

WIRE SAG REPORT

LINE SECTION NAME:

STRUCTURE FROM:

STRUCTURE TO:

DATE:

CONDUCTOR SIZE:

OHSW SIZE:

OPGW SIZE:

ADSS SIZE:

DATUM TEMP:

SAG METHOD (check one): TRANSIT/TARGET: STOP WATCH: OTHER: (Describe under remarks)

SAG NO.	TRANSIT STR.	TRANSIT STR.	DATUM SAG	A \emptyset			B \emptyset			C \emptyset			DATUM SAG	OPGW	DATUM SAG	OHSW OR ADSS
				A1	A2	A3	B1	B2	B3	C1	C2	C3				

REMARKS:

CONTRACTOR SIGNATURE:

DATE:

INSPECTOR SIGNATURE:

DATE:

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact System Engineering - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A



TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL

WIRE SAG REPORT
CONDUCTOR, OHSW, OPGW AND ADSS
FOR TRANSMISSION PROJECTS

REVISION
00
DATE
5/21/2015

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
B. Franklin	6/15/2012	Becken/Hart	3/05/2015	Barry R. Hart	4/09/2015

TM2.23.TF-01-004

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

 ANSIB 11" X 17"

AAAC-6201			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross-Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	Equiv. Diameter ACSR	SAP Compatible Unit (CU) for Wire	
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel					TOTAL	DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)						AC @ 20° C/ 68° F (*mile)
				Alum.	Steel																	
Azusa	123.3	7	72001	0.1327		0.398			0.115	4460	0.0968	1-1068				1.006	0.01111	0.546	0.124	1/0 6/1		
Annapolis	1/0	19	113-110-00			0.403			0.1157	4137	0.0968	1-1056								-		
** Alliance **	246.9	7	113-112-00	0.1878		0.563			0.232	8560	0.1939	1-1068				0.5023	0.01571	0.504	0.1136	4/0 6/1	U*CT-TF-ALLIANCE	
Amarillo	4/0	19	1011311600			0.570			0.230	8280	0.1939	1-1056				0.4393	0.0172	0.493	0.1106	-		
Darien	559.5	19	-	0.1716		0.858			0.5217	18800	0.4394	1-1056								477 26/7		

+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.


Standard IUSA Conductor = ** Wire Code Word **

Replaces NYSEG STD V52-031-00 and V52-032-XX.

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

CU Function: U_TL69 for 35kV & 46kV, U_TG69 for 69kV through 344kV, U_T345 for 345kV & greater.

For correct CU: substitute 2 for NYSEG, 3 for CMP or 4 for RG&E in place of asterisk (U*_).

Contact Engineering Standards - Transmission for the creation of new standards and CUs.						Drawing Scale: N/A	
	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL		TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE			Revision	
			(All Aluminum-Alloy Conductor, Bare)			00	
Date Dr.: 8/10/2012		Checked By: Shepard/Becken/Hart		Date Ck.: / /2014		Date	
Drwn. By: L.A. Best				Approved By: Barry R. Hart		/ /2014	
<div style="display: flex; justify-content: space-between;"> TM2.23.TF-02-001 Sheet 1 </div>							

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSI B 11" X 17"

AAC			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	Equiv. Diameter ACSR	SAP Compatible Unit (CU) for Wire	
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel					TOTAL	DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)						AC @ 20° C/ 68° F (*mile)
				Alum.	Steel																	
Iris	#2	7		0.0974		0.292			0.0620	1350	0.0522								1/0 6/1			
Poppy	1/0	7	110-400-00	0.1228		0.368			0.0991	1990	0.0829	1-918			0.871	0.01111	0.546	0.124				
-	1/0	19				0.373			0.0991	2090					0.871	0.01177	0.539	0.1236				
Aster	2/0	7	110-410-00	0.1379		0.414			0.1249	2510	0.1045	1-918			0.691	0.0125	0.532	0.1204				
Phlox	3/0	7	110-420-00	0.1548		0.464			0.1575	3040	0.1317	1-918			0.549	0.014	0.518	0.1172				
Oxlip	4/0	7	110-430-00	0.1739		0.522			0.1986	3830	0.1663	1-918			0.435	0.01584	0.503	0.1138				
-	4/0	19				0.528			0.1986	3890	0.1318				0.435	0.01666	0.4969	0.1132				
-	214.0	7				0.524					0.1662				0.428	0.01597	0.502	0.0929				
Tulip	336.4	19	71960	0.1331		0.666			0.3158	6150	0.2644	1-945			0.274	0.02096	0.469	0.1063				
Cosmos	477.0	19	72486	0.1584		0.793			0.4478	8360	0.3744	1-945			0.194	0.02492	0.448	0.1011				
Syringa	477.0	37		0.1135		0.795			0.4478	8690	0.3744	1-1049			0.194	0.02534	0.446	0.1011				
Hyacinth	500.0	37		0.1162		0.814			0.4694	9110	0.3924	1-1049			0.1885	0.02608	0.4425	0.1004				
Dahlia	556.5	19		0.1711		0.856			0.522	9750	0.4369	1-945			0.167	0.0271	0.438	0.0989				
Mistletoe	556.5	37		0.1226		0.858			0.5224	9940	0.4368	1-1049			0.1698	0.02751	0.436	0.0988				
Orchid	636.0	37	110-560-00	0.1311		0.918			0.5969	11400	0.4995	1-1049			0.147	0.02939	0.428	0.0968				
Arbutus	795.0	37	75267	0.1466		1.026			0.7463	13900	0.6245	1-1049			0.118	0.03271	0.415	0.0935				
Lilac	795.0	61	110-590-10	0.1142		1.028			0.7467	14300	0.6248	1-1010			0.118	0.033	0.414	0.0935				
Magnolia	954.0	37		0.1606		1.124			0.896	16400	0.7495	1-1049			0.0994	0.03581	0.404	0.0935				
Bluebell	1033.5	37	72583	0.1671		1.170			0.9702	17700	0.8114	1-1049			0.0923	0.03732	0.399	0.0896	U*CT-TF-BLUEBELL			
Larkspur	1033.5	61		0.1302		1.172			0.9702	18300	0.8122	1-1010			0.0923	0.0376	0.398	0.0896				
Hawthorn	1192.5	61	752396	0.1398		1.258			1.119	21100	0.9363	1-1010			0.0824	0.0405	0.389	0.0875				
Narcissus	1272.0	61	20-5152	0.1444		1.300			1.192	22000	0.999											
Carnation	1431.0	61		0.1532		1.378			1.341	24300	1.244											
Coreopsis	1590.0	61	752401	0.1614		1.453			1.493	27000	1.248	1-1010			0.0637	0.0466	0.372	0.0832				


+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.

Replaces NYSEG STD V52-031-00 and V52-032-XX.

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

CU Function: U_TL69 for 35kV & 46kV, U_TG69 for 69kV through 344kV, U_T345 for 345kV & greater.

For correct CU: substitute 2 for NYSEG, 3 for CMP or 4 for RG&E in place of asterisk (U*_).

Contact Engineering Standards - Transmission for the creation of new standards and CUs.										Drawing Scale: N/A	
		IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL			TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE					Revision	
					AAC (All Aluminum Conductor, Bare)					00	
Date Dr.: 8/10/2012		Checked By: Shepard/Becken/Hart		Date Ck.: / /2014		Approved By: Barry R. Hart		Date App.: / /2014		Date / /2014	
TM2.23.TF-02-002										Sheet 1	

ACAR

Wire Code Word	Wire Size (kcmil)	Stranding	Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross-Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	
				Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel					TOTAL	DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)				AC @ 20° C/ 68° F (*mile)
				Alum.	Steel															
-	1280.0	42/19	752405	0.			1.302	0.		1.202	30800	0.024	1-960	X	X	X				


PE SEAL

+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.

Replaces V52-031-00 and V52-032-XX.

CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

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Contact System Engineering - Transmission Section for the creation of new standards and CUs.														Drawing Scale: N/A	
	TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM.2.23				TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE ACAR (Aluminum Conductor, Aluminum Alloy Reinforced, Bare)										ISSUE 0
	Date Dr.: 8/10/2012				Checked By: _____				Date Ck.: / /2012		Approved By: Barry R. Hart		Date App.: / /2012		DATE / /2012
TF-02-003												Sheet 1			

ACCC			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel					TOTAL	DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)				AC @ 20° C/ 68° F (*mile)
				Alum.	Steel															
-	1280.0	42/19	752405	0.			1.302	0.		1.202	30800	0.024	1-960	X	X	X				

PE SEAL


+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature,
2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.

Replaces V52-031-00 and V52-032-XX.

CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact System Engineering - Transmission Section for the creation of new standards and CUs. Drawing Scale: N/A

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM.2.23	TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE ACCC (Aluminum Conductor Composite Core, Bare)	ISSUE 0 DATE / /2012
	Drwn. By: L.A. Best Date Dr.: 8/10/2012 Checked By:	Date Ck.: / /2012 Approved By: Barry R. Hart Date App.: / /2012	TF-02-004

3M ACCR			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel					TOTAL	DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)				AC @ 20° C/ 68° F (*mile)
				Alum.	Steel															
Drake795	824-T16	26/19	752405	0.			1.302	0.		1.202	30800	0.024	1-960	X	X	X				

PE SEAL

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+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature,
2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.

Replaces V52-031-00 and V52-032-XX.

CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

		TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM.2.23	TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE ACCR (3M Aluminum Conductor Composite Reinforced, Bare)	ISSUE 0 DATE / /2012
Drwn. By: L.A. Best	Date Dr.: 8/23/2012	Checked By:	Date Ck.: / /2012	Approved By: Barry R. Hart
Date App.: / /2012			TF-02-005	
				Sheet 1

Drawing Scale: N/A

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ACSR			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)				Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	SAP Compatible Unit (CU) for Wire
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel	TOTAL					DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)	AC @ 20° C/ 68° F (*mile)				
				Alum.	Steel																
Turkey	#6	6/1		0.0661	0.0661	0.0661	0.198	0.0245	0.0116	0.0361	1190	0.024		105	0.641	0.806					
Swan	#4	6/1	114-030-00	0.0834	0.0834	0.0834	0.250	0.039	0.018	0.0574	1860	0.0382	1-1023	140	0.403	0.515	2.24	0.0065	0.611	0.1354	
Swanate	#4	7/1	752406	0.0772	0.103	0.103	0.257	0.039	0.028	0.067	2360	0.0411	1-670	140	0.399	0.519					
Swallow	#3	6/1		0.0937	0.0937	0.0937	0.281	0.0492	0.0232	0.0724	2300	0.0482			0.32265		1.78	0.00689	0.604	0.1319	
Sparrow	#2	6/1	20-4554	0.1052	0.1052	0.1052	0.316	0.062	0.029	0.091	2850	0.0608		184	0.254	0.332					
Sparate	#2	7/1	752407	0.0974	0.1298	0.1298	0.325	0.062	0.045	0.1067	3460	0.0654	1-670	184	0.251	0.338	1.41	0.00761	0.592	0.1279	
Robin	#1	6/1	114-050-00	0.1181	0.1181	0.1181	0.354	0.078	0.037	0.115	3550	0.0767		212	0.201	0.268	1.12	0.0084	0.58	0.125	
Raven	1/0	6/1	6000204600	0.1327	0.1327	0.1327	0.398	0.099	0.047	0.1452	4380	0.0968	1-938	242	0.159	0.217	0.888	0.00927	0.568	0.1216	
Quail	2/0	6/1	752408	0.1489	0.1489	0.1489	0.447	0.124	0.059	0.1831	5310	0.1219	1-938	276	0.126	0.176	0.706	0.0104	0.554	0.1184	
Pigeon	3/0	6/1	752409	0.1672	0.1672	0.1672	0.502	0.156	0.074	0.2308	6620	0.1737	1-938	315	0.100	0.144	0.56	0.01168	0.54	0.1147	
Penguin	4/0	6/1	752410	0.1878	0.187	0.1878	0.563	0.197	0.093	0.2911	8350	0.1939	1-938	357	0.0795	0.119	0.445	0.01332	0.524	0.1114	
-	219.9	8/7	752412				0.6079	0.062	0.029	0.3655	12300	0.2194	1-882				0.417	0.0172	0.493	0.1091	
Waxwing	266.8	18/1	20-4680	0.1217	0.1217	0.1217	0.609	0.250	0.039	0.289	6880	0.2210		449	0.0643	0.0787					
Owl	266.8	6/7	20-4692	0.2109	0.0703	0.2109	0.633	0.250	0.092	0.343	9680	0.2367			0.06395						
Piper (Kaiser)	300.0	30/7		0.1000	0.1000	0.3000	0.700	0.284	0.186	0.468	15430	0.2906					0.311	0.02411	0.452	0.1048	
Merlin	336.4	18/1	752413	0.1367	0.1367	0.1367	0.684	0.315	0.049	0.3653	8680	0.2789	1-844	519	0.0510	0.0625	0.273	0.02221	0.462	0.1055	
Linnet	336.4	26/7	71901	0.1137	0.0885	0.2654	0.721	0.317	0.146	0.462	14100	0.3070	1-782	529	0.0505	0.0618	0.267	0.02431	0.451	0.1041	U*CT-TF-LINNET
Oriole	336.4	30/7	752415	0.1059	0.1059	0.3177	0.741	0.318	0.209	0.527	17300	0.3259	1-773	535	0.0502	0.0613	0.268	0.02554	0.445	0.1031	
Chickadee	397.5	18/1		0.1486	0.1486	0.1486	0.743	0.373	0.058	0.431	9940	0.3295	1-844	576	0.0432	0.0529	0.231	0.02411	0.452	0.1031	
Ibis	397.5	26/7		0.1236	0.0962	0.2885	0.783	0.374	0.172	0.547	16300	0.3627	1-782	587	0.0428	0.0523	0.226	0.0264	0.441	0.1015	
** Pelican **	477.0	18/1	752416	0.1628	0.1628	0.1628	0.814	0.447	0.070	0.518	11800	0.3953	1-844	646	0.0360	0.0442	0.193	0.0264	0.441	0.1004	U*CT-TF-PELICAN
Hawk	477.0	26/7	752397	0.1354	0.1053	0.316	0.858	0.449	0.0207	0.657	19500	0.4353	1-782	659	0.0356	0.0436	0.188	0.02891	0.43	0.0989	
Hen	477.0	30/7	752398	0.1261	0.1261	0.3783	0.883	0.450	0.296	0.747	23800	0.4621	1-773	666	0.0354	0.0433	0.19	0.03037	0.424	0.096	
Osprey	556.5	18/1		0.1758	0.1758	0.1758	0.879	0.522	0.082	0.603	13700	0.4612	1-844	711	0.0308	0.0379	0.166	0.02843	0.432	0.0981	
Squab	605.0	26/7		0.1525	0.1186	0.3559	0.966	0.570	0.262	0.832	24300	0.5522	1-782	765	0.0281	0.0345	0.149	0.03271	0.415	0.0953	
Kingbird	636.0	18/1		0.188	0.188	0.188	0.940	0.596	0.094	0.690	15700	0.5274	1-844	773	0.0270	0.0332					
Rook	636.0	24/7		0.1628	0.1085	0.3256	0.977	0.599	0.219	0.818	22600	0.5643	1-889	784	0.0268	0.0330	0.143	0.03271	0.415	0.095	
Grosbeak	636.0	26/7		0.1564	0.1216	0.3649	0.990	0.599	0.275	0.874	25200	0.5808	1-782	789	0.0267	0.0328	0.142	0.03353	0.412	0.0945	
Scoter	636.0	30/7		0.1456	0.1456	0.4368	1.019	0.600	0.395	0.995	30400	0.6161	1-773	798	0.0256	0.0325					
Egret	636.0	30/19	114-185-00	0.1456	0.0874	0.4368	1.019	0.600	0.386	0.987	31500	0.6135	1-757	798	0.0266	0.0326	0.143	0.03523	0.406	0.0945	

+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.


Standard IUSA Conductor = ** Wire Code Word **

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

CU Function: U_TL69 for 35kV & 46kV, U_TG69 for 69kV through 344kV, U_T345 for 345kV & greater.

For correct CU: substitute 2 for NYSEG, 3 for CMP or 4 for RG&E in place of asterisk (U*_).

Replaces NYSEG STD V52-031-00 and V52-032-XX.

Contact Engineering Standards - Transmission for the creation of new standards and CUs.				Drawing Scale: N/A	
	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL	TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE ACSR (Aluminum Conductor, Steel Reinforced, Bare)			Revision
					00
		Date			
		/ / 2014			
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	8/10/2012	Shepard/Becken/Hart	/ / 2014	Barry R. Hart	/ / 2014
TM2.23.TF-02-006					Sheet 1

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ACSR			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)				Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	SAP Compatible Unit (CU) for Wire
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel	TOTAL					DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)	AC @ 20° C/ 68° F (*mile)				
				Alum.	Steel																
Redwing	715.5	30/19		0.1544	0.0927	0.4633	1.081	0.676	0.435	1.110	34600	0.6897	1-757	859	0.0236	0.0290	0.126	0.03732	0.399	0.0919	
Cuckoo	795.0	24/7		0.1820	0.1213	0.364	1.092	0.749	0.274	1.024	27900	0.7053	1-889								
** Drake **	795.0	26/7	752399	0.1749	0.136	0.408	1.107	0.749	0.344	1.093	31500	0.7263	1-537	907	0.0214	0.0263	0.114	0.03732	0.399	0.0913	U*CT-TF-DRAKE
Coot	795.0	36/1	752400	0.1486	0.1486	0.1486	1.040	0.745	0.058	0.804	16800	0.6417	1-898	884	0.0217	0.0268	0.127	0.03325	0.413	0.0931	
Tern	795.0	45/7	752421	0.1329	0.0886	0.2658	1.063	0.749	0.146	0.895	22100	0.6674	1-955	887	0.0216	0.0269	0.116	0.03523	0.406	0.0924	
Condor	795.0	54/7		0.1213	0.1213	0.03873	1.092	0.749	0.274	1.023	28200	0.7049		889	0.0215	0.0272					
Mallard	795.0	30/19		0.1628	0.0977	0.4884	1.140	0.751	0.483	1.234	38400	0.7669	1-757	918	0.0213	0.0261	0.114	0.03921	0.393	0.0904	
-	850.8	45/7	6000204807	0.1375	0.0917	0.2751	1.100	0.801	0.157	0.958	24300				0.02023	0.02505	0.1089	0.0363	0.4025	0.0914	
Canary	900.0	54/7		0.1291	0.1291	0.3873	1.162	0.848	0.310	1.158	31900	0.7984		961	0.0190	0.0241					
Rail	954.0	45/7		0.1456	0.0971	0.2912	1.165	0.899	0.175	1.074	25900	0.8011	1-955	993	0.0180	0.0225	0.0978	0.03857	0.395	0.0898	
Cardinal	954.0	54/7	6000204835	0.1329	0.1329	0.3987	1.196	0.899	0.329	1.227	33800	0.8462		996	0.0179	0.0228					
Tanager	1033.5	36/1	752422	0.1694	0.1694	0.1694	1.186			1.046	21400	0.8339	1-898				0.0936	0.0381	0.3965	0.0892	
Ortolan	1033.5	45/7	752423	0.1515	0.101	0.3031	1.212	0.973	0.190	1.163	27700	0.8673	1-957	1043	0.0167	0.0209	0.0905	0.04019	0.39	0.0886	
ORTOLAN	NON-SPECULAR		1011422700																		
Curlew	1033.5	54/7	752385	0.1383	0.1383	0.415	1.245	0.973	0.356	1.330	36600	0.9164	1-838	1047	0.0165	0.0211	0.0893	0.04188	0.385	0.0877	
Bluejay	1113.0	45/7	600020480	0.1573	0.1048	0.3145	1.258	1.048	0.205	1.253	29800	0.9350		1092	0.0155	0.0194	0.0792	0.04293	0.382	0.0864	
** Bunting **	1192.5	45/7	752386	0.1628	0.1085	0.3256	1.302	1.123	0.219	1.343	32000	1.001	1-957	1139	0.0144	0.0144	0.0778	0.04511	0.376	0.0841	U*CT-TF-BUNTING
Grackle	1192.5	54/19	752387	0.1486	0.0892	0.4458	1.337	1.129	0.402	1.531	41900	1.055	1-1009	1140	0.0144	0.0184	0.0751	0.0466	0.372	0.0847	
Pheasant	1272.0	54/19	114-247-00	0.1535	0.0921	0.4605	1.381	1.204	0.429	1.633	43600	1.126	1-1009	1187	0.0135	0.0173	0.0668	0.04701	0.371	0.0837	
Bobolink	1431.0	45/7	752388	0.1783	0.1189	0.3566	1.427	1.348	0.263	1.611	38300	1.201	1-957	1272	0.0120	0.0153					
Plover	1431.0	54/19		0.1628	0.0977	0.489	1.465	1.355	0.483	1.838	49100	1.267		1270*	0.0120	0.0151		0.0495			
Lapwing	1590.0	45/7	114-255-00	0.188	0.1253	0.3759	1.504	1.498	0.292	1.790	42200	1.335	1-957	1354	0.0108	0.0139	0.0608	0.0498	0.364	0.0821	
** Falcon **	1590.0	54/19	6000204845	0.1716	0.103	0.5148	1.544	1.505	0.536	2.041	54500	1.407	1-1009	1359	0.0108	0.0140					U*CT-TF-FALCON
Bluebird	2156.0	84/19	752389	0.1602	0.0962	0.4808	1.762	2.040	0.468	2.508	60300	1.831	1-1020	1623	0.00801	0.0105	0.0475	0.05858	0.3443	0.0774	
Petrel	101.8 **	12/7	752411	0.0921	0.0921	0.2763	0.461	0.096	0.158	0.2541	10400	0.1266	1-546	237	0.158	0.250	0.83	0.01168	0.54	0.1174	
Leghorn	134.6 **	12/7		0.1059	0.1059	0.3177	0.530	0.127	0.209	0.335	13600	0.1674	1-546	184	0.120	0.204	0.63	0.01377	0.52	0.1132	
Dorking	190.8 **	12/7		0.1261	0.1261	0.3783	0.631	0.180	0.296	0.476	18700	0.237	1-546	324	0.0845	0.160			0.501	0.1079	
Cochin	211.3 **	12/7	114-110-00	0.1327	0.1327	0.398	0.663	0.199	0.328	0.527	28400	0.2628	1-546	340	0.0763	0.150	0.4	0.01692	0.495	0.1066	

** These are high mechanical strength wires.

+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.


Standard IUSA Conductor = ** Wire Code Word **

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

CU Function: U_TL69 for 35kV & 46kV, U_TG69 for 69kV through 344kV, U_T345 for 345kV & greater.

For correct CU: substitute 2 for NYSEG, 3 for CMP or 4 for RG&E in place of asterisk (U*_).

Replaces NYSEG STD V52-031-00 and V52-032-XX.

Contact Engineering Standards - Transmission for the creation of new standards and CUs.				Drawing Scale: N/A	
	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL	TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE ACSR (Aluminum Conductor, Steel Reinforced, Bare)			Revision
					00
		Date			/ / 2014
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	8/10/2012	Shepard/Becken/Hart	/ / 2014	Barry R. Hart	/ / 2014
TM2.23.TF-02-006					Sheet 2

AWLD			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	Equiv. Diameter	
Wire Code Word	Wire Size (kcmil)	Stranding		Individual Wires		Steel Core	Total Cable Diameter	Alum.	Steel					TOTAL	DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)					AC @ 20° C/ 68° F (*mile)
				Alum.	Steel																
	3#6	3	20-5474						0.1781	10280	0.06185										
	7#10	7							0.1647	10020	0.05708	1-1218									
	7#8	7	1011950000						0.2618	15930	0.09077	1-1218							3/8"		
	7#7	7	1011950500						0.3300	19060	0.1145	1-1218							7/16"		
	7#6	7	20-5430						0.4163	22730	0.1443								1/2"		
	19#10	19	6000205451						0.4487	27190	0.1549										
	19#9	19	25-2364						0.5658	34290	0.1954										
	19#8	19	6000252362						0.7135	43240	0.2464	1-1140									
	19#5	19	6000252360						1.430	73350	0.4940										
	6M	7	25-2460	0.081					0.104	6000											
	8M	7	6000252430	0.091					0.131	8000											
	12.5M	7	6000252370	0.114					0.208	12500											
	20M	7	6000252400	0.148					0.347	20000											

STANDARD STATIC WIRE

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A

+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.

Replaces V52-031-00 and V52-032-XX.

CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.



IBERDROLA USA
TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL TM2.23.00

TRANSMISSION CONDUCTOR AND STATIC WIRE
MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE
AWLD
(Alumoweld, Bare)

ISSUE
0
DATE
/ /2012

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TF-02-009	Sheet 1
L.A. Best	8/10/2012	Bartczak/Becken/Shepard	/ /2012	Barry R. Hart	/ /2012		

CWLD			Wire MID (or stock code/number if no MID)	Conductor Diameter (inches)			Weight per Foot (pounds)			Rated Strength (pounds)	Cross- Sectional Area (Square inches)	Chart	Allowable Ampacity (AMPS) +	Resistance (OHMS/*)			GMR (feet)	Inductive Reactance (OHMS per mile @ 1 Ft.)	Capacitive Reactance (megohms -mile @ 1 Ft.)	EQUIV. SIZE
TYPE	Wire Size (kcmil)	Stranding		Individual Wires		Total Cable Diameter	CWLD	Steel	TOTAL					DC @ 20° C/ 68° F (*1000 Ft)	AC @ 75° C/ 167° F (*1000 Ft)	AC @ 20° C/ 68° F (*mile)				
				CWLD	Steel															
40% HS	#2	Solid	752373					0.2576												
30% EHS	3#8	3						0.277					140	0.7176			0.00323	0.696	0.1324	
30% EHS	3#7	3	186-380-00					0.311					160	0.5691			0.00363	0.682	0.1289	
30% EHS	3#6	3	20-6509					0.349					190	0.4513			0.00407	0.668	0.1255	
40% HS	7#10	7	186-400-00					0.306					200	0.3676			0.00395	0.671	0.1294	
40% HS	7#9	7	x					0.343					230	0.2915			0.00443	0.658	0.1260	
40% HS	7#8	7	1018642000					0.385					270	0.2312			0.00497	0.644	0.1226	
40% HS	7#7	7	186-430-00					0.433					310	0.1822			0.00559	0.629	0.1191	
40% HS	19#5	19						0.910					690	0.4264			0.01175	0.539	0.0971	
	6M	7	6000252490	0.079				0.237						0.8152						
	8M	7	6000252520	0.092				0.276						0.6011						
	12.5M	7	6000252550	0.115				0.345						0.3847						

PE SEAL

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Contact System Engineering - Transmission Section for the creation of new standards and CUs.

Drawing Scale: N/A

+ Ampacity based on 75° C/167° F conductor temperature, 25° C/77° F ambient temperature, 2 foot/second wind in sun, emissivity 0.5, 52.5% conductivity.

Replaces V52-031-00 and V52-032-XX.

CONTACT SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

	TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM.2.23		TRANSMISSION CONDUCTOR AND STATIC WIRE MECHANICAL AND ELECTRICAL CHARACTERISTICS BY WIRE CWLD (Copperweld, Bare)				ISSUE 0
	Drwn. By: L.A. Best	Date Dr.: 8/10/2012	Checked By:	Date Ck.: / /2012	Approved By: Barry R. Hart	Date App.: / /2012	DATE / /2012
TF-02-011						Sheet 1	

AAC			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Iris	#2	7		0.0620	NR 42.28 ³	1400	22471
					NR 36.22 ³	700	11236
Poppy	1/0	7	110-400-00	0.0991	NR 42.28 ³	1400	14127
					NR 36.22 ³	700	7064
-	1/0	19		0.0991			
Aster	2/0	7	110-410-00	0.1249	NR 42.28 ³	1400	11208
					NR 36.22 ³	700	5604
Phlox	3/0	7	110-420-00	0.1575	NR 42.28 ³	1400	8888
					NR 36.22 ³	700	4444
Oxlip	4/0	7	110-430-00	0.1986	NR 42.28 ³	1400	7049
					NR 36.22 ³	700	3525
-	4/0	19		0.1986			
-	214.0	7					
Tulip	336.4	19	752394	0.3158	NR 66.28 ³	3800	12032
					RM 66.32 [^]	3800	12030
					RM 66.38 [^]	3800	12030
					NR 48.28 ³	1900	6016
					NR 42.28 [^]	1265	4010
Cosmos	477.0	19	72486	0.4478	NR 66.28 ³	3800	8486
					RM 66.32 [^]	3800	8490
					RM 68.38 [^]	3800	8490
					NR 48.28 ³	1900	4243
					NR 42.28 [^]	1265	2830
Syringa	477.0	37		0.4478	RMT 84.45 ³	7400	16525
					NR 66.28 ³	3700	8263
Hyacinth	500.0	37		0.4694	RMT 84.45 ³	7400	15765
					NR 66.28 ³	3700	7882
Dahlia	556.5	19		0.522	NR 66.28 ³	3800	7274
					NR 48.28 ³	1900	3637
Mistletoe	556.5	37		0.5224	RMT 84.45	7400	14165
					NR 66.28 ³	3700	7083
Orchid	636.0	37	110-560-00	0.5969	RMT 84.45	7400	12400
					NR 66.28	3700	6200
					RM 68.32	3700	6200
					RM 68.38	3700	6200
					NR 42.28	1850	3100

AAC			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Arbutus	795.0	37	752395	0.7463	RMT 96.60 [^]	11100	14870
					RMT 84.45	7400	9920
					NR 66.28	3700	4960
					RM 66.32	3700	4960
					RM 68.38	3700	4960
					NR 48.28	1850	2480
Lilac	795.0	61	110-590-10	0.7467	RMT 90.45	9760	13080
					RM 68.38	4880	6540
Magnolia	954.0	37		0.896	RMT 84.45	7400	8260
					NR 66.28	3700	4130
					RM 66.32	3700	4130
					RM 68.38	3700	4130
					NR 48.28	1850	2065
Bluebell	1033.5	37	72583	0.9702	RMT 96.60 [^]	11100	11440
					RMT 84.45	7400	7630
					NR 66.28	3700	3815
					RM 66.32	3700	3815
					RM 68.38	3700	3815
					NR 48.28	1850	1910
Larkspur	1033.5	61		0.9702	RMT 90.45	9760	10060
					RM 68.38	4880	5030
Hawthorn	1192.5	61	752396	1.119	RMT 90.45	9760	8720
					RM 68.38	4880	4360
Narcissus	1272.0	61	6000205152	1.192	RMT 90.45	9760	8170
					RM 68.38	4880	4085
Carnation	1431.0	61		1.341	RMT 90.45	9760	7270
					RM 68.38	4880	3635
Coreopsis	1590.0	61	752401	1.493	RMT 96.60 [^]	15860	10620
					RMT 90.45	9760	6540
					RM 68.38	4880	3270
					RM 68.38 ³	4880	3629


CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

NOTES:

**1 See TF-03-002 for standard reel dimensions of the reels.

**2 Conductor weight (lbs/reel) does not include the weight of the reel. See TF-03-002 for weight of reel.

reel designation³: Southwire catalog used as source of information

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Contact Engineering Standards - Transmission for the creation of new standards and CUs.				Drawing Scale: N/A	
	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE REEL DATA AAAC, AAC		ISSUE
	Data from IEEE STD 524-2003 appendix H & I unless otherwise noted				0
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	1/17/2014	Bartczak/Becken/Shepard	/ /2014	Barry R. Hart	/ /2014
TF-03-001					Sheet 1

AAAC-6201			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Azusa	123.3	7	72001	0.115	NR 42.28 ³	1400	12100
Annapolis	1/0	19	113-110-00	0.118			
Alliance	246.9	7	6000204946	0.232	NR 42.28 ³	1400	6039
Amarillo	4/0	19	1011311600	0.230	NR 42.28 ³	1289	5600
Darien	559.5	19	-	0.522	NR 66.28 ³	3800	7235

ACAR			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
-	1280.0	42/19	752405	1.202	RMT 84.45 ³		

ACCC			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
-	1280.0	42/19	752405	1.202			

3M ACCR			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Drake795	824-T16	26/19	752405	1.202			

ACSS			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Drake/ACSS	795	26/7	6000204790	1.093			

ACSR			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Turkey	#6	6/1		0.0361	NR 30.22 ³	590	16344
Swan	#4	6/1	114-030-00	0.0574	NR 36.22 ³	885	15418
Swanate	#4	7/1	752406	0.067	NR 38.22 ³	1200	17910
					NR 30.22 ³	600	8955
Swallow	#3	6/1		0.0724			
Sparrow	#2	6/1	20-4554	0.091	NR 42.28 ³	1770	19387
					NR 36.22 ³	885	9693
Sparate	#2	7/1	752407	0.1067	NR 38.22 ³	1200	11247
					NR 30.22 ³	600	5623
Robin	#1	6/1	114-050-00	0.115	NR 42.28 ³	1770	15365
					NR 36.22 ³	885	7682
Raven	1/0	6/1	6000204600	0.1452	NR 42.28 ³	1770	12190
					NR 36.22 ³	885	6095
Quail	2/0	6/1	752408	0.1831	NR 42.28 ³	1770	9667
					NR 36.22 ³	885	4833
Pigeon	3/0	6/1	752409	0.2308	NR 42.28 ³	1770	7666
					NR 36.22 ³	885	3833
Penguin	4/0	6/1	752410	0.2911	NR 42.28 ³	1770	6080
					NR 36.22 ³	885	3040
					NR 30.22 [^]	590	2025
-	219.9	8/7	752412	0.3655			
Waxwing	266.8	18/1	20-4680	0.289	NR 66.28 ³	4160	14345
					NR 48.28 ³	2080	7172
Owl	266.8	6/7	20-4692	0.343			
Piper (Kaiser)	300.0	30/7		0.468			
Merlin	336.4	18/1	752413	0.3653	NR 66.28 ³	4160	11397
					RM 66.32 [^]	4160	11390
					RM 68.38 [^]	4160	11390
					NR 48.28 ³	2080	5699
					NR 42.28 [^]	1385	3795


CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

NOTES:

**1 See TF-03-002 for standard reel dimensions of the reels.

**2 Conductor weight (lbs/reel) does not include the weight of the reel. See TF-03-002 for weight of reel.

reel designation³: Southwire catalog used as source of information


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	Data from IEEE STD 524-2003 appendix H & I unless otherwise noted				0
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	1/17/2014	Bartczak/Becken/Shepard	/ /2014	Barry R. Hart	/ /2014
TF-03-001					Sheet 2

ACSR			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Linnet	336.4	26/7	71901	0.462	RMT 84.36 ³	7590	16393
					NR 60.28 ³	3795	8197
Oriole	336.4	30/7	752415	0.527	NR 66.28 ³	4970	9430
					RM 66.32 [^]	4970	9430
					RM 68.38 [^]	4970	9430
Chickadee	397.5	18/1		0.431	NR 66.28 ³	4160	9630
					NR 48.28 ³	2080	4815
Ibis	397.5	26/7		0.547	RMT 84.36 ³	7590	13876
					NR 60.28 ³	3795	6938
Pelican	477.0	18/1	752416	0.518	NR 66.28 ³	4160	8030
					RM 66.32 [^]	4160	8030
					RM 68.38 [^]	4160	8030
					NR 48.28 ³	2080	4015
					NR 42.28 [^]	1385	2675
Hawk	477.0	26/7	752397	0.657	RMT 84.36 ³	7590	11553
					RMT 84.45 [^]	7590	11560
					NR 60.28 ³	3795	5776
Hen	477.0	30/7	752398	0.747	NR 66.28 ³	4970	6650
					RM 66.32 [^]	4970	6650
					RM 68.38 [^]	4970	6650
Osprey	556.5	18/1		0.603	NR 66.28 ³	4160	6887
					NR 48.28 ³	2080	3444
Squab	605.0	26/7		0.832	RMT 84.36 ³	7590	9112
					NR 60.28 ³	3795	4556
Kingbird	636.0	18/1		0.690	RM 66.32	4160	6020
					NR 66.28	4160	6020
					RM 68.38	4160	6020
					NR 48.28	2080	3010
					NR 42.28	1385	2005
Rook	636.0	24/7		0.818	RMT 84.36	6550	8000
					RMT 84.45	6550	8000
					NR 60.28	3275	4000
Grosbeak	636.0	26/7		0.874	RMT 84.36	7590	8670
					RMT 84.45	7590	8670
					NR 60.28	3795	4335
Scoter	636.0	30/7		0.995			

ACSR			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Egret	636.0	30/19	114-185-00	0.987	RMT 84.45	9860	9980
					RM 66.32	4930	4990
					NR 66.28	4930	4990
					RM 68.38	4930	4990
Redwing	715.5	30/19		1.110	RMT 84.45	9860	8880
					RM 66.32	4930	4440
					NR 66.28	4930	4440
					RM 68.38	4930	4440
Cuckoo	795.0	24/7		1.024	RMT 84.36	6550	6400
					RMT 84.45	6550	6400
					NR 60.28	3275	3200
Drake	795.0	26/7	752399	1.093	RMT 90.45	11380	10400
					RMT 84.36	7590	6940
					RMT 84.45	7590	6940
					NR 60.28	3795	3470
Coot	795.0	36/1	752400	0.804	RMT 84.45	9640	7760
Tern	795.0	45/7	752421	0.895	RMT 96.60 [^]	16130	18000
					RMT 90.45	10750	12000
					RM 68.38	5375	6000
					NR 60.28	3585	4000
Condor	795.0	54/7		1.023	RMT 90.45	11800	11520
					RM 68.38	5900	5760
Mallard	795.0	30/19		1.234	RMT 84.45	9860	7980
					RM 66.32	4930	3990
					NR 66.28	4930	3990
					RM 66.28	4930	3990
-	850.8	45/7	6000204807	0.958			
Canary	900.0	54/7		1.158	RMT 90.45	11800	10180
					RM 68.38	5900	5090

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

NOTES:
 *** See TF-03-002 for standard reel dimensions of the reels.
 **2 Conductor weight (lbs/reel) does not include the weight of the reel. See TF-03-002 for weight of reel.
 reel designation ³: Southwire catalog used as source of information

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Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	1/17/2014	Bartczak/Becken/Shepard	/ /2014	Barry R. Hart	/ /2014
TF-03-001					Sheet 3

ACSR			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Rail	954.0	45/7		1.074	RMT 90.45	10750	10000
					RM 68.38	5375	5000
					NR 60.28	3585	3335
Cardinal	954.0	54/7	6000204835	1.227	RMT 90.45	11900	9600
					RM 68.38	5900	4800
Tanager	1033.5	36/1	752422	1.046			
Ortolan	1033.5	45/7	752423	1.163	RMT 96.60 ^	16130	13850
			1011422700 for Non-Specular		RMT 90.45	10750	9230
					RM 68.38	5375	4615
					NR 60.28	3585	3075
Curlew	1033.5	54/7	752385	1.330	RMT 96.60 ^	19170	14400
					RMT 90.45	11800	8870
					RM 68.38	5900	4435
Bluejay	1113.0	45/7	600020480	1.253	RMT 90.45	10750	8570
					RM 68.38	5375	4285
					NR 60.28	3585	2855
Bunting	1192.5	45/7	752386	1.343	RMT 96.60	16130	12000
					RMT 90.45	10750	8000
					RM 68.38	5375	4000
					NR 60.28	1585	2665
Grackle	1192.5	54/19	752387	1.531	RMT 90.45	11720	7650
					RM 68.38	5860	3825
Pheasant	1272.0	54/19	114-247-00	1.633	RMT 90.45	11720	7175
					RM 68.38	5860	3585
Bobolink	1431.0	45/7	752388	1.611	RMT 90.45	10750	6665
					RM 68.38	5375	3335
					NR 60.28	3585	2220
Plover	1431.0	54/19		1.838	RMT 90.45	10720	6375
					RM 68.38	5860	3190
Lapwing	1590.0	45/7	114-255-00	1.790	RMT 96.60	16130	9000
					RMT 90.45	10750	6000
					RM 68.38	5375	3000
					NR 60.28	3585	2000
Falcon	1590.0	54/19	6000204845	2.041	RMT 90.45	11720	5740
					RM 68.38	5860	2870
Bluebird	2156.0	84/19	752389	2.508	RMT 96.60	18830	7500
					RMT 96.60 ³	18333	7298

ACSR **			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Petrel	101.8	12/7	752411	0.2541	NR 48.28 ³	3175	12500
Leghorn	134.6	12/7		0.335	NR 48.28 ³	3175	9449
Dorking	190.8	12/7		0.476	NR 48.28 ³	3175	6670
Cochin	211.3	12/7	114-110-00	0.527	NR 48.28 ³	3175	6013

** These are high mechanical strength wires.

ACSR/TW			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
X/TW	477.0	22/7		0.7457			
X/TW	568.4 TW-23	22/7		0.884			
Hen/TW	602.5 TW-16	20/7	752433	0.822			
Grosbeak/TW	636.0 TW-16	20/7		0.8749			
Drake/TW	795.0 TW-16	22/7		1.094			
Bittern/TW	1272.0 TW-7	33/7	115-181-00	1.434			

ACSS			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
Drake/ACSS	795	26/7	6000204790	1.093			


CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

NOTES:

**1 See TF-03-002 for standard reel dimensions of the reels.

**2 Conductor weight (lbs/reel) does not include the weight of the reel. See TF-03-002 for weight of reel.

reel designation ³: Southwire catalog used as source of information

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	Data from IEEE STD 524-2003 appendix H & I unless otherwise noted						DATE / /2014
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TF-03-001	
L.A. Best	1/17/2014	Bartczak/Becken/Shepard	/ /2014	Barry R. Hart	/ /2014	Sheet 4	

AWLD			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
	3#6	3	20-5474	0.1781			
	7#10	7		0.1647			
	7#8	7	1011950000	0.2618			
	7#7	7	1011950500	0.3300			
	7#6	7	20-5430	0.4163			
	19#10	19	6000205451	0.4487			
	19#9	19	25-2364	0.5658			
	19#8	19	6000252362	0.7135			
	19#5	19	6000252360	1.430			
	6M	7	25-2460	0.104			
	8M	7	6000252430	0.131			
	12.5M	7	6000252370	0.208			
	20M	7	6000252400	0.347			

EHS STEEL			Wire MID (or stock code/number if no MID)	Weight per Foot (pounds)	Reel Designation **1	Conductor Weight (lbs/reel) **2	Conductor Length (feet/reel)
Wire Code Word	Wire Size (kcmil)	Stranding					
	1/4	3		0.117			
	5/16	3	191-930-00	0.171			
	5/16	7	191-931-00	0.205			
	3/8	7	1019193500	0.273	NR 36.22	1638	6000
					NR 30.22	1537	5630
	7/16	7	1019194000	0.399	NR 38.22	2394	6000
					NR 36.22	2394	6000
	1/2	7	1019194500	0.517	NR 42.28	3102	6000
					NR 38.22	2451	4740
					NR 36.22	2273	4396
	9/16	7	191-947-00	0.671	NR 42.28	4026	6000
	9/16	19	191-948-00	0.637			
	3/4	19	191-950-00	0.1155			

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

NOTES:


**1 See TF-03-002 for standard reel dimensions of the reels.

**2 Conductor weight (lbs/reel) does not include the weight of the reel. See TF-03-002 for weight of reel.

NOTE:

Steel static wire is typically purchased in lengths of 6000 foot/reel. The reel designations shown above are the smallest reels that will accommodate 6000 foot of the given conductor. Where applicable, reels for smaller lengths than 6000 foot are given. All reel sizes are Aluminum Association Incorporated standard reel sizes.

reel designation ³: Southwire catalog used as source of information

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Drwn. By: L.A. Best		Date Dr.: 1/17/2014		DATE / /2014	
Checked By: Bartczak/Becken/Shepard		Date Ck.: / /2014		Approved By: Barry R. Hart	
				Date App.: / /2014	
TF-03-001					Sheet 5

Aluminum Association Reel Designation	Total Reel Volume (in ³)	NOMINAL REEL DIMENSIONS					Approximate Weight of Reel Without Conductor (pounds)	
		Flange Diameter (inches)	Drum Diameter (inches)	Width		Arbor Hole Diameter (inches)	Bare Reel	With Fiber Board Wrap
				Inside (inches)	Outside (inches)			
NR 30.22	11100	30	16	22	25	3 to 3-1/4	55	60
NR 36.22	16800	36	18	22	25	3 to 3-1/4	75	80
NR 38.22	18000	38	20	22	25	3 to 3-1/4	80	85
NR 42.28	29100	42	21	28	32-1/2	3 to 3-1/4	100	105
NR 48.28	38000	48	24	28	32-1/2	3 to 3-1/4	185	190
NR 60.28	61900	60	28	28	32-1/2	3 to 3-1/4	275	285
NR 66.28	76000	66	30	28	32-1/2	3 to 3-1/4	345	355
RM 66.32*	76900	66	36	32	38	3 to 3-1/4	360	370
RM 68.38**	99300	68	36	38	44	3 to 3-1/4	450	465
RMT 84.36***	122100	78 to 84	42	36	43	5 to 5-1/4	870	890
RMT 84.45	152700	78 to 84	42	45	52	5 to 5-1/4	925	945
RMT 90.45	187000	84 to 90	42	45	52	5 to 5-1/4	1030	1050
RMT 96.60	298600	90 to 96	42	60	67	5 to 5-1/4	1290	1315
RMT 108.74	422400	102 to 108	56	74	83-1/2	5 to 5-1/4	1930	1960

* RM 68.38 may be used as an alternate
 ** RM 84.36 may be used as an alternate
 *** RMT 84.45 may be used as an alternate

Table data (1st 7 columns) and notes:
 IEEE STD 524-2003 appendix K.1

NOTES:

- Prefix NR denotes wooden non-returnable reel, RM denotes metal returnable reel and RMT denotes metal returnable reel with I-beam tires.
- Reels RM 66.32 and RM 68.38 have flat rims.
- Reels RMT 84.36, RMT 84.45, RMT 90.45, RMT 96.60 and RMT 108.74 have 3 inch I-beam tires. Reels with similar dimensions except without I-beam tires are sometimes used.
- Pay off equipment for reels NR 48.28 and smaller should be a minimum of 2 inches wider than the nominal outside reel width to provide for extension of bolts and for possible flange distortion. For reels NR 60.28 and larger, either wood or metal, pay off equipment should be not less than 4 inches wider than the reel width.
- Hub reinforcements will be provided for reels NR 60.28 and 66.28.
- Reels are not designed to withstand the forces required for braking during tension stringing operations.
- Where NR and RM reels are shown as alternates, RM reels are preferred for more reliable conductor protection.
- The RMT 108.74 reel is not employed for any packages included in this standard. It is listed in this table, however, because it may be used for large sizes of conductors that may be added in the future.
- Total reel volume is the volume to the edge of the flange for NR and RM reels, and to the inside edge of the I-beam for RMT reels.

CONTACT ENGINEERING STANDARDS - TRANSMISSION OR ELECTRIC SYSTEM
 ENGINEERING - TRANSMISSION SECTION FOR ASSISTANCE.

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 MANUAL TM2.23.00

TRANSMISSION CONDUCTOR AND STATIC WIRE
 STANDARD REEL SIZES AND DIMENSIONS

ISSUE
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 DATE
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Drwn. By: L.A. Best Date Dr.: 1/17/2014 Checked By: Bartczak/Becken/Shepard Date Ck.: / /2014 Approved By: Barry R. Hart Date App.: / /2014

TF-03-002

Sheet 1

Standard Design Conductors	Code Word	Diameter (inches)	Rated Strength (pounds)	NESC Tension @ 0°F, 1/2" ICE, 4# WIND (pounds)						
				35kV Single Pole	46kV Single Pole	69kV Single Pole	115kV Single Pole	115kV H-Frame	230kV H-Frame	345kV H-Frame
4/0 AAAC 7	Alliance	0.563	8560	3000	3000	3000				
477 ACSR 18/1	Pelican	0.814	11800	4000	4000	4000	4000			
795 ACSR 26/7	Drake	1.107	31500	5000	5000	5000	8000	10000	10000	
1192.5 ACSR 45/7	Bunting	1.302	32000				8000	10000	10000	
1590 ACSR 54/19	Falcon	1.544	54500				8000	10000	10000	14000
New Substation Bay	All Conductors **			1500	1500	1500	1500	1500	5000	5000

Conductors may be single phase or bundled.

Standard Design Static Wires	Code Word	Diameter (inches)	Rated Strength (pounds)	NESC Tension @ 0°F, 1/2" ICE, 4# WIND (pounds)						
				35kV Single Pole	46kV Single Pole	69kV Single Pole	115kV Single Pole	115kV H-Frame	230kV H-Frame	345kV H-Frame
7#7 ALWD		0.433	19060	3000	3000	3000	4000	6750	6750	6750
36 Fiber OPGW	DNO-8155	0.583	20900	3000	3000	3000	4000	6750	6750	6750
New Substation Bay	All Static Wires **			1500	1500	1500	1500	1500	3000	3000

** The tensions shown are for new construction with new substation bays.

Connection tensions into existing substation bays should be confirmed by substation engineering.

MAXIMUM CONDUCTOR DESIGN TEMPERATURES

Conductor Type	35kV through 345kV		
	Normal (note 1)	Long Term Emergency (note 1)	Short Term Emergency (note 1,2)
AAAC, ACAR	200°F	230°F	250°F
AAC, Aluminum, SAC	185°F	200°F	220°F
ACSR	200°F	240°F	260°F
CU, CWLD/CU	165°F	210°F	260°F

Contact Electric System Engineering - Transmission Section or Engineering Standards - Transmission for assistance.

NOTE 1: These conductor temperatures are based on the conductor ratings as defined by the 1995 "Final Report: NYPP Task Force on Tie Line Ratings".

NOTE 2: All references to maximum conductor temperature imply that the Short Term Emergency rating is to be used. The Short Term Emergency conductor rating is used for all NESC ground clearance calculations for transmission lines built after 1977. It is also used for all highway and rail crossing clearance requirements.

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TRANSMISSION CONDUCTOR AND STATIC WIRE
STANDARD WIRE SIZES
TYPICAL DESIGN TENSIONS
MAXIMUM DESIGN TEMPERATURES

ISSUE	0
DATE	5/20/2014

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	10/17/2013	Bartczak/Becken/Shepard	5/15/2014	Barry R. Hart	5/20/2014

TF-04-001

Sheet 1

The following criteria were used to devise the conductor ampacity charts given in Standards TF-10-002 through TF-10-013. The Conductor Ampacity Data Charts are based on "The Report of the New York Power Pool (NYPP) Task Force on Tie Line Ratings", issued November 1995.

1. Assumed life of tie line is 40 years.
2. Summer period is May to October.
3. Summer Ambient Temperatures: 35°C maximum, 30°C average daily maximum.
4. Summer Ambient Wind Speed: Over head Conductor - 3 fps (in direction 90° to the conductor)
Bus sections - 2 fps
5. Winter period is November to April.
6. Winter Ambient Temperatures: 10°C maximum, 5°C average daily maximum.
7. Winter Ambient Wind Speed: Over head Conductor - 3 fps (in direction 90° to the conductor)
Bus sections - 2 fps
8. Short Term Emergency (STE) time period 15 minutes totaling not more than 12-1/2 hours for the life of the tie line.
9. Normal preload in establishing STE rating.
10. Long Term Emergency (LTE) time period 4 hours totaling not more than 300 hours for the life of the tie line.
11. Maximum conductor operating temperature as shown in Operating Conditions Chart below.
12. Underground, aerial and submarine cables are rated per manufacturer's specifications and recommendations.
13. The rating of a transmission circuit shall equal the most limiting applicable equipment rating of the individual equipment that comprises that circuit.

Operating Conditions	Maximum Conductor Temperatures		
	Normal	LTE	STE
ACSR (1350 Alloy, Steel Core)	95°C 203°F	115°C 239°F	125°C 257°F
AAC, SAC (1330 Alloy)	85°C 185°F	95°C 203°F	105°C 221°F
ACAR, AAAC (6201 Alloy)	95°C 203°F	110°C 230°F	120°C 248°F
Copper, Copperweld, Copperweld/Copper	75°C 167°F	100°C 212°F	125°C 257°F
HTLS (High Temperature, Low Sag) including ACCC, ACCR and ACSS	to be determined	to be determined	to be determined

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	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00	TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION WIRE AMPACITY DATA CONDUCTOR AMPACITY CRITERIA	ISSUE				
			0				
		DATE					
		/ /2014					
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TF-10-001	Sheet 1
L.A. Best	11/5/2012	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014		

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ANSI A 8-1/2" X 11"

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AAAC-6201

SUMMER 35°C / 95°F

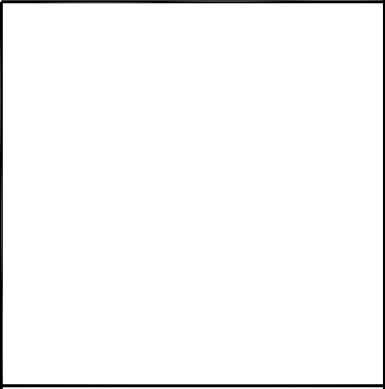
WINTER 10°C (50°F)

* A = AWG; K = KCM

Wire Code Word	Wire Size	A or K	Stranding	Normal 95°C 203°F	LTE 110°C 230°F	STE 120°C 248°F	Normal 95°C 203°F	LTE 110°C 230°F	STE 120°C 248°F
Azusa	1/0 123.3	A K	7	305	340	365	370	400	420
Annapolis	1/0	A	19						
Alliance	4/0 246.9	A K	7	480	535	570	580	625	655
Amarillo	4/0	A	19	470	525	565	570	615	645
Darien	559.5	K	19	805	900	985	980	1055	1125

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A



IBERDROLA USA
TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL TM2.23.00

TRANSMISSION CONDUCTOR AND STATIC WIRE DATA
TRANSMISSION CONDUCTOR AMPACITY DATA
ALL ALUMINUM ALLOY CONDUCTOR (AAAC)

ISSUE	0
DATE	/ /2014

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	4/16/2013	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014

TF-10-002

Sheet 1

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSI B 11" X 17"


AAC				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 85°C 185°F	LTE 95°C 203°F	STE 105°C 221°F	Normal 85°C 185°F	LTE 95°C 203°F	STE 105°C 221°F
Peachbell	#6	A	7	110	120	130	140	145	155
Rose	#4	A	7	150	165	175	185	195	205
Iris	#2	A	7	200	220	235	250	265	280
Pansy	#1	A	7	230	250	275	290	305	325
Poppy	1/0	A	7	270	295	320	335	355	375
-	1/0	A	19						
Aster	2/0	A	7	310	340	370	390	410	435
Phlox	3/0	A	7	360	395	425	450	475	505
Oxlip	4/0	A	7	415	455	495	525	550	585
-	4/0	A	19						
(AL 214)	214.0	K	7	420	460	505	530	560	595
Daisy	266.8	K	7	480	525	575	605	640	680
Laurel	266.8	K	19	480	530	575	610	640	680
Foxglove	266.8	K	37	485	530	580	610	645	685
Tulip	336.4	K	19	560	615	670	705	745	790
Canna	397.0	K	19	620	680	750	785	830	885
(AL 428)	428.0	K	19	655	720	790	830	875	935
Cosmos	477.0	K	19	695	765	845	880	930	995
Syringa	477.0	K	37	695	765	845	880	930	995
Zinnia	500.0	K	19	715	790	870	905	960	1025
Hyacinth	500.0	K	37						
Dahlia	556.5	K	19	765	840	935	970	1025	1100
Mistletoe	556.5	K	37	765	845	935	970	1030	1100
Orchid	636.0	K	37	835	920	1025	1060	1120	1205
(AL 642)	642.0	K	19	835	920	1025	1060	1120	1210
Violet	715.5	K	37	900	990	1110	1140	1205	1305
Nasturtium	715.5	K	61	900	990	1110	1140	1205	1305

AAC				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 85°C 185°F	LTE 95°C 203°F	STE 105°C 221°F	Normal 85°C 185°F	LTE 95°C 203°F	STE 105°C 221°F
Petunia	750.0	K	37	925	1020	1145	1175	1245	1345
Cattail	750.0	K	61	925	1020	1145	1175	1245	1345
Arbutus	795.0	K	37	960	1055	1190	1220	1290	1400
Lilac	795.0	K	61	960	1055	1190	1220	1290	1400
Anemone	874.5	K	37	1015	1120	1270	1295	1370	1490
Crocus	874.5	K	61	1020	1120	1270	1295	1370	1490
Magnolia	954.0	K	37	1075	1185	1345	1365	1445	1580
Goldenrod	954.0	K	61	1075	1185	1345	1365	1450	1580
Bluebell	1033.5	K	37	1125	1245	1420	1435	1520	1665
Larkspur	1033.5	K	61	1125	1245	1420	1435	1520	1665
Marigold	1113.0	K	61	1180	1300	1495	1505	1595	1750
Hawthorn	1192.5	K	61	1230	1360	1565	1570	1660	1835
Narcissus	1272.0	K	61	1280	1415	1640	1630	1730	1915
Columbine	1351.5	K	61	1325	1465	1710	1695	1795	1995
Carnation	1431.0	K	61	1375	1520	1775	1755	1860	2070
Gladiolus	1431.0	K	61	1415	1570	1845	1810	1920	2150
Coreopsis	1590.0	K	61	1460	1615	1910	1870	1980	2225
Cowslip	2000.0	K	91	1670	1850	2200	2145	2280	2565
Sagebrush	2250.0	K	91	1775	1970	2405	2280	2425	2785
(AL 2335)	2335.0	K	91	1810	2010	2445	2330	2475	2835
Lupine	2500.0	K	91	1890	2100	2590	2430	2585	2995
Bitterroot	2750.0	K	91	1980	2200	2745	2550	2710	3170
Trillium	3000.0	K	127	2080	2310	2915	2680	2850	3355
Bluebonnet	3500.0	K	127	2250	2510	3225	2905	3095	3695

* A = AWG; K = KCM

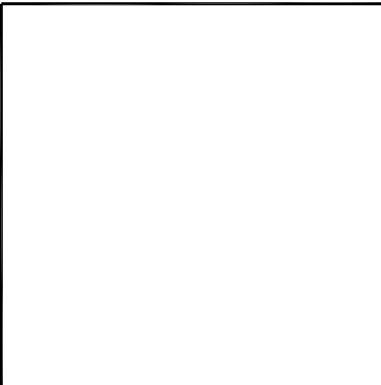
NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.

Contact Engineering Standards - Transmission for the creation of new standards and CUs.						Drawing Scale: N/A	
		IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA ALL ALUMINUM CONDUCTOR (AAC)			ISSUE
							0
							DATE
							/ /2014
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TF-10-003	
L.A. Best	4/16/2013	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014		

ACAR				SUMMER 35°C / 95°F			WINTER 10°C (50°F)			* A = AWG; K = KCM
Wire Code Word	Wire Size	A or K*	Stranding	Normal 95°C 203°F	LTE 110°C 230°F	STE 120°C 248°F	Normal 95°C 203°F	LTE 110°C 230°F	STE 120°C 248°F	
	1172.0	K	18/19	1340	1505	1705	1640	1765	1940	
(ALCOA)	1277.0	K	42/19	1410	1580	1795	1725	1855	2040	
(KAISER)	1280.0	K	42/19	1415	1590	1810	1735	1865	2055	
Keystone	2493.0	K	54/37	2075	2345	2840	2560	2765	3195	

- NOTES:
- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
 - 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs. Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA ALUMINUM CONDUCTOR ALUMINUM REINFORCED (ACAR)				ISSUE
							0
							DATE / /2014
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:	TF-10-004	
L.A. Best	4/16/2013	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014		

ACCC

SUMMER 35°C / 95°F

WINTER 10°C (50°F)


* A = AWG; K = KCM

Wire Code Word	Wire Size	A or K*	Stranding	Normal	LTE	STE	Normal	LTE	STE
				X°C X°F	X°C X°F	X°C X°F	X°C X°F	X°C X°F	X°C X°F
Drake/ACCC	1026	K		X	X	X	X	X	X
Falcon/ACCC	2045	K		X	X	X	X	X	X
Bluebird/ACCC	2741	K		X	X	X	X	X	X

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.

Contact Engineering Standards - Transmission for the creation of new standards and CUs. Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA ALUMINUM CONDUCTOR COMPOSITE CORE (ACCC)				ISSUE
							0
							DATE / /2014

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSI A 8-1/2" X 11"

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSIA 8-1/2" X 11"

3M ACCR

SUMMER 35°C / 95°F

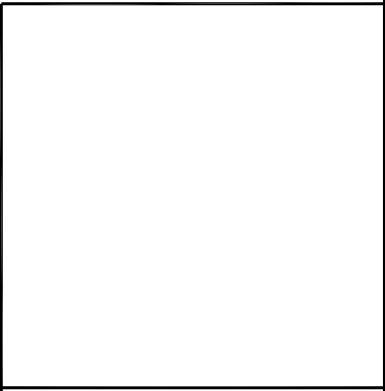
WINTER 10°C (50°F)

* A = AWG; K = KCM

Wire Code Word	Wire Size	A or K*	Stranding	SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
				Normal X°C X°F	LTE X°C X°F	STE X°C X°F	Normal X°C X°F	LTE X°C X°F	STE X°C X°F
Drake795	824-T16	K	26/19	X	X	X	X	X	X
1742-T9	1742-T9	K	48/19	X	X	X	X	X	X
1962-T11	1962-T11	K	51/19	X	X	X	X	X	X

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A



IBERDROLA USA
TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL TM2.23.00

TRANSMISSION CONDUCTOR AND STATIC WIRE DATA
TRANSMISSION CONDUCTOR AMPACITY DATA
ALUMINUM CONDUCTOR COMPOSITE REINFORCED (ACCR)

ISSUE	0
DATE	/ /2014

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	4/16/2013	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014

TF-10-006

Sheet 1

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ACSR				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F
Turkey	#6	A	6/1	125	140	150	150	160	170
Swan	#4	A	6/1	165	185	200	195	215	225
Swanate	#4	A	7/1	165	190	200	200	220	230
Swallow	#3	A	6/1						
Sparrow	#2	A	6/1	215	250	265	260	285	300
Sparate	#2	A	7/1	220	250	270	265	290	305
Robin	#1	A	6/1	250	285	305	300	330	345
Raven	1/0	A	6/1	290	330	350	350	380	400
Quail	2/0	A	6/1	330	375	400	400	435	460
Pigeon	3/0	A	6/1	375	430	460	455	495	520
Penguin	4/0	A	6/1	430	495	530	525	575	605
-	219.9	K	28/7						
Waxwing	266.8	K	18/1	535	615	660	650	710	750
Owl	266.8	K	6/7						
Partridge	266.8	K	6/7	545	625	675	665	725	765
Ostrich	300.0	K	26/7	590	675	730	715	785	830
Piper (Kaiser)	300.0	K	30/7	590	680	730	720	785	830
Merlin	336.4	K	18/1	620	710	765	750	820	870
Linnet	336.4	K	26/7	630	725	785	770	840	895
Oriole	336.4	K	30/7	640	735	800	780	855	905
Chickadee	397.5	K	18/1	690	795	860	840	920	975
Ibis	397.5	K	26/7	705	810	880	855	935	1000
Lark	397.5	K	30/7	710	820	895	870	950	1015
Pelican	477.0	K	18/1	775	890	970	945	1035	1100
Flicker	477.0	K	24/7	785	905	985	955	1050	1120
Hawk	477.0	K	26/7	790	910	995	960	1055	1130
Hen	477.0	K	30/7	800	920	1010	975	1070	1145
Heron	500.0	K	30/7	820	945	1040	1000	1095	1180
Osprey	556.5	K	18/1	855	985	1075	1040	1140	1220
Parakeet	556.5	K	24/7	865	1000	1095	1055	1155	1245
Dove	556.5	K	26/7	870	1005	1105	1065	1165	1255
Eagle	556.5	K	30/7	880	1015	1125	1075	1180	1275
Peacock	605.0	K	24/7	915	1055	1160	1115	1220	1315
Squab	605.0	K	26/7	920	1060	1175	1120	1230	1330
Teal	605.0	K	30/19	930	1070	1190	1135	1245	1350
Kingbird	636.0	K	18/1	925	1065	1175	1130	1235	1330
Rook	636.0	K	24/7	945	1085	1205	1150	1260	1360
Goose	636.0	K	54/7	920	1060	1175	1120	1230	1325
Grosbeak	636.0	K	26/7	950	1095	1215	1160	1270	1375
Scoter	636.0	K	30/7						
Egret	636.0	K	30/19	960	1110	1235	1170	1285	1395
Flamingo	666.0	K	24/7	970	1120	1245	1185	1300	1410
Crow	715.5	K	54/7	1005	1160	1290	1225	1345	1460
Starling	715.5	K	26/7	1025	1180	1320	1250	1370	1490
Redwing	715.5	K	30/19	1035	1195	1340	1265	1385	1515
Cuckoo	795.0	K	24/7						
Drake	795.0	K	26/7	1095	1260	1420	1335	1465	1600
Coot	795.0	K	36/1	1060	1225	1360	1295	1420	1540
Tern	795.0	K	45/7	1055	1215	1355	1285	1410	1525
Condor	795.0	K	54/7	1065	1230	1375	1300	1425	1550
Mallard	795.0	K	30/19	1105	1280	1445	1350	1485	1630


ACSR				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F
-	850.8	K	45/7						
Crane	874.5	K	54/7	1120	1295	1455	1365	1500	1640
Ruddy	900.0	K	45/7	1130	1305	1465	1380	1515	1650
Canary	900.0	K	54/7	1150	1325	1495	1400	1535	1685
Rail	954.0	K	45/7	1175	1355	1530	1435	1570	1720
Cardinal	954.0	K	54/7	1190	1375	1555	1450	1590	1750
Tanager	1033.5	K	36/1	1250	1445	1630	1525	1675	1840
Ortolan	1033.5	K	45/7	1225	1415	1600	1495	1635	1800
Curlew	1033.5	K	54/7	1250	1445	1645	1525	1670	1845
Bluejay	1113.0	K	45/7	1285	1485	1690	1570	1720	1895
Finch	1113.0	K	54/19	1305	1505	1725	1590	1740	1930
(ACSR 1158)	1158.4	K	63/19	1365	1580	1835	1670	1840	2060
Bunting	1192.5	K	45/7	1340	1545	1770	1635	1790	1985
Grackle	1192.5	K	54/19	1355	1560	1800	1650	1810	2015
Bittern	1272.0	K	45/7	1390	1605	1845	1695	1855	2065
Pheasant	1272.0	K	54/19	1405	1625	1880	1715	1880	2105
Dipper	1351.5	K	45/7	1440	1660	1920	1755	1920	2145
Martin	1351.5	K	54/19	1455	1680	1955	1775	1945	2185
Bobolink	1431.0	K	45/7	1485	1715	1990	1810	1985	2225
Wagtail	1431.0	K	48/7	1550	1800	2100	1900	2090	2355
Plover	1431.0	K	54/19	1505	1735	2030	1830	2010	2265
Nuthatch	1510.0	K	45/7	1530	1765	2060	1865	2045	2295
Parrot	1510.0	K	54/19	1550	1790	2100	1890	2070	2345
Lapwing	1590.0	K	45/7	1575	1815	2125	1920	2100	2370
Falcon	1590.0	K	54/19	1595	1840	2175	1945	2130	2420
Chukar	1780.0	K	84/19	1765	2050	2445	2170	2385	2735
Bluebird	2156.0	K	84/19	1970	2285	2790	2425	2665	3110
Kiwi	2167.0	K	72/7	1970	2285	2775	2425	2670	3095
(ACSR 2385)	2385.0	K	72/7	2060	2390	2925	2535	2790	3260

- NOTES:
- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
 - 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.

* A = AWG; K = KCM

High Strength ACSR **				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 85°C 185°F	LTE 95°C 203°F	STE 105°C 221°F	Normal 85°C 185°F	LTE 95°C 203°F	STE 105°C 221°F
Petrel	101.8	K	12/7						
Leghorn	134.6	K	12/7						
Dorking	190.8	K	12/7						
Cochin	211.3	K	12/7						

** These are high mechanical strength wires.

Contact Engineering Standards - Transmission for the creation of new standards and CUs.						Drawing Scale: N/A	
	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA			ISSUE	
				TRANSMISSION CONDUCTOR AMPACITY DATA			0
			ALUMINUM CONDUCTOR STEEL REINFORCED (ACSR)			DATE	
						/ /2014	
Drwn. By: L.A. Best	Date Dr.: 4/16/2013	Checked By: Shepard/Becken/Hart	Date Ck.: / /2014	Approved By: Barry R. Hart	Date App.: / /2014	TF-10-007	
						Sheet 1	

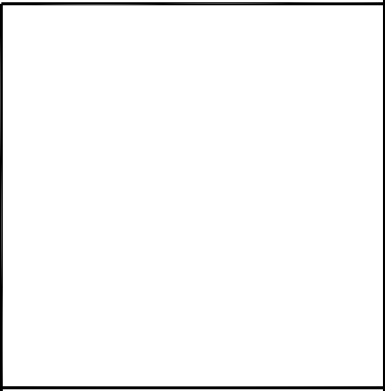
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ACSR/TW				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F
	477.0 TW-	K	22/7						
	568.4 TW-23	K	22/7						
Hen/TW	602.5 TW-16	K	20/7	900	1035	1150	1095	1200	1300
Grosbeak/TW	636.0 TW-16	K	20/7	930	1070	1190	1130	1240	1350
Drake/TW	795.0 TW-16	K	22/7						
Bittern/TW	1272.0 TW-7	K	35/7						

* A = AWG; K = KCM

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA ALUMINUM CONDUCTOR STEEL REINFORCED TRAPEZOIDAL SHAPED ALUMINUM STRANDS (ACSR/TW)				ISSUE 0
	DATE / 2014		DATE / 2014				DATE / /2014
Drwn. By: L.A. Best	Date Dr.: 4/16/2013	Checked By: Shepard/Becken/Hart	Date Ck.: / /2014	Approved By: Barry R. Hart	Date App.: / /2014	TF-10-008	Sheet 1

ANSIA 8-1/2" X 11"

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

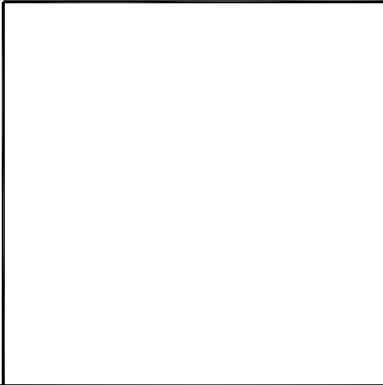
ANSIA
8-1/2" X 11"

ACSS				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal X°C X°F	LTE X°C X°F	STE X°C X°F	Normal X°C X°F	LTE X°C X°F	STE X°C X°F
Hen/ACSS	477	K	30/7	X	X	X	X	X	X
Drake/ACSS	795	K	26/7	X	X	X	X	X	X
Tern/ACSS	795	K	45/7	X	X	X	X	X	X
Ortolan/ACSS	1033.5	K	45/7	X	X	X	X	X	X
Curlew/ACSS	1033.5	K	54/7	X	X	X	X	X	X
Bluejay/ACSS	1113	K	45/7	X	X	X	X	X	X
Bunting/ACSS	1192.5	K	45/7	X	X	X	X	X	X
Falcon/ACSS	1590	K	54/19	X	X	X	X	X	X

* A = AWG; K = KCM

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A



IBERDROLA USA
TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL TM2.23.00

TRANSMISSION CONDUCTOR AND STATIC WIRE DATA
TRANSMISSION CONDUCTOR AMPACITY DATA
ALUMINUM CONDUCTOR STEEL SUPPORTED (ACSS)

ISSUE
0
DATE
/ /2014

Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	4/16/2013	Shepard/Becken/Hart	/ /2014	Barry R. Hart	/ /2014

TF-10-009

Sheet 1

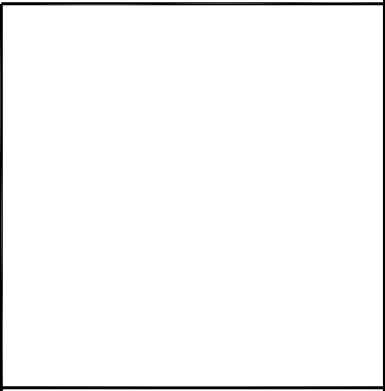
THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSI A
8-1/2" X 11"

AWLD				SUMMER 35°C / 95°F			WINTER 10°C (50°F)			* A = AWG; K = KCM
Wire Code Word	Wire Size	A or K*	Stranding	Normal X°C X°F	LTE X°C X°F	STE X°C X°F	Normal X°C X°F	LTE X°C X°F	STE X°C X°F	
	3#6	A	3	X	X	X	X	X	X	
	7#10		7							
	7#8		7							
	7#7		7							
	7#6		7							
	19#10		19							
	19#9		19							
	19#8		19							
	19#5		19							
	6M		7							
	8M		7							
	12.5M		7							
	20M		7							

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs. Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA ALUMOWELD (AWLD)			ISSUE
						0
						DATE / /2014
Drwn. By: L.A. Best	Date Dr.: 4/16/2013	Checked By: Shepard/Becken/Hart	Date Ck.: / /2014	Approved-By: Barry R. Hart	Date App.: / /2014	TF-10-010
						Sheet 1

THIS IS A COMPUTER GENERATED DRAWING - DO NOT REVISE MANUALLY

ANSI A 8-1/2" X 11"


CU				SUMMER 35°C / 95°F			WINTER 10°C (50°F)			* A = AWG; K = KCM
Wire Code Word	Wire Size	A or K*	Stranding	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F	Normal 95°C 203°F	LTE 115°C 239°F	STE 125°C 257°F	
	#8	A	Solid	95	115	140	120	140	155	
MHD	#6	A	Solid	125	155	185	160	185	210	
MHD	#4	A	Solid	165	210	250	215	250	280	
MHD	#3	A	Solid	190	245	290	250	290	325	
MHD	#2	A	Solid	225	290	340	300	345	390	
MHD	#1	A	Solid							
	1/0	A	Solid							
	2/0	A	Solid							
	4/0	A	Solid							
	#4	A	3	175	220	260	230	265	300	
	#2	A	3	235	295	350	305	355	400	
	#1	A	3	270	345	410	355	410	465	
HD	#4	A	7							
	#3	A	7	195	250	295	260	295	335	
HD	#2	A	7	225	290	340	300	345	390	
HD	#1	A	7	260	335	395	345	400	450	
	1/0	A	7	305	385	460	400	460	520	
HD	2/0	A	7	350	450	535	465	535	605	
HD	3/0	A	7	405	520	620	535	620	705	
HD	4/0	A	7	470	600	725	620	720	825	
	300.0	K	12	590	760	930	790	910	1055	
	350.0	K	12	650	840	1035	870	1005	1170	
HD	4/0	A	19	470	605	730	625	725	830	
	250.0	K	19	520	670	815	695	800	925	
	300.0	K	19	585	750	925	780	800	1045	
	350.0	K	19	640	830	1025	855	990	1160	
	400.0	K	19	695	900	1125	930	1080	1270	
	500.0	K	37	800	1035	1325	1075	1245	1490	

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.

Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA COPPER CONDUCTOR (CU)				ISSUE
							0
Drwn. By: L.A. Best		Date Dr.: 4/16/2013		Checked By: Shepard/Becken/Hart		DATE / /2014	
Date App.: / /2014		Date Ck.: / /2014		Approved By: Barry R. Hart		TF-10-011	
							Sheet 1



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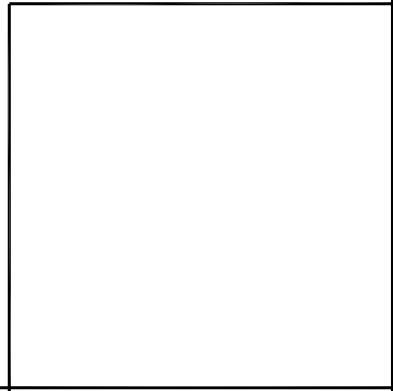
ANSIA
8-1/2" X 11"

CWLD				SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
Wire Code Word	Wire Size	A or K*	Stranding	Normal 75°C 167°F	LTE 100°C 212°F	STE 125°C 257°F	Normal 75°C 167°F	LTE 100°C 212°F	STE 125°C 257°F
30% EHS	3#8	A	3	105	135	160	140	160	180
30% EHS	3#7	A	3	125	155	185	160	185	210
30% EHS	3#6	A	3						
40% HS	7#10	A	7						
40% HS	7#9	A	7						
40% HS	7#8	A	7	170	220	260	225	260	295
40% HS	7#7	A	7						
40% HS	19#5	A	19						
	6M		7						
	8M		7						
	12.5M		7						


* A = AWG; K = KCM

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs. Drawing Scale: N/A

	IBERDROLA USA TRANSMISSION CONSTRUCTION STANDARDS MANUAL TM2.23.00		TRANSMISSION CONDUCTOR AND STATIC WIRE DATA TRANSMISSION CONDUCTOR AMPACITY DATA COPPERWELD CONDUCTOR (CWLD)				ISSUE 0
							DATE / /2014
Drwn. By: L.A. Best	Date Dr.: 4/16/2013	Checked By: Shepard/Becken/Hart	Date Ck.: / /2014	Approved-By: Barry R. Hart	Date App.: / /2014	TF-10-012	Sheet 1



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ANSIA 8-1/2" X 11"

CWLD/CU

SUMMER 35°C / 95°F

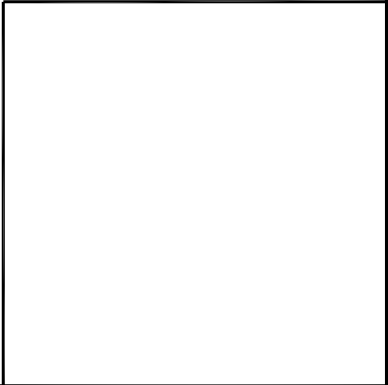
WINTER 10°C (50°F)

* A = AWG; K = KCM

Wire Code Word	Wire Size	A or K*	Stranding	SUMMER 35°C / 95°F			WINTER 10°C (50°F)		
				Normal 75°C 167°F	LTE 100°C 212°F	STE 125°C 257°F	Normal 75°C 167°F	LTE 100°C 212°F	STE 125°C 257°F
	1/0f	A	1/6	305	385	460	400	460	520
	2/0f	A	1/6	350	445	535	465	535	605
	4/0e	A	7/12						
	4/0ek	A	4/15	475	610	735	630	730	835
	7a	A	1/2						
	7d	A	2/1						
	6a	A	1/2	135	170	200	175	200	230
	6d	A	2/1	140	175	210	185	210	240
	4a	A	1/2	180	225	270	235	270	305
	2a	A	1/2	240	305	360	315	360	410
	2f	A	1/6						
	350 ek	K	4/15	650	835	1025	865	1005	1165

NOTES:

- 1) AMPACITIES ARE LISTED FOR SUMMER AND WINTER AMBIENT CONDITIONS.
- 2) AMPACITIES ARE GIVEN FOR NORMAL (NORM), 4 HOUR LONG TERM EMERGENCY (LTE) AND 15 MINUTE SHORT TERM EMERGENCY (STE) OPERATING CONDITIONS.



Contact Engineering Standards - Transmission for the creation of new standards and CUs.

Drawing Scale: N/A



IBERDROLA USA
TRANSMISSION
CONSTRUCTION
STANDARDS
MANUAL TM2.23.00

TRANSMISSION CONDUCTOR AND STATIC WIRE DATA
TRANSMISSION CONDUCTOR AMPACITY DATA
COPPERWELD CONDUCTOR COPPER REINFORCED (CWLD/CU)

ISSUE	0
DATE	/ / 2014

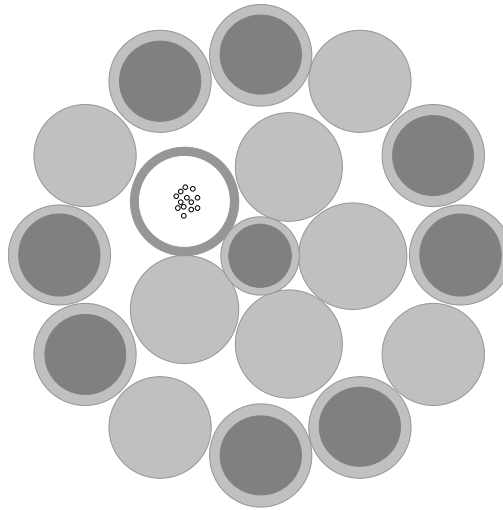
Drwn. By:	Date Dr.:	Checked By:	Date Ck.:	Approved By:	Date App.:
L.A. Best	4/16/2013	Shepard/Becken/Hart	/ / 2014	Barry R. Hart	/ / 2014

TF-10-013

Sheet 1

Specification DNO-8155

PentaCore Optical Ground Wire



S4-61/61/583

Component Details						
Component	#	OD		Area		
CENTER						
Aluminum Clad Steel (20.3% IACS)	1	2.31 mm	0.0909 in	4.19 mm ²	0.0065 in ²	
LAYER 1 - RIGHT HAND LAY						
Aluminum Alloy 6201	4	3.25 mm	0.1280 in	33.18 mm ²	0.0514 in ²	
Stainless Steel Tube	1	3.20 mm	0.1260 in	1.88 mm ²	0.0029 in ²	
LAYER 2 - LEFT HAND LAY						
Aluminum Clad Steel (20.3% IACS)	8	3.00 mm	0.1181 in	56.55 mm ²	0.0877 in ²	
Aluminum Alloy 6201	4	3.00 mm	0.1181 in	28.27 mm ²	0.0438 in ²	

Standards	
Designed and Manufactured in accordance with the following:	
Cable	IEEE 1138, IEC 60794-4
Fiber	IEC 60793, ITU-T G.65x Series
Color Code	ANSI/EIA 359-A, 598-A, IEC 60304
Stainless Steel Tubes	ASTM A240, ASTM A632
Aluminum Alloy Wires	ASTM B398, IEC 60104
Aluminum Clad Steel Wires	ASTM B415

Specification DNO-8155

Mechanical / Electrical Details		
Calculated Breaking Load	9,480 kg	20,900 lbs
Maximum Cable Design Tension	6,512 kg	14,357 lbs
Approximate Cable Diameter	14.81 mm	0.583 in
Total Cross-Sectional Area	124.08 mm ²	0.1923 in ²
Approximate Cable Weight	596 kg/km	2,114 lbs/mile
Modulus of Elasticity	11,286 kg/mm ²	16,052 kpsi
Coefficient of Linear Expansion	1.58E-05 1/°C	8.76E-06 1/°F
Sag10™ Chart Number	1-420	1-420
Calculated DC Resistance (20°C)	0.3916 Ohms/km	0.6302 Ohms/mile
Short Circuit Rating	106 (kA) ² •sec	106 (kA) ² •sec
Short Circuit Ambient Temperature	40 °C	104 °F
Short Circuit Duration 0.2 sec	23.0 kA	23.0 kA
Short Circuit Max Cable Temperature	210 °C	410 °F

Optical Details

Attenuation Characteristics for Corning® SMF-28e™ Single-mode Fiber

Max Individual

0.40 dB/km 1310 nm

0.30 dB/km 1550 nm

3.2mm Stainless Steel Tube Design		Fiber Count
Unit	Fiber Type	
Tube 1	Corning® SMF-28e™ Single-mode	36
Total Fiber Count		36

Standard Fiber Color Code

Fiber	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

Designs with more than 12 fibers per tube will use the standard color code and binders for identification of the fibers.

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL Telecommunications documents listed below. Contact AFL to request copies.

Recommended Installation Procedures for Composite Optical Ground Wire

Installation Instructions for Installing Optical Ground Wire in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Specification DNO-8155

Quick Reference Installation Notes		
Approximate Cable Diameter	14.81 mm	0.583 in
Maximum Stringing Tension (at tensioner)*	1,896 kg	4,180 lbs
Minimum Bull Wheel Diameter	104 cm	41 in
Stringing Sheave Diameter**	60 cm	24 in
Minimum Bending Radius		
Cable		
Static (No load)	23 cm	9 in
Dynamic (under tension)	30 cm	12 in
Fiber		
Static (No load)	3.8 cm	1.5 in
Stainless Steel Tube		
Static (No load)	14.4 cm	5.7 in
<p>* - The stringing tension is always measured at the tensioner side. In general the maximum stringing tension should be approximately half of the maximum sagging tension and should never exceed 20% RBS of the OPT-GW.</p> <p>** - The value indicated is for the first and last structures of the pull and is based on 40 times the diameter of the OPT-GW. Smaller diameters can be used at tangent structures. Reference AFL's installation instructions for more details.</p>		
<p>Reference AFL's "Recommended Installation Procedures for Composite Optical Ground Wire" for detailed installation instructions.</p>		

Shipping Reels												
Reel Type	FL	TR	DR	OW	Tare (kgs)	FL	TR	DR	OW	Tare (lbs)	Capacity (meters) (feet)	
Wood	147	81	71	97	200	58	32	28	38	441	4,000	13,120
Wood	168	91	91	107	260	66	36	36	42	573	5,380	17,650
Wood	183	91	91	107	300	72	36	36	42	662	6,080	19,940
Wood	213	86	89	104	385	84	34	35	41	849	6,080	19,940
Steel	152	81	81	97	345	60	32	32	38	761	3,960	12,990
Steel	183	91	102	107	540	72	36	40	42	1,191	6,380	20,930
Steel	213	114	107	130	773	84	45	42	51	1,704	7,000	22,960
<p>FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width Arbor Hole Diameter: Wood: 3-1/4in (7.9cm) Steel: 3in (7.6cm)</p> <p>Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible.</p> <p>Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum. A typical reel length distribution is as follows:</p> <p>6000m – 7000m ~ 15% of reels 4500m – 6000m ~ 55% of reels 2500m – 4500m ~ 25% of reels <2500m ~ 5% of reels</p> <p>Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request.</p> <p>Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.</p>												

Specification DNO-8155

Electrical Characteristics					
Composite DC Resistance	[20°C]	0.3916 Ohms/km	0.6302 Ohms/mile		
Geometric Mean Radius		0.58 cm	0.0189 feet		
Inductive Reactance	[60 Hz frequency]	0.2991 Ohms/km	0.4814 Ohms/mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2493 Ohms/km	0.4012 Ohms/mile		
Capacitive Reactance	[60 Hz frequency]	0.1775 MOhms-km	0.1103 MOhms-mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2130 MOhms-km	0.1323 MOhms-mile		
Composite Coefficient of Thermal Resistance		0.00354 (1/°C)			
Temperature		DC Resistance		AC Resistance	
(°C)	(°F)	(Ohms/km)	(Ohms/mile)	(Ohms/km)	(Ohms/mile)
20	68	0.3916	0.6302	0.3994	0.6428
25	77	0.3985	0.6413	0.4065	0.6542
30	86	0.4054	0.6525	0.4135	0.6655
35	95	0.4123	0.6636	0.4206	0.6769
40	104	0.4193	0.6747	0.4277	0.6882
45	113	0.4262	0.6859	0.4347	0.6996
50	122	0.4331	0.6970	0.4418	0.7110
55	131	0.4400	0.7082	0.4488	0.7223
60	140	0.4470	0.7193	0.4559	0.7337
65	149	0.4539	0.7304	0.4630	0.7451
70	158	0.4608	0.7416	0.4700	0.7564
75	167	0.4677	0.7527	0.4771	0.7678
80	176	0.4746	0.7639	0.4841	0.7791
85	185	0.4816	0.7750	0.4912	0.7905
90	194	0.4885	0.7862	0.4983	0.8019
95	203	0.4954	0.7973	0.5053	0.8132
100	212	0.5023	0.8084	0.5124	0.8246
105	221	0.5093	0.8196	0.5194	0.8360
110	230	0.5162	0.8307	0.5265	0.8473
115	239	0.5231	0.8419	0.5336	0.8587
120	248	0.5300	0.8530	0.5406	0.8701
125	257	0.5369	0.8641	0.5477	0.8814
130	266	0.5439	0.8753	0.5547	0.8928
135	275	0.5508	0.8864	0.5618	0.9041
140	284	0.5577	0.8976	0.5689	0.9155
145	293	0.5646	0.9087	0.5759	0.9269
150	302	0.5716	0.9198	0.5830	0.9382

Specification DNO-8155

PLS-CADD Inputs

Use simplified elastic cable model (no creep, no coefficient)

Name				
Description		AFL OPGW DNO-8155 S4-61/61/583		
Cross section area (in ²)	<input type="text" value="0.1923"/>	Unit weight (lbs/ft)	<input type="text" value="0.400"/>	Number of independent wires <input type="text" value="1"/> <small>(above should be 1 unless cables are separated by spacers)</small>
Outside diameter (in)	<input type="text" value="0.583"/>	Ultimate tension (lbs)	<input type="text" value="20,900"/>	
Temperature at which strand data below obtained (deg F)	<input type="text" value="74"/>			

Outer Strands						Core Strands (if different from outer strands)					
Final Modulus of elasticity (psi/100)	<input type="text" value="35000"/>					Final Modulus of elasticity (psi/100)	<input type="text" value="132000"/>				
Thermal expansion coeff. (/100 deg)	<input type="text" value="0.001280"/>					Thermal expansion coeff. (/100 deg)	<input type="text" value="0.000640"/>				
Polynomial coefficients (all strains in %)						Polynomial coefficients (all strains in %)					
	A0	A1	A2	A3	A4		A0	A1	A2	A3	A4
Stress-strain	<input type="text" value="-400.4"/>	<input type="text" value="59139.1"/>	<input type="text" value="-136945.2"/>	<input type="text" value="149862"/>	<input type="text" value="-62863"/>	Stress-strain	<input type="text" value="10"/>	<input type="text" value="133655"/>	<input type="text" value="-5265.4"/>	<input type="text" value="-123739"/>	<input type="text" value="79454"/>
Creep	<input type="text" value="-65.7"/>	<input type="text" value="24585.5"/>	<input type="text" value="-48147.6"/>	<input type="text" value="51073"/>	<input type="text" value="-22039"/>	Creep	<input type="text" value="-815"/>	<input type="text" value="120554.3"/>	<input type="text" value="-22177.3"/>	<input type="text" value="-51091"/>	<input type="text" value="27844"/>

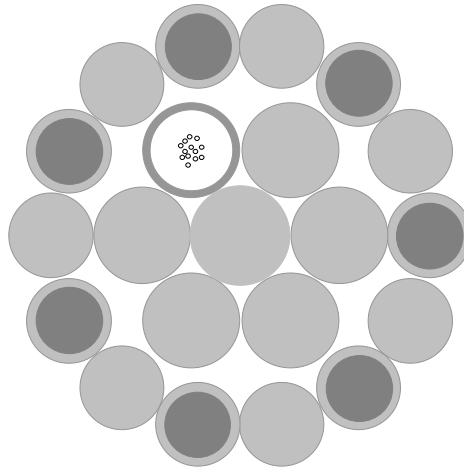
Thermal Rating Properties					
Resistance at two different temperatures			Emissivity coefficient <input type="text" value="0.5"/>		
Resistance (Ohm/mile)	<input type="text" value="0.6413"/>	at (deg F) <input type="text" value="77"/>	Solar absorption coefficient <input type="text" value="0.5"/>		
Resistance (Ohm/mile)	<input type="text" value="0.7527"/>	at (deg F) <input type="text" value="167"/>	* Outer strands heat capacity (Watt-s/ft-deg F) <input style="background-color: #cccccc;" type="text"/>		
			* Core heat capacity (Watt-s/ft-deg F) <input style="background-color: #cccccc;" type="text"/>		

Generate Coefficients from points on stress-strain	OK	Cancel
--	----	--------

* These two fields do not need to be entered for OPGW - intentionally left blank.

Specification DNO-8228

HexaCore Optical Ground Wire



S4-92/42/602

Component Details						
Component	#	OD		Area		
CENTER						
Aluminum Alloy 6201	1	3.30 mm	0.1299 in	8.55 mm ²	0.0133 in ²	
LAYER 1 - RIGHT HAND LAY						
Aluminum Alloy 6201	5	3.25 mm	0.1280 in	41.48 mm ²	0.0643 in ²	
Stainless Steel Tube	1	3.20 mm	0.1260 in	1.88 mm ²	0.0029 in ²	
LAYER 2 - LEFT HAND LAY						
Aluminum Clad Steel (20.3% IACS)	7	2.75 mm	0.1083 in	41.58 mm ²	0.0644 in ²	
Aluminum Alloy 6201	7	2.75 mm	0.1083 in	41.58 mm ²	0.0644 in ²	

Standards	
Designed and Manufactured in accordance with the following:	
Cable	<i>IEEE 1138, IEC 60794-4</i>
Fiber	<i>IEC 60793, ITU-T G.65x Series</i>
Color Code	<i>ANSI/EIA 359-A, 598-A, IEC 60304</i>
Stainless Steel Tubes	<i>ASTM A240, ASTM A632</i>
Aluminum Alloy Wires	<i>ASTM B398, IEC 60104</i>
Aluminum Clad Steel Wires	<i>ASTM B415</i>

Specification DNO-8228

Mechanical / Electrical Details			
Calculated Breaking Load	7,849	kg	17,303 lbs
Maximum Cable Design Tension	6,279	kg	13,842 lbs
Approximate Cable Diameter	15.30	mm	0.602 in
Total Cross-Sectional Area	135.07	mm ²	0.2094 in ²
Approximate Cable Weight	552	kg/km	1,960 lbs/mile
Modulus of Elasticity	9,482	kg/mm ²	13,486 kpsi
Coefficient of Linear Expansion	1.76E-05	1/°C	9.79E-06 1/°F
Sag10™ Chart Number	1-355		1-355
Calculated DC Resistance (20°C)	0.3100	Ohms/km	0.4989 Ohms/mile
Short Circuit Rating	138	(kA) ² •sec	138 (kA) ² •sec
Short Circuit Ambient Temperature	40	°C	104 °F
Short Circuit Duration 1 sec	11.8	kA	11.8 kA
Short Circuit Max Cable Temperature	210	°C	410 °F

See Note 1
See Note 2

Optical Details

Attenuation Characteristics for ITU-T G.652D Single-mode Fiber

Max Individual

0.35 dB/km 1310 nm
0.22 dB/km 1550 nm

3.2mm Stainless Steel Tube Design		Fiber Count
Unit	Fiber Type	
Tube 1	ITU-T G.652D Single-mode	36
Total Fiber Count		36

Standard Fiber Color Code

Fiber	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

Designs with more than 12 fibers per tube will use the standard color code and stripes for identification of the fibers.

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL Telecommunications documents listed below. Contact AFL to request copies.

Recommended Installation Procedures for Composite Optical Ground Wire

Installation Instructions for Installing Optical Ground Wire in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Notes:

1. Calculated Breaking Strength: RBS: based on 10% derate from cable UTS, and without contribution from stainless steel tube.
2. Maximum Cable Design Tension=Cable Tension for Zero Fiber Strain=80%RBS

Specification DNO-8228

Electrical Characteristics					
Composite DC Resistance	[20°C]	0.3100 Ohms/km	0.4989 Ohms/mile		
Geometric Mean Radius		0.60 cm	0.0195 feet		
Inductive Reactance	[60 Hz frequency]	0.2967 Ohms/km	0.4775 Ohms/mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2472 Ohms/km	0.3979 Ohms/mile		
Capacitive Reactance	[60 Hz frequency]	0.1759 MOhms-km	0.1093 MOhms-mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2111 MOhms-km	0.1312 MOhms-mile		
Composite Coefficient of Thermal Resistance		0.00351 (1/°C)			
Temperature		DC Resistance		AC Resistance	
(°C)	(°F)	(Ohms/km)	(Ohms/mile)	(Ohms/km)	(Ohms/mile)
20	68	0.3100	0.4989	0.3162	0.5089
25	77	0.3155	0.5077	0.3218	0.5178
30	86	0.3209	0.5164	0.3273	0.5268
35	95	0.3263	0.5252	0.3329	0.5357
40	104	0.3318	0.5339	0.3384	0.5446
45	113	0.3372	0.5427	0.3440	0.5536
50	122	0.3427	0.5515	0.3495	0.5625
55	131	0.3481	0.5602	0.3551	0.5714
60	140	0.3536	0.5690	0.3606	0.5804
65	149	0.3590	0.5778	0.3662	0.5893
70	158	0.3644	0.5865	0.3717	0.5982
75	167	0.3699	0.5953	0.3773	0.6072
80	176	0.3753	0.6040	0.3828	0.6161
85	185	0.3808	0.6128	0.3884	0.6250
90	194	0.3862	0.6216	0.3939	0.6340
95	203	0.3917	0.6303	0.3995	0.6429
100	212	0.3971	0.6391	0.4050	0.6519
105	221	0.4025	0.6478	0.4106	0.6608
110	230	0.4080	0.6566	0.4161	0.6697
115	239	0.4134	0.6654	0.4217	0.6787
120	248	0.4189	0.6741	0.4273	0.6876
125	257	0.4243	0.6829	0.4328	0.6965
130	266	0.4298	0.6916	0.4384	0.7055
135	275	0.4352	0.7004	0.4439	0.7144
140	284	0.4406	0.7092	0.4495	0.7233
145	293	0.4461	0.7179	0.4550	0.7323
150	302	0.4515	0.7267	0.4606	0.7412

Specification DNO-8228

PLS-CADD Inputs

Use simplified elastic cable model (no creep, no coefficient)

Name				
Description		AFL OPGW DNO-8228 S4-92/42/602		
Cross section area (in ²)	<input type="text" value="0.2094"/>	Unit weight (lbs/ft)	<input type="text" value="0.371"/>	Number of independent wires <input type="text" value="1"/> <small>(above should be 1 unless cables are separated by spacers)</small>
Outside diameter (in)	<input type="text" value="0.602"/>	Ultimate tension (lbs)	<input type="text" value="17,660"/>	
Temperature at which strand data below obtained (deg F)	<input type="text" value="70"/>			

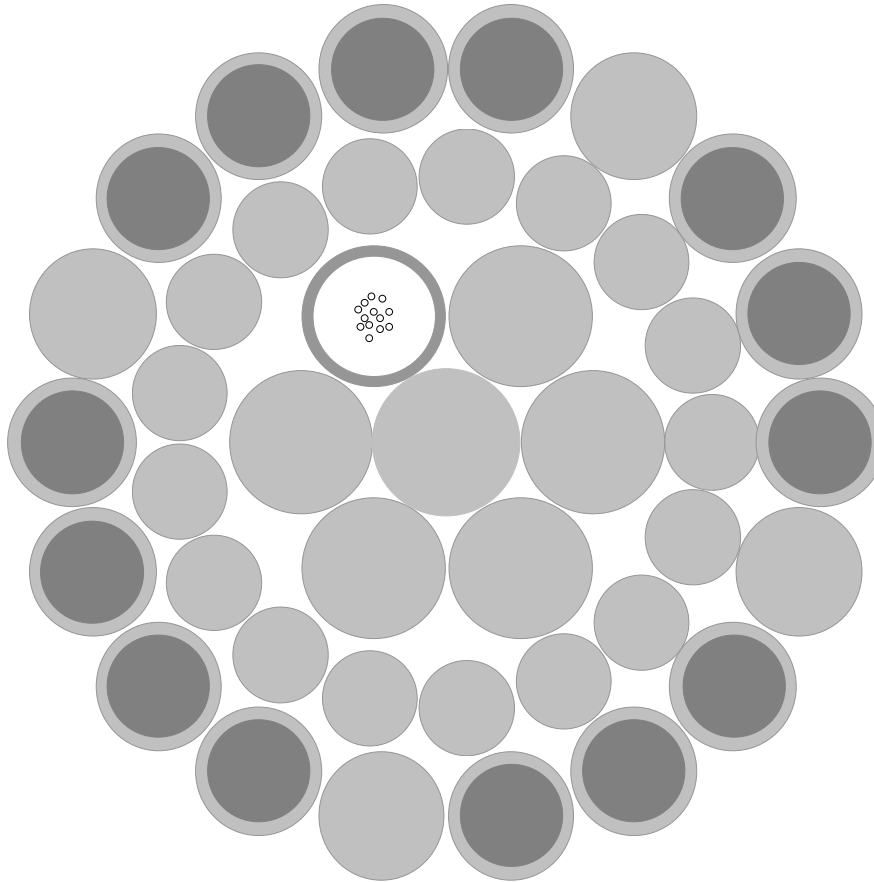
Outer Strands					Core Strands (if different from outer strands)						
Final Modulus of elasticity (psi/100)	<input type="text" value="134000"/>				Final Modulus of elasticity (psi/100)	<input type="text"/>					
Thermal expansion coeff. (/100 deg)	<input type="text" value="0.000930"/>				Thermal expansion coeff. (/100 deg)	<input type="text"/>					
Polynomial coefficients (all strains in %)					Polynomial coefficients (all strains in %)						
	A0	A1	A2	A3	A4		A0	A1	A2	A3	A4
Stress-strain	<input type="text" value="390.9"/>	<input type="text" value="104664.8"/>	<input type="text" value="115773.8"/>	<input type="text" value="-388787"/>	<input type="text" value="265690"/>	Stress-strain	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Creep	<input type="text" value="-197.6"/>	<input type="text" value="79837"/>	<input type="text" value="-43024.6"/>	<input type="text" value="38844"/>	<input type="text" value="-20431"/>	Creep	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Thermal Rating Properties					
Resistance at two different temperatures			Emissivity coefficient <input type="text" value="0.5"/>		
Resistance (Ohm/mile)	<input type="text" value="0.5077"/>	at (deg F) <input type="text" value="77"/>	Solar absorption coefficient <input type="text" value="0.5"/>		
Resistance (Ohm/mile)	<input type="text" value="0.5953"/>	at (deg F) <input type="text" value="167"/>	* Outer strands heat capacity (Watt-s/ft-deg F) <input type="text"/>		
			* Core heat capacity (Watt-s/ft-deg F) <input type="text"/>		

* These two fields do not need to be entered for OPGW - intentionally left blank.

Specification DNO-8230

HexaCore Optical Ground Wire



S5-188/120/913

Component Details						
	Component	#	OD		Area	
CENTER	Aluminum Alloy 6201	1	3.90 mm	0.1535 in	11.95 mm ²	0.0185 in ²
LAYER 1 - LEFT HAND LAY	Aluminum Alloy 6201	5	3.85 mm	0.1516 in	58.21 mm ²	0.0902 in ²
	Stainless Steel Tube	1	3.80 mm	0.1496 in	2.26 mm ²	0.0035 in ²
LAYER 2 - RIGHT HAND LAY	Aluminum Alloy 6201	17	2.50 mm	0.0984 in	83.45 mm ²	0.1293 in ²
LAYER 3 - LEFT HAND LAY	Aluminum Clad Steel (20.3% IACS)	14	3.30 mm	0.1299 in	119.74 mm ²	0.1856 in ²
	Aluminum Alloy 6201	4	3.30 mm	0.1299 in	34.21 mm ²	0.0530 in ²

Standards	
Designed and Manufactured in accordance with the following:	
Cable	<i>IEEE 1138, IEC 60794-4</i>
Fiber	<i>IEC 60793, ITU-T G.65x Series</i>
Color Code	<i>ANSI/EIA 359-A, 598-A, IEC 60304</i>
Stainless Steel Tubes	<i>ASTM A240, ASTM A632</i>

Specification DNO-8230

Aluminum Alloy Wires	<i>ASTM B398, IEC 60104</i>
Aluminum Clad Steel Wires	<i>ASTM B415</i>

Specification DNO-8230

Mechanical / Electrical Details			
Calculated Breaking Load	20,347 kg	44,857 lbs	See Note 1
Maximum Cable Design Tension	17,295 kg	38,128 lbs	See Note 2
Approximate Cable Diameter	23.20 mm	0.913 in	
Total Cross-Sectional Area	309.82 mm ²	0.4802 in ²	
Approximate Cable Weight	1,351 kg/km	4,794 lbs/mile	
Modulus of Elasticity	10,008 kg/mm ²	14,234 kpsi	
Coefficient of Linear Expansion	1.68E-05 1/°C	9.32E-06 1/°F	
Sag10™ Chart Number	1-1455	1-1455	
Calculated DC Resistance (20°C)	0.1434 Ohms/km	0.2307 Ohms/mile	
Short Circuit Rating	703 (kA) ² •sec	703 (kA) ² •sec	
Short Circuit Ambient Temperature	40 °C	104 °F	
Short Circuit Duration 1 sec	26.5 kA	26.5 kA	
Short Circuit Max Cable Temperature	210 °C	410 °F	

Optical Details

Attenuation Characteristics for ITU-T G.652D Single-mode Fiber

Max Individual

0.35 dB/km 1310 nm
0.22 dB/km 1550 nm

3.8mm Stainless Steel Tube Design		Fiber Count
Unit	Fiber Type	Fiber Count
Tube 1	ITU-T G.652D Single-mode	36
Total Fiber Count		36

Standard Fiber Color Code

Fiber	1	2	3	4	5	6	7	8	9	10	11	12
Color	Blue	Orange	Green	Brown	Slate	White	Red	Black	Yellow	Violet	Rose	Aqua

Designs with more than 12 fibers per tube will use the standard color code and stripes for identification of the fibers.

Installation and Handling Recommendations

Installation and cable preparation procedures are outlined in the AFL Telecommunications documents listed below. Contact AFL to request copies.

Recommended Installation Procedures for Composite Optical Ground Wire

Installation Instructions for Installing Optical Ground Wire in an AFL Telecommunications Splice Enclosure

Fiber Optic Cable Receiving, Handling and Storage. Document ACS-WI-809

Notes:

1. Calculated Breaking Strength: RBS: based on 10% derate from cable UTS, and without contribution from stainless steel tube.
2. Maximum Cable Design Tension=Cable Tension for Zero Fiber Strain=85%RBS

Specification DNO-8230

Quick Reference Installation Notes		
Approximate Cable Diameter	23.20 mm	0.913 in
Maximum Stringing Tension (at tensioner)*	4,108 kg	9,057 lbs
Minimum Bull Wheel Diameter	163 cm	64 in
Stringing Sheave Diameter**	93 cm	37 in
Minimum Bending Radius		
Cable		
Static (No load)	35 cm	14 in
Dynamic (under tension)	47 cm	19 in
Fiber		
Static (No load)	3.8 cm	1.5 in
Stainless Steel Tube		
Static (No load)	17.1 cm	6.8 in
<p>* - The stringing tension is always measured at the tensioner side. In general the maximum stringing tension should be approximately half of the maximum sagging tension and should never exceed 20% RBS of the OPT-GW.</p> <p>** - The value indicated is for the first and last structures of the pull and is based on 40 times the diameter of the OPT-GW. Smaller diameters can be used at tangent structures. Reference AFL's installation instructions for more details.</p> <p>Reference AFL's "Recommended Installation Procedures for Composite Optical Ground Wire" for detailed installation instructions.</p>		

Shipping Reels											
Reel Type	FL	TR	DR	OW	Tare	FL	TR	DR	OW	Tare	Capacity
	(cm)				(kgs)	(in)				(lbs)	(meters)
Steel	183	91	102	107	540	72	36	40	42	1,191	2,600 8,530
Steel	213	114	107	130	773	84	45	42	51	1,704	3,700 12,130
<p>FL - Flange Diameter; TR - Inside Traverse Width; DR - Drum Diameter; OW - Outside Overall Width</p> <p>Arbor Hole Diameter: Wood: 3-1/4in (7.9cm) Steel: 3in (7.6cm)</p> <p>Maximum lengths shown are the longest lengths that AFL offers. Longer lengths may be possible.</p> <p>Ordered lengths should include a distribution of lengths, i.e., all reels cannot be ordered at the maximum. A typical reel length distribution is as follows:</p> <p>6000m – 7000m ~ 15% of reels 4500m – 6000m ~ 55% of reels 2500m – 4500m ~ 25% of reels <2500m ~ 5% of reels</p> <p>Wood reels with flex-wrap covering are standard. Non-returnable steel reels and/or wood lagging are available upon request. Additional reel sizes may be available upon request.</p> <p>Steel reels are recommended for long term storage. Reference AFL's "Fiber Optic Cable Receiving, Handling and Storage" document for additional information.</p>											

Specification DNO-8230

Electrical Characteristics					
Composite DC Resistance	[20°C]	0.1434 Ohms/km	0.2307 Ohms/mile		
Geometric Mean Radius		0.90 cm	0.0296 feet		
Inductive Reactance	[60 Hz frequency]	0.2653 Ohms/km	0.4270 Ohms/mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.2211 Ohms/km	0.3558 Ohms/mile		
Capacitive Reactance	[60 Hz frequency]	0.1560 MOhms-km	0.0970 MOhms-mile		
	[one foot (0.3048 meter) spacing]				
	[50 Hz frequency]	0.1872 MOhms-km	0.1163 MOhms-mile		
Composite Coefficient of Thermal Resistance		0.00352 (1/°C)			
Temperature		DC Resistance		AC Resistance	
(°C)	(°F)	(Ohms/km)	(Ohms/mile)	(Ohms/km)	(Ohms/mile)
20	68	0.1434	0.2307	0.1462	0.2353
25	77	0.1459	0.2348	0.1488	0.2395
30	86	0.1484	0.2389	0.1514	0.2436
35	95	0.1509	0.2429	0.1540	0.2478
40	104	0.1535	0.2470	0.1565	0.2519
45	113	0.1560	0.2510	0.1591	0.2561
50	122	0.1585	0.2551	0.1617	0.2602
55	131	0.1610	0.2592	0.1643	0.2643
60	140	0.1636	0.2632	0.1668	0.2685
65	149	0.1661	0.2673	0.1694	0.2726
70	158	0.1686	0.2714	0.1720	0.2768
75	167	0.1711	0.2754	0.1746	0.2809
80	176	0.1737	0.2795	0.1771	0.2851
85	185	0.1762	0.2835	0.1797	0.2892
90	194	0.1787	0.2876	0.1823	0.2934
95	203	0.1812	0.2917	0.1849	0.2975
100	212	0.1838	0.2957	0.1874	0.3016
105	221	0.1863	0.2998	0.1900	0.3058
110	230	0.1888	0.3038	0.1926	0.3099
115	239	0.1913	0.3079	0.1952	0.3141
120	248	0.1939	0.3120	0.1977	0.3182
125	257	0.1964	0.3160	0.2003	0.3224
130	266	0.1989	0.3201	0.2029	0.3265
135	275	0.2014	0.3242	0.2055	0.3306
140	284	0.2039	0.3282	0.2080	0.3348
145	293	0.2065	0.3323	0.2106	0.3389
150	302	0.2090	0.3363	0.2132	0.3431

Specification DNO-8230

PLS-CADD Inputs

Use simplified elastic cable model (no creep, no coefficient)

Name:

Description:

Cross section area (in²): Unit weight (lbs/ft):

Outside diameter (in): Ultimate tension (lbs): Number of independent wires:

Temperature at which strand data below obtained (deg F): (above should be 1 unless cables are separated by spacers)

Outer Strands					Core Strands (if different from outer strands)						
Final Modulus of elasticity (psi/100)	<input type="text" value="124000"/>				Final Modulus of elasticity (psi/100)	<input type="text"/>					
Thermal expansion coeff. (/100 deg)	<input type="text" value="0.000880"/>				Thermal expansion coeff. (/100 deg)	<input type="text"/>					
Polynomial coefficients (all strains in %)					Polynomial coefficients (all strains in %)						
	A0	A1	A2	A3	A4		A0	A1	A2	A3	A4
Stress-strain	<input type="text" value="-1114.5"/>	<input type="text" value="137270.3"/>	<input type="text" value="-16623.3"/>	<input type="text" value="-113531"/>	<input type="text" value="78251"/>	Stress-strain	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Creep	<input type="text" value="709.2"/>	<input type="text" value="78505.3"/>	<input type="text" value="59189"/>	<input type="text" value="-132936"/>	<input type="text" value="73913"/>	Creep	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Thermal Rating Properties

Resistance at two different temperatures	Emissivity coefficient	<input type="text" value="0.5"/>
Resistance (Ohm/mile) <input type="text" value="0.2348"/> at (deg F) <input type="text" value="77"/>	Solar absorption coefficient	<input type="text" value="0.5"/>
Resistance (Ohm/mile) <input type="text" value="0.2754"/> at (deg F) <input type="text" value="167"/>	* Outer strands heat capacity (Watt-s/ft-deg F)	<input style="background-color: #cccccc;" type="text"/>
	* Core heat capacity (Watt-s/ft-deg F)	<input style="background-color: #cccccc;" type="text"/>

* These two fields do not need to be entered for OPGW - intentionally left blank.