

Part 1 General**1.1 Related Requirements**

- .1 Section 02 41 00.08 – Demolition for Minor Works
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 09 21 16 – Gypsum Board Assemblies
- .5 Section 09 91 23 – Interior Painting

1.2 REFERENCE STANDARDS

- .1 Environmental Protection Agency (EPA)
 - .1 EPA Method 24: Determination of Volatile Organic Compound (VOC) Content in Paints, Inks, and Related Coating Products.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .3 The Master Painters Institute (MPI)
 - .1 Maintenance Repainting Manual 2015, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.
- .4 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada – 2015 (NFC)
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act (TDGA), 1992, S.C. 1992, c. 34.

1.3 QUALITY ASSURANCE

- .1 Conform to latest MPI requirements for interior repainting work including cleaning, preparation and priming.
- .2 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents) shall be in accordance with the latest edition of the MPI Approved Product List and shall be from a single manufacturer for each system used.
- .3 Paint materials such as linseed oil, shellac, reducers and turpentine shall be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.
- .4 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
- .5 Standard of Acceptance: when viewed using final lighting source surfaces shall indicate the following:

- .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.
- .3 Final coat to exhibit uniformity of colour and sheen across full surface area.
- .6 Mock-ups: construct mock-ups in accordance with Section 01 45 00 – Quality Control.
 - .1 Provide a mock-up in accordance with requirements of Section 01 45 00 – Quality Control to Departmental Representative.
 - .2 Prepare and repaint mock-up designated interior room, surface or item to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Maintenance Repainting Manual standards for review and approval.
 - .3 When approved, repainted room, surface and/or item shall become acceptable standard of finish quality and workmanship for similar on-site interior repainting work.

1.4 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI “Environmentally Friendly” E2 and E3 ratings based on VOC (EPA Method 24) content levels.

1.5 SCHEDULING

- .1 Submit work schedule for various stages of painting to Departmental Representative.
- .2 Paint occupied facilities in accordance with approved schedule. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.
- .3 Obtain written authorization from Departmental Representative for changes in work schedule.
- .4 Schedule repainting operations to prevent disruption by other trades if applicable and by occupants in and about building.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide product data and manufacturer’s installation/application instructions for each paint and coating product to be used in accordance with the requirements of Section 01 33 00 – Submittal Procedures.
- .2 Provide samples in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Submit full range colour sample chips for review and selection. Indicate where colour availability is restricted.
 - .2 Submit WHMIS SDS - Safety Data Sheets for paint and coating materials.
- .3 Closeout Submittals:
 - .1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.
 - .1 Submit records of products used. List products in relation to finish system and include following:

- .1 Product name, type and use (i.e. materials and location).
- .2 Manufacturer's product number.
- .3 Colour code numbers.
- .4 MPI Environmentally Friendly classification system rating.
- .5 Manufacturer's Safety Data Sheets (SDS).

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements, supplemented as follows:
 - .1 Deliver and store materials in original containers, sealed, with labels intact.
 - .2 Labels to indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
 - .3 Remove damaged, opened and rejected materials from site.
 - .4 Store and handle in accordance with manufacturer s recommendations.
 - .5 Store materials and equipment in secure, dry, well-ventilated area with temperature range between 10 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and sensitive products above minimum temperature as recommended by manufacturer.
 - .6 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
 - .7 Remove paint materials from storage in quantities required for same day use.
 - .8 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .9 Fire Safety Requirements:
 - .1 Provide 9 one kg Type ABC dry chemical fire extinguishers 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 daily.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .2 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

- .3 Materials that cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .5 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
 - .3 Return solvent and oil-soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.
 - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
 - .6 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.
- .6 Where paint recycling is available, collect waste materials by type and provide for delivery to recycling or collection facility.
- .7 Set aside and protect surplus and uncontaminated finish materials: Deliver to or arrange collection by employees, or individuals for verifiable re-use or re-manufacturing organizations

1.8 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Do not perform repainting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application and until paint has cured sufficiently.
 - .2 Ventilate enclosed spaces.
 - .1 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .3 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
 - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements. Use of gas-fired appliances is not permitted.
 - .5 Do not perform painting work unless minimum lighting level of 323 Lux is provided on surfaces to be painted.

- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, do not perform repainting work when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Relative humidity within area to be repainted is above 85%.
 - .2 Conduct moisture tests using properly calibrated electronic Moisture Meter, except use simple cover patch test on concrete floors to be repainted.
 - .3 Do not perform repainting work when maximum moisture content of substrate exceeds:
 - .1 12% for concrete and masonry (clay and concrete brick/block).
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
 - .4 Test painted concrete, masonry and 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 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 noted herein.
 - .3 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise pre-approved by specific coating manufacturer.
 - .4 Apply paint in occupied facilities during silent hours only unoccupied rooms or areas. Schedule operations to approval of the DCC Representative Departmental Representative Consultant such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.9 MAINTENANCE

- .1 Extra Materials:
- .2 Submit maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.
- .3 Submit one – one (1) or four (4) litre can of each type and colour of finish coating or stain and primer/sealer. Identify type and colour in relation to established colour schedule and finish system.

Part 2 Products

2.1 MATERIALS

- .1 Paint materials listed in latest edition of MPI Approved Product List (APL) are acceptable for use on this project.

- .2 Where required by authorities having jurisdiction, paints and coatings to provide a fire-resistant rating.
- .3 Paint materials for repaint systems to be products of single manufacturer.
- .4 Only qualified products with MPI “Environmentally Friendly” E3 or E2 rating are acceptable for use on this project.
- .5 Paints, coatings, thinners, solvents, cleaners and other fluids used in repainting, to be as follows:
 - .1 Not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
 - .2 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
 - .3 Be manufactured without compounds which contribute to smog in lower atmosphere.
 - .4 Be manufactured where matter generating Biochemical Oxygen Demand (BOD) in undiluted production plant effluent discharged to natural watercourse or a sewage treatment facility lacking secondary treatment does not exceed 15 mg/L.
 - .5 Be manufactured where total suspended solids (TSS) content in undiluted production plant effluent discharged to natural watercourse or sewage treatment facility lacking secondary treatment does not exceed 15 mg/L.
- .6 Paints and coatings must not be formulated or manufactured with formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

2.2 COLOURS

- .1 Submit proposed Colour Schedule to Departmental Representative for approval after Contract award Departmental Representative.
- .2 Colour schedule will be based upon selection of five base colours and three accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .5 First coat in two coat (Premium) repaint system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed with Departmental Representative’s written permission.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer s written instructions.
- .3 Where thinner is used, addition not to exceed paint manufacturer s recommendations. Do not use kerosene or such organic solvents to thin water-based paints.

- .4 Thin paint for spraying in accordance with paint manufacturer' instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant Departmental Representative Project Manager DCC Representative.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 GLOSS/SHEEN RATINGS

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

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

- .2 Gloss level ratings of repainted surfaces as noted on Finish Schedule shall be as specified herein.

2.5 INTERIOR PAINTING SYSTEMS

- .1 RIN 5.1 - Structural Steel and Metal Fabrications (Stair stringers).
 - .1 RIN 5.1R – W.B. Light Industrial Coating finish, G3 finish, modified to use MPI 17 as full primer coat – clean and de-gloss existing surface prior to application, following Manufacturer's Instructions.
- .2 RIN 5.3 - Galvanized Metal: High Contact/High Traffic Areas (Doors, Frames, Railings, Pipes, and Handrails).
 - .1 RIN 5.3J – High Performance Architectural Acrylic, Premium Grade, G4 finish.
 - .2 When painting over existing alkyd paint, modify system to use MPI 17 as full primer coat – clean and de-gloss existing surface prior to application, following Manufacturer's Instructions.
- ~~.4.3~~ RIN 6.3 - Dressed Lumber: (Including Doors, Door and Window Frames, and Mouldings).
 - .1 RIN 6.3T – High Performance Acrylic Premium Grade, G4 finish.
 - .1 When painting over existing alkyd paint or varnish, modify system to use MPI 17 as full primer coat – clean and de-gloss existing surface prior to application, following Manufacturer's Instructions.
- ~~.5.4~~ RIN 9.2 - Plaster and Gypsum Board: (gypsum wallboard, drywall, and sheet rock type material).
 - .1 RIN 9.2B - High Performance Acrylic Premium Grade, G2 finish (walls), G1 or G2 finish (ceilings), following Manufacturer's Instructions.

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 EXAMINATION

- .1 Interior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractors Association. Painting contractor to notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project repainting specification and Finish Schedule (as well as plans and elevation drawings).
- .2 Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .3 Where an assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.

3.3 PREPARATION

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare interior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using stiff bristle brush to remove dirt, oil and surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

- .4 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture metre before commencing work.
- .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water-based paints.
- .6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from distance up to 1000 mm.

3.4 EXISTING CONDITIONS

- .1 Prior to commencing work, examine site conditions and existing interior substrates to be repainted. Report in writing to Departmental Representative damages, defects, or unsatisfactory or unfavourable conditions or surfaces that will adversely affect this work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple “cover patch test” and report findings to Departmental Representative. Maximum moisture content not to exceed specified limits.
- .3 Do not commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to Painting Subcontractor and Inspection Agency.
- .4 Degree of surface deterioration (DSD) to be assessed using MPI Identifiers and Assessment criteria indicated in MPI Maintenance Repainting Manual. MPI DSD ratings and descriptions are as follows:

Condition	Description
DSD-0	Sound Surface (includes visual (aesthetic) defects that do not affect film s protective properties).
DSD-1	Slightly Deteriorated Surface (indicating fading; gloss reduction, slight surface contamination, minor pin holes scratches).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, and staining).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).

DSD-4	Substrate Damage (repair or replacement of surface required).
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3.5 PROTECTION

- .1 Protect existing surfaces and adjacent fixtures and furnishings from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect general public and building occupants in and about building.
- .5 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and surface mounted equipment, fittings and fastenings prior to undertaking re-painting operations. Store items and re-install after painting is completed.
- .6 Move and cover furniture and portable equipment as necessary to carry out repainting operations. Replace as painting operations progress.
- .7 As repainting operations progress, place "WET PAINT" signs in occupied areas to approval of Departmental Representative.

3.6 APPLICATION

- .1 Apply paint by method that is best suited for substrate being repainted using roller brush, air sprayer and/or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise. Methods of application as pre-approved by Departmental Representative before commencing work.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller of types suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple unless approved by Departmental Representative.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray Application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application by intermittent agitation or continuous mechanical agitation frequently as necessary.
 - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern.
 - .4 Back roll spray applications and brush out runs and sags immediately.

- .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Departmental Representative.
- .5 Apply paint coats in continuous manner and allow surfaces to dry and properly cure between coats for minimum time period as recommended by manufacturer. Minimum dry film thickness of coats not less than that recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Sand and dust between coats to remove visible defects.
- .7 Repaint 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.
- .8 Repaint top, bottom, and vertical edges of doors to be repainted.
- .9 Repaint closets and alcoves to match existing, unless otherwise scheduled or noted.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise noted, repainting to include exposed to view/previously painted mechanical and electrical equipment and components (panels, conduits, piping, hangers, and ductwork.).
- .2 Touch up scratches and marks and repaint such mechanical and electrical equipment and components with colour, and sheen finish to match existing unless otherwise noted or scheduled.
- .3 Do not paint over name plates or instruction labels.
- .4 Leave unfinished exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish.
- .5 Keep sprinkler heads free of paint.
- .6 Do not paint interior transformers and substation equipment.
- .7 Standard of Acceptance: when viewed using natural prevailing sunlight at peak period of day (mid-day) on surface viewed, surfaces to indicate following:
 - .1 Walls: no defects visible from distance of 1000 mm at 90 degrees to surface.
 - .2 Soffits: no defects visible from grade at 45 degrees to surface.
 - .3 Final coat to exhibit uniformity of colour and sheen across full surface area.

3.8 FIELD QUALITY CONTROL

- .1 Inspection:
- .2 Advise Departmental Representative when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with Paint Inspection Agency and provide access to areas of work.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 00 10 – General Instructions, “Cleaning”, supplemented as follows:

- .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
- .2 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris.
- .3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.
- .4 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil-based materials as well as other cleaning and protective materials (e.g. rags, drop cloths, and masking papers), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction and as noted herein.
- .5 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operations to be recycled or disposed of in manner acceptable to authorities having jurisdiction.
- .6 Recycle paint and coatings in excess of repainting requirements as specified.

3.10 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 affected exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of 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 Departmental Representative.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 07 92 00 – Joint Sealants
- .2 Section 09 30 13 – Ceramic Tiling
- .3 Section 09 51 99 – Acoustic Panel Ceilings
- .4 Section 09 72 16 – Vinyl-Coated Fabric Wall Coverings.
- .5 Section 09 91 23 – Interior Painting
- .6 Section 26 05 33 – Raceway and Boxes for Electrical Systems

1.2 REFERENCE STANDARDS

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03 (R2009), Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C475/C475M-17, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C514-04 (R2014), Standard Specification for Nails for the Application of Gypsum Board.
 - .3 ASTM C557-03 (R2017), Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .4 ASTM C840-18b, Standard Specification for Application and Finishing of Gypsum Board.
 - .5 ASTM C954-18, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
 - .6 ASTM C1002-18, 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.
 - .7 ASTM C1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .8 ASTM C1178/C1178M-18, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Panel.
 - .9 ASTM C1396/C1396M-17, Standard Specification for Gypsum board.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
 - .1 AWCI GA-214-2015, Recommended Levels of Gypsum Board Finish.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86 (R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

- .2 CAN/CGSB-71.25-M88, Adhesives, for Bonding Drywall to Wood Framing and Metal Studs.
- .5 Green Seal Environmental Standards (GS)
 - .1 GS-11-2015, Paints, Coatings, Stains, and Sealers.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2016, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2017, Adhesives and Sealant Applications.
- .7 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

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 Shop Drawings:
 - .1 Submit gypsum board assembly drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario, Canada.
 - .2 Indicate components such as fastener type, dimensions, spacing and locations at gypsum board edges, ends and in field of board as well as installation methods. Components and work to confirm to ASTM C840 standard specification for application and finishing of gypsum board.
 - .3 Indicate type of joint compound, and number of joint compound layers.
 - .4 Indicate number and location of electrical boxes for wall and ceiling.
- .4 Samples:
 - .1 Submit for review and acceptance of each component specified or necessary for complete installation. Include technical descriptive data.
 - .2 Submit 300 mm long samples of insulating strip, shadow mould, corner and casing beads, cornice cap, and vinyl mouldings.
 - .3 Samples will be returned for inclusion into work.
- .5 Certifications:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Construction Waste Management Plan highlighting recycling and salvage requirements.

- .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
- .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-industrial, post-consumer content, and total cost of materials for project.
- .3 Low-Emitting Materials:
 - .1 Submit listing of paints, coatings, adhesives, and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer s written instructions 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 and applicable standard designation.
- .3 Exercise care in unloading gypsum board materials shipment to prevent damage.
- .4 Storage and Handling Requirements in accordance with ASTM C840:
 - .1 Store gypsum board assemblies’ materials level, flat, off ground, indoors, in dry location 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 Protect ready mix joint compounds from freezing, exposure to extreme heat and direct sunlight.
 - .5 Protect from weather, elements and damage from construction operations.
 - .6 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .7 Protect prefinished aluminum surfaces with wrapping strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .8 Replace defective or damaged materials with new.
- .5 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19 – Waste Management and Disposal.
- .6 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, packaging materials padding, crates, as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

1.5 AMBIENT 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.

Part 2 Products**2.1 MATERIALS**

- .1 Standard board: to ASTM C1396/C1396M regular, 13 mm and 16 mm type x 1200 mm wide x maximum practical length, ends square cut, edges.
- .2 Water-resistant board: to ASTM C1396/C1396 regular for washroom partitions.
- .3 Glass mat water-resistant gypsum backing board: to ASTM C1178/C1178M, for kitchen backsplash, and washroom walls receiving ceramic tile finish.
- .4 Metal furring runners, hangers, tie wires, inserts, and anchors
- .5 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .6 Resilient drywall furring clips: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .7 Nails: to ASTM C514.
- .8 Steel drill screws: to ASTM C1002.
- .9 Stud adhesive: to ASTM C557 and CAN/CGSB-71.25.
- .10 Laminating compound: as recommended by manufacturer, asbestos-free.
- .11 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one-piece length per location.
- .12 Sealants: in accordance with Section 07 92 00 – Joint Sealants.
 - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.Acoustic sealant: in accordance with Section 07 92 00 – Joint Sealants.
- .13 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 45 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .14 Joint compound: to ASTM C475, asbestos-free.

Part 3 Execution**3.1 EXAMINATION**

- .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 Departmental Representative.
 - .2 Inform 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 Departmental Representative.

3.2 ERECTION

- .1 Do application and finishing of gypsum board to ASTM C840 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C1280-13a.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across between layers of gypsum board joists studs, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 38 mm common nail 25 mm drywall screw.
- .14 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 single layer gypsum board to metal furring or framing using screw fasteners. 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.
 - .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 layers at right angles to supports unless otherwise indicated.
 - .3 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.
 - .4 Tape but do not sand joints of base layer
- .3 Apply single layer gypsum board to concrete block surfaces, where indicated, using laminating adhesive.
 - .1 Comply with gypsum board manufacturer's recommendations.
 - .2 Brace or fasten gypsum board until fastening adhesive has set.
 - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Apply water-resistant gypsum board where wall tiles to be applied. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .5 Maintain no more than 9 mm gap around periphery of each face of partitioning between gypsum board and adjacent construction. Scribe and cut edges of gypsum board to fit floor, wall and ceiling contour
- .6 Apply 9 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, with acoustic sealant.
- .7 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .8 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.
- .9 Install gypsum board with face side out.
- .10 Do not install damaged or damp boards.

- .11 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.
- .12 Partitions surrounding Secure Room 111 and the Vestibule 111.1 (Partition types P4b, P5, P5a, and P12 will be field tested for STC 52.
 - .1 Top of partition construction should be similar to UIC HW-18 except with double stud assembly as shown in drawings.
 - .2 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.
 - .3 Bottom of gypsum board to be installed as close as possible to the slab. Maintain no more than 6 mm gap around periphery of each face of partitioning between gypsum board and adjacent construction. Scribe and cut edges of gypsum board to fit floor, wall and ceiling slab contour
 - .4 Apply 6 mm diameter bead of red coloured fire rated acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components.
 - .5 Seal full perimeter of cut-outs around electrical boxes, ducts, with red coloured fire rated sealant.
 - .6 There must be no gap larger than 6 mm between ducts or conduit penetrating these partitions and the drywall. All ducting penetrations must be at least 50 mm apart. Provide a single layer gypsum board collar around all ducting penetrations as shown in the photo below. Seal around the collar with red fire rated sealant.



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 using contact adhesive for full length at 150 mm on centre.
- .2 Install casing beads around perimeter of suspended ceilings.

- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .6 Provide continuous polyethylene dust barrier behind and across control joints.
- .7 Locate control joints at changes in substrate construction where indicated at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.
- .8 Install control joints straight and true.
- .9 Ensure that screws or nails are properly applied in process of attaching gypsum board to framing without damaging of gypsum board edges and ends.
- .10 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .11 Install expansion joint straight and true.
- .12 Splice corners and intersections together and secure to each member with 3 screws.
- .13 Ensure that electrical boxes on opposing wall faces are located in separate stud cavities
- .14 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
 - .2 Install steel rough in box for cable pass throughs to new floor mounted raceways at base of partitions
- .15 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.
- .16 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Recommended Levels of Gypsum Board Finish
 - .1 Levels of finish:
 - .1 Level 1: above-ceiling plenum barriers embed tape for joints and interior angles in joint compound. Surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .2 Level 2: tile backer board, specialty tile backer board, embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .3 Level 5: 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; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

- .17 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board, invisible after surface finish is completed.
- .19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .20 Completed installation smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .21 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .22 Mix joint compound slightly thinner than for joint taping.
- .23 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .24 Allow skim coat to dry completely.
- .25 Remove ridges by light sanding or wiping with damp cloth.
- .26 Painting: Section 09 91 23 – Interior Painting

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, "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 00 10 – General instructions, "Cleaning."
- .2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

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.

3.7 SCHEDULES

- .1 Construct fire rated assemblies where indicated.
 - .1 1-hour fire rated partition assembly, ULC Design No. W453.
 - .2 Construct high performance secure STC 52 partitions at Secure Room 111 and Vestibule

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 07 92 00 – Joint Sealants
- .3 Section 09 21 16 – Gypsum Board Assemblies
- .4 Section 10 28 00 – Toilet and Bath Accessories

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-18, Specifications for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM C553-13, Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
 - .3 ASTM C645-18, Standard Specification for Nonstructural Steel Framing Members.
 - .4 ASTM C754-18, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Environmental Choice Program (ECP)
 - .1 CCD-047-98(R2005), Architectural Surface Coatings.
 - .2 CCD-048-95(R2006), Surface Coatings: Recycled Water-Borne.
- .3 Expanded Metal Manufacturers Association Division of NAAMM National Association of Architectural Metal Manufacturers
 - .1 EMMA 557-18, Standards for Expanded Metal
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #26, Primer, Galvanized Metal, Cementitious.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2017, Adhesives and Sealant Applications.
- .7 Steel Stud Manufacturer's Association (SSMA)
 - .1 2015 International Building Code (IBC) SSMA Product Technical Guide.
- .8 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702.1-14, Standard for Mineral Fibre Thermal Insulation for Buildings.

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.
 - .2 Submit WHMIS SDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.
- .3 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit Construction Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
 - .3 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-industrial, post-consumer content, and total cost of materials for project.
- .4 Shop Drawings:
 - .1 Submit drawings stamped and signed by a professional engineer licensed in the Province of Ontario, Canada
 - .2 Indicate framing for partitions below and above new ceilings as well as lateral support framing required to support partitions independent of existing suspended ceiling system, to which the partition assembly will not be fastened. Indicate member design thickness exclusive of coatings, connection and bracing details, screw sizing and spacing, and anchors
 - .3 Indicate locations, dimensions, openings and requirements of related work
 - .4 Allow for and indicate sufficient framing and blocking for partition-supported monitors and smart boards weighing 30 kg, location as indicated in Drawings.
 - .5 Allow for and indicate sufficient framing and blocking for installation of wall mounted plumbing fixtures, stone counters, and folding wall mounted adult change bed.

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.
- .3 Site review and Post-Installation Certification: Engineer who stamped shop drawings shall provide periodic site review and reports, progress billing review and reports, and

signed and stamped certification that the work of this Section has been performed in conformance with shop drawings.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location 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.
- .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19 – Waste Management and Disposal.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C645, 65 mm and 92 mm stud size and as otherwise indicated, thickness as required by engineered shop drawings, roll formed, hot dipped galvanized steel sheet, for screw attachment of gypsum board.
 - .1 Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.
- .3 Furring Channels: Commercial steel sheet in accordance with ASTM A653, Z180, hot dipped zinc-coated (galvanized), as follows:
 - .1 Hat Shaped, Rigid Furring Channels: ASTM C645, 0.75 mm thickness x 22 mm deep.
 - .2 Resilient Furring Channels: 0.46 mm thickness x 13 mm deep members designed to reduce sound transmission having asymmetrical face attached to single flange by a slotted leg (web).
- .4 Curving Tracks: Commercial steel sheet with ASTM A653, Z180, hot dipped zinc-coated (galvanized), complete with flexible sliding straps to allow for curvature indicated on drawings; width to suit framing, and as follows:
 - .1 Width: 65 mm.
 - .2 Minimum base metal thickness: 0.75 mm
- .5 Metal channel stiffener: 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.

- .6 Acoustical sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .7 Noise stop foam seal, continuous, 12 mm thick x 45 mm wide, with self sticking permanent adhesive on one face, lengths as required.
- .8 Insulating strip: rubberized, moisture resistant 3 mm thick foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.
- .9 Batt and blanket mineral fibre: to ASTM C553 and CAN/ULC S702.1
 - .1 Type: 1 or 2
 - .2 Thickness: as indicated to fit cavities of acoustic partitions.
 - .3 ULC Classification marking as to surface burning characteristics and Fire Resistance Rating
- .10 Wall Protection Material for all walls surrounding Secure Room 111.
 - .1 Flattened Metal Mesh: To EMMA 557. Style ¾-9F: nominal strand thickness of 0.120" (0.108" to 0.132"). Diamond opening of 0.563" x 1.688". 19MM #10 (10GA) rolled and flattened metal mesh.
 - .2 Rivets: 4.7mm steel rivets and "fender" washer (38mm outside diameter, 4.7mm inside diameter)
 - .1 Suggested material:
 - .1 Rivets 4.7mm steel pop rivet: Speaneur part #301-440
 - .2 Washers: 38mm outside diameter, 4.7mm inside diameter "fender" washer: Fastenal part #1133204

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 non-structural metal framing application in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative
 - .2 Inform 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 Departmental Representative

3.2 ERECTION

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .2 Place studs vertically at 600 mm on centre and not more than 50 mm 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.
- .3 Erect metal studding to tolerance of 1:1000.

- .4 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .5 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .6 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified.
 - .1 Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .7 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs.
 - .1 Secure track to studs at each end, in accordance with manufacturer's instructions.
 - .2 Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .8 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .9 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, and accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .10 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .11 Extend partitions to ceiling height except where noted otherwise on drawings.
- .12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
 - .1 Use 50 mm leg ceiling tracks. Use double track slip joint as required.
- .13 Install insulating strip under studs and tracks around perimeter of sound control partitions.
- .14 Installation for Secure Wall with Wall Protection surrounding Secure Room 111
 - .1 Top and bottom tracks: SSMA standard: 50mm x 152mm, 18ga (600t200-43). top track to be double nested track with inner top track that slides vertically within outer top track. provide 13mm gap between inner and outer top tracks to avoid transmission of structural loads to studs. secure outer top track and bottom stud track to both slabs at 300mm oc using any expanding (preferably double expanding) mechanical fastener. non-expanding (e.g "tapcon") screws are not acceptable.
 - .2 Studs: SSMA standard: 50mm x 152mm, 18ga (600s200-43: 33ksi). space studs at 300 mm oc and secure to the inner top track and bottom track with welds or rivets (not screws). install double (jamb) studs at the door frame opening. install anti-spread bracing approximately 1200 mm from the bottom of the wall between the door frame double stud and the adjacent stud on both sides of the frame. construct wall corners with double studs.
 - .1 Construct wall corners with double studs.

- .3 Wall Protection Material: 19mm #10 (10ga) rolled and flattened metal mesh full height to structural ceiling on public side (outside or attack side) of partition. support all edges by anti-spread bracing, studs or corners. align the sheet edges at every vertical and horizontal seam on the centre line of the steel stud or anti-spread bracing and secure all sheets with rivets.
- .4 Gypsum Board; Install 16mm gypsum board both sides, secured with drywall screws as per Section 09 21 16 – Gypsum Board Assemblies.
- .5 Seal all gaps with fire-rated acoustic sealant to CAN/ULC S115. Apply continuous bead of fire-rated acoustic sealant on both sides of the top and bottom tracks. See Section 07 92 00 – Joint Sealants.
- .6 Fill cavity with sound attenuating fibre batts.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, “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 00 10 – General Instructions, “Cleaning”.
- .3 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by non-structural metal framing application.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 02 41 00.08 – Demolition for Minor Works
- .2 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
 - .1 ANSI/CTI A108-2017, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4, CTI A118.1 to A118.6, ANSI A136.1).
 - .2 CTI A118.3, Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
 - .3 CTI A118.4, Specification for Latex Cement Mortar (included in ANSI A108.1).
 - .4 CTI A118.5, Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).
 - .5 CTI A118.6, Specification for Ceramic Tile Grouts (included in ANSI A108.1).
 - .6 ANSI A137.1, Tile Slip Test
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C144-2018, Standard Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C207-2018, Standard Specification for Hydrated Lime for Masonry Purposes.
 - .3 ASTM C847-2018, Standard Specification for Metal Lath.
 - .4 ASTM C979/C979M-2016, Standard Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CGSB 71-GP-22M, Adhesive, Organic, for Installation of Ceramic Wall Tile.
 - .3 CAN/CGSB-75.1-M, Tile, Ceramic.
 - .4 CAN/CGSB-25.20, Surface Sealer for Floors.
- .4 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A3000-18, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .5 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 TTMAC Specifications Guide 09 30 00 2016-2017, Tile Installation Manual.
 - .2 TTMAC Hard Surface Maintenance Guide.

1.3 ACTION AND INFORMATIONAL 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.
 - .1 Include manufacturer's information on:
 - .1 Ceramic tile, marked to show each type, size, and shape required.
 - .2 Chemical resistant mortar and grout (Epoxy and Furan).
 - .3 Cementitious backer unit.
 - .4 Dry-set cement mortar and grout.
 - .5 Divider strip.
 - .6 Elastomeric membrane and bond coat.
 - .7 Reinforcing tape.
 - .8 Levelling compound.
 - .9 Latex cement mortar and grout.
 - .10 Commercial cement grout.
 - .11 Organic adhesive.
 - .12 Slip resistant tile.
 - .13 Waterproofing isolation membrane.
 - .14 Fasteners.
- .3 Provide samples in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Wall tile: submit duplicate, 300 mm x 300 mm sample panels of each colour, texture, size, and pattern of tile.
 - .2 Floor tile: submit duplicate, 300 mm x 300 mm sample panels of each colour, texture, size, and pattern of tile.
 - .3 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .2 Separate waste materials for recycling and reuse in accordance with Section 01 74 19 - Waste Management and Disposal.
 - .3 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating the % of construction wastes that were recycled or salvaged.
 - .4 Recycled Content:
 - .1 Porcelain tile to have a minimum of 6% recycled content.
 - .2 Submit listing of recycled content used, and percentages of post-consumer content.

1.4 QUALITY ASSURANCE

- .1 All preparation, materials, and workmanship shall be in accordance with TTMAC Tile Installation Manual.
- .2 Quality Assurance Submittals:

- .1 Manufacturer's Instructions: manufacturer's installation instructions.
- .2 Manufacturer's Field Reports: manufacturer's field reports specified.

1.5 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 Waste Management and Disposal:
 - .1 Separate waste materials for reuse recycling in accordance with Section 01 74 19 – Waste Management and Disposal.

1.6 AMBIENT CONDITIONS

- .1 Unless otherwise indicated in manufacturer's written instructions:
 - .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and 48 hours after, installation.
 - .2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
 - .3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

1.7 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.
 - .2 Provide minimum 2% of each type and colour of tile and grout required for project for maintenance use. Store where directed.
 - .3 Maintenance material same production run as installed material.

Part 2 Products

2.1 BACKSPLASH WALL TILE

- .1 Porcelain or Ceramic, hexagonal pattern. (T4). Provide a range of choices.
 - .1 Porcelain wall tile: hexagonal mosaic tiles. Size and colour as selected by Departmental Representative. Up to two colours may be selected.
 - .2 Ceramic tile: to CAN/CGSB-75.1, minimum Type 3, Class MR 1, hexagonal, 304.5mm x 304.5 mm sheet of rectangular mosaic tiles, glazed surface. Size and colour as selected by Departmental Representative. Up to two colours may be selected.

2.2 PORCELAIN WALL TILE (Washrooms)

- .1 Porcelain wall tile (T3): rectangular, subtle stone look pattern, Coloured Body, rectified, matte finish, size 30mm x 60 mm. Colour variation to V2 or V3. Colour light to medium

gray, selected by Departmental Representative from manufacturer's standard line of finishes. Must be compatible with porcelain floor tile.

2.3 PORCELAIN FLOOR TILE (Washrooms)

- .1 Porcelain tile (T1): 30 cm x 60 cm x 11 mm size, matt finish, slip resistant surface to meet or exceed ANSI A137.1, Tile Slip Test 9, Scratch Resistant finish to MOHs 5, coloured body porcelain, with a natural concrete or stone-gray appearance. Colour variation to V2 or V3. Colour selected by Departmental Representative from manufacturer's standard line of finishes. Must be compatible with porcelain wall tile.

2.4 PORCELAIN STAIR TILE (Sparks Street Lantern Stairs)

- .1 Repair and patch tread surface according to Section 02 41 00.08 – Demolition for Minor Works.
- .2 Porcelain stair tile (T2): 30 mm by 60 mm x 11 mm, sized to suit stair tread configuration, flamed or matte finish slip resistant surface to meet or exceed ANSI A137.1, Tile Slip Test. Scratch Resistant finish to MOHs 5, coloured body porcelain, with a natural concrete, stone or slate look appearance, light gray colour to selection of departmental representative.
- .3 Stair nosing and safety tread trim: stainless steel anchoring leg (anchors in the mortar under the porcelain stair tile), with removable, medium-gray (or solid colour to contrast with the tread and pan) slip-resistant resilient wear surface to ensure the top of the nosing of the resilient stair treads have a rounded or beveled edge extending not less than 3mm, and not more than 8 mm, measured horizontally from the front of the stair nosing.

2.5 PORCELAIN TRANSITION STRIPS

- .1 Porcelain Tactile Transition Strip: 30 mm by 30 mm x 11 mm size, matt gray, raised dome pattern. Colour variation V1.

2.6 MORTAR AND ADHESIVE MATERIALS

- .1 Cement: to CSA-A5, type 10. All mixes, mortars and adhesives must be compatible to the ceramic or porcelain tile to be set. Provide, in written format, proof of compatibility between tile and mix, mortar and/or adhesives from the tile manufacturer.
- .2 Sand: to ASTM C144, passing 16 mesh.
- .3 Hydrated lime: to ASTM C207, Type S
- .4 Latex additive: formulated for use in cement mortar and thin set bond coat.
- .5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.
- .6 Adhesives:
 - .1 Maximum VOC limit 65 g/L.

2.7 BOND COAT

- .1 Dry set cement mortar: to ANSI A108.1.
- .2 Organic adhesive: to ANSI A136.1.

- .3 Latex Cement mortar: to ANSI A108.1, two-component universal dry-set mortar.
- .4 Epoxy bond coat: non-toxic, non-flammable, non-hazardous during storage, mixing, application, and when cured. To produce shock and chemical resistant mortars having the following physical characteristics:
 - .1 Compressive Strength: 246 kg/cm².
 - .2 Bond Strength: 53 kg/cm².
 - .3 Water Absorption: 4.0% Max.
 - .4 Ozone Resistance, 200 hours @ 200 ppm: no loss of strength.
 - .5 Smoke Contribution Factor: 0.
 - .6 Flame Contribution Factor: 0.
 - .7 Finished mortar and grout to be resistant to urine, dilute acid, dilute alkali, sugar, brine and food waste products, petroleum distillates, oil and aromatic solvents.
 - .8 Bond Coat: maximum VOC limit 65 g/L...

2.8 GROUT

- .1 Colouring Pigments:
 - .1 Pure mineral pigments, lime proof and nonfading, complying with ASTM C979.
 - .2 Colouring pigments to be added to grout by manufacturer.
 - .3 Job coloured grout are not acceptable.
 - .4 Use in Commercial Cement Grout, Dry-Set Grout, and Latex Cement Grout.
- .2 Cement Grout: to ANSI A108.1.
 - .1 Use one-part white cement to one-part white sand passing a number 30 screen.
- .3 Commercial Cement Grout: to ANSI A118.6.
- .4 Dry-Set Grout: to ANSI A118.6.
- .5 Latex Cement Grout: to ANSI A108.1, fast curing, high early strength, polymer-modified, stain resistant, sanded mix for floors, un-sanded mix for walls and floors with polished tiles commercial tile grout.

2.9 ACCESSORIES

- .1 Transition Strips: purpose made metal extrusion; anodized aluminum or stainless steel type to suit thickness of tile and specific applications.

2.10 MIXES

- .1 All mixes, mortars and adhesives must be compatible to the ceramic or porcelain tile to be set. Provide, in written format, proof of compatibility between tile and mix, mortar and/or adhesives from the tile manufacturer.
- .2 Cement:
 - .1 Scratch coat: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water, and latex additive (where required). Adjust water volume depending on water content of sand.

- .2 Slurry bond coat: cement and water mixed to creamy paste. Latex additive may be included.
- .3 Mortar bed for floors: 1 part cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.
- .4 Mortar bed for walls and ceilings: 1 part cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. Latex additive may be included.
- .5 Levelling coat: 1 part cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.
- .6 Bond or setting coat: 1 part cement, 1/3 part hydrated lime, 1 part water.
- .7 Measure mortar ingredients by volume.
- .3 Dry set mortar: mix to manufacturer's instructions.
- .4 Organic adhesive: pre-mixed.
 - .1 Adhesives: maximum VOC limit 65 g/L.
 - .2 Mix bond and levelling coats, and grout to manufacturer's instructions.
 - .3 Adjust water volumes to suit water content of sand.

2.11 PATCHING AND LEVELLING COMPOUND

- .1 Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials, use and environment, in accordance with manufacturer's instructions.
- .2 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.
- .3 Compounds ready for use in 48 hours after application (where possible).

2.12 CLEANING COMPOUNDS

- .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

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 WORKMANSHIP

- .1 Do tile work in accordance with TTMAC Tile Installation Manual 2016-2017, "Ceramic Tile", except where specified otherwise by the tile manufacturer.
- .2 Apply tile or backing coats to clean and sound surfaces.

- .3 Fit tile around corners, fittings, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .8 Make internal angles square, external angles bull-nosed.
- .9 Use bullnose edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.
- .10 Install divider/transition strips at junction of tile flooring and dissimilar materials.
- .11 Allow minimum 24 hours after installation of tiles, before grouting.
- .12 Clean installed tile surfaces after installation and grouting cured.

3.3 FLOOR TILE AND TRANSITION STRIPS

- .1 Install floor tile underlay system per manufacturers written instructions.
- .2 Install in accordance with TTMAC details and manufacturer's instructions. Coordinate level of transition strip with level of adjacent materials.

3.4 WALL TILE

- .1 Install in accordance with TTMAC details and manufacturer's instructions.

3.5 STAIR TREADS

- .1 Install in accordance with TTMAC details and manufacturer's instructions Coordinate with the stair nosing specified.

3.6 FLOOR SEALER AND PROTECTIVE COATING

- .1 Apply in accordance with manufacturer's instructions.

3.7 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.8 CLEANING

- .1 Proceed in accordance with Section 01 00 10 – General Instructions, “Cleaning”.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 09 21 16 – Gypsum Board Assemblies
- .2 Section 09 22 16 – Non-Structural Metal Framing
- .3 Section 10 21 13.13 – Metal Toilet Compartments
- .4 Section 23 82 36 – Radiant Panels.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C635/C635M-17, Standard Specification for Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - .3 ASTM E1264-14, Standard Classification for Acoustical Ceiling Products.
 - .4 ASTM E1477-98A (R2017)e1, Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 CSA Group (CSA)
 - .1 CSA B111-74 (R2003), Wire Nails, Spikes and Staples.
- .4 Green Seal Environmental Standards (GS)
 - .1 GS-11-2015, Paints, Coatings, Stains, and Sealers.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2016, Architectural Coatings.
- .7 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

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 ceiling panels and ceiling suspension system and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario, Canada.
 - .2 Submit stamped shop drawings for any replacement, reinstatement and/or alterations/additions made to existing acoustical ceiling grid or suspension system.
 - .3 Submit reflected ceiling plans for special grid patterns as indicated.
 - .4 Indicate lay-out, seismic restraint details, insert and hanger spacing and fastening details, splicing method for main and cross runners, change in level details, and acoustical unit support at ceiling fixture lateral bracing and accessories.
- .4 Site Review and Post-Installation Certification:
 - .1 Engineer who stamped shop drawings shall provide periodic site review and reports and progress billing review and stamped post-installation certification that work of this Section in in conformance with stamped shop drawings.
- .5 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate full-size samples of each type acoustical units.
- .6 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Construction Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
 - .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer post-industrial content, and total cost of materials for project.
 - .3 Low-Emitting Materials:
 - .1 Submit listing of touch-up paints used in building, comply with VOC and chemical component limits or restriction requirements.

1.4 DELIVERY, STORAGE AND HANDLING

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

- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store materials inside, level, under cover. Protect from weather, damage from construction operations, and other causes, in accordance with manufacturer's printed instructions.
 - .3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.
 - .4 Store and protect acoustic ceiling materials from nicks, scratches, and blemishes.
 - .5 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 19 – Waste Management and Disposal.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra stock materials: deliver to Departmental Representative extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 – Closeout Submittals.
 - .1 Quantity: provide minimum 10% of ceiling tile each size.

Part 2 Products

2.1 COMPONENTS

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.
 - .1 Non-Directional Pattern, pebbled finish, Class A.
 - .2 Noise Reduction Coefficient (NRC) designation of 0.55.
 - .3 Light Reflectance (LR) range of 0.87 to ASTM E1477.
 - .4 EcoLogo certified Cellulose fibre with minimum 75% recycled content.
 - .5 Ceiling Attenuation Class (CAC) rating 35, in accordance with ASTM E1264.
 - .6 Edge type square.
 - .7 Colour white
 - .8 Size (General Office Space): 508mm by 1524 mm x 16 mm thick.
 - .9 Shape flat.
- .2 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.
- .3 Acoustical Suspension:
 - .1 Heavy Duty system to ASTM C635/635M.

- .2 Basic materials for suspension system: commercial quality cold rolled steel, zinc coated.
 - .3 Suspension system: non-fire rated, two directional exposed tee bar grid.
 - .4 Exposed tee bar grid components: shop painted satin sheen, white colour. Components die cut. Grid dimensions as indicated to suit panel size. Main tee / cross tee connection to be high tensile quick release clips on cross-tee ends, providing plug-in positive-lock insertion for quick installation and easy removal without the use of tools. Override ends on cross-tees to resist twisting.
 - .5 Hanger wire: galvanized soft annealed steel wire, 3.6 mm diameter for access tile ceilings.
 - .6 Hanger inserts: purpose made.
 - .7 Carrying channels: 38 mm channel, galvanized steel, thickness to be determined by engineered shop drawings.
 - .8 Accessories: splices, clips, wire ties, retainers and wall moulding flush reveal, to complement suspension system components, as recommended by system manufacturer.
- .4 Performance/Design Criteria:
- .1 Maximum deflection: 1/360th of span to ASTM C635/635M deflection test.

2.2 ACCESSORIES

- .1 Touch-up paint: in accordance with manufacturer's recommendations for surface conditions:
 - .1 Paint: VOC limit 250 g/L maximum to GS-11 SCAQMD Rule 1113.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions prior to acoustical ceiling installation.
 - .1 Visually inspect substrate in presence of Departmental Representative
 - .2 Inform 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 Departmental Representative.

3.2 COORDINATION

- .1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.
- .2 Do not install acoustical panels and tiles until work above ceiling has been inspected by Departmental Representative.

3.3 INSTALLATION

- .1 Installation: in accordance with ASTM C636/C636M except where specified otherwise.
- .2 Co-ordinate ceiling work to accommodate components of other sections, such as ceiling-hung toilet partitions, sprinkler heads and lights to be built into acoustical ceiling components.
- .3 Suspension System:
 - .1 Erect ceiling suspension system after work above ceiling has been inspected by Departmental Representative Secure hangers to overhead structure using attachment methods as indicated acceptable to Departmental Representative.
 - .2 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
 - .3 Lay out centreline of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width system according to reflected ceiling plan.
 - .4 Install wall moulding to provide correct ceiling height.
 - .5 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.
 - .6 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
 - .7 Interlock cross member to main runner to provide rigid assembly.
 - .8 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
 - .9 Remove existing column trims, raise and reuse at new ceiling height.
 - .10 Erect two main runners parallel, 25 mm apart, on building expansion joint line. Lay in strip of acoustic tile/board, 25% narrower than space between 2 'T' bars.
 - .11 Erect main runners to support radiant ceiling panel system. Coordinate with mechanical Section 23 82 36 Radiant Panels.
 - .12 Ensure finished ceiling system is square with adjoining walls and level within 1:1000.
 - .13 Install seismic restraint system to structural engineer's instructions and certification organizations tested design requirements.
- .4 Acoustic Panels:
 - .1 Install acoustical panels and tiles in ceiling suspension system.
 - .2 Co-ordinate ceiling work with work of other sections such as interior lighting, fire protection communication, and intrusion and detection systems.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, "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 00 10 – General Instructions, “Cleaning”.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5

PROTECTION

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

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 02 41 00.08 – Demolition for Minor Works
- .2 Section 09 68 13 – Tile Carpeting

1.2 REFERENCE STANDARDS

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
 - .1 ANSI A108/A118/A136.1-17, Specifications for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, A108.4-09, A118.1-18, A136.1-08 (R2013)).
 - .2 ANSI A118.3-13, Specification for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive (included in ANSI A108.1).
 - .3 ANSI A118.4-18, Specifications for Modified Dry-Set Cement Mortar (included in ANSI A108.1).
 - .4 ANSI A118.5-99 (R2016), Specification for Chemical Resistant Furan Mortars and Grouts for Tile Installation (included in ANSI A108.1).
 - .5 ANSI A118.6-10 (R2016), Specification for Standard Cement Grouts for Tile Installation (included in ANSI A108.1).
- .2 ASTM International
 - .1 ASTM C144-18, Standard Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C150/C150M-18, Standard Specification for Portland Cement.
 - .3 ASTM C207-18, Standard Specification for Hydrated Lime for Masonry Purposes.
 - .4 ASTM C629/C629M-10, Standard Specification for Slate Dimension Stone.
 - .5 ASTM C847-18, Standard Specification for Metal Lath.
- .3 CSA Group (CSA)
 - .1 CAN/CSA A3000-18, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .5 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168-A2017, Adhesive and Sealant Applications.
- .6 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 Tile Specification Guide 09300 2016/2017, Tile Installation Manual.
 - .2 Tile Maintenance Guide (2000).
- .7 Tile Council of North America (TCNA), Inc.
 - .1 2018 TCNA Handbook for Ceramic, Glass and Stone Tile Installation.

1.3 PRE-INSTALLATION MEETING

- .1 Prior to enclosing framing, convene a meeting of contractor, stone counter installer, plumbing fixture installer, and framing subcontractor.
 - .1 Review locations of concealed steel framing supports for counter, and backing required for lavatories, as shown on shop drawings and as necessary for installation.
 - .2 Review method of attachment for counter, concealed counter support to wall system.
 - .3 Coordinate provision of templates for cutouts for lavatories.
 - .4 Review and coordinate with other affected sections.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
 - .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-industrial post-consumer content, and total cost of materials for project.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit 2 copies of TTMAC maintenance recommendations to Departmental Representative in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Provide specific warning of maintenance practices or materials that may damage or disfigure finished work.
- .3 Submit product data WHMIS SDS sheets for floor sealer products.

1.6 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 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.

- .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19 – Waste Management and Disposal.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of crates, padding, packaging materials pallets, as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

1.7 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
 - .2 Maintain temperatures at or above 12 degrees C until cementitious materials have fully cured.
 - .3 Do not apply epoxy mortar and grouts at temperatures below 20 degrees C or above 35 degrees C.

Part 2 Products

2.1 TILE MATERIALS

- .1 Stone Tile: existing slate tile salvaged from demolition
 - .1 Size: as found 190 mm by 762 mm
 - .2 Thickness: 13 mm
 - .3 Carefully remove mortar backing from salvaged slate tile. Select best tiles from salvaged materials for installation of flooring at junction of entrance vestibule and mall entrance.
- .2 Slate Base: non-coved; type, size, colour and texture to match adjacent salvaged flooring material. Height 100 mm.

2.2 STONE COUNTER MATERIALS

- .1 Black granite size as indicated, Thickness 19 mm thick

2.3 MORTAR MATERIALS

- .1 Portland Cement: to ASTM C150/C150M, Type I and CAN/CSA A3000, Type 10.
- .2 Hydrated Lime: to ASTM C207, Type N or NA.
- .3 Sand: to ASTM C144, passing 16 mesh.
- .4 Dry-Set Portland Cement Mortar: to ANSI A118.1.
- .5 Latex-Portland Cement Mortar: to ANSI A118.4.

2.4 GROUT MATERIALS

- .1 Commercial Portland Cement Grout: to ANSI A118.6.
- .2 Latex-Portland Cement Grout: to ANSI A118.6.
- .3 Epoxy Adhesive and Grout: to ANSI A118.3.

.1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.

.1 Adhesives: maximum VOC limit

.4 Furan Mortars and Grout: to ANSI A118.5.

2.5 ACCESSORIES

.1 Anti-slip stair high visual contrast abrasive strips

.1 Extruded Units for Renovation: Aluminum channel with 25 mm tapered back, abrasive filler consisting of aluminum oxide, silicon carbide, or a combination of both, in an epoxy-resin binder. Fabricate units in lengths necessary to accurately fit width of stairs.

.2 Provide ribbed bar units, with abrasive two black filler strips projecting a minimum of 1/16 inch (1.5 mm) above aluminum extrusion

.3 Height of section no greater than 6mm.

.2 Cleavage Membrane: 0.15 mm thick polyethylene film, to CAN/CGSB-51.34.

.3 Reinforcing Mesh: 50 x 50 mm size; 1.6 mm thick steel wire mesh; welded fabric, galvanized.

.4 Adhesives: in accordance with Section 07 92 00 – Joint Sealants.

.1 Organic Adhesive: to ANSI A136.1, Type 1 2.

.1 Adhesives:

.2 Adhesives: maximum VOC limit 65 g/L to SCAQMD Rule 1168.

.5 Latex Additive: formulated for use in cement mortars and grout.

.6 Thresholds: slate, honed finish on exposed surfaces, size to suit door opening and frame width, bevelled two sides

.7 Water: clean, cold and potable.

.1 Maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.8 Sealant: in accordance with Section 07 92 00 – Joint Sealants.

.1 Sealant:

.2 Sealants: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.9 Sealer: as recommended by sealer manufacturer for intended application.

.1 Floor sealer: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

2.6 MIXES

.1 Levelling Coat:

.1 1 part cement.

.2 4 parts sand.

.3 Latex additive as per manufacturer s instructions.

.4 Premixed mortar may be used in accordance with manufacturer s written instructions.

.2 Mortar Bed for Floors:

- .1 1 part cement.
- .2 4 parts sand.
- .3 Latex additive as desired.
- .4 Water, sufficient volume to obtain consistency and workability that will allow maximum compaction during tamping of mortar bed.
- .5 Premixed mortar may be used in accordance with manufacturer s written instructions.
- .6 Adjust water volume depending on moisture content of sand to obtain consistency and workability.
- .7 Mortar bed mixed with water:
 - .1 Have consistency and workability permitting maximum compaction during tamping of mortar bed.
 - .2 Achieve minimum compressive strength of 15 MPa after 28 days.

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 stone flooring installation in accordance with manufacturer s written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform 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 Departmental Representative.
- .2 Verify substrate surfaces are clean, dimensionally stable, cured and free of contaminants such as oil, sealers and curing compounds.
- .3 Verify that concrete has been allowed to cure for minimum of preferably 90 days or longer 28 days.
- .4 Verify concrete floors have not been treated with proprietary curing compounds.
- .5 Verify concrete floors scheduled to receive tile applied over bonded mortar bed have been screed finished.
 - .1 Verify substrate surface variation does not exceed 6 mm in 3049 mm.
- .6 Beginning of installation implies acceptance of existing conditions.
- .7 Report in writing any unsuitable conditions to Departmental Representative. Proceed with work only after written instruction is received from Departmental Representative.

3.2 MANUFACTURER'S INSTRUCTIONS

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

3.3 PREPARATION

- .1 Protect surrounding work from damage or disfiguration.
- .2 Clean surfaces which are to receive tile finish to ensure removal of grease, oil or dust film.
- .3 Apply latex cementitious levelling coat wherever slight substrate irregularity exists.
 - .1 Limit levelling coat thickness to less than 8 mm where thin-set tile methods are to be used.
 - .2 Set levelling coat in excess of 8 mm with mortar bed method.
- .4 Install cleavage membrane over structural slab.
 - .1 Lay 6 mm thick sand-bed under cleavage membrane when cleavage membrane is installed over rough substrate.

3.4 STONE FLOOR INSTALLATION

- .1 Install cleaned, salvaged and sound slate tile on mortar setting bed with reinforcing mesh over cleavage membrane to requirements of TCNA Handbook for Ceramic, Glass and Stone Tile Installation and Tile Specification Guide 09300, Tile Installation Manual.
- .2 Fit tile units around corners, fitments, fixtures, drains and other built-in objects to maintain uniform joint appearance.
- .3 Make cut edges smooth, even and free from chipping. Do not split tile.
- .4 Lay out tiles as indicated so that perimeter and cut tiles are no less than half size.
- .5 Set tiles in place while bond coat is wet and tacky, prior to skinning over. Slide tile back and forth to ensure a proper bond and level surface. Avoid slippage.
- .6 Clean backs of tiles and back butter tiles to ensure a 95% bond coverage.
- .7 Clean excess mortar from surface prior to final set.
- .8 Sound tiles after setting materials have cured and replace hollow sounding tile before grouting.
- .9 Clean structural slabs and place cleavage plane membrane, lapping joints minimum of 4".
- .10 Place mortar bed and screed to required level. Apply bond coat to mortar bed.
- .11 Maintain uniform 6mm wide joints between units true to line in both directions.
- .12 Finished floor shall be level and true in plant to within 3mm when checked with a 3000 mm straight edge placed anywhere on the surface.
- .13 Interior Slate Base:
 - .1 Set base in cement mortar as specified for floors, except without cleavage membrane.
 - .2 Set Base over floor slate with 6mm joint between slate floor surface and bottom edge of base and between sections.
 - .3 Base to be 13 mm nominal thickness, cut to 100 mm high, in 762 mm nominal lengths. Top edge of base shall have 1/16" chamfer to plaster screed.
 - .4 Base to have a sanded finish to match existing adjacent base.

- .14 Install control joints and expansion joints in tile work in accordance with TTMAC Detail 301EJ and TCNA Detail EJ171.
- .15 Keep control and expansion joints free of setting materials.

3.5 CONTRASTING ABRASIVE STRIPS ON STONE TREADS

- .1 Apply anti-slip stair tread high visual contrast abrasive strips to two stone block stairs and upper landing at Queen street lantern using adhesive fastenings as recommended by manufacturer and suitable to solid slate stone substrate.

3.6 GROUTING

- .1 Allow proper setting time prior to grouting. Sound tiles after setting materials have cured and replace hollow sounding tile before grouting.
- .2 Preseal tiles requiring protection from grout staining.
- .3 Force grout into joints to ensure dense finish.
- .4 Remove excess and polish with clean cloths.

3.7 STONE COUNTER INSTALLATION

- .1 Investigate millwork support framing and ensure it is level and suited to installation of new counters.
- .2 Measure on site and scribe template for cutting stone counters. Shop cut and polish stone counters.
- .3 Deliver to site and install using stone supplier's recommended adhesives, and purpose made support brackets. Ensure installation is level and true.
- .4 Protect finished counter until final inspection.

3.8 TOLERANCES

- .1 Level tiles to conform to 1 mm tolerance over 3 mm joint.

3.9 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, “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 00 10 – General Instructions, “Cleaning”.
 - .1 Apply floor sealer in accordance with manufacturer s instructions.
- .3 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.10 PROTECTION

- .1 Protect finished areas from traffic until setting materials have sufficiently cured.
- .2 Protect grouted areas from traffic for 24 hours after grouting.
- .3 Provide protective covering until Completion of Contract.
- .4 Protect wall tiles and bases from impact, vibration, heavy hammering on adjacent and opposite walls for at least 14 days after installation.

3.11 SCHEDULE

- .1 Floor Tile: Salvaged slate at main entrance.
- .2 Counters: Black granite in washrooms

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 01 61 00 – Common Product Requirements
- .2 Section 01 74 19 – Waste Management and Disposal
- .3 Section 02 41 00.08 – Demolition for Minor Works
- .4 Section 26 05 33 – Raceway and Boxes for Electrical Systems

1.2 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM F137 - 08(2018) Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus
 - .2 ASTM F710-19, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
 - .3 ASTM F970 – 17 Standard Test Method for Measuring Recovery Properties of Floor Coverings after Static Loading
 - .4 ASTM F1066-04 (R2018), Standard Specification for Vinyl Composition Floor Tile.
 - .5 ASTM F1861-16, Standard Specification for Resilient Wall Base
 - .6 ASTM F1869-16a, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
 - .7 ASTM F1914-18 Standard Test Methods for Short-Term Indentation and Residual Indentation of Resilient Floor Covering
 - .8 ASTM F2199-18 Standard Test Method for Determining Dimensional Stability and Curling Properties of Resilient Flooring after Exposure to Heat
 - .9 ASTM F2873-18 Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring
 - .10 ASTM D3960-05(2018) Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings
- .2 International Standards and Training Alliance (INSTALL)
 - .1 INSTALL Resilient Certification.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
 - .2 CAN/CGSB-25.21-95, Detergent-Resistant Floor Polish.

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 tile in size specified, transition strips, edge strips 300 mm long.
- .4 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Construction Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
 - .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages of recycled content materials and products, showing their costs and percentages of post-industrial post-consumer content, and total cost of materials for project.
 - .3 Regional Materials: submit evidence that project incorporates percentage 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
 - .4 Low-Emitting Materials:
 - .1 Submit listing of adhesives, sealants, paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra Materials:
 - .1 Provide maintenance materials of resilient tile flooring, base and adhesive in accordance with Section 01 78 00 – Closeout Submittals.
 - .2 Provide extra materials from same production run as installed materials.
 - .3 Identify each container of floor tile and each container of adhesive.
 - .4 Deliver to Departmental Representative upon completion of the work of this section.
 - .5 Store where directed by Departmental Representative.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:

- .1 Store materials 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 Develop Construction Waste Management Plan related to Work of this Section in accordance with Section 01 74 19 – Waste Management and Disposal.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of pallets, packaging materials padding, crates, as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

1.6 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees C for 48 hours before, during and for 48 hours after installation unless otherwise indicated in manufacturer's written instructions.

Part 2 Products

2.1 MATERIALS

- .1 Vinyl composition static dissipative tile: to ASTM F1066, Class 2 – through pattern, 3.2 mm, 305 mm x 305 mm size, colour and pattern selected by Departmental Representative.
- .2 Commercial Polymeric Composite Floor tiles, 2 to 2.5 mm thick, plank format, wood grain look to ASTM F137, ASTM F2199, ASTM F970, ASTM F1914.
- .3 Resilient base: continuous, top set, complete with pre-moulded end stops and external corners:
 - .1 Type: rubber.
 - .2 Style: straight.
 - .3 Thickness: 3.17 mm.
 - .4 Height: 101.6 mm.
 - .5 Lengths: cut lengths minimum 2400 mm.
 - .6 Colour: selected by Departmental Representative from manufacturer's full range.
- .4 Primers and adhesives: waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.
 - .1 Flooring adhesives:
 - .1 Adhesive: maximum VOC limit 40 g/L according to ASTM D3960-05 testing methods.
 - .2 Cove base adhesives:
 - .1 Adhesive: maximum VOC limit 40 g/L according to ASTM D3960-05 testing methods.

- .5 Self leveling underlayment and filler: white premix latex requiring water only to produce cementitious paste, 2-part latex-type filler requiring no water as recommended by flooring manufacturer for use with their product and in accordance with ASTM F2873-18.
- .6 Metal edge strips: aluminum extruded, smooth, polished with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .7 Sealant:
 - .1 Sealer: type recommended by flooring manufacturer to CAN/CGSB-25.20, Type 2-water based.
 - .2 Sealant: maximum VOC limit 50 g/L in accordance with ASTM D3960-05.
- .8 Wax: type recommended by flooring manufacturer to CAN/CGSB-25.21.

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 resilient tile flooring installation in accordance with manufacturer s written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform 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 Departmental Representative.

3.2 INSPECTION

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

3.3 SUB-FLOOR TREATMENT

- .1 Clean floor and apply filler and self leveling underlayment; trowel and float to leave smooth, flat hard surface in accordance with ASTM F2873. Prohibit traffic until filler cured and dry.
- .2 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .3 Seal concrete sub-floor. Prime to flooring manufacturer's printed instructions.

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 (1) 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 Install flooring tile in a random, staggered pattern, with pattern grain parallel for units and parallel to width or length of room.
- .5 As installation progresses, and after installation, roll flooring with a weighted roller (weighted according to manufacturer's written instructions) to ensure full 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 BASE APPLICATION

- .1 Lay out base to keep number of joints at minimum. Base joints at maximum length available or at internal or pre-moulded corners.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller (or weight according to manufacturer's instructions).
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use pre-moulded end pieces at flush door frames.
- .7 Cope internal corners. Use pre-moulded corner units for right angle external corners. Use formed straight base material for external corners of other angles, minimum 300 mm each leg. Wrap around toeless base at external corners.
- .8 Install toeless type base before installation of carpet on floors.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, "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 00 10 – General Instructions, "Cleaning".
 - .1 Clean flooring base surfaces to flooring manufacturer's printed instructions.

- .3 Remove excess adhesive from floor, base and wall surfaces without damage.
- .4 Clean, seal and wax floor and base surface to flooring manufacturer's instructions. In carpeted areas clean, seal and wax base surface before carpet installation.
- .5 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

- .1 Protect new floors until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.

3.8 SCHEDULE

- .1 Install Static Dissipative VCT in both Electrical and Data Closets 107 and 109.
- .2 Install Polymeric Composite Flooring in all other locations identified to receive resilient flooring.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 02 41 00.08 – Demolition for Minor Works
- .2 Section 26 05 33 – Raceway and Boxes for Electrical Systems.

1.2 REFERENCE STANDARDS

- .1 American Association of Textile Chemists and Colorists (AATCC)
 - .1 Test Methods (TM):
 - .1 AATCC TM16.1-2014, Colorfastness to Light: Outdoor.
 - .2 AATCC TM23-2015, Colorfastness to Burnt Gas Fumes.
 - .3 AATCC TM129-2016, Colorfastness to Ozone in the Atmosphere under High Humidities.
 - .4 AATCC TM134-2016, Electrostatic Propensity of Carpets.
 - .5 AATCC TM165-2013, Colorfastness to Crocking: Textile Floor Coverings – Crockmeter Method.
 - .6 AATCC TM171-2014, Carpets: Cleaning of; Hot Water Extraction Method.
 - .7 AATCC TM175-2013, Stain Resistance: Pile Floor Coverings.
 - .8 AATCC TM189-2017, Fluorine Content of Carpet Fibers.
 - .2 American National Standards Institute (ANSI)
 - .1 ISO 2551: 1981, Machine-made Textile Floor Coverings – Determination of Dimensional Changes Due to the Effects of Varied Water and Heat Conditions ISO 2551 (Previously AACHEN DIN 54318, Dimensional Stability Test).
 - .3 ASTM International (ASTM)
 - .1 ASTM D1335-17e, Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings.
 - .2 ASTM D3936-17, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
 - .3 ASTM D 5116-17, Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
 - .4 ASTM D5252-15, Standard Practice for the Operation of the Hexapod Tumble Drum Tester.
 - .5 ASTM E 648-17a, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - .6 ASTM E662-18, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - .7 ASTM F2873-18 Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring

- .4 California Department of Public Health (CDPH), CA Section 01350 Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers (using ASTM D 5116-17).
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No. 22-2004 (R2013), Textile Test Methods - Colourfastness to Rubbing (Crocking).
 - .2 CAN/CGSB-4.2 No.27.6-M91 (R2013), Textile Test Methods Flame Resistance - Methenamine Tablet Test for Textile Floor Coverings.
 - .3 CAN/CGSB-4.2 No. 76-94/ISO 2551: 1981 (R2010), Textile Test Methods Machine-Made Textile Floor Coverings - Determination of Dimensional Changes Due to the Effects of Varied Water and Heat Conditions.
 - .4 CAN/CGSB-4.2 No.77.1-94/ISO 4919: 2012 (R2018), Textile Test Methods Carpets - Determination of Tuft Withdrawal Force.
 - .5 CAN/CGSB-4.129-93, Carpets for Commercial Use.
 - .6 CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .6 Carpet and Rug Institute (CRI)
 - .1 CRI 104 Carpet Installation Standard for Commercial Carpet 2015.
 - .2 CRI Green Label Plus Indoor Air Quality Testing Program (Meets CDPH CA Section 01350 using ASTM D 5116-17).
- .7 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS): Safety Data Sheets (SDS).
 - .2 C.R.C., c.923-10, Hazardous Products Act - Carpet Regulations, Part II of Schedule 1.
- .8 National Floor Covering Association (NFCA)
 - .1 NFCA Floor Covering Reference Manual, latest edition.
- .9 ULC Standards (ULC)
 - .1 CAN/ULC-S102-:2018, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC-S102.2-:2018, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.
 - .3 UL 2818 GREENGUARD Certification Program for Chemical Emissions for Building Materials, Finishes and Furnishings (Meets CDPH Section 01350 using ASTM D 5116-17).
 - .4 UL 2821 GREENGUARD Certification Program Method for Measuring and Evaluating Chemical Emissions From Building Materials, Finishes and Furnishings (Meets CDPH CA Section 01350 using ASTM D 5116-17).

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Testing:

- .1 At the time of product delivery to the work site, the Contractor must turn over a representative sampling range of Materials for testing to the Departmental Representative. Note: The Departmental Representative shall have full authority to select materials for testing from an unrestricted range of unopened, original containers or wrappings with Manufacturer's seals and labels intact, after materials have been delivered to the work site.
- .2 The following tests may be requested to be carried out by an independent laboratory and /or by the Departmental Representative. This list is representative only and should not be considered comprehensive. Although date may not be mentioned below, it is understood that the latest testing date is to be used (eg: AATCC_16-2014). Other tests may be requested/conducted at the sole discretion of the Departmental Representative.
 - .1 AATCC 16.1, Colorfastness to Light, minimum L4 (Gray Scale) after 60 hours.
 - .2 Testing against CAN/CGSB-4.129, quality in construction.
 - .3 AACHEN Din 54318/ISO 2551:1981, Dimensional Stability – maximum 0.15% change.
 - .4 ASTM D3936-17, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering, minimum 4 Newtons /cm).
 - .5 Pile Density (calculation not test) – minimum 367,000 g/m³. Provide calculations of determined kilotex.
 - .6 Appearance Retention Hexapod Drum Test, ASTM D5252-15 for 12,000 cycles, minimum rating of 3.0 using CRI TM-103 Reference Scales.
 - .7 AATCC TM175-2013, Stain Resistance: Pile Floor Coverings, minimum 2 washings to simulate removal of topical treatments by hot water extraction, followed by: AATCC TM175-2013, results to a minimum of 8 on the Red 40 Stain Scale
 - .8 Soil Resistance: Where a fluorine coating is applied to the carpet fibre to achieve soil resistance, an average of 3 fluorine analyses AATCC TM189-2017 of a single composite sample to be a minimum of 300 ppm fluorine by weight when new and an average of 3 fluorine analyses using AATCC TM189-TM 189 to be a maximum of 200 ppm fluorine by weight after two (2) AATCC TM171-2014 (HWE) cleanings.
 - .9 CAN/CGSB 4.2 method 77.1/ISO 4919 Carpet-Determination of Tuft withdrawal Force – minimum 35 N force.
 - .10 CAN/CGSB 4.2, No. 27.6-M91, Textile Test Methods - Flame Resistance – Methemine Tablet Test (ASTM D-2859) for Textile Floor Coverings, sampling by CAN/CGSB-4.155, as required under the Hazardous Products Act.
 - .11 ASTM E 648-17a: passes Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - .12 Maximum flame spread rating 300, maximum smoke developed classification 500, when tested to CAN/ULC-S102.2.
 - .13 Smoke Density: ASTM E662 ≤450.

- .14 AATCC TM134-2016, Electrostatic Propensity of Carpet: maximum 3.5 kV at 20% RH and 21°C.
- .15 AATCC TM165-2013 Colourfastness to Crocking, greater than or equal to Color Transfer Class 4 wet, dry.
- .16 AATCC TM171-2014 Carpets: Cleaning of: Hot water extraction method followed by AATCC TM175-2013 Stain resistance Pile Floor coverings. Rating to AATCC Red 40 Stain scale.
- .3 Testing to be conducted by an independent testing agency accredited to do the specified tests, by the Standards Council of Canada or by the U.S. National Institute of Science and Technology's National Voluntary Accreditation Program (NVLAP).
- .4 To be considered independent, a testing agency shall not in any way be involved or have an interest in the manufacture or sale of the product being tested.
- .2 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, on-site installation, with Departmental Representative to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other construction subtrades.
 - .4 Review manufacturer s written installation instructions and warranty requirements.
 - .3 Sequencing: sequence with other work. Comply with manufacturer's written recommendations for sequencing construction operations.
 - .4 Scheduling: schedule with other work.

1.4 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 concrete filler and leveling compound, and adhesive carpet tile and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit two (2) copies of WHMIS SDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Ontario, Canada.
 - .2 Information on shop drawings to indicate:
 - .1 Nap: direction, open edges, special patterns.
 - .2 Cutouts: show locations where cutouts are required.
 - .3 Edgings: show location of edge moldings and edge bindings.
- .4 Samples:

- .1 Submit two (2) samples for review and acceptance of each accessory.
- .2 Submit two (2) samples of each type of carpet tile specified and duplicate tiles for each colour selected, base divider strips 150 mm length binder bars.
- .5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .6 Test and Evaluation Reports:
 - .1 Certified test reports showing compliance with specified performance characteristics and physical properties.
 - .1 Submit verification to demonstrate compliance with CAN/ULC S102.2.
 - .2 Submit report verifying that tuft bind meets requirements for CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No. 77.1/ISA 4919.
- .7 Manufacturer's Instructions: submit manufacturer's installation storage instructions, Annex A, completed indicating all information on carpet: product/supplier; nylon: supplier/type/percentages if more than one type; list of colours: colour names/descriptions.
- .8 Manufacturers Reports:
 - .1 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance with specifications.
- .9 Sustainable Design Submittals:
 - .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating a minimum of 75% of construction wastes recycled or salvaged.
 - .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer post-industrial content, and total cost of materials for project.
 - .3 Low-Emitting Materials:
 - .1 Submit listing of coatings used, showing compliance with VOC and chemical component limits or restriction requirements.
 - .2 Submit listing of carpet, carpet backer and adhesive used, showing compliance with CA Section 01350 CRI Green Label Plus Indoor Air Quality Test Program or UL Greenguard program (ASTM D5116).
- .10 Qualification Statements:
 - .1 All preparation, materials and workmanship shall be in accordance with NGCA requirements and material manufacturer's written recommendations and detail requirements for conditions of work that apply.
 - .2 Compliance: to CAN/ULC-S102.2 CAN/ULC-S102.

- .3 Testing: passes CA Section 01350 CRI Green Label Plus Indoor Air Quality Test Program or UL Greenguard program (ASTM D5116).
- .4 Tuft bind: meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No.77.1.
- .5 Provide Environmental Product Declaration.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for installed products for incorporation into manual.
- .3 Warranty Documentation: submit warranty documents specified.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra stock materials: deliver to Departmental Representative extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with section 01 78 00 – Closeout Submittals.
- .2 Quantity: provide minimum 10% of carpet tile each colour, carpet base and adhesives.

1.7 QUALITY ASSURANCE

- .1 Quality Assurance: in accordance with Section 01 45 00 – Quality Control.
- .2 Regulatory Requirements:
 - .1 Prequalification: compliance with Health Canada regulations under “Hazardous Products Act”, Part II of Schedule 1, to CAN/CGSB-4.2 No. 27.6.
- .3 Qualifications:
 - .1 Manufacturer: capable of providing field service representation during construction and approving application method.
 - .2 Flooring Applicator Contractor:
 - .1 Experienced in performing work of this Section who has specialized in installation of work similar to that required for this project.
 - .2 Certified by carpet manufacturer for carpet installation.
 - .3 No sub-contract labour without written approval of Departmental Representative.
 - .4 Responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturer’s written instructions.

1.8 REGULATORY REQUIREMENTS

- .1 Prequalification: compliance with Health Canada regulations under “Hazardous Products Act”, Part II of the Schedule, tested to CAN/CGSB 4.2-No. 27.6.
- .2 Indoor Air Quality: compliance with CA Section 01350 CRI Green Label Plus Indoor Air Quality Test Program or UL Greenguard program (ASTM D5116).

1.9 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.
- .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 materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - .3 Store and protect adhesive carpet tile in original containers or wrapping with manufacturer s seals and labels intact.
 - .4 Store and protect carpet tile and accessories in location as directed by Departmental Representative.
 - .5 Store carpet and adhesive at minimum temperature of 18 degrees C and relative humidity of maximum 65% for minimum of 48 hours before installation.
 - .6 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.
 - .7 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
 - .8 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19 – Waste Management and Disposal.
- .5 Packaging Waste Management: remove for reuse by manufacturer and return of padding, crates, pallets, packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

1.10 SITE CONDITIONS

- .1 Moisture: substrate within moisture limits and alkalinity limits recommended by manufacturer. Prepare moisture testing and provide report to Departmental Representative.
- .2 Temperature: maintain ambient temperature of minimum 18 degrees C from 48 hours before installation to minimum 48 hours after completion of work unless otherwise specified by flooring manufacturer.
- .3 Relative humidity: maintain between 10% and 65% for 48 hours before, during and 48 hours after installation unless otherwise specified by flooring manufacturer.
- .4 Ventilation:
 - .1 Departmental Representative will co-ordinate operation of ventilation system during installation of carpet. Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.
 - .2 Ventilate enclosed spaces in accordance with Section 01 00 10 – General Instructions, “Temporary Utilities”. Provide fans with HEPA filters.

- .3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 30 days after completion of carpet installation.
- .5 Install carpet after:
 - .1 Space enclosed and weatherproof.
 - .2 Wet-work in space completed and nominally dry.
 - .3 Work above ceilings complete.
 - .4 Subfloor has been properly prepared. Refer to ASTM F2873-18 Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring where tile backing is resilient material.

1.11 WARRANTY

- .1 Manufacturer's warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights Owner may have under Specifications and Drawings.
 - .1 Labour Warranty period: one (1) year, commencing on date of substantial performance of work.
 - .1 Warranty covers labour repair or replacement of defective components for one (1) year after date of substantial performance.
 - .2 Materials Warranty Indicate: 15-year warranty from date of invoice, for edge ravel, domination, shrinking, stretching, dimensional stability, wear beyond 10% by weight of face fibre and static control.

1.12 MOCK UP

- .1 Provide three nominally 15 m2 mock ups of the patterned carpet tile installation at locations to be determined by the departmental representative.
- .2 Approved mock up may be incorporated into the work.
- .3 Intent of mock up is to review the degree of variance of the carpet tile, the appearance in herringbone and running bond patterns and the joint condition between the two patterned carpets.

Part 2 Products

2.1 MATERIALS

- .1 Manufacturers:
 - .1 Ensure manufacturer has minimum five (5) years experience in manufacturing components similar to or exceeding requirements of project.
 - .2 Certification: to CRI Green Label Plus Indoor Air Quality Test Program or UL Greenguard program (ASTM D5116).
- .2 Description:
 - .1 Modular Carpet Tile

- .2 Project Requirement: size, style and colour.
 - .1 Size all types minimum, 500 mm by 500 mm: maximum 610 mm by 610 mm.
 - .2 Style: Tufted Patterned level Loop Carpet: Modular multiple tile patterned neutral colour carpet tile is required to be selected from manufacturer's full range of colours.
 - .3 Minimum 4 individual colours within one carpet tile for each type. Pattern integrated with face material and not applied after surface manufacturing. Multiple colour tones in medium colour to reduce the visible effects of soiling and staining.
 - .1 Type 1: subtle stone and flagstone or paver look pattern mix.
 - .2 Type 2: more pronounced flagstone or paver look pattern mix.
 - .3 Type 3: lightly accented Moss in flagstone or paver look pattern mix.
 - .4 Type 4: mottled moss colour semi-solid mix.
 - .4 Recycled Content: to contribute to >75% of tile, including backing, by mass
 - .5 Poly Vinyl Chloride (PVC): to contribute to <10% of tile, including backing, by mass.
- .3 Carpet and Accessories:
 - .1 >75% recycled content. Post-industrial (65% min) Post-consumer (10% minimum).
 - .2 Provide Environmental Product Declaration.

2.2 PERFORMANCE

- .1 Flammability: certified for flammability to Health Canada regulations under Hazardous Products - Carpet Regulations, Part II of Schedule 1.
- .2 Flame Spread: maximum flame spread rating 300, maximum smoke developed classification 500, when tested to CAN/ULC-S102.2.
- .3 Smoke Development: ASTM E662 \leq 450.
- .4 Dry Breaking Strength: to ASTM D2661, minimum acceptable tear strength in both length and width:
 - .1 11.3 kg for carpets installed by glue down installation.
- .5 Wear: maximum 10% loss of pile face fibre by weight for 10 years.
- .6 Edge Ravel: none for 10 years.
- .7 Static Resistance: permanent static control to AATCC 134, 3000 V maximum at 20% RH and 22 degrees C.
- .8 Static Generation: less than 3.0 kV per AATCC 134 for 10 years.
- .9 Tuft Bind: Tuft Lock: to CAN/CGSB-4.129 ASTM D1335, minimum acceptable 1.6 kilograms for cut pile product, 3.6 for loop pile product.
- .10 De-lamination of Secondary Backing: Lamination Strength of Secondary Backing: to ASTM D3936, minimum acceptable peel strength of 1.6 kg/25 mm.

- .11 Stain resistance: to AATCC 175, 8.
- .12 Soil Resistance: Fluorine Durability Level to AATCC 189 350 ppm fluorine minimum.
- .13 Colorfastness, dimensional stability, permanency of finishes, and ease of cleaning: to AATCC 171.
- .14 Colourfastness to light: to AATCC 16 CAN/CGSB-4.2 No.18.3.
- .15 Colourfastness to atmosphere: to AATCC 23 AATCC 129.
- .16 Colourfastness to crocking: to CAN/CGSB-4.2 No. 22.
- .17 Cleaning of Carpets with Hot Water Extraction Method: to AATCC 171.
- .18 Indoor Air Quality Certification: certified to CRI Green Label Plus or UL Greenguard program IAQ requirements.

2.3 FABRICATION

- .1 Face construction:
 - .1 Tufted.
- .2 Pile Surface Appearance:
 - .1 Level loop: textured.
- .3 Pile fibre: to CAN/CGSB-4.129.
 - .1 Nylon: Type 6.
 - .1 Fibre shape to have a maximum Modification Ratio of 1.9 to 2.2 for soil release capabilities.
- .4 Face Fiber Content:
- .5 Face Fiber Yarn Weight: Minimum 745 g/m².
- .6 Dyeing Method: solution dyed.
- .7 Tufted Carpet Backing: to CAN/CGSB-4.129.
 - .1 Primary backing: non-woven.
- .8 Secondary and Unitary Backings: to CAN/CGSB-4.129.
- .9 Pile Weight Density: minimum 367,089.8 g/m³.
- .10 Surface Pile Weight: minimum 576 g/m².
- .11 Dimensional Stability: AACHEN Din 54318 <0.10%.

2.4 TILE CUSHION BACKING

- .1 Not accepted.

2.5 ACCESSORIES

- .1 Base:
 - .1 Wall Carpet Base: standard resilient cove base to coordinate w/ flooring, as selected by Departmental Representative.

- .2 Binder Bars: aluminum.
- .3 Edge Strips:
 - .1 Metal:
 - .1 Designed for carpet being installed.
 - .2 Floor flange minimum 38 mm wide, face minimum 16 mm wide.
 - .3 Finish: to be selected from manufacturer's full range by Departmental Representative.
 - .2 Carpet Base Top Edge Strip:
 - .1 Vinyl J strip wall flange minimum 38 mm wide with cap beveled from wall to finish flush with carpet being installed.
 - .2 Colour for selection by Departmental Representative from manufacturer's full range.
- .4 Adhesive:
 - .1 Multi-purpose Adhesive Type: recommended by carpet tile manufacturer for direct glue down installation.
 - .2 Pressure Sensitive Type: recommended by carpet tile manufacturer for direct glue down installation of speciality-backed carpet tiles.
 - .3 Mill-applied Adhesive Type: fully cured. Combination of pre-applied adhesive and tile to meet carpet only VOC emissions criteria of Carpet and Rug Institute Green Label Plus Indoor Air Quality Certification Program or UL Greenguard program (ASTM D5116).
 - .4 Pre-applied Adhesive: non-transferable.
 - .5 On site application VOC limit: 50 g/L maximum, where possible, as recommended by the flooring manufacturer.
- .5 Transition Mouldings:
 - .1 Carpet edge/reducer strip:
- .6 Carpet protection: non-staining heavy duty kraft paper.
- .7 Concrete floor sealer primer:
 - .1 VOC limit: 150 g/L maximum, according to concrete manufacturer's instructions and to ensure compatibility with floor covering manufacturer's installation instructions.
- .8 Subfloor patching compound: Portland cement base filler, mix with latex water to form cementitious paste.

Part 3 Execution

3.1 INSTALLERS

- .1 Experienced and qualified technicians to carry out assembly and installation of tile carpet.

3.2 EXAMINATION

- .1 Examine conditions, substrates and work to receive work of this Section.
- .2 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for carpet tile installation in accordance with manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions remedied and after receipt of written approval to proceed from Departmental Representative.

3.3 PREPARATION

- .1 Subfloor Preparation:
 - .1 Inspect concrete and determine special care required to make it suitable for carpet installation.
 - .2 Fill and level cracks 3 mm wide or protrusions over 0.8 mm with appropriate and compatible latex polymer fortified patching compound, to comply with manufacturer's written recommendations for maximum patch thickness and apply the compound according to the manufacturer's instructions.
 - .3 Prime large patch areas with compatible primer.
 - .4 Ensure concrete substrates cured, clean and dry.
 - .5 Ensure concrete substrates free of paint, dirt, grease, oil, curing or parting agents, and other contaminants, including sealers, that interfere with bonding of adhesive.
 - .6 Where powdery or porous concrete surface encountered, apply primer compatible with adhesive to provide suitable surface for glue-down installation.
- .2 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Section 01 00 10 – General Instructions, "Examination and Preparation" and refer to ASTM F2873-18 Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring where tile backing is resilient material.
 - .1 Prepare floor surfaces in accordance with CRI Carpet Installation Standard.
 - .2 Coordinate floor leveling with installation of modular nominally 19mm high flatwire cabling system. See electrical specifications and drawings.
 - .3 Apply self-leveling underlayment to areas where transition strips and modular flat wire type cabling system will be installed to provide feathered smooth transitions. Coordinate with electrical and porcelain tactile transition strips and stair landings to provide consistent levels and ensure consistent riser heights.
- .3 Tile Carpeting Preparation:
 - .1 Pre-condition carpeting following manufacturer's written instructions.

3.4 INSTALLATION

- .1 Install carpet tiles in accordance with manufacturer's written instructions, and CRI Carpet Installation Standard and co-ordinate with Section 01 73 00 – Execution.

- .2 Co-ordinate tile carpeting work with work of other trades, for proper time and sequence to avoid construction delays.
- .3 Install carpet tile after finishing work is completed. Coordinate with installation of Electrical Wireways. Install carpet in wireway cover caps designed to receive carpet strip. Refer to Section 26 05 33 – Raceway and Boxes for Electrical Systems.
- .4 Install carpet tile in accordance with manufacturer s recommendation. This can include quarter-turn 90-degree format, monolithic, random, quarter turn ashlar, horizontal, herringbone or vertical ashlar.
- .5 Snugly join carpet tiles in completed installation.
 - .1 Measure distance covered by 11 carpet tiles (10 joints) and ensure distance is compliance with manufacturer specifications.
 - .2 Trapping yarn between carpet tiles is prohibited.
- .6 Apply thin film of pressure-sensitive adhesive according to manufacturer’s recommendations.
- .7 Finished installation to present smooth wearing surface free from conspicuous seams, burring and other faults.
- .8 Use material from same dye lot.
 - .1 Colour, pattern and texture to match within visual areas.
 - .2 Maintain constant pile direction.
- .9 Fit around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.
- .10 Extend carpet tiles into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .11 Install carpet tiles smooth and free from bubbles, puckers, and other defects.
- .12 Protect exposed carpet tile edges at transition to other flooring materials with suitable transition strips.
- .13 Base Installation:
 - .1 Lay out base to keep number of joints at minimum. Base joints at maximum length available or at internal corners.
 - .2 Clean substrate and prime with one coat of adhesive.
 - .3 Apply adhesive to back of base.
 - .4 Set base against wall and floor carpet surfaces neat and tightly by using manufacturer recommended hand roller.
 - .5 Install straight and level to variation of 1:1000.
 - .6 Scribe and fit to door frames and other obstructions.

3.5 SITE QUALITY CONTROL

- .1 Manufacturer’s Field Services:
 - .1 Co-ordinate manufacturer’s services with Section 01 45 00 – Quality Control. Have manufacturer review work involved in handling, installation/application,

protection and cleaning of its products, and submit written reports, in acceptable format, to verify compliance of work with Contract.

- .2 Manufacturer's field services: provide manufacturer's field services, consisting of product use recommendations and periodic site visits for inspection of product installation, in accordance with manufacturer's instructions.
- .3 Schedule site visits:
 - .1 After delivery and storage of products, and when preparatory Work, or other Work, on which Work of this Section depends, complete but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning carried out.
- .4 Obtain reports within 3 days of review and submit immediately to Departmental Representative.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 – General Instructions, "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 00 10 – General Instructions, "Cleaning".
 - .1 Vacuum carpets clean immediately after completion of installation.
- .2 Waste Management: separate waste materials for recycling and reuse in accordance with Section 01 74 19 – Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Prohibit traffic on carpet for minimum period of 24 hours after installation and until adhesive is cured, unless otherwise instructed by product manufacturer.
- .3 Install carpet protection as directed by Departmental Representative.
- .4 Repair damage to adjacent materials caused by tile carpeting installation.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 09 21 16 – Gypsum Board Assemblies.

1.2 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 41-GP-30M-82, Wallcoverings, Vinyl-Coated Fabrics.
- .2 General Services Administration (GSA)
 - .1 GSA Federal Specification CCC-W-408 D
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .4 NSF/ANSI
 - .1 NSF/ANSI 342.Sustainability Assessment for Wallcovering Brochure
- .5 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL 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.
 - .1 Submit WHMIS SDS - Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures. WHMIS SDS acceptable to Labour Canada and Health and Welfare Canada for vinyl-coated fabric wall coverings. Indicate VOC content.
 - .2 Submit complete written description, including total fabric weight, name of fabric backing, tensile strength, tear strength and fire rating characteristics.
- .3 Provide samples in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Due to product lead times, order material immediately upon approval of wall covering from Departmental Representative
 - .2 Submit duplicate 203.2 mm x 254 mm samples of colours and textures of wall coverings.
- .4 Sustainable Design Submittals
 - .1 Submit listing of recycled content used, including percentages of post-consumer content.
 - .2 Submit listing of sealers, sizing and adhesives used, showing compliance with VOC and chemical component limits or restriction requirements.

- .5 Closeout Submittals:
 - .1 Provide maintenance data for vinyl-coated fabric wall covering in accordance with Section 01 78 00 – Closeout Submittals.

1.4 **QUALITY ASSURANCE**

- .1 Field Sample:
 - .1 Before commencing application, prepare wall and apply samples of wall covering from current production run of materials selected to show evidence there are no roller marks or other imperfections which may occur during manufacturing process of wall covering to three full wall panels, for Departmental Representative's approval.
 - .2 Construct mock-ups in accordance with Section 01 45 00 – Quality Control.
 - .1 Apply vinyl-coated wall covering of each finish to 10 m² area of surface to be covered. Approximately three full wall panels.
 - .2 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with wall covering work.
 - .3 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.
- .3 Sustainable Requirements:
 - .1 Comply with California 03150 Indoor Air quality – low VOC emitting vinyl wall coverings meets California Department of Health Services Section 01350 requirement for office and school interiors.
 - .2 Anti microbial with a permeability rating of 10 or higher where possible.
 - .3 PVC & POA (Olefin) free, no plasticizers, no phthalates, no formaldehyde, no chlorine, no halogen, no heavy metals, including: Cadmium, Mercury, Lead, or Zinc.
 - .4 Stain and mildew resistance. Best rating (0) as tested in accordance with GS. Federal Specification CCC-W-408 D.
 - .5 A minimum of 15% recycled content is required.

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 19 – Waste Management and Disposal.

1.6 **AMBIENT CONDITIONS**

- .1 Temperature: maintain air temperature and structural base temperature at wall covering installation area above 20 degrees C and relative humidity below 40% for 72 hours before, during, and 72 hours after installation.
- .2 Ventilation:

- .1 Ventilate enclosed spaces in accordance with Section 01 00 10 – General Instructions, “Temporary Utilities”.
- .2 Provide continuous ventilation during and after coating application.
- .3 Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.

1.7 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide extra materials of vinyl coated fabric wall covering, adhesives and cleaners in accordance with Section 01 78 00 – Closeout Submittals.
 - .2 Provide 5 m² of full width material of each pattern, texture and colour of vinyl-coated fabric wall covering.
 - .3 Provide sufficient adhesive to install extra material vinyl-coated fabric wall covering provided.
 - .4 Extra materials from same production run/and or dye lot as installed materials.
 - .5 Identify rolls of vinyl-coated fabric wall coverings and containers of adhesives.
 - .6 Deliver to Departmental Representative upon completion of work of this section.
 - .7 Store where directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Wall covering: Fabric-backed vinyl wallcovering, w/ polyesters and natural fibre blend, to CGSB 41-GP-30M, NSF/ANSI 342 or CCC-W-408D requirements for Type II Wallcoverings.
 - .1 Surface burning characteristics in accordance with CAN/ULC-S102: Flame Spread: 0 to 25, Smoke Developed: 0 to 450 (ASTM E-84 Class A Rated).
 - .2 Weight Minimum 19 oz. /lin. Yard
 - .3 Repeat: Random Match/ Non-reverse hang.
 - .4 Pattern and look: Biophilic photorealistic wall coverings.
 - .1 PLANTS LOOK: Biophilic natural textured look resembling moss, lichen or other dense plant material at 1:1 scale. pattern to selection of Departmental Representative from manufacturer’s full range.
 - .2 FOREST LOOK: Biophilic natural forest scene photorealistic high-resolution wall mural extend to suit entire wall plane identified, pattern to selection from Manufacturer’s full range by Departmental Representative from manufacturer’s full range.
 - .3 CONTINUOUS LOOK; Biophilic natural landscape scene to be provided contiguous across rear walls in rooms #103 to #106. Image to be selected by Departmental Representative from manufacturer’s full range or artwork will be provided by Departmental Representative.
- .2 Sealer: as recommended by covering manufacturer.

- .1 Primer / Sealer: maximum VOC limit 150 g/L. Refer to covering manufacturers instructions for the minimum wait time between applying sealers, sizing and wall coverings.
- .3 Sizing: as recommended by covering manufacturer.
- .4 Adhesive: adhesives and sizing designed for permeable wallcoverings when used. Bio-based (wheat powder or cornstarch-based adhesive) where possible. Adhesives and Primers must contain mildew inhibitors. See manufacturer's recommendations for commercially available products.
 - .1 Adhesives: maximum VOC limit 50 g/L.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 PREPARATION

- .1 Unwrap wall covering when ventilation conditions are accelerated. Allow 24 hours acclimation in installation before application.
- .2 Prepare surfaces according to covering manufacturer's instructions.
- .3 Work penetrating substrate to be completed before installing covering.
- .4 Prime/Seal and size surfaces to receive covering. Allow a minimum of 14 days between application of typical water-based wall primer/sealers and size. Apply according to covering manufacturer's instructions.

3.3 INSTALLATION

- .1 Installation sequence:
 - .1 Use rolls in consecutive numerical sequence of manufacture.
 - .2 Place strip panels consecutively in exact order they are cut from roll; including spaces above or below windows, doors or similar penetrations.
 - .3 Reverse alternate strips except on match patterns.
 - .4 Trim additional salvage where required to achieve colour and pattern match at seams.
 - .5 No horizontal seams permitted.
 - .6 Install covering before installation of plumbing fixtures electrical equipment casings bases cabinets.
 - .7 Apply adhesive as recommended by manufacturer.
 - .8 Remove excess adhesive along finished seams immediately after strips of wall covering is applied. As work progresses ensure clean warm water is used for final rinsing of wall covering and leave clean.

- .9 Leave completed work smooth, clean, without wrinkles, gaps, overlaps or air pockets.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 00 10 – General Instructions, “Cleaning”.
- .2 Clean surfaces to covering manufacturer's written instructions.

3.5 PROTECTION

- .1 Protect finished surfaces and exterior corners from damage until final inspection.

END OF SECTION

Part 1 General**1.1 RELATED REQUIREMENTS**

- .1 Section 09 21 16 GYPSUM BOARD ASSEMBLIES

1.2 REFERENCE STANDARDS

- .1 ASTM International (ASTM)
 - .1 ASTM C423-17, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .2 ASTM D6207 - Standard Test Method for Dimensional Stability of Fabrics to Changes in Humidity and Temperature
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-92.1-[M89], Sound Absorptive Prefabricated Acoustical Units.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .4 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-2017, Adhesives and Sealants Applications.
- .5 Underwriter Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
 - .2 CAN/ULC-S102- 2018 Standard Method of Test for Surface Burning Characteristics of building Materials and Assemblies

1.3 ACTION AND INFORMATIONAL 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.
 - .1 Submit independent testing demonstrating compliance of acoustic panel in accordance with ASTM C-423, Type "F5" mounting as defined by ASTM E-795
 - .2 Submit a certificate of compliance to specified acoustical and fire performance criteria, signed by the panel manufacturer. Attach independent laboratory test results for product used, showing that the products supplied as components and complete assemblies, meet or exceed the specified requirements.
 - Include independent testing demonstrating compliance of acoustic panel in accordance with ASTM C-423, Type "F5" mounting as defined by ASTM E-795.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate sample of acoustical unit.
- .4 Sustainable Design Submittals:

- .1 Construction Waste Management:
 - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.
- .2 Recycled Content:
 - .1 Submit listing of recycled content products used, including details of percentages of recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
- .3 Low-Emitting Materials:
 - .1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.4 QUALITY ASSURANCE

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 Construct one representative mock-up of acoustical wall treatment system.
- .3 Construct mock-up 1.5 m² minimum to indicate method of assembly, installation and fixing.
- .4 Construct mock-up where directed.
- .5 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with work.
- .6 When accepted, mock-up will demonstrate minimum standard for this work. Accepted mock up can remain.

1.5 ENVIRONMENTAL REQUIREMENTS

- .1 Commence installation after the room is enclosed and dust generating activities are completed.
- .2 Permit wet work to dry prior to commencement of installation.
- .3 Maintain uniform minimum temperature of 15 degrees C and relative humidity of 20-40% prior to, during and after installation.

1.6 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 or recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

Part 2 Products**2.1 MATERIALS**

- .1 Acoustical construction products must:
 - .1 Not require being labelled as poisonous, corrosive, flammable or explosive under Consumer Chemical and Container Regulations of the Hazardous Products Act.
 - .2 Be accompanied by detailed instructions for proper handling and installation so as to minimize health concerns.
 - .3 Recycled Content:
- .2 Acoustic units
 - .1 Acoustic core material:
 - .1 High Impact Resistance 28mm thick with chemically hardened edges or with concealed aluminum edges.
 - .2 96 to 112 kg/cu.m. density acoustically absorptive core, face laminated with a 3mm 256 - 320 kg/cu.m. high density acoustically transparent layer
 - .3 Size of finished panel: 1000mm by 1500mm. Size and accuracy tolerance to 1.6mm.
 - .4 Acoustic, solid colour 100% polyester fabric finish to be selected from manufacturer's standard range tested to meet ASTM D6207 for dimensional stability.
 - .5 Flame spread class of 25 or less to CAN/ULC S102-2018
 - .6 Smoke developed 50 or less to CAN/ULC S102-2018
 - .7 NRC designation of 0.95
 - .8 Metal support clips: roll formed galvanized steel to acoustic unit supplier's standard.
 - .3 Provide mounting system for acoustic wall panels as recommended by manufacturer for size and weight of panels. type and condition of substrate.
 - .1 Either slide and engage clips ("Z" clips), into an anti-rattle wall clip, or into continuous wall track; or by adhesive; or magnetic mount; or hook and loop mount.
 - .2 Panel clips and wall clips or continuous wall track shall be a minimum 20-gauge satin-coat steel with wall clips mechanically mounted to the back of the panels.
 - .4 All fasteners, staples, nails and screws non-corrosive finish are to be supplied by the installing contractor.
 - .5 Adhesive: type recommended by acoustic unit manufacturer.
 - .1 Adhesives: maximum VOC limit 50 g/L [to SCAQMD Rule 1168].

2.2 FABRICATION

- .1 Demountable acoustic units:
 - .1 Bond or stretch apply fabric to the panel face. Bonded to the panel edges and returned a minimum of one inch (25mm) on the back of the panel. The finish

shall be flat and wrinkle free and fully tailored at corners with no exposed darting. Fabric finish to be tested to ASTM D6207 for dimensional stability and approved for use by the panel manufacturer prior to procurement and fabrication.

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

- .1 Ensure substrate surface is straight to tolerance of plus or minus 3 mm over 3000 mm.
- .2 Use clean, lightweight gloves when handling panel materials.
- .3 Install acoustic units to clean, dry and firm substrate using screws, adhesive nails, staples.
- .4 Install acoustic units plumb and aligned. Arrange units symmetrical on each wall. Cut units to be at least 50 % of unit width.
- .5 Butt joints tight.

3.3 CLEANING

- .1 Proceed in accordance with Section 01 74 00 – Cleaning.
- .2 Keep acoustic installation and all components clean. Remove blemishes immediately.

3.4 PROTECTION

- .1 Protect finished acoustical wall treatment from damage.
- .2 Remove protection material prior to substantial completion.

3.5 SCHEDULES

- .1 Apply two panels on each side of the vestibule room number 111.1 centred on the two walls without doors.

END OF SECTION

Part 1 General**1.1 Related Requirements**

- .1 Section 05 50 00 – Metal Fabrications
- .2 Section 06 40 00 – Architectural Woodwork
- .3 Section 08 11 00 – Metal Doors and Frames
- .4 Section 09 01 90.63 – Interior Repainting
- .5 Section 09 21 16 – Gypsum Board Assemblies

1.2 REFERENCE STANDARDS

- .1 Environmental Protection Agency (EPA)
 - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - (for Surface Coatings).
 - .2 SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .3 The Master Painters Institute (MPI)
 - .1 Maintenance Repainting Manual 2015, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.
- .4 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada – 2015 (NFC)
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act (TDGA), 1992, S.C. 1992, c. 34.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling
 - .1 Submit work schedule for various stages of painting to Departmental Representative for review. Submit schedule minimum of 48 hours in advance of proposed operations.
 - .2 Obtain written authorization from Departmental Representative for changes in work schedule.
 - .3 Schedule painting operations to prevent disruption of occupants.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer s instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit 2 copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (SDS) in accordance with Section 01 33 00 – Submittal Procedures and Section 01 35 29.06 – Health and Safety Requirements.
- .3 Confirm products to be used are in MPI’s approved product list by clearly identifying the MPI product number and paint system to which the paint and paint products belong.
- .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer s product number.
 - .3 Colour number(s).
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer’s Safety Data Sheets (SDS).
 - .6 MPI #
- .4 Samples:
 - .1 Submit Manufacturer’s full range colour sample chips to indicate where colour availability is restricted.
 - .2 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
 - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
 - .4 Test reports: submit 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: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .6 Manufacturer's Instructions:
 - .1 Submit manufacturer's application instructions.
 - .7 Sustainable Design Submittals:
 - .1 Construction Waste Management: Provide project Construction Waste Management Plan highlighting recycling and salvage requirements.

- .2 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.
- .3 Recycled Content: Submit listing of recycled content products used, including details of percentages of recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
- .4 Low-Emitting Materials:
 - .1 Provide listing of adhesives and sealants, paints and coatings used, showing compliance with VOC and chemical component limits or restriction requirements.

1.5 CLOSEOUT SUBMITTALS

- .1 Provide in accordance with Section 01 78 00 – Closeout Submittals.
- .2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.
- .3 Include:
 - .1 Product name, type and use.
 - .2 Manufacturer s product number.
 - .3 Colour number(s).
 - .4 MPI Environmentally Friendly classification system rating.

1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 – Closeout Submittals.
 - .2 Quantity: provide one four litre can of each type and colour of primer and paint. Identify colour and paint type in relation to established colour schedule and finish system.
 - .3 Delivery, storage and protection: comply with Departmental Representative requirements for delivery and storage of extra materials.

1.7 QUALITY ASSURANCE

- .1 Conform to latest MPI requirements for painting work including preparation and priming.
- .2 Materials: in accordance with MPI Painting Specification Manual Approved Product listing and from a single manufacturer for each system used.
- .3 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

- .4 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings and bulkheads; 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.
- .5 Mock-Ups:
 - .1 When requested by Departmental Representative, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.
 - .2 Construct mock-ups in accordance with Section 01 45 00 – Quality Control.
 - .1 Provide one room mock-up. Prepare and paint designated room to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
 - .2 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
 - .3 Locate where directed.
 - .4 Allow 24 hours for inspection of mock-up before proceeding with work.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
- .6 Pre-Installation Meeting:
 - .1 Convene pre-installation meeting one week prior to beginning work of this Section.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other trades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer s written instructions and 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.
 - .1 Labels: to indicate:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.

- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.
- .2 Storage and Protection:
 - .1 Provide and maintain dry, temperature controlled, secure storage.
 - .2 Store materials and supplies away from heat generating devices.
 - .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .3 Storage and Handling Requirements:
 - .1 Remove damaged, opened and rejected materials from site.
 - .2 Store materials off ground in dry locations indoors and in accordance with manufacturer s recommendations in clean, dry, well-ventilated area.
 - .3 Observe manufacturer’s recommendations for storage and handling.
 - .4 Store materials and supplies away from heat generating devices.
 - .5 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
 - .6 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
 - .7 Remove paint materials from storage only in quantities required for same day use.
 - .8 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS)
 - .9 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC or dry chemical fire extinguisher as recommended by the paint manufacturer 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 daily.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .4 Waste Management and Disposal:
 - .1 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 74 19 – Waste Management and Disposal
 - .2 Packaging Waste Management: remove for reuse by manufacturer and return of crates, packaging materials, padding, pallets, as specified in Construction Waste Management Plan in accordance with Section 01 74 19 – Waste Management and Disposal.

1.9 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.

- .2 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.
- .3 Provide continuous ventilation for seven days after completion of application of paint.
- .4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
- .5 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.
- .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .7 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless pre-approved written approval by Departmental Representative, 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 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 Allow new concrete and masonry to cure minimum of 28 days.
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
 - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
 - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.

- .8 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.
- .9 Additional interior application requirements:
 - .1 Apply paint finishes when temperature and other environmental and substrate surface conditions at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .2 Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly"; E3 or E2 ratings based on VOC (EPA Method 24) content levels.
 - .2 Green Performance in accordance with MPI Standard GPS-1 or GPS-2.

2.2 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 or E2 "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 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .7 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.

- .8 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
 - .1 Matter in undiluted production plant effluent generating Biochemical Oxygen Demand (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum Environmentally Friendly E2 rating.
- .10 Recycled water-borne surface coatings must not contain:
 - .1 Lead, Mercury, Cadmium, Hexavelant
 - .2 Organochlorines or polychlorinated biphenyls (PCBS)

2.3 COLOURS

- .1 Departmental Representative will provide colour schedule after contract award.
- .2 Colour schedule will be based upon selection of up to 11 colours.
- .3 Selection of colours from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by Departmental Representative.
- .6 Assume that at least 4 colours identified in the colour schedule will be dark and/or bright colours. For deep and ultra deep colours; 4 coats may be required.

2.4 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from 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 written 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.

2.5 GLOSS/SHEEN RATINGS

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

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

- .2 Gloss level ratings of painted surfaces as indicated.

2.6 INTERIOR PAINTING SYSTEMS

- .1 INT 5.3 - Galvanized Metal

- .1 High Contact/High Traffic Areas (Doors, Frames, Stair surrounds, Stringers, Square Sections and Angle Frames for Huddle Canopy Framing, Square Sections and Angle Frames for Smartboard Monitor Stand, and Pipes):

- .1 INT 5.3M - High Performance Architectural Acrylic, Premium Grade, G4 finish, modified to use MPI 17 as full primer coat – clean and de-gloss existing surface prior to application, following Manufacturer’s Instructions.

- .2 Low Contact/Low Traffic Areas (Over-Head Decking, Pipes, Ducts, Etc.):

- .1 INT 5.3M - High Performance Architectural Acrylic, Premium Grade, G4 finish. Prepare surfaces and apply product according to Manufacturer’s Instructions.

- .3 Existing Ceiling Grid

- .1 INT 5.3M - High Performance Architectural Acrylic, Premium Grade, finish to match existing, modified to use MPI 17 as full primer coat – clean and de-gloss existing surface prior to application, following Manufacturer’s Instructions.

- .2 INT 5.5 - Exposed Copper Piping

- .1 INT 5.5A Alkyd (over vinyl wash primer) G1 Flat or matte

- .3 INT 6.3 - Dressed lumber:

- .1 INT 6.3A - High Performance Architectural Latex, Premium Grade, G4 finish on Tambour (in charging station) and existing south wall window headers. Prepare surfaces and apply product according to Manufacturer’s Instructions.

- .2 INT 6.4Q – S.B., Clear (assume application over S.B. Stain – colour to be chosen by Departmental Representative) on “Huddle” canopy, red-oak wood framing, MPI 62. Prepare surfaces and apply product according to Manufacturer’s Instructions.

- .4 INT 6.4 - Plywood

- .1 INT 6.4S – High Performance Architectural Latex, Premium Grade, G4 Finish

- .2 INT 6.4PP – Fire retardant coating, pigmented, waterborne, MPI 64. Apply in accordance with manufacturer's instructions. Apply to all six sides of plywood electrical backboards.
- .3 INT 9.2 - Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes
- .4 Field Paint:
 - .1 INT 9.2B - High performance architectural latex, Premium Grade, G2 finish (walls), G1 or G2 finish (ceilings)
- .5 On Partitions Enclosing Secure Room #111.
 - .1 INT 9.2B - High performance architectural latex, Premium Grade, G5 finish (walls).

2.7 SOURCE QUALITY CONTROL

- .1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
 - .1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.
 - .2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.
 - .3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

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. Notify Departmental Representative in the event of discrepancies with requirements of this Section.

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 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative

- damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test".
- .3 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.4 PREPARATION

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified by the manufacturer.
- .2 Apply paint materials in accordance with paint manufacturer s written application instructions.
- .3 Protection:
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
 - .4 Protect building occupants and general public in and about the building.
- .4 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 Departmental Representative.
- .5 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements.
- .6 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .7 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.

- .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
- .2 Apply wood filler to nail holes and cracks.
- .3 Tint filler to match stains for stained woodwork.
- .8 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.
- .9 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 brushing with clean brushes blowing with clean dry compressed air and/or vacuum cleaning.
- .10 Touch up of shop primers with primer as specified.
- .11 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

3.5 EXISTING CONDITIONS

- .1 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test"; and report findings to Departmental Representative. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
 - .1 Maximum moisture content as follows:
 - .2 Stucco: 12%.
 - .3 Concrete: 12 %.
 - .4 Clay and Concrete Block/Brick: 12 %.
 - .5 Hard Wood: 15 %.
 - .6 Soft Wood: 17%.

3.6 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. Apply paint by brush or roller. 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 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 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

- .4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 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.
- .8 Finish closets and alcoves as specified for adjoining rooms.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

- .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 Electrical and Telecom Closets: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint fire protection piping red.
- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 Paint all 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.
- .12 Do not paint interior transformers and substation equipment.

3.8 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.

3.9 FIELD QUALITY CONTROL

- .1 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .2 Cooperate with inspection firm and provide access to areas of work.
- .3 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

3.10 CLEANING

- .1 Leave Work area clean at end of each day.
- .2 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
- .3 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
- .5 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.11 RESTORATION

- .1 Clean and re-install hardware items removed before undertaking 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 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 Departmental Representative.

END OF SECTION