.1 General

.1 The University’s power distribution and communications campus backbone consists of underground ducts and manholes which provide durability and flexibility during maintenance operations and when new facilities are being constructed.

.2 Consideration shall be given to design new ductbanks that have spare capacity and that provide flexibility for providing services to potential future campus development sites.

.3 Typical ductbanks for the campus will include concrete encased ducts that carry power, telephone cabling, copper data communications cabling, fiber optic cabling, security cabling and fire alarm cabling.

.2 Cable Protection

.1 Provide plastic marker tape with metallic backing strip above all ductbanks in order to facilitate future locating of ducts.

.3 Direct Burial Of Cables

.1 Direct buried cables are to be avoided as much as possible. When needed, they shall be enveloped in sand bedding and separated as required by code.

.2 Underground cable splices not acceptable.

.3 Minimum permitted radius at cable bends for rubber, plastic or lead covered cables, 8 times diameter of cable; for metallic armoured cables, 12 times diameter of cables or in accordance with manufacturer's instructions.

.4 Cable separation shall be as prescribe by the Canadian Electrical Code.

.4 Cable Installation In Ducts

.1 Installation of cables in ducts is the preferred underground installation. Cabling shall be installed without splices inside ducts.

.2 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

.3 To facilitate matching of colour coded multiconductor control cables reel off in same direction during installation.

.4 Before pulling cable into ducts and until cables are properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape.

.5 After installation of cables, seal duct ends with duct sealing compound.

.5 Markers

.1 Mark cable every 150 m along duct runs and changes in direction.

.2 Mark underground splices.

.3 Where markers are removed to permit installation of additional cables, reinstall existing markers.

.4 Install cedar post type markers.

.5 Lay concrete markers flat and centred over cable with top flush with finish grade.

.6 Field Quality Control

.1 All cables and wires shall be checked for phase rotation, for continuity, short circuits and grounds. Ensure resistance to ground of circuits is not less than 50 megohms.

.2 After installing cable but before splicing and terminating, contractors are to perform insulation resistance test with 1000 V megger on each phase conductor.
.3 Provide Consultant with list of test results showing location at which each test was made, circuit tested and result of each test.

.4 Remove and replace entire length of cable if cable fails to meet any of test criteria.