1.0 GENERAL

.1 Power Distribution Systems

.1 Power distribution systems should match existing as much as possible – review and coordinate requirements with BCIT Facilities

2.0 MATERIALS

.1 Switchboards

.1 Rating:

.1 Switchboard: indoor, [_____]V, [____] A, [__] phase, [_____] wire, 60 Hz, minimum short circuit [_] kA (rms symmetrical).

.2 Enclosure:

.1 Main incoming section to contain;

.1 Moulded case circuit breaker with solid state trip unit (LSIG), sized as indicated.

.2 Customer digital power meter.

.3 Transient voltage surge suppression.

.2 Distribution sections to contain;

.1 Moulded case circuit breaker with solid state trip unit, sized as indicated.

.2 Silver flashed copper bus, from main section to distribution sections including vertical bussing.

.3 Blanked off spaces for future units.

.4 Metal enclosed, free standing, floor mounted, dead front, indoor, CSA Enclosure 2, sprinkler proof cubicle unit.

.5 Ventilating louvres: vermin, insect, sprinkler proof with easily replaceable fibre glass filters.

.6 Access from front only.

.7 Steel channel sills for base mounting in single length common to multi-cubicle switchboard.

.8 Provision for future extension on [left] [right] side.

.3 Busbars:

.1 Three phase and full capacity neutral silver flashed copper Busbars, continuous current rating [2000] A self-cooled, extending full width of multi-cubicle switch board], suitably supported on insulators.

.2 Main connections between bus and major switching component to have continuous current rating to match major switching components.

.3 Busbars and main connections: 99.30% conductivity copper.

.4 Provision for extension of bus on [left] [right] side of unit without need for further drilling or preparation in field.

.5 Silver surfaced joints, secured with non-corrosive bolts and Belleville washers.

.6 Identify phases of busbars by suitable marking.

.7 Busbar connectors, when switchboard shipped in more than one section.

.4 Grounding:

.1 Copper ground bus not smaller than 50 x 6 mm extending full width of multi-cubicle switchboard and situated at bottom.

.2 Lugs at each end for size 3/0 AWG grounding cable.

.5 Circuit Breakers:

.1 Moulded case circuit breaker, bolt-on, solid state trip unit.

.2 Breaker interrupting capacity: 10kAIC RMS symmetrical.

.3 Breaker tripping devices, solid state as indicated;

.1 Instantaneous overcurrent relays.

.2 Overvoltage relay.

.3 Undervoltage relay.

.4 Time overcurrent relay.

.5 Time-delay relay.

.6 Ground fault relay.

.4 Trip setting devices: dials.

.5 Auxiliary contacts: 2 - N.O., 2 - N.C.

.6 Provide spare parts as recommended by the manufacturer for a maintenance period of at least two (2) years.

.2 Panelboards Breaker Type

.1 Panelboards:

.1 Panelboards to CSA C22.2 No. 29 and product of one manufacturer.

.1 In addition to CSA requirements, manufacturer's nameplate shall show fault current that panel, including breakers, has been built to withstand.

.2 250 and 600 V panelboards: bus and breakers rated for 10kAIC (symmetrical) interrupting capacity or as indicated.

.3 Panelboards: Mains, number of circuits, and number and size of branch circuit breakers as indicated. Minimum panel is to be 42 cct with 225 A bus.

.4 Two keys for each panelboard and key panelboard alike.

.5 Copper bus with neutral of same ampere rating as mains.

.6 Mains: Suitable for bolt-on breakers.

.7 Trim with concealed front bolts and hinges.

.8 Trim and door finish: As per colour schedule.

.2 Breakers:

.1 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.

.2 Main breaker: Separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.

.3 Equipment Identification:

.1 Provide equipment identification in accordance with Section 26 05 00 Electrical General Requirements.

.2 Nameplate for each panelboard.

.3 Nameplate for each circuit in distribution panelboards.

.4 Complete circuit directory with typewritten legend showing location and load of each circuit.

.3 Panelboards Switch and Fuse Type

.1 Panelboards:

.1 Panelboards to CSA C22.2 No. 29 and product of one manufacturer.

.1 Assemble panelboard interior before shipment. Ship fuses loose for on-site installation.

.2 In addition to CSA requirements, manufacturer's nameplates must show fault current that panelboard has been built to withstand.

.2 250 and 600 V panelboards: bus and breakers rated for 10 kAIC (symmetrical) interrupting capacity or as indicated.

.3 Panelboards: Mains, number of circuits, and number and size of branch circuit breakers as indicated.

.4 Two keys for each panelboard and key panelboard alike.

.5 Copper bus with neutral of same ampere rating as mains.

.6 Mains: Suitable for plug in or bolt-on fusible sections.

.7 Trim with concealed front bolts and hinges.

.8 Trim and door finish: As per colour schedule.

.2 Fuses:

.1 Fuse clips shall be suitable for type of fuses specified for each unit.

.3 Equipment Identification:

.1 Provide equipment identification in accordance with Section 26 05 00 – Common Work Results - Electrical.

.2 Nameplate for each panel.

.3 Nameplate for each circuit in distribution panels.

.4 Complete circuit directory with typewritten legend showing location and load of each circuit. Install circuit directory under plastic protective cover on front of panel.

.4 Fuses – Low Voltage

.1 Fuses – General:

.1 Fuse type references L1, L2, J1, R1, etc. have been adopted for use in this specification.

.2 Type of fuse shall be suitable for specified equipment.

.3 Fuses shall be the product of one manufacturer.

.2 Fuse Types:

.1 Class L Fuses;

.1 Type L1, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.

.2 Type L2, fast acting.

.2 Class J Fuses;

.1 Type J1, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.

.2 Type J2, fast acting.

.3 Class R-R Fuses;

.1 Type R1, (UL Class RK1), time delay, capable of carrying 500% of its rated current for 10 seconds minimum, to meet UL Class RK1 maximum let- through limits.

.2 Type R2, time delay, capable of carrying 500% of its rated current for 10 seconds minimum.

.3 Type R3, (UL Class RK1), fast acting Class R, to meet UL Class RK1 maximum let-through limits.

.3 Accessories:

.1 Fuse Storage Cabinet;

.1 Fuse storage cabinet, manufactured with hinged, lockable front access door finished in accordance with Section 26 05 00 – Common Work Results for Electrical.

.5 Moulded Case Circuit Breakers

.1 Breakers General:

.1 [Moulded-case circuit breakers,] [Circuit breakers,] [and] [Ground-fault circuit-interrupters,] [Fused circuit breakers,] [and] [Accessory high-fault protectors] to CSA C22.2 No. 5.

.2 Bolt-on moulded case circuit breaker: quick-make, quick-break type, for manual and automatic operation [with temperature compensation for 40°C ambient].

.3 Common-trip breakers with single handle for multi-pole applications.

.4 Magnetic instantaneous trip elements in circuit breakers to operate only when value of current reaches setting.

.1 Trip settings on breakers with adjustable trips to range from [three to eight] times current rating.

.5 Circuit breakers with interchangeable trips [as indicated].

.6 Circuit breakers to have minimum 10kA symmetrical RMS interrupting capacity rating or as indicated.

.2 Thermal Magnetic Breakers:

.1 Moulded case circuit breaker to operate automatically by means of thermal and magnetic tripping devices to provide inverse time current tripping and instantaneous tripping for short circuit protection.

.3 Magnetic Breakers:

.1 Moulded case circuit breaker to operate automatically by means of magnetic tripping devices to provide instantaneous tripping for short circuit protection.

.4 Current Limiting and Series Rated Thermal Magnetic Breakers:

.1 Thermal magnetic breakers with current limiters;

.1 Time current limiting characteristics of fuses limiters coordinated with time current tripping characteristics of circuit breaker.

.2 Coordination to result in interruption by breaker of fault-level currents up to interrupting capacity of breaker.

.2 Series rated breakers to be manufacturer tested and listed. Breakers to be applied following manufacturer's guidelines and accepted best practice.

.1 Breakers applied following manufacturer's guidelines and accepted best practice.

.5 Solid State Trip Breakers:

.1 Moulded case circuit breaker to operate by means of solid-state trip unit with associated current monitors and self-powered shunt trip to provide inverse time current trip under overload condition, and [long time] [short time] [instantaneous] tripping for [phase] [ground] fault short circuit protection.

.6 Accessories:

.1 Shunt trip.

.2 Auxiliary switch.

.3 Motor-operated mechanism [complete with time delay unit].

.4 Under-voltage release.

.5 On-off locking device.

.6 Handle mechanism.

.6 Disconnect Switches – Fused and Non-Fused

.1 Disconnect Switches:

.1 Fusible, non-fusible, horsepower rated disconnect switch in CSA Enclosure, to CAN/CSA C22.2 No.4 size as indicated.

.2 Provision for padlocking in off switch position by locks.

.3 Fuseholders: to [CSA C22.2 No.39] suitable without adaptors, for type and size of fuse indicated.

.4 Quick make, quick break action.

*** END OF **POWER DISTRIBUTION** SECTION ***