

# ANNEX B: APPLICATION INFORMATION FOR AMPACITY CALCULATION ITEMS B.310.15(B)(1) THROUGH B.310.15(B)(7)

## B.310.15(B)(1) EQUATION APPLICATION INFORMATION

This informative annex provides application information for ampacities calculated under engineering supervision.

## B.310.15(B)(2) TYPICAL APPLICATIONS COVERED BY TABLES

Typical ampacities for conductors rated 0 through 2,000 volts are shown in Table B.310.15(B)(2)(1) through Table B.310.15(B)(2)(10). Table B.310.15(B)(2)(11) provides the adjustment factors for more than three current-carrying conductors in a raceway or cable with load diversity. Underground electrical duct bank configurations, as detailed in Figure B.310.15(B)(2)(3), Figure B.310.15(B)(2)(4) and Figure B.310.15(B)(2)(5), are utilized for conductors rated 0 through 5,000 volts. In Figure B.310.15(B)(2)(2) through Figure B.310.15(B)(2)(5), where adjacent duct banks are used, a separation of 1.5 m (5 ft) between the centerlines of the closest ducts in each bank or 1.2 m (4 ft) between the extremities of the concrete envelopes is sufficient to prevent derating of the conductors due to mutual heating. These ampacities were calculated as detailed in the basic ampacity paper, AIEE Paper 57-660, *The Calculation of the temperature Rise and Load Capability of Cable Systems*, by J. H. Neher and M. H. McGrath. For additional information concerning the application of these ampacities, see IEEE/ICEA Standard S-135/p-46-426, *Power Cable Ampacities*, and IEEE Standard 835-1,994, *Standard Power Cable Ampacity Tables*.

Typical values of thermal resistivity (Rho) are as follows:

- Average Soil (90% of USA) = 90
- Concrete = 55
- Damp Soil (coastal areas, high water table) = 60
- Paper Insulation = 550
- Polyethylene (PE) = 450
- Polyvinyl Chloride (PVC) = 650
- Rubber and Rubber-Like = 500
- Very Dry Soil (rocky or sandy) = 120

*Thermal resistivity*, as used in this informative annex, refers to the heat transfer capability through a substance by conduction. It is the reciprocal of thermal conductivity and is normally expressed in the units °C-cm/watt. For additional information on determining soil thermal resistivity (Rho), see ANSI/IEEE Standard 442-1,996, *Guide for Soil thermal Resistivity Measurements*.

## B.310.15(B)(3) CRITERIA MODIFICATIONS

Where values of load factor and Rho are known for a particular electrical duct bank installation and they are different from those shown in a specific table or figure, the ampacities shown in the table of figure can be modified by the application of factors derived from the use of Figure B.310.15(B)(2)(1).

Where two different ampacities apply to adjacent portions of a circuit, the higher ampacity can be used beyond the point of transition, a distance equal to 3 m (10 ft) or 10 percent of the circuit length calculated at the higher ampacity, whichever is less.

Where the burial depth of direct burial or electrical duct bank circuits are modified from the values shown in a figure or table, ampacities can be modified as shown in (a) and (b) as follows.

(a) Where burial depths are increased in part(s) of an electrical duct run to avoid underground obstructions, no decrease in ampacity of the conductors is needed, provided the total length of parts of the duct run increased in depth to avoid obstructions is less than 25 percent of the total run length.

(b) Where burial depths are deeper than shown in a specific underground ampacity table or figure, an ampacity derating factor of 6 percent per increased 300 mm (foot) of depth for all values of Rho can be utilized. No rating change is needed where the burial depth is decreased.

## B.310.15(B)(4) ELECTRICAL DUCTS

The term electrical duct(s) is defined in 310.60.

## B.310.15(B)(5) TABLES B.310.15(B)(2)(6) AND B.310.7(B)(2)(7)

(a) To obtain the ampacity of cables installed in two electrical ducts in one horizontal row with 190-mm (7.5 in) center-to-center spacing between electrical ducts, similar to Figure B.310.15(B)(2)(2), Detail 1, multiply the ampacity shown for one duct in Table B.310.15(B)(2)(6) and Table B.310.15(B)(2)(7) by 0.88.

(b) To obtain the ampacity of cables installed in four electrical ducts in one horizontal row with 190-mm (7.5 in) center-to-center spacing between electrical ducts, similar to Figure B.310.15(B)(2)(2), Detail 2, multiply the ampacity shown for three electrical ducts in Table B.310.15(B)(2)(2) and Table B.310.15(B)(2)(2) by 0.94.

## B.310.15(B)(6) ELECTRICAL DUCTS USED IN FIGURE B.310.15(B)(2)(2)

If spacing between electrical ducts, as shown in Figure B.310.15(B)(2)(2), is less than specified in Figure B.310.15(B)(2)(2), where electrical ducts enter equipment enclosures from underground, the ampacity of conductors contained within such electrical ducts need not be reduced.

## B.310.15(B)(7) EXAMPLES SHOWING USE OF FIGURE B.310.15(B)(2)(1) FOR ELECTRICAL DUCT BANK AMPACITY MODIFICATIONS

Figure B.310.15(B)(2)(1) is used for interpolation or extrapolation for values of Rho and load factor for cables installed in electrical ducts. The upper family of curves shows the variation in ampacity and Rho at unity load factor in terms of  $I_1$ , the ampacity for Rho = 60 and 50 percent load factor. Each curve is designated for a particular ratio  $I_2/I_1$ , where  $I_2$  is the ampacity at Rho = 120 and 100 percent load factor. The lower family of curves shows the relationship between Rho and load factor that will give substantially the same ampacity as the indicated value of Rho at 100 percent load factor.

As an example, to find the ampacity of a 500 kcmil copper cable circuit for six electrical ducts as shown in Table B.310.15(B)(2)(5): At the Rho = 60, LF = 50,  $I_1 = 583$ ; for Rho = 120 and LF = 100,  $I_2 = 400$ . The ratio  $I_2/I_1 = 0.686$ . Locate Rho = 90 at the bottom of the chart and follow the 90 Rho line to the intersection with 100 percent load factor where the equivalent Rho = 90. Then follow the 90 Rho line to  $I_2/I_1$  ratio of 0.686 where F = 0.74. The desired ampacity =  $0.74 \times 583 = 431$ , which agrees with the table for Rho = 90, LF = 100.

To determine the ampacity for the same circuit where Rho = 80 and LF = 75, using Figure B.310.15(B)(2)(1), the equivalent Rho = 43, F = 0.855 and the desired ampacity =  $0.855 \times 583 = 498$  amperes. Values for using Figure B.310.15(B)(2)(1) are found in the electrical duct bank ampacity tables of this informative annex.

Where the load factor is less than 100 percent and can be verified by measurement or calculation, the ampacity of electrical duct bank installations can be modified as shown. Different values of Rho can be accommodated in the same manner.

# ANNEX B: APPLICATION INFORMATION FOR AMPACITY CALCULATION

## TABLES B.310.15(B)(2)(1) AND B.310.15(B)(2)(3)

**Table B.310.15(B)(2)(1)** Ampacities of Two or Three Insulated Conductors, Rated 0 Through 2,000 Volts, Within an Overall Covering (Multiconductor Cable), in Raceway in Free Air Based on Ambient Air Temperature of 30°C (86°F)\*

Temperature Rating of Conductor [See Table 310.104(A), NEC2011]							
Size AWG or kcmil	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	Size AWG or kcmil
	Types TW, UF	Types RHW, THHW, THW, THWN, SHHW, ZW	Types THHN, THHW, THW-2, THWN-2, RHH, RWH-2, USE-2, XHHW, XHHW-2, ZW-2	Types TW, UF	Types RHW, THHW, THW, THWN, SHHW, ZW	Types THHN, THHW, THW-2, THWN-2, RHH, RWH-2, USE-2, XHHW, XHHW-2, ZW-2	
COPPER				ALUMINUM OR COPPER-CLAD ALUMINUM			
14	16**	18**	21**	—	—	—	14
12	20**	24**	27**	16**	18**	21**	12
10	27**	33**	36**	21**	25**	28**	10
8	36	43	48	28	33	37	8
6	48	58	65	38	45	51	6
4	66	79	89	51	61	69	4
3	76	90	102	59	70	79	3
2	88	105	119	69	83	93	2
1	102	121	137	80	95	106	1
1/0	121	145	163	94	113	127	1/0
2/0	138	166	186	108	129	146	2/0
3/0	158	189	214	124	147	167	3/0
4/0	187	223	253	147	176	197	4/0
250	205	245	276	160	192	217	250
300	234	281	317	185	221	250	300
350	255	305	345	202	242	273	350
400	274	328	371	218	261	295	400
500	315	378	427	254	303	342	500
600	343	413	468	279	335	378	600
700	349	452	514	310	371	420	700
750	387	466	529	321	384	435	750
800	397	479	543	331	397	450	800
900	415	500	570	350	421	477	900
1000	448	542	617	382	460	521	1000

**Table B.310.15(B)(2)(3)** Ampacities of Multiconductor Cables with Not More Than Three Insulated Conductors, Rated 0 Through 2,000 Volts, in Free Air Based on Ambient Air Temperature of 40°C (104°F)(types TC, MC, MI, UF and USE Cables)\*

Temperature Rating of Conductor [See Table 310.104(A), NEC2011]									
Size AWG or kcmil	60°C (140°F)	75°C (167°F)	85°C (185°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	85°C (185°F)	90°C (194°F)	Size AWG or kcmil
	COPPER				ALUMINUM OR COPPER-CLAD ALUMINUM				
18	—	—	—	11	—	—	—	—	18
16	—	—	—	16	—	—	—	—	16
14	18	21	24	25	—	—	—	—	14
12	21	28	30	32	18	21	24	25	12
10	28	36	41	43	21	28	30	32	10
8	39	50	56	59	30	39	44	46	8
6	52	68	75	79	41	53	59	61	6
4	69	89	100	104	54	70	78	81	4
3	81	104	116	121	63	81	91	95	3
2	92	118	132	138	72	92	103	108	2
1	107	138	154	161	84	108	120	126	1
1/0	124	160	178	186	97	125	139	145	1/0
2/0	143	184	206	215	111	144	160	168	2/0
3/0	165	213	238	249	129	166	185	194	3/0
4/0	190	245	274	287	149	192	214	224	4/0
250	212	274	305	320	166	214	239	250	250
300	237	306	341	357	186	240	268	280	300
350	261	337	377	394	205	265	296	309	350
400	281	363	406	425	222	287	317	334	400
500	321	416	465	487	255	330	368	385	500
600	354	459	513	538	284	368	410	429	600
700	387	502	562	589	306	405	462	473	700
750	404	523	586	615	328	424	473	495	750
800	415	539	604	633	339	439	490	513	800
900	438	570	639	670	362	469	514	548	900
1000	461	601	674	707	385	499	558	584	1000

\*Refer to 310.15(B)(2) for the ampacity correction factors where the ambient temperature is other than 40°C (104°F)

\*\* Unless otherwise specifically permitted elsewhere in this Code, the overcurrent protection for these conductor types shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG and 30 amperes for 10 AWG copper; or 15 amperes for 12 AWG and 25 amperes for 10 AWG aluminum and copper-clad aluminum

# ANNEX B: APPLICATION INFORMATION FOR AMPACITY CALCULATION TABLES B.310.15(B)(2)(5) AND B.310.15(B)(2)(6)

**Table 310.15(B)(2)(5)** Ampacities of Single Insulated Conductors, Rated 0 Through 2,000 Volts, in Nonmagnetic Underground Electrical Ducts (One Conductor per Electrical Duct), Based on Ambient Earth Temperature of 20°C (68°F), Electrical Duct Arrangement in Accordance with Figure B.310.15(B)(2)(2), Conductor Temperature 75°C (167°F)

Size AWG or kcmil	3 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 2)			6 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 3)			9 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 4)			3 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 2)			6 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 3)			9 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 4)			Size AWG or kcmil												
	Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE															
COPPER																ALUMINUM OR COPPER-CLAD ALUMINUM															
RHO RHO RHO																															
	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120													
	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF													
	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100													
250	410	344	327	386	295	275	369	270	252	320	269	256	302	230	214	288	211	197	250												
350	503	418	396	472	355	330	446	322	299	393	327	310	369	277	258	350	252	235	350												
500	624	511	484	583	431	400	545	387	360	489	401	379	457	337	313	430	305	284	500												
750	794	640	603	736	534	494	674	469	434	626	505	475	581	421	389	538	375	347	750												
1000	936	745	700	864	617	570	776	533	493	744	593	557	687	491	453	629	432	399	1000												
1250	1055	832	781	970	686	632	854	581	536	848	668	627	779	551	508	703	478	441	1250												
1500	1160	907	849	1063	744	685	918	619	571	941	736	689	863	604	556	767	517	477	1500												
1750	1250	970	907	1142	793	729	975	651	599	1026	796	745	937	651	598	823	550	507	1750												
2000	1332	1027	959	1213	836	768	1030	683	628	1103	850	794	1005	693	636	877	581	535	2000												
Ambient Temp. (°C)	Correction Factors																Ambient Temp. (°F)														
6-10	1.09			1.09			1.09			1.09			1.09			1.09			43-50												
11-15	1.04			1.04			1.04			1.04			1.04			1.04			52-59												
16-20	1.00			1.00			1.00			1.00			1.00			1.00			61-68												
21-25	0.95			0.95			0.95			0.95			0.95			0.95			70-77												
26-30	0.90			0.90			0.90			0.90			0.90			0.90			79-86												

**Table 310.15(B)(2)(6)** Ampacities of Three Insulated Conductors, Rated 0 Through 2,000 Volts, Within an Overall Covering (Three Conductor Cable), in Underground Electrical Ducts (One Cable per Electrical Duct) Based on Ambient Earth Temperature of 20°C (68°F), Electrical Duct Arrangement in Accordance with Figure B.310.15(B)(2)(2), Conductor Temperature 75°C (167°F)

Size AWG or kcmil	3 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 1)			6 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 2)			9 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 3)			3 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 1)			6 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 2)			9 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 3)			Size AWG or kcmil																
	Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE			Types RHW, THHW, THW, THWN, XHHW, USE																			
COPPER																		ALUMINUM OR COPPER-CLAD ALUMINUM																	
RHO RHO RHO																																			
	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120																	
	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF																	
	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100																	
8	58	54	53	59	48	46	53	42	39	45	42	41	43	37	36	41	32	30	8																
6	77	71	69	74	63	60	70	54	51	60	55	54	57	49	47	54	42	39	6																
4	101	93	91	96	81	77	91	69	65	78	72	71	75	63	60	71	54	51	4																
2	132	121	118	126	105	100	119	89	83	103	94	92	98	82	78	92	70	65	2																
1	154	140	136	146	121	114	137	102	95	120	109	106	114	94	89	107	79	74	1																
1/0	177	160	156	168	137	130	157	116	107	138	125	122	131	107	101	122	90	84	1/0																
2/0	203	183	178	192	156	147	179	131	121	158	143	139	150	122	115	140	102	95	2/0																
3/0	233	210	204	221	178	158	205	148	137	182	164	159	172	139	131	160	116	107	3/0																
4/0	268	240	232	253	202	190	234	168	155	209	187	182	198	158	149	183	131	121	4/0																
250	297	265	256	280	222	209	258	184	169	233	207	201	219	174	163	202	144	132	250																
350	363	321	310	340	267	250	312	219	202	285	252	244	267	209	196	245	172	158	350																
500	444	389	375	414	320	299	377	261	240	352	308	297	328	254	237	299	207	190	500																
750	552	478	459	511	388	362	462	314	288	446	386	372	413	314	293	374	254	233	750																
1000	682	539	518	579	435	405	522	351	321	521	447	430	480	361	336	433	291	266	1000																
Ambient Temp. (°C)	Correction Factors																Ambient Temp. (°F)																		
6-10	1.09			1.09			1.09			1.09			1.09			1.09			43-50																
11-15	1.04			1.04			1.04			1.04			1.04			1.04			52-59																
16-20	1.00			1.00			1.00			1.00			1.00			1.00			61-68																
21-25	0.95			0.95			0.95			0.95			0.95			0.95			70-77																
26-30	0.90			0.90			0.90			0.90			0.90			0.90			79-86																

# ANNEX B: APPLICATION INFORMATION FOR AMPACITY CALCULATION TABLES B.310.15(B)(2)(7) AND B.310.15(B)(2)(8)

**Table 310.15(B)(2)(7)** Ampacities of Three Single Insulated Conductors, Rated 0 Through 2,000 Volts, in Underground Electrical Ducts (Three Conductors per Electrical Duct), Based on Ambient Earth Temperature of 20°C (68°F), Electrical Duct Arrangement in Accordance with Figure B.310.15(B)(2)(2), Conductor Temperature 75°C (167°F)

Size AWG or kcmil	1 Electrical Duct (Fig. B.310.15(B)(2)(2), Detail 1)			3 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 2)			6 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 3)			1 Electrical Duct (Fig. B.310.15(B)(2)(2), Detail 1)			3 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 2)			6 Electrical Ducts (Fig. B.310.15(B)(2)(2), Detail 3)			Size AWG or kcmil										
	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE	Types RHW, THHW, THW, THWN, XHHW, USE														
COPPER															ALUMINUM OR COPPER-CLAD ALUMINUM														
	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO	RHO								
	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120	60	90	120								
	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF								
	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100	50	100	100								
8	63	58	57	61	51	49	57	4	41	49	45	44	47	40	38	45	34	32	45	34	32								
6	84	77	75	80	67	63	75	56	53	66	60	58	63	52	49	59	44	41	59	44	41								
4	111	100	98	105	86	81	98	73	67	86	78	76	79	97	63	7	57	52	7	57	52								
3	129	116	113	122	99	94	113	83	77	101	91	89	83	77	73	84	65	60	84	65	60								
2	147	132	128	139	112	106	129	93	86	115	103	100	108	87	82	101	73	67	101	73	67								
1	171	153	148	161	128	121	149	106	98	133	119	115	126	100	94	116	83	77	116	83	77								
1/0	197	175	169	185	146	137	170	121	111	153	136	132	144	114	107	133	94	87	133	94	87								
2/0	226	200	193	212	166	156	194	136	126	176	156	151	165	130	121	151	106	98	151	106	98								
3/0	260	228	220	243	189	177	222	154	142	203	178	172	189	147	138	173	121	111	173	121	111								
4/0	301	263	253	280	215	201	255	175	161	235	205	198	219	168	157	199	137	126	199	137	126								
250	334	290	279	310	236	220	281	192	176	261	227	218	242	185	172	220	150	137	220	150	137								
300	373	321	308	344	260	242	310	210	192	293	252	242	272	204	190	245	165	151	245	165	151								
350	409	354	337	377	283	264	340	228	209	321	276	265	296	222	207	266	179	164	266	179	164								
400	442	376	361	394	302	280	368	243	223	349	297	284	321	238	220	288	191	174	288	191	174								
500	503	427	409	460	341	316	412	273	249	397	338	323	364	270	250	326	216	197	326	216	197								
600	552	468	447	511	371	343	457	296	270	446	373	356	408	296	274	365	236	215	365	236	215								
700	602	509	486	553	402	371	492	319	291	488	408	389	443	321	297	394	255	232	394	255	232								
750	632	529	505	574	417	385	509	330	301	508	425	405	461	334	309	409	265	241	409	265	241								
800	654	544	520	597	428	395	527	338	308	530	439	418	484	344	318	427	273	247	427	273	247								
900	692	375	549	628	450	415	554	355	323	563	466	444	510	365	337	450	288	261	450	288	261								
1000	730	605	576	659	472	435	581	372	338	597	494	471	538	385	355	475	304	276	475	304	276								
Ambient Temp. (°C)	Correction Factors																		Ambient Temp. (°F)										
6-10	1.09			1.09			1.09			1.09			1.09			1.09			43-50										
11-15	1.04			1.04			1.04			1.04			1.04			1.04			52-59										
16-20	1.00			1.00			1.00			1.00			1.00			1.00			61-68										
21-25	0.95			0.95			0.95			0.95			0.95			0.95			70-77										
26-30	0.90			0.90			0.90			0.90			0.90			0.90			79-86										

**Table 310.15(B)(2)(7)** Ampacities of Three Single Insulated Conductors, Rated 0 Through 2,000 Volts, in Underground Electrical Ducts (Three Conductors per Electrical Duct), Based on Ambient Earth Temperature of 20°C (68°F), Electrical Duct Arrangement in Accordance with Figure B.310.15(B)(2)(2), Conductor Temperature 75°C (167°F)

Size AWG or kcmil	1 Cable (Fig. B.310.15(B)(2)(2), Detail 5)		2 Cable (Fig. B.310.15(B)(2)(2), Detail 6)		1 Cable (Fig. B.310.15(B)(2)(2), Detail 5)		2 Cable (Fig. B.310.15(B)(2)(2), Detail 6)		Size AWG or kcmil
	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	
	Type UF	RHW, THHW, THW, THWN, XHHW, USE	Type UF	RHW, THHW, THW, THWN, XHHW, USE	Type UF	RHW, THHW, THW, THWN, XHHW, USE	Type UF	RHW, THHW, THW, THWN, XHHW, USE	
COPPER					ALUMINUM OR COPPER-CLAD ALUMINUM				
8	64	75	60	79	51	59	47	55	8
6	85	100	81	95	68	75	60	70	6
4	107	125	100	117	83	97	78	91	4
2	137	161	128	150	107	126	110	117	2
1	155	182	145	170	121	142	113	132	1
1/0	177	208	165	193	138	162	129	151	1/0
2/0	201	236	188	220	157	184	146	171	2/0
3/0	229	269	213	250	179	210	166	195	3/0
4/0	259	304	241	282	203	238	188	220	4/0
250	-	333	-	308	-	261	-	241	250
350	-	401	-	370	-	315	-	290	350
500	-	81	-	442	-	381	-	350	500
750	-	585	-	535	-	473	-	433	750
1000	-	657	-	600	-	545	-	497	1000
Ambient Temp. (°C)	Correction Factors								Ambient Temp. (°F)
6-10	1.12	1.09	1.12	1.09	1.12	1.09	1.12	1.09	43-50
11-15	1.06	1.04	1.06	1.04	1.06	1.04	1.06	1.04	52-59
16-20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	61-68
21-25	0.94	0.95	0.94	0.95	0.94	0.95	0.94	0.95	70-77
26-30	0.87	0.90	0.87	0.90	0.87	0.90	0.87	0.90	79-86

# ANNEX B: APPLICATION INFORMATION FOR AMPACITY CALCULATION

## TABLES B.310.15(B)(2)(9) AND B.310.15(B)(2)(10)

**Table 310.15(B)(2)(9)** Ampacities of Three Triplexed Single Insulated Conductors, Rated 0 Through 2,000 Volts, Directly Buried in Earth Based on Ambient Earth Temperature of 20°C (68°F), Electrical Duct Arrangement in Accordance with Figure B.310.15(B)(2)(2), 100 Percent Load Factor, Thermal Resistance (Rho) 90

Size AWG or kcmil	See Fig. B.310.15(B)(2)(2) Detail 7		See Fig. B.310.15(B)(2)(2) Detail 8		See Fig. B.310.15(B)(2)(2) Detail 7		See Fig. B.310.15(B)(2)(2) Detail 8		Size AWG or kcmil
	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	
	Type UF	Type USE	Type UF	Type USE	Type UF	Type USE	Type UF	Type USE	
	COPPER				ALUMINUM OR COPPER-CLAD ALUMINUM				
8	72	84	66	77	55	65	51	60	8
6	91	107	84	99	72	84	66	77	6
4	119	139	109	128	92	108	85	100	4
2	153	179	140	164	119	139	109	128	2
1	173	203	159	186	135	158	124	145	1
1/0	197	231	181	212	154	180	141	165	1/0
2/0	223	262	205	240	175	205	159	187	2/0
3/0	254	298	232	272	199	233	181	212	3/0
4/0	289	339	263	308	226	265	206	241	4/0
250	–	370	–	336	–	289	–	263	250
350	–	445	–	403	–	349	–	316	350
500	–	536	–	483	–	424	–	382	500
750	–	654	–	587	–	525	–	471	750
1000	–	744	–	665	–	608	–	544	1000
Ambient Temp. (°C)	Correction Factors								Ambient Temp. (°F)
6-10	1.12	1.09	1.12	1.09	1.12	1.09	1.12	1.09	43-50
11-15	1.06	1.04	1.06	1.04	1.06	1.04	1.06	1.04	52-59
16-20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	61-68
21-25	0.94	0.95	0.94	0.95	0.94	0.95	0.94	0.95	70-77
26-30	0.87	0.90	0.87	0.90	0.87	0.90	0.87	0.90	79-86

**Table 310.15(B)(2)(10)** Ampacities of Three Single Insulated Conductors, Rated 0 Through 2,000 Volts, Directly Buried in Earth Based on Ambient Earth Temperature of 20°C (68°F), Electrical Duct Arrangement in Accordance with Figure B.310.15(B)(2)(2), 100 Percent Load Factor, Thermal Resistance (Rho) 90

Size AWG or kcmil	See Fig. B.310.15(B)(2)(2) Detail 9		See Fig. B.310.15(B)(2)(2) Detail 10		See Fig. B.310.15(B)(2)(2) Detail 9		See Fig. B.310.15(B)(2)(2) Detail 10		Size AWG or kcmil
	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	60°C (140°F)	75°C (167°F)	
	Type UF	Type USE	Type UF	Type USE	Type UF	Type USE	Type UF	Type USE	
	COPPER				ALUMINUM OR COPPER-CLAD ALUMINUM				
8	84	98	78	92	66	77	61	72	8
6	107	126	101	118	84	98	78	92	6
4	139	163	130	152	108	127	101	118	4
2	179	209	165	194	139	163	129	151	2
1	201	236	187	219	157	184	146	171	1
1/0	230	270	212	249	179	210	165	194	1/0
2/0	261	306	241	283	204	239	188	220	2/0
3/0	297	348	274	321	232	272	213	250	3/0
4/0	336	394	309	362	262	307	241	283	4/0
250	–	429	–	394	–	335	–	308	250
350	–	516	–	474	–	403	–	370	350
500	–	626	–	572	–	490	–	448	500
750	–	767	–	700	–	605	–	552	750
1000	–	887	–	808	–	706	–	642	1000
1250	–	979	–	891	–	787	–	716	1250
1500	–	1063	–	965	–	862	–	783	1500
1750	–	1133	–	1027	–	930	–	843	1750
2000	–	1195	–	1082	–	990	–	897	2000
Ambient Temp. (°C)	Correction Factors								Ambient Temp. (°F)
6-10	1.12	1.09	1.12	1.09	1.12	1.09	1.12	1.09	43-50
11-15	1.06	1.04	1.06	1.04	1.06	1.04	1.06	1.04	52-59
16-20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	61-68
21-25	0.94	0.95	0.94	0.95	0.94	0.95	0.94	0.95	70-77
26-30	0.87	0.90	0.87	0.90	0.87	0.90	0.87	0.90	79-86

Technical Reference