Table 18 Continued

Wire size, AWG or kcmil	Wire size, (mm^2)	60°C[a] Copper	60°C[a] Aluminum	75°C[a] Copper	75°C[a] Aluminum
1 250	633	see footnote e	see footnote e	590	485
1 500	760	see footnote e	see footnote e	625	520
1 750	887	see footnote e	see footnote e	650	545
2 000	1 013	see footnote e	see footnote e	665	560

NOTES.

1 For internal wiring, larger ampacities may be used on the basis of a temperature test.

2 These values of ampacity apply only where a maximum of 3 current carrying conductors will be field-installed in a single conduit. If 4 or more conductors other than a grounding conductor or a neutral that carries the unbalanced current will be installed in a conduit, the ampacity of each of these conductors is reduced as shown below. These reduced values do not apply to internal wiring of a busway fitting.

a) 4 – 6 conductors = 80 percent of values in the table.

b) 7 – 24 conductors = 70 percent of values in the table.

c) 25 – 42 conductors = 60 percent of values in the table.

d) 43 or more conductors = 50 percent of values in the table.

[a] The values 60°C and 75°C indicate the wire temperature rating.

[b] The values shown in parentheses shall be used for wires connected to an overcurrent protective device.

[c] The ampacity of these sizes shall be considered to be the same as for 60° wire when connected to a molded-case circuit breaker unless the breaker is marked 75°C.

[d] For a multiple conductor connector at a terminal, the ampacity value shall be multiplied by the number of conductors that the terminal will accommodate 1/0 AWG and larger.

[e] For wire sizes 1/0 AWG and larger, it is assumed that wire at least a 75°C temperature rating will be used.

Table 19
Ampacity of insulated conductors in free air

Wire size, AWG or kcmil	Wire size, (mm^2)	60°C[a] Copper	60°C[a] Aluminum	75°C[a] Copper	75°C[a] Aluminum
14	2.1	(20) 25[b]	–	(20) 30[b]	–
12	3.3	(25) 30[b]	(20) 25[b]	(25) 35[b]	(20) 30[b]
10	5.3	40	(30) 35[b]	(40) 50[b]	(30) 40[b]
8	8.4	60	45	70[c]	55[c]
6	13.3	80	60	95[c]	75[c]
4	21.2	105	80	125[c]	100[c]
3	26.7	120	95	145[c]	115[c]
2	33.6	140	110	170[c]	135[c]
1	42.4	165	130	195[c]	155[c]
1/0	53.5	see footnote d	see footnote d	230	180
2/0	67.4	see footnote d	see footnote d	265	210
3/0	85.0	see footnote d	see footnote d	310	240
4/0	107	see footnote d	see footnote d	360	280
250	127	see footnote d	see footnote d	405	315
300	152	see footnote d	see footnote d	445	350

Table 19 Continued on Next Page

Table 19 Continued

Wire size,		60°C[a]		75°C[a]	
AWG or kcmil	(mm^2)	Copper	Aluminum	Copper	Aluminum
350	177	see footnote d	see footnote d	505	395
400	203	see footnote d	see footnote d	545	425
500	253	see footnote d	see footnote d	620	485
600	304	see footnote d	see footnote d	690	540
700	355	see footnote d	see footnote d	755	595
750	380	see footnote d	see footnote d	785	620
800	405	see footnote d	see footnote d	815	645
900	456	see footnote d	see footnote d	870	700
1 000	506	see footnote d	see footnote d	935	750
1 250	633	see footnote d	see footnote d	1 065	855
1 500	760	see footnote d	see footnote d	1 175	950
1 750	887	see footnote d	see footnote d	1 280	1 050
2 000	1 013	see footnote d	see footnote d	1 385	1 150

NOTE – Table 18 applicable only with respect to Clause 7.8.3.9.

[a] The rating indicates the wire temperature rating.

[b] The values shown in parentheses shall be used for wires connected to an overcurrent protective device.

[c] The ampacity of these sizes shall be considered to be the same as for 60°C wire when connected to molded case circuit breakers unless the breaker is marked 75°C.

[d] For wire sizes 1/0 AWG and larger, it is assumed that wire with at least a 75°C temperature rating will be used.

7.8.3.10 The size and type of a field-installed conductor shall be determined as follows:

a) For currents as indicated in Table 18 and Table 19:

1) Wire rated at 75°C shall be used for 1/0 AWG (53.5 mm^2) and larger sizes.

2) Wire rated at 60°C shall be used for the 1 AWG (42.4 mm^2) size; however, wire rated at 75°C may be used when the busway fitting provided with circuit breakers rated 110 A or less is tested and marked in accordance with Clause 5.2.20.18.

3) Wire rated at 60° C shall be used for 2 AWG (33.6 mm^2) and smaller sizes, however, sizes 2 AWG (33.6 mm^2) wire rated at 75° C may be used if the busway fitting is provided with a 100 A circuit breaker marked for use with 75°C aluminum wire. When so marked, the circuit breakers need not be spaced apart from other circuit breakers or be subjected to the test described in Clause 8.2.1.

b) Aluminum wire shall be used at any terminal identified on a wiring diagram or the like as described in Clauses 5.2.20.3 – 5.2.20.11 as being rated for use with such wire, whether or not that terminal is also identified as being rated for use with copper wire.

7.8.3.11 A bolted connection between a wire connector and a bus bar shall be evaluated for compliance with Clauses 7.8.1.6 – 7.8.1.10.

7.8.3.12 A wire connector shall be prevented from being turned to such a position that spacings would be reduced to values less than those required. When minimum or larger spacings exist after the wire connectors are turned from their normal position 30 degrees toward each other or toward other live or grounded metal parts, no means to prevent turning need be provided.

7.8.3.13 A wire-binding screw or stud of a wiring terminal shall be no smaller than No. 10 (M5) with no more than 32 threads per inch (0.80 pitch). The terminal shall be provided with an upturned lug, a cupped

washer, or the equivalent, capable of retaining a 14 AWG (2.1 mm^2) solid conductor even though the screw or nut might become loose; however, a No. 8 (M4) machine screw having more than 32 threads per inch (0.70 pitch) may be used at a terminal intended only for the connection of a 14 AWG (2.1 mm^2) conductor.

7.8.3.14 A wire-binding screw terminal design is one in which the conductor is intended to encircle the terminal screw for at least three-quarters of its circumference, but without overlapping of the conductor.

7.8.3.15 A wire-binding screw shall thread into metal.

7.8.3.16 A terminal plate tapped for a wire-binding screw shall be of metal no less than 0.76 mm (0.030 in) thick. There shall be two or more full threads in the metal, which may be extruded if necessary to provide the threads.

7.8.3.17 If a pressure-wire connector is used as a terminating device for aluminum, it shall be investigated and determined acceptable for use with aluminum under the conditions involved (for example, temperature, heat cycling, or the like).

7.8.3.18 A drop cord connected to a plug-in unit shall be Type S, SE, SO, ST, or STO flexible cord, or bus drop cable having an ampacity, as shown in Table 20, no less than the current rating of the plug-in unit.

Table 20
Cord ampacity

Copper conductor size,		Ampacity, A	
AWG	(mm^2)	1-Phase	3-Phase
18	0.82	10	7
16	1.30	13	10
14	2.10	18	15
12	3.30	25	20
10	5.30	30	25
8	8.40	40	35
6	13.30	55	45
4	21.20	70	60
2	33.60	95	80

7.8.3.19 A drop cord connected to a fitting shall be provided with strain relief and bushings.

7.8.3.20 If a knot in a flexible cord serves as a strain relief, a surface that the knot can touch shall be free from projections, sharp edges, burrs, fins, or the like that can cause abrasion of the cord insulation.

7.8.3.21 At a point where a flexible cord passes or is intended to pass through an opening in a wall, barrier, or enclosing case, there shall be a secured bushing or the equivalent, and it shall have a smoothly rounded surface against which the cord can bear.

7.8.3.22 A busway fitting having a drop cord or flexible cord or containing a receptacle shall also contain overcurrent protection ahead of the cord or receptacle. The ampere rating of the overcurrent protection shall not exceed the ampere rating of the cord or receptacle.

7.8.3.23 A fitting constructed or marked so that it will not be installed in a busway rated over 20 A need not contain overcurrent protection.

7.8.3.24 A fitting constructed or marked so that it will not be installed on a busway having an ampere rating higher than the cord ampacity or the receptacle ampere rating need not contain overcurrent protection.

7.8.3.25 A fitting need not contain overcurrent protection if it is marked for use only on the load side of overcurrent protection not exceeding the receptacle ampere rating.

7.8.3.26 Overcurrent protection may be omitted from the fitting if the line of fittings intended for use with the busway includes a fitting with a receptacle of the same rating and is provided with proper overcurrent protection.

7.9 Requirements for electronic equipment supply circuits

Reserved for future use.

7.10 Electromagnetic compatibility

Reserved for future use.

7.11 Description of the types of electrical connections or functional units

Reserved for future use.

8 Test specifications

8.1 General

Reserved for future use.

8.2 Type tests

8.2.1 Verification of temperature-rise limits

8.2.1.1 General

8.2.1.2 Arrangement of the bus bar trunking system

8.2.1.2.1 For the temperature rise test, three 3.05 m (10 ft) lengths of busway shall be bolted together in a straight run in the intended manner and supported horizontally 508 mm (20 in) or more from the floor. The opening at each end of the run shall be blocked to prevent the passage of air. The sample shall be tested in still air. The sample shall be placed in a position representing the service conditions most likely to produce maximum operating temperatures or in accordance with the marked instructions in Clause 5.2.10, 5.2.17.3, or 5.2.17.6. If an elbow or tee requires testing, it shall be assembled between two 3.05 m (10 ft) lengths of busway.

8.2.1.3 Temperature rise limits (stabilization method)

8.2.1.3.1 The busway shall be tested at any convenient voltage, with rated current flowing, and the supply circuit shall have the number of phases corresponding to the busway rating. A 60-Hz power supply shall be used unless another frequency is indicated in the busway marking. If a line of busways is involved, heating tests shall be made on the 3-phase, 3-pole products. Such tests shall be generally considered as representing 3-phase, 4-wire and single-phase, 2-wire or 3-wire busways, provided that the ampacity of the neutral, if any, complies with Clause 7.8.2.7. The phase currents in polyphase supply connections to

the busway shall be balanced. If there are two or more bus bars per phase, the current shall be allowed to distribute itself in the various bus bars according to the characteristics of the busway.

8.2.1.3.2 Conductors of rated size shall be used in connecting the ends of the bus bars to the source of supply and for short circuiting the bars at the other ends. These conductors shall be such that no appreciable amount of heat is contributed to or withdrawn from the busway under test. Heat flow through the connections to external conductors shall be determined by comparing temperature observations made by means of thermocouples placed on the external conductors and the ends, the center, and intermediate points throughout the run of busway under test. A temperature shall be considered to be constant when three successive readings taken at 15-minute intervals indicate no change. Normally this requires 8 to 10 hours of operation.

8.2.1.4 Temperature rise limits (heat cycling method)

8.2.1.4.1 General

8.2.1.4.1.1 A busway shall be subjected to a heat cycling test if it employs:

a) Spring-loaded bus bar joints or

b) Aluminum bus bars that are not provided with spring washers or the like at bolted connections between bus bars.

For the heat cycling test, the rated busway current shall vary in cycles in the manner described in Clauses 8.2.1.4.2.2 and 8.2.1.4.2.3. Results shall comply with the limitations on increase in temperature rise specified in Clause 8.2.1.4.2.3.

8.2.1.4.1.2 Two 3.05 m (10 ft) lengths of the busway shall be connected together. The joints between the bus bars shall be conditioned by being assembled and disassembled 5 times prior to final assembly for the test.

8.2.1.4.1.3 A spring-loaded joint shall be considered to be one in which the clamping force is developed by the deflection of a spring member in the assembly of the joint. For the purpose of this requirement, a dished washer shall not be considered to exert spring loading.

8.2.1.4.1.4 When a busway employing aluminum bus bars and intended for use with a plug-in fitting is tested with such a fitting in the manner described in Clauses 8.2.1.4.2.1 – 8.2.1.4.2.3, and with rated current flowing, the change in temperature rise shall be no more than indicated in Clause 8.2.1.4.2.3.

8.2.1.4.2 Test arrangement

8.2.1.4.2.1 This test is to determine the suitability of the plating of aluminum bus bars. If plating of the same characteristics is employed on a line of busways of the same design but of different current ratings, a test on one combination of busway and plug-in fitting shall be considered to be representative of the line. For the test, the largest size (ampere rating) of plug-in device shall be mounted on the smallest size (ampere rating) busway that will accommodate it. Before any current is allowed to flow, the bus bars shall be conditioned by 25 cycles of insertion and removal of the plug-in device in the intended manner.

8.2.1.4.2.2 The temperature rises on the contacts of the fitting and on the bus bars adjacent to the contacts shall be determined while the equipment is carrying the specified current continuously. After temperatures have become constant under these conditions, the current shall be stopped and the equipment shall be allowed to cool to room temperature.

8.2.1.4.2.3 The equipment shall then be subjected to two successive sets of cycling of the current. Each set shall consist of 42 complete cycles. During each cycle the current shall be on for 2 hours and off for 2 hours; or if, during the initial heating mentioned in Clause 8.2.1.4.2.2, average temperatures on the fitting contacts and the bus bars at the end of 2 hours are more than 5° C lower than the average final temperatures during continuous operation, the current shall remain on for 3 hours in each cycle. Stable maximum temperatures shall be observed again after the 42nd cycle and also after the 84th cycle. The final temperatures shall not be more than 5° C higher than those observed initially, nor shall the final temperatures be more than 5°C higher than those observed at the conclusion of the 42nd cycle.

8.2.1.5 Measurement of temperatures

Reserved for future use.

8.2.1.6 Ambient air temperature

Reserved for future use.

8.2.1.7 Results to be obtained

8.2.1.7.1 The connection between a plug-in device and the busway shall be able to continuously carry the current indicated in Clause 8.2.1.7.2 without showing a temperature rise of more than 30° C or be tested in accordance with Clauses 8.2.1.4.2.2 and 8.2.1.4.2.3 without showing a temperature rise of more than 55°C.

8.2.1.7.2 For the test mentioned in Clause 8.2.1.4.2.3:

a) A plug-in device incorporating fuseholders shall be tested at its rated current with dummy fuses in the fuseholders.

b) A circuit breaker plug-in device shall be tested while carrying 80 percent of its rated current.

During the test, no current shall flow through the busway (other than that of the device on test). No preliminary conditioning cycles of assembly and disassembly shall be required. A plug-in device shall be tested when installed on a busway for which it is intended, and that has an ampere rating of twice the ampere rating of the plug-in device (or as close to that as possible).

8.2.1.7.3 The temperature rise on an enclosed switch, circuit breaker, or other component of a plug-in device shall comply with the requirements for such component.

8.2.1.7.4 When performing a heating test on the trolley of a trolley busway, the following shall be considered:

a) The type of moving contact;

b) The materials involved; and

c) Any other features that would be affected by the temperatures attained.

8.2.2 Verification of dielectric voltage withstand

8.2.2.1 General

8.2.2.1.1 A busway and its fittings shall withstand for 1 minute without breakdown the application of a 60-Hz essentially sinusoidal potential of 1 000 V plus twice maximum rated voltage:

a) Between live parts and the enclosure and

b) Between live parts of opposite polarity.

8.2.2.1.2 Test arrangement

The test shall be made with a 500 V-A or larger capacity transformer, the output voltage of which is essentially sinusoidal and can be varied. The applied potential shall be increased from zero to the required test value for 1 minute. The increase in the applied potential shall be at a substantially uniform rate and as rapid as consistent with its value being correctly indicated by the voltmeter. The dielectric voltage-withstand test of a trolley busway shall follow the endurance test without any cleaning of the sample.

8.2.2.2 Clamped joint test

A clamped joint between two insulators shall be tested using two samples:

a) The clamped joint on the first sample shall be opened up to produce a space 3.2 mm (1/8 in) wide. This may be accomplished by loosening the clamping means or by drilling a 3.2 mm (1/8 in) diameter hole at the joint between the insulators at a point of minimum spacing between the metal parts on the opposite sides of the joint. The drilled hole shall not decrease spacings between the opposite polarity parts as measured through the crack between the insulators. The 60-Hz dielectric breakdown voltage through this hole shall then be determined by applying a gradually increasing voltage (500 V per second) until breakdown occurs.

b) The second sample, with the clamped joint intact, shall be subjected to a gradually increasing 60-Hz voltage until 110 percent of the breakdown voltage of (a) has been reached. If the breakdown voltage of (a) is less than 4 600 V rms, the voltage to be applied to the second sample shall be further increased to 5 000 V rms and held for 1 second. There shall be no electrical breakdown of the second sample.

8.2.2.3 Reduced insulation thickness test

An insulating covering, as specified in Clause 7.1.1.16, shall be subjected to the application of a 5 000-V, 60-Hz potential applied between the bus bar and a metal foil wrapped around the insulating covering. In conducting this test, the potential shall be brought to the required value and held for 1 second. There shall be no electrical breakdown.

8.2.3 Verification of short-circuit withstand strength

8.2.3.1 Short-circuit withstand strength test at rated voltage

8.2.3.1.1 General

8.2.3.1.1.1 If a busway fitting includes a meter socket, the fitting shall be subjected to a short-circuit test in accordance with the applicable requirements in Reference Item No. 8, Annex B.

8.2.3.1.1.2 Except as indicated below, a busway fitting containing a switch shall be subjected to the following tests as covered in the applicable sections of the requirements in Reference Item No. 10 or 19, Annex B

a) The Close-Open Test;

b) The Dielectric Voltage-Withstand Test;

c) The Short Circuit-Withstand Test;

d) The Low Level Dielectric Voltage-Withstand Test;

e) The Closing Test; and

f) The Low Level Dielectric Voltage-Withstand Repeated Test.

8.2.3.1.1.3 The tests described in Clause 8.2.3.1.1.2 need not be performed if the switch was previously evaluated for the short-circuit current rating involved and all three of the following conditions are met:

a) The enclosure of the busway fitting has equal or greater volume than the enclosure used in the investigation of the switch;

b) The distance from an arcing part to the nearest live part or grounded metal surface in the busway fitting is no less than that distance in the test enclosure; and

c) The hinges and latch or screws in the fitting construction are equal to or stronger than those in the tested enclosure.

8.2.3.1.1.4 If a busway fitting contains a circuit breaker, the circuit breaker shall be a type that has been tested and rated for the short-circuit current and voltage marked on the busway fitting (including a series combination rating described in Clause 8.2.3.1.1.7 and the marking described in Clause 5.2.14). The tests on a busway fitting containing a circuit breaker shall be conducted in accordance with Reference Item No. 13, Annex B. If the circuit breaker is located in a panelboard in the busway fitting, the test shall be conducted in accordance with Reference Item No. 8, Annex B. The fitting employing the circuit breaker is to be subjected to the following tests:

a) The Maximum Current Test (single- and three-phase ground path);

b) The Maximum Voltage-Withstand Test; and

c) The Dielectric Voltage-Withstand Test.

8.2.3.1.1.5 The tests described in Clause 8.2.3.1.1.4 need not be performed if all three of the following conditions were met during the evaluation of the circuit breaker:

a) The enclosure of the busway fitting has equal or greater volume than the test enclosure used in the investigation of the circuit breaker;

b) The distance from an arcing part to the nearest live part or grounded metal surface in the busway fitting is equal to or greater than that distance in the test enclosure; and

c) The hinges and latch or screws in the busway fitting construction are equal to or stronger than those in the test enclosure.

8.2.3.1.1.6 The tests specified in Clauses 8.2.3.1.3.11 – 8.2.3.1.3.14 shall be conducted on a busway and fitting even if a switch or circuit breaker in the fitting complies with the conditions specified in Clauses 8.2.3.1.1.2 and 8.2.3.1.1.4.

8.2.3.1.1.7 If the short-circuit current rating of the busway fitting exceeds the interrupting rating of a circuit breaker within the fitting, the fitting and circuit breaker shall be tested in accordance with the requirements for series-connected molded-case circuit breakers in Reference Item No. 13, Annex B, and be marked in accordance with Clauses 5.2.13(b) and 5.2.14.

8.2.3.1.1.8 If the short-circuit current rating of the fitting exceeds the short-circuit current rating of any circuit breaker that can be added in the field, the fitting shall be marked in accordance with Clause 5.2.13(c).

8.2.3.1.1.9 A typical configuration of a busway system shall be tested to determine compliance with the requirements specified in Clause 8.2.3.1.4.1. A busway system with a 5 000-A, short-circuit current rating or a busway system rated over 100 A with a 7 500- or 10 000-A, short-circuit current rating need not be tested.

8.2.3.1.1.10 If the busway is marked for use on the load side of fuses as described in Clause 5.2.14, a short-circuit test is not required if the same bus and support system has been previously tested with acceptable results, and the peak-let-through currents (I_p) recorded in the previous test is greater than the let-through characteristics of the fuse as shown in Table 21.

Table 21
Peak-let-through currents (I_p) and clearing I^2t for fuses

Fuse rating, A	Between threshold and 50 kA		100 kA		200 kA	
	$I_p \times 10^3$	$I^2t \times 10^3$	$I_p \times 10^3$	$I^2t \times 10^3$	$I_p \times 10^3$	$I^2t \times 10^3$
Class CC and G fuses						
15	3[a]	2[a]	3	2	4[a]	3[a]
20	3[b]	2[a]	4	3	5[a]	3[a]
30[a]	6[b]	7[a]	7.5[a]	7[a]	12[a]	7[a]
30[b]	–	–	6[b]	5[b]	–	–
60[b]	–	–	10[b]	25[b]	–	–
300-V Class T fuses						
30	5	3.5	7	3.5	9	3.5
60	7	15	9	15	12	15
100	9	40	12	40	15	40
200	13	150	16	150	20	150
400	22	550	28	550	35	550
600	29	1 000	37	1 000	46	1 000
800	37	1 500	50	1 500	65	1 500
1 200	50	3 500	65	3 500	80	4 000
Class J and 600-V Class T fuses						
30	6	7	7.5	7	12	7
60	8	30	10	30	16	30
100	12	60	14	80	20	80
200	16	200	20	300	30	300
400	25	1 000	30	1 100	45	1 100
600	35	2 500	45	2 500	70	2 500
800[c]	50[c]	4 000[c]	55[c]	4 000[c]	75[c]	4 000[c]
Class L fuses						
800	80	10 000	80	10 000	80	10 000
1 200	80	12 000	80	12 000	120	15 000
1 600	100	22 000	100	22 000	150	30 000
2 000	110	35 000	120	35 000	165	40 000
2 500	–	–	165	75 000	180	75 000
Class L fuses						
3 000	–	–	175	100 000	200	100 000
4 000	–	–	220	150 000	250	150 000
5 000	–	–	–	350 000	300	350 000

Table 21 Continued on Next Page

Table 21 Continued

Fuse rating, A	Between threshold and 50 kA		100 kA		200 kA	
	$I_p \times 10^3$	$I^2t \times 10^3$	$I_p \times 10^3$	$I^2t \times 10^3$	$I_p \times 10^3$	$I^2t \times 10^3$
Class L fuses						
6 000	–	–	–	350 000	350	500 000
Class R fuses[d]						
30	11	50	11	50	14	50
60	20	200	21	200	26	200
100	22	500	25	500	32	500
200	32	1 600	40	1 600	50	2 000
400	50	5 000	60	5 000	75	6 000
600	65	10 000	80	10 000	100	12 000

NOTE – Measurement instrumentation for test circuits delivering more than 10 000 A shall be in accordance with Reference Item No. 13, Annex B.

[a] Value applies only to Class CC fuses.

[b] Value applies only to Class G fuses.

[c] Value applies only to Class T fuses.

[d] Value applies only to Class RK5 fuses.

8.2.3.1.1.11 An alternative bus support need not be subjected to a short-circuit test if it has the same shape and equal or greater mechanical strength than the support that was subjected to a short-circuit test.

8.2.3.1.2 Test arrangement

8.2.3.1.2.1 The following guidelines shall be used for sample selection:

a) A line of busway and fittings need only be tested at maximum and minimum ampere ratings if the general constructions are similar and if the following are all the same:

1) Short-circuit rating;

2) Bus bars per phase;

3) Method of bus bar support;

4) Center-to-center phase spacing; and

5) Spacing between supports.

Busways and fittings at intermediate ratings shall also to be tested if calculations based on their construction and short-circuit current rating indicate the likelihood of greater force on a support or greater deflection of a bus than would occur in the test at either the maximum or minimum rating.

b) In a line of busways and fittings with different short-circuit current ratings, the samples selected for testing to represent the line shall represent:

1) The weakest bus support and the weakest bus structure including the ground bus or a reduced size neutral bus;

2) The differences in joints between busway sections; and

3) The differences in field wiring terminals.

c) Among the factors to be considered in selecting samples as specified in (b) are:

1) The stiffness of the bus bars as related to bus cross-section, material, and distance between supports along the bus;

2) The force on the bus as related to distance between buses of opposite polarity, distance between supports along the bus, short-circuit current rating, and impedance of the busway; and

3) The force on bus supports as related to length of bus between supports, distance between bus of opposite polarity, short-circuit current rating, and impedance of the busway.

If the thermal performance of the busway depends on intimate contact between the bars and the housing, samples shall represent the construction most likely to result in loss of contact due to bowing of the bus bar or of the housing. The combination of these factors will usually require that more than one test be conducted.

d) Tests on a busway with multiple bus bars per phase may be considered representative of a similar busway with fewer bars per phase if:

1) The assigned short-circuit current rating of the busway with fewer bus bars per phase is no greater than the tested busway rating reduced by the ratio of the number of bus bars in the two constructions;

2) The bus bars are of the same size and material as in the tested construction;

3) The spacing between supports is no greater than the tested construction;

4) The center-to-center, phase-to-phase spacing is no less than the tested construction; and

5) The type of bus support and overall general construction is the same as in the tested busway.

8.2.3.1.2.2 The following configurations shall be tested:

a) Samples containing an end cable tap box installed on the line end of the busway shall have a combined length not exceeding 7.62 m (25 ft). Samples containing an end cable tap box installed on the load end of the busway shall have a combined length not exceeding 6.4 m (21 ft) and the length of a cable connected to the end tap box shall not exceed 1.22 m (4 ft). Each type of fitting and a straight length typical of the longest single length of busway shall be tested. Each test sample shall include at least one joint.

b) A busway plug-in fitting, trolley, service entrance busway fitting, or a bolt-on take-off device shall be tested on any convenient length of the highest current rated busway for which it is intended and shall be installed at the first available position closest to the point of power supply with any contacts closed.

A smaller rated busway may be used if the difference in impedance is compensated by using larger or shorter leads or by having more than required available short-circuit current. The length of the busway used to connect the fitting may be of any convenient length.

8.2.3.1.3 Current source characteristics

8.2.3.1.3.1 The characteristics of the current source shall be as follows:

a) The open circuit voltage shall be no less than the busway voltage rating for the short-circuit rating involved. All ac test potentials shall be obtained from a 48- to 60-Hz source of supply.