

PWGSC
Health Canada
New UPS and electrical rooms

Architectural Specification

ISSUED FOR BID

September 2018

Spec number : 181-03430-01
Client file: R.094477.001

TPSGC – SANTÉ CANADA

New UPS and electrical room

ARCHITECTURAL Specification

ISSUED for BIDS



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PART 1 - GENERAL

1.1 REFERENCE STANDARDS

- .1 CSA International
 - .1 CSA S350-FM1980(R2003), Code of Practice for Safety in Demolition of Structures.
- .2 Conseil national de recherches Canada (CNRC)
 - .1 Code national du bâtiment - Canada 2015 (CNB).
 - .2 Code national de prévention des incendies du Canada 2015 (CNPI).

1.2 WASTE MANAGEMENT AND DISPOSAL

- .1 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 - Cleaning.

1.3 SITE CONDITIONS

- .1 Review "Designated Substance Report", if applicable, and take precautions to protect environment.
- .2 If material resembling spray or trowel-applied asbestos or other designated substance and listed as hazardous be encountered, stop work, take preventative measures, and notify the Departmental Representative immediately.
 - .1 Proceed only after receipt of written instructions have been received from the Departmental Representative.
- .3 Notify the Departmental Representative before disrupting building access or services.

PART 2- PRODUCTS

2.1 NOT APPLICABLE

- .1 Not applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Inspect building and site with Departmental Representative, and verify location and extent of items to be removed, disposed of, recovered, recycled, recovered, and those to remain in place.

3.2 PREPARATION

- .1 Protection of In-Place Conditions
 - .1 Prevent movement, settlement, or damage to adjacent parts of building and structures. 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.
- .2 Demolition/Removal:
 - .1 Demolish structures and parts of structure as indicated.
 - .2 Removal of hard coatings, Curbs and Gutters:
 - .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by the Departmental Representative.
 - .2 Protect adjacent joints and load transfer devices.
 - .3 Protect underlying and adjacent granular materials.
 - .3 Remove parts of existing building to permit new construction.
 - .4 Trim edges of partially demolished building elements to tolerances as defined by the Departmental Representative to suit future use.

3.3 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 Refer to demolition drawings and specifications for items to be salvaged for reuse.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A 496/A 496M-07, Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
- .2 CSA Group (CSA)
 - .1 CAN/CSA-A82-F06, Fired Masonry Brick Made From Clay or Shale.
 - .2 CAN/CSA-A165 SERIES-F04 (C2009), CSA Standards on Concrete Masonry Units (Consists of A165.1-04, A165.2, A165.3).
 - .3 CAN/CSA-A179-F04 (C2009), Mortar and Grout for Unit Masonry.
 - .4 A370-F04 (C2009), Connectors for Masonry.
 - .5 CAN/CSA-A371-F04 (C2009), Masonry Construction for Buildings.
 - .6 CSA G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
 - .7 CSA S304.1-F04 (C2009), Design of masonry structures.
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .4 National Research Council Canada (NRC)
 - .1 National Building Code of Canada 2015 (CNB).
 - .2 National Fire Code of Canada 2015 (NFC).

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 unit masonry products, mortar and grout, connectors, anchorage and reinforcing, and accessories. Include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 43- Environmental Procedures.
 - .1 The sheets must indicate the VOC emission rate, in g / L, of the epoxy coatings, galvanizing coatings and retouching products to be applied inside the building envelope.
 - .3 Shop Drawings
 - .1 Submitted shop drawings must bear the seal and signature of a qualified engineer qualified or licensed to practice in [province] [territory], Canada.
 - .2 Shop drawings must include a list of required reinforcing bars as well as bending details and installation drawings.
 - .3 Installation drawings must indicate the number of reinforcement elements,

crampons and anchors required and the dimensions, spacing and location of these parts.

.4 Samples

- .1 Submit samples of each proposed product for review and acceptance.
- .2 Submit two (2) full-size samples of each type of brick proposed.

1.3 DOCUMENTS TO BE SUBMITTED UPON COMPLETION OF WORK

- .1 Submit manufacturer's instructions for the care, cleaning and maintenance of glazed masonry units and attach them to the manual referred to in Section 01 78 00 - Closeout Submittals

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions 01 61 00- Common Product Requirements.
- .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 [in dry location] [off ground] [indoors] and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect masonry products from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Manage and sort waste for reuse and recycling in accordance with Section 01 74 1 Cleaning.

1.5 CONDITIONS OF IMPLEMENTATION

- .1 Ambient conditions: do assembly and commissioning only when the temperature is above 4 degrees Celsius.
- .2 Work in hot or cold weather: in accordance with CAN / CSA-A371.
- .3 Cold weather requirements
 - .1 As per CAN / CSA-A371 and the requirements listed below.
 - .1 Maintain mortar at a temperature between 5 and 50 degrees Celsius until use or stabilization of the mix.
 - .2 Maintain masonry and its constituent materials at a temperature between 5 and 50 degrees Celsius and protect the site against wind chill.
 - .3 Maintain masonry above freezing for at least seven (7) days after mortar application.

- .4 Preheat unheated wall sections in enclosures to a temperature above 10 degrees Celsius at least 72 hours prior to mortar application.
- .4 Hot weather requirements
 - .1 Cover waterproof masonry, which does not stain, with freshly made masonry so that it does not dry too quickly
 - .2 As long as the masonry is not completed or protected by flashings or other permanent structure, keep them dry with waterproof tarps that do not stain, which extend beyond the top and sides of the works over a distance sufficient to protect them against wind-driven rain.
 - .3 Spray mortar surfaces at regular intervals to keep them moist for at least three (3) days after installation.

PART 2 – PRODUCTS

2.1 MASONRY UNITS

- .1 Standard concrete masonry units: to CAN / CSA-A165 (CAN / CSA-A165.1) standards.
 - .1 Type: H/15/A/M.
 - .2 Dimensions: modular. 90, 140 or 190mm thick according to the drawings and the required fire resistance x 190mm high and 390mm long
 - .3 Special form elements: sharp-edged elements shall be used for exposed angles, and specially shaped elements adapted for this purpose, for lintels and connecting beams; other special shaped elements must be provided as indicated.
- .2 Fireproof masonry units: in accordance with CAN / CSA-A165 (CAN / CSA-A165.1), taking into account the following requirements.
 - .1 Type: H / 15 / B / M, taking into account the fire resistance characteristics mentioned below
 - .2 Fire resistance characteristics: The aggregate used for concrete fabrication and the equivalent thickness of the elements must comply with the requirements of the National Building Code of Canada (NFC). .
 - .3 Dimensions: modular. Dimensions: modular. 90, 140 or 190mm thick according to the drawings and the required fire resistance x 190mm high and 390mm long.
 - .4 Special form elements: sharp-edged elements shall be used for exposed angles, specially shaped elements adapted for this purpose, for lintels and connecting beams; other special shaped elements must be provided as indicated.

2.2 REINFORCEMENT AND CONNECTORS

- .1 Bar reinforcement: Grade 400 in accordance with CAN/CSA-A371 and CSA G30.18.
- .2 Reinforcing wire: ladder or mesh, to CAN / CSA-A371 and ASTM A496 / A496M.
- .3 Connectors and Anchors: to CAN/CSA-A370 et CSA S304.1.

- .4 Protection against corrosion:
 - .1 All fasteners and anchors to be incorporated into the outer casing or any other place exposed to bad weather, hot-cold or humid air.
 - .1 Stainless steel, grade 304.
 - .2 All fasteners and anchors located inside the building and rebars :
 - .1 Hot dipped galvanized steel, after fabrication, to CAN3-A370.
 - .2 Wire: ASTM A153-09, Class B2, 458gr / mc.
 - .3 Bars: ASTM standard A123-09, 610gr / mc.
 - .4 The reinforcement of walls and partitions will have a class 3 galvanized finish in accordance with ASTM A116-11

2.3 MORTAR AND GROUT

- .1 Mortar: to CAN/CSA-A179.
 - .1 Use aggregate passing 1.18 mm sieve where 6 mm thick joints are indicated.
 - .2 Colour: ground coloured natural aggregates or metallic oxide pigments.
- .2 Following applies regardless of mortar types and uses specified above:
 - .1 Mortar for exterior and interior structures of non-load bearing masonry, above ground level and, where applicable, for plasterwork:
 - .1 N-type mortar, minimum compressive strength 5MPa (28-day test) per CAN / CSA A 179-F04 specifications.
 - .2 Premixed at the factory (cement + lime + sand + dye).
 - .2 Grout for reinforced concrete masonry, lintel blocks, chaining blocks:
 - .1 Complies with the description of the properties of paragraph 7.2.3 of CSA A179-F04 having the required consistency and sufficient fluidity to completely fill cavities, but without segregation or excessive bleeding.
 - .2 Minimum resistance of grout: 15Mpa @ 28days.
 - .3 Mortar Color: Based on the sample (s) approved by the Departmental Representative.
 - .1 For concrete block masonry: standard gray.

PARTIE 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.
Visually inspect substrate in presence of Departmental Representative.
- .2 Inform the Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Departmental Representative.

3.2 INSTALLATION

- .1 Do masonry work in accordance with CAN/CSA-A371 except where specified otherwise.
 - .1 Bond: running stretcher bond with vertical joints in perpendicular alignment and centred on adjacent stretchers above and below.
 - .2 Coursing height: 200 mm for one block and one joint.
 - .3 Jointing: concave and smooth where they will be visible.
- .2 Build masonry plumb, level, and true to line, with vertical joints in alignment.
- .3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.3 CONSTRUCTION

- .1 Exposed masonry:
 - .1 Remove chipped, cracked, and otherwise damaged units, in exposed masonry and replace with undamaged units.
 - .2 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects. Make cuts straight, clean, and free from uneven edges.
- .2 Building-in:
 - .1 Install masonry connectors and reinforcement where indicated on drawings. Build in items required to be built into masonry.
 - .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
 - .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.
 - .4 Install loose steel lintels centered over openings where indicated.
- .3 Concrete block lintels:
 - .1 Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated.
 - .2 End bearing: not less than 200 mm as indicated on drawings.
- .4 Interface with other work:
 - .1 Cut openings in existing work as indicated.
 - .2 Openings in walls: approved by the Departmental Representative.
 - .3 Make good existing work. Use materials to match existing.
 - .4 Overlap joints to a width of 150 mm and seal with adhesive.

3.4 REINFORCING AND CONNECTING

- .1 Install masonry connectors and reinforcement in accordance with CAN/CSA-A370, CAN/CSA-A371 and CSA S304.1.
- .2 Prior to placing grout and mortar, obtain the Departmental Representative's] approval of placement of reinforcement and connectors.

3.5 REINFORCED LINTELS AND BOND BEAMS

- .1 Reinforce masonry lintels and bond beams as indicated.
- .2 Place and grout reinforcement in accordance with CAN/CSA-A179, CAN/CSA-A371.

3.6 GROUTING

- .1 Grout masonry in accordance with CAN/CSA-A179, CAN/CSA-A371 and as indicated.

3.7 ANCHORS

- .1 Supply and install metal anchors as indicated.

3.8 LATERAL SUPPORT AND ANCHORAGE

- .1 Supply and install lateral support and anchorage in accordance with CSA S304.1 and as indicated.

3.9 SITE TOLERANCES

- .1 Tolerances of CAN/CSA-A371 apply.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Section [01 74 00- Cleaning] .
- .2 Leave Work area clean at end of each day.
- .3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning .

3.11 PROTECTION

- .1 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
- .2 Repair damage to adjacent materials caused by masonry products installation.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 22 16 – Non-structural metal framing.
- .2 Section 09 91 23– Paintings - Interior new works; for the painting of equipment mounting panels.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM A 123/A 123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A 653/A 653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvaneal) by the Hot-Dip Process.
 - .3 ASTM D 1761-06, Standard Test Methods for Mechanical Fasteners in Wood.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN / CGSB-71.26-FM88, Adhesive for bonding plywood to wood frame construction on floors.
- .3 CSA Group (CSA)
 - .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O121-08, Douglas Fir Plywood.
 - .3 CSA O141-05(R2009), Softwood Lumber.
 - .4 CSA O151-09, Canadian Softwood Plywood.
 - .5 CAN/CSA-Z809-08, Sustainable Forest Management.
- .4 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
- .5 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2008.
- .6 Sustainable Forestry Initiative (SFI)
 - .1 SFI-2010-2014 Standard.

1.3 ACTION AND INFORMATION 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 wood products and their accessories and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 QUALITY ASSURANCE

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA standards.
- .3 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions 01 61 00- Common Product Requirements.
- .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 off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect wood from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 – Cleaning.

PART 2 - PRODUCTS

2.1 FRAMEWORK ELEMENTS, STRUCTURAL ELEMENTS AND PANELS

- .1 Description
 - .1 Characteristics related to sustainable development
 - .1 Plywood and Oriented Urea Formaldehyde Free Oriented Particleboard (OSB) panels certified to CAN / CSA-Z809 or FSC or SFI.
- .2 Lumber: softwood with S4S finish (bleached on 4 sides) with a moisture content of no more than 19% (R-SEC).
 - .1 Complies with CSA O141.
 - .2 Complies with NLGA Classification Rules for Canadian Lumber.
- .3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
 - .1 Board sizes: "Standard" or better grade.
 - .4 Dimension sizes: "Standard" light framing or better grade.
 - .5 Post and timbers sizes: "Standard" or better grade.
- .4 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .5 Canadian softwood plywood (CSP): to CSA O151, standard construction.

2.2 ACCESSOIRES

- .1 Air sealant: polyurethane foam or closed cell polyethylene foam.
- .2 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .3 All-Purpose Glue: Complies with CSA O112.9.
- .4 Nails, crampons and riders: to CSA B111.
- .5 Patented fasteners: rocker bolts, expansion pads with lag bolts, screws with lead or inorganic fiber bushings, recommended by the manufacturer.
- .6 Finishing of fasteners
 - .1 Galvanized metal: according to ASTM A65, for exterior structures and wooden structures

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for rough carpentry installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform the Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Departmental Representative.

3.2 USE OF MATERIALS

- .1 Panels for mounting electrical equipment
 - .1 Canadian Pine Fir (Douglas Fir) or Canadian Softwood Fir Plywood, Grade B1C,
with squared edges, 19 mm thick.
- .2 Concealed nailing boards
 - .1 Canadian softwood plywood with squared edges, minimum 16 mm thick, where indicated.

3.3 INSTALLATION

- .1 Install elements square and plumb, according to height ratings, levels and alignments.
- .2 Make continuous elements from the longest possible parts.
- .3 Install exterior wall support panels in plywood or OSB in accordance with manufacturer' written instructions.

- .4 Install furring and shims necessary to move away from walls and support cabinet wall and ceiling finishes, liners, curbs, mounting panels for electrical equipment and other structures as required.
- .5 Install furring to support vertical siding where the liner cannot be nailed directly to the framing.
 - .1 Install furring and shims in order to ensure flatness and verticality of structures, the permissible deviation being 1: 600.
- .6 Install around bays false frames, nailing strips and trim to support frames and other structures.
- .7 Install nailing bases and nailing strips to secure the elements to gypsum board walls and ceilings. Screw plywood panels securely into wood or metal frames; use sheet metal brackets as needed.
- .8 Install battens and battens, nailing bases, nailing rods, members and other required wood supports, and secure with galvanized fasteners.
- .9 Install joists as indicated.
- .10 Do not work with particle board without taking the necessary precautions. use dust collectors and wear a high quality respirator to cut or sand wood panels.
- .11 Assemble, anchor, fasten, fasten and contravene components to provide strength and rigidity.
- .12 If necessary, mill holes so bolt heads do not protrude.
- .13 Use only stainless steel screws to secure fireproof mounting panels.

3.4 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.

3.5 PROTECTION

- 1. Protect installed equipment and components from damage during construction.
- 2. Repair damage to adjacent materials and equipment by installing carpentry elements.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Carpentry.
- .2 Section 09 21 16 – Gypsum board assemblies.
- .3 Section 09 22 16 – Non-structural metal framing.

1.2 REFERENCE STANDARDS

- .1 CSA Group
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples
- .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702-2012, Standard for Mineral Fibre Insulation for Buildings.

1.3 ACTION AND INFORMATION 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 blanket insulation and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions 01 61 00- Common Product Requirements.
- .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 in dry location, indoors, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect specified materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 - Cleaning

PART 2 - PRODUCTS

2.1 ACOUSTIC INSULATION

- .1 Blanket fiberglass insulation: to CAN/ULC S702.
 - .1 Type : 1.
 - .2 Thickness and width: as indicated.
 - .3 Density: at least 9 kg/m3.
 - .4 Colour : rose
 - .5 Without formaldehyade.
- .2 Blanket mineral (rock wool) insulation: conformes à la norme CAN/ULC S702.
 - .1 Type : 1.
 - .2 Thickness and width: as indicated.
 - .3 Density: 40 kg/m3.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for blanket insulation application in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of the Departmental Representative.
 - .2 Inform the Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 LOCATION

- .1 In addition to the locations indicated on the drawings, install 76 mm thick mineral fiber acoustical insulation above all rooms with a gypsum ceiling.

3.3 INSULATION INSTALLATION

- .1 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .2 Do not compress insulation to fit into spaces.
- .3 Do not enclose insulation until it has been inspected and approved by the Departmental Representative.

3.4 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.

END OF SECTION

PART 1- GENERAL

1.1 DESCRIPTION OF WORK SUBJECT TO THIS SECTION

- .1 Provide fire and smoke protection systems consisting of a material or combination of materials installed to maintain the fire resistance of the fire separation by providing an effective barrier against the spread of flame, smoke, heat and / or hot gases through penetrations, rough openings, construction joints, or at the perimeter of a fire containment structure within or near a separation firebreak, in accordance with the requirements of the National Building Code.
- .2 Use only fire and smoke resistant systems tested by tests in the following locations, but not limited to:
 - .1 Technical penetrations for the passage of ventilation ducts, cable trays, pipes, shielded bars and pipes in empty or large openings, vertical fire separations (walls and partitions), horizontal openings with a cut-off separation. (sets of floors / ceilings) as well as in walls of vertical ducts and partitions forming a fire separation.
 - .2 Openings between independent sections of walls or ceilings with fire separation.
 - .3 Seals at the base of walls or joints installed between two walls (plasterboard and concrete wall or concrete blocks).
 - .4 Wall and ceiling joints, floors or roofs, sliding joints or concrete removal joints.
 - .5 Boxes of electrical and mechanical equipment built in through a wall with a fire resistance rating.
 - .6 Expansion joints between vertical and horizontal fire separations.
 - .7 Systems designed and installed to allow movement (expansion) in all joints, according to architectural and structural drawings and specifications, as well as movements of plumbing and fire extinguishers during activation of these. systems.
 - .8 Openings around structure elements penetrating horizontal and vertical fire separations at walls with a fire resistance rating.
- .3 A degree of fire resistance is required for all fire separations as shown in the drawings. Both sides of a fire separation with no degree of fire resistance shall be provided with a proven fire and smoke barrier equal to or greater than F, as indicated.
- .4 Multiple technical penetration of a fire separation shall have a minimum spacing equal to the diameter of the smallest pipe, at least 50 mm, between the pipes, to be considered penetration of a single equipment. Penetrations in the case of a spacing of less than 50 mm or as indicated will be classified as multiple penetrations. Provide an opening with a square or rectangular frame around the penetrations and protect the entire opening with a fire and smoke barrier system.
- .5 This section covers materials and / or systems intended to serve as a means of fire and smoke protection to prevent the passage of fire, hot gases and toxic smoke in the fire protection, for the purposes determining the fire resistance rating of a wall, floor, ceiling or roof assembly. It applies to any penetrating floor, termination device through a wall, a rough opening, a gap, a void or any seal or opening without penetration, and is intended to form an airtight barrier to

airflow within the interior of the building used to delay the passage of smoke or flames or between these systems.

1.2 RELATED REQUIREMENTS

- .1 Section 09 21 16 – Gypsum board assemblies.
- .2 Divisions 22, 23 et 26 – Plumbing, Ventilation and Electricity.

1.3 REFERENCE STANDARDS

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .2 National Research Council Canada (NRC)
 - .1 National Building Code of Canada 2015 (NBC).
- .3 Underwriter's Laboratories of Canada (ULC)
 - .1 ULC-S115- 1995, Fire Tests of Fire stop Systems.

1.4 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, cable trays, conduits, ducts and pipes and poke-through termination devices, including electrical outlet boxes along with their means of support through wall or floor openingsEnsembles coupe-feu à composant unique : éléments ou matériaux coupe-feu faisant l'objet d'un dessin normalisé, utilisés seuls comme protection coupe-feu, sans isolant pour température élevée ou autres matériaux/matériels assimilés.
- .2 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.
- .3 Traversées parfaitement étanches (CNB, 3.1.9.1(1) et 9.10.9.6(1)) : dont les manchons ou fourreaux sont noyés dans le béton, dans le cas des bâtiments incombustibles, ou qui ne présentent aucun vide annulaire, dans le cas des bâtiments combustibles.
 - .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.

1.5 ACTION AND INFORMATION SUBMITTALS

- .1 Provide submittals in accordance with Section [01 33 00- Submittal Procedures].
- .2 Product Data:
 - .1 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:
 - .1 Submit duplicate 300 x 300 mm samples showing actual fire stop material proposed for project.
- .5 Quality assurance submittals: submit the following documents.
 - .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, cleaning procedures

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section [01 61 00- Common Product Requirements] .
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 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 in dry location indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
 - .1
- .3 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 – Cleaning

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 CAN-ULC-S115 and not to exceed opening sizes for which they are intended and conforming to specified special requirements described in PART 3.
 - .2 Degree of fire resistance of the fire assembly: according to the fire resistance indicated for the crossed assembly.
- .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.
- .8 Water (if applicable): 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.

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.
 - .1 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 unpenetrated 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 SEQUENCE OF OPERATION

- .1 Proceed with installation only when submittals have been reviewed by the Departmental Representative.
- .2 Install floor fire stopping before interior partition erections.
- .3 Metal deck bonding: fire stopping to precede spray applied fireproofing to ensure required bonding.
- .4 Mechanical pipe insulation: [certified] fire stop system component.
 - .1 Ensure pipe insulation installation precedes fire stopping.

3.5 FIELD QUALITY CONTROL

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

3.6 CLEANING

- .1 Proceed in accordance with Section 01 74 11- Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.
- .3 Remove temporary dams after initial set of fire stopping and smoke seal materials.

3.7 LOCATION OF FIREPROOF SYSTEMS

- .1 Provide fire and smoke protection at the locations indicated below.
 - .1 Crossings of masonry, concrete and plasterboard partitions and walls with an upper part of masonry or plasterboard partitions or walls with a fire resistance rating.
 - .2 Intersections of masonry or plasterboard walls or walls with a fire resistance rating.
 - .3 Floors of floors, ceilings and roofs with a degree of fire resistance.
 - .4 Access and passage openings in fire partitions for future use.
 - .5 Perimeter of pipes and other mechanical and electrical equipment passing through fire walls.
 - .6 Rigid ducts of section greater than 129 cm²: fire protection made by means of a bead of fireproof material placed between the retaining angle and the firewall and between the retaining angle and the duct, on both sides of the firewall

END OF SECTION

PART 1 – GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Carpentry
- .2 Section 09 21 16 – Revêtements en plaques de plâtre.
- .3 Section 09 22 16 – Non-structural metal framing.

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C919-[08] , Standard Practice for Use of Sealants in Acoustical Applications.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 19-GP-5M-1984 , Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
 - .2 CAN/CGSB-19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .3 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
 - .4 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).

1.3 ACTION AND INFORMATION 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 joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Manufacturer's product to describe:
 - .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
 - .3 Submit [2] copies of WHMIS SDS in accordance with Section 01 35 43- Environmental Procedures.
- .3 Samples:
 - .1 Submit [2] samples of each type of material and colour.
 - .2 Cured samples of exposed sealants for each colour where required to match adjacent material.

- .4 Manufacturer's Instructions:
 - .1 Submit instructions to include installation instructions for each product used.

1.4 CLOSEOUT SUBMITTALS

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

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions 01 61 00- Common Product Requirements.
- .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 off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect joint sealants from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Proceed with installation of joint sealants only when:
 - .1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - .2 Joint substrates are dry.
 - .3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
- .2 Joint-Width Conditions:
 - .1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENT

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (SDS) acceptable to Health Canada.
- .2 Ventilate area of work as directed by the Departmental Representative by use of approved portable supply and exhaust fans.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 SEALANT MATERIAL DESCRIPTIONS

- .1 Type 21: Soundproofing Sealant, Flexible Synthetic Rubber, Concealed Sealant: to ASTM C919 and CAN / CGSB-19.21, VOC content less than 250 g / L.
- .2 Type 22: One-component Silicone Acrylic Latex Sealant, for non-concealed, paintable sealant: to ASTM C919, VOC content less than 250 g / L.
 - .1 Movement capacity of $\pm 12.5\%$.
- .3 Preformed, compressible and non-compressible seam
 - .1 Elements made of polyethylene foam, urethane, neoprene or vinyl.
 - .1 Extruded cellular foam filling rods.
 - .2 Oversized elements from 30 to 50%.
 - .2 Neoprene or rubber-butyl parts.
 - .1 Round and solid rods with a Shore A hardness of 70.
 - .3 High density foam elements.
 - .1 Extruded cellular PVC foam extruded cellular polyethylene foam with Shore A hardness of 20 and tensile strength of 140 to 200 kPa, extruded polyolefin foam, density of 32 kg / m³, or neoprene, recommended by the manufacturer.
- .4 Anti-seizing tape.
 - .1 Polyethylene tape that does not adhere to the sealant.

2.3 LOCATION OF SEALANTS

- .1 Interior frames, as indicated and detailed: type 22 product.
- .2 Apparent control joints in drywall constructions: product type 22.
- .3 Concealed control joints in drywall constructions: product type 21

2.4 JOINT CLEANER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.
- .2 Primer: in accordance with sealant manufacturer's written recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for joint sealants installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of the Departmental Representative.
 - .2 Inform the Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 SURFACE PREPARATION

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

- .1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

- .1 Sealant :
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - .3 Apply sealant in continuous beads.

- .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .8 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
- .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Clean adjacent surfaces immediately.
 - .3 Remove excess and droppings, using recommended cleaners as work progresses.
 - .4 Remove masking tape after initial set of sealant.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

PART 1- GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 91 23 – Interior painting.

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 CSA Group (CSA)
 - .1 CSA-G40.20-F04/G40.21-F04 (C2009), Exigences générales relatives à l'acier de construction laminé ou soudé/Aciers de construction.
 - .2 CSA W59-F03 (c2008), Construction soudée en acier (soudage à l'arc).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2000.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA 80-2010, Standard for Fire Doors and Fire Windows.
 - .2 NFPA 252-03, Standard Methods of Fire Tests of Door Assemblies.
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
- .2 CAN4-S105M-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements
 - .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.

1.4 ACTION AND INFORMATION SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00- Submittal Procedures.
- .2 Provide product data: in accordance with Section 01 33 00- Submittal Procedures.

- .3 Provide shop drawings: in accordance with Section 01 33 00- Submittal Procedures.
 - .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, glazed openings, arrangement of hardware fire rating and finishes.
 - .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings finishes.
 - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .4 Provide samples in accordance with Section 01 33 00- Submittal Procedures.
- .5 Submit one 300 x 300 mm corner sample of each type of frame.
 - .1 Show glazing stops and butt cutout.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse/recycling] in accordance with Section 01 74 11 - Cleaning.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.2 DOOR CORE MATERIALS

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

2.3 ADHESIVES

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

2.4 PRIMER

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

2.5 PAINT

- .1 Field paint steel doors and frames in accordance with Section 09 91 23- Interior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSOIRES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Horizontal closure profiles at the top of exterior doors: Rigid PVC extruded profiles to CGSB 41-GP-19Ma.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.

2.7 FRAME 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, knocked-down and or welded
- .4 Blank, reinforce, drill and tap frames for mortised, templated hardware, electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware. Les mortaises doivent être protégées au moyen de couvre-mortaises en acier.
- .5 Mortises must be protected with steel mortice covers.
- .6 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
- .7 Manufacturer's nameplates on frames and screens are not permitted.
- .8 Conceal fastenings except where exposed fastenings are indicated.
- .9 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 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre maximum.

2.9 FRAMES: WELDED TYPE

- .1 Welding in accordance with CSA W59.
- .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 Securely attach floor anchors to inside of each jamb profile.
- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.10 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Longitudinal edges of doors must be welded. The longitudinal joint must be visible.
- .3 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .4 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .5 Reinforce doors where required, for surface mounted hardware.
- .6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .7 Manufacturer's nameplates on doors are not permitted.

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 INSTALLATION GENERAL

- .1 Install doors and frames to CSDMA Installation Guide.

3.3 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.

- .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 1200 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.

3.4 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Doors Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor and thresholds 13 mm.
- .3 Adjust operable parts for correct function.

3.5 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation.
- .2 Fill exposed frame anchors [surfaces with imperfections] with metallic paste filler and sand to a uniform smooth finish.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 06 10 00 – Carpentry; for blocking and nailing strips.
- .2 Section 07 21 16 – Blanket insulation
- .3 Section 07 84 00 – Fire stopping.
- .4 Section 07 92 00 – Joint sealants.
- .5 Section 09 22 16 – Non-structural metal framing.
- .6 Section 09 91 23 – Interior painting.

1.2 RÉFÉRENCES

- .1 ASTM International
 - .1 ASTM C475-02 (2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
 - .3 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .4 ASTM C1047-10a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .5 ASTM C1280-09, Standard Specification for Application of Gypsum Sheathing.
 - .6 ASTM C1177/C1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .7 ASTM C1178/C1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 - .8 ASTM C1396/C1396M-11, Standard Specification for Gypsum Wallboard.
 - .9 ASTM C1629 / C1629M - 06(2011) Standard Classification for Abuse-Resistant Non decorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels.
- .2 Association of the Wall and Ceilings Industries International (AWCI)
 - .1 AWCI Levels of Gypsum Board Finish-97.

1.3 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 board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit for review and acceptance of each component specified or necessary for complete installation.
 - .2 Submit duplicate 300 x 300 mm size samples of 300 mm long samples of insulating strip corner beads.
 - .3 Samples will be returned for inclusion into work.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements 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 and applicable standard designation.
- .3 Entreposage et manutention
 - .1 Store gypsum board assemblies materials level flat indoors, in dry location, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
 - .3 Protect gypsum board from direct exposure to rain, snow, sunlight, or other excessive weather conditions.
 - .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .5 Replace defective or damaged materials with new.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 - Cleaning.

1.6 AMBIANT CONDITIONS

- .1 Maintain temperature 10 °C minimum, 21 °C maximum for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, clean, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

PARTIE 2 PRODUCTS

2.1 MATERIALS

- .1 Standard board: to ASTM C1396/C1396M Type X, and regular, indicated thickness, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Metal furring runners, hangers, tie wires, inserts, and anchors: to ASTM C840.
- .3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .4 Resilient clips : 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .5 Steel drill screws: to ASTM C1002-14.
- .6 Laminating compound: as recommended by manufacturer, asbestos-free.
- .7 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, galvanized metal or zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .8 Sealants: in accordance with Section 07 92 00- Joint Sealants.
 - .1 Acoustic sealant: in accordance with Section 07 92 00- Joint Sealants.
- .9 Insulating strip: rubberized, moisture resistant, 3mm thick cork closed cell neoprene strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .10 Joint compound: to ASTM C475, asbestos-free.

PARTIE 3 EXECUTION

3.1 EXAMEN

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for gypsum board assemblies installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of the Departmental Representative.
 - .2 Inform the Departmental Representative] of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied

3.2 ERECTION

- .1 Do application and finishing of gypsum board to ASTM C840-16 except where specified otherwise.
- .2 Install work level to tolerance of 1:1200.
- .3 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, as indicated.
- .4 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

- .5 Install furring to fasten gypsum board forming vertical partitions to suspended ceiling or true ceiling, as applicable.
- .6 Install wall furring for gypsum board wall finishes to ASTM C840–16, except where specified otherwise.
- .7 Furr openings and around built-in equipment, cabinets, access panels. Consult the equipment supplier for the required clearances.
- .8 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .9 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply double or single layer gypsum board to metal furring or framing using for first layer screw fasteners, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C840-16.
 - .2 Apply gypsum board on walls vertically or horizontally, providing sheet lengths that will minimize number of board edges or end joints.
 - .2 Double-Layer Application:
 - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
 - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
 - .3 Apply base layers at right angles to supports unless otherwise indicated.
 - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least [250] mm with base layer joints.
- .3 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitons whose perimeter is lined with an acoustic sealant. Coordinate the installation of the acoustic sealants with the fire seal provided in Section 07 84 00 Fire Stopping
- .4 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .5 Do not install damaged or damp boards.
- .6 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 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 elements at 150 mm on centre. Install casing beads around perimeter of suspended ceilings.
- .2 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated.
- .3 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .4 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .5 Locate control joints where indicated.
- .6 Install control joints straight and true
- .7 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .8 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.
- .9 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
 - .1 Level 4: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

3.5 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.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by gypsum board assemblies installation.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 21 16 – Gypsum board assemblies

1.2 REFERENCE STANDARDS

- .1 Standards Council of Canada:
 - .1 CAN/CSA- CSA S136-12 North American Specification for the Design of Cold Formed Steel Structures Members Welding Requirements
- .2 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C645-14e1, Standard Specification for Nonstructural Steel Framing Members.
 - .2 ASTM C754-15, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - .3 ASTM A653 / A653M - 15e1 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .3 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.40-97, Alkyd resins anticorrosive primer paint for structural steel
- .4 ULC underwriter laboratories of Canada – Fire resistance assemblies
- .5 American Iron Steel Institute
 - .1 AISI S220-15 - North American Standard for Cold-Formed Steel Framing - Nonstructural Members
 - .2 AISI S201-12 - North American Standard for Cold-Formed Steel Framing - Product Data

1.3 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 metal framing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit duplicate 300 mm long samples of non-structural metal framing.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.
- .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, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect metal framing from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 - Cleaning.

PARTIE 2 PRODUCTS

2.1 MATERIALS

- .1 Non-structural structure of metal sections: posts with mechanical opening minimum 0.46mm (0.0179 ") thick before galvanizing for regular walls. For fire resistance assemblies, respect the minimum thickness prescribed in the assemblies listed in the plans and specifications. At all times, the profiles must comply with ASTM C645 including the prescribed thickness.
 - .1 Grade of steel: minimum of 33ksi in accordance with ASTM C645
 - .2 Galvanization: minimum 0.40 oz per square foot in accordance with ASTM 653
 - .3 Dimensions: as shown on the drawings.
 - .4 Propriété sectionnelle : maximum 50% selon AISI-S201
 - .5 Sectional property: maximum 50% according to AISI-S201
 - .6 Identification: Each component delivered to the site must be identified individually according to the ASTM C645 / AISI S220 code required.
- .2 Floor and ceiling tracks minimum of 0.46mm (0.0179 inch) thick before galvanizing.
 - .1 Grade of steel: minimum of 33ksi in accordance with ASTM C645
 - .2 Galvanization: minimum 0.40 oz per square foot in accordance with ASTM 653
 - .3 Dimension: width appropriate to the dimensions of the studs and provided with folded plates 32mm high.
 - .4 Identification: Each component delivered to the site must be identified individually according to the ASTM C645 / AISI S220 code required.
- .3 Floor and ceiling tracks jambs minimum of 0.46mm (0.0179 inch) thick before galvanizing,
 - .1 Grade of steel: minimum of 33ksi in accordance with ASTM C645

- .2 Galvanization: minimum 0.40 oz per square foot in accordance with ASTM 653
- .3 Dimension: width appropriate to the dimensions of the studs and provided with folded plates 50 mm high.
- .4 Identification: Each component delivered to the site must be identified individually according to the ASTM C645 / AISI S220 code required.
- .4 Pre perforated upper deflection tracks minimum of 0.46mm (0.0179 inch) thick before galvanizing,
 - .1 Grade of steel: minimum of 33ksi in accordance with ASTM C645
 - .2 Galvanization: minimum 0.40 oz per square foot in accordance with ASTM 653
 - .3 Dimension: width appropriate to the dimensions of the studs and provided with folded plates 64mm high.
 - .4 Opening: 4.8 x 38 mm minimum
 - .5 Identification: Each component delivered to the site must be identified individually according to the ASTM C645 / AISI S220 code required.
- .5 Metal channel stiffener :
 - .1 Sections in "C" 1.12mm (0.044po) thick
 - .2 Grade of steel: minimum of 33ksi in accordance with ASTM C645
 - .3 Galvanization: minimum 0.40 oz per square foot in accordance with ASTM 653
 - .4 Dimensions : as required.
- .6 Acoustical sealant: in accordance with Section 07 92 00- Joint Sealants.
 - Sealants for joints.
 - .1 Acoustic sealant : in accordance with Section 07 92 00 – Joint Sealants
- .7 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

PARTIE 3 EXECUTION

3.1 EXAMINATION

- .1 Quality Control: Steel thicknesses and dimensions must be approved prior to installation of materials and cannot be installed without the written approval of the professional.
 - .2 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of the Departmental Representative.
 - .2 Inform the Departmental Representative of unacceptable conditions immediately upon discovery.
- Proceed with installation after unacceptable conditions have been remedied.

3.2 ERECTION

- .1 Erect partitions in accordance with framing requirements of ASTM C754 and the ULC fire assemblies requirements.

- .2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .3 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .4 Place studs vertically at 50mm from abutting walls, and at each side of openings and corners.
 - .1 Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .5 Erect metal studding to tolerance of 1:1000.
- .6 Attach studs to bottom and ceiling tracks using screws.
- .7 Co-ordinate simultaneous erection of studs with installation of service lines. Align web openings when erecting studs.
- .8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .9 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .10 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .11 Extend partitions to ceiling height except where noted otherwise on drawings.
- .12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs, follow details on the drawings.
 - .1 Install the upper perforated tracks with 64mm wings.
- .13 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .14 Install insulating strip under studs and tracks around perimeter of sound control partitions.

3.3 CLEANING

- .1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 21 16 – Gypsum board assemblies.

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM F 150: «Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring».
 - .2 ASTM F 710 : « Practice for preparing concrete floors to receive resilient flooring ».
 - .3 ASTM E 648 : « Test method for critical radiant flux of floor covering systems using a radiant heat energy source ».
 - .4 ASTM E 662 : « Test method for specific optical density of smoke generated by solid materials
 - .5 ASTM F1344-10, Standard Specification for Rubber Floor Tile.
 - .6 ASTM F 1869 : « Standard test method for measuring moisture vapor emission rate of concrete subfloor using anhydrous calcium chloride ».
 - .7 ASTM F 2170 : « Determining relative humidity in concrete floor slabs using in situ probes ».
- .2 ASTM International
 - .1 ASTM F 1066-04(2010) e1, Standard Specification for Vinyl Composition Floor Tile.
 - .2 ASTM F 1344-12e1, Standard Specification for Rubber Floor Tile.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.

1.3 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 resilient tile flooring and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit duplicate vinyl and rubber tile in size specified and border 300 mm long.

.4 Documents / Deliverables upon Completion.

- .1 Provide maintenance sheets for flexible tile floor coverings and attach to the manual referred to in Section 01 78 00 Documents / Components to be submitted upon completion of the work

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00- Common Product Requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Manage and sort waste for reuse and recycling in accordance with Section 01 74 11 - Cleaning.

1.6 AMBIANTE CONDITIONS

- .1 Maintain the ambient temperature in the area of application and the temperature of the substrate to receive the coating above 20 degrees Celsius for a period of 48 hours before laying, throughout the installation and during 48 hours after completion of this work.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Anti-Static Vinyl Tiles: to ASTM F1700, Class 1 printed pattern, type A, asbestos-free composition, smooth surface, homogeneous, 3.2 mm thick and 305 x 305 mm. Indicated CV1 tiles in the drawings.
 - .1 These tiles will be used, among others, in the telecom room.
 - .2 These tiles must conduct electricity either in the conductive domain (CVT) or in the dissipative domain (SDT).
 - .3 Complies with EOS / EDS 7.1S (ASTM-F150).
 - .4 Floorscore certified gray color.
 - .5 Acceptable products:
 - .1 Electrotile from American Brite, low gloss gray color
 - .2 Colorex EC by Forbo, quartz color
 - .3 Armstrong SDT, colour fossil gray.
- .2 Flexible baseboards: continuous, supported on the floor covering, with pre-molded end pieces and protruding corners, in accordance with the requirements of ASTM F1861, Type TP, Group 1.
 - .1 Type **CA1**: thermoplastic rubber;
 - .2 Model : grooved
 - .3 Thickness : 3.17 mm;
 - .4 Height :
 - .1 **CA1** : 102 mm;
 - .5 Length : in roll of 30.48 m;
Colours: matching the adjacent tiles.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written requirements, recommendations, and specifications, including any available technical bulletins, instructions for handling, storing, and implementing products, and data sheet instructions

3.2 INSPECTION

- .1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer.

3.3 TRAVAUX PRÉPARATOIRES

- .1 Prepare the substrates according to the manufacturer's recommendations for the coating to be installed.
- .2 Before installation, measure the moisture content of the concrete as well as the pH and ensure that the results comply with the manufacturer's specifications.
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .5 Seal the concrete slab or concrete surfaces according to the written instructions of the manufacturer of the resilient flooring.

3.4 TILE APPLICATION

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.
- .4 Arrange the tiles in square grid pattern with aligned joints and parallel to the length of the room.
- .5 As the work progresses, and immediately after installation, pass a cylinder of at least 45 kg on the tiles, in both directions, to ensure perfect adhesion.
- .6 Cut tile and fit neatly around fixed objects.
- .7 Install feature strips and floor markings where indicated. Fit joints tightly.
- .8 Install flooring in pan type floor access covers. Maintain floor pattern.
- .9 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .10 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

- .11 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 QUALITY CONTROL ON SITE

- .1 On-site inspections by the resilient floor manufacturers.
 - .1 The various manufacturers must make recommendations on the use of the product (s), and make periodic visits to verify whether the implementation has been carried out in accordance with its recommendations.

3.6 CLEANING

- .1 Perform cleaning according to section 01 74 11 - Cleaning.
- .2 Carefully remove excess adhesive from the floor, baseboards and walls.
- .3 Clean, seal and wax vinyl tile according to the flooring manufacturer's written instructions.

3.7 PROTECTION DES SURFACES FINIES

- .1 Protect the floor covering of newly coated floors from the moment of final setting of the adhesive until the final inspection.
- .2 Prohibit traffic on coated floors for 48 hours after flooring installation

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 06 20 00 – Carpentry.
- .2 Section 08 11 10 – Metal doors and frames.
- .3 Section 09 21 16 – Non-structural metal framing.

1.2 NORMES DE RÉFÉRENCE

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (LCPE), (1999), ch. 33.
- .2 Environmental Protection Agency (EPA)
 - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (SDS).
- .4 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada 2015 (NFC).
- .6 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transports Canada (TC)
 - .1 Transportation of Dangerous Goods act, ch.34

1.3 QUALITY ASSURANCE

- .1 Qualifications
 - .1 Paint work must be performed by qualified workers.
 - .2 Apprentices: may be employed provided they work under direct supervision of qualified journeyman in accordance with trade regulations.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00- Submittal Procedures.
- .2 Data Sheets
 - .1 Submit data sheets and instructions required for each type of paint or coating used in the production of the coating.
 - .2 Submit data sheets for the application or use of paint thinner.
 - .3 Submit two (2) Material Safety Data Sheets required under the Workplace Hazardous

Materials Information System (WHMIS), which must comply with this system, in accordance with Section 01 33 00 - Submittal Procedures. records must indicate the VOC emission rate of the products during application and cure

- .3 Samples
- .1 Submit samples of all available colors if products are manufactured in a limited color range.
 - .2 Provide two (2) 200 mm x 300 mm sample panels of each required paint of each color, texture and degree of gloss or gloss required in accordance with the requirements of the MPI Architectural Painting Specification Manual, using the substrate materials listed below.
 - .1 Use a 3 mm thick steel plate for products applied to a metal substrate.
 - .2 Use 13 mm thick poplar plywood panel for products applied to a wooden substrate.
 - .3 Use 13 mm thick plasterboard for coating products applied to drywall and other smooth surfaces.
 - .3 Conserver sur le chantier même les échantillons de l'ouvrage examinés afin d'indiquer la norme minimale de qualité jugée acceptable pour les revêtements de surface réalisés sur place.
 - .4 Test reports: Provide certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Lead, cadmium and chromium: presence of and amounts.
 - .2 Mercury: presence of and amounts.
 - .3 Organochlorines and PCBs: presence of and amounts.
 - .5 Certificates: Provide certificates signed by manufacturer certifying that Materials comply with specified performance characteristics and physical properties.
 - .6 Manufacturer's Instructions:
 - .1 Provide manufacturer's installation [application] instructions.
 - .7 Upon completion, provide records of products used, submit the following information for maintenance work for inclusion in the manual specified in Section 01 78 00 - Closeout Submittals
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour number s.
 - .4 MPI Environmentally Friendly classification system rating.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements] [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.
 - .1 Labels: to indicate:
 - .1 Type of paint or coating.
 - .2 Compliance with applicable standard.
 - .3 Colour number in accordance with established colour schedule.

- .3 Remove damaged and unauthorized materials and products from site
- .4 Storage and Handling Requirements:
 - .1 Provide a safe storage area, kept dry and maintained at a controlled temperature, and maintain it properly.
 - .2 Store materials and products away from heat sources.
 - .3 Store materials and products in a well-ventilated area with temperatures between 7 degrees Celsius and 30 degrees Celsius
- .5 The storage temperature of temperature-sensitive products must never be lower than the minimum temperature recommended by the manufacturer.
- .6 Keep areas used for storage, cleaning and surface preparation clean and in good order. Once the work is done, return these areas to their original state of cleanliness.
- .7 Remove from the storage area only the quantities of products that will be implemented the same day.
- .8 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 (NFC).
- .9 Waste Management and Disposal
 - .1 Separate waste materials for reuse and / or recycling in accordance with Section 01 74 00 - Cleaning.
 - .2 Handle and dispose of hazardous materials in accordance with CEPA.
 - .3 Ensure empty containers are sealed and stored properly for disposal.
 - .4 Dispose of unused paint products to approved hazardous material collection site accepted by Departmental Representative.
 - .5 Paints, as well as related products such as thinners and solvents, are considered hazardous materials and, as such, are subject to applicable regulations for their disposal. Information on relevant legislation can be obtained from provincial ministers responsible for the environment and the relevant regional governments.
 - .6 Products that cannot be reused must be treated as hazardous waste and disposed of properly.
 - .7 Place hazardous or toxic materials and products, including used tubes and containers of adhesive and sealant, in designated areas or receptacles intended to receive hazardous waste.
 - .8 To reduce contamination of soil or waterways and sanitary and stormwater systems, strictly follow the following guidelines.
 - .1 Store the water used for cleaning in the case of paints and other water-based products so that the various deposited materials can be collected by filtration.
 - .2 Store cleaning products, thinners, solvents and excess paint in designated containers and dispose of properly.
 - .3 Store oil and solvent-soaked rags used in paint work to recover and dispose of contaminants, or to clean rags appropriately, as appropriate.
 - .4 Arrange for the removal of contaminants in accordance with the Hazardous Waste Regulations.

- .5 Allow empty paint containers to dry before disposal or recycling (in areas with appropriate facilities).
- .9 Where paint recycling service is available, collect surplus paint, sort by product type, and plan for shipment to collection or recycling facility.

1.6 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

- .1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
- .2 Provide continuous ventilation for 7 days after completion of application of paint.
- .3 Co-ordinate use of existing ventilation system with the 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 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels

- .1 Unless pre-approved written approval by product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - .5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - .6 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
- .2 Perform painting work when maximum moisture content of the substrate is below:
 - .1 Moisture content 15 % maximum for wood
 - .2 Moisture content 12 % maximum for plaster and gypsum board
 - .3 Test for moisture using calibrated electronic Moisture Meter
 - .4 Test plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

- .1 Apply paint finish 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 to adequately prepared surfaces and to surfaces within moisture limits.
- .3 Apply paint when previous coat of paint is dry or adequately cured.

.1

- .4 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

PART 2- PRODUITS

2.1 MATERIALS

- .1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 The products used, whether primers or printing products, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents and others, must appear on the List of Approved Products presented in the MPI Architectural Painting Specification Manual.
- .6 Linseed oil, shellac lacquer and turpentine must be premium quality products on the MPI Architectural Painting Specification Manual and must be compatible with other coating products used.
- .7 The paint products used must comply with the requirements for obtaining the "Environmental Choice" E3 MPI, granted according to the content of volatile organic compounds (VOCs) determined according to method number 24 of the Environmental Protection Agency (EPA).
- .8 Paints, coatings, adhesives, solvents, cleaning products, lubricants and other products used must have the following characteristics:
 - .1 water based products;
 - .2 non-flammable products;
 - .3 products manufactured without any ozone depleting compounds in the upper atmosphere;
 - .4 products manufactured without any compound that promotes smog formation in the lower atmosphere;
 - .5 products not containing methylene chloride (dichloromethane), no chlorinated hydrocarbons and no toxic metallic pigments;
- .9 Formulate and prepare water-based coatings that do not contain any aromatic solvents, halogenated solvents, formaldehyde, mercury, lead, cadmium, hexavalent chromium or any of their derivatives.
- .10 Flash point: 61.0 degrees Celsius or higher for water-based coatings and recycled water-based coatings.

- .11 The preparation and application of water-based coatings and recycled water-based coatings shall under no circumstances release:
- .1 material capable of generating a biochemical oxygen demand (BOD) greater than 15 mg / L in the undiluted effluent of a production facility that discharges into a natural watercourse or a water treatment facility used with no secondary treatment;
 - .2 material carrying total suspended solids (TSS) greater than 15 mg / L in the case of an undiluted effluent discharged into a natural watercourse or wastewater treatment facility that does not provide for secondary treatment.

2.2 COLOURS

- .1 A maximum of five (5) colors will be chosen for all work and no more than three (3) colors will be used in the same sector.
- .2 The colors will be submitted at the beginning of the work, the colors chosen will match the colors chosen from the color chart of Benjamin Moore or Sico according to the following indications.
 - .1 Color P1: Among others for ceilings, walls, doors and frames, decking, steel structure, equipment / electromechanical conduits: white;
 - .2 Color P2: Among other things for glazed partitions, doors and frames, black or very dark color.
- .3 In three (3) coat paint systems, the second coat should be slightly lighter in color than the top coat to facilitate visual identification of each coat.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from the Departmental Representative for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .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. Strain as necessary.

2.4 GLOSS/SHEEN RATINGS

- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

Degree of gloss	Gloss @ 60 degrees	Gloss @ 85 degrees
1 – Matte Finish	Max. 5	Max. 10
2 – Velvet-Like Finish	Max. 10	10 to 35
3 – Eggshell Finish	10 to 25	10 to 35
4 – Satin-Like Finish	20 to 35	min. 35
5 – Semi-Gloss Finish	35 to 70	
6 – Gloss	70 to 85	
7 – High Gloss Finish	More than 85	

Gloss level ratings of painted surfaces as indicated.

2.5 INTERIOR PAINTING SYSTEMS

- .1 Structural steel and other metal assemblies: beams, columns (columns), joists (joists)
 - .1 INT 5.1R - High Performance Latex Architectural Product, Brilliance # 3 for Bracing and Metalwork columns.
 - .2 INT 5.1R - High Performance Latex Architectural Product, Gloss # 2 for beams, joists, fabricated metals, piping, ductwork, conduit support, or other steel ceiling elements
- .2 Galvanized metal: including doors, frames, railings, miscellaneous steel components, piping, raised decks / supports and ducts.
 - .1 INT 5.3M - High performance latex architectural product, gloss level # 3 for doors, frames and glazed partitions.
 - .2 INT 5.3M - High Performance Latex Architectural Product, # 2 gloss for bridging, ventilation ducts, piping, conduit supports or other galvanized steel ceiling elements
- .3 Glulam beams and studs or engineered wood.
 - .1 INT 6.1N - High performance latex architectural product, degree of gloss # 3.
- .4 Dimension lumber: columns, beams, exposed joists, underside of decking:
 - .1 INT 6.2B - High performance architectural latex, degree of gloss # 3.
- .5 Dressed lumber: including doors, door and window frames, casings, mouldings:
 - .1 INT 6.3A - High performance architectural latex, degree of gloss # 3.
- .6 Wood paneling and casework: partitions, panels, shelving, millwork:
 - .1 INT 6.4V - Polyurethane, Clear, Moisture cured flat finish.
- .7 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2B - High performance latex architectural product, # 2 gloss level for ceilings and # 3 gloss level on walls.

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 data sheet.

3.2 GENERAL

- .1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

- .1 Inspect existing substrates to determine if their condition may compromise proper preparation of surfaces to be painted or coated. Before commencing work, report to Departmental Representative, if applicable, any unsatisfactory or unfavorable damages, defects or conditions found.
- .2 Perform tests to verify the moisture content of surfaces to be painted using a properly calibrated electronic moisture meter. Do not start work until surface conditions are acceptable, within the manufacturer's recommended range.
- .3 Maximum moisture content
 - .1 Drywall: 12%.
 - .2 Wood: 15%.

3.4 PREPARATION

- .1 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 surfaces as directed by the 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 Protect building occupants and general public in and about the building.
- .2 Surface preparation
 - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
 - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
 - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of the Departmental Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural 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, and wiping with dry clean cloths.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable 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. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 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 pretreatment as soon as possible after cleaning and before deterioration occurs.
- .5 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.
- .6 Carried out during shop priming: 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, vacuum cleaning and brushing with clean brushes.
- .7 Touch up of shop primers with primer as specified.
- .8 Do not apply paint until prepared surfaces have been accepted by the Departmental Representative.

3.5 APPLICATION

- .1 Method of application to be as approved by the Departmental Representative. Apply paint by air sprayer, brush, roller, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type 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 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 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 uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes and rollers 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.
- .5 Apply coats of paint 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 inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPEMENT

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Do not paint over nameplates.
- .3 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .4 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.
- .5 Do not paint interior transformers and substation equipment.

3.7 SITE TOLERANCES

- .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
- .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of the Departmental Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by the Departmental Representative.

END OF SECTION