (3.28 ft.) above ground level, with the line at the rated voltage. The magnetic field strength requirement is 200 mG, measured at one meter (3.28 ft.) above grade, at the edge of ROW. The determination of the phase currents will be based on the Winter Normal rating from the NYISO Tie-line Rating Report. Finally, the conductor will be measured as its minimum height above ground for both electric and magnetic fields.

1.3 EXPOSURE STANDARDS

A number of organizations have provided some guidance on limiting exposure to electric and magnetic fields. The International Non-Ionizing Radiation Committee of International Radiation Protection (“IRPA”) provided their “ICNIRP Guidelines for Limiting Exposure on Time-Varying Electric and Magnetic Fields (1Hz-100kHz)”.

Table - 1 International Commission on Non-Ionizing Radiation Protection Guidelines		
Exposure (60 Hz)	Electric Field	Magnetic Field
Occupational: Reference Levels for Time-Varying Fields	8.333 kV/m	4.167 G
	(8,333 V/m)	(4,167 mG)
Current Density for Head and Body	10 mA/m ²	10 mA/m ² (5 G)
	(25 kV/m)	
General Public:		
Reference Levels for Time-Varying Fields	4.167 kV/m	0.833 G (833 mG)
	(4,167 V/m)	
Current Density for Head and Body	2 mA/m ²	2 mA/m ² (1 G)
	(5 kV/m)	

“Additionally, the American Conference of Governmental Industrial Hygienists (ACGIH 1998) established threshold limit values to which it is believed that nearly all workers may be exposed repeatedly without adverse health effects, based upon an assessment of available data from laboratory research and human exposure studies. The threshold limit values were developed as a guideline to assist in the control of health and safety hazards.”

Table - 2 ACGIH Occupational Threshold Limit Values for Sub-Radio	
Electric Field	Magnetic Field
Occupational exposures should not exceed: 25 kV/m (from 0 Hz to 100 Hz)	Occupational exposures should not exceed: 60 Hz: 10 G (10,000 mG)
Prudence dictates the use of protective devices (e.g., suits, gloves, insulation) in fields above 15 kV/m.	50 Hz: 12 G (12,000 mG)
For workers with cardiac pace- makers, maintain exposure at or below 1 kV/m.	For workers with cardiac pace- makers, the field should not exceed 1 G (1,000 mG).

Both the ICNIRP and ACGIH guidelines are based on established adverse health effects. The guidelines and these types of effect are much lower than typical levels found in residential and occupational environments.

2.0 DESIGN INPUTS

2.1 GENERAL

1. Local Computer: ZL11091
2. Bonneville Power Administrative (BPA) Corona and Field Effects Program (Version 3.1)
3. 8pt_10262017.xyz (PLS CADD model file)
4. PLS CADD v.14.4 (V&V # 03.7.893-14.4)
5. AutoCAD 2014 (V&V # 03.2.085-14.0)
6. MS Office (V&V # 03.2.435-14.0)
7. CYMCAP V6.2 (V&V # 03.7.919-6.2)

2.2 VERIFIED INPUTS

Table - 3 CABLE PROPERTIES			
Conductor Properties	Transmission Line	OH Collection Line	UG Collection Line
	1590 kcmil "Lapwing"	477 kcmil "Hawk"	1250 kcmil "XLPE"
Size (kcmil)	1590	477	1250
Stranding	45/7	26/7	N/A
Conductor Diameter (in)	1.504	0.858	1.25
Conductor Cross Sectional Area (in ²)	1.3355	0.4354	0.98181
Weight (lbs/ft)	1.7902	0.6553	3.069
Rated Tensile Strength (lbs)	42,200	19,500	N/A
Resistance, DC, 20°C (Ω /1000 ft)	0.0108	0.0356	N/A
Resistance, AC, 75°C (Ω /1000 ft)	0.0143	0.0436	N/A

*See Appendix A - General Cable Catalog

Table - 4 RATING OUTPUT SUMMARY			
Case	Rating Condition	Thermal Rating (Amperes)	Apparent Power " S_{MVA} " (MVA)
1	NYISO - Winter – Normal "Lapwing"	1979.1	394.21
1	NYISO - Winter – Normal "Hawk"	970.1	57.969
1	@ 90°C - UG Cable "1250 kcmil"	709	42.4

*See Appendix A for Rating Calculations and Reports

Probe characteristics for the calculations of Electric Field and Magnetic Field will be measured at 1 meter (3.28 ft) above ground elevation.

2.3 UNVERIFIED INPUTS/ASSUMPTIONS

Soil Conditions:

The soil resistivity value was assumed to be $100 \Omega \cdot m$. The noted ground resistivity was then converted into the required ground conductivity input value as follows:

The inputs to the BPA programs requires the ground conductivity to be entered ($mmhos/m = mS/m$). Therefore, the reciprocal of the ground resistivity of $100 \Omega \cdot m =$ the ground conductivity of $10 mS/m$.

Electric Field Shielding

Shield from objects was not considered as part of this calculation.

Conductor Phasing

Conductor Phasing was assumed B-A-C east to west for the typical wooden H-frame tangent structure. For the typical steel monopole tangent structure, conductors A, C, and B are assumed to be on the top western arm, lower western arm, and lower eastern arm, respectively.

Conductor Phasing on the adjacent line was not provided. It is assumed that phasing on the adjacent transmission line will produce the highest electric and magnetic fields.

Existing Transmission Line Ampacities / Clearances

Table - 5 EXISTING LINES - AMPACITIES

Item #	Line Name	kV	Conductor	Amps
1	Line # 966	115	1033.5 Ortolan ACSR	732
2	Line # 932	115	336.4 Oriole ACSR	720
3	Line # 539	34.5	397.5 Lark ACSR	595
4	Unknown	34.5	1033.5 Ortolan ACSR	595

Table - 6 EXISTING CABLE PROPERTIES

Conductor Properties	Existing Transmission / Distribution Lines		
	1033.5 kcmil "Ortolan"	336.4 kcmil "Oriole"	397.5 kcmil "Lark"
Size (kcmil)	1033.5	336.4	397.5
Stranding	45/7	26/7	30/7
Conductor Diameter (in)	1.212	0.741	0.806
Conductor Cross Sectional Area (in ²)	0.8681	0.359	0.385
Weight (lbs/ft)	1.163	0.526	.622
Rated Tensile Strength (lbs)	27,700	17,300	20,300
Resistance, DC, 20°C (Ω/1000 ft)	0.0167	0.0502	0.0425
Resistance, AC, 75°C (Ω/1000 ft)	0.0215	0.0614	0.0519

Existing Conductor configuration

See Appendix B cross section drawings for assumed dimensions. Minimum ground clearance of 20.3 ft. was assumed for all circuits.

The assumed 12.4kV distribution line is visible in the cross-section drawing 13139-043-TI-0905 (Appendix B), but given that it lies outside of the ROW with an approximate offset of 87ft from the edge of ROW. Its EMF Impact is not included in the assessment.

Ground elevation

The ground elevation input for the typical wood H-frame tangent and steel monopole tangent was 1980', based on LiDAR flown for the project. This is the average structure elevation for the entire line.

Underground collection line data

Backfill thermal resistivity is assumed to be 1.0 °C-M/W for the proposed underground collection line.

3.0 METHODOLOGY

3.1 CROSS SECTION STUDY AREA (EXHIBIT 35)

35 (a) ROW Segments with Unique Characteristics

Six (6) ROW segments with unique electric and magnetic field (EMF) characteristics were identified in the EMF study (Appendix B) off the entire transmission line and overhead collection line corridor for the proposed project. These ROW segments have unique EMF characteristics due to the type and average height of structures, corridor widths, and/or co-location of other transmission facilities in the corridor.

Table - 7 Description of ROW segments with Unique EMF Characteristics	
ROW Segment	ROW Segment Name
1	Overhead 115kV T-line with wood H-frames
2	Overhead 115kV T-line with steel monopoles
3	Overhead 115kV T-line with steel monopoles and an adjacent existing 115/34.5kV transmission and distribution lines (On the North side)
4	Overhead 115kV T-line with steel monopoles and an adjacent existing 34.5kV Distribution line (On the East side)
5	Overhead 115kV T-line with steel monopoles and adjacent UG 34.5kV Collection line
6	Overhead 34.5kV Collection line

35(b) Cross Sections

For the 6 unique ROW segments identified (see Table- 5 above), the EMF study provides both base case (where existing facilities are present) and proposed cross section, to scale, showing:

- All overhead electric transmission, sub-transmission and distribution facilities including the proposed project showing structural details and dimensions and identifying phase spacing, phasing, and any other characteristics affecting EMF calculation;

- All underground electric transmission, sub-transmission, and distribution facilities;
- All right-of-way boundaries; and
- Structural details and dimensions for all structures (dimensions, phase spacing, phasing, and similar categories) and include a station number identifying the locations.

Table - 8 Description of Route ROW Cross sections					
ROW Segment	Location	Applicable Route Section	ROW Width (ft)	Existing Utilities Adjacent to ROW	Proposed Lines in ROW
3	POI Take-Off to Mile 0.14	Cross Section - 1	100	34.5 kV Dist-line/115 kV T-line/ DC 115&34.5 kV T-lines	115 kV Eight Point Wind T-line
4	Mile 0.14 to Mile 0.68	Cross Section - 2	100	34.5 kV Dist-line.	115 kV Eight Point Wind T-line
2	Mile 0.68 to Mile 3.38	Cross Section - 3	100		115 kV Eight Point Wind T-line
2	Mile 3.38 to Mile 3.58	Cross Section - 4	75		115 kV Eight Point Wind T-line
2	Mile 3.58 to Mile 3.86	Cross Section - 5	100		115 kV Eight Point Wind T-line
2	Mile 3.86 to Mile 4.14	Cross Section - 6	100	12.4 kV Dist.	115 kV Eight Point Wind T-line
2	Mile 4.14 to Mile 5.27	Cross Section - 7	100		115 kV Eight Point Wind T-line
1	Mile 5.27 to Mile 7.57	Cross Section - 8	100		115 kV Eight Point Wind T-line
2	Mile 7.57 to Mile 11.87	Cross Section - 9	100		115 kV Eight Point Wind T-line
2	Mile 11.87 to Mile 12.23	Cross Section - 10	100	Gas Line	115 kV Eight Point Wind T-line

ROW Segment	Location	Applicable Route Section	ROW Width (ft)	Existing Utilities Adjacent to ROW	Proposed Lines in ROW
2	Mile 12.23 to Mile 13.3	Cross Section - 11	100		115 kV Eight Point Wind T-line
2	Mile 13.3 to Mile 14.32	Cross Section - 12	75		115 kV Eight Point Wind T-line
2	Mile 14.32 to Mile 14.82	Cross Section - 13	100		115 kV Eight Point Wind T-line
2	Mile 14.82 to Mile 15.79	Cross Section - 14	150		115 kV Eight Point Wind T-line
2	Mile 15.79 to Mile 16.26	Cross Section - 15	100		115 kV Eight Point Wind T-line
5	Mile 16.26 to Collector Take-Off	Cross Section - 16	100	UG 34.5kV Collection Line	115 kV Eight Point Wind T-line
6	Riser Str. 1 to Riser Str. 19	Cross Section	50		34.5 kV Eight Point Overhead Collection line

There are no underground gas transmission facilities planned as part of the project.

See Appendix B for cross section drawings.

35(c) Enhanced Aerial Photos/Drawings

Appendix C includes a set of sketches showing the exact location of each unique ROW segment and each cross-section. No occupied buildings were within the ROWs. In cases where a residence or occupied building was visible in a drawing but outside of the ROW, distance from the centerline of the proposed line to the nearest edge of the building are provided in the sketches.

AutoCAD was utilized to create cross sections drawings of the transmission line and overhead collection line route. These cross section drawings are intended only to present the dimensional locations of the line positions and are not intended to accurately depict the framing/construction of the existing or proposed structures.

Circuit Specifications:

The circuit inputs were entered into an MS Excel spreadsheet and then saved as a comma delimited (.csv) text file. The .csv files required minimal editing and are utilized directly by the BPA Corona and Field Effects Program.

4.0 RESULTS

Table - 9 EMF Results

Case Designation	EMF at Edge of 100' NEER ROW	EMF at Edge of 75' NEER ROW	EMF at Edge of 50' NEER ROW	Within ROW Maximum EMF	NYPSC Criteria at Edge of ROW
Electric Field kV/m)					
ROW Segment 1	0.555	n/a	n/a	1.788	1.6 kV/m
ROW Segment 2	0.351	0.76	n/a	1.739	1.6 kV/m
ROW Segment 3	0.357	n/a	n/a	1.744	1.6 kV/m
ROW Segment 4	0.355	n/a	n/a	1.729	1.6 kV/m
ROW Segment 5	0.351	n/a	n/a	1.739	1.6 kV/m
ROW Segment 6	n/a	n/a	0.376	0.498	1.6 kV/m
Magnetic Field (mG)					
ROW Segment 1	103.55	n/a	n/a	527	200 mG
ROW Segment 2	93.6	159	n/a	417	200 mG
ROW Segment 3	93.7	n/a	n/a	410.7	200 mG
ROW Segment 4	84.4	n/a	n/a	450	200 mG
ROW Segment 5	94.75	n/a	n/a	429.4	200 mG
ROW Segment 6	n/a	n/a	111.6	249.93	200 mG

In conclusion, the results of the study show that the calculated electric and magnetic fields are acceptable when compared to the electric fields requirement of 1.6 kV/m, one meter (3.28 ft.) above ground level, and the magnetic field strength requirement is 200 mG, measured at one meter (3.28 ft.) above grade, at the proposed NEER edge of ROW.

See Appendix B for the inputs and results of the Bonneville Power Administration (BPA) Corona and Field Effects and CYMCAP (©CYME International) computer programs.

5.0 EMF HEALTH EFFECTS

EMF exposure in residential and occupational situations has been studied for a wide variety of sources, including transmission lines, distribution lines, household wiring, electric appliances, electrically operated equipment or machinery, and others. A number of studies over the last 20 years or so generally have found no conclusive evidence of harmful effects from typical power line and substation EMF. Some studies during this period did report the potential for harmful effects. The evidence for such an association is inconclusive, and the most recent independent comprehensive review of the scientific literature by the National Academy of Sciences, Possible Health Effects of Exposure to Residential Electric and Magnetic Fields (1997), reached the following conclusions:

“Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects.”

The committee reviewed residential exposure levels to electric and magnetic fields, evaluated the available epidemiological studies, and examined laboratory investigations that used cells, isolated tissues, and animals. At exposure levels well above those normally encountered in residences, electric and magnetic fields can produce biologic effects (promotion of bone healing is an example), but these effects do not provide a consistent picture of a relationship between the biologic effects of these fields and health hazards. An association between residential wiring configurations (called wire codes) and childhood leukemia persists in multiple studies, although the causative factor responsible for that statistical association has not been identified. No evidence links contemporary measurements of magnetic-field levels to childhood leukemia.”

6.0 REFERENCES

1. STATE OF NEW YORK PUBLIC SERVICE COMMISSION CASES 26529 and 26559 - Proceeding on Motion of the Commission as to Regulations Regarding Electric and Magnetic Field Standards for Transmission Lines – Statement of Interim Policy on Magnetic Fields of Major Electric Transmission Facilities (Issued and Effective: September 11, 1990)
2. STATE OF NEW YORK PUBLIC SERVICE COMMISSION OPINION NO. 78-13 - Opinion and Order Determining Health and Safety Issues, Imposing Operating Conditions and Authorizing, in Case 26529, Operation Pursuant to those Conditions (Issued June 19, 1978)
3. New York Power Pool – Tie-Line Rating Task Force – Final Report on Tie-Line Rating (Approved November 1995)
4. General Cable Electric Utility Catalog (March 2014)
5. S&L Eight Point Line Conductor Rating Report Rev. A (S&L 13139-043-008, Dated 3/20/17)

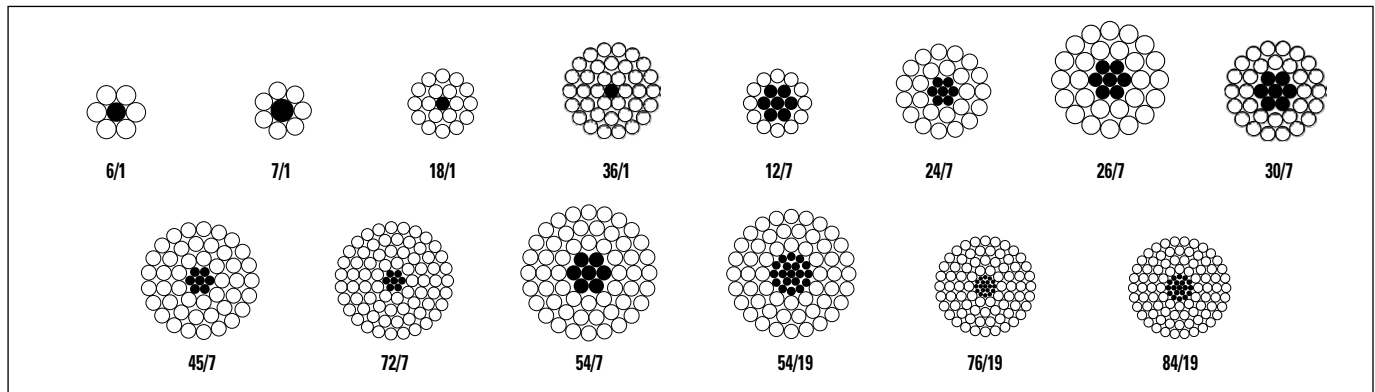
7.0 DIRECTORY OF APPENDICES

1. Appendix A: General Cable Catalog – Overhead Conductor Properties
2. Appendix B: EMF Study of Each Segment
3. Appendix C: Cross Section Sketches.

Appendix A: General Cable Catalog – Overhead Conductor Properties (ACSR Lapwing and
Lark Conductors)

TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded



Product Construction:

Complete Conductor:

ACSR is a composite concentric-lay-stranded conductor. ACSR conductors are manufactured in accordance with the requirements of the latest issue of ASTM B232.

The steel strand or strands form the central core of the conductor, around which is stranded one or more layers of aluminum 1350-H19 wires.

The steel core may consist of a single strand or a concentric-stranded cable of 7, 19, 37 or more wires. Numerous combinations of aluminum and steel strands and layers are possible. The sizes and strandings listed on the following pages are those most frequently used for overhead lines.

Features and Benefits:

ACSR conductors are recognized for their record of economy, dependability and favorable strength/weight ratio. ACSR conductors combine the light weight and good conductivity of aluminum with the high tensile strength and ruggedness of steel. In line design, this can provide higher tensions, less sag and longer span lengths than obtainable with most other types of overhead conductors. The steel strands are added as mechanical reinforcement. The cross-sections above illustrate some common strandings.

Features and Benefits (cont'd.):

The steel core wires are protected from corrosion by galvanizing. The standard Class A zinc coating is usually adequate for ordinary environments. For greater protection, Class C galvanized coatings may be specified. High-Strength (/GA3), Extra-High-Strength (/GA4) and Ultra-High-Strength (/GA5) steel core with Class A galvanizing and High-Strength (/MA3), Extra-High-Strength (/MA4) and Ultra-High-Strength (/MA5) steel core with Class A zinc-5% aluminum mischmetal alloy-coated steel core are also available.

The product is also available with corrosion inhibitor treatment applied to the central steel component.

Applications:

Aluminum Conductors, Steel-Reinforced (ACSR) are extensively used for overhead distribution and transmission lines.

Options:

- High-conductivity aluminum (/HC) (62.2% IACS)
- Regular-strength Class C galvanized steel core (/GC2)
- High-strength Class A galvanized steel core (/GA3 to ASTM B606)

Options (cont'd.):

- Extra-high-strength Class A galvanized steel core (/GA4 to ASTM B957)
- Ultra-high-strength Class A galvanized steel core (/GA5 to ASTM B957)
- Regular-strength Class A zinc-5% aluminum mischmetal alloy-coated steel core (/MA2 to ASTM B802)
- High-strength Class A zinc-5% aluminum mischmetal alloy-coated steel core (/MA3 to ASTM B803)
- Extra-high-strength Class A zinc-5% aluminum mischmetal alloy-coated steel core (/MA4 to ASTM B958)
- Ultra-high-strength Class A zinc-5% aluminum mischmetal alloy-coated steel core (/MA5 to ASTM B958)
- Aluminum-clad steel core (/AW)—see ACSR/AW catalog section
- Non-specular surface finish (/NS)
- Compact ACSR (ASTM B401) designs are available
- Trapezoidal-shaped aluminum strands (/TW)—see ACSR/TW catalog section
- Aluminum Alloy Steel Reinforced Conductors AACSR (ASTM B711) designs are available

For more information, or information on other conductor sizes, designs and/or specific installation requirements not shown in the tables, contact your General Cable sales representative or e-mail info@generalcable.com.



General Cable
info@generalcable.com

TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (MECHANICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	APPROX. WEIGHT LB/1000 FT (2)			PERCENT BY WEIGHT		RATED STRENGTH LBS			STANDARD PACKAGES (3)		
		AL	STEEL	TOTAL	AL		TOTAL	AL	STEEL	AL	STEEL	GA2	GA3 (HS)	GA5 (UHS)	REEL DESIGNATION	WEIGHT POUNDS	LENGTH FEET
Turkey	6	6x0.0661	1x0.0661	0.0240	0.0206	0.198	36.0	24.5	11.6	67.90	32.10	1190	1260	1320	NR 30.22 COIL	590 195	16340 5400
Swan	4	6x0.0834	1x0.0834	0.0382	0.0328	0.250	57.4	38.9	18.4	67.88	32.12	1860	1970	2070	NR 36.22 COIL	885 220	15420 3835
Swanate	4	7x0.0772	1x0.1029	0.0411	0.0328	0.257	67.0	38.9	28.0	58.13	41.87	2360	2520	2680	NR 38.22 NR 30.22 COIL	1200 600 240	17910 8955 3580
Sparrow	2	6x0.1052	1x0.1052	0.0608	0.0522	0.316	91.2	61.9	29.3	67.86	32.14	2850	3010	3180	NR 42.28 NR 36.22 NR 30.22 COIL	1770 885 590 220	19390 9695 6465 2410
Sparate	2	7x0.0974	1x0.1299	0.0654	0.0521	0.325	106.6	61.9	44.7	58.07	41.93	3640	3890	4150	NR 38.22 NR 30.22 COIL	1200 600 240	11250 5625 2250
Robin	1	6x0.1181	1x0.1181	0.0767	0.0657	0.354	115.0	78.1	36.9	67.88	32.12	3550	3760	3980	NR 42.28 NR 36.22 NR 30.22 COIL	1765 885 590 220	15360 7680 5120 1910
Raven	1/0	6x0.1327	1x0.1327	0.0968	0.0830	0.398	145.1	98.5	46.6	67.87	32.13	4380	4650	4910	NR 42.28 NR 36.22 NR 30.22 COIL	1770 885 590 220	12190 6095 4060 1515
Quail	2/0	6x0.1489	1x0.1489	0.1219	0.1045	0.447	182.9	124.1	58.7	67.89	32.11	5300	5720	6050	NR 42.28 NR 36.22 NR 30.22	1770 885 590	9670 4835 3220
Pigeon	3/0	6x0.1672	1x0.1672	0.1537	0.1317	0.502	230.5	156.5	74.0	67.89	32.11	6620	7150	7570	NR 42.28 NR 36.22 NR 30.22	1765 885 590	7670 3835 2560
Penguin	4/0	6x0.1878	1x0.1878	0.1939	0.1662	0.563	290.8	197.4	93.4	67.88	32.12	8350	9010	9550	NR 42.28 NR 36.22 NR 30.22	1770 885 590	6080 3040 2025
Waxwing	266.8	18x0.1217	1x0.1217	0.2210	0.2097	0.609	289	250	39	86.44	13.56	6880	7110	7330	RM 68.38 NR 66.28 NR 48.28	4150 4150 2075	14360 14360 7180
Spoonbill	266.8	22x0.1101	7x0.0612	0.2300	0.2095	0.624	321	251	70	78.28	21.72	8720	9120	9520	RM 68.38 NR 60.28 NR 48.28	2810 2810 1875	8755 8755 5835
Scaup	266.8	24x0.1054	7x0.0703	0.2366	0.2095	0.633	343	251	92	73.20	26.80	10000	10500	11100	RM 68.38 NR 66.28 NR 60.28	3265 3265 2180	9520 9520 6350
Partridge	266.8	26x0.1013	7x0.0788	0.2437	0.2096	0.642	367	251	116	68.50	31.50	11300	11900	12600	NR 60.28	3790	10330
Junco	266.8	30x0.0943	7x0.0943	0.2584	0.2095	0.660	417	252	166	60.35	39.65	13900	14900	15800	RM 68.38 NR 66.28	4970 4970	11890 11890
Ostrich	300.0	26x0.1074	7x0.0835	0.2739	0.2355	0.680	412	283	130	68.53	31.47	12700	13400	14200	NR 60.28	3785	9190
Merlin	336.4	18x0.1367	1x0.1367	0.2789	0.2642	0.684	365	315	49	86.43	13.57	8680	8960	9240	RM 68.38 NR 66.28 NR 48.28	4155 4155 2080	11390 11390 5695
Trogon	336.4	20x0.1297	7x0.0576	0.2825	0.2642	0.692	379	317	62	83.69	16.31	9470	9820	10200	RM 68.38 NR 60.28	4780 2390	12610 6305
Woodcock	336.4	22x0.1237	7x0.0687	0.2903	0.2644	0.701	405	317	88	78.29	21.71	10900	11400	11900	RMT 84.36 NR 60.28	5620 2810	13880 6940
Widgeon	336.4	24x0.1184	7x0.0789	0.2985	0.2642	0.710	433	317	116	73.22	26.78	12500	13200	13800	RMT 84.36 NR 60.28	6550 3275	15130 7565
Linnet	336.4	26x0.1137	7x0.0884	0.3070	0.2640	0.720	462	317	145	68.54	31.46	14100	14900	15800	RMT 84.36 NR 60.28	7580 3785	16390 8195
Oriole	336.4	30x0.1059	7x0.1059	0.3259	0.2642	0.741	526	318	209	60.34	39.66	17300	18500	19700	RM 68.38 NR 66.28	4970 4970	9430 9430
Chickadee	397.5	18x0.1486	1x0.1486	0.3295	0.3122	0.743	431	373	58	86.43	13.57	9940	10400	10700	RM 68.38 NR 66.28 NR 48.28	4150 4150 2075	9630 9630 4815
Ptarmigan	397.5	20x0.1410	7x0.0627	0.3339	0.3123	0.752	448	374	73	83.65	16.35	11100	11500	11900	RM 68.38 NR 60.28	4780 2390	10670 5335

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (/GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(2) Due to rounding, total values may be slightly greater or slightly less than the sum of the component values.

(3) Weights shown are for conductor only and do not include the reel. Normal length and shipping tolerances apply.

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.

TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (ELECTRICAL PROPERTIES)													
CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	RESISTANCE (4) OHMS/1000 FT			AMPACITY 75°C (5)	GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/1000 FT (6)	CAPACITIVE REACTANCE MEGAOHM 1000 FT (6)
		AL	STEEL	TOTAL	AL		DC @ 20°C	AC @ 25°C	AC @ 75°C				
Turkey	6	6x0.0661	1x0.0661	0.0240	0.0206	0.198	0.641	0.655	0.819	105	0.0017	0.1465	0.7511
Swan	4	6x0.0834	1x0.0834	0.0382	0.0328	0.250	0.403	0.411	0.524	140	0.0026	0.1372	0.7147
Swanate	4	7x0.0772	1x0.1029	0.0411	0.0328	0.257	0.399	0.407	0.529	140	0.0022	0.1410	0.7103
Sparrow	2	6x0.1052	1x0.1052	0.0608	0.0522	0.316	0.254	0.259	0.337	185	0.0039	0.1273	0.6784
Sparate	2	7x0.0974	1x0.1299	0.0654	0.0521	0.325	0.251	0.256	0.341	170	0.0037	0.1289	0.6740
Robin	1	6x0.1181	1x0.1181	0.0767	0.0657	0.354	0.201	0.206	0.272	210	0.0048	0.1226	0.6602
Raven	1/0	6x0.1327	1x0.1327	0.0968	0.0830	0.398	0.159	0.163	0.218	240	0.0059	0.1178	0.6420
Quail	2/0	6x0.1489	1x0.1489	0.1219	0.1045	0.447	0.126	0.129	0.177	275	0.0072	0.1133	0.6239
Pigeon	3/0	6x0.1672	1x0.1672	0.1537	0.1317	0.502	0.100	0.102	0.143	315	0.0086	0.1093	0.6058
Penguin	4/0	6x0.1878	1x0.1878	0.1939	0.1662	0.563	0.0795	0.0812	0.116	365	0.0101	0.1055	0.5876
Waxwing	266.8	18x0.1217	1x0.1217	0.2210	0.2097	0.609	0.0643	0.0657	0.0787	450	0.0196	0.0903	0.5755
Spoonbill	266.8	22x0.1101	7x0.0612	0.2300	0.2095	0.624	0.0643	0.0657	0.0786	450	0.0206	0.0893	0.5716
Scaup	266.8	24x0.1054	7x0.0703	0.2366	0.2095	0.633	0.0640	0.0654	0.0782	455	0.0211	0.0887	0.5694
Partridge	266.8	26x0.1013	7x0.0788	0.2437	0.2096	0.642	0.0637	0.0651	0.0779	455	0.0216	0.0882	0.5672
Junco	266.8	30x0.0943	7x0.0943	0.2584	0.2095	0.660	0.0633	0.0646	0.0773	460	0.0225	0.0872	0.5628
Ostrich	300.0	26x0.1074	7x0.0835	0.2739	0.2355	0.680	0.0567	0.0579	0.0693	490	0.0229	0.0868	0.5581
Merlin	336.4	18x0.1367	1x0.1367	0.2789	0.2642	0.684	0.0510	0.0522	0.0625	520	0.0220	0.0877	0.5573
Trogon	336.4	20x0.1297	7x0.0576	0.2825	0.2642	0.692	0.0512	0.0523	0.0626	520	0.0226	0.0871	0.5555
Woodcock	336.4	22x0.1237	7x0.0687	0.2903	0.2644	0.701	0.0510	0.0521	0.0624	520	0.0231	0.0866	0.5534
Widgeon	336.4	24x0.1184	7x0.0789	0.2985	0.2642	0.710	0.0508	0.0519	0.0621	525	0.0237	0.0861	0.5513
Linnet	336.4	26x0.1137	7x0.0884	0.3070	0.2640	0.720	0.0505	0.0517	0.0618	530	0.0242	0.0855	0.5491
Oriole	336.4	30x0.1059	7x0.1059	0.3259	0.2642	0.741	0.0502	0.0513	0.0614	535	0.0253	0.0845	0.5446
Chickadee	397.5	18x0.1486	1x0.1486	0.3295	0.3122	0.743	0.0432	0.0442	0.0529	575	0.0240	0.0857	0.5443
Ptarmigan	397.5	20x0.1410	7x0.0627	0.3339	0.3123	0.752	0.0433	0.0444	0.0531	575	0.0245	0.0852	0.5424

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core ((GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(4) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C for aluminum and 8% IACS at 20°C for the steel core. AC resistance for single-layer and three-layer designs approximates the effects of core magnetization. To convert to ohms/mile, multiply by 5.28. To convert to ohms/km, multiply by 3.281.

(5) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity, 0.5 coefficient of absorptivity, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft² of solar and sky radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.

(6) Values for inductive reactance and capacitive reactance are expressed in terms of a 1 ft radius.



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TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (MECHANICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	APPROX. WEIGHT LB/1000 FT (2)			PERCENT BY WEIGHT		RATED STRENGTH LBS			STANDARD PACKAGES (3)		
		AL	STEEL	TOTAL	AL		TOTAL	AL	STEEL	AL	STEEL	GA2	GA3 (HS)	GA5 (UHS)	REEL DESIGNATION	WEIGHT POUNDS	LENGTH FEET
Stork	397.5	22x0.1344	7x0.0747	0.3428	0.3121	0.762	478	374	104	78.28	21.72	12900	13400	14000	RMT 84.36 NR 60.28	5605 2805	11730 5865
Brant	397.5	24x0.1287	7x0.0858	0.3527	0.3122	0.772	511	374	137	73.21	26.79	14600	15400	16200	RMT 84.36 NR 60.28	6535 3270	12790 6395
Ibis	397.5	26x0.1236	7x0.0961	0.3627	0.3120	0.783	546	374	172	68.53	31.47	16300	17300	18200	RMT 84.36 NR 60.28	7575 3785	13870 6935
Lark	397.5	30x0.1151	7x0.1151	0.3850	0.3121	0.806	622	375	247	60.35	39.65	20300	21700	23100	RM 68.38 NR 66.28	4965 4965	7980 7980
Pelican	477.0	18x0.1628	1x0.1628	0.3955	0.3747	0.814	517	447	70	86.43	13.57	11800	12300	12700	RM 68.38 NR 66.28 NR 48.28	4150 4150 2075	8030 8030 4015
Tailorbird	477.0	20x0.1544	7x0.0686	0.4003	0.3746	0.824	537	449	88	83.69	16.31	13100	13600	14100	RM 68.38 NR 60.28	4780 2390	8900 4450
Toucan	477.0	22x0.1472	7x0.0818	0.4112	0.3744	0.834	574	449	125	78.30	21.70	15200	15900	16700	RMT 84.36 NR 60.28	5620 2810	9790 4895
Flicker	477.0	24x0.1410	7x0.0940	0.4233	0.3747	0.846	614	449	164	73.20	26.80	17200	18100	19000	RMT 84.36 NR 60.28	6535 3265	10660 5330
Hawk	477.0	26x0.1354	7x0.1053	0.4353	0.3744	0.858	656	449	206	68.52	31.48	19500	20700	21900	RMT 84.36 NR 60.28	7580 3785	11560 5780
Hen	477.0	30x0.1261	7x0.1261	0.4621	0.3747	0.883	746	450	296	60.34	39.66	23800	25500	27200	RM 68.38 NR 66.28	4960 4960	6650 6650
Heron	500.0	30x0.1291	7x0.1291	0.4843	0.3927	0.904	782	472	310	60.35	39.65	25000	26700	28500	RM 68.38	4960	6345
Osprey	556.5	18x0.1758	1x0.1758	0.4612	0.4369	0.879	603	522	82	86.44	13.56	13700	14300	14800	RM 68.38 NR 66.28 NR 48.28	4155 4155 2075	6890 6890 3445
Tody	556.5	20x0.1668	7x0.0741	0.4672	0.4370	0.890	626	524	102	83.68	16.32	15300	15800	16400	RM 68.38 NR 60.28	4770 2385	7620 3810
Sapsucker	556.5	22x0.1590	7x0.0883	0.4797	0.4368	0.901	669	524	145	78.32	21.68	17600	18400	19200	RMT 84.36 NR 60.28	5615 2805	8390 4195
Parakeet	556.5	24x0.1523	7x0.1015	0.4939	0.4372	0.914	716	524	192	73.22	26.78	19800	20900	22000	RMT 84.36 NR 60.28	6545 3270	9140 4570
Dove	556.5	26x0.1463	7x0.1138	0.5083	0.4371	0.927	765	524	241	68.50	31.50	22600	24000	25300	RMT 84.36 NR 60.28	7580 3790	9910 4955
Eagle	556.5	30x0.1362	7x0.1362	0.5391	0.4371	0.953	871	525	345	60.35	39.65	27800	29700	31700	RM 68.38 NR 66.28	4960 4960	5700 5700
Peacock	605.0	24x0.1588	7x0.1059	0.5370	0.4753	0.953	779	570	209	73.19	26.81	21600	22700	23900	RMT 84.36 NR 60.28	6550 3275	8410 4205
Squab	605.0	26x0.1525	7x0.1186	0.5522	0.4749	0.966	832	570	262	68.52	31.48	24300	25800	27300	RMT 84.36 NR 60.28	7580 3790	9110 4555
Wood Duck	605.0	30x0.1420	7x0.1420	0.5860	0.4751	0.994	947	571	375	60.35	39.65	28900	31600	33700	RM 68.38 NR 66.28	4960 4960	5245 5245
Teal	605.0	30x0.1420	19x0.0852	0.5834	0.4751	0.994	939	571	367	60.85	39.15	30000	32000	34000	RMT 84.45 RM 68.38 NR 66.28	9840 4920 4920	10490 5245 5245
Swift	636.0	36x0.1329	1x0.1329	0.5133	0.4994	0.930	643	596	47	92.72	7.28	13800	14000	14300	RMT 96.60 RMT 84.45 RM 68.38 NR 66.28	11630 7750 3875 3875	18090 12050 6025 6025
Kingbird	636.0	18x0.1880	1x0.1880	0.5274	0.4997	0.940	690	596	94	86.43	13.57	15700	16300	16900	RMT 84.36 RM 68.38 NR 66.28 NR 48.28	6250 4155 4155 2075	9060 6020 6020 3010
Turacos	636.0	20x0.1783	7x0.0792	0.5339	0.4994	0.951	716	599	117	83.69	16.31	17400	18100	18800	RMT 84.36 RM 68.38 NR 60.28	7160 4775 2390	10000 6670 3335
Goldfinch	636.0	22x0.1700	7x0.0944	0.5483	0.4994	0.963	765	599	166	78.32	21.68	19900	20800	21700	RMT 84.45 RMT 84.36 NR 60.28	8425 5615 2810	11010 7340 3670
Rook	636.0	24x0.1628	7x0.1085	0.5643	0.4996	0.977	818	599	219	73.22	26.78	22600	23900	25100	RMT 84.45 RMT 84.36 NR 60.28	9815 6545 3270	12000 8000 4000

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (/GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(2) Due to rounding, total values may be slightly greater or slightly less than the sum of the component values.

(3) Weights shown are for conductor only and do not include the reel. Normal length and shipping tolerances apply.

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.



TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (ELECTRICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	RESISTANCE (4) OHMS/1000 FT			AMPACITY 75°C (5)	GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/1000 FT (6)	CAPACITIVE REACTANCE MEGAOHM 1000 FT (6)
		AL	STEEL	TOTAL	AL		DC @ 20°C	AC @ 25°C	AC @ 75°C				
Stork	397.5	22x0.1344	7x0.0747	0.3428	0.3121	0.762	0.0431	0.0442	0.0528	580	0.0251	0.0847	0.5404
Brant	397.5	24x0.1287	7x0.0858	0.3527	0.3122	0.772	0.0430	0.0440	0.0526	585	0.0257	0.0841	0.5382
Ibis	397.5	26x0.1236	7x0.0961	0.3627	0.3120	0.783	0.0428	0.0438	0.0523	585	0.0263	0.0836	0.5360
Lark	397.5	30x0.1151	7x0.1151	0.3850	0.3121	0.806	0.0425	0.0434	0.0519	595	0.0275	0.0826	0.5316
Pelican	477.0	18x0.1628	1x0.1628	0.3955	0.3747	0.814	0.0360	0.0369	0.0442	645	0.0263	0.0836	0.5300
Tailorbird	477.0	20x0.1544	7x0.0686	0.4003	0.3746	0.824	0.0361	0.0370	0.0443	645	0.0269	0.0831	0.5281
Toucan	477.0	22x0.1472	7x0.0818	0.4112	0.3744	0.834	0.0359	0.0369	0.0441	650	0.0275	0.0826	0.5261
Flicker	477.0	24x0.1410	7x0.0940	0.4233	0.3747	0.846	0.0358	0.0367	0.0439	655	0.0282	0.0820	0.5240
Hawk	477.0	26x0.1354	7x0.1053	0.4353	0.3744	0.858	0.0356	0.0365	0.0437	660	0.0288	0.0815	0.5218
Hen	477.0	30x0.1261	7x0.1261	0.4621	0.3747	0.883	0.0354	0.0362	0.0433	665	0.0301	0.0805	0.5173
Heron	500.0	30x0.1291	7x0.1291	0.4843	0.3927	0.904	0.0338	0.0346	0.0413	685	0.0309	0.0799	0.5136
Osprey	556.5	18x0.1758	1x0.1758	0.4612	0.4369	0.879	0.0308	0.0317	0.0379	710	0.0284	0.0819	0.5179
Tody	556.5	20x0.1668	7x0.0741	0.4672	0.4370	0.890	0.0309	0.0318	0.0380	710	0.0290	0.0813	0.5161
Sapsucker	556.5	22x0.1590	7x0.0883	0.4797	0.4368	0.901	0.0308	0.0317	0.0378	715	0.0297	0.0808	0.5140
Parakeet	556.5	24x0.1523	7x0.1015	0.4939	0.4372	0.914	0.0307	0.0315	0.0376	720	0.0304	0.0803	0.5119
Dove	556.5	26x0.1463	7x0.1138	0.5083	0.4371	0.927	0.0305	0.0313	0.0375	725	0.0311	0.0797	0.5097
Eagle	556.5	30x0.1362	7x0.1362	0.5391	0.4371	0.953	0.0303	0.0311	0.0372	735	0.0326	0.0787	0.5052
Peacock	605.0	24x0.1588	7x0.1059	0.5370	0.4753	0.953	0.0282	0.0290	0.0347	760	0.0317	0.0793	0.5053
Squab	605.0	26x0.1525	7x0.1186	0.5522	0.4749	0.966	0.0281	0.0289	0.0345	765	0.0325	0.0788	0.5031
Wood Duck	605.0	30x0.1420	7x0.1420	0.5860	0.4751	0.994	0.0279	0.0286	0.0342	775	0.0339	0.0777	0.4987
Teal	605.0	30x0.1420	19x0.0852	0.5834	0.4751	0.994	0.0279	0.0287	0.0342	775	0.0340	0.0777	0.4987
Swift	636.0	36x0.1329	1x0.1329	0.5133	0.4994	0.930	0.0271	0.0282	0.0349	750	0.0301	0.0805	0.5090
Kingbird	636.0	18x0.1880	1x0.1880	0.5274	0.4997	0.940	0.0270	0.0278	0.0332	775	0.0303	0.0803	0.5075
Turacos	636.0	20x0.1783	7x0.0792	0.5339	0.4994	0.951	0.0271	0.0279	0.0333	775	0.0310	0.0798	0.5056
Goldfinch	636.0	22x0.1700	7x0.0944	0.5483	0.4994	0.963	0.0270	0.0278	0.0331	780	0.0318	0.0793	0.5036
Rook	636.0	24x0.1628	7x0.1085	0.5643	0.4996	0.977	0.0268	0.0276	0.0330	785	0.0325	0.0787	0.5014

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (/GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(4) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C for aluminum and 8% IACS at 20°C for the steel core. AC resistance for single-layer and three-layer designs approximates the effects of core magnetization. To convert to ohms/mile, multiply by 5.28. To convert to ohms/km, multiply by 3.281.

(5) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity, 0.5 coefficient of absorptivity, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft² of solar and sky radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.

(6) Values for inductive reactance and capacitive reactance are expressed in terms of a 1 ft radius.



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TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (MECHANICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	APPROX. WEIGHT LB/1000 FT (2)			PERCENT BY WEIGHT		RATED STRENGTH LBS			STANDARD PACKAGES (3)		
		AL	STEEL	TOTAL	AL		TOTAL	AL	STEEL	AL	STEEL	GA2	GA3 (HS)	GA5 (UHS)	REEL DESIGNATION	WEIGHT POUNDS	LENGTH FEET
Grosbeak	636.0	26x0.1564	7x0.1216	0.5808	0.4995	0.990	874	599	275	68.52	31.48	25200	26800	28300	RMT 90.45 RMT 84.36 NR 60.28	11370 7580 3790	13010 8670 4335
Scoter	636.0	30x0.1456	7x0.1456	0.6160	0.4995	1.019	995	601	395	60.35	39.65	30400	33200	35400	RMT 96.60 RM 68.38	14930 4975	15020 5005
Egret	636.0	30x0.1456	19x0.0874	0.6135	0.4995	1.019	987	601	387	60.83	39.17	31500	33600	35800	RMT 96.60 RMT 84.45 RM 68.38 NR 66.28	14765 9850 4925 4925	14960 9980 4990 4990
Flamingo	666.6	24x0.1667	7x0.1111	0.5917	0.5238	1.000	858	628	230	73.21	26.79	23700	25000	26300	RMT 84.45 RMT 84.36 NR 60.28	9835 6545 3275	11460 7630 3815
Gannet	666.6	26x0.1601	7x0.1245	0.6086	0.5234	1.014	916	628	289	68.52	31.48	26400	28000	29700	RMT 90.45 RMT 84.36 NR 60.28	11380 7595 3795	12410 8280 4140
Stilt	715.5	24x0.1727	7x0.1151	0.6350	0.5622	1.036	921	674	247	73.21	26.79	25500	26900	28300	RMT 84.45 RMT 84.36 NR 60.28	9820 6540 3270	10660 7100 3550
Starling	715.5	26x0.1659	7x0.1290	0.6535	0.5620	1.051	984	674	310	68.51	31.49	28400	30100	31900	RMT 90.45 RMT 84.36 NR 60.28	11365 7585 3795	11550 7710 3855
Redwing	715.5	30x0.1544	19x0.0926	0.6897	0.5617	1.081	1110	676	434	60.88	39.12	34600	36900	39300	RMT 96.60 RMT 84.45 RM 68.38 NR 66.28	14750 9850 4925 4925	13300 8880 4440 4440
Coot	795.0	36x0.1486	1x0.1486	0.6417	0.6244	1.040	804	745	58	92.72	7.28	16800	17200	17500	RMT 96.60 RMT 84.45 NR 66.28	11620 7740 3870	14470 9640 4820
Macaw	795.0	42x0.1376	7x0.0764	0.6567	0.6246	1.055	857	749	109	87.33	12.67	20100	20700	21300	RMT 90.45 RM 68.38 NR 60.28	9610 4805 3200	11200 5600 3730
Turbit	795.0	20x0.1994	7x0.0886	0.6677	0.6246	1.063	895	749	146	83.67	16.33	21800	22600	23500	RMT 84.36 RM 68.38 NR 60.28	7160 4770 2385	8000 5330 2665
Tern	795.0	45x0.1329	7x0.0886	0.6674	0.6242	1.063	895	749	146	83.67	16.33	22100	22900	23700	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16110 10740 5370 3580	18000 12000 6000 4000
Puffin	795.0	22x0.1901	7x0.1056	0.6857	0.6244	1.077	956	749	208	78.30	21.70	24800	26000	27200	RMT 84.45 RMT 84.36 NR 60.28	8420 5620 2810	8800 5870 2935
Cuckoo	795.0	24x0.1820	7x0.1213	0.7053	0.6244	1.092	1023	749	274	73.22	26.78	27900	29500	31000	RMT 84.45 RMT 84.36 NR 60.28	9830 6545 3275	9610 6400 3200
Condor	795.0	54x0.1213	7x0.1213	0.7049	0.6240	1.092	1023	749	274	73.22	26.78	28200	29700	31300	RMT 96.60 RMT 90.45	19130 11775	18720 11520
Drake	795.0	26x0.1749	7x0.1360	0.7263	0.6246	1.107	1093	749	344	68.50	31.50	31500	33500	35400	RMT 90.45 RMT 84.36 NR 60.28	11365 7585 3795	10400 6940 3470
Mallard	795.0	30x0.1628	19x0.0977	0.7669	0.6245	1.140	1234	751	483	60.84	39.16	38400	41100	43700	RMT 96.60 RMT 84.45 RM 68.38	14770 9845 4925	11970 7980 3990
Ruddy	900.0	45x0.1414	7x0.0943	0.7555	0.7066	1.131	1013	848	166	83.66	16.34	24400	25400	26300	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16095 10730 5365 3575	15890 10590 5295 3530
Canary	900.0	54x0.1291	7x0.1291	0.7985	0.7069	1.162	1158	848	310	73.21	26.79	31900	33700	35400	RMT 96.60 RMT 90.45	19155 11790	16540 10180
Catbird	954.0	36x0.1628	1x0.1628	0.7702	0.7494	1.140	964	894	70	92.72	7.28	19800	20300	20700	RMT 96.60 RMT 84.45	11625 7740	12060 8030
Phoenix	954.0	42x0.1507	7x0.0837	0.7877	0.7491	1.155	1029	899	130	87.33	12.67	23400	24100	24900	RMT 90.45 RM 68.38	9600 4800	9340 4670

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (/GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(2) Due to rounding, total values may be slightly greater or slightly less than the sum of the component values.

(3) Weights shown are for conductor only and do not include the reel. Normal length and shipping tolerances apply.

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.



TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (ELECTRICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	RESISTANCE (4) OHMS/1000 FT			AMPACITY 75°C (5)	GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/1000 FT (6)	CAPACITIVE REACTANCE MEGAOHM 1000 FT (6)
		AL	STEEL	TOTAL	AL		DC @ 20°C	AC @ 25°C	AC @ 75°C				
Grosbeak	636.0	26x0.1564	7x0.1216	0.5808	0.4995	0.990	0.0267	0.0275	0.0328	790	0.0333	0.0782	0.4992
Scoter	636.0	30x0.1456	7x0.1456	0.6160	0.4995	1.019	0.0265	0.0273	0.0326	795	0.0348	0.0772	0.4948
Egret	636.0	30x0.1456	19x0.0874	0.6135	0.4995	1.019	0.0266	0.0273	0.0326	795	0.0348	0.0772	0.4947
Flamingo	666.6	24x0.1667	7x0.1111	0.5917	0.5238	1.000	0.0256	0.0264	0.0315	805	0.0333	0.0782	0.4977
Gannet	666.6	26x0.1601	7x0.1245	0.6086	0.5234	1.014	0.0255	0.0262	0.0313	810	0.0341	0.0777	0.4956
Stilt	715.5	24x0.1727	7x0.1151	0.6350	0.5622	1.036	0.0239	0.0246	0.0294	845	0.0345	0.0774	0.4922
Starling	715.5	26x0.1659	7x0.1290	0.6535	0.5620	1.051	0.0238	0.0245	0.0292	850	0.0353	0.0768	0.4900
Redwing	715.5	30x0.1544	19x0.0926	0.6897	0.5617	1.081	0.0236	0.0243	0.0290	860	0.0369	0.0758	0.4856
Coot	795.0	36x0.1486	1x0.1486	0.6417	0.6244	1.040	0.0217	0.0227	0.0279	865	0.0337	0.0779	0.4916
Macaw	795.0	42x0.1376	7x0.0764	0.6567	0.6246	1.055	0.0217	0.0227	0.0279	870	0.0346	0.0773	0.4894
Turbit	795.0	20x0.1994	7x0.0886	0.6677	0.6246	1.063	0.0216	0.0224	0.0268	890	0.0347	0.0772	0.4881
Tern	795.0	45x0.1329	7x0.0886	0.6674	0.6242	1.063	0.0216	0.0226	0.0279	870	0.0351	0.0770	0.4881
Puffin	795.0	22x0.1901	7x0.1056	0.6857	0.6244	1.077	0.0216	0.0223	0.0266	895	0.0355	0.0767	0.4861
Cuckoo	795.0	24x0.1820	7x0.1213	0.7053	0.6244	1.092	0.0215	0.0222	0.0265	900	0.0364	0.0762	0.4840
Condor	795.0	54x0.1213	7x0.1213	0.7049	0.6240	1.092	0.0215	0.0223	0.0276	880	0.0366	0.0760	0.4840
Drake	795.0	26x0.1749	7x0.1360	0.7263	0.6246	1.107	0.0214	0.0221	0.0263	905	0.0372	0.0756	0.4818
Mallard	795.0	30x0.1628	19x0.0977	0.7669	0.6245	1.140	0.0213	0.0219	0.0261	915	0.0389	0.0746	0.4773
Ruddy	900.0	45x0.1414	7x0.0943	0.7555	0.7066	1.131	0.0191	0.0200	0.0246	940	0.0373	0.0756	0.4784
Canary	900.0	54x0.1291	7x0.1291	0.7985	0.7069	1.162	0.0190	0.0198	0.0244	955	0.0390	0.0746	0.4742
Catbird	954.0	36x0.1628	1x0.1628	0.7702	0.7494	1.140	0.0181	0.0191	0.0234	970	0.0369	0.0758	0.4773
Phoenix	954.0	42x0.1507	7x0.0837	0.7877	0.7491	1.155	0.0181	0.0190	0.0234	975	0.0379	0.0752	0.4751

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core ((GA2)). See the Options section to find the appropriate code word modifier designation for alternative design options.

(4) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C for aluminum and 8% IACS at 20°C for the steel core. AC resistance for single-layer and three-layer designs approximates the effects of core magnetization. To convert to ohms/mile, multiply by 5.28. To convert to ohms/km, multiply by 3.281.

(5) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity, 0.5 coefficient of absorptivity, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft² of solar and sky radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.

(6) Values for inductive reactance and capacitive reactance are expressed in terms of a 1 ft radius.



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TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (MECHANICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	APPROX. WEIGHT LB/1000 FT (2)			PERCENT BY WEIGHT		RATED STRENGTH LBS			STANDARD PACKAGES (3)		
		AL	STEEL	TOTAL	AL		TOTAL	AL	STEEL	AL	STEEL	GA2	GA3 (HS)	GA5 (UHS)	REEL DESIGNATION	WEIGHT POUNDS	LENGTH FEET
Corncrake	954.0	20x0.2184	7x0.0971	0.8011	0.7492	1.165	1074	899	175	83.66	16.34	25600	26600	27600	RMT 84.36 RM 68.38	7165 4780	6670 4450
Rail	954.0	45x0.1456	7x0.0971	0.8011	0.7492	1.165	1074	899	175	83.66	16.34	25900	26900	27900	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16110 10740 5370 3350	15000 10000 5000 3335
Towhee	954.0	48x0.1410	7x0.1097	0.8157	0.7495	1.175	1123	899	224	80.05	19.95	28500	29700	31000	RMT 96.60 RMT 90.45 RMT 84.36	17970 11980 5990	16000 10670 5335
Redbird	954.0	24x0.1994	7x0.1329	0.8466	0.7495	1.196	1227	899	329	73.21	26.79	33500	35400	37200	RMT 84.45 RMT 84.36	9825 6545	8000 5330
Cardinal	954.0	54x0.1329	7x0.1329	0.8462	0.7491	1.196	1227	899	329	73.21	26.79	33800	35700	37600	RMT 96.60 RMT 90.45	19140 11780	15600 9600
Canvasback	954.0	30x0.1783	19x0.1070	0.9201	0.7493	1.248	1480	901	580	60.85	39.15	46100	49300	52500	RMT 96.60 RMT 84.45 RM 68.38	14770 9855 4930	9980 6660 3330
Snowbird	1033.5	42x0.1569	7x0.0872	0.8539	0.8121	1.203	1115	973	142	87.31	12.69	25300	26100	26900	RMT 90.45 RM 68.38	9610 4805	8610 4305
Ortolan	1033.5	45x0.1515	7x0.1010	0.8681	0.8121	1.212	1163	973	190	83.68	16.32	27700	28800	29800	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16110 10735 5365 3575	13850 9230 4615 3075
Whooper	1033.5	48x0.1467	7x0.1141	0.8829	0.8113	1.223	1216	973	242	80.07	19.93	30800	32200	33500	RMT 96.60 RMT 90.45 RMT 84.36	17945 11970 5985	14770 9850 4925
Curlew	1033.5	54x0.1383	7x0.1383	0.9164	0.8112	1.245	1329	973	356	73.22	26.78	36600	38700	40700	RMT 96.60 RMT 90.45	19140 11790	14400 8870
Avocet	1113.0	42x0.1628	7x0.0904	0.9192	0.8743	1.248	1200	1048	152	87.33	12.67	27100	27900	28800	RMT 96.60 RMT 90.45 RM 68.38	14410 9610 4805	12000 8000 4000
Bluejay	1113.0	45x0.1573	7x0.1049	0.9350	0.8745	1.259	1253	1048	205	83.66	16.34	29800	31000	32100	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16115 10745 5375 3580	12850 8570 4285 2855
Bullfinch	1113.0	48x0.1523	7x0.1184	0.9516	0.8744	1.269	1310	1048	261	80.04	19.96	32800	34300	35800	RMT 96.60 RMT 90.45 RMT 84.36	17945 11975 5985	13700 9140 4570
Finch	1113.0	54x0.1436	19x0.0861	0.9854	0.8746	1.293	1430	1053	376	73.69	26.31	39100	41100	43200	RMT 96.60 RMT 90.45	19035 11725	13310 8200
Oxbird	1192.5	42x0.1685	7x0.0936	0.9847	0.9365	1.292	1286	1123	163	87.32	12.68	29000	29900	30900	RMT 96.60 RMT 90.45 RM 68.38	14405 9605 4805	11200 7470 3735
Bunting	1192.5	45x0.1628	7x0.1085	1.0014	0.9367	1.302	1342	1123	219	83.68	16.32	32000	33200	34400	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16105 10735 5370 3575	12000 8000 4000 2665
Cormorant	1192.5	48x0.1576	7x0.1226	1.0190	0.9364	1.313	1403	1123	280	80.06	19.94	34700	36300	37900	RMT 96.60 RMT 90.45 RMT 84.36	17960 11970 5985	12800 8530 4265
Grackle	1192.5	54x0.1486	19x0.0892	1.0553	0.9365	1.338	1531	1129	403	73.70	26.30	41900	44100	46300	RMT 96.60 RMT 90.45	19025 12560	12420 8200
Skylark	1272.0	36x0.1880	1x0.1880	1.0271	0.9993	1.316	1286	1192	94	92.72	7.28	26400	27000	27600	RMT 96.60 RMT 84.45	11645 7750	9050 6020
Scissortail	1272.0	42x0.1740	7x0.0967	1.0501	0.9987	1.334	1372	1198	174	87.32	12.68	30900	31900	32900	RMT 96.60 RMT 90.45 RM 68.38	14405 9605 4800	10500 7000 3500
Bittern	1272.0	45x0.1681	7x0.1121	1.0678	0.9987	1.345	1432	1198	234	83.67	16.33	34100	35400	36700	RMT 96.60 RMT 90.45 RM 68.38 NR 60.28	16110 10740 5370 3580	11250 7500 3750 2500

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (/GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(2) Due to rounding, total values may be slightly greater or slightly less than the sum of the component values.

(3) Weights shown are for conductor only and do not include the reel. Normal length and shipping tolerances apply.

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.



TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (ELECTRICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	RESISTANCE (4) OHMS/1000 FT			AMPACITY 75°C (5)	GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/1000 FT (6)	CAPACITIVE REACTANCE MEGAOHM 1000 FT (6)
		AL	STEEL	TOTAL	AL		DC @ 20°C	AC @ 25°C	AC @ 75°C				
Corncrake	954.0	20x0.2184	7x0.0971	0.8011	0.7492	1.165	0.0180	0.0188	0.0224	995	0.0380	0.0751	0.4738
Rail	954.0	45x0.1456	7x0.0971	0.8011	0.7492	1.165	0.0180	0.0190	0.0233	975	0.0384	0.0749	0.4738
Towhee	954.0	48x0.1410	7x0.1097	0.8157	0.7495	1.175	0.0180	0.0189	0.0232	980	0.0390	0.0746	0.4725
Redbird	954.0	24x0.1994	7x0.1329	0.8466	0.7495	1.196	0.0179	0.0186	0.0222	1010	0.0398	0.0741	0.4697
Cardinal	954.0	54x0.1329	7x0.1329	0.8462	0.7491	1.196	0.0179	0.0187	0.0230	990	0.0401	0.0739	0.4697
Canvasback	954.0	30x0.1783	19x0.1070	0.9201	0.7493	1.248	0.0177	0.0183	0.0218	1025	0.0426	0.0725	0.4630
Snowbird	1033.5	42x0.1569	7x0.0872	0.8539	0.8121	1.203	0.0167	0.0176	0.0216	1025	0.0394	0.0743	0.4688
Ortolan	1033.5	45x0.1515	7x0.1010	0.8681	0.8121	1.212	0.0167	0.0176	0.0215	1025	0.0400	0.0740	0.4676
Whooper	1033.5	48x0.1467	7x0.1141	0.8829	0.8113	1.223	0.0166	0.0175	0.0214	1030	0.0405	0.0737	0.4662
Curlew	1033.5	54x0.1383	7x0.1383	0.9164	0.8112	1.245	0.0165	0.0173	0.0213	1040	0.0418	0.0730	0.4634
Avocet	1113.0	42x0.1628	7x0.0904	0.9192	0.8743	1.248	0.0155	0.0164	0.0201	1070	0.0409	0.0735	0.4630
Bluejay	1113.0	45x0.1573	7x0.1049	0.9350	0.8745	1.259	0.0155	0.0164	0.0200	1075	0.0415	0.0731	0.4618
Bullfinch	1113.0	48x0.1523	7x0.1184	0.9516	0.8744	1.269	0.0154	0.0163	0.0199	1080	0.0421	0.0728	0.4604
Finch	1113.0	54x0.1436	19x0.0861	0.9854	0.8746	1.293	0.0154	0.0162	0.0199	1085	0.0434	0.0721	0.4576
Oxbird	1192.5	42x0.1685	7x0.0936	0.9847	0.9365	1.292	0.0145	0.0154	0.0188	1115	0.0423	0.0727	0.4576
Bunting	1192.5	45x0.1628	7x0.1085	1.0014	0.9367	1.302	0.0144	0.0154	0.0187	1120	0.0429	0.0723	0.4564
Cormorant	1192.5	48x0.1576	7x0.1226	1.0190	0.9364	1.313	0.0144	0.0153	0.0187	1125	0.0436	0.0720	0.4550
Grackle	1192.5	54x0.1486	19x0.0892	1.0553	0.9365	1.338	0.0144	0.0152	0.0186	1135	0.0449	0.0713	0.4522
Skylark	1272.0	36x0.1880	1x0.1880	1.0271	0.9993	1.316	0.0135	0.0146	0.0177	1155	0.0426	0.0725	0.4548
Scissortail	1272.0	42x0.1740	7x0.0967	1.0501	0.9987	1.334	0.0136	0.0145	0.0177	1160	0.0437	0.0719	0.4526
Bittern	1272.0	45x0.1681	7x0.1121	1.0678	0.9987	1.345	0.0135	0.0145	0.0176	1165	0.0443	0.0716	0.4513

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(4) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C for aluminum and 8% IACS at 20°C for the steel core. AC resistance for single-layer and three-layer designs approximates the effects of core magnetization. To convert to ohms/mile, multiply by 5.28. To convert to ohms/km, multiply by 3.281.

(5) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity, 0.5 coefficient of absorptivity, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft² of solar and sky radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.

(6) Values for inductive reactance and capacitive reactance are expressed in terms of a 1 ft radius.



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TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (MECHANICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	APPROX. WEIGHT LB/1000 FT (2)			PERCENT BY WEIGHT		RATED STRENGTH LBS			STANDARD PACKAGES (3)		
		AL	STEEL	TOTAL	AL		TOTAL	AL	STEEL	AL	STEEL	GA2	GA3 (HS)	GA5 (UHS)	REEL DESIGNATION	WEIGHT POUNDS	LENGTH FEET
Diver	1272.0	48x0.1628	7x0.1266	1.0873	0.9992	1.357	1496	1198	298	80.06	19.94	37000	38700	40400	RMT 96.60 RMT 90.45	17950 11970	12000 8000
Pheasant	1272.0	54x0.1535	19x0.0921	1.1259	0.9993	1.381	1633	1204	429	73.71	26.29	43600	46000	48300	RMT 96.60 RMT 90.45	19025 11715	11650 7175
Ringdove	1351.5	42x0.1794	7x0.0997	1.1163	1.0617	1.376	1458	1273	185	87.31	12.69	32900	33900	35000	RMT 96.60 RMT 90.45	14415 9615	9880 6590
Dipper	1351.5	45x0.1733	7x0.1155	1.1348	1.0614	1.386	1521	1273	248	83.68	16.32	36200	37600	39000	RMT 96.60 RMT 90.45	16095 10730	10590 7060
-none-	1351.5	48x0.1678	7x0.1305	1.1551	1.0614	1.398	1590	1273	317	80.06	19.94	39400	41200	43000	RMT 96.60 RMT 90.45	17940 11965	11290 7530
Martin	1351.5	54x0.1582	19x0.0949	1.1958	1.0614	1.424	1735	1279	456	73.72	26.28	46300	48800	51300	RMT 96.60 RMT 90.45	19015 11720	10960 6755
Popinjay	1431.0	42x0.1846	7x0.1026	1.1820	1.1241	1.415	1544	1348	196	87.31	12.69	34800	35900	37100	RMT 96.60 RMT 90.45	14405 9605	9330 6220
Bobolink	1431.0	45x0.1783	7x0.1189	1.2013	1.1236	1.426	1611	1348	263	83.67	16.33	38300	39800	41300	RMT 96.60 RMT 90.45	16110 10735	10000 6665
Wagtail	1431.0	48x0.1727	7x0.1343	1.2235	1.1244	1.439	1684	1348	336	80.06	19.94	41700	43600	45500	RMT 96.60 RMT 90.45	17950 11975	10660 7110
Plover	1431.0	54x0.1628	19x0.0977	1.2665	1.1241	1.465	1838	1354	483	73.71	26.29	49100	51700	54400	RMT 96.60 RMT 90.45	19025 11715	10350 6375
Nuthatch	1510.5	45x0.1832	7x0.1221	1.2682	1.1862	1.466	1700	1423	277	83.68	16.32	40100	41600	43200	RMT 96.60 RMT 90.45	16105 10740	9480 6320
Parrot	1510.5	54x0.1672	19x0.1003	1.3358	1.1856	1.505	1939	1430	509	73.74	26.26	51700	54500	57300	RMT 96.60 RMT 90.45	18990 11705	9800 6040
Ratite	1590.0	42x0.1946	7x0.1081	1.3134	1.2492	1.492	1715	1498	218	87.32	12.68	38700	39900	41200	RMT 96.60 RMT 90.45	14405 9605	8400 5600
Lapwing	1590.0	45x0.1880	7x0.1253	1.3355	1.2492	1.504	1790	1498	292	83.67	16.33	42200	43900	45500	RMT 96.60 RMT 90.45	16110 10740	9000 6000
Hornbill	1590.0	48x0.1820	7x0.1416	1.3590	1.2487	1.517	1871	1498	373	80.05	19.95	45300	47900	50000	RMT 96.60 RMT 90.45	17960 11975	9600 6400
Falcon	1590.0	54x0.1716	19x0.1030	1.4072	1.2489	1.545	2042	1505	537	73.70	26.30	54500	57500	60400	RMT 96.60 RMT 90.45	19030 11720	9320 5740
Chukar	1780.0	84x0.1456	19x0.0874	1.5126	1.3986	1.602	2071	1685	387	81.33	18.67	51000	53100	55200	RMT 96.60	19070	9200
Seahawk	1869.0	68x0.1658	7x0.0921	1.5148	1.4681	1.603	1927	1769	158	91.81	8.19	40000	40900	41800	RMT 96.60	17345	9000
Mockingbird	2034.5	72x0.1681	7x0.1121	1.6670	1.5979	1.681	2160	1926	234	89.17	10.83	46800	48100	49400	RMT 96.60	16115	7460
Roadrunner	2057.5	76x0.1645	19x0.0768	1.7033	1.6152	1.700	2246	1947	299	86.71	13.29	50400	52100	53700	RMT 96.60	17510	7800
Bluebird	2156.0	84x0.1602	19x0.0961	1.8310	1.6931	1.762	2508	2041	467	81.36	18.64	60300	62800	65400	RMT 96.60	18805	7500
Kiwi	2167.0	72x0.1735	7x0.1157	1.7758	1.7022	1.735	2300	2051	249	89.17	10.83	49800	51300	52700	RMT 96.60	16100	7000
Thrasher	2312.0	76x0.1744	19x0.0814	1.9144	1.8155	1.802	2524	2188	335	86.71	13.29	56700	58500	60400	RMT 96.60	17660	7000
Joree	2515.0	76x0.1819	19x0.0849	2.0826	1.9750	1.880	2745	2380	365	86.71	13.29	61700	63700	65700	RMT 96.60	17295	6300

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED-HIGH-STRENGTH STRANDING (MECHANICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	APPROX. WEIGHT LB/1000 FT (2)			PERCENT BY WEIGHT		RATED STRENGTH LBS			STANDARD PACKAGES (3)		
		AL	STEEL	TOTAL	AL		TOTAL	AL	STEEL	AL	STEEL	GA2	GA3 (HS)	GA5 (UHS)	REEL DESIGNATION	WEIGHT POUNDS	LENGTH FEET
Grouse	80.0	8x0.1000	1x0.1670	0.0847	0.0628	0.367	148.8	75.0	73.9	50.38	49.62	5200	5730	6150	NR 36.22	1130	7580
Petrel	101.8	12x0.0921	7x0.0921	0.1266	0.0799	0.461	253.8	95.9	157.9	37.78	62.22	10400	11200	12100	NR 48.28	3175	12500
Minorca	110.8	12x0.0961	7x0.0961	0.1378	0.0870	0.480	276.3	104.4	171.9	37.78	62.22	11300	12200	13200	NR 48.28	3170	11480
Leghorn	134.6	12x0.1059	7x0.1059	0.1674	0.1057	0.530	335.5	126.8	208.7	37.79	62.21	13600	14800	16000	NR 48.28	3175	9450
Guinea	159.0	12x0.1151	7x0.1151	0.1977	0.1249	0.576	396.3	149.8	246.6	37.79	62.21	16000	17400	18800	NR 48.28	3175	8000
Dotterel	176.9	12x0.1214	7x0.1214	0.2199	0.1389	0.607	440.9	166.6	274.3	37.79	62.21	17300	18900	20400	NR 48.28	3175	7195
Dorking	190.8	12x0.1261	7x0.1261	0.2373	0.1499	0.630	475.7	179.7	296.0	37.78	62.22	18800	20400	22100	NR 48.28	3175	6665
Brahma	203.2	16x0.1127	19x0.0977	0.3020	0.1596	0.714	674.6	191.4	483.2	28.37	71.63	28400	31100	33700	RM 68.38	5310	7875
Cochin	211.3	12x0.1327	7x0.1327	0.2628	0.1660	0.663	526.8	199.0	327.8	37.78	62.22	20700	22600	24400	NR 48.28	3175	6020

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core ((GA2)). See the Options section to find the appropriate code word modifier designation for alternative design options.

(2) Due to rounding, total values may be slightly greater or slightly less than the sum of the component values.

(3) Weights shown are for conductor only and do not include the reel. Normal length and shipping tolerances apply.

Dimensions and weights not designated minimum or maximum are nominal values and subject to manufacturing tolerances. In this context, weight means mass.

TransPowr® ACSR Bare Overhead Conductor

Aluminum Conductor Steel-Reinforced Concentric-Lay-Stranded

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED (ELECTRICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	RESISTANCE (4) OHMS/1000 FT			AMPACITY 75°C (5)	GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/1000 FT (6)	CAPACITIVE REACTANCE MEGAOHM 1000 FT (6)
		AL	STEEL	TOTAL	AL		DC @ 20°C	AC @ 25°C	AC @ 75°C				
Diver	1272.0	48x0.1628	7x0.1266	1.0873	0.9992	1.357	0.0135	0.0144	0.0175	1170	0.0450	0.0713	0.4500
Pheasant	1272.0	54x0.1535	19x0.0921	1.1259	0.9993	1.381	0.0135	0.0143	0.0175	1180	0.0464	0.0706	0.4471
Ringdove	1351.5	42x0.1794	7x0.0997	1.1163	1.0617	1.376	0.0128	0.0137	0.0167	1205	0.0451	0.0712	0.4478
Dipper	1351.5	45x0.1733	7x0.1155	1.1348	1.0614	1.386	0.0127	0.0137	0.0166	1210	0.0457	0.0709	0.4466
-none-	1351.5	48x0.1678	7x0.1305	1.1551	1.0614	1.398	0.0127	0.0136	0.0165	1215	0.0464	0.0706	0.4452
Martin	1351.5	54x0.1582	19x0.0949	1.1958	1.0614	1.424	0.0127	0.0135	0.0165	1225	0.0478	0.0699	0.4424
Popinjay	1431.0	42x0.1846	7x0.1026	1.1820	1.1241	1.415	0.0121	0.0131	0.0158	1245	0.0464	0.0706	0.4434
Bobolink	1431.0	45x0.1783	7x0.1189	1.2013	1.1236	1.426	0.0120	0.0130	0.0157	1255	0.0470	0.0703	0.4421
Wagtail	1431.0	48x0.1727	7x0.1343	1.2235	1.1244	1.439	0.0120	0.0129	0.0157	1260	0.0477	0.0699	0.4408
Plover	1431.0	54x0.1628	19x0.0977	1.2665	1.1241	1.465	0.0120	0.0128	0.0156	1270	0.0492	0.0692	0.4379
Nuthatch	1510.5	45x0.1832	7x0.1221	1.2682	1.1862	1.466	0.0114	0.0124	0.0150	1295	0.0483	0.0696	0.4379
Parrot	1510.5	54x0.1672	19x0.1003	1.3358	1.1856	1.505	0.0114	0.0122	0.0148	1310	0.0505	0.0686	0.4337
Ratite	1590.0	42x0.1946	7x0.1081	1.3134	1.2492	1.492	0.0108	0.0119	0.0143	1330	0.0489	0.0694	0.4351
Lapwing	1590.0	45x0.1880	7x0.1253	1.3355	1.2492	1.504	0.0108	0.0118	0.0143	1335	0.0496	0.0690	0.4338
Hornbill	1590.0	48x0.1820	7x0.1416	1.3590	1.2487	1.517	0.0108	0.0117	0.0142	1340	0.0503	0.0687	0.4325
Falcon	1590.0	54x0.1716	19x0.1030	1.4072	1.2489	1.545	0.0108	0.0117	0.0141	1350	0.0518	0.0680	0.4297
Chukar	1780.0	84x0.1456	19x0.0874	1.5126	1.3986	1.602	0.00970	0.0106	0.0125	1450	0.0532	0.0674	0.4240
Seahawk	1869.0	68x0.1658	7x0.0921	1.5148	1.4681	1.603	0.00930	0.0104	0.0122	1470	0.0523	0.0678	0.4239
Mockingbird	2034.5	72x0.1681	7x0.1121	1.6670	1.5979	1.681	0.00853	0.00965	0.0112	1550	0.0551	0.0666	0.4164
Roadrunner	2057.5	76x0.1645	19x0.0768	1.7033	1.6152	1.700	0.00842	0.00950	0.0111	1565	0.0560	0.0662	0.4146
Bluebird	2156.0	84x0.1602	19x0.0961	1.8310	1.6931	1.762	0.00801	0.00903	0.0105	1620	0.0586	0.0652	0.4090
Kiwi	2167.0	72x0.1735	7x0.1157	1.7758	1.7022	1.735	0.00801	0.00917	0.0106	1605	0.0569	0.0659	0.4115
Thrasher	2312.0	76x0.1744	19x0.0814	1.9144	1.8155	1.802	0.00749	0.00865	0.0100	1670	0.0594	0.0649	0.4055
Joree	2515.0	76x0.1819	19x0.0849	2.0826	1.9750	1.880	0.00689	0.00810	0.00935	1750	0.0619	0.0639	0.3989

ACSR, ALUMINUM CONDUCTOR, STEEL-REINFORCED, CONCENTRIC-LAY-STRANDED-HIGH-STRENGTH STRANDING (ELECTRICAL PROPERTIES)

CODE WORD (1)	SIZE AWG OR kcmil	STRANDING NO. X DIA. INCHES		CROSS-SECTION SQ. INCHES		O.D. INCHES	RESISTANCE (4) OHMS/1000 FT			AMPACITY 75°C (5)	GEOMETRIC MEAN RADIUS FT	INDUCTIVE REACTANCE OHM/1000 FT (6)	CAPACITIVE REACTANCE MEGAOHM 1000 FT (6)
		AL	STEEL	TOTAL	AL		DC @ 20°C	AC @ 25°C	AC @ 75°C				
Grouse	80.0	8x0.1000	1x0.1670	0.0847	0.0628	0.367	0.206	0.211	0.291	205	0.0037	0.1284	0.6548
Petrel	101.8	12x0.0921	7x0.0921	0.1266	0.0799	0.461	0.158	0.161	0.239	240	0.0039	0.1276	0.6192
Minorca	110.8	12x0.0961	7x0.0961	0.1378	0.0870	0.480	0.145	0.148	0.223	250	0.0042	0.1256	0.6125
Leghorn	134.6	12x0.1059	7x0.1059	0.1674	0.1057	0.530	0.120	0.122	0.189	280	0.0051	0.1213	0.5973
Guinea	159.0	12x0.1151	7x0.1151	0.1977	0.1249	0.576	0.101	0.103	0.165	305	0.0059	0.1179	0.5843
Dotterel	176.9	12x0.1214	7x0.1214	0.2199	0.1389	0.607	0.0911	0.0926	0.151	325	0.0065	0.1158	0.5759
Dorking	190.8	12x0.1261	7x0.1261	0.2373	0.1499	0.630	0.0845	0.0858	0.142	340	0.0067	0.1149	0.5700
Brahma	203.2	16x0.1127	19x0.0977	0.3020	0.1596	0.714	0.0764	0.0777	0.132	360	0.0080	0.1110	0.5505
Cochin	211.3	12x0.1327	7x0.1327	0.2628	0.1660	0.663	0.0763	0.0775	0.130	360	0.0076	0.1121	0.5620

(1) Code words shown denote ACSR with regular-strength Class A Galvanized steel core (GA2). See the Options section to find the appropriate code word modifier designation for alternative design options.

(2) Based on a conductivity of 61.2% (minimum lot average) IACS at 20°C for aluminum and 8% IACS at 20°C for the steel core. AC resistance for single-layer and three-layer designs approximates the effects of core magnetization. To convert to ohms/mile, multiply by 5.28. To convert to ohms/km, multiply by 3.281.

(5) Based on a conductor temperature of 75°C at 60 Hz and the following conditions: 25°C ambient temperature, 2 ft/sec crosswind (90° to conductor), 0.5 coefficient of emissivity, 0.5 coefficient of absorptivity, 30° northern latitude, sea level elevation, 90° azimuth of line (East-West), clear atmosphere, and a date and time of noon on July 1 (resulting in 96.0 W/ft² of solar and sky radiated heat). Actual ampacity will differ based on local conditions. For specific ampacities, please contact your General Cable sales representative.

(6) Values for inductive reactance and capacitive reactance are expressed in terms of a 1 ft radius.



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Sargent & Lundy

Project Name: 'f:\nextera\eight point collection\04.0 design documents\04.03 drawings - native files (working)\.08 transmission\models\pls\08072017_oh collection route.D0N'

Line Title: 'EIGHT POINT OH COLLECTION SHORT SPANS - WOOD'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC

EIGHT POINT WIND, LLC

13139-045

DESIGN CRITERIA: REV. A DATED XX/XX/XXXX

PROJECT LOCATION: STEUBEN COUNTY, NY

NESC ZONE: HEAVY

INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE

ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

IEEE Std. 738-2006 method of calculation

Air temperature is 41.00 (deg F)

Wind speed is 3.00 (ft/s)

Angle between wind and conductor is 90 (deg)

Conductor elevation above sea level is 1980 (ft)

Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)

Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)

Conductor latitude is 43.0 (deg)

Atmosphere is CLEAR

Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

Conductor description: 477.0 kcmil 26/7 Hawk/ACSR/GA2 - General Cable [Chart A7/C26/0.8601] Conductor Type 16

Conductor diameter is 0.858 (in)

Conductor AC resistance is 0.1918 (Ohm/mile) at 77.0 (deg F)

and 0.2293 (Ohm/mile) at 167.0 (deg F)

Emissivity is 0.6 and solar absorptivity is 0.6

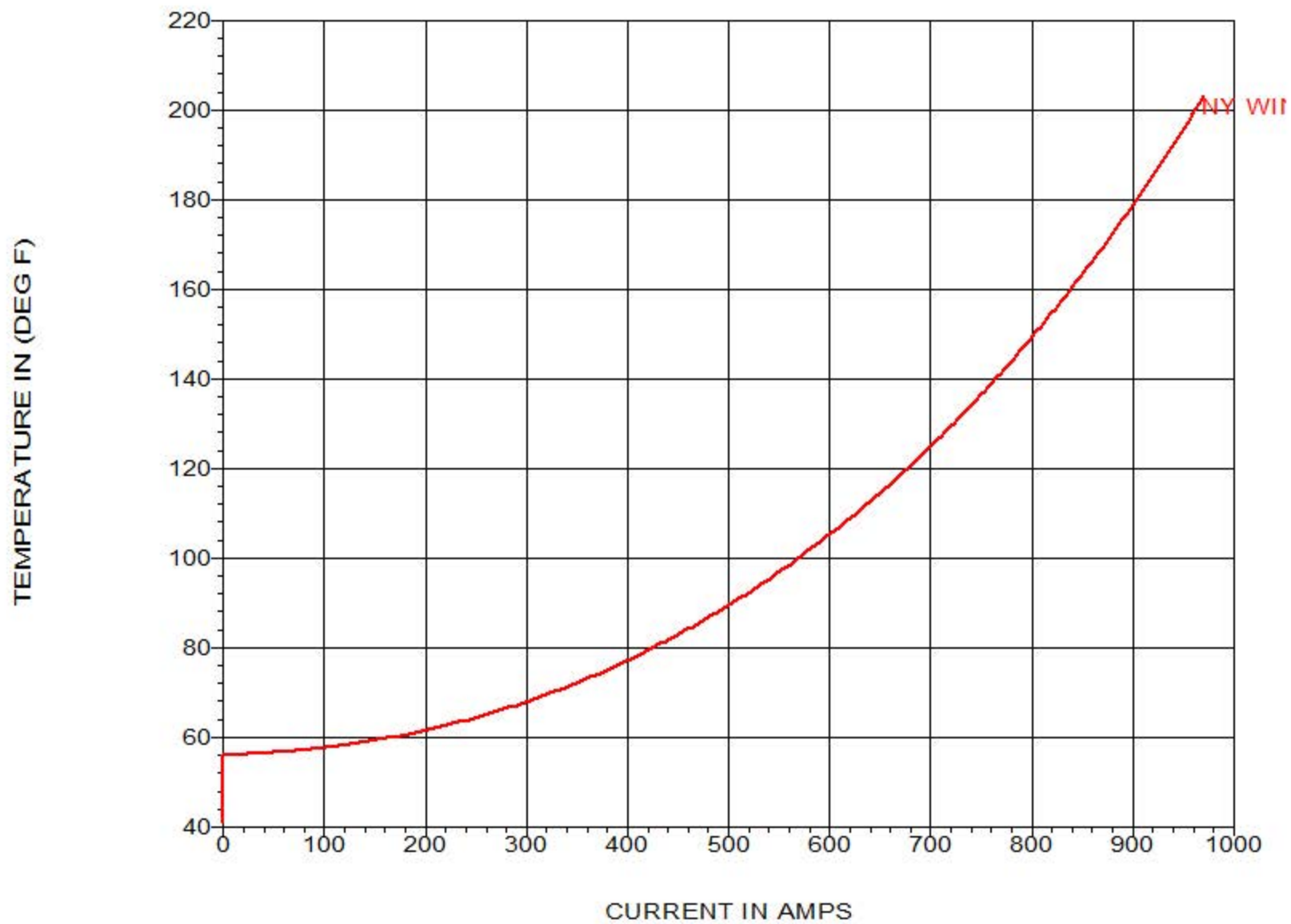
Solar heat input is 4.340 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft^2) - which was calculated)

Radiation cooling is 8.786 (Watt/ft)

Convective cooling is 39.101 (Watt/ft)

Given a maximum conductor temperature of 203.0 (deg F),

The steady-state thermal rating is 970.1 amperes





**NextEra Energy Resources, LLC
Eight Point Wind, LLC**

Transmission Line Conductor Rating Report

**Report SL-13139-043-008
Preliminary Not for Construction**

Revision A

04/05/2017

Project No.: 13139-043

Prepared by



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NextEra Energy Resources, LLC

Preliminary Not for Construction - Eight Point Wind, LLC

115kV Transmission Line

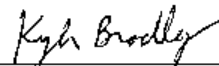
Transmission Line Conductor Rating Report

ISSUE SUMMARY AND APPROVAL PAGE

This is to certify that this Conductor Rating Report has been prepared, reviewed and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ANSI/ISO/ASSQC Q9001 Quality Management Systems.

CONTRIBUTORS

Prepared by:



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3/20/17

Date

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Kunhal Parikh
Project Manager

4/05/17

Date

Approved by:



Kunhal Parikh
Project Manager

4/05/17

Date

NextEra Energy Resources, LLC
Preliminary Not for Construction – Eight Point Wind, LLC
Transmission Line Conductor Rating Report

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EXECUTIVE SUMMARY

NextEra Energy Resources, LLC (Owner) has requested Sargent & Lundy, L.L.C. (S&L) to provide engineering services for the Eight Point Wind, LLC 115kV transmission line, which interconnects the proposed Eight Point Collector with the existing NYSEG Substation.

As part of the deliverables, S&L will determine the conductor line ratings for the Summer and Winter Normal, LTE and STE line ratings per the New York Power Pool (Tie-Line Ratings Task Force). Additionally, S&L will determine the conductor line ratings based on Normal and Emergency Rating based on FAC-008 and FAC-009 document, provided by the Owner.

1. PURPOSE/OBJECTIVE

1.1. DESCRIPTION

In order to, determine the required ampacity and conductor rating for the Eight Point Wind, LLC 115kV transmission line, S&L will utilize IEEE 738 – 2006, “IEEE Standard for Calculating the Current-Temperature Relationship of Bare Overhead Conductors”. The calculation will utilize the PLS-CADD thermal rating calculation module that implements the IEEE standard stated above.

2. ASSUMPTIONS/INPUTS

2.1. INPUTS

2.1.1. CONDUCTOR PROPERTIES

The project will utilize 1590 kcmil 45/7 ACSR “Lapwing” conductor.

TABLE - 1 CABLE PROPERTIES

Conductor Properties	1590 kcmil “Lapwing”
Size (kcmil)	1590
Stranding	45/7
Conductor Diameter (in)	1.504
Conductor Cross Sectional Area (in ²)	1.3355
Weight (lbs/ft)	1.7902
Rated Tensile Strength (lbs)	42,200
Resistance, DC, 20°C (Ω/1000 ft)	.0108
Resistance, AC, 75°C (Ω/1000 ft)	.0143

*Properties from General Cable

The following inputs from the New York Power Pool (Tie-Line Ratings Task Force Dated November 1995) and they will be utilized for the calculation for IEEE 738 – 2006.

TABLE - 2 NEW YORK POWER POOL RATING INPUT CONDITIONS

Rating Input Conditions	Assumptions for Summer Rating	Assumptions for Winter Rating
Conductor Temperature (°C/°F)	NYPP Normal – 95/203 NYPP LTE – 115/239 NYPP STE – 125/257	NYPP Normal – 95/203 NYPP LTE – 115/239 NYPP STE – 125/257
Average Ambient Air Temperature (°C/°F)	30/86	5/41
Emissivity	0.6	0.6
Absorptivity	0.6	0.6
Wind speed normal to conductor (fps)	3	3
Altitude (ft)	1980	1980
Conductor Latitude (°)	43	43
Sun time (hours)	12	12
Wind to Conductor Angle/Bearing(°)	90	90
Atmosphere	Clear	Clear

TABLE - 3 NEXTERA NERC FAC-008 AND FAC-009 INPUT CONDITIONS

Rating Input Conditions	Assumptions for Normal Rating	Assumptions for Emergency Rating
Conductor Temperature (°C/°F)	100/212	100/212
Average Ambient Air Temperature (°C/°F)	40/104	40/104
Emissivity	0.7	0.7
Absorptivity	0.8	0.8
Wind speed normal to conductor (fps)	2	2
Altitude (ft)	1980	1980
Solar and sky radiated heat flux (W/ft ²)	93	93

2.2. ASSUMPTIONS/UNVERIFIED INPUTS

-N/A

3. CONDUCTOR RATING RESULTS

3.1.1. IEEE 738-2006 RESULTS

The steady-state thermal rating outputs for all rating conditions were included in Appendix A. The following table summarizes the output and calculates the thermal rating and apparent power for each condition.

TABLE - 4 RATING OUTPUT SUMMARY

Case	Rating Condition	Thermal Rating (Amperes)	Apparent Power “ S_{MVA} ” (MVA)
1	Summer – Normal	1662.8	331.21
2	NYPP – Summer – LTE	1905.8	379.61
3	NYPP – Summer – STE	2011.6	400.68
4	NEER – Normal	1457.3	290.27
5	NEER – Emergency	1457.3	290.27
6	Winter – Normal	1979.1	394.21
7	NYPP – Winter – LTE	2170.2	432.27
8	NYPP – Winter – STE	2256.3	449.42

The following formulas were used to calculate the apparent power (S_{MVA}).

$$S_{MVA} = \sqrt{3} \times I_{lapwing} \times N_{bundle} \times V_{P-P(kV)} / 1000$$

$$I_{lapwing} = \text{See Table 4}$$

$$N_{bundle} = 1$$

$$V_{P-P(kV)} = 115 \text{ kV}$$

4. REFERENCES

4.1. CODES & STANDARDS

1. INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE) 738-2006
2. NEW YORK POWER POOL – TIE-LINE RATINGS TASK FORCE – 1995
3. EXHIBIT NERC FAC-008-3 ENGINEERING AND DOCUMENTATION REQUIRED FOR COMPLIANCE FOR NEER TRANSMISSION AND GENERATION FACILITIES – (2014)

4.2. MATERIAL

1. GENERAL CABLE PRODUCT CATALOG

APPENDIX A – PLS-CADD IEEE 738-2006 OUTPUT

CASE 1: NYPP – SUMMER NORMAL RATING (203°F) CRITERIA

PLS-CADD Version 14.40x64 10:56:13 AM Thursday, March 09, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\spt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

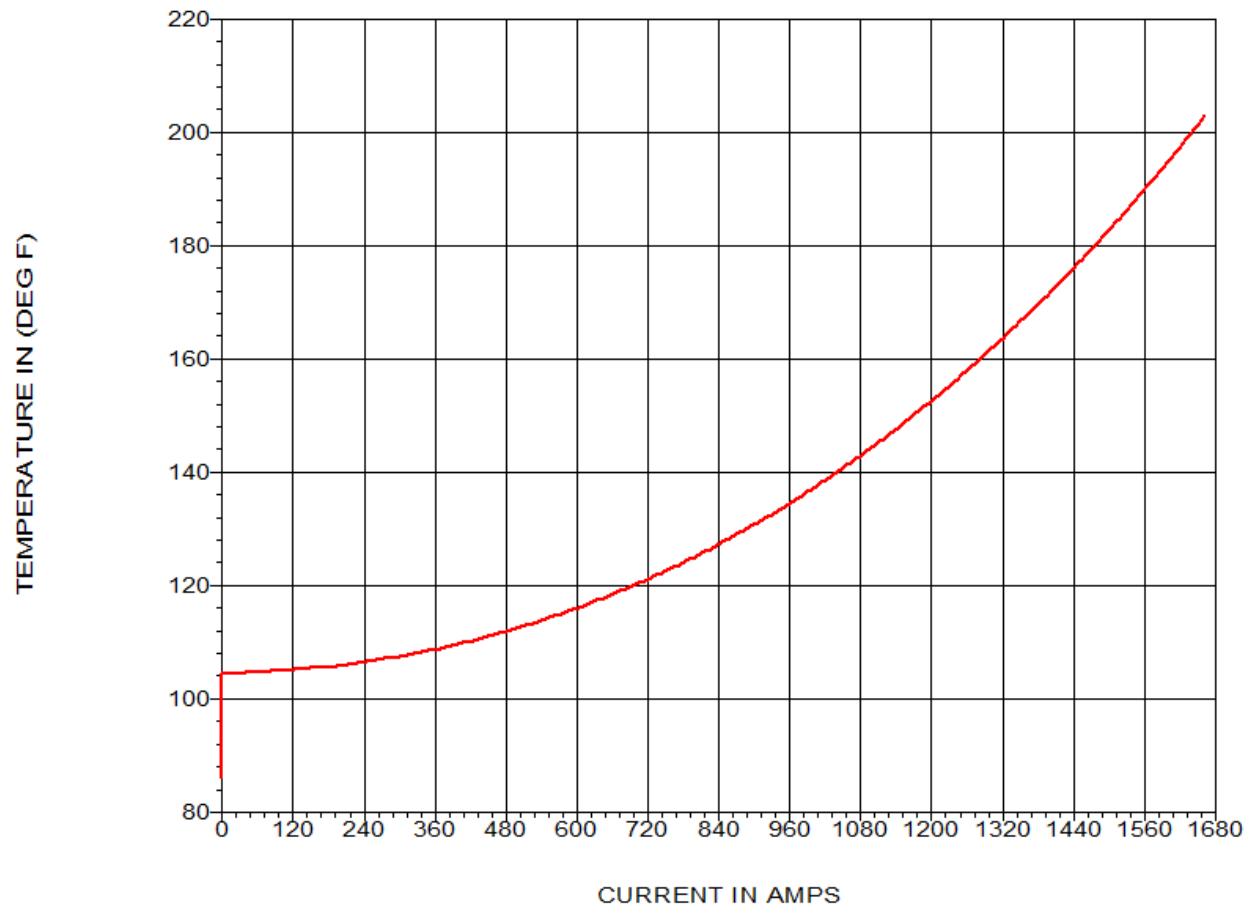
IEEE Std. 738-2006 method of calculation

Air temperature is 86.00 (deg F)
Wind speed is 3.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)
Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)
Conductor latitude is 43.0 (deg)
Atmosphere is CLEAR
Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and
Conductor diameter is 1.504 (in)
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)
Emissivity is 0.6 and solar absorptivity is 0.6

Solar heat input is 7.608 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft²) - which was calculated)
Radiation cooling is 12.342 (Watt/ft)
Convective cooling is 37.567 (Watt/ft)

Given a maximum conductor temperature of 203.0 (deg F),
The steady-state thermal rating is 1662.8 amperes



CASE 2: NYPP – SUMMER LTE RATING (239°F) CRITERIA

PLS-CADD Version 14.40x64 11:03:24 AM Thursday, March 09, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\8pt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

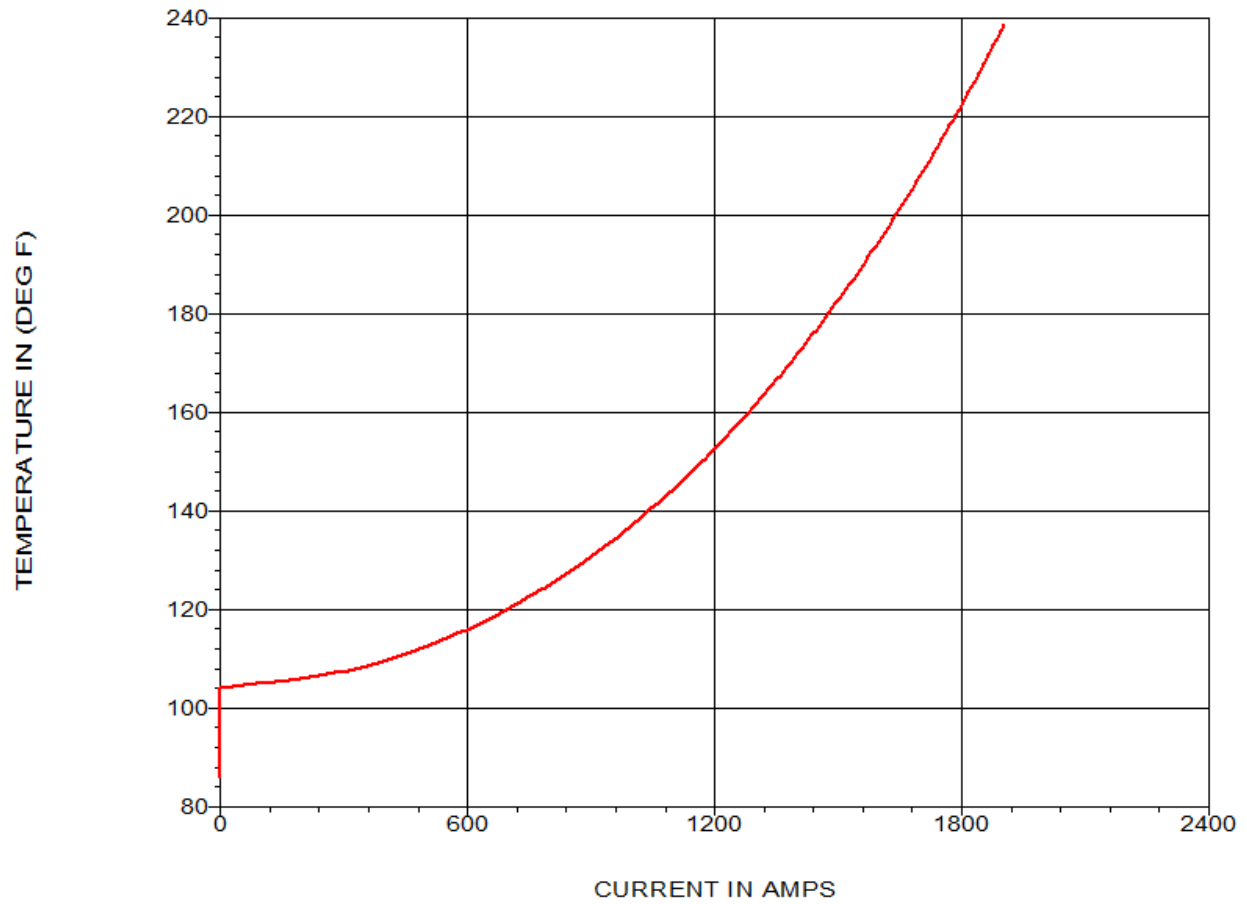
IEEE Std. 738-2006 method of calculation

Air temperature is 86.00 (deg F)
Wind speed is 3.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)
Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)
Conductor latitude is 43.0 (deg)
Atmosphere is CLEAR
Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and
Conductor diameter is 1.504 (in)
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)
Emissivity is 0.6 and solar absorptivity is 0.6

Solar heat input is 7.608 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft²) - which was calculated)
Radiation cooling is 17.727 (Watt/ft)
Convective cooling is 49.082 (Watt/ft)

Given a maximum conductor temperature of 239.0 (deg F),
The steady-state thermal rating is 1905.8 amperes



CASE 3: NYPP – SUMMER STE RATING (257°F) CRITERIA

PLS-CADD Version 14.40x64 11:06:47 AM Thursday, March 09, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\8pt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

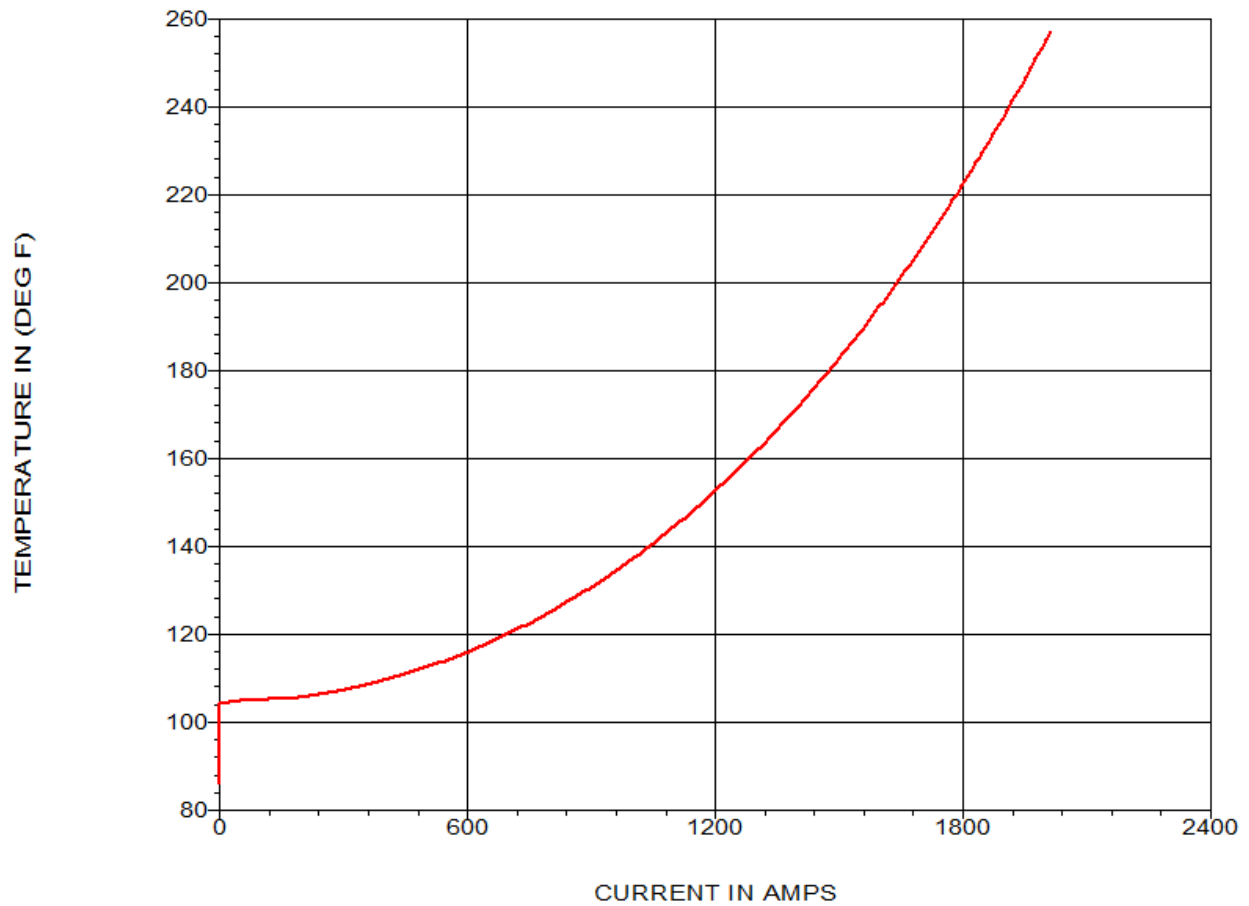
IEEE Std. 738-2006 method of calculation

Air temperature is 86.00 (deg F)
Wind speed is 3.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)
Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)
Conductor latitude is 43.0 (deg)
Atmosphere is CLEAR
Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and
Conductor diameter is 1.504 (in)|
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)
Emissivity is 0.6 and solar absorptivity is 0.6

Solar heat input is 7.608 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft²) - which was calculated)
Radiation cooling is 20.751 (Watt/ft)
Convective cooling is 54.835 (Watt/ft)

Given a maximum conductor temperature of 257.0 (deg F),
The steady-state thermal rating is 2011.6 amperes



CASE 4&5: NEER – NORMAL AND EMERGENCY CRITERIA

PLS-CADD Version 14.40x64 9:01:50 AM Wednesday, April 05, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\8pt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

IEEE Std. 738-2006 method of calculation

Air temperature is 104.00 (deg F)
Wind speed is 2.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Solar radiation measured at 93.000 (Watt/ft²)

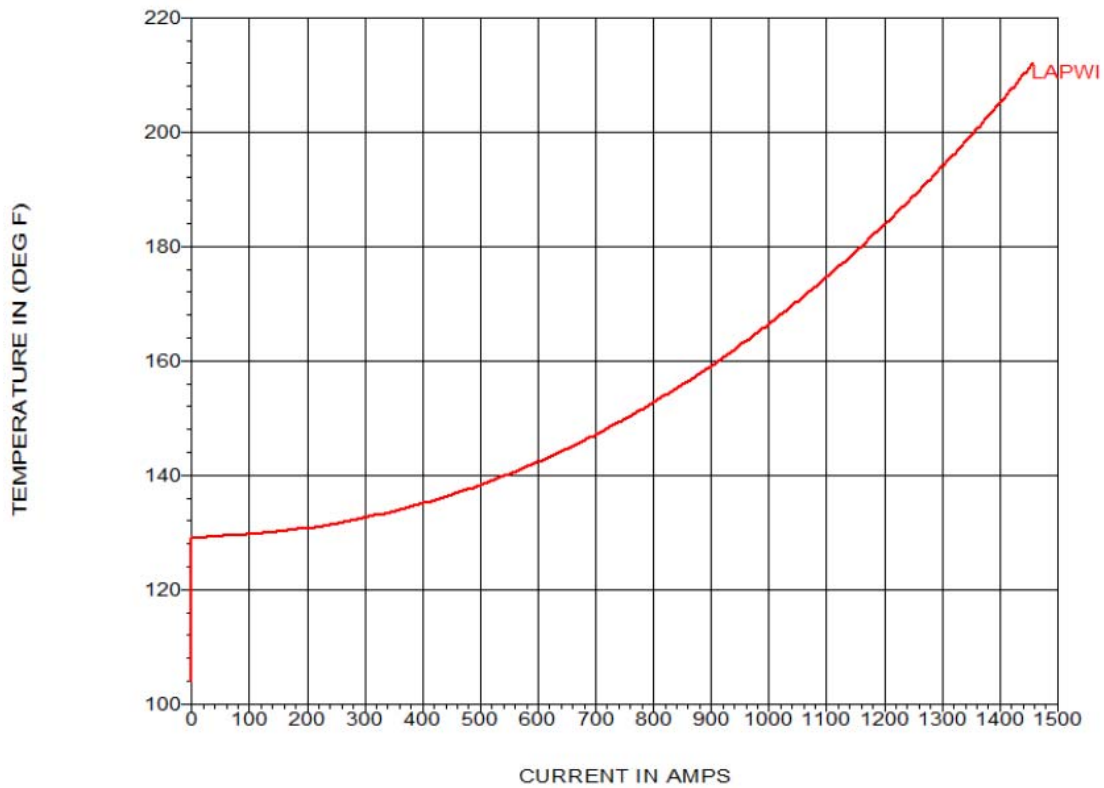
Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and is for the use in association with Southwire product only.

Conductor diameter is 1.504 (in)
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)

Emissivity is 0.7 and solar absorptivity is 0.8

Solar heat input is 9.325 (Watt/ft) (corresponds to Global Solar Radiation of 93.000 (Watt/ft²) - which was input by user)
Radiation cooling is 14.178 (Watt/ft)
Convective cooling is 28.169 (Watt/ft)

Given a maximum conductor temperature of 212.0 (deg F),
The steady-state thermal rating is 1457.3 amperes



CASE 6: NYPP – WINTER NORMAL RATING (203°F) CRITERIA

PLS-CADD Version 14.40x64 11:15:37 AM Thursday, March 09, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\8pt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

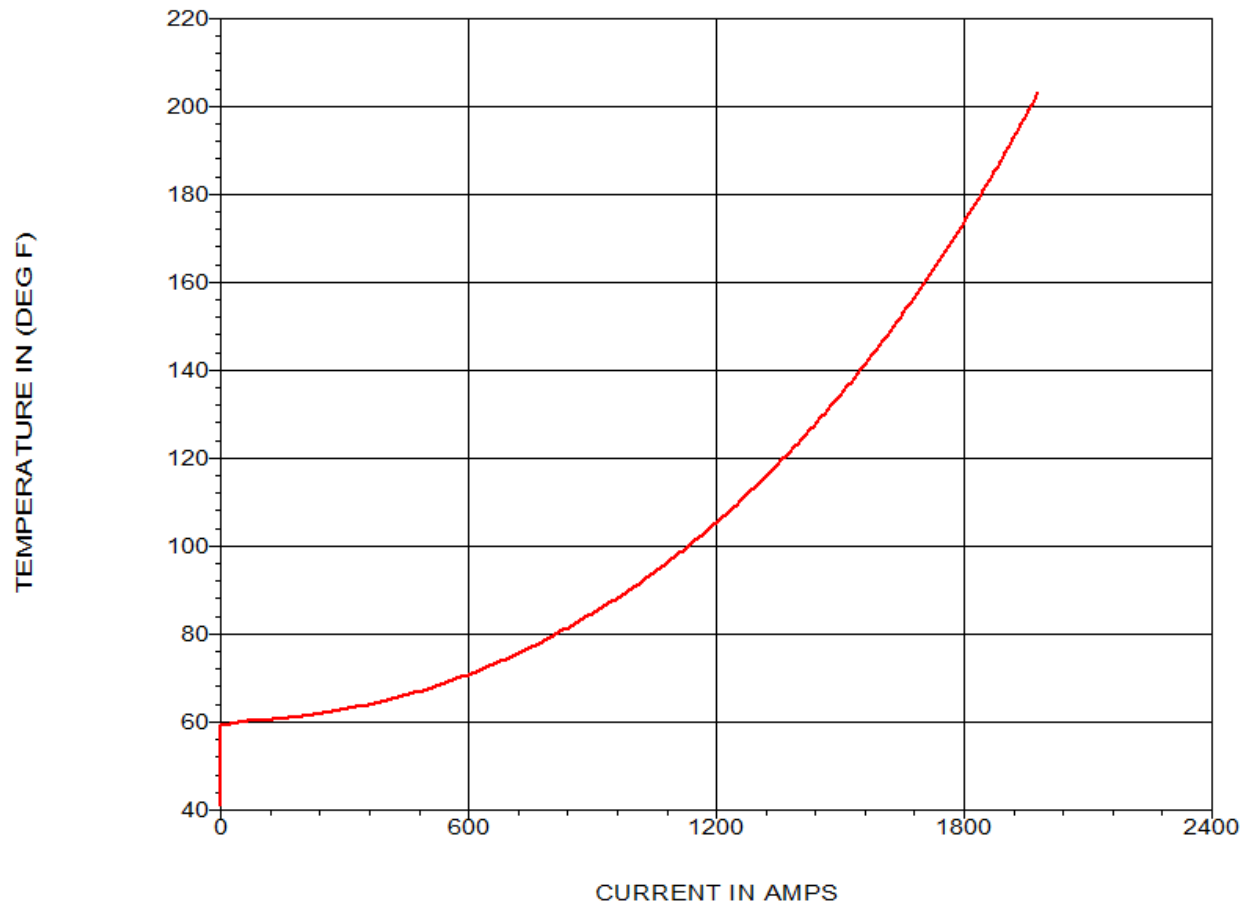
IEEE Std. 738-2006 method of calculation

Air temperature is 41.00 (deg F)
Wind speed is 3.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)
Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)
Conductor latitude is 43.0 (deg)
Atmosphere is CLEAR
Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and Sargent & Lundy
Conductor diameter is 1.504 (in)
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)
Emissivity is 0.6 and solar absorptivity is 0.6

Solar heat input is 7.608 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft²) - which was calculated)
Radiation cooling is 15.401 (Watt/ft)
Convective cooling is 52.134 (Watt/ft)

Given a maximum conductor temperature of 203.0 (deg F),
The steady-state thermal rating is 1979.1 amperes



CASE 7: NYPP – WINTER LTE RATING (239°F) CRITERIA

PLS-CADD Version 14.40x64 11:20:52 AM Thursday, March 09, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\8pt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

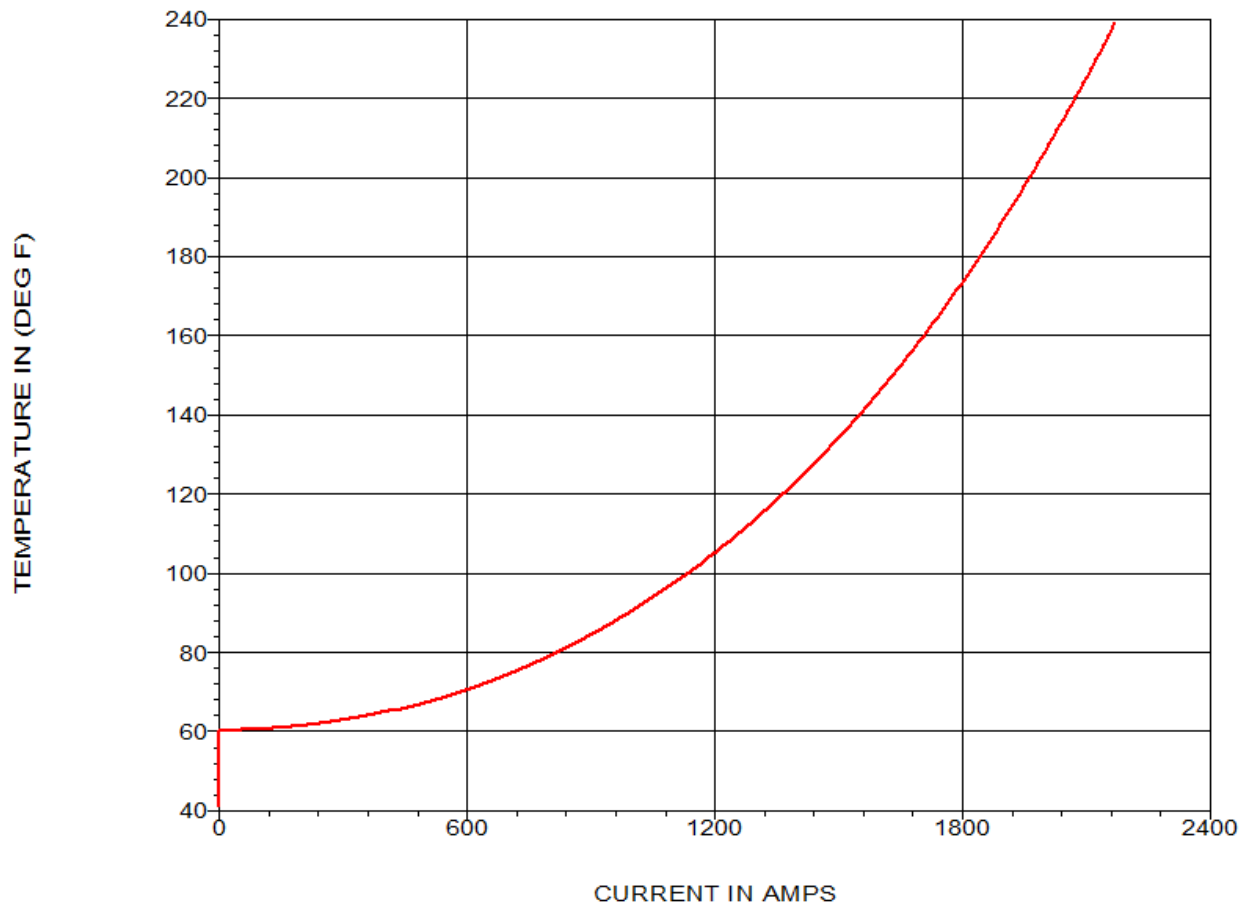
IEEE Std. 738-2006 method of calculation

Air temperature is 41.00 (deg F)
Wind speed is 3.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)
Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)
Conductor latitude is 43.0 (deg)
Atmosphere is CLEAR
Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and
Conductor diameter is 1.504 (in)
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)
Emissivity is 0.6 and solar absorptivity is 0.6

Solar heat input is 7.608 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft²) - which was calculated)
Radiation cooling is 20.785 (Watt/ft)
Convective cooling is 63.592 (Watt/ft)

Given a maximum conductor temperature of 239.0 (deg F),
The steady-state thermal rating is 2170.2 amperes



CASE 8: NYPP – WINTER STE RATING (257°F) CRITERIA

PLS-CADD Version 14.40x64 11:24:16 AM Thursday, March 09, 2017
Sargent & Lundy
Project Name: 'f:\nextera\eight point\pls\8pt_03042017.DON'
Line Title: 'Prelim - Steel and Wood'

Criteria Notes:

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
13139-043
DESIGN CRITERIA: REV. A DATED XX/XX/XXXX
PROJECT LOCATION: STEUBEN COUNTY, NY
NESC ZONE: HEAVY
INSULATOR STRENGTH REDUCTION: ACCOUNTED FOR IN PLS-POLE
ALLOWABLE TENSIONS FOR GUYS IN PLS-POLE SHALL BE RBS

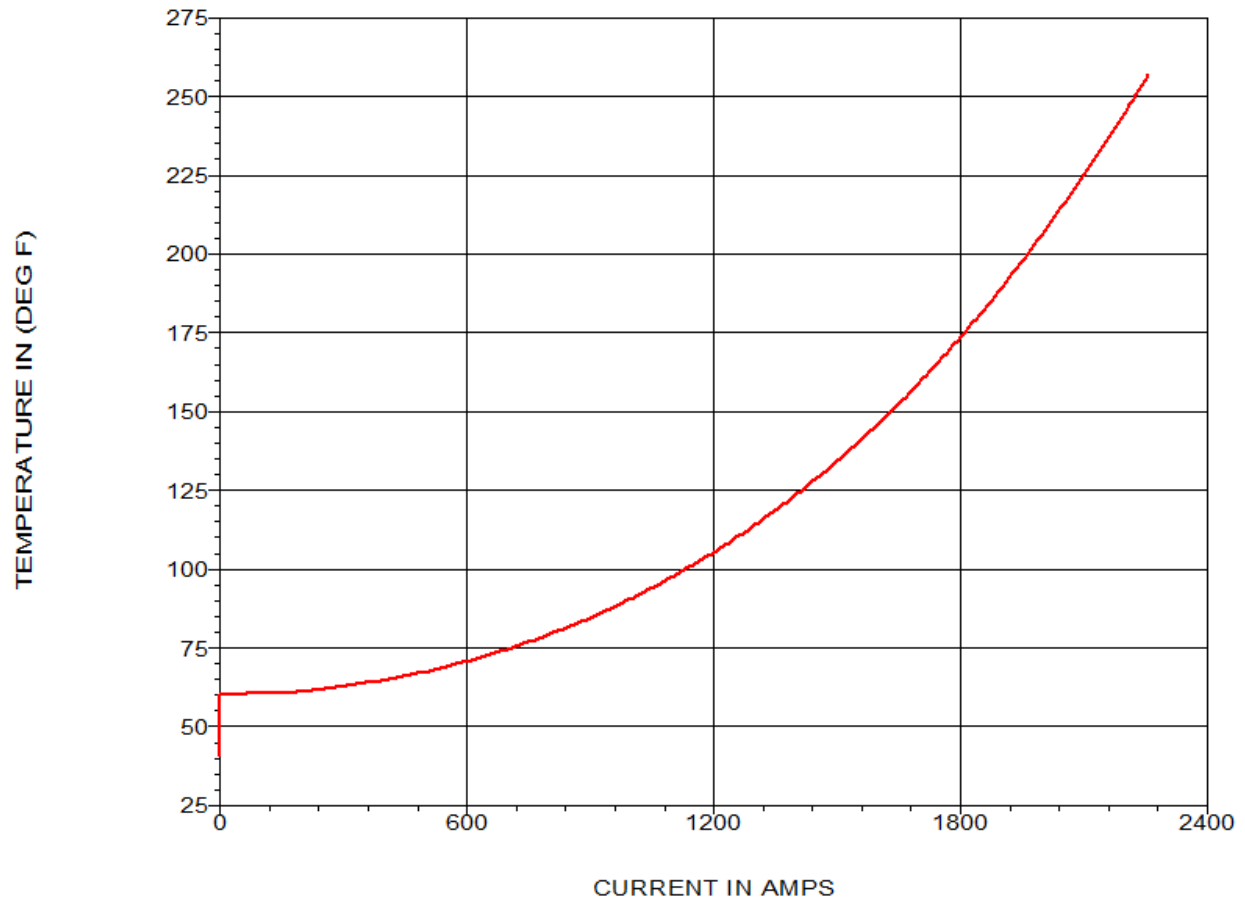
IEEE Std. 738-2006 method of calculation

Air temperature is 41.00 (deg F)
Wind speed is 3.00 (ft/s)
Angle between wind and conductor is 90 (deg)
Conductor elevation above sea level is 1980 (ft)
Conductor bearing is 90 (deg) (user specified bearing, may not be value producing maximum solar heating)
Sun time is 12 hours (solar altitude is 70 deg. and solar azimuth is 180 deg.)
Conductor latitude is 43.0 (deg)
Atmosphere is CLEAR
Day of year is 172 (corresponds to June 21 in year 2017) (day of the year with most solar heating)

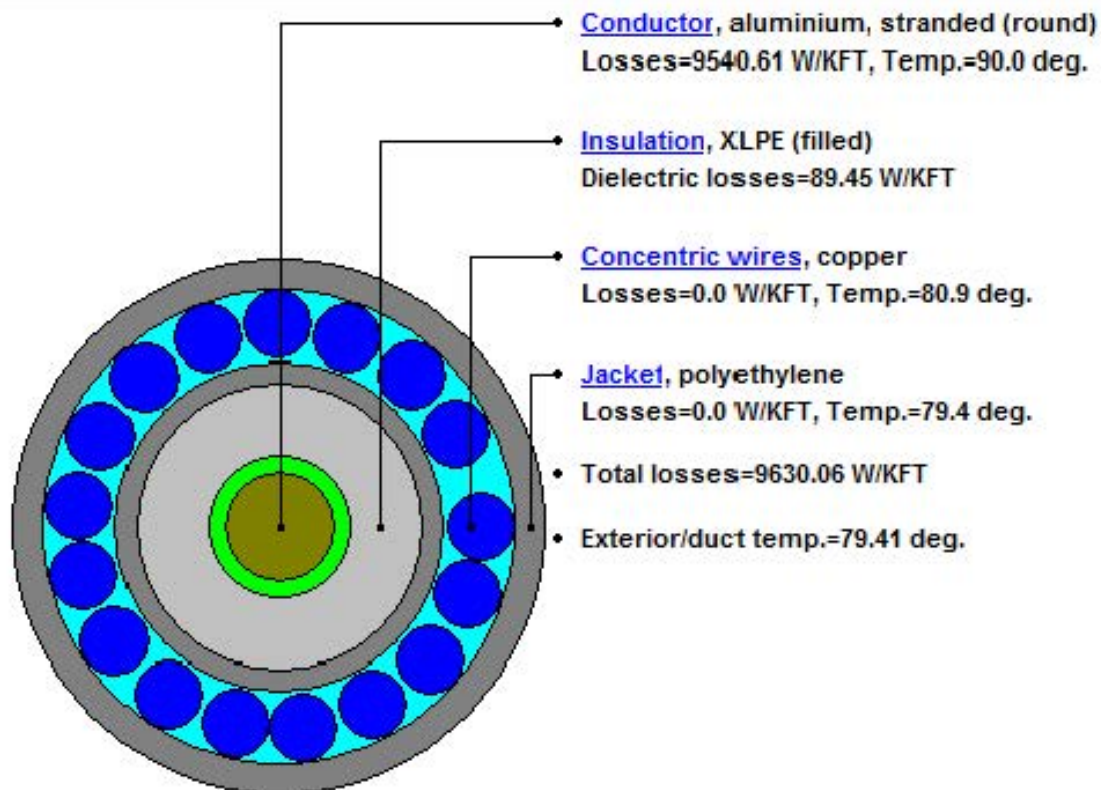
Conductor description: 1590 kcmil (45/7) LAPWING ACSR -Data herein is to be considered confidential and proprietary to Southwire and
Conductor diameter is 1.504 (in)
Conductor AC resistance is 0.0623 (Ohm/mile) at 77.0 (deg F)
and 0.0755 (Ohm/mile) at 167.0 (deg F)
Emissivity is 0.6 and solar absorptivity is 0.6

Solar heat input is 7.608 (Watt/ft) (corresponds to Global Solar Radiation of 101.166 (Watt/ft²) - which was calculated)
Radiation cooling is 23.809 (Watt/ft)
Convective cooling is 69.338 (Watt/ft)

Given a maximum conductor temperature of 257.0 (deg F),
The steady-state thermal rating is 2256.5 amperes



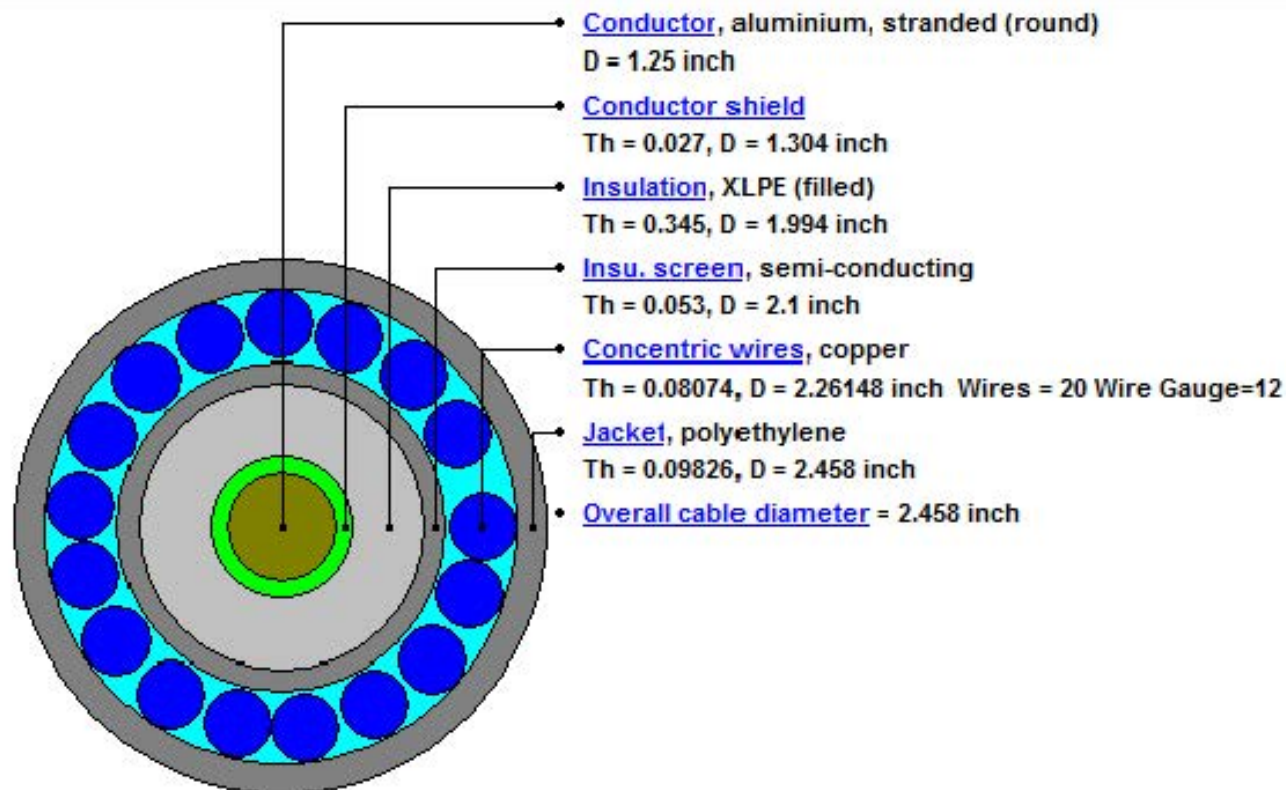
(SW-1250KCMIL-TRXLPE) 1250KCMIL-TRXP



Voltage = 34.5 kV Cond. area = 0.98181 inch² (1250 kcmil)

NEXTERA SPEC

(SW-1250KCMIL-TRXLPE) 1250KCMIL-TRXPLE



Voltage = 34.5 kV Cond. area = 0.98181 inch² (1250 kcmil)

NEXTERA SPEC

NextEra Energy Resources, LLC
Eight Point Wind, LLC
13139-043
Electric and Magnetic Field (EMF) Calculation

SL Report No.: SL-13139-043-006
Preliminary Not for Construction
Rev. No. C
02/16/2018

Appendix B: EMF Study (ROW Segments 1-6)

ROW Segment -1:

Overhead 115kV line with wood H-frames

A



C



E

F

- | | | | | | |
|----|------------|--------------------------------------|------|-------|-----------|
| - | | | | | |
| - | | | | | |
| - | | | | | |
| - | | | | | |
| D | 02/16/2018 | PRELIMINARY - ARTICLE VIII/ARTICLE X | NJT | TRK | KVP S&L |
| C | 01/08/2018 | PRELIMINARY - ARTICLE VII | NJT | JDJ | KVP S&L |
| B | 10/04/2017 | PRELIMINARY - NOT FOR CONSTRUCTION | CRC | JDJ | KVP S&L |
| A | 02/08/2017 | PRELIMINARY - ISSUED FOR REVIEW | NJT | WAS | - S&L |
| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRWN | REV'D | APPR COMP |

NONE

PREP:	NJT	CHKD:	WAS
APPD:	KVP	DATE:	02/08/2017

ANY MODIFICATION OR ADDITION TO THIS
DRAWING BY ANY ORGANIZATION OTHER
THAN SARGENT & LUNDY IS NOT THE
RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

COLLECTOR
TAKEOFF—

F

13139-043-T1-0907

Inputs

[illegible]

INPUT DATA LIST

```

10/ 3/2017      15:33:58
EIGHT POINT - EMF CALC - 13139-043-TL-006 - STL POLE,,,,,,,,,
PREPARED: SAHMADZAI,,,,,,,,,
1,0, 3, 5,0.0,   0.50,   1.00,1980.00

```

(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF 5 CONDUCTORS, OF WHICH 3 ARE ENERGIZED PHASES

[illegible]

1COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD
EIGHT POINT - EMF CALC - 13139-043-TL-006 - STL POLE,,,,,,,,,
PREPARED: SAHMADZAI,,,,,,,,,

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (kAmps)	CORONA LOSSES (KW/MI)
PH. A-1	0.00	23.80	6.49	1.50	1	0.00	66.39	0.00	1.98	0.066
PH. B-1	-15.50	23.80	6.08	1.50	1	0.00	66.39	240.00	1.98	0.043
PH. C-1	15.50	23.80	6.09	1.50	1	0.00	66.39	120.00	1.98	0.043
OPGW 1	8.75	36.60	1.26	0.53	1	0.00	0.00	0.00	0.00	0.000
OPGW 2	-8.75	36.60	1.77	0.36	1	0.00	0.00	0.00	0.00	0.000

AN MICROPHONE HT.= 5.0 FT, RI ANT. HT.= 6.6 FT, TV ANT. HT.= 9.8 FT, ALTITUDE= 1980.0 FT
RI FREQ= 1.000 MHZ, TV FREQ= 75.000 MHZ, WIND VEL.(OZ)= 0.500 MPH, GROUND CONDUCTIVITY = 10.0 MMHOS/M
E-FIELD TRANSDUCER HT.= 3.3FT, B-FIELD TRANSDUCER HT.= 3.3FT

Wood H-Frame - ROW Segment 1

Results

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	(FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	(FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-500.0	-5.9	-30.9	-14.3	-31.3	-47.4	0.000000	0.001	0.00139
-495.0	-5.9	-30.9	-14.2	-31.2	-47.2	0.000000	0.001	0.00142
-490.0	-5.8	-30.8	-14.1	-31.1	-47.0	0.000000	0.001	0.00145
-485.0	-5.8	-30.8	-14.0	-31.0	-46.8	0.000000	0.001	0.00148
-480.0	-5.7	-30.7	-13.9	-30.9	-46.6	0.000000	0.001	0.00151
-475.0	-5.7	-30.7	-13.8	-30.8	-46.5	0.000000	0.001	0.00154
-470.0	-5.6	-30.6	-13.7	-30.7	-46.3	0.000000	0.001	0.00158
-465.0	-5.6	-30.6	-13.6	-30.6	-46.1	0.000000	0.001	0.00161
-460.0	-5.5	-30.5	-13.5	-30.5	-45.9	0.000000	0.001	0.00165
-455.0	-5.5	-30.5	-13.4	-30.4	-45.7	0.000000	0.001	0.00168
-450.0	-5.4	-30.4	-13.2	-30.2	-45.5	0.000000	0.001	0.00172
-445.0	-5.4	-30.4	-13.1	-30.1	-45.3	0.000000	0.001	0.00176
-440.0	-5.3	-30.3	-13.0	-30.0	-45.1	0.000000	0.001	0.00180
-435.0	-5.3	-30.3	-12.9	-29.9	-44.9	0.000000	0.002	0.00184
-430.0	-5.2	-30.2	-12.8	-29.8	-44.7	0.000000	0.002	0.00188
-425.0	-5.1	-30.1	-12.7	-29.7	-44.5	0.000000	0.002	0.00193
-420.0	-5.1	-30.1	-12.6	-29.6	-44.3	0.000000	0.002	0.00197
-415.0	-5.0	-30.0	-12.5	-29.5	-44.1	0.000000	0.002	0.00202
-410.0	-5.0	-30.0	-12.3	-29.3	-43.9	0.000000	0.002	0.00207
-405.0	-4.9	-29.9	-12.2	-29.2	-43.7	0.000000	0.002	0.00212
-400.0	-4.8	-29.8	-12.1	-29.1	-43.5	0.000000	0.002	0.00218
-395.0	-4.8	-29.8	-12.0	-29.0	-43.3	0.000000	0.002	0.00223
-390.0	-4.7	-29.7	-11.9	-28.9	-43.0	0.000000	0.002	0.00229
-385.0	-4.6	-29.6	-11.7	-28.7	-42.8	0.000000	0.002	0.00235
-380.0	-4.6	-29.6	-11.6	-28.6	-42.6	0.000000	0.002	0.00241
-375.0	-4.5	-29.5	-11.5	-28.5	-42.4	0.000000	0.002	0.00248
-370.0	-4.4	-29.4	-11.3	-28.3	-42.1	0.000000	0.002	0.00254
-365.0	-4.4	-29.4	-11.2	-28.2	-41.9	0.000000	0.002	0.00261
-360.0	-4.3	-29.3	-11.1	-28.1	-41.7	0.000000	0.002	0.00269
-355.0	-4.2	-29.2	-10.9	-27.9	-41.4	0.000000	0.003	0.00276
-350.0	-4.2	-29.2	-10.8	-27.8	-41.2	0.000000	0.003	0.00284
-345.0	-4.1	-29.1	-10.6	-27.6	-40.9	0.000000	0.003	0.00293
-340.0	-4.0	-29.0	-10.5	-27.5	-40.7	0.000000	0.003	0.00301
-335.0	-4.0	-29.0	-10.3	-27.3	-40.4	0.000000	0.003	0.00310
-330.0	-3.9	-28.9	-10.2	-27.2	-40.1	0.000000	0.003	0.00320
-325.0	-3.8	-28.8	-10.0	-27.0	-39.9	0.000000	0.003	0.00330
-320.0	-3.7	-28.7	-9.9	-26.9	-39.6	0.000000	0.003	0.00340
-315.0	-3.7	-28.7	-9.7	-26.7	-39.3	0.000000	0.004	0.00351
-310.0	-3.6	-28.6	-9.5	-26.5	-39.1	0.000000	0.004	0.00362
-305.0	-3.5	-28.5	-9.4	-26.4	-38.8	0.000000	0.004	0.00374
-300.0	-3.4	-28.4	-9.2	-26.2	-38.5	0.000000	0.004	0.00387
-295.0	-3.3	-28.3	-9.0	-26.0	-38.2	0.000000	0.004	0.00400
-290.0	-3.2	-28.2	-8.8	-25.8	-37.9	0.000000	0.004	0.00414
-285.0	-3.2	-28.2	-8.6	-25.6	-37.6	0.000000	0.005	0.00428
-280.0	-3.1	-28.1	-8.4	-25.4	-37.3	0.000000	0.005	0.00444
-275.0	-3.0	-28.0	-8.3	-25.3	-37.0	0.000000	0.005	0.00460
-270.0	-2.9	-27.9	-8.1	-25.1	-36.7	0.000000	0.005	0.00477
-265.0	-2.8	-27.8	-7.8	-24.8	-36.3	0.000000	0.006	0.00495
-260.0	-2.7	-27.7	-7.6	-24.6	-36.0	0.000000	0.006	0.00515

Wood H-Frame - ROW Segment 1

Results

-255.0	-2.6	-27.6	-7.4	-24.4	-35.7	0.000000	0.006	0.00535
-250.0	-2.5	-27.5	-7.2	-24.2	-35.3	0.000000	0.007	0.00557
-245.0	-2.4	-27.4	-7.0	-24.0	-35.0	0.000000	0.007	0.00579
-240.0	-2.3	-27.3	-6.8	-23.8	-34.6	0.000000	0.007	0.00604
-235.0	-2.2	-27.2	-6.5	-23.5	-34.3	0.000000	0.008	0.00630
-230.0	-2.1	-27.1	-6.3	-23.3	-33.9	0.000000	0.008	0.00657
-225.0	-2.0	-27.0	-6.0	-23.0	-33.5	0.000000	0.009	0.00687
-220.0	-1.9	-26.9	-5.8	-22.8	-33.1	0.000000	0.009	0.00718
-215.0	-1.8	-26.8	-5.5	-22.5	-32.7	0.000000	0.010	0.00752
-210.0	-1.6	-26.6	-5.2	-22.2	-32.4	0.000000	0.011	0.00788
-205.0	-1.5	-26.5	-4.9	-21.9	-32.2	0.000000	0.011	0.00827
-200.0	-1.4	-26.4	-4.6	-21.6	-32.0	0.000000	0.012	0.00868
-195.0	-1.3	-26.3	-4.3	-21.3	-31.8	0.000000	0.013	0.00913
-190.0	-1.2	-26.2	-4.0	-21.0	-31.6	0.000000	0.014	0.00962
-185.0	-1.0	-26.0	-3.7	-20.7	-31.3	0.000000	0.015	0.01014
-180.0	-0.9	-25.9	-3.4	-20.4	-31.1	0.000000	0.016	0.01071
-175.0	-0.8	-25.8	-3.0	-20.0	-30.9	0.000000	0.018	0.01133
-170.0	-0.6	-25.6	-2.7	-19.7	-30.6	0.000000	0.019	0.01200
-165.0	-0.5	-25.5	-2.3	-19.3	-30.3	0.000000	0.021	0.01274
-160.0	-0.3	-25.3	-1.9	-18.9	-30.1	0.000000	0.023	0.01354
-155.0	-0.2	-25.2	-1.5	-18.5	-29.8	0.000000	0.025	0.01442
-150.0	0.0	-25.0	-1.1	-18.1	-29.5	0.000000	0.028	0.01539
-145.0	0.2	-24.8	-0.6	-17.6	-29.2	0.000000	0.030	0.01646
-140.0	0.3	-24.7	-0.2	-17.2	-28.9	0.000000	0.034	0.01765
-135.0	0.5	-24.5	0.3	-16.7	-28.6	0.000000	0.037	0.01897
-130.0	0.7	-24.3	0.8	-16.2	-28.3	0.000000	0.042	0.02044
-125.0	0.9	-24.1	1.4	-15.6	-28.0	0.000000	0.046	0.02209
-120.0	1.1	-23.9	1.9	-15.1	-27.6	0.000000	0.052	0.02395
-115.0	1.3	-23.7	2.5	-14.5	-27.2	0.000000	0.059	0.02605
-110.0	1.5	-23.5	3.2	-13.8	-26.9	0.000000	0.067	0.02844
-105.0	1.8	-23.2	3.8	-13.2	-26.5	0.000000	0.076	0.03117
-100.0	2.0	-23.0	4.5	-12.5	-26.0	0.000000	0.088	0.03430
-95.0	2.3	-22.7	5.3	-11.7	-25.6	0.000000	0.101	0.03793
-90.0	2.5	-22.5	6.0	-11.0	-25.2	0.000000	0.118	0.04216
-85.0	2.8	-22.2	6.9	-10.1	-24.7	0.000000	0.138	0.04713
-80.0	3.1	-21.9	7.8	-9.2	-24.2	0.000000	0.164	0.05302
-75.0	3.4	-21.6	8.8	-8.2	-23.6	0.000000	0.196	0.06006
-70.0	3.7	-21.3	10.1	-6.9	-23.0	0.000000	0.236	0.06855
-65.0	4.1	-20.9	11.5	-5.5	-22.4	0.000000	0.287	0.07893
-60.0	4.5	-20.5	13.1	-3.9	-21.8	0.000000	0.354	0.09174
-55.0	4.9	-20.1	14.8	-2.2	-21.0	0.000000	0.441	0.10775
-50.0	5.3	-19.7	16.7	-0.3	-20.3	0.000000	0.555	0.12801
-45.0	5.8	-19.2	18.7	1.7	-19.4	0.000000	0.704	0.15391
-40.0	6.3	-18.7	21.0	4.0	-18.4	0.000000	0.896	0.18725
-35.0	6.9	-18.1	23.4	6.4	-17.0	0.000000	1.136	0.23003
-30.0	7.4	-17.6	25.9	8.9	-15.4	0.000000	1.408	0.28377
-25.0	8.0	-17.0	28.2	11.2	-13.9	0.000000	1.660	0.34748
-20.0	8.6	-16.4	29.9	12.9	-12.7	0.000000	1.788	0.41469
-15.0	9.0	-16.0	30.5	13.5	-12.2	0.000000	1.684	0.47271
-10.0	9.4	-15.6	31.4	14.4	-10.7	0.003597	1.361	0.50970
-5.0	9.6	-15.4	33.2	16.2	-9.4	0.003695	1.021	0.52457
0.0	9.7	-15.3	33.9	16.9	-8.9	0.003039	0.895	0.52716
5.0	9.6	-15.4	33.2	16.2	-9.4	0.008345	1.017	0.52457

Wood H-Frame - ROW Segment 1

Results

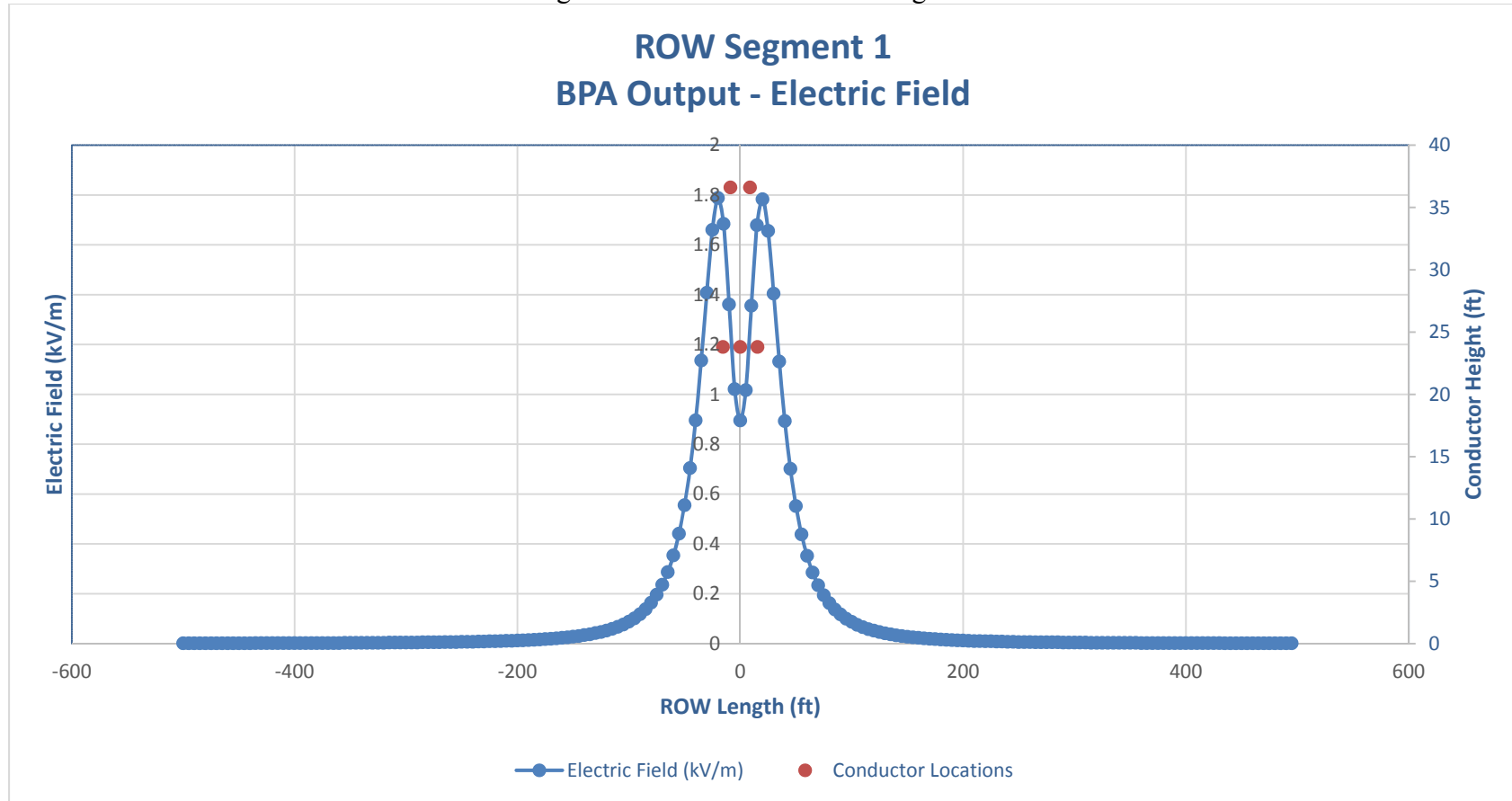
10.0	9.4	-15.6	31.4	14.4	-10.7	0.008692	1.356	0.50970
15.0	9.0	-16.0	30.5	13.5	-12.2	0.007269	1.679	0.47271
20.0	8.6	-16.4	29.9	12.9	-12.7	0.009141	1.783	0.41469
25.0	8.0	-17.0	28.2	11.2	-13.9	0.009138	1.656	0.34748
30.0	7.4	-17.6	25.9	8.9	-15.4	0.007848	1.404	0.28377
35.0	6.9	-18.1	23.4	6.4	-16.9	0.006809	1.132	0.23003
40.0	6.3	-18.7	21.0	4.0	-18.3	0.006018	0.893	0.18725
45.0	5.8	-19.2	18.8	1.8	-19.4	0.005402	0.701	0.15391
50.0	5.3	-19.7	16.7	-0.3	-20.3	0.004910	0.552	0.12801
55.0	4.9	-20.1	14.8	-2.2	-21.0	0.004507	0.438	0.10775
60.0	4.5	-20.5	13.1	-3.9	-21.8	0.004170	0.352	0.09174
65.0	4.1	-20.9	11.6	-5.4	-22.4	0.003884	0.285	0.07893
70.0	3.7	-21.3	10.1	-6.9	-23.0	0.003638	0.234	0.06855
75.0	3.4	-21.6	8.8	-8.2	-23.6	0.003423	0.194	0.06006
80.0	3.1	-21.9	7.8	-9.2	-24.2	0.003235	0.162	0.05302
85.0	2.8	-22.2	6.9	-10.1	-24.7	0.003068	0.137	0.04713
90.0	2.5	-22.5	6.0	-11.0	-25.2	0.002918	0.117	0.04216
95.0	2.3	-22.7	5.3	-11.7	-25.6	0.002784	0.100	0.03793
100.0	2.0	-23.0	4.5	-12.5	-26.0	0.002662	0.087	0.03430
105.0	1.8	-23.2	3.8	-13.2	-26.5	0.002552	0.075	0.03117
110.0	1.5	-23.5	3.2	-13.8	-26.9	0.002451	0.066	0.02844
115.0	1.3	-23.7	2.5	-14.5	-27.2	0.002358	0.058	0.02605
120.0	1.1	-23.9	1.9	-15.1	-27.6	0.002272	0.052	0.02395
125.0	0.9	-24.1	1.4	-15.6	-28.0	0.002193	0.046	0.02209
130.0	0.7	-24.3	0.8	-16.2	-28.3	0.002120	0.041	0.02044
135.0	0.5	-24.5	0.3	-16.7	-28.6	0.002052	0.037	0.01897
140.0	0.4	-24.6	-0.2	-17.2	-28.9	0.001988	0.033	0.01765
145.0	0.2	-24.8	-0.6	-17.6	-29.2	0.001929	0.030	0.01646
150.0	0.0	-25.0	-1.1	-18.1	-29.5	0.001873	0.027	0.01539
155.0	-0.2	-25.2	-1.5	-18.5	-29.8	0.001821	0.025	0.01442
160.0	-0.3	-25.3	-1.9	-18.9	-30.1	0.001772	0.023	0.01354
165.0	-0.5	-25.5	-2.3	-19.3	-30.3	0.001725	0.021	0.01274
170.0	-0.6	-25.6	-2.7	-19.7	-30.6	0.001681	0.019	0.01200
175.0	-0.7	-25.7	-3.0	-20.0	-30.9	0.001640	0.018	0.01133
180.0	-0.9	-25.9	-3.4	-20.4	-31.1	0.001601	0.016	0.01071
185.0	-1.0	-26.0	-3.7	-20.7	-31.3	0.001563	0.015	0.01014
190.0	-1.2	-26.2	-4.0	-21.0	-31.6	0.001528	0.014	0.00962
195.0	-1.3	-26.3	-4.3	-21.3	-31.8	0.001494	0.013	0.00913
200.0	-1.4	-26.4	-4.6	-21.6	-32.0	0.001462	0.012	0.00868
205.0	-1.5	-26.5	-4.9	-21.9	-32.2	0.001431	0.011	0.00827
210.0	-1.6	-26.6	-5.2	-22.2	-32.4	0.001401	0.010	0.00788
215.0	-1.8	-26.8	-5.5	-22.5	-32.7	0.001373	0.010	0.00752
220.0	-1.9	-26.9	-5.8	-22.8	-33.1	0.001346	0.009	0.00718
225.0	-2.0	-27.0	-6.0	-23.0	-33.5	0.001320	0.009	0.00687
230.0	-2.1	-27.1	-6.3	-23.3	-33.9	0.001296	0.008	0.00657
235.0	-2.2	-27.2	-6.5	-23.5	-34.3	0.001272	0.008	0.00630
240.0	-2.3	-27.3	-6.8	-23.8	-34.6	0.001249	0.007	0.00604
245.0	-2.4	-27.4	-7.0	-24.0	-35.0	0.001227	0.007	0.00579
250.0	-2.5	-27.5	-7.2	-24.2	-35.3	0.001206	0.006	0.00557
255.0	-2.6	-27.6	-7.4	-24.4	-35.7	0.001185	0.006	0.00535
260.0	-2.7	-27.7	-7.6	-24.6	-36.0	0.001166	0.006	0.00515
265.0	-2.8	-27.8	-7.8	-24.8	-36.3	0.001147	0.005	0.00495
270.0	-2.9	-27.9	-8.1	-25.1	-36.7	0.001129	0.005	0.00477

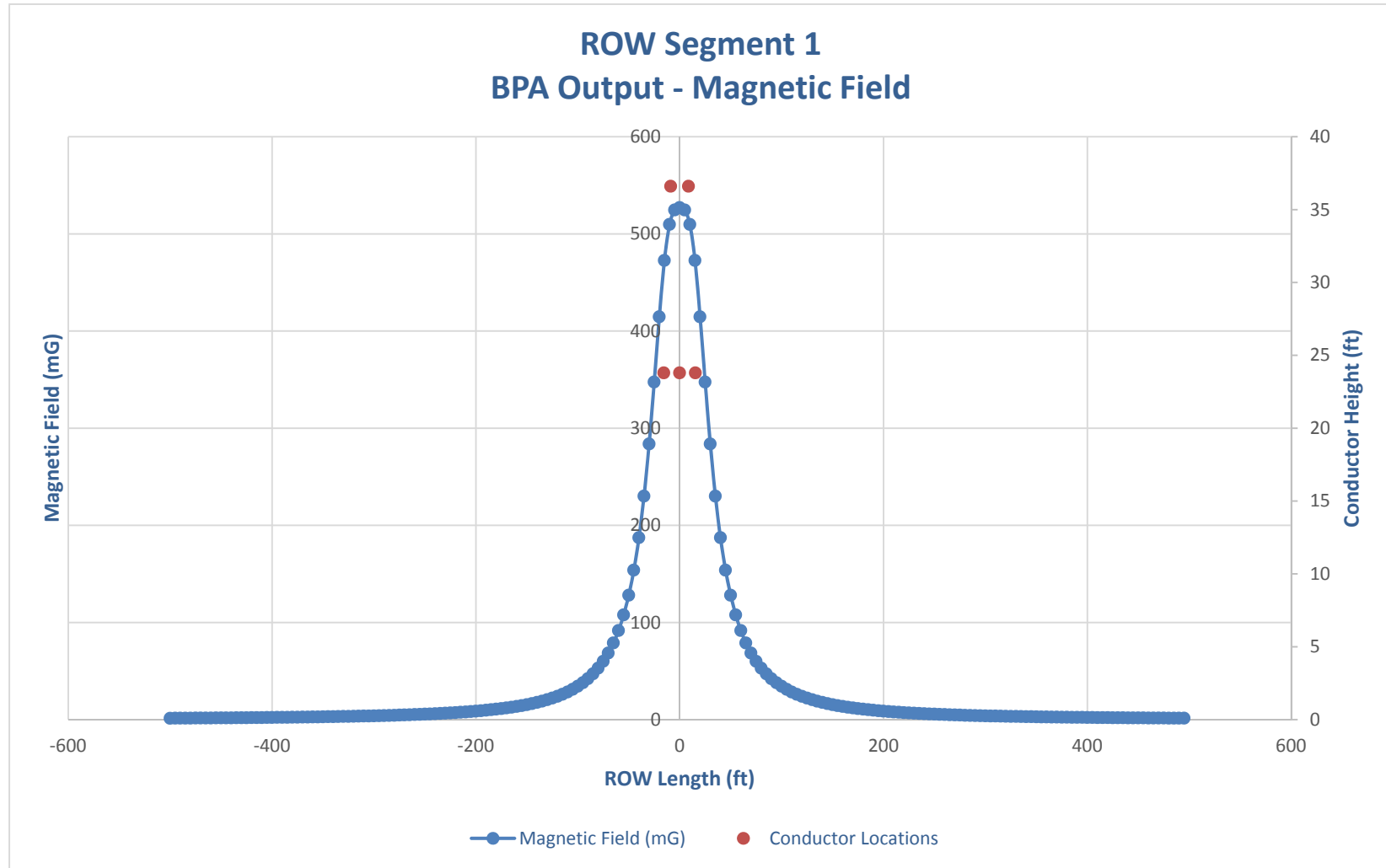
Wood H-Frame - ROW Segment 1

Results

275.0	-3.0	-28.0	-8.3	-25.3	-37.0	0.001111	0.005	0.00460
280.0	-3.1	-28.1	-8.4	-25.4	-37.3	0.001094	0.005	0.00444
285.0	-3.2	-28.2	-8.6	-25.6	-37.6	0.001077	0.005	0.00428
290.0	-3.2	-28.2	-8.8	-25.8	-37.9	0.001061	0.004	0.00414
295.0	-3.3	-28.3	-9.0	-26.0	-38.2	0.001046	0.004	0.00400
300.0	-3.4	-28.4	-9.2	-26.2	-38.5	0.001031	0.004	0.00387
305.0	-3.5	-28.5	-9.4	-26.4	-38.8	0.001016	0.004	0.00374
310.0	-3.6	-28.6	-9.5	-26.5	-39.1	0.001002	0.004	0.00362
315.0	-3.7	-28.7	-9.7	-26.7	-39.3	0.000988	0.003	0.00351
320.0	-3.7	-28.7	-9.9	-26.9	-39.6	0.000975	0.003	0.00340
325.0	-3.8	-28.8	-10.0	-27.0	-39.9	0.000962	0.003	0.00330
330.0	-3.9	-28.9	-10.2	-27.2	-40.1	0.000950	0.003	0.00320
335.0	-4.0	-29.0	-10.3	-27.3	-40.4	0.000937	0.003	0.00310
340.0	-4.0	-29.0	-10.5	-27.5	-40.7	0.000925	0.003	0.00301
345.0	-4.1	-29.1	-10.6	-27.6	-40.9	0.000914	0.003	0.00293
350.0	-4.2	-29.2	-10.8	-27.8	-41.2	0.000903	0.003	0.00284
355.0	-4.2	-29.2	-10.9	-27.9	-41.4	0.000892	0.003	0.00276
360.0	-4.3	-29.3	-11.1	-28.1	-41.7	0.000881	0.002	0.00269
365.0	-4.4	-29.4	-11.2	-28.2	-41.9	0.000871	0.002	0.00261
370.0	-4.4	-29.4	-11.3	-28.3	-42.1	0.000860	0.002	0.00254
375.0	-4.5	-29.5	-11.5	-28.5	-42.4	0.000851	0.002	0.00248
380.0	-4.6	-29.6	-11.6	-28.6	-42.6	0.000841	0.002	0.00241
385.0	-4.6	-29.6	-11.7	-28.7	-42.8	0.000832	0.002	0.00235
390.0	-4.7	-29.7	-11.9	-28.9	-43.0	0.000822	0.002	0.00229
395.0	-4.8	-29.8	-12.0	-29.0	-43.3	0.000813	0.002	0.00223
400.0	-4.8	-29.8	-12.1	-29.1	-43.5	0.000805	0.002	0.00218
405.0	-4.9	-29.9	-12.2	-29.2	-43.7	0.000796	0.002	0.00212
410.0	-5.0	-30.0	-12.3	-29.3	-43.9	0.000788	0.002	0.00207
415.0	-5.0	-30.0	-12.5	-29.5	-44.1	0.000780	0.002	0.00202
420.0	-5.1	-30.1	-12.6	-29.6	-44.3	0.000772	0.002	0.00197
425.0	-5.1	-30.1	-12.7	-29.7	-44.5	0.000764	0.002	0.00193
430.0	-5.2	-30.2	-12.8	-29.8	-44.7	0.000756	0.002	0.00188
435.0	-5.2	-30.2	-12.9	-29.9	-44.9	0.000749	0.001	0.00184
440.0	-5.3	-30.3	-13.0	-30.0	-45.1	0.000741	0.001	0.00180
445.0	-5.4	-30.4	-13.1	-30.1	-45.3	0.000734	0.001	0.00176
450.0	-5.4	-30.4	-13.2	-30.2	-45.5	0.000727	0.001	0.00172
455.0	-5.5	-30.5	-13.4	-30.4	-45.7	0.000720	0.001	0.00168
460.0	-5.5	-30.5	-13.5	-30.5	-45.9	0.000713	0.001	0.00165
465.0	-5.6	-30.6	-13.6	-30.6	-46.1	0.000707	0.001	0.00161
470.0	-5.6	-30.6	-13.7	-30.7	-46.3	0.000700	0.001	0.00158
475.0	-5.7	-30.7	-13.8	-30.8	-46.5	0.000694	0.001	0.00154
480.0	-5.7	-30.7	-13.9	-30.9	-46.6	0.000688	0.001	0.00151
485.0	-5.8	-30.8	-14.0	-31.0	-46.8	0.000682	0.001	0.00148
490.0	-5.8	-30.8	-14.1	-31.1	-47.0	0.000676	0.001	0.00145
495.0	-5.9	-30.9	-14.2	-31.2	-47.2	0.000670	0.001	0.00142

ROW Segment 1 – Wood H-Frame Tangent Structure





ROW Segment 2:

Overhead 115kV line with steel monopoles

NOTES:

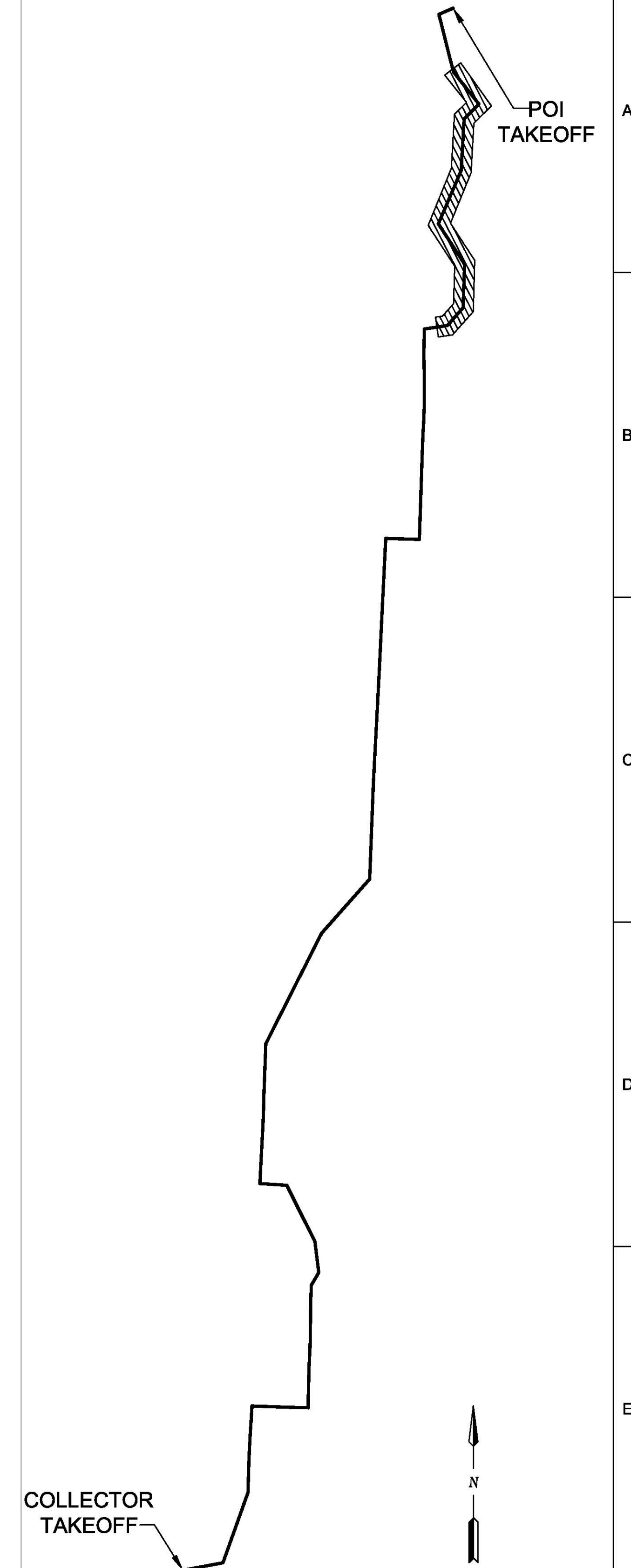
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| D | 02/18/2018 | PRELIMINARY - ARTICLE VIIIARTICLE X | NJT | TRK | KVP S&L |
| C | 01/08/2018 | PRELIMINARY - ARTICLE VII | NJT | JDJ | KVP S&L |
| B | 10/04/2017 | PRELIMINARY - NOT FOR CONSTRUCTION | CRC | JDJ | KVP S&L |
| A | 02/08/2017 | PRELIMINARY - ISSUED FOR REVIEW | NJT | WAS | - S&L |
| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRWN | REV'D | APPR COMP |

NONE

ANY MODIFICATION OR ADDITION TO THIS
DRAWING BY ANY ORGANIZATION OTHER
THAN SARGENT & LUNDY IS NOT THE
RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

13139-043-T1-0902



PROJECT LINE OVERVIEW
NOT TO SCALE

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| D | 02/16/2018 | PRELIMINARY - ARTICLE VII/ARTICLE X | | NJT | TRK | KVP | S&L | | |
| C | 01/08/2018 | PRELIMINARY - ARTICLE VII | | NJT | JDJ | KVP | S&L | | |
| B | 10/04/2017 | PRELIMINARY - NOT FOR CONSTRUCTION | | CRC | JDJ | KVP | S&L | | |
| A | 02/08/2017 | PRELIMINARY - ISSUED FOR REVIEW | | NJT | WAS | -- | S&L | PREP: NJT CHKD: WAS | |
| NO | DATE | REVISIONS AND RECORD OF ISSUE | | DRWN | REV'D | APPR | COMP | APPD: KVP DATE: 02/08/2017 | |

NONE

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DRAWING BY ANY ORGANIZATION OTHER
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RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY 
RESOURCES

13139-043-T1-0903



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DRAWING BY ANY ORGANIZATION OTHER
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RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
CROSS SECTION - 5
TRANSMISSION LINE

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D	02/16/2018	PRELIMINARY - ARTICLE VII/ARTICLE X			NJT	TRK	KVP	
C	01/08/2018	PRELIMINARY - ARTICLE VII			NJT	JDJ	KVP	S&L
B	10/04/2017	PRELIMINARY - NOT FOR CONSTRUCTION			CRC	JDJ	KVP	S&L
A	02/08/2017	PRELIMINARY - ISSUED FOR REVIEW			NJT	WAS	-	S&L
NO	DATE	REVISIONS AND RECORD OF ISSUE			DRWN	REV'D	APPR	COMP
					APPD:		KVP	DATE: 02/08/2017
					PREP:		NJT	CHKD: WAS

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| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRWN | REV'D | APPR | COMP | APPD: | KVP | DATE: 10/04/2017 |
|----|------|-------------------------------|------|-------|------|------|-------|-----|------------------|

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRWN	REV'D	APPR	COMP	APPD:	KVP	DATE: 10/04/2017
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NONE

ANY MODIFICATION OR ADDITION TO THIS
DRAWING BY ANY ORGANIZATION OTHER
THAN SARGENT & LUNDY IS NOT THE
RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY 
RESOURCES

13139-043-T1-0908



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NO.	DATE	REVISIONS AND RECORD OF ISSUE	DRAWN	REV'D	APPR	COMP	APPD:	KVP	DATE: 10/04/2017
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NONE

ANY MODIFICATION OR ADDITION TO THIS
DRAWING BY ANY ORGANIZATION OTHER
THAN SARGENT & LUNDY IS NOT THE
RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

PRELIMINARY
NOT FOR CONSTRUCTION

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| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRWN | REV'D | APPR | COMP | APPD: KVP | DATE: 10/04/2017 |
|----|------|-------------------------------|------|-------|------|------|-----------|------------------|

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRWN	REV'D	APPR	COMP	APPD: KVP	DATE: 10/04/2017
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NONE

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DRAWING BY ANY ORGANIZATION OTHER
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NEXtera
ENERGY
RESOURCES

13139-043-T1-0910



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LA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
CROSS SECTION - 11
TRANSMISSION LINE

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| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRWN | REV'D | APPR | COMP | APPD: KVP | DATE: 10/04/2017 |
|----|------|-------------------------------|------|-------|------|------|-----------|------------------|

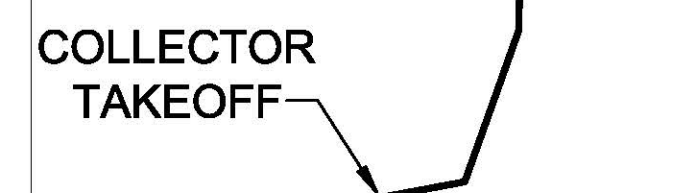
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRWN	REV'D	APPR	COMP	APPD: KVP	DATE: 10/04/2017
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NONE

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DRAWING BY ANY ORGANIZATION OTHER
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RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

13139-043-T1-0911



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| NO | DATE | REVISIONS AND RECORD OF ISSUE | DRWN | REV'D | APPR | COMP | APPD: KVP | DATE: 10/04/2017 |
|----|------|-------------------------------|------|-------|------|------|-----------|------------------|

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRWN	REV'D	APPR	COMP	APPD: KVP	DATE: 10/04/2017
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NONE

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DRAWING BY ANY ORGANIZATION OTHER
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RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

13139-043-T1-0912



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1. HEIGHTS OF EXISTING AND NEW STRUCTURES ARE TYPICAL, HEIGHTS MAY VARY ALONG RIGHT-OF-WAY.
2. ALL DIMENSIONS ARE PRELIMINARY AND SUBJECT TO CHANGE WITH FINAL SURVEY AND DESIGN.
3. CROSS SECTIONS ARE TYPICAL. VARIATIONS ALONG SEGMENT MAY OCCUR.
4. PROPOSED NEXTERA TLINE PHASING IS PRELIMINARY AND WILL BE FINALIZED DURING DETAILED DESIGN.
5. PRIVILEGED AND CONFIDENTIAL ATTORNEY-CLIENT COMMUNICATION/ATTORNEY WORK PRODUCT PREPARED AT THE DIRECTION OF LEGAL COUNSEL.

[illegible]

NONE

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RESPONSIBILITY OF SARGENT & LUNDY.

NEXtera
ENERGY
RESOURCES

13139-043-T1-0913

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PRELIMINARY
NOT FOR CONSTRUCTION

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PROPOSED CROSS SECTION
LOOKING TOWARDS PROPOSED COLLECTOR TAKEOFF

PROPOSED EDGE OF RIGHT OF WAY/ VEGETATION REMOVAL

1. HEIGHTS OF EXISTING AND NEW STRUCTURES ARE TYPICAL, HEIGHTS MAY VARY ALONG RIGHT-OF-WAY.
2. ALL DIMENSIONS ARE PRELIMINARY AND SUBJECT TO CHANGE WITH FINAL SURVEY AND DESIGN.
3. CROSS SECTIONS ARE TYPICAL. VARIATIONS ALONG SEGMENT MAY OCCUR.
4. PROPOSED NEXTERA TLINE PHASING IS PRELIMINARY AND WILL BE FINALIZED DURING DETAILED DESIGN.
5. PRIVILEGED AND CONFIDENTIAL ATTORNEY-CLIENT COMMUNICATION/ATTORNEY WORK PRODUCT PREPARED AT THE DIRECTION OF LEGAL COUNSEL.

-							SCALE: NONE
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C	02/16/2018	PRELIMINARY - ARTICLE VII/ARTICLE X		NJT	TRK	KVP	S&L
B	01/08/2018	PRELIMINARY - ARTICLE VII		NJT	JDJ	KVP	S&L
A	10/04/2017	PRELIMINARY - NOT FOR CONSTRUCTION		CRC	JDJ	KVP	S&L
NO	DATE	REVISIONS AND RECORD OF ISSUE		DRWN	REVD	APPR	COMP
						APPD:	KVP
						DATE:	10/04/2017

CONTRACTOR/INSTALLER SHALL TAKE ALL APPROPRIATE PRECAUTIONS TO ENSURE THE SAFETY OF ALL PEOPLE LOCATED ON THE WORK SITE; INCLUDING CONTRACTOR'S /INSTALLER'S PERSONNEL (OR THAT OF ITS SUB-CONTRACTOR(S)) PERFORMING THE WORK.

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DRAWING BY ANY ORGANIZATION OTHER
THAN SARGENT & LUNDY IS NOT THE
RESPONSIBILITY OF SARGENT & LUNDY.

Sargent & Lundy
55 EAST MONROE ST., CHICAGO, ILL.

NEXtera
ENERGY 
RESOURCES

NEXTERA ENERGY RESOURCES, LLC
EIGHT POINT WIND, LLC
CROSS SECTION - 15
TRANSMISSION LINE

13139-043-T1-0914

COLLECTOR
TAKEOFF—

PROJECT LINE OVERVIEW
NOT TO SCALE

PRELIMINARY
NOT FOR CONSTRUCTION

POI
TAKEOFF

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Steel Monopole - ROW Segment 2 Inputs

[illegible]

INPUT DATA LIST

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10/ 3/2017      15:39:51
EIGHT POINT - EMF CALC - 13139-043-TL-006 - STL POLE,,,,,,,,,
PREPARED: SAHMADZAI,,,,,,,,,
1,0, 3, 4,0.0, 0.50, 1.00,1980.00

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(ENGLISH UNITS OPTION)

(GRADIENTS ARE COMPUTED BY PROGRAM)

PHYSICAL SYSTEM CONSISTS OF 4 CONDUCTORS, OF WHICH 3 ARE ENERGIZED PHASES

[illegible]

1COMBINED OUTPUT OF AUDIBLE NOISE, RADIO NOISE, TVI, OZONE CONCENTRATION, GROUND GRADIENT AND MAGNETIC FIELD
EIGHT POINT - EMF CALC - 13139-043-TL-006 - STL POLE,,,,,,,,,
PREPARED: SAHMADZAI,,,,,,,,,

	DIST. FROM CENTER OF TOWER (FEET)	HEIGHT (FEET)	MAXIMUM GRADIENT (KV/CM)	SUBCON DIAM. (IN)	NO. OF SUBCON	SUBCON SPACING (IN)	VOLTAGE L-N (KV)	PHASE ANGLE (DEGREES)	CURRENT (kAmps)	CORONA LOSSES (KW/MI)
PH. A-1	9.00	42.80	5.90	1.50	1	0.00	66.39	0.00	1.98	0.035
PH. B-1	-9.20	23.80	6.08	1.50	1	0.00	66.39	240.00	1.98	0.043
PH. C-1	9.20	23.80	6.28	1.50	1	0.00	66.39	120.00	1.98	0.053
OPGW 1	1.20	60.00	1.66	0.53	1	0.00	0.00	0.00	0.00	0.000

AN MICROPHONE HT.= 5.0 FT, RI ANT. HT.= 6.6 FT, TV ANT. HT.= 9.8 FT, ALTITUDE= 1980.0 FT
RI FREQ= 1.000 MHZ, TV FREQ= 75.000 MHZ, WIND VEL.(OZ)= 0.500 MPH, GROUND CONDUCTIVITY = 10.0 MMHOS/M
E-FIELD TRANSDUCER HT.= 3.3FT, B-FIELD TRANSDUCER HT.= 3.3FT

Steel Monopole - ROW Segment 2 Results

LATERAL DIST FROM REFERENCE (FEET)	AUDIBLE NOISE (RAIN) L50 DBA	(FAIR) L50 DBA	RADIO INTERFERENCE (RAIN) L50 DBUV/M	(FAIR) L50 DBUV/M	TVI TOTAL RAIN DBUV/M	OZONE FOR RAIN RATE OF 1.00 IN/HR AT 0. FT LEVEL PPB	ELECTRIC FIELD KV/M	MAGNETIC FIELD GAUSS
-500.0	-7.2	-32.2	-14.3	-31.3	-47.5	0.000000	0.003	0.00118
-495.0	-7.1	-32.1	-14.2	-31.2	-47.4	0.000000	0.003	0.00120
-490.0	-7.1	-32.1	-14.1	-31.1	-47.2	0.000000	0.003	0.00123
-485.0	-7.0	-32.0	-14.0	-31.0	-47.0	0.000000	0.003	0.00125
-480.0	-7.0	-32.0	-13.9	-30.9	-46.9	0.000000	0.003	0.00128
-475.0	-6.9	-31.9	-13.8	-30.8	-46.7	0.000000	0.004	0.00131
-470.0	-6.9	-31.9	-13.7	-30.7	-46.5	0.000000	0.004	0.00133
-465.0	-6.8	-31.8	-13.6	-30.6	-46.3	0.000000	0.004	0.00136
-460.0	-6.8	-31.8	-13.5	-30.5	-46.1	0.000000	0.004	0.00139
-455.0	-6.7	-31.7	-13.4	-30.4	-45.9	0.000000	0.004	0.00142
-450.0	-6.7	-31.7	-13.3	-30.3	-45.8	0.000000	0.004	0.00146
-445.0	-6.6	-31.6	-13.2	-30.2	-45.6	0.000000	0.004	0.00149
-440.0	-6.6	-31.6	-13.1	-30.1	-45.4	0.000000	0.004	0.00152
-435.0	-6.5	-31.5	-13.0	-30.0	-45.2	0.000000	0.004	0.00156
-430.0	-6.4	-31.4	-12.9	-29.9	-45.0	0.000000	0.004	0.00159
-425.0	-6.4	-31.4	-12.8	-29.8	-44.8	0.000000	0.004	0.00163
-420.0	-6.3	-31.3	-12.7	-29.7	-44.6	0.000000	0.004	0.00167
-415.0	-6.3	-31.3	-12.6	-29.6	-44.4	0.000000	0.005	0.00171
-410.0	-6.2	-31.2	-12.4	-29.4	-44.2	0.000000	0.005	0.00175
-405.0	-6.2	-31.2	-12.3	-29.3	-44.0	0.000000	0.005	0.00180
-400.0	-6.1	-31.1	-12.2	-29.2	-43.8	0.000000	0.005	0.00184
-395.0	-6.0	-31.0	-12.1	-29.1	-43.6	0.000000	0.005	0.00189
-390.0	-6.0	-31.0	-12.0	-29.0	-43.3	0.000000	0.005	0.00194
-385.0	-5.9	-30.9	-11.8	-28.8	-43.1	0.000000	0.005	0.00199
-380.0	-5.8	-30.8	-11.7	-28.7	-42.9	0.000000	0.005	0.00204
-375.0	-5.8	-30.8	-11.6	-28.6	-42.7	0.000000	0.005	0.00209
-370.0	-5.7	-30.7	-11.5	-28.5	-42.5	0.000000	0.006	0.00215
-365.0	-5.6	-30.6	-11.3	-28.3	-42.4	0.000000	0.006	0.00221
-360.0	-5.6	-30.6	-11.2	-28.2	-42.3	0.000000	0.006	0.00227
-355.0	-5.5	-30.5	-11.1	-28.1	-42.2	0.000000	0.006	0.00233
-350.0	-5.4	-30.4	-10.9	-27.9	-42.1	0.000000	0.006	0.00240
-345.0	-5.4	-30.4	-10.8	-27.8	-41.9	0.000000	0.006	0.00247
-340.0	-5.3	-30.3	-10.6	-27.6	-41.8	0.000000	0.007	0.00254
-335.0	-5.2	-30.2	-10.5	-27.5	-41.7	0.000000	0.007	0.00262
-330.0	-5.2	-30.2	-10.3	-27.3	-41.6	0.000000	0.007	0.00270
-325.0	-5.1	-30.1	-10.2	-27.2	-41.4	0.000000	0.007	0.00278
-320.0	-5.0	-30.0	-10.0	-27.0	-41.3	0.000000	0.007	0.00287
-315.0	-4.9	-29.9	-9.9	-26.9	-41.2	0.000000	0.008	0.00296
-310.0	-4.8	-29.8	-9.7	-26.7	-41.0	0.000000	0.008	0.00305
-305.0	-4.8	-29.8	-9.6	-26.6	-40.9	0.000000	0.008	0.00315
-300.0	-4.7	-29.7	-9.4	-26.4	-40.7	0.000000	0.008	0.00326
-295.0	-4.6	-29.6	-9.2	-26.2	-40.4	0.000000	0.008	0.00337
-290.0	-4.5	-29.5	-9.1	-26.1	-40.1	0.000000	0.009	0.00349
-285.0	-4.4	-29.4	-8.9	-25.9	-39.9	0.000000	0.009	0.00361
-280.0	-4.4	-29.4	-8.7	-25.7	-39.6	0.000000	0.009	0.00374
-275.0	-4.3	-29.3	-8.5	-25.5	-39.3	0.000000	0.010	0.00387
-270.0	-4.2	-29.2	-8.3	-25.3	-38.9	0.000000	0.010	0.00402
-265.0	-4.1	-29.1	-8.1	-25.1	-38.6	0.000000	0.010	0.00417

Steel Monopole - ROW Segment 2

Results

-260.0	-4.0	-29.0	-7.9	-24.9	-38.3	0.000000	0.011	0.00433
-255.0	-3.9	-28.9	-7.7	-24.7	-38.0	0.000000	0.011	0.00450
-250.0	-3.8	-28.8	-7.5	-24.5	-37.7	0.000000	0.011	0.00468
-245.0	-3.7	-28.7	-7.3	-24.3	-37.3	0.000000	0.012	0.00487
-240.0	-3.6	-28.6	-7.1	-24.1	-37.0	0.000000	0.012	0.00507
-235.0	-3.5	-28.5	-6.9	-23.9	-36.6	0.000000	0.013	0.00528
-230.0	-3.4	-28.4	-6.7	-23.7	-36.3	0.000000	0.013	0.00551
-225.0	-3.3	-28.3	-6.4	-23.4	-35.9	0.000000	0.014	0.00576
-220.0	-3.2	-28.2	-6.2	-23.2	-35.5	0.000000	0.014	0.00602
-215.0	-3.1	-28.1	-5.9	-22.9	-35.1	0.000000	0.015	0.00629
-210.0	-3.0	-28.0	-5.7	-22.7	-34.8	0.000000	0.016	0.00659
-205.0	-2.8	-27.8	-5.4	-22.4	-34.4	0.000000	0.016	0.00691
-200.0	-2.7	-27.7	-5.2	-22.2	-34.1	0.000000	0.017	0.00726
-195.0	-2.6	-27.6	-4.9	-21.9	-33.9	0.000000	0.018	0.00763
-190.0	-2.5	-27.5	-4.6	-21.6	-33.7	0.000000	0.019	0.00802
-185.0	-2.3	-27.3	-4.3	-21.3	-33.5	0.000000	0.019	0.00845
-180.0	-2.2	-27.2	-4.0	-21.0	-33.2	0.000000	0.020	0.00892
-175.0	-2.1	-27.1	-3.7	-20.7	-33.0	0.000000	0.021	0.00942
-170.0	-1.9	-26.9	-3.3	-20.3	-32.8	0.000000	0.023	0.00997
-165.0	-1.8	-26.8	-3.0	-20.0	-32.5	0.000000	0.024	0.01057
-160.0	-1.6	-26.6	-2.7	-19.7	-32.3	0.000000	0.025	0.01122
-155.0	-1.5	-26.5	-2.3	-19.3	-32.0	0.000000	0.027	0.01194
-150.0	-1.3	-26.3	-1.9	-18.9	-31.7	0.000000	0.028	0.01272
-145.0	-1.2	-26.2	-1.5	-18.5	-31.5	0.000000	0.030	0.01358
-140.0	-1.0	-26.0	-1.1	-18.1	-31.2	0.000000	0.032	0.01454
-135.0	-0.8	-25.8	-0.7	-17.7	-30.9	0.000000	0.034	0.01559
-130.0	-0.7	-25.7	-0.3	-17.3	-30.6	0.000000	0.037	0.01677
-125.0	-0.5	-25.5	0.2	-16.8	-30.3	0.000000	0.040	0.01807
-120.0	-0.3	-25.3	0.7	-16.3	-29.9	0.000000	0.043	0.01954
-115.0	-0.1	-25.1	1.2	-15.8	-29.6	0.000000	0.047	0.02119
-110.0	0.1	-24.9	1.7	-15.3	-29.3	0.000000	0.052	0.02305
-105.0	0.3	-24.7	2.3	-14.7	-28.9	0.000000	0.057	0.02517
-100.0	0.6	-24.4	2.9	-14.1	-28.5	0.000000	0.064	0.02758
-95.0	0.8	-24.2	3.5	-13.5	-28.1	0.000000	0.071	0.03036
-90.0	1.1	-23.9	4.2	-12.8	-27.7	0.000000	0.081	0.03356
-85.0	1.3	-23.7	5.2	-11.8	-27.1	0.000000	0.093	0.03728
-80.0	1.6	-23.4	6.2	-10.8	-26.5	0.000000	0.107	0.04164
-75.0	1.9	-23.1	7.3	-9.7	-25.9	0.000000	0.126	0.04678
-70.0	2.2	-22.8	8.5	-8.5	-25.3	0.000000	0.150	0.05290
-65.0	2.5	-22.5	9.7	-7.3	-24.6	0.000000	0.182	0.06025
-60.0	2.9	-22.1	11.1	-5.9	-23.8	0.000000	0.223	0.06916
-55.0	3.2	-21.8	12.7	-4.3	-23.0	0.000000	0.278	0.08008
-50.0	3.6	-21.4	14.3	-2.7	-22.1	0.000000	0.351	0.09360
-45.0	4.1	-20.9	16.1	-0.9	-21.1	0.000000	0.450	0.11052
-40.0	4.5	-20.5	18.2	1.2	-20.0	0.000000	0.584	0.13188
-35.0	5.0	-20.0	20.3	3.3	-18.7	0.000000	0.761	0.15900
-30.0	5.6	-19.4	22.7	5.7	-17.4	0.000000	0.988	0.19336
-25.0	6.1	-18.9	25.2	8.2	-15.9	0.000000	1.261	0.23603
-20.0	6.7	-18.3	27.6	10.6	-14.3	0.000000	1.542	0.28638
-15.0	7.2	-17.8	29.5	12.5	-13.0	0.000000	1.739	0.33966
-10.0	7.6	-17.4	30.5	13.5	-12.3	0.000000	1.739	0.38582
-5.0	7.9	-17.1	30.0	13.0	-12.7	0.002710	1.516	0.41361
0.0	8.0	-17.0	30.0	13.0	-12.1	0.003839	1.291	0.41749

Steel Monopole - ROW Segment 2

Results

5.0	8.1	-16.9	31.7	14.7	-11.0	0.003192	1.379	0.39799
10.0	8.0	-17.0	32.2	15.2	-10.6	0.002638	1.539	0.35858
15.0	7.7	-17.3	31.2	14.2	-11.3	0.007647	1.511	0.30666
20.0	7.2	-17.8	29.3	12.3	-12.6	0.008305	1.311	0.25261
25.0	6.7	-18.3	26.9	9.9	-14.2	0.007368	1.050	0.20454
30.0	6.1	-18.9	24.4	7.4	-15.6	0.006424	0.814	0.16588
35.0	5.5	-19.5	22.1	5.1	-17.0	0.005655	0.633	0.13703
40.0	5.0	-20.0	19.9	2.9	-18.3	0.005042	0.505	0.11585
45.0	4.5	-20.5	17.9	0.9	-19.4	0.004548	0.416	0.09925
50.0	4.1	-20.9	16.0	-1.0	-20.4	0.004145	0.351	0.08570
55.0	3.7	-21.3	14.4	-2.6	-21.3	0.003810	0.303	0.07450
60.0	3.3	-21.7	12.9	-4.1	-22.1	0.003528	0.265	0.06517
65.0	2.9	-22.1	11.5	-5.5	-22.9	0.003286	0.233	0.05736
70.0	2.6	-22.4	10.2	-6.8	-23.6	0.003078	0.207	0.05078
75.0	2.2	-22.8	9.2	-7.8	-24.2	0.002895	0.185	0.04520
80.0	1.9	-23.1	8.3	-8.7	-24.8	0.002735	0.166	0.04045
85.0	1.7	-23.3	7.5	-9.5	-25.4	0.002592	0.149	0.03637
90.0	1.4	-23.6	6.7	-10.3	-25.9	0.002465	0.135	0.03286
95.0	1.1	-23.9	5.9	-11.1	-26.4	0.002350	0.122	0.02981
100.0	0.9	-24.1	5.2	-11.8	-26.9	0.002246	0.111	0.02716
105.0	0.6	-24.4	4.5	-12.5	-27.4	0.002152	0.101	0.02483
110.0	0.4	-24.6	3.8	-13.2	-27.8	0.002065	0.093	0.02279
115.0	0.2	-24.8	3.2	-13.8	-28.2	0.001986	0.085	0.02098
120.0	-0.0	-25.0	2.6	-14.4	-28.6	0.001913	0.078	0.01937
125.0	-0.2	-25.2	2.1	-14.9	-29.0	0.001846	0.072	0.01793
130.0	-0.4	-25.4	1.5	-15.5	-29.4	0.001784	0.067	0.01665
135.0	-0.6	-25.6	1.0	-16.0	-29.7	0.001725	0.062	0.01550
140.0	-0.8	-25.8	0.5	-16.5	-30.0	0.001671	0.057	0.01446
145.0	-1.0	-26.0	0.0	-17.0	-30.4	0.001621	0.053	0.01352
150.0	-1.1	-26.1	-0.4	-17.4	-30.7	0.001573	0.050	0.01267
155.0	-1.3	-26.3	-0.9	-17.9	-31.0	0.001529	0.046	0.01189
160.0	-1.4	-26.4	-1.3	-18.3	-31.3	0.001487	0.044	0.01119
165.0	-1.6	-26.6	-1.7	-18.7	-31.6	0.001448	0.041	0.01054
170.0	-1.8	-26.8	-2.1	-19.1	-31.8	0.001410	0.038	0.00995
175.0	-1.9	-26.9	-2.4	-19.4	-32.1	0.001375	0.036	0.00940
180.0	-2.0	-27.0	-2.8	-19.8	-32.3	0.001342	0.034	0.00890
185.0	-2.2	-27.2	-3.1	-20.1	-32.6	0.001310	0.032	0.00844
190.0	-2.3	-27.3	-3.5	-20.5	-32.8	0.001280	0.030	0.00801
195.0	-2.4	-27.4	-3.8	-20.8	-33.1	0.001251	0.029	0.00761
200.0	-2.6	-27.6	-4.1	-21.1	-33.3	0.001224	0.027	0.00725
205.0	-2.7	-27.7	-4.4	-21.4	-33.5	0.001198	0.026	0.00690
210.0	-2.8	-27.8	-4.7	-21.7	-33.7	0.001173	0.025	0.00659
215.0	-2.9	-27.9	-5.0	-22.0	-34.0	0.001149	0.023	0.00629
220.0	-3.0	-28.0	-5.3	-22.3	-34.2	0.001126	0.022	0.00601
225.0	-3.1	-28.1	-5.5	-22.5	-34.5	0.001105	0.021	0.00575
230.0	-3.3	-28.3	-5.8	-22.8	-34.9	0.001084	0.020	0.00551
235.0	-3.4	-28.4	-6.0	-23.0	-35.3	0.001064	0.019	0.00528
240.0	-3.5	-28.5	-6.3	-23.3	-35.6	0.001044	0.019	0.00507
245.0	-3.6	-28.6	-6.5	-23.5	-36.0	0.001026	0.018	0.00486
250.0	-3.7	-28.7	-6.8	-23.8	-36.4	0.001008	0.017	0.00467
255.0	-3.8	-28.8	-7.0	-24.0	-36.7	0.000991	0.016	0.00449
260.0	-3.9	-28.9	-7.2	-24.2	-37.1	0.000974	0.016	0.00433
265.0	-4.0	-29.0	-7.4	-24.4	-37.4	0.000958	0.015	0.00417

Steel Monopole - ROW Segment 2

Results

270.0	-4.1	-29.1	-7.6	-24.6	-37.8	0.000943	0.015	0.00401
275.0	-4.1	-29.1	-7.8	-24.8	-38.1	0.000928	0.014	0.00387
280.0	-4.2	-29.2	-8.0	-25.0	-38.4	0.000913	0.013	0.00374
285.0	-4.3	-29.3	-8.2	-25.2	-38.7	0.000899	0.013	0.00361
290.0	-4.4	-29.4	-8.4	-25.4	-39.0	0.000886	0.012	0.00349
295.0	-4.5	-29.5	-8.6	-25.6	-39.4	0.000873	0.012	0.00337
300.0	-4.6	-29.6	-8.8	-25.8	-39.7	0.000860	0.012	0.00326
305.0	-4.7	-29.7	-9.0	-26.0	-39.9	0.000848	0.011	0.00315
310.0	-4.7	-29.7	-9.1	-26.1	-40.2	0.000836	0.011	0.00305
315.0	-4.8	-29.8	-9.3	-26.3	-40.5	0.000825	0.010	0.00296
320.0	-4.9	-29.9	-9.5	-26.5	-40.8	0.000813	0.010	0.00287
325.0	-5.0	-30.0	-9.6	-26.6	-41.0	0.000802	0.010	0.00278
330.0	-5.1	-30.1	-9.8	-26.8	-41.1	0.000792	0.009	0.00270
335.0	-5.1	-30.1	-9.9	-26.9	-41.2	0.000782	0.009	0.00262
340.0	-5.2	-30.2	-10.1	-27.1	-41.4	0.000772	0.009	0.00254
345.0	-5.3	-30.3	-10.3	-27.3	-41.5	0.000762	0.009	0.00247
350.0	-5.3	-30.3	-10.4	-27.4	-41.6	0.000752	0.008	0.00240
355.0	-5.4	-30.4	-10.6	-27.6	-41.7	0.000743	0.008	0.00233
360.0	-5.5	-30.5	-10.7	-27.7	-41.9	0.000734	0.008	0.00227
365.0	-5.6	-30.6	-10.8	-27.8	-42.0	0.000726	0.008	0.00221
370.0	-5.6	-30.6	-11.0	-28.0	-42.1	0.000717	0.007	0.00215
375.0	-5.7	-30.7	-11.1	-28.1	-42.2	0.000709	0.007	0.00209
380.0	-5.8	-30.8	-11.2	-28.2	-42.3	0.000701	0.007	0.00204
385.0	-5.8	-30.8	-11.4	-28.4	-42.5	0.000693	0.007	0.00199
390.0	-5.9	-30.9	-11.5	-28.5	-42.6	0.000685	0.007	0.00194
395.0	-5.9	-30.9	-11.6	-28.6	-42.8	0.000678	0.007	0.00189
400.0	-6.0	-31.0	-11.8	-28.8	-43.0	0.000670	0.006	0.00184
405.0	-6.1	-31.1	-11.9	-28.9	-43.2	0.000663	0.006	0.00180
410.0	-6.1	-31.1	-12.0	-29.0	-43.4	0.000656	0.006	0.00175
415.0	-6.2	-31.2	-12.1	-29.1	-43.6	0.000649	0.006	0.00171
420.0	-6.3	-31.3	-12.3	-29.3	-43.9	0.000643	0.006	0.00167
425.0	-6.3	-31.3	-12.4	-29.4	-44.1	0.000636	0.006	0.00163
430.0	-6.4	-31.4	-12.5	-29.5	-44.3	0.000630	0.005	0.00159
435.0	-6.4	-31.4	-12.6	-29.6	-44.5	0.000623	0.005	0.00156
440.0	-6.5	-31.5	-12.7	-29.7	-44.7	0.000617	0.005	0.00152
445.0	-6.5	-31.5	-12.8	-29.8	-44.9	0.000611	0.005	0.00149
450.0	-6.6	-31.6	-12.9	-29.9	-45.1	0.000605	0.005	0.00146
455.0	-6.7	-31.7	-13.0	-30.0	-45.3	0.000600	0.005	0.00142
460.0	-6.7	-31.7	-13.1	-30.1	-45.5	0.000594	0.005	0.00139
465.0	-6.8	-31.8	-13.3	-30.3	-45.6	0.000588	0.005	0.00136
470.0	-6.8	-31.8	-13.4	-30.4	-45.8	0.000583	0.005	0.00134
475.0	-6.9	-31.9	-13.5	-30.5	-46.0	0.000578	0.004	0.00131
480.0	-6.9	-31.9	-13.6	-30.6	-46.2	0.000572	0.004	0.00128
485.0	-7.0	-32.0	-13.7	-30.7	-46.4	0.000567	0.004	0.00125
490.0	-7.0	-32.0	-13.8	-30.8	-46.6	0.000562	0.004	0.00123
495.0	-7.1	-32.1	-13.9	-30.9	-46.7	0.000557	0.004	0.00120

ROW Segment 2 – Steel Monopole Tangent Structure

