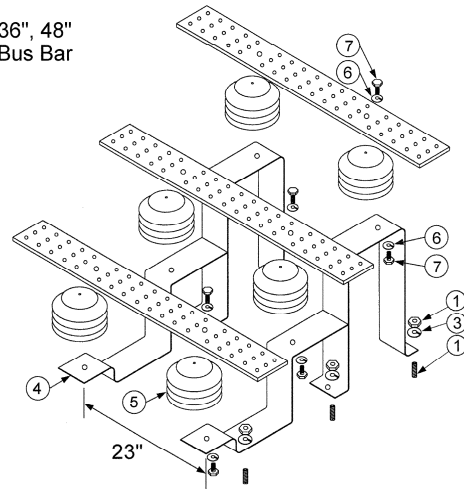


INSTALLATION OF SECONDARY BUS BAR

Notes:

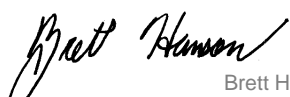


- A. Use special support (Stock No. 696836) for limited working space.
- B. Secondary Bus Bar shall not be installed in below-grade Looped Radial vaults.
- C. Use 2 bus bars per phase for 2000 amp.
- D. Use 2 bus bars per phase for 3000 amp.
- E. For copper cable and copper lugs, use silicon bronze bolts and hardware. For aluminum cable and lugs, use either aluminum or stainless steel bolt kits. See D14-4/NSV-20.
- F. Cable limiters are used for most bus tie cables and secondary conductors.

36", 48"
 Bus Bar



Material List

Item	Quantity by Bus Bar Length, in.				Description	Stock Number
	36	48	51	62-1/2		
01	06	06	12	09	ANCHOR, 1/2"-13 x 3-3/4", SS Kwik Bolt	780141
02	18	18	36	27	CLOTH, varnished cambric, 5"x12"	735283E
03	06	06	12	09	WASHER, lock, 1/2" galvanized	584255E
04	02	02	04	03	SUPPORT, secondary bus, insulators	696832
05	06	06	12	09	INSULATOR, bus bar support	690856
06	12	12	24	18	WASHER, split lock, 3/4" silicon bronze	788127E
07	12	12	24	18	CAP SCREW, 3/4"x1-1/2" hex, silicon bronze	784627E
08a	Note C				BUS BAR, 36"	679757
8b	Note C				48"	679760
8c	Note D				51"	679763
8d	Note D				62-1/2"	679764
10a	as required - see NTP-90				LIMITERS, Cu for Cu cable, or	683621 thru 683630
					LIMITERS, Al for Al cable	683637 thru 683659
10b	as required - see NTP-90				LUGS, Cu for Cu cable, or	677072E thru 677110
					LUGS, Al for Al cable	651267 thru 651295
10c	as required - see NTP-90				HEAT SHRINK TUBING	737451 thru 737604
11	see Note C				BOLT KITS, 1/2" x 2" stainless steel	782040
12	as required				RACKING MATERIALS (Stock Class 70)	-
13	as required				TAPE, friction, 3/4"	736400E
14	3 roll (RL)				TAPE, friction, 2"	736415
15	as required				VARNISH, insulating, quart	725471

standards coordinator	standards supervisor	unit director
 Brett Hanson	 John Shipek	 Darnell Cola

Seattle City Light
CONSTRUCTION GUIDELINE

Installation of Secondary Bus Bar

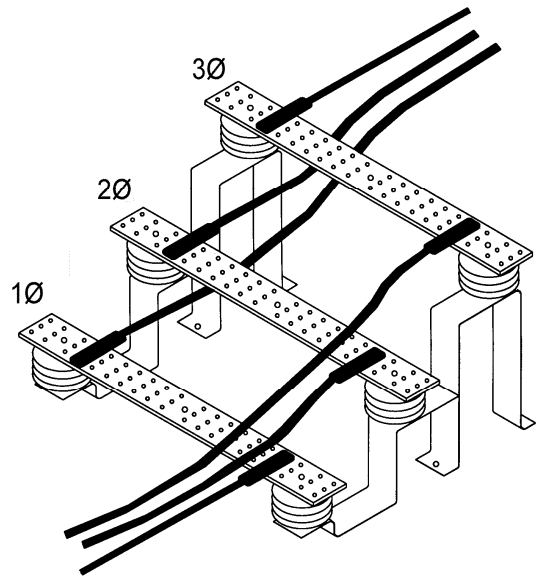
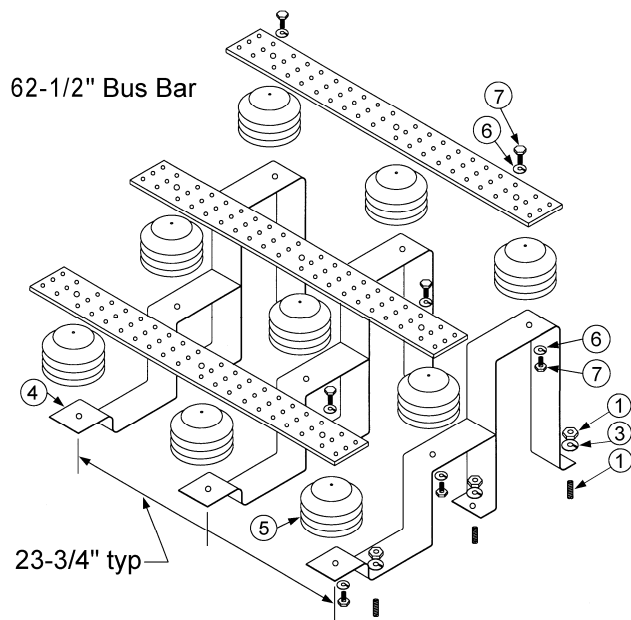
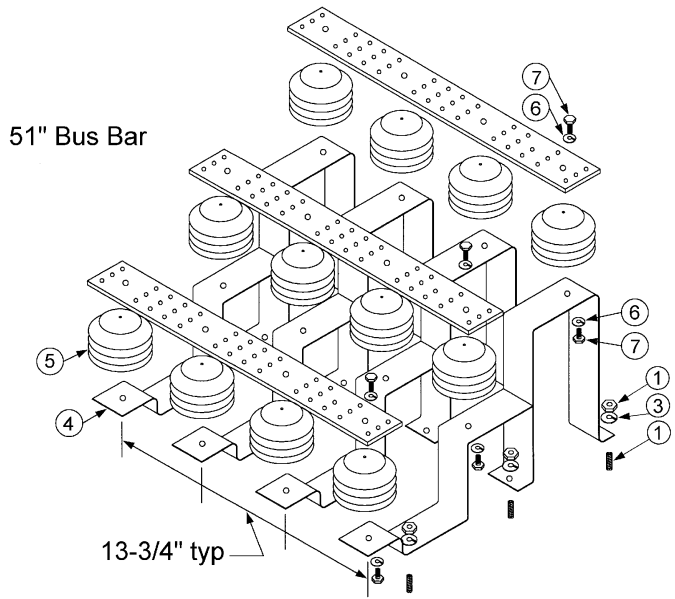
standard number: **U4-5/NCB-50**

superseding: February 14, 2013

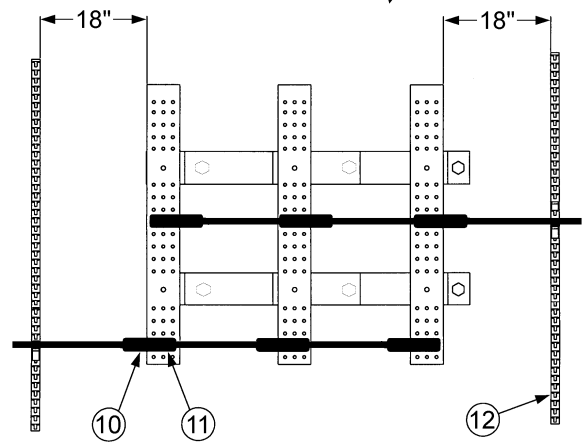
effective date: December 6, 2013

page: 2 of 4

Installation Details



See note 11b

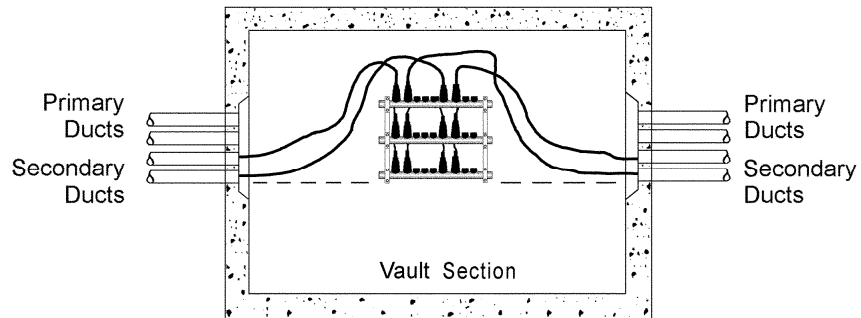


Installation Procedure

1. Locate and drill 1/2" diameter anchor holes. Allow space for size of bus bar specified. See Note 9, below.
2. Mount supports (Stock No. 696832) using 1/2" x 3-3/4" stainless steel concrete anchors (Stock No. 780141) and 1/2" galvanized lock washers (Stock No. 584255E). Do not tighten.
3. Install insulators (Stock No. 690856) to supports using 3/4" x 1-1/2" silicon bronze cap screws (Stock No. 784627E) and 3/4" silicon bronze lock washers (Stock No. 788127E). Do not tighten.
4. Clean and install bus bars with three (3) pieces of 5" x 12" varnished cambric cloth (Stock No. 735283E) between the bus bars and the insulators using 3/4" x 1-1/2" silicon bronze cap screws (Stock No. 784627E) and silicon bronze lock washers (Stock No. 788127E). Tighten all bolts making sure there are no stresses in the insulators due to warped or misaligned parts.
5. Connect secondary cables.
6. Cover crimped connector end of limiters with heat shrink tubing.
7. Wrap all exposed bolts, bars and connectors with three layers of varnished cambric. Secure in place with 3/4" wide friction tape (Stock No. 736400E).
8. Wrap with 2" wide friction tape (Stock No. 736415) to seal all parts where moisture can enter. Completely cover the varnished cambric. Use a minimum of one half-lapped layer to provide a smooth base for insulating varnish.
9. Paint all taped surfaces with insulating varnish (Stock No. 725471) to make entire installation water-resistant.
10. Guidelines for positioning bus bars in manholes and vaults:
 - 10a Bus bars should be installed so as not to block duct runs for pulling through.
 - 10b The bottom of bus bars should be no less than 36" from the floor and as high as possible, so the bars are at a proper working height for connections. The bars should be at least 6" from the ceiling to leave room for splicing. Avoid heights where bus bars must be worked from ladders (sump pumps are required in bus bar vaults).
 - 10c Bus bars should be placed vertically so cables can be brought in from both sides.
 - 10d Bus Bars should be installed above waterline.
11. Cable training, racking and phasing:
 - 11a All cables from one duct must be installed on the same position on each phase. Bus ties from one direction and parallel services should be back to back.
 - 11b Cables shall be racked so that they traverse the bus bars over each phase position for that set.
 - 11c Cable sets shall be racked together within 18" of the closest bus bar.
 - 11d Phasing shall start with Phase 1 on the bar closest to the wall and work out from the wall in order (1, 2, 3).
 - 11e Bring in all cables from the direction of the bus bar that is furthest from the wall. This will avoid blocking access to the lower bars with the upper cables.
 - 11f If installing cable to cable limiters, install as close to bus bars as possible.

University and First Hill Vaults, figures

Mole Bar Layout, section



Mole Bare Layout, plan view

