

Part 1 General

- .1 This Section covers items common to sections of Division 26. This section supplements requirements of Division 1.

1.1 CODES AND STANDARDS

- .1 Do complete installation in accordance with CSA C22.1-2012 except where specified otherwise.
- .2 Do overhead and underground systems in accordance with CSA C22.3No.1-M1979 except where specified otherwise.
- .3 Abbreviations for electrical terms: to CSA Z85-1983.

1.2 CARE, OPERATION AND START-UP

- .1 Instruct the City and operating personnel in the operation, care and maintenance of equipment.
- .2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.

1.3 VOLTAGE RATINGS

- .1 Operating voltages: to CAN3-C235-83.
- .2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard. Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

1.4 PERMITS, FEES AND INSPECTION

- .1 Submit to Electrical Inspection Department and Supply Authority necessary number of drawings and specifications for examination and approval prior to commencement of work.
- .2 Pay associated fees.
- .3 The City will provide drawings and specifications required by Electrical Inspection Department and Supply Authority at no cost.
- .4 Notify the City of changes required by Electrical Inspection Department prior to making changes.
- .5 Furnish Certificates of Acceptance from authorities having jurisdiction on completion of work to the City.

1.5 MATERIALS AND EQUIPMENT

- .1 Equipment and material to be CSA certified. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Electrical Inspection Department.
- .2 Factory assemble control panels and component assemblies.

1.6 FINISHES

- .1 Shop finish metal enclosure surfaces by application of rust resistant primer inside and outside, and at least two (2) coats of finish enamel:
 - .1 Paint indoor switchgear and distribution enclosures light grey to EEMAC 2Y-1-1958; and,
 - .2 Paint outdoor electrical equipment "Equipment Green" finish to EEMAC Y1-1-1955.
- .2 Clean and touch up surfaces of shop-painted equipment scratched or marred during shipment or installation, to match original paint.
- .3 Clean and prime exposed non-galvanized hangers, racks and fastenings to prevent rusting.

1.7 EQUIPMENT IDENTIFICATION

- .1 Panels, switchboards, telephone cabinets, motor starters and controls, disconnect switches, control devices, and similar equipment connected to the electrical systems shall be properly identified by means of engraved laminated plastic nameplates.
- .2 Nameplates shall be at least 50 x 75 mm (2" x 3") with the minimum size of lettering 5 mm (1/8") high, thickness of 5 mm (3/16").
- .3 Nameplates shall be as follows:

	<u>Background</u>	<u>Letters</u>
208 Volt Normal	Black	White
208 Volt Essential	Red	White
600 Volt Normal	Green	White
600 Volt Essential	Blue	White

Panel sample:

ESD208-1-2
Fed from TS208-1-2 Generator Room
120/208V, 3Ø, 4W
19 mm panel name, 12 mm for remainder

- .4 Submit a complete list of all nameplates, including proposed inscriptions to the Engineer for approval prior to placing the order for the manufacture of the nameplate.
- .5 Nameplates shall be fastened to the equipment with adhesive backing and two self-tapping metal screws.

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- .6 Pressure indented adhesive strip nameplates are not acceptable and shall not be used.

1.8 WIRING IDENTIFICATION

- .1 Identify wiring with permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.
- .2 Maintain phase sequence and colour coding throughout.
- .3 Colour code: to CSA C22.1-2012.
- .4 Use colour coded wires in communication cables, matched throughout system.

1.9 CONDUIT AND CABLE IDENTIFICATION

- .1 Colour code conduits, boxes and metallic sheathed cables.
- .2 Code with plastic tape or paint at points where conduit or cable enters wall, ceiling, or floor, and at 15 m intervals.
- .3 Colours: 25 mm wide prime colour and 19 mm inch wide auxiliary colour to match existing.

1.10 WIRING TERMINATIONS

- .1 Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.

1.11 MANUFACTURERS AND CSA LABELS

- .1 Visible and legible after equipment is installed.

1.12 WARNING SIGNS

- .1 As specified and to meet requirements of Electrical Inspection Department and the City.
- .2 Decal signs, minimum size 150 x 250 mm.

1.13 MOUNTING HEIGHTS

- .1 Mounting height of equipment is from finished floor to centerline of equipment unless specified or indicated otherwise.
- .2 If mounting height of equipment is not specified or indicated, verify before proceeding with installation.

1.14 CONDUIT AND CABLE INSTALLATION

- .1 Install conduit and sleeves prior to pouring of concrete. Sleeves through concrete: plastic, sized for free passage of cables and protruding 50 mm inches.

1.15 FIELD QUALITY CONTROL

- .1 Insulation resistance testing:
 - .1 Megger circuits, feeders and equipment up to 350 V with a 500 V instrument;
 - .2 Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument;
 - .3 Check resistance to ground before energizing;
 - .4 Carry out tests in presence of the City;
 - .5 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project;
 - .6 Submit test results for the City's review;
 - .7 All shutdowns to be coordinated with the City. Advise the City forty-eight (48) hours prior to shutdown.

1.16 FIRE STOPPING

- .1 All conduit and cable penetrations through fire separations shall be sealed with 3M or Hilti fire stopping material to ensure integrity of fire separation assembly is maintained.

1.17 THERMAL SCANNING

- .1 All conduit and cable penetrations through existing concrete floors or walls shall be thermal scanned prior to coring.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA C22.1-2012 Canadian Electrical Code, Part 1.
 - .2 CAN/CSA-C22.2No.18-98, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware.
 - .3 CSA C22.2No.65-93 (R1999), Wire Connectors.
- .2 Electrical and Electronic Manufacturers' Association of Canada (EEMAC)
 - .1 EEMAC 1Y-2, 1961 Bushing Stud Connectors and Aluminum Adapters (1200 Ampere Maximum Rating).
- .3 National Electrical Manufacturers Association (NEMA)

Part 2 Products

2.1 MATERIALS

- .1 Pressure type wire connectors to: CSA C22.2No.65, with current carrying parts of copper and copper alloy sized to fit copper conductors as required.
- .2 Fixture type splicing connectors to: CSA C22.2No.65, with current carrying parts of copper and copper alloy sized to fit copper conductors 10 AWG or less.
- .3 Bushing stud connectors: to NEMA to consist of:
 - .1 Connector body and stud clamp for stranded conductors.
 - .2 Clamp for stranded copper conductors.
 - .3 Stud clamp bolts.
 - .4 Bolts for copper conductors.
 - .5 Sized for conductors as indicated.
- .4 Clamps or connectors for flexible conduit, as required to: CAN/CSA-C22.2No.18.

Part 3 Execution

3.1 INSTALLATION

- .1 Remove insulation carefully from ends of conductors and:
 - .1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CSA C22.2No.65.
 - .2 Install fixture type connectors and tighten. Replace insulating cap.
 - .3 Install bushing stud connectors in accordance with NEMA.

END OF SECTION

Part 1 General

1.1 RELATED WORK

- .1 Common Work Results – Electrical – 26 05 01.

Part 2 Products

2.1 TECK CABLE

- .1 Conductors:
 - .1 Grounding conductor: copper; and,
 - .2 Circuit conductors: copper, size as indicated.
- .2 Insulation:
 - .1 Chemically cross-linked thermosetting polyethylene rated type RW90, 1000 V for 600 volt systems, minimum 600 volt for 208 volt (or lower) systems.
- .3 Inner jacket: polyvinyl chloride material.
- .4 Armour: interlocking aluminium.
- .5 Overall covering: thermoplastic polyvinyl chloride material FT4 rated.
- .6 Fastenings:
 - .1 One (1)-hole steel straps to secure surface cables 50 mm and smaller. Two hole steel straps for cables larger than 50 mm; and,
 - .2 Channel type supports for two or more cables at one metre centers.
 - .3 9 mm dia. threaded rods to support suspended channels.
- .7 Connectors:
 - .1 Approved for TECK cable.

2.2 CONTROL CABLES

- .1 Single conductor wire shall be 98% conductivity copper type RW90 90oC insulation rated at 600 V, stranded conductor, sizes to suit but generally no smaller than #14 AWG. Insulation shall be manufactured to CSA specification C22.2 No. 38.
- .2 Control panel and cabinet wiring shall be based on stranded copper conductor Type TEW or TBS with insulation rated at 600 V. Wiring shall be sized to code for the intended application but should not be smaller than #18 AWG.

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- .3 Cable for power and control, integral to the equipment furnished but not internal wiring of control panels or cabinets, shall be based on TECK 90 armoured cable, with stranded copper conductors, 90oC insulation, rated at 600 V AC, manufactured to CSA specification C22.2 No. 131, integral copper ground wire, PVC inner jacket, aluminum interlocking armour, and PVC outer jacket having heat, flame and moisture retardant properties. Flame retardancy of outer jacket shall be rated in accordance with CSA Standard C22.2 No. 0.3.
 - .4 Analog instrumentation cable shall use single or multiple pair, seven strand copper conductor, individually twisted and shielded, individual tinned copper drain wire, complete electrical isolation between shields, overall multi-conductor cable shield with drain wire, interlocking aluminum armour and flame retardant rated outer PVC jacket. Cable and conductor insulation shall be rated for 90oC and 600 V. Conductor size shall be minimum #18 AWG or as noted on drawings.
 - .5 Connectors shall utilize CSA approved types to suit conductor size, watertight in all cases.
 - .6 Cable for control purposes integral to the equipment furnished, with the exception of internal wiring of control panels or cabinets which do not require armour protection, shall be based on multi-conductor, shielded copper conductor with cross linked flame resistant polyethylene insulation with overall flame resistant neoprene jacket insulation to be rated for 600 V, 90oC sized to suit application.

Part 3 Execution

3.1 INSTALLATION OF TECK CABLE 0-1000 V

- .1 Use TECK cable to connect motors and related equipment to the equipment disconnect.
- .2 Use TECK cable direct buried in trenches and in other locations as show on drawings.

3.2 INSTALLATION OF CONTROL CABLES

- .1 Install control cables as indicated.
- .2 Ground control cable shield at the source end only.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 26 05 01 - Common Work Results - Electrical.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE):
 - .1 ANSI/IEEE 837-1989 (R1996), Qualifying Permanent Connections Used in Substation Grounding.
 - .2 Canadian Standards Association, (CSA International).

Part 2 Products

2.1 EQUIPMENT

- .1 Grounding conductors: bare stranded copper, soft annealed, size as indicated.
- .2 Insulated grounding conductors: green, type R90.
- .3 Non-corroding accessories necessary for grounding system, type, size, material as indicated, including but not necessarily limited to:
 - .1 Grounding and bonding bushings;
 - .2 Protective type clamps;
 - .3 Bolted type conductor connectors;
 - .4 Thermit welded type conductor connectors;
 - .5 Bonding jumpers, straps; and,
 - .6 Pressure wire connectors.

Part 3 Execution

3.1 INSTALLATION GENERAL

- .1 Install complete permanent, continuous grounding system including, conductors, connectors, and accessories. Where EMT is used, run ground wire in conduit.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 Protect exposed grounding conductors from mechanical injury.
- .4 Use mechanical connectors for grounding connections to equipment provided with lugs.
- .5 Soldered joints not permitted.

- .6 Install bonding wire for flexible conduit, connected at both ends to grounding bushing, solderless lug, clamp or cup washer, and screw. Neatly cleat bonding wire to exterior of flexible conduit.

3.2 EQUIPMENT GROUNDING

- .1 Install grounding connections to typical equipment included in, but not necessarily limited to following list. Service equipment, transformers, switchgear, duct systems, frames of motors, motor control centres, starters, control panels, building steel work, generators, elevators and escalators, distribution panels, outdoor lighting.

END OF SECTION

Part 1 General

1.1 SUPPORT CHANNELS

- .1 U shape, galvanized size 41 x 41 mm, 2.5 mm thick, surface mounted suspended.

Part 2 Execution

2.1 INSTALLATION

- .1 Secure equipment to solid masonry, tile and plaster surfaces with lead anchors or nylon shields.
- .2 Secure equipment to poured concrete with concrete wedge anchors.
- .3 Secure equipment to hollow masonry walls or suspended ceilings with toggle bolts.
- .4 Secure surface mounted equipment with twist clip fasteners to inverted T-bar ceilings. Ensure that T-bars are adequately supported to carry weight of equipment specified before installation.
- .5 Support equipment, conduit or cables using clips, spring loaded bolts, cable clamps designed as accessories to basic channel members.
- .6 Fasten exposed conduit or cables to building construction or support system using straps:
 - .1 One(1)-hole steel straps to secure surface conduits and cables 50 mm and smaller;
 - .2 Two(2)-hole steel straps for conduits and cables larger than 50 mm; and,
 - .3 Beam clamps to secure conduit to exposed steel work.
- .7 Suspended support systems:
 - .1 Support individual cable or conduit runs with 6 mm dia threaded rods and spring clips; and,
 - .2 Support two (2) or more cables or conduits on channels supported by 6 mm dia threaded rod hangers where direct fastening to building construction is impractical.
- .8 For surface mounting of two (2) or more conduits use channels at 0.9 m on center spacing.
- .9 Provide metal brackets, frames, hangers, clamps and related types of support structures where indicated or as required to support conduit and cable runs.
- .10 Ensure adequate support for raceways and cables dropped vertically to equipment where there is no wall support.
- .11 Do not use wire lashing or perforated strap to support or secure raceways or cables.
- .12 Do not use supports or equipment installed for other trades for conduit or cable support except with permission of other trade and approval of Contract Administrator.

- .13 Install fastenings and supports as required for each type of equipment cables and conduits, and in accordance with manufacturer's installation recommendations.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 CSA C22.1-2012, Canadian Electrical Code, Part 1.

Part 2 Products

2.1 OUTLET AND CONDUIT BOXES GENERAL

- .1 Size boxes in accordance with CSA C22.1.
- .2 102 mm square or larger outlet boxes as required for special devices.
- .3 Gang boxes where wiring devices are grouped.
- .4 Blank cover plates for boxes without wiring devices.
- .5 347 V outlet boxes for 347V switching devices.
- .6 Combination boxes with barriers where outlets for more than one system are grouped.

2.2 SHEET STEEL OUTLET BOXES

- .1 Electro-galvanized steel single and multi-gang flush device boxes for flush installation, minimum size 76 x 50 x 38 mm or as indicated. 102 mm square outlet boxes when more than one conduit enters one side with extension and plaster rings as required.
- .2 Electro-galvanized steel utility boxes for outlets connected to surface-mounted EMT conduit, minimum size 102 x 54 x 48 mm.
- .3 102 mm square or octagonal outlet boxes for lighting fixture outlets.
- .4 102 mm square outlet boxes with extension and plaster rings for flush mounting devices in finished tile walls.

2.3 MASONRY BOXES

- .1 Electro-galvanized steel masonry single and multi-gang boxes for devices flush mounted in exposed block walls.

2.4 CONCRETE BOXES

- .1 Electro-galvanized sheet steel concrete type boxes for flush mount in concrete with matching extension and plaster rings as required.
- .2 Adjustable, watertight, concrete tight, cast floor boxes with openings drilled and tapped for 12 mm and 19 mm conduit. Minimum size: 73 mm deep.

2.5 CONDUIT BOXES

- .1 Cast FD ferrous boxes with factory-threaded hubs and mounting feet for surface wiring of switches and receptacle.

2.6 OUTLET BOXES FOR NON-METALLIC SHEATHED CABLE

- .1 Electro-galvanized, sectional, screw ganging steel boxes, minimum size 76 x 50 x 63 mm with two (2) double clamps to take non-metallic sheathed cables.

2.7 FITTINGS - GENERAL

- .1 Bushing and connectors with nylon insulated throats.
- .2 Knock-out fillers to prevent entry of debris.
- .3 Conduit outlet bodies for conduit up to 32 mm and pull boxes for larger conduits.
- .4 Double locknuts and insulated bushings on sheet metal boxes.

Part 3 Execution

3.1 INSTALLATION

- .1 Support boxes independently of connecting conduits.
- .2 Fill boxes with paper, sponges or foam or similar approved material to prevent entry of debris during construction. Remove upon completion of work.
- .3 For flush installations mount outlets flush with finished wall using plaster rings to permit wall finish to come within 6 mm of opening.
- .4 Provide correct size of openings in boxes for conduit, mineral insulated and armoured cable connections. Reducing washers are not allowed.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials and installation for standard and custom breaker type panelboards.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 26 05 01 - Common Work Results - Electrical.
- .3 Section 26 28 21 - Moulded Case Circuit Breakers.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International):
 - .1 CSA C22.2 No.29-M1989 (R2000), Panelboards and enclosed Panelboards.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Drawings to include electrical detail of panel, branch breaker type, quantity, ampacity and enclosure dimension.

Part 2 Products

2.1 PANELBOARDS

- .1 Panelboards: to CSA C22.2No.29 and product of one manufacturer:
 - .1 Install circuit breakers in panelboards before shipment;
 - .2 In addition to CSA requirements manufacturer's nameplate must show fault current that panel including breakers has been built to withstand; and,
- .2 250 V panelboards: bus and breakers rated for 18kA (symmetrical) interrupting capacity or as indicated.
- .3 Sequence phase bussing with odd numbered breakers on left and even on right, with each breaker identified by permanent number identification as to circuit number and phase.
- .4 Panelboards: mains, number of circuits, and number and size of branch circuit breakers as indicated.
- .5 Two (2) keys for each panelboard and key panelboards alike.
- .6 Copper bus with neutral of same ampere rating as mains.
- .7 Mains: suitable for bolt-on breakers.

- .8 Trim with concealed front bolts and hinges.
- .9 Trim and door finish: baked grey enamel.

2.2 BREAKERS

- .1 Breakers: to Section 26 28 21 - Moulded Case Circuit Breakers.
- .2 Breakers with thermal and magnetic tripping in panelboards except as indicated otherwise.
- .3 Main breaker: separately mounted on top or bottom of panel to suit cable entry. When mounted vertically, down position should open breaker.
- .4 Lock-on devices for number of 15A breakers as indicated. Turn over unused lock-on devices to the City.
- .5 Lock-on devices for fire alarm, emergency, door supervisory, exit and night light circuits.

2.3 EQUIPMENT IDENTIFICATION

- .1 Provide equipment identification in accordance with Section 26 05 01 - Common Work Results - Electrical.
- .2 Nameplate for each panelboard size four engraved as indicated.
- .3 Nameplate for each circuit in distribution panelboards size two (2) engraved as indicated.
- .4 Complete circuit directory with typewritten legend showing location and load of each circuit.

Part 3 Execution

3.1 INSTALLATION

- .1 Locate panelboards as indicated and mount securely; plumb, true and square, to adjoining surfaces.
- .2 Install surface mounted panelboards on plywood backboards in accordance with Section 06 10 10 - Rough Carpentry. Where practical install group panelboards on common backboard.
- .3 Mount panelboards to height specified in Section 26 05 01 - Common Work Results - Electrical or as indicated.
- .4 Connect loads to circuits.
- .5 Connect neutral conductors to common neutral bus with respective neutral identified.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Switches, receptacles, wiring devices, cover plates and their installation.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 26 05 01 - Common Work Results - Electrical.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International):
 - .1 CSA-C22.2 No.42-99 (R2002), General Use Receptacles, Attachment Plugs and Similar Devices;
 - .2 CSA-C22.2 No.42.1-[00], Cover Plates for Flush-Mounted Wiring Devices (Bi-national standard, with UL 514D);
 - .3 CSA-C22.2 No.55-[M1986(July 2001), Special Use Switches; and,
 - .4 CSA-C22.2 No.111-[00], General-Use Snap Switches (Bi-national standard, with UL 20, twelfth edition).

1.4 SHOP DRAWINGS AND PRODUCT DATA

- .1 Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.

Part 2 Products

2.1 SWITCHES

- .1 20 A, 120 V, single pole, switches to: CSA-C22.2 No.55 and CSA-C22.2 No.111.
- .2 Manually-operated specification grade ac switches with following features:
 - .1 Terminal holes approved for No. 10 AWG wire;
 - .2 Silver alloy contacts;
 - .3 Urea or melamine moulding for parts subject to carbon tracking;
 - .4 Suitable for back and side wiring; and,
 - .5 Brown toggle.
- .3 Toggle operated fully rated for tungsten filament and fluorescent lamps, and up to 80% of rated capacity of motor loads.
- .4 Switches of one manufacturer throughout project.
- .5 Acceptable materials: Hubbel, Leviton.

2.2 RECEPTACLES

- .1 Duplex receptacles, CSA type 5-15 R, 125 V, 15 A, U ground, to: CSA-C22.2 No.42 with following features:
 - .1 Specification grade;
 - .2 Brown urea moulded housing;
 - .3 Suitable for No. 10 AWG for back and side wiring;
 - .4 Break-off links for use as split receptacles;
 - .5 Eight (8) back wired entrances, four side wiring screws; and,
 - .6 Triple wipe contacts and riveted grounding contacts.
- .2 Other receptacles with ampacity and voltage as indicated.
- .3 Receptacles of one manufacturer throughout project.
- .4 Acceptable materials: Hubbel, Leviton.

2.3 COVER PLATES

- .1 Cover plates for wiring devices to: CSA-C22.2 No.42.1.
- .2 Cover plates from one manufacturer throughout project.
- .3 Sheet steel utility box cover for wiring devices installed in surface-mounted utility boxes.
- .4 Plastic brown cover plates, [thickness 2.5 mm] for wiring devices mounted in flush-mounted outlet box.
- .5 Sheet metal cover plates for wiring devices mounted in surface-mounted FS or FD type conduit boxes.
- .6 Weatherproof double lift spring-loaded cast aluminum cover plates, complete with gaskets for duplex receptacles as indicated.
- .7 Weatherproof spring-loaded cover plates complete with gaskets for single receptacles or switches.

Part 3 Execution

3.1 INSTALLATION

- .1 Switches:
 - .1 Install single throw switches with handle in "UP" position when switch closed;
 - .2 Install switches in gang type outlet box when more than one switch is required in one location; and,
 - .3 Mount toggle switches at height [in accordance with Section 26 05 01 - Common Work Results - Electrical.

- .2 Receptacles:
 - .1 Install receptacles in gang type outlet box when more than one receptacle is required in one location;
 - .2 Mount receptacles at height in accordance with Section 26 05 01 - Common Work Results – Electrical; and,
 - .3 Where split receptacle has one (1) portion switched, mount vertically and switch upper portion.
- .3 Cover plates:
 - .1 Protect stainless steel cover plate finish with paper or plastic film until painting and other work is finished;
 - .2 Install suitable common cover plates where wiring devices are grouped; and,
 - .3 Do not use cover plates meant for flush outlet boxes on surface-mounted boxes.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 Materials for moulded-case circuit breakers, circuit breakers, and ground-fault circuit-interrupters.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International):
 - .1 CSA-C22.2 No. 5-02, Moulded-Case Circuit Breakers, Molded-Case Switches and Circuit-Breaker Enclosures (Tri-national standard with UL 489, tenth edition, and the second edition of NMX-J-266-ANCE).

1.3 SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Include time-current characteristic curves for breakers with ampacity of 200A and over or with interrupting capacity of 22,000. A symmetrical (rms) and over at system voltage.

Part 2 Products

2.1 BREAKERS GENERAL

- .1 Moulded-case circuit breakers, Circuit breakers, and Ground-fault circuit-interrupter: 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 degrees C ambient.
- .3 Plug-in moulded case circuit breakers: quick- make, quick-break type, for manual and automatic operation with temperature compensation for 40 degrees C ambient.
- .4 Common-trip breakers: with single handle for multi-pole applications.
- .5 Circuit breakers to have minimum 14 kA symmetrical rms interrupting capacity rating or to match circuit breaker in existing panel boards.

2.2 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.

2.3 MAGNETIC BREAKERS

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

Part 3 Execution

3.1 INSTALLATION

- .1 Install circuit breakers as indicated.

END OF SECTION