Issued for TENDER

3851 Fallowfield Rd.

Nepean, ON

CFAI Main Building 201 Replacement of Main Fire Pump

Project no. 2078

February 19, 2021

Specifications:

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

1.2 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 00 10 - General Instructions.

1.3 SITE CONDITIONS

.1 Should material resembling spray or trowel-applied asbestos or other designated substance listed as hazardous be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.

.1 Do not proceed until written instructions have been received from Departmental Representative.

.2 Notify Departmental Representative before disrupting building access or services.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 PREPARATION

.1 Inspect building with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Cooperate with and coordinate all trades in marking out required locations of floor and wall penetrations necessary to accommodate installation of new services.

3.2 PROTECTION

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring required.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Protect building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

.5 Do Work in accordance with Section 01 35 29.06 - Health and Safety Requirements.

3.3 DEMOLITION

.1 Remove parts of existing building where necessary to permit new construction.

.2 Trim edges of partially demolished building elements to tolerances as defined by Departmental Representative to suit future use.

3.4 CUTTING AND CORING

.1 Coordinate layout and marking of all required coring and cutting locations of existing slabs and walls with all sub-trades.

.2 Locate existing reinforcement and conduit and obtain approval of Departmental Representative before coring or cutting existing slabs and walls. Retain an independent testing company to locate existing reinforcement and conduit in the areas of proposed openings and to mark locations on the surfaces of slabs on which the cores and cuts are to be started. X-ray concrete unless other methods can be shown by Contractor to accurately locate reinforcement and conduit. Mark locations and sizes of cores and openings and locations of reinforcement and conduit using indelible markers with red for top bars, green for bottom bars and black for cores, openings and conduit. Departmental Representative will review marked-up locations once a week. If locations are not acceptable to Departmental Representative, relocate proposed openings and repeat process at no extra cost to the Contract.

.3 Coring: Do not cut existing reinforcement and conduit when coring existing concrete unless approved in advance by the Departmental Representative. Save the complete length of all cores. Label each core with location taken. Make all cores available for review by Departmental Representative. Dispose of cores only with approval of Departmental Representative.

.4 Cutting: Do not cut existing reinforcement and conduit when cutting existing concrete unless approved in advance by the Consultant. Core the corners of all openings prior to cutting sides. Saw cut sides. Do not over cut openings. Chip corners square if necessary.

.5 Wet coring not acceptable in normally occupied areas of building.

.6 Carry out all cutting, coring, and drilling activities after normal business hours. Provide minimum 10 days notification to Departmental Representative for such work.

3.5 DISPOSAL

.1 Dispose of removed materials, to appropriate recycling facilities or reuse facilities except where specified otherwise, in accordance with authority having jurisdiction.

END OF SECTION

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1 GENERAL

1.01 SECTION INCLUDES

.1 Work requirements for concrete restoration and waterproofing in accordance with Section 01 11 00 - Summary of Work including the following:
- .1 Chipping and breaking out all deteriorated, spalled and delaminated concrete, defective cold joints, and the subsequent filling of voids, cracks and rebuilding of exterior surface profiles.
- .5 Coating of interior floor surfaces.

1.04 RELATED REQUIREMENTS

.1 Section 02 41 00.08 Demolition for Minor Works.

1.05 REFERENCE STANDARDS

.1 ASTM International (ASTM)
- .1 ASTM C 109/C 109M-[16a], Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. (50-mm) Cube Specimens).
- .2 ASTM C 157/C 157M-[08(2014)e1], Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
- .3 <B>ASTM C 190-[85], Method of Test for Tensile Strength of Hydraulic Cement Mortars.
- .4 .ASTM C348-[14], Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars.
- .5 ASTM C 469/C 469M-[14], Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
- .6 ASTM C 496/C 496M-[17] Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
- .7 ASTM C 596-[09(2017)], Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement.
- .8 ASTM C 779/C 779M-[12], Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
- .9 ASTM C 1059/C 1059M-[13], Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete.
- .10 ASTM C 1202-[17], Standard Test Method for Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.

.2 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB-19.24-[M90], Multicomponent, Chemical-Curing Sealing Compound.

.3 Transport Canada (TC)
- .1 Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA).

.4 International Concrete Repair Institute (ICRI):
- .1 ICRI Concrete Repair Terminology [2010].

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1.06 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section [01 33 00 - Submittal Procedures].

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for [compounds] and include product characteristics, performance criteria, physical properties, finish and limitations.

1.07 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section [01 78 00 - Closeout Submittals].

1.08 QUALITY ASSURANCE

.1 Manufacturer's Instructions: submit manufacturer's application instructions and special handling criteria, cleaning procedures.

.2 Provide [testing] [inspection] results [and] [reports] for review by [Departmental Representative] and do not proceed without written approval when deviations from mix design or parameters are found.

1.09 EXISTING CONDITIONS

.1 Examine Site conditions and existing surfaces to be restorated.

2 PRODUCTS

2.01 MATERIALS

.1 Patching compound (for 6-50 mm horizontal and 6-25 mm for vertical applications): fast setting, non-shrink, premixed, requiring addition of water only, free of wax, metal, tar, emulsion and calcium chloride.
- .1 Compressive strength: to ASTM C 109/C 109M, 24 MPa at 24 h and 44 MPa at 28 days.
- .2 Flexural strength: to ASTM C 348, 6.8 MPa at 7 days, 8.5 MPa at 28 days.
- .3 <B>ASTM C 190, 4 MPa at 7 days, 5.5 MPa at 28 days.
- .4 Modulus of elasticity: to ASTM C 469/C 469M, 1.5 x 10Z MPa at 28 days.

.3 Bonding agent: acrylic polymer emulsion formulated for bonding new concrete to cured concrete, non-yellowing, water based, compatible with [and] [or] recommended by patching compound manufacturer.
- .1 Compressive strength: to ASTM C 109/C 109M, 31 MPa at 28 days.
- .2 Flexural strength: to ASTM C 348, 12.4 MPa at 28 days.

.5 Finish coating: 100% acrylic emulsion paint for concrete; weather, alkali, acid and mildew resistant, Departmental Representative to select colour from manufacturer's standard range].

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.7 Water: potable.

.9 Joint filler: extruded polyethylene, closed cell, Shore A hardness 20, tensile strength, 140 to 200 kPa, outsized 30 to 50%, CFC free.

.10 Sealant: multi-component, chemical curing to CAN/CGSB-19.24, Type 2, Class B, white, Ecologo certified, primer recommended by sealant

2.02 EQUIPMENT

.1 Pneumatically operated scabbler with high-speed tungsten carbide tipped pistons to pulverize protective coatings, laitance, and concrete substrate in a single process, leaving surface clean with uniformly keyed texture, ready to receive new [protective coatings] [toppings] and the following:
- .1 Production rate: 1.9-2.8 m² /hour at 1.6 mm surface removal.
- .2 Size: 305 mm long x 150 mm wide x 305 mm high.
- .3 Air consumption: 1.7 m³ /min.
- .4 Vacuum flow:
  - .1 Interfacable with self-cleaning, high efficiency HEPA filtered vacuum.

.2 Mobile, high performance HEPA Vacuum/Drumming System as follows:
- .1 Two-stage positive filtration of hazardous particles.
  - .1 First stage: Automatic self-cleaning by reverse-flow pulses of high pressure air. Efficiency of 95% at 1 micron.
  - .2 Second stage: HEPA efficiency of 99.7% at 0.3 microns.
- .2 Controlled-seal drum fill system to allow filling, sealing, removal and waste drum replacement under controlled vacuum system.
- .3 Size: 1219 mm long x 711 mm wide x [1828 mm] [2134 mm] high.
- .4 Automatic, full-drum level alarm.

3 EXECUTION

3.01 SURFACE PREPARATION

.1 Remove protective coatings (using pneumatically operated scabbler and HEPA vacuum/drumming system.
- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.
- .2 Remove drums from site and dispose of in accordance with the Federal, Provincial, Territorial and municipal regulations.

.3 Remove loose, spalled, cracked, eroded and disintegrated concrete to solid surface, 9 mm minimum depth.

.4 Chisel under perimeter of areas to be patched.

.5 Sandblast loose rust and scale from exposed steel surfaces.

.6 Utilize dustless decontamination and surface preparation system for scabbling concrete

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floors and slabs.

.7 Clean area of loose material, dirt, oil and scale.

.8 Clean cracks 6 mm thick or wider with pressurized water jet or sandblasting.

.9 Chip and break out all deteriorated concrete, previous repairs that are delaminated, existing delaminations and defective cold joints to sound concrete.

3.02 MIXING

.1 Patching Compound:
- .1 Mix components in accordance with manufacturer's written instructions.
- .2 Use drill mixer to mechanically mix components. Ensure components are thoroughly mixed.
  - .1 Add up to 6.8 kg of aggregate to 25 kg bag of patching compound for large cavities and patches in excess of 25 mm thick.
- .3 Apply mix immediately.
- .4 Dispose of not used mix immediately, do not retemper.

.2 Base Coating:
- .1 Perform coating in accordance with manufacturer's written instructions.
- .2 Mix 1 part bonding agent to 3 parts water.
- .3 Add bonding mixture to base coating and mix to cement mortar consistency with 50 to 76 mm slump.

3.03 SURFACE REPAIRS

.1 Rebuild surface profile following surface preparation, previously described, and fill with patching compound and bonding agent.

.2 Install repair material in accordance with manufacturer's written instructions.

.3 Mix patching compound to batter consistency and apply by brush over dampened concrete within patching area.

.4 Slush mix over old concrete within patching area with brush coat before filling patch with heavier, trowel coat of patching compound.

.5 Place and level patching compound within five to ten minutes after mixing water is added.

.6 Apply mix in successive 12 mm to 25 mm layers.
- .1 Scratch first layer, cool with water and apply second layer within 15 to 20 minutes.

.7 Sponge float surface. If patch gets hot and turns light grey, cool by wetting. Keep patch damp 30 to 45 minutes after filling.

.9 Repair scaled or spalled concrete and missing corners deeper or greater than 6 mm with patching compound and bonding agent to render a regular flush surface.

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.1 When rebuilding projecting concrete, such as cracked caps, key into existing concrete by means of edge cutting at a minimum depth of 20 mm.

.10 Protect other trades work and/or other prepared surfaces from patching material spills.

3.04 FINISH COATING INTERIOR APPLICATION

.1 Prepare interior surface by sanding to remove loose paint, efflorescence and heavy rust to staining adequate substrate.

.2 Patch holes and spalls with patching compound.

.3 Rout out and fill prepared cracks with patching compound.

.4 Protect equipment with drop sheets.

.5 Brush or roll on two coats, total coverage 4.0 m² /l in accordance with manufacturer's written instructions. Coat interior wall and ceiling surfaces with [white] finish coating. Allow minimum 3 to 4 hours wait between coats.

.6 Allow minimum 3 to 4 hours wait between coats.

3.05 SEALANT INSTALLATION

.1 Clean and dry joints before work starts.

.2 Insert joint filler where applicable to a depth of 1/2 joint width, minimum of 6 mm.

.3 Prime joints when recommended by sealant manufacturer.

.4 Apply sealant in accordance with manufacturer's instructions.

.5 Make surfaces smooth and concave.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 73 00 – Execution: for penetrations through existing fire-resistive rated substrates.

1.2 REFERENCES

.1 Canada Green Building Council (CaGBC)

.1 LEED Canada-CI, Green Building Rating System for Commercial Interiors, Version 1.0, February 2007

.2 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)

.1 SCAQMD Rule 1168 Adhesives and Sealants. Amended October 3, 2003; Rules in affect January 1, 2003

.2 SCAQMD Rule 1113 Architectural Coatings; Rules in affect January 1, 2004

.3 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S115-11, Standard Method of Fire Tests of Firestop Systems

1.3 DEFINITIONS

.1 Fire Stop Material: device intended to close off opening or penetration during fire or materials that fill openings in wall or floor assembly where penetration is by cables, cabletrays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openings.

.2 Single Component Fire Stop System: fire stop material that has Listed Systems Design and is used individually without use of high temperature insulation or other materials to create fire stop system.

.3 Multiple Component Fire Stop System: exact group of fire stop materials that are identified within Listed Systems Design to create on site fire stop system.

.4 Tightly Fitted; (ref: NBC Part 3 and Part 9): penetrating items that are cast in place in buildings of non-combustible construction or have "0" annular space in buildings of combustible construction.

.1 Words "tightly fitted" should ensure that integrity of fire separation is such that it prevents passage of smoke and hot gases to unexposed side of fire separation.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings to show location, proposed material, reinforcement, anchorage, fastenings and method of installation.

.2 Construction details should accurately reflect actual job conditions.

.4 Samples: Submit duplicate 300 by 300 mm samples showing actual fire stop material proposed for project.

.5 Quality assurance submittals:

.1 Test reports: in accordance with CAN-ULC-S101 for fire endurance and CAN-ULC-S102 for surface burning characteristics.

.1 Submit certified test reports from approved independent testing laboratories, indicating compliance of applied fire stopping with specifications for specified performance characteristics and physical properties.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.

.4 Manufacturer's Field Reports: submit to manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in Part 3 – FIELD QUALITY CONTROL.

1.5 QUALITY ASSURANCE

.1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section, with Contractor's representative and Departmental Representative to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building assemblies.

.4 Review manufacturer's installation instructions and warranty requirements.

.2 Site Meetings: as part of Manufacturer's Services described in Part 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work, at stages listed.

.1 After delivery and storage of products, and when preparatory Work is complete, but before installation begins.

.2 Twice during progress of Work at 25% and 60% complete.

.3 Upon completion of Work, after cleaning is carried out.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Deliver materials to the site in undamaged condition and in original unopened containers, marked to indicate brand name, manufacturer, ULC markings.

.2 Storage and Protection:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.3 Separate waste materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Fire stopping and smoke seal systems: in accordance with CAN-ULC-S115.

.1 Asbestos-free materials and systems capable of maintaining effective barrier against flame, smoke and gases in compliance with requirements of CANULC-S115 and not to exceed opening sizes for which they are intended and conforming to specified special requirements described in Part 3.

.2 Fire stop system rating: F and FT.

.2 Service penetration assemblies: systems tested to CAN-ULC-S115.

.3 Service penetration fire stop components: certified by test laboratory to CAN-ULC-S115.

.4 Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

.5 Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

.6 Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal.

.7 Primers: to manufacturer's recommendation for specific material, substrate, and end use.

.1 Maximum VOC Content: 200 g/L, less water in accordance with SCAQMD Rule 1113.

.8 Water: potable, clean and free from injurious amounts of deleterious substances.

.9 Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

.10 Sealants for vertical joints: non-sagging.

.1 Maximum VOC Content: 250 g/L, less water in accordance with SCAQMD Rule 1168.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

.4 Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.3 INSTALLATION

.1 Install fire stopping and smoke seal material and components in accordance with manufacturer's certified tested system listing.

.2 Seal holes or voids made by through penetrations, poke-through termination devices, and non-penetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.4 Tool or trowel exposed surfaces to neat finish.

.5 Remove excess compound promptly as work progresses and upon completion.

3.4 SEQUENCES OF OPERATION

.1 Proceed with installation only when submittals have been reviewed by Departmental Representative.

.2 Install floor fire stopping before interior partition erections.

.3 Mechanical pipe insulation: Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

.1 Inspections: notify Departmental Representative when ready for inspection and prior to concealing or enclosing fire stopping materials and service penetration assemblies.

.2 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in Part 1 - SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.3 Schedule site visits, to review Work, as directed in Part 1 – QUALITY ASSURANCE.

3.6 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 SCHEDULE

.1 Fire stop and smoke seal at:

.1 Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

.2 Top of fire-resistance rated masonry and gypsum board partitions.

.3 Intersection of fire-resistance rated masonry and gypsum board partitions.

.4 Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

.5 Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

.6 Openings and sleeves installed for future use through fire separations.

.7 Around mechanical and electrical assemblies penetrating fire separations.

.8 Rigid ducts: greater than 129 cm: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealants.

.2 Section 08 71 00 - Door Hardware.

.3 Section 09 91 23 - Interior Painting.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM).

.1 ASTM A 653/A 653M-15e1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B 29-14, Specification for Refined Lead.

.3 ASTM B 749-14, Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA).

.1 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door and Frame Manufacturers' Association, (CSDMA).

.1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.

.2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.

1.3 DESIGN REQUIREMENTS

.1 Design door frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.5 ACTION AND INFORMAL SUBMITTALS

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

.2 Provide for each type of door and frame, elevations of all doors and frames, jamb and head details for all frame types, meeting and style details on pairs of doors, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, glazed openings, door grilles, arrangement of hardware, fire rating, method of anchorage, junction boxes and conduit for electrical hardware and wiring.

.3 For each door and frame scheduled for electrical hardware, submit detailed shop drawings indicating location and size of junction boxes, conduit cut-outs and all other information related to electrical hardware. This should include information on interrelated

systems such as fire alarm and security systems/controls. Coordinate with Division 26 - Electrical, 27 – Communications, and 28 – Electronic Safety and Security.

.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.5 Submit test and engineering data, and installation instructions.

1.6 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit one 300 x 300 mm corner sample of each type of frame.

.1 Show glazing stops.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away from children.

.4 Place materials defined as hazardous or toxic waste in designated containers, and place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

.5 Return solvent and oil soaked rags, used during installation, for contaminant recovery, proper disposal, or appropriate cleaning with no contaminant release to water systems.

.6 Close and seal tightly all partly used sealant and adhesive containers and store protect in well ventilated fire-safe area at moderate temperature.

.7 Separate corrugated cardboard and place in designated areas for recycling.

.8 Fold up metal banding, flatten, and place in designated area for recycling.

.9 Collect wood packing shims and pallets and place in designated area for recycling and reuse.

.10 Do not dispose of paints or solvents by pouring on the ground. Place in designated containers and ensure proper disposal in accordance with federal, provincial and municipal regulations.

.11 Solvent based paints, which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner in accordance with hazardous waste regulations. Empty paint cans are to be dry prior to disposal or recycling (where available).

.12 Where paint recycling is available collect all waste paint by type and provide for delivery to recycling or collection facility.

.13 Paints and finishes are regarded as hazardous products and are subject to regulations for their disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional levels of Government.

Part 2 Products

2.1 REGULATORY REQUIREMENTS

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104M for ratings specified or indicated.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN/ULC-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

2.2 MATERIALS

.1 Hot dipped galvanized steel sheet: commercial grade, cold rolled, annealed, stretcher levelled, to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts, except where specified othe

.2 Accessories including reinforcement, anchors: to CSA G40.20/G40.21, Type 300W, coating designation to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts, except where specified otherwise.

.3 Composites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

.4 The manufacturing process must adhere to Lifecycle Assessment Standards as per CAN/CSA-ISO 14040-06 (R2016).

2.3 DOOR CORE MATERIALS

.1 Honeycomb construction: Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m3 minimum sanded to required thickness.

2.4 ADHESIVES

.1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

2.5 PRIMERS

.1 Touch-up prime CAN/CGSB-1.181-99.

2.6 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Jamb spreader: minimum 1.2 mm thick.

.3 Astragals: minimum 2.0 mm thick.

.4 Top caps: flush, steel, spot welded channel closure.

.5 Bottom caps: inverted, recessed, channels, minimum 25 mm deep, spot welded to both door faces.

.6 Reinforcements:

.1 Hinge reinforcement: minimum 4.5 mm thick, full height, full cavity width.

.2 Strike reinforcement: minimum 2.66 mm thick.

.3 Surface applied hardware reinforcement: minimum 2.66 mm thick.

.4 Lock reinforcement: minimum 1.52 mm thick.

.7 Floor and Wall Anchors: minimum 1.52 mm thick.

.8 Door bottom seal: as specified in Door Hardware Schedule.

.9 Metallic paste filler: to manufacturer's standard.

.10 Fire labels: metal riveted to doors and frames.

.11 Sealant: as specified in Section 07 92 00 – Joint Sealants.

.12 Metallic paste filler: to manufacturer's standard.

2.7 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Interior frames: 1.6 mm welded type construction.

.4 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.5 Protect mortised cut-outs with steel guard boxes.

.6 Reinforce frame heads without loose lintels provided by others, with bent plate channels, minimum 3 mm thick. Reinforce frame heads wider than 1200 mm.

.7 Top hinge reinforcement: weld in top hinge reinforcement with 19 mm leg to hinge reinforcement, 25 mm leg to frame.

.8 Prepare frame for door silencers, 2 at head for double door.

.9 Manufacturer's nameplates on frames and screens are not permitted.

.10 Conceal fastenings except where exposed fastenings are indicated.

.11 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

2.8 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide expansion anchors for door frames installed in existing masonry walls.

.4 Provide steel jamb anchors, suitable design, securely welded inside each jamb, to door and sidelight frames in steel stud partitions.

.5 Weld base/floor anchors inside, full width jamb profile, punched for 6 mm diameter expansion bolts for fixing to floor slab.

.6 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.7 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.9 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59-03 (R2008).

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

.5 Perimeter corner joints: as defined in Appendix 2 of CSDMA, “Recommended Specifications for Commercial Steel Door and Frame Products”, except as specified otherwise:

.1 Profile welded, saw-mitered: continuously welded on inside of frame along profile faces, rabbets, returns stops, and soffit intersections. Fill exposed faces and grind smooth to uniform seamless surface.

.2 Tack welded: not permitted.

.6 Securely attach floor anchors to inside of each jamb profile.

.7 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

.8 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

.9 Sleeve and weld joint of field splices of frame sections requiring assembly on site. Mechanical fastening of field splices not permitted. Make field splices inconspicuous after assembly.

2.10 DOOR FABRICATION, GENERAL

.1 Doors: swing type, flush, with provision for louvre openings as indicated.

.2 Interior doors: Form each face sheet for interior doors from 1.60 mm thick ZF75 coated steel with honeycomb core laminated under pressure to face sheets.

.3 Fabricate doors with longitudinal edges mechanically interlocked and tack welded. Tack weld using welds minimum 6 mm long, top and bottom of door, above and below each cutout and at 150 mm oc maximum spacing. Fill seam with metallic paste filler and sand to uniform finish.

.4 Blank, reinforce, drill doors and tap for mortised, templated hardware, and electronic hardware.

.5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.6 Reinforce doors where required, for surface mounted hardware. Provide closer reinforcement both sides all doors, including doors not scheduled to receive closers.

.7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.8 Provide fire labeled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN/ULC-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.9 Provide astragals to paired doors to ULC requirements, where required.

.10 Manufacturer’s nameplates on doors are permitted only on hinge side of door, concealed from view.

2.11 SHOP PAINTING

.1 Clean metal surfaces of loose scale, shavings, filings, dirt, dust, other objectionable materials. Use wire brushes, other approved methods. Remove grease, oil with benzene, other similar Xylol cleaners.

.2 Factory touch up galvanized finish damaged during fabrication and cleaning.

.3 Apply one shop coat light grey coloured primer to reinforcing, attachment steel surfaces, two shop coats where in contact with concrete or masonry.

Part 3 Execution

3.1 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

3.2 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation. Maximum diagonal distortion, F 1-6mm.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1150 mm wide. Remove temporary spreaders after frames are built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Caulk perimeter of frames between frame and adjacent material.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide clearances for swinging doors as follows, with a minus 2 mm tolerance:

.1 Along top: 3 mm.

.2 Hinge and latch jambs: 3 mm.

.3 Along meeting edge of doors in pairs: 3 mm.

.4 At bottom edge of single swing door: 10 mm.

.5 At bottom edge of pair of doors: 6 mm.

.3 Adjust operable parts for correct function.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

END OF SECTION

Part 1 General

1.1 RELATED WORK

.1 Section 08 11 00 – Metal Doors & Frames

1.2 REFERENCE STANDARDS

.1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.2 CAN/CGSB-69.18-M90/ANSI/BHMA A156.1-2013, Butts and Hinges.

.3 CAN/CGSB-69.19-93/ANSI/BHMA A156.3-2014, Exit Devices.

.4 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-2013, Door Controls (Closers).

.5 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-2010, Architectural Door Trim.

.6 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-2010, Door Controls - Overhead Holders.

.7 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-2017, Mortise Locks and Latches.

.8 CAN/CGSB-69.31-M89/ANSI/BHMA A156.15-2016 Closer/Holder Release Device.

.9 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-2013, Auxiliary Hardware.

.10 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-2016, Materials and Finishes.

1.3 REQUIREMENTS REGULATORY AGENCIES

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.4 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit for review and acceptance of each unit.

.2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.3 After approval samples will be returned for incorporation in Work.

.4 Hardware Schedule:

.1 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.2 Organize Hardware List by door numbers identified in Contract Documents, in numerical sequence in ascending order. An additional reference number may be assigned for reference purposes. For each door number identify:

.1 Door number.

.2 Room number and room name of each side of door and direction door is opening.

.3 Hand of door.

.4 Door size.

.5 Door and frame material.

.6 Fire rating (if applicable).

.7 All hardware components listed by item, quantity, model number, function, size, finish and manufacturer.

.5 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.6 After approval samples will be returned for incorporation in the Work.

.7 Keying Schedule: Prepared under the supervision of the Departmental Representative, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Departmental Representative to approve submitted keying schedule prior to the ordering of permanent cylinders.

1.5 HARDWARE LIST

.1 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

1.6 MAINTENANCE DATA

.1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Brief maintenance staff regarding proper care, cleaning, and general maintenance.

1.7 MAINTENANCE MATERIALS

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

1.8 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.9 DELIVERY AND STORAGE

.1 Store finishing hardware in locked, clean and dry area.

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

Part 2 Products

2.1 HARDWARE ITEMS

.1 Use one manufacturer's products only for all similar items.

2.2 DOOR HARDWARE

.1 Locks and latches:

.1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, series 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.

.2 Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, grade 1, designed for function and keyed to base building standard.

.3 Lever handles: Plain flat face design with return to 12 mm from door face

.4 Roses: Plain, max 54 mm diameter round design.

.5 Normal strikes: box type, lip projection.

.6 Cylinders: key into existing keying system as directed.

.7 Finished indicated in Door Hardware Schedule.

.2 Butts and hinges:

.1 Butts and hinges: to CAN/CGSB-69.18, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

.2 All hinges to be supplied complete with flat button tips.

.3 Self-closing hinges and pivots: to ANSI/BHMA A156.17.

.4 Non-removable pin: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed where indicated in Door Hardware Schedule.

.3 Door Closers and Accessories:

.1 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule, cast iron body 41 mm cover projection finished to 689.

.2 Door controls - overhead holders: to CAN/CGSB-69.24, designated by letter C and numeral identifiers listed in Hardware Schedule, finished to 630.

.3 Closer/holder release devices: to ANSI/BHMA A156.15, finish indicated in Door Hardware Schedule.

.4 Auxiliary hardware: to CAN/CGSB-69.32, designated by letter L and numeral identifiers as listed in Hardware Schedule, finished to 630.

.1 Door protection plates: kick plate and push plates 1.27 mm thick, Tape, Stainless Steel.

.5 Gaskets and sound seals:

.1 Head and jamb seal: Heavy duty extruded aluminum frame with adjusting screws and solid closed cell neoprene insert, clear anodized finish.

.2 Door bottom: Heavy duty extruded aluminum frame, felt insert, surface mounted.

2.3 FASTENINGS

.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.2 Exposed fastening devices to match brushed stainless steel finish of hardware.

.3 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 All locksets to be keyed differently and/or keyed alike in groups, master keyed, grand master keyed to existing system as directed. Prepare detailed keying schedule in conjunction with Departmental Representative.

.2 Provide keys in duplicate for every lock in this Contract.

.3 Stamp keying code numbers on keys and cylinders.

.4 Cylinders to be keyed to existing corbin N3 or MUL-T-LOCK system. Confirm requirements with Departmental Representative.

Part 3 Execution

3.1 EXAMINATION

.1 Examine doors and frames for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.

.1 Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

.2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION INSTRUCTIONS

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Furnish manufacturers' instructions for proper installation of each hardware component.

.4 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.5 Use only manufacturer's supplied fasteners.

.1 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is **unacceptable.**

.6 Where door stop contacts door pulls, mount stop to strike bottom of pull.

3.3 ADJUSTING NEW DOORS

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to ensure tight fit at contact points with frames.

.4 Replace components that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.4 ADJUSTING EXISTING SLIDING DOORS

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to ensure tight fit at contact points with frames.

.4 Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.5 CLEANING AND PROTECTION

.1 Clean adjacent surfaces soiled by door hardware installation.

.2 Clean operating items as necessary to restore proper function and finish.

.3 Provide final protection and maintain conditions that ensure that door hardware is without

.4 damage or deterioration at time of Substantial Completion.

3.6 DEMONSTRATION

.1 Brief maintenance staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.

.2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by door hardware installation.

3.8 SCHEDULE

.1 Door D001 & D002

.1	(4) Hinges	A8111 114x114	630
.2	(1) Passage	Mortise body-lever style	630
.3	(1) Door closer	CO20111 PT4C, PT4D	689
.4	(2) Kickplate	J102 305mm x Door Width – self adhesive	630
.5	(1) Floor stops	L02161	

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 ASTM International

.1 ASTM C1396/C1396M-17, Standard Specification for Gypsum Wallboard.

.2 ASTM C475/C475M-15, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.3 ASTM C645-14e1, Standard Specification for Non-structural Steel Framing Members.

.4 ASTM C754-15a, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.5 ASTM C840-16, Standard Specification for Application and Finishing of Gypsum Board.

.6 ASTM C954-15, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.122 in. (2.84 mm) in Thickness.

.7 ASTM C1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.2 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.3 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum, framing, sealants] and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Test and Evaluation Reports: submit test reports in accordance with Section 01 45 00 - Quality Control, from approved independent testing laboratory, certifying partition system complies with fire-resistance rating as specified.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions.

.3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.

.4 Store and protect partition materials from nicks, scratches, and blemishes.

.5 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Performance / Design Criteria:

.1 Partition assembly to be non-combustible construction fire resistance rated 2H.

.2 Non-structural Metal Framing:

.1 Non-load bearing channel stud framing: to ASTM C645, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.

.3 Metal channel stiffener: 19 x 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

.3 Gypsum Board:

.1 Type C: to CAN/CSA-A82.31, regular 15.9mm, 1200 mm wide and maximum practical length, ends square cut, edges tapered.

.2 Metal furring runners, hangers, tie wires, inserts, anchors: to ASTM C1047.

.3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.4 Steel screws: to ASTM C954.

.5 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.

2.2 ACCESSORIES

.1 Sealants: to ASTM C475.

.1 VOC limit 250 g/L maximum to SCAQMD Rule 116.

.2 Fire-rated Medium-Density Fiberboard: to CAN/ULC-S102

.1 19mm medium-density fiberboard backboard, painted, with countersunk screws

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to partition installation.

.1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied.

3.2 ERECTION OF FRAMING

.1 Install steel framing members to receive screw-attached gypsum board in accordance with ASTM C754 except where specified otherwise.

.2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.3 Place studs vertically at 400 mm on centre and maximum of 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

.4 Erect metal studding to tolerance of 1:1000.

.5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.6 Include two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.7 Install heavy gauge single jamb studs at openings.

.8 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.9 Include 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

.10 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.11 Extend partitions to ceiling height except where indicated.

.12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use double track slip joint.

.13 Install continuous insulating strips to isolate studs from uninsulated surfaces.

3.3 ERECTION OF GYPSUM BOARD AND ACCESSORIES

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

.3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.4 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.

.5 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.6 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

.7 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.

.8 Install acoustical insulation and sealant in sound rated partitions to correspond with tested assembly.

.9 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

3.4 APPLICATION

.1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

3.5 INSTALLATION

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

.5 Install access doors to electrical and mechanical fixtures specified in respective sections.

.1 Rigidly secure frames to furring or framing systems.

.6 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.7 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

.8 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.9 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by partition installation.

END OF SECTION

1 General

1.1 RELATED SECTIONS

.1 Section 08 11 00 – Metal Doors and Frames

.2 Section 09 21 16.08 – Gypsum Board Assemblies for Minor Works

1.2 REFERENCES

.1 MPI Architectural Painting Specifications Manual, 2014.

.2 Systems and Specifications Manual, SSPC Painting Manual, Volume Two, Society for Protective Coatings (SSPC).

.3 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 -1995 (for Surface Coatings) of the Environmental Protection Agency (EPA).

.4 National Fire Code of Canada - 2015.

1.3 QUALITY ASSURANCE

.1 Conform to latest MPI requirements for interior painting work including preparation and priming.

.2 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with MPI Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.

.3 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.

.4 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

.6 Standard of Acceptance:

.1 Walls: No defects visible from a distance of 1000 mm at 90° to surface.

.2 Ceilings: No defects visible from floor at 45° to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.4 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 All paint materials shall conform to the latest edition of MPI GPS-01 (Master Painters Institute Green Performance Standard-01), listed in the Green Approved Products List. Refer to www.specifygreen.com for the latest edition of the list.

.2 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.

.3 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 rating.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with Section 01 33 00 - Submittal Procedures.

.2 Upon completion, submit records of products used. List products in relation to finish system and include the following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

.4 MPI Environmentally Friendly classification system rating.

.5 Manufacturer's Material Safety Data Sheets (MSDS).

1.6 QUALITY CONTROL

.1 When requested by Departmental Representative, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.7 DELIVERY, HANDLING AND STORAGE

.1 Deliver, store and handle materials in accordance with good construction practice.

.2 Labels shall clearly indicate:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Provide and maintain dry, temperature controlled, secure storage.

.5 Observe manufacturer's recommendations for storage and handling.

.6 Store materials and supplies away from heat generating devices.

.7 Store materials and equipment in a well ventilated area with temperature range 7°C to 30°C.

.8 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.9 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.

.10 Remove paint materials from storage only in quantities required for same day use.

.11 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.12 Fire Safety Requirements:

.1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.8 SITE REQUIREMENTS

.1 Heating, Ventilation and Lighting:

.1 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 °C for 24 hours before, during and after paint application until paint has cured sufficiently.

.2 Where required, provide continuous ventilation for seven days after completion of application of paint.

.3 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.

.4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.5 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by the specifying body and the applied product manufacturer, perform no painting work when:

.1 Ambient air and substrate temperatures are below 10°C.

.2 Substrate temperature is over 32°C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 The relative humidity is above 75% or when the dew point is less than 3°C variance between the air/surface temperature.

.2 Perform no painting work when the maximum moisture content of the substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.2 15% for wood.

.3 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

.1 Apply paint finish only in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint only to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint only when previous coat of paint is dry or adequately cured.

.4 Additional Interior Application Requirements:

.1 Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials.

.2 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.,) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.3 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground the following procedures shall be strictly adhered to:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.6 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

.7 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

2 Products

2.1 MATERIALS

.1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Paint materials for paint systems shall be products of a single manufacturer.

.3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.

.4 Water-borne surface coatings must be manufactured and transported in a manner that steps of process, including disposal of waste products arising there from, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.5 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.6 Water-borne surface coatings and recycled water-borne surface coatings must have a flash point of 61.0 0C or greater.

.7 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.8 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

.9 Recycled water-borne surface coatings must contain 50% post-consumer material by volume.

.10 Recycled water-borne surface coatings must not contain:

.1 Lead in excess of 600.0 ppm weight/weight total solids.

.2 Mercury in excess of 50.0 ppm weight/weight total product.

.3 Cadmium in excess of 1.0 ppm weight/weight total product.

.4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.

.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

.11 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

2.2 COLOURS

.1 Departmental Representative will provide Colour Schedule after Contract award.

.2 Colour schedule will be based upon the existing colour scheme.

.3 Second coat in a three-coat system to be tinted slightly lighter colour than topcoat to show visible difference between coats.

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with Departmental Representative's written permission.

.2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.

.3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.

.4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN RATINGS

.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level Category	*Units @ 60º*	*Units @ 85º*
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces shall be as specified herein.

2.5 INTERIOR PAINTING SYSTEMS

.1 Metal Doors and Frames.

.1 INT 5.3K W.B. Light Industrial Coating, G5 finish.

.1 One (1) coat bonding primer – MPI#17.

.2 Two (2) coats waterborne light industrial coating – MPI#153 (G5).

.2 Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock type material", new and repaint.

.1 INT 9.2F Epoxy-Modified Latex G1 (ceilings), G3 (walls) finish (over latex sealer).

.2 One (1) coat primer – MPI#50

.3 Two (2) coats finish – MPI#215

.3 Epoxy Floor.

.1 Surface Preparation of Concrete to SSPC-SP 13

.2 INT 3.2C Epoxy

.3 Two (2) coats finish – MPI#177

3 Execution

3.1 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.2 EXISTING CONDITIONS

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:

.1 Stucco, Plaster and Gypsum Board: 12%.

.2 Concrete: 12%.

.3 Wood: 15%.

3.3 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Removal of electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings shall be done prior to undertaking any painting operations. Items shall be securely stored and re-installed after painting is completed.

.5 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.6 As painting operations progress, place "WET PAINT" signs in occupied areas to approval of DCR. Refer to Section 01 00 10, Paragraph 14.1, all signs shall be bilingual or pictograms.

3.4 CLEANING AND PREPARATION

.1 Clean and prepare surfaces in accordance with MPI Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 Prepare surfaces for water-based painting; water-based cleaners should be used in place of organic solvents.

.6 Use trigger operated spray nozzles for water hoses.

.7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.

.2 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.

.3 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.4 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by blowing with clean dry compressed air, or vacuum cleaning.

.5 Touch up of shop primers with primer as specified in applicable section. Major touch-up, including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.

.6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

3.5 APPLICATION

.1 Apply paint by brush, roller, or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately all runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Departmental Representative.

.5 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.9 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Elevator machine room, electrical rooms: do not paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

.3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.5 Do not paint over nameplates.

.6 Keep sprinkler heads free of paint.

.7 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

END OF SECTION