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3. All wiring in finished areas shall be concealed. Conduits shall be run at right angles to the building lines.  
4. Conduit and wiring shall be grouped where possible and clipped in a neat and workmanlike manner.  
5. AC-90 cable to be used for drops from conduit systems to recessed lighting fixtures in accessible ceilings or outlet boxes in steel stud walls only. Home runs shall be in conduit. Maximum run of AC-90 in accessible ceiling space shall be 5'-0".  
6. Existing AC-90 runs to base building panels shall be removed and replaced with conduit and wire within this Contract.  
7. All unused communication and power wiring in ceiling space shall be removed.  
8. Conduit runs shall be installed and inspected before AC-90 runs are installed to ensure conformance with Item 5 herein.  
10. Soft wiring NMD-7 may be utilized in all wood construction where same meets Code. Conduit shall be installed to central junction box for NMD-7 cable termination. All wiring in health care facilities shall be run in conduit.

**1.15 MOUNTING**  
1. Maximum height of equipment is from finished floor to centerline of equipment unless specified or indicated otherwise.  
2. If mounting height of equipment is not indicated, verify with Contract Administrator before proceeding with installation.  
3. Install electrical equipment at the following heights unless indicated or directed otherwise.  
1. Outlets above counters: 6" (150mm), backsplash: 4" (100mm).  
2. General receptacles: 18" (450mm).  
3. Receptacles in medical areas: 42" (1075mm).  
4. Switches and push buttons, two bracket: 42" (1075mm).  
5. Thermostats: 53" (1500mm).  
6. Electric hand dryers: 42" (1075mm) (confirm with the City, age dependant)  
7. Branch circuit panels, control panels, annunciators, etc.: 71" (1800mm).  
8. Accessibility suite switches, dimmers, pushbuttons: 35" (900mm).  
9. Accessibility suite thermostats: 47" (1200mm).  
10. Accessibility suite telephones, telephone, television: 24" (600mm).  
11. Occupancy sensor as per Manufacturer's instruction. Refer to accessibility design standards.  
4. All transformers, motor control centres and floor-mounted distribution panels shall be mounted on 4" (100mm) concrete housekeeping pads. The Electrical Subcontractor shall be responsible for provision of these pads. Where ceiling heights will not allow housekeeping pads to be installed below distributions, and where pre-approved by the Contract Administrator, 1½" (38mm) galvanized cantuss shall be provided in place of the pad.

**26 05 35 OUTLET BOXES**  
1. Outlet, junction and switch boxes shall be galvanized pressed steel of size and type to suit each individual application.  
2. Where buildings have curtain walls outlets shall not be located anywhere on the outside curtain wall. Outlets shown thus shall be mounted on the nearest dividing wall 2' from outside wall, or nearest, turned out column.

**26 05 36 MECHANICAL EQUIPMENT WIRING**  
1. Provide starters and wiring for all heating, ventilating and plumbing equipment unless specified otherwise.  
2. Control wiring for mechanical equipment shall be performed by Mechanical Subcontractor. Electrical Subcontractor shall provide T20V circuit in location designated by Controls Subcontractor.  
3. Electrical Subcontractor to provide all control wiring for The City supplied equipment and as designed on Drawing.

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**1.8 "AS-BUILT" DRAWINGS**  
1. Contractor shall maintain accurate "as-built" Drawings on Site and shall be present for review at each Site review. Submit these next to Drawings in AutoCAD 2010 or newer format. All floor plans must be included. (A minimum of \$1,000.00 per Drawing shall be held-back until all Drawings are submitted and deemed complete.) The Contract Administrator will not perform final inspections nor certify for occupancy until the "as-built" Drawings have been received, reviewed and accepted. After acceptance of "as-built" Drawings by the Contract Administrator, provide one (1) complete set on CD-ROM and three (3) sets of prints.  
2. As-builts shall include circling of new and existing equipment to remain. Transfer changes to electronic disc AutoCAD file. Submit disc and hard copy for final review and submission to the City.  
3. Submit a Certificate of Inspection from the local Inspection Authority upon completion of Work and include with As-builts.  
4. The Contract Administrator reserves the right to recommend that a portion of the Contract funds be withheld pending submission of acceptable as-built Drawings.

**1.9 TEST**  
1. The electrical installation shall be completely tested, demonstrating that the equipment and systems installed perform in the manner intended.

**1.10 GROUNDING**  
1. The entire installation shall be grounded in accordance with the Canadian Electrical Code.

**1.11 WORKMANSHIP**  
1. All electrical conduit, cables and wires in a workmanlike manner to present a neat appearance to the satisfaction of the Contract Administrator. Install conduit and cable runs parallel and perpendicular in chases, behind furring or above ceilings. In areas where systems are to be exposed (electrical room only), install neatly and group to present a tidy appearance.  
2. Install equipment and apparatus requiring maintenance, adjustment or eventual replacement with adequate clearances and accessibility for same.  
3. Include, in the Work, all requirements shown on the Shop Drawings or manufacturers' installation instructions.  
4. Provide a Workmanlike Factory to the Contract Administrator without extra cost.  
5. All conduit must be clipped to structure by means of anchors or fastening in a neat hangars as close to US as possible. Tie wraps for wire hanging and fastening is not acceptable, unless pre-authorized by the Building The City. Perforated strapping is also unacceptable.  
6. All support Material for all luminaires, outlet boxes, junction boxes, etc. in a non-combustible building shall be of non-combustible Material. Wood is not acceptable.

**1.12 IDENTIFICATION OF EQUIPMENT**  
1. All equipment, including receptacles, shall be identified with engraved amacoid nameplates either screwed or riveted in place. Where Phenolic plastic coverplates are utilized, the circuit identification to be attached to the outlet box, visible when the coverplate is removed.  
2. The utilization of Dynamo 6000, P-Touch for receptacle or an approved equal in accordance with B7.  
3. Wiring for coverplates shall be confirmed by Contract Administrator.

**1.13 CUTTING AND PATCHING**  
1. Arrange and pay for all cutting and patching as required for the electrical installation.

**1.14 WIRING METHODS**  
1. Unless otherwise shown on the Drawings, all wires shall be copper, minimum #12 AWG with 90°C x-alk insulation. Wiring to be installed in conduit.  
2. Provide a separate grounding conductor in EMT conduit runs embedded in concrete slabs. Conduits installed in areas exposed to moisture shall have watertight fittings.

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**26 00 10 BASIC MATERIAL AND METHODS**  
**1.1 GENERAL REQUIREMENTS**  
1. The Specifications, the General Conditions of the Contract, General Specifications, Instructions to Bidders and all associated Sections form an integral part of this Specification and shall be read in conjunction herewith.  
**1.2 SCOPE**  
1. Provide all Materials, labour, plant and equipment required for a complete and Working installation as herein specified and as shown on the Drawings.  
2. The Specifications, the General Conditions of the Contract, General Specifications, Instructions to Bidders and all associated Sections form an integral part of this Specification and shall be read in conjunction herewith.  
3. Obtain all permits, approvals and pay all related fees required for this installation.  
4. All equipment supplied under this Contract shall be new and be C.S.A. approved.  
5. Co-ordinate all telephone and cablevision conduit runs with MTS and Shaw before installation begins.  
6. Arrange for, and coordinate, rough-in and final inspections with City of Winnipeg and Contract Administrator.  
**1.3 EXAMINATION**  
1. Examine the architectural, interior design, structural and mechanical Drawings to ensure that the Work under this Contract can be satisfactorily carried out. Report any discrepancies to the Contract Administrator prior to submission of Bid Opportunity.  
2. Examine the Site, local conditions and all existing apparatus if any to be re-used and verify that the condition of this equipment is suitable for its intended use in the new construction.  
**1.4 SUPERVISION**  
1. Supervise the Work at all times through a responsible and competent supervisor.  
2. Full co-operation shall be shown with other trades to facilitate installations and to avoid delays in carrying out the Work.  
**1.5 ACCURACY OF DATA**  
1. Drawings and specifications, exact locations, distances, levels and other dimensions shall be checked and verified by the contractor.  
2. Outlets or equipment shall be moved to any point within a 10' radius when the Contract Administrator requests relocation before the Work has been Substantially Performed, without additional cost.  
3. Branch circuit wiring shall be installed with circuits arranged exactly as shown on the Drawings. Conduit and cable runs shall be modified to suit the installation.  
4. Contractor shall provide a typical mock-up of one area if requested prior to complete rough-in.  
**1.6 APPROVAL OF MATERIAL**  
1. Request for approval of Material as equals or alternates to be in accordance with B7.  
2. Approvals shall be transmitted electronically providing all pertinent information is included for a complete review by the Contract Administrator.  
**1.7 SHOP DRAWINGS**  
1. Submit Shop Drawings of electrical equipment to the Contract Administrator for review. Fabrication of equipment shall not commence until the Contract Administrator has received Shop Drawings of such equipment. Two (2) sets shall be submitted with local Inspection Department approval where required.  
2. Shop Drawings shall be transmitted electronically and in PDF format and Contractors shall include their review confirmation.  
3. Electronic Submissions (pdf only).  
a. Shop drawings and equipment submittals to [wsg.shopdrawing@mcw.com](mailto:wsg.shopdrawing@mcw.com) only. Please do not copy staff members directly.

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4. Refer to the mechanical Drawings for the exact location of mechanical equipment requiring an electrical connection.  
5. Electrical Subcontractor shall report any discrepancies in voltage and control wiring Specifications.  
6. Provide a means of disconnect for all mechanical equipment.

**26 06 22 MISCELLANEOUS APPARATUS AND APPLIANCES**  
**1.1 GENERAL**  
1. Provide all required electrical devices, components, conduits, fittings, wiring, disconnects, and miscellaneous equipment to make all connections to equipment.  
2. Be familiar with the apparatus being supplied and carefully coordinate and cooperate with the supplier/installer to ensure a proper and complete installation.  
**1.2 BARRIER FREE DOOR OPERATORS AND CONTROLS**  
1. Wire and connect operator motors, and safety controls for the motorized entrance/exit doors as per the equipment supplier requirements.  
2. Wire and connect associated controls including, but not limited to entry pushbuttons, kick buttons, power supplies, motion sensors, panic hardware switches, powered hinges, electric strikes, key switches etc.  
3. Refer to architectural door hardware schedules and/or electrical door hardware schedule for further requirements.  
**1.3 RECEPTACLES**  
1. Where equipment has line cord and plug, ensure cap is compatible with receptacle. Provide cord sets to equipment where required.  
**1.4 ELECTRIC HAND-DRYERS**  
1. Provide electric hand-dryers at washbas and locations shown on Drawings.  
2. Enclosures shall be Dyson Airblads Y HU 02 with Sprayed Nickel finish and surface mounted accessories.  
**26 24 16 PANELBOARDS**  
1. New panelboards: Load centres are not acceptable. Panels shall be complete with panel trim having concealed hinges and trim mounting screws, locking door with flush catch. Provide Circuit breakers shall be bolt on moulded case with thermal breakers rated at 10,000A symmetrical.  
3. Affix typewritten directory to the inside of the panelboard indicating loads controlled by each circuit.  
4. Panelboards to be surface or recessed mounted as indicated.  
**26 27 10 MAIN DISTRIBUTION**  
1. Disconnect existing equipment and terminate cables or remove cables as indicated on the Drawings. All equipment to be handed over to The City for their utilization in the future.  
2. Main distribution to incorporate main breaker, complete with enclosure and utility metering transformer cabinet and sub-feeder distribution CDP. Arrangements of components to be shown on the Drawings.  
3. Submit Shop Drawings and product data.  
4. Provide a means of incorporation into Maintenance Manual.  
5. Materials:  
6. Power Supply:  
1. Moulded case circuit breakers: to CSA C22.2 No. 5.  
1. Power supply: 120/240-volt, 1 phase, 3 wire, grounded neutral.  
2. 60 Hz, short circuit current rated at 25 KA RMS symmetrical.  
7. Main Disconnect:

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8. Incandescent lighting dimmer controls shall be Lutron Nova T rated at 1500, 1000 or 600 watts as indicated on Drawing. Colour of dimmer snap-on cover shall be Ivory colour or shall match existing, unless indicated otherwise on Drawing. Mount dimmers 48" A.F.F. unless otherwise noted.  
9. Screw in LED lamp dimmer controls shall be Lutron or Leviton and shall be rated to meet the requirement of the lamp. LED luminaires shall be provided with 0-10V driver with compatible dimmer control. Approved dimmers are Lutron or Leviton.  
11. Provide stainless steel coverplates for recessed devices.  
12. Wet location covers shall be equal to Cooper, Metal WeatherBox While-in-Use protective covers, WJUMV-1 for vertical mounting and WJUMH-1 for horizontal mounting. Plastic covers will not be accepted.  
13. All equals for devices listed above shall be approved in accordance with B7.

**26 50 00 LIGHTING**  
1. Supply and install all luminaires complete with lamps. All new luminaires shall be provided with Driver or electronic ballast, Power Smart approved.  
2. Install luminaires supplied by the the City, as indicated.  
3. Re-lamp all fixtures to be re-used.  
4. Lighting shall adhere to the Manitoba Hydro Power Smart Program.  
5. Compact fluorescent fixtures or LED fixtures shall utilize Power Smart approved ballasts or drivers.

**END OF SECTION**

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8. Hydro Utility Metering Cabinet:  
1. Separate compartment for exclusive use of utility company metering equipment.  
2. Provide mounting and wiring for the following:  
1. Current transformers  
2. Hydro utility metering transformers to be supplied by the Hydro  
3. Utility and factory installed by the cabinet manufacturer.  
9. Finishes:  
1. Apply finishes as follows:  
1. Equipment finish to be interior gray.  
2. Supply box (2) meter case touch-up enamel.  
3. Treated to inhibit rusting.  
10. Equipment Identification:  
1. Provide equipment identification as follows:  
1. Nameplates: Black plate, white letters, size 7, to indicate voltage, amp rating and designation.  
2. Main disconnect: labelled "Main Breaker".  
3. Sub-breakers: labelled to indicate panel or equipment fed.  
11. Manufacturers:  
1. Acceptable manufacturers: Cutler Hammer, Group, Schneider, Square D & Siemens.  
12. Grounding:  
1. Bond the non-current parts of the distribution equipment to the main ground point in the distribution.  
2. Bond the neutral point of the main disconnect to the main building ground electrode in accordance with the requirements of the local inspection authorities.  
13. Installation:  
1. Locate service entrance equipment as indicated.  
2. Connect main secondary service entrance cables to line terminals of main disconnect.  
3. Connect load terminals of distribution breakers to outgoing feeders as indicated.  
4. Check factory-made connections for mechanical security and electrical Run one (1) #6 bare copper, grounding conductor in 1" (25mm) conduit from ground point to the main building ground.  
**26 27 26 WIRING DEVICES**  
1. Colours of receptacles, switches, outlets and coverplates shall be confirmed with Contract Administrator.  
2. Switches shall be totally enclosed in moulded housing, 15AC1 or 20AC1 series, 15 amps or 20 amps, 125 VAC as indicated equal to Hubbell No. 1201, P & S No. 15AC1, or Bryant No. 4801.  
3. Ceiling mounted motion sensors shall be equal to Watt Stopper DT- 355.  
4. Wall mounted motion/manual vacancy sensor shall be equal to Leviton single pole and 3-way IPV15-ILZ.  
5. Wall mounted motion/manual vacancy sensor and dimmer equal to Leviton single pole and 3-way IPV15-ILZ.  
6. Receptacles shall be 15 ampere, 125 VAC, ivory, parallel slot, U-ground, side and back wiring screw terminate. Approved manufacturers are: Hubbell No. 5262, Arrow Hart No. 5262, Bryant No. 5262 or equal.  
7. Isolated ground receptacles shall be Pass & Seymour G5620 pr Bryant No. GF-5262-1 with orange triangle.

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