



.1 General

- .1 This section applies to underground primary conductors fed from the University of Victoria 15kV primary voltage infrastructure.
- .2 Main electric services to new buildings typically requires dual radial primary voltage feeders from the main distribution loop to each building in order to achieve a dual bumpless power transfer system.
- .3 The following provides technical requirements for primary voltage systems cabling, manholes, terminations and support hardware.

.2 Rubber Insulated Cables 5001 - 15000 V

- .1 15 kV cables shall be #250 MCM single-core copper, Class B stranding, with semi-conducting shield cover core conductor, 90° C rated tre-retardant insulation of cross-linked thermosetting polyethylene material, 15 kV rated for 100% voltage level, semi-conducting insulation shield overlaid with metallic wire or tape shield as described below, separator tape over shield, and extruded PVC jacketed rates –40° C.
- .2 In general, all 15kV cables to be connected to the existing underground distribution system shall have concentrically served copper wire shield made up of 14 #18 strands (or equal) to match the established University standard installation and to withstand 3000 A of ground fault current for 0.2 second.
- .3 For projects requiring total cable quantities less than 1000 m, the following alternative shield construction, cable installation and grounding arrangement may be acceptable by obtaining prior written permission from the University:
 - .1 Cable construction utilizing overlapping copper tape shield providing 100% coverage over the semi-conducting layer, and
 - .2 Cable installation which provides an additional #4/0 green insulated copper conductor installed in the same duct as the 3-phase conductors, and,
 - .3 Grounding arrangement which provides for the direct and effective bonding of the additional #4/0 grounding conductor to the cable shield ground leads at each end of the phase cables.
 - .4 The use of alternative shielding shall require each trefoil of feeder to have an accompanying #4/0 grounding cable in the same duct in addition to the standard duct bank grounding conductor which shall be separately installed in a 50 mm duct as shown on the drawings.
- .4 The construction and testing of HV cables shall be in general accordance with ICEA Publication S-66-524 and AEIC Specification No. 5-71.
- .5 Cables shall be as manufactured by Canada Wire and Cable, CGE, Phillips, Pirelli, or Northern Electric Ltd.
- .6 HV cable grips for single cable or trefoil bundle: high grade, non-magnetic tin-coated bronze strand construction. Kellems Type 022-01 (closed mesh), 022-02 (split mesh, lace closing).
- .7 HV cable identification tag ties: Thomas & Betts Nylon Ty-Rap # TY529M.

.3 Concentric Neutral Power Cables 5001 - 15000 V

- .1 Concentric neutral power cable: to NEMA WC7-1992/ICEAS-66-524.
- .2 Single copper conductor, size as indicated.
- .3 Semi-conducting strand shield.
- .4 compact round.



- .5 Insulation: cross-linked thermosetting polyethylene material rated 90EC and 15kV for 133 % voltage level.
- .6 Semi-conducting insulation shielding layer.
- .7 Copper neutral wires applied helically over insulation shield equivalent to 133 % full capacity.
- .8 Separator tape over neutral wires.
- .9 Extruded PVC jacket rated minus 40EC.

.4 Connectors and Terminations Rubber Insulated Cables

- .1 Copper crimp-on compression connectors as required sized for conductors.
- .2 All terminations 5kV and above shall meet IEEE 48.
- .3 Indoor 15 kV high voltage switchgear cable termination: complete with stress cones, shield grounding devices, and lugs. 3M Quick-Term II, 5620K series, Raychem HVT-152 series, or equal.
- .4 kV rated submersible, 600 A, elbow-type, non-loadbreak power distribution connector: Elastimold 650 LR series, complete with all necessary components, adapters, spade terminals, plugs, caps, connectors, and shield grounding devices suitable for the type and size of cable specified and compatible for connection to existing standard connectors in use at the University. The connector is to be equipped with voltage test points and all necessary bolts and hex nuts for assembling and dismantling without the use of hot-stick tools.

.5 Manhole Cable Support Hardware

- .1 Hot-dipped galvanized continuous concrete preset inserts for mounting of steel channel supports: Cantruss RH2C or equal.
- .2 41 x 41 mm hot-dipped galvanized continuous concrete preset inserts for mounting of steel channel supports: Cantruss RH2C or equal.
- .3 Steel channels for mounting of cable brackets: as specified.
- .4 Porcelain 'slip on' insulators, suitable for use with cable brackets specified: Pursley "Power-Strut" PS-1500 (for single cables) and PS-1501 (for trefoil cable bundle) or equal.
- .5 Heat shrink boots for cable bracket ends: T&B HSC, Raychem ESC, 3M ICEC, or equal.

.6 Duct Allocation Signs In Manholes

- .1 216 x 216 mm drawings on standard bond paper, sealed with thermally applied clear plastic laminate on both sides, sandwiched between two clear plexiglass plates.
- .2 Install duct allocation signs at each duct entry location in each new and existing re-used manholes.

END OF SECTION