1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry.

.2 Section 07 21 16 - Blanket Insulation.

.3 Section 09 91 00 – Painting.

.4 Section 10 28 10 – Toilet and Bath Accessories.

1.02 REFERENCES

.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 C475-015), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .2 ASTM C514-04(2014), Standard Specification for Nails for the Application of Gypsum Board.
- .3 ASTM C557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
- .4 ASTM C840-16, Standard Specification for Application and Finishing of Gypsum Board.
- .5 ASTM C954-15, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
- .6 ASTM C1002-14, 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 C1177/C1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .9 ASTM C1178/C1178M-13, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .10 ASTM C1280-13a, Standard Specification for Application of Gypsum Sheathing.
- .11 ASTM C1396/C1396M-14a, Standard Specification for Gypsum board.

.3 Association of the Wall and Ceilings Industries International (AWCI)
.1 AWCI Levels of Gypsum Board Finish-GA-214-2015.

.4 Canada Green Building Council (CaGBC)
.1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations.

.5 Green Seal Environmental Standards (GS)
.1 Standard GS-11, Paints, Coatings, Stains, and Sealers, Edition 3.2, October 26, 2015.
.2 Standard GS-36, Adhesives for Commercial Use, Edition 2.1, July 12, 2013.

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1113-16, Architectural Coatings.
.2 SCAQMD Rule 1168-A2011, Adhesives and Sealants 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.

1.03 ACTION AND INFORMATION SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
.1 Submit gypsum board assembly drawings.
.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 duplicate 300 mm long samples of corner and casing beads, mouldings, shadow mould, cornice cap, and insulating strip.
.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 LEED Canada- Submittals: in accordance with Section 01 35 21 - LEED Requirements
.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 and post-industrial content, and total cost of materials for project.
.3 Regional Materials: submit evidence that project incorporates required percentage 20% 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 and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.04 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 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, 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 damage and 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. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

.8 Replace defective or damaged materials with new.

1.05 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.

2 PRODUCTS

2.01 MATERIALS

.1 Standard Board: to ASTM C1396/C1396M, regular 16 mm thick or as otherwise indicated, and Type 'X' and Type 'C', 120 mm wide x maximum practical length, ends square cut.

.2 Water Resistant Board: to ASTM C1396/C1396M, regular and Type 'X' and Type 'C', 16 mm thick or as otherwise indicated, 1200 mm wide x maximum practical length.

.3 Tile Backer Board: glass mat water-resistant gypsum backing board, to ASTM C1178/C1178M; regular 16 mm thick or as otherwise indicated, size 1200 mm x maximum practical length.

.4 Metal furring runners, hangers, tie wires, inserts, anchors as required.

.5 Drywall furring channels: 0.75 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.6 Resilient clips and drywall furring: 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 Wood stud adhesive: to ASTM C557.

.10 Laminating compound: as recommended by manufacturer, asbestos-free.

.11 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, PVC, perforated flanges, one piece length per location.

.12 Cornice cap: 12.7 mm deep x partition width, of 1.6 mm base thickness galvanized sheet steel, prime painted. Include splice plates for joints.

.13 Shadow mould: 35 mm high, Snap-on trim, of extruded PVC plastic, colour as selected by Departmental Representative.

.14 Strippable Edge Trim: Extruded PVC with pre-masked L-shaped tape on trim with tear away protective serrated strip for removal after compound and paint is applied, for use at areas where gypsum butts aluminum frames and where gypsum butts concrete or concrete block.

.15 Sealants: to Section 07 92 00 - Joint Sealants.

.16 Partition Wall Insulation: to Section 07 21 16 - Blanket Insulation.

.17 VOC limit 250 g/L maximum to SCAQMD Rule 1168.

.18 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.

.19 Insulating Strip / Acoustic Strip: rubberized, moisture-resistant, 3 mm thick closed cell neoprene strip, or 8 mm thick open cellular rubber reinforced with solid rubber particles bonded to cellulose, full width of wood surface in contact with concrete, with self-sticking permanent adhesive on one face, lengths as required.

.20 Joint compound: to ASTM C475, asbestos-free.

2.02 FINISHES

.1 Gypsum Board Joint Treatment: All exposed gypsum board for this Contract shall receive minimum AWCI Level 4 finish.

.2 Painting: in accordance with Section 09 91 00 – Painting.
.1 VOC limit to GS-11 and SCAQMD Rule 1113 criteria, and meeting requirements of Section 01 35 21 - LEED® Requirements.

3 EXECUTION

3.01 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.

3.02 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.

.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, and 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 C 840-16, except where specified otherwise.

.11 Furr openings and around built-in equipment, cabinets, and access panels on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

.12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

.13 Erect drywall resilient furring transversely across studs, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.

.14 Install 150 mm continuous strip of 13 mm gypsum board along base of partitions where resilient furring installed.

3.03 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.

.2 Apply single or double layer gypsum board to wood furring or framing using screw fasteners for first layer, laminating adhesive for second layer. Maximum spacing of screws 300 mm on centre.
- .1 Single Layer Application:
  - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.
  - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
- .2 Double Layer Application:
  - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
  - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
  - .3 Apply base layers at right angles to supports unless otherwise indicated.
  - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.3 Except where Tile Backer Board is required at tile locations, apply water-resistant gypsum board at inside face of exterior walls, adjacent to slop sinks and janitors' closets, in kitchen areas, concessions, serveries, and washrooms. Apply water and mould resistant sealant to edges, ends, cut outs that expose gypsum core and to fastener heads.

.4 Apply Tile Backer Board at locations to receive wall tiles.
- .1 Do not apply joint treatment on areas to receive tile finish.

.5 Apply 13 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.

.6 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.

.7 Install gypsum board with face side out.

.8 Do not install damaged or damp boards.

.9 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.04 INSTALLATION

.1 Gypsum wall sheathing board shall be mechanically fastened to supporting assembly independent of insulation, with joints either backed or taped and filled.

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

.3 Install casing beads around perimeter of suspended ceilings.

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

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

.6 Construct control and expansion joints of preformed units or two back to back casing beads set in gypsum board facing and supported independently on both sides of joint.

.7 Provide continuous polyethylene dust barrier behind and across control joints.

.8 Expansion and Control Joints:
.1 Locate control joints where indicated or as required, and at changes in substrate construction, at approximate 10 m spacing on long corridor runs, and at approximate 15 m spacing on ceilings.
.2 Install control joints straight and true.
.3 Construct expansion joints at building expansion and construction joints. Provide continuous dust barrier.
.4 Install expansion joint straight and true.

.9 Splice corners and intersections together and secure to each member with 3 screws.

.10 Install access doors to electrical and mechanical fixtures specified in respective sections.
.1 Rigidly secure frames to furring or framing systems.

.11 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.

.12 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI GA-214, Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels:
.1 Levels of finish:
.1 Level 0: no tapping, finishing or accessories required.
.2 Level 1: embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.
.3 Level 2: 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.
.4 Level 3: embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.5 Level 4: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.13 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.

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

.15 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

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

.17 Mix joint compound slightly thinner than for joint taping.

.18 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.19 Remove ridges by light sanding or wiping with damp cloth.

.20 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.06 PROTECTION

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

.2 Repair damage to adjacent materials caused by gypsum board assemblies installation.

3.07 SCHEDULES

.1 Use Type 'X' and 'Type 'C' Fire Rated board options at fire rated wall and ceiling assemblies as indicated and as required by NBC and authorities having jurisdiction.

.2 Install board as indicated, and as follows:
- .1 Standard Board: 16 mm thick, general use unless otherwise specified.
- .2 Water Resistant Board: 16 mm thick, inside face of exterior walls, adjacent to sinks and basins, and at plumbing walls.
- .3 Tile Backer Board: 16 mm thick, at all wall tile locations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 35 00 – Concrete Finishing.

.2 Section 07 92 00 – Joint Sealants.

.3 Section 09 21 16 – Gypsum Board Assemblies.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
- .1 ANSI/CTI (Ceramic) A108/A118/A136.1-2008, Specification for the Installation of Ceramic Tile - A Collection of 20 ANSI/CTI A108 Series Standards on Ceramic Tile Installation: A108.1 A-C, 108.4 -.13, A118.1-.10, ANSI A136.1.

.2 Canada Green Building Council (CaGBC)
- .1 LEED® Green Building Rating System Reference Guide: LEED for Commercial Interiors Version 1.0, Canada Green Building Council, February 2007.

.3 International Organization for Standardization (ISO) / Technical Report (TR)
- .1 ISO/TR 17870-1:2015, Ceramic tiles - Guidelines for installation - Part 1: Installation of ceramic wall and floor tiles.
- .2 ISO/TR 17870-2:2015, Ceramic tiles - Guidelines for installation - Part 2: Installation of thin ceramic wall and floor tiles and panels.

.4 South Coast Air Quality Management District (SCAQMD), California State
- .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.5 Terrazzo Tile and Marble Association of Canada (TTMAC)
- .1 Specification Guide 09 30 00, Tile Installation Manual, 2016-2017.
- .2 Hard Surface Maintenance Guide.

.6 Tile Council of North America (TCNA)
- .1 TCNA Handbook for Ceramic, Glass, and Stone Tile Installation, Version 2016.
- .2 ANSI/TCNA A137.2-2013 Glass Tile Specifications.

.7 Underwriters Laboratories Canada (ULC)
.1 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:
.1 Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Coordination with other construction subtrades.
.4 Review manufacturer's written installation instructions and warranty requirements.

.2 Sequencing: sequence with other work in accordance with Section 01 32 16.07. Comply with manufacturer's written recommendations for sequencing construction operations.
.1 Ceramic tile work shall be performed after painting and sealant applications are finished in affected areas. Install ceramic tile after work that may stain or damage installation. Protect from construction damage.

.3 Scheduling: schedule with other work in accordance with Section 01 32 16.07

1.4 ACTION AND INFORMATION SUBMITTALS

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

.2 Provide Product Data:
.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 Shop Drawings:
.1 Indicate tile layouts, patterns, colour arrangement, perimeter conditions, junctions with dissimilar materials, thresholds, and setting details.
.2 Locate and detail movement joints.

.4 Provide Samples:
.1 Base tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
.2 Floor tile: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
.3 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.
.4 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

.5 LEED Submittals: Submit in accordance with Section 01 35 21 – General LEED Requirements:
.1 At project start-up meeting, submit LEED Conformance Submittals for the following:
.1 Recycled content.
.2 Regional materials.
.3 Low VOC Content.
.2 Submit LEED submittal forms for Credit MR 4 – Recycled Content. Indicate the following:
.1 Recycled Content: provide listing of products incorporating recycled content. Include details of percentages of post-consumer and pre-consumer recycled content for materials and products. Indicate material and product costs.
.3 Submit LEED submittal forms for Credits MR 5 – Regional Materials. Indicate the following:
.1 Regional Materials: use building materials or products that have been extracted, harvested, recovered and processed within 800 km, or 2400 km if shipped by rail or water, of the final manufacturing site.

.4 Sealants: Documentation identifying that VOC content is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168.

.5 Adhesives: Documentation identifying that VOC content is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168.

1.5 QUALITY ASSURANCE

.1 Conform to requirements of Terrazzo, Tile and Marble Association of Canada (TTMAC).

.2 Obtain each type of tile material required from single source. For colour consistency, ensure the supplier has capacity to provide products from the same production run, dye lot, calibre and batch number.

.3 Obtain setting and grouting materials from one manufacturer to ensure compatibility.

1.6 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Materials:

.1 Provide maintenance materials of each type of ceramic tile flooring, base and adhesive in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 1.5 square metres of each colour, pattern and type flooring material required for this project for maintenance use.

.3 Extra materials from same production run as installed materials.

.4 Identify each container of floor tile and each container of adhesive.

.5 Deliver to Departmental Representative, upon completion of the work of this section.

.6 Store where directed by Departmental Representative.

1.7 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect specified materials from damage that may impair appearance, performance or durability of installation.
.3 Replace defective or damaged materials with new.

1.8 SITE CONDITIONS

.1 Surfaces for tile installation must be clean, dimensionally stable, cured, level, plumb and free of contaminants such as oil, sealers and curing compounds.

.2 Ambient Conditions:
.1 Maintain air temperature and structural base temperature at flooring installation area above 18 degrees C for 48 hours before, during and for 48 hours after installation. Tile and setting material stored at same conditions 48 hours before and 7 days after application.

1.9 WARRANTY

.1 For the work of this Section, the 12 month warranty period prescribed in Subsection GC 32.1 of General Conditions "C" is extended to 24 months.

Part 2 Products

2.1 DESIGN AND PERFORMANCE CRITERIA

.1 Factory blend tile that exhibits colour variations within the ranges selected and package so tile units taken from one package show the same range in colours as those taken from other packages.

.2 Provide tile products manufactured in accordance with ANSI A108.1 as appropriate to the colour and texture specifications established by the general design concept for the project.

.3 Performance Requirements:

.1 Tile Slip Resistance: minimum pendulum test value (BPN) of 35, tested in accordance with United Kingdom Slip Resistance Group (UKSRG) Standards - Issue 4/2011, using British Pendulum test equipment (or equivalent results tested in accordance with Australian Standard AS HB 198:2014).

.2 Load Bearing Performance: Provide installations rated for the following load bearing performance in accordance with ASTM C627 for ceramic tile installed on walkway surfaces:

.1 Extra Heavy: Passes cycles 1 through 14.

.2 Heavy: Passes cycles 1 through 12.

.3 Floor Level Tolerances: Provide materials to attain floor levelness tolerances required by this Section; calculate quantity of materials based on the difference between the specified tolerance and the initial tolerance specified in Section 03 35 00; measurements will be made in the same manner as used in Section 03 35 00.

.1 Use frost resistant tiles for exterior work in accordance with CAN/CGSB 75.1 having a moisture absorption rating of 3.5% or less.

.2 Provide Products used in exits having a flame spread rating of 25 or less when tested in accordance with ASTM E84 or ULC S102.2.

2.2 WALL AND FLOOR TILE AND TILE BASE

.1 Wall, Floor and Coved Base Tile: commercial-grade coloured body (through body) porcelain stoneware, to ASTM C1027 (Class 5 for floors), rectified edges. Colour range shall be earthy tones, exact selections made by Departmental Representative from manufacturer’s full range. For floor applications, coefficient of friction shall be 0.60 or greater (wet) when tested to ASTM C1028, and heavy to extra-heavy load bearing performance when tested to ASTM C627.

.2 Colours and Sizes: products and colours shall be selected by Departmental Representative from manufacturer's full range of selections. Submit samples for initial selection and coordinate with construction schedule as required.
.1 Two different sizes may be selected for installation in building at sole discretion of Departmental Representative: 60x60 cm and/or 60x120 cm.

.3 Coved Base: 100 mm high.

2.3 MORTAR AND GROUT

.1 Mortar: premium-grade, non-sag, polymer-modified, thin-set mortar, reinforced with a para-aramid synthetic fibre, with "Extra Heavy Service" rating to TCNA performance levels (tested to ASTM C627 Robinson Floor Test), and meeting or exceeding tile manufacturer's printed recommendations and guidelines.

.2 Unsanded Latex Portland Cement Grout for Wall Joints less than 3 mm: latex-modified, factory blended, mildew resistant, non-sanded grout consisting of Portland cement and additives; meet or exceed ANSI A118.6.

.3 Sanded Latex Portland Cement Grout for Wall and Floor Joints greater than 3 mm: latex-modified, factory-blended, mildew-resistant, sanded grout consisting of Portland cements, graded quartz and additives; meet or exceed ANSI A118.7.

2.4 DECORATIVE EDGE PROTECTION AND TRIM

.1 Edge protection, trim shapes and transition profiles: brushed stainless steel, sized to suit tile thickness, profiles as selected by Departmental Representative from manufacturer's full range.

.2 Control Joints: Rigid PVC anchoring legs and side sections, with soft CPE top and bottom movement zones which is also the only visible surface, 5 mm wide overall. Thickness to suit tile, colour to later selection. Install every 4500 mm maximum in each direction and/or as indicated on drawings, at change of tile material under doors, changes in substrate, and in strict accordance with the manufacturer's specifications.

2.5 SPACERS

.1 Purpose-made product as required to assure even and consistent tile joint sizes.

2.6 SEALER

.1 Floor sealer and protective coating: to CAN/CGSB-25.20, Type 1 to tile and grout manufacturer's recommendations.

2.7 PATCHING AND LEVELLING COMPOUND

.1 Cement base, acrylic polymer compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following minimum physical properties:
.1 Compressive strength: 25 MPa.
.2 Tensile strength: 7 MPa.
.3 Flexural strength: 7 MPa.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

2.8 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 EXAMINATION

.1 Verification of Conditions: verify that conditions are acceptable for product installation in accordance with manufacturer's written instructions.
.1 Check and verify that no irregularities exist that would affect quality of execution of work specified.
.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 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's printed preparation and installation instructions, technical datasheets, and specifications.

3.3 INSTALLATION

.1 Work shall meet or exceed ISO/TR 17870 guidelines.

.2 Do tile work in accordance with “Specification Guide 09 30 00, Tile Installation Manual” and ANSI/TCNA A137.2, except where specified otherwise.

.3 Apply tile to clean and sound surfaces.

.4 Fit tile around corners, fitments, fixtures, and other built in objects. Maintain uniform joint appearance. Cut edges smooth and even.

.5 Maximum surface tolerance 1:800.

.1 After 2-day cure-period, Departmental Representative will measure flatness of applications for adherence to specified tolerances using standard straight edge method; non-compliant work shall be re-done as required by Contractor at Contractor's expense.

.6 Make joints between tile uniform and approximately 3 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

.7 Lay out tiles so perimeter tiles are minimum ½ size. Layout in accordance with reviewed shop drawings and ensure that joints are located to align with elements in the washroom.

.8 100% back butter all wall and floor tile at time of installation.

.9 Grout tile as specified.

.10 Sound tiles after setting and replace hollow sounding units to obtain full bond.

.11 Make internal angles square.

.12 Allow minimum of 24-hours after installation of tiles before grouting.

.13 Build in control joints as required.

.14 Install accent tiles as indicated or as directed by Departmental Representative.

.15 Cut tiles with a wet saw and lightly sand edges if required.

.16 Install floor tile to TTMAC detail 311F; install wall tile to TTMAC detail 305W; install base tile at perimeter of ceramic floor tile areas to TTMAC specifications.

3.4 SPECIAL ACCESSORIES

.1 Install transitions, edge protection, control joints, and other accessories in the tile work in accordance with manufacturer's specifications. Use longest lengths practical.

3.5 FIELD QUALITY CONTROL

.1 After 2-day cure-period, Departmental Representative will sound all tiles (100%), and any hollow-sounding tiles shall be replaced at Contractor’s expense.

.2 After 2-day cure-period, Departmental Representative will measure flatness of applications for adherence to specified tolerances using standard straight edge method; non-compliant work shall be re-done as required by Contractor at Contractor’s expense.

.3 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.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning. Perform cleaning after installation to remove construction and accumulated environmental dirt.

.3 Manage and dispose of demolition and construction waste materials in accordance with Section 01 74 21 - Construction Demolition Waste Management and Disposal and Section 01 35 21 – LEED Requirements.

3.7 PROTECTION

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

.2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

1 GENERAL

1.01 REFERENCES

.1 ASTM International
- .1 ASTM C423-17, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
- .2 ASTM C635/C635M-13a, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
- .3 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .4 ASTM E1264-14, Standard Classification for Acoustical Ceiling Products.
- .5 ASTM E1414/E1414M-16, Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
- .6 ASTM E1477-98a(2017), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.

.2 Canada Green Building Council (CaGBC)
- .1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations.

.3 Green Seal Environmental Standards (GS)
- .1 Standard GS-11, Paints, Coatings, Stains, and Sealers, Edition 3.2, October 26, 2015.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
- .1 SCAQMD Rule 1113-A2016, Architectural Coatings.

.6 Underwriter's Laboratories of Canada (ULC)
- .1 CAN/ULC S102-2010, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.02 ACTION AND INFORMATION SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for 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 and indicate lay-out, 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 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.

.5 Sustainable Design Submittals:
- .1 LEED Canada: in accordance with Section 01 35 21 - LEED Requirements.
- .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 and post-industrial content, and total cost of materials for project.
- .3 Regional Materials: submit evidence that project incorporates required percentage 20% 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 touch-up paints used in building, comply with VOC and chemical component limits or restriction requirements.

1.03 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 damage and nicks, scratches, and blemishes.
- .5 Replace defective or damaged materials with new.

1.04 WARRANTY

.1 For the work of this Section, the 12 month warranty period prescribed in Subsection GC 32.1 of General Conditions "C" is extended to 24 months.

2 PRODUCTS

2.01 COMPONENTS

.1 Acoustic Tile 1: conforming to ASTM E1264.
- .1 Type IV, Form 1 & 2, Pattern E, G.
- .2 Classification: Fire Class A.
- .3 Material: Wet-formed mineral fiber with acoustically transparent membrane.
- .4 Total Recycled Content: ≥ 50%; low-VOC.
- .5 No added urea formaldehyde.
- .6 Size: 610 x 1220 x 19 mm, Beveled Tegular edge (shadow line profile).
- .7 Noise Reduction Coefficient, to ASTM C423 (NRC): ≥ 0.75.
- .8 Ceiling Attenuation Class. To ASTM E1414 (CAC): ≥ 35.

.9 Light Reflectance (LR): ≥ 90%.
.10 CAN/ULC S102: Class A; Flame Spread = 25 or less; Smoke Developed = 50 or less.
.11 Colour: white; Texture: fine.

.2 Acoustic Tile 2: conforming to ASTM E1264.
.1 Type III, Form 4, Pattern D.
.2 Classification: Fire Class A.
.3 Material: Wet-formed mineral fiber with acoustically transparent membrane.
.4 Total Recycled Content: ≥ 50%; low-VOC.
.5 No added urea formaldehyde.
.6 Size: 610 x 1220 x 19 mm, Square lay-in edge.
.7 Noise Reduction Coefficient, to ASTM C423 (NRC): ≥ 0.70.
.8 Ceiling Attenuation Class. To ASTM E1414 (CAC): ≥ 35.
.9 Light Reflectance (LR): ≥ 79%.
.10 CAN/ULC S102: Class A; Flame Spread = 25 or less; Smoke Developed = 50 or less.
.11 Colour: white; Texture: fine fissured.

2.02 SUSPENSION SYSTEM

.1 Physical Data and Performance Requirements:
.1 Duty Classification: Heavy-duty system to ASTM C635/ASTM C635M.
.2 Face dimension and profile: 24 mm Exposed Tee System.
.3 Hot dipped galvanized.
.4 Powder coated.
.5 Manufactured and tested to ASTM C635.
.6 Cross Tee/Main Beam Interface: override.
.7 End Details: main beams: staked-on clips; cross tees: stacked-on clips.

.2 Basic materials for suspension system: commercial quality cold rolled steel, hot dipped galvanized and factory powder coated, colour selected by Departmental Representative from manufacturer’s full powder-coated range.
.1 Suspension system: manufacturer’s system parts including but not limited to the following:
.1 2-directional exposed tee bar grid.
.2 2-directional Main beams.
.3 2-directional Cross Tees.
.4 Perimeter shadow moulding reveals, 10 mm reveal.

.3 Accessories: beam end retaining clips, single tee adapter clips, expansion sleeves, joint clips, clip wall attachment able to join main beam or cross tee to wall moulding, slip joints, acoustical panel-to-gypsum board ceiling transition mouldings, and other accessories and parts as required to complement suspension system components as recommended by system manufacturer for a complete installation.

.4 Hold-Down Clips for Wind Uplift (at or near entrances and where panels may be subject to draft uplift: Provide hold down clips spaced 610 mm on centre at all cross tees for interior ceilings consisting of acoustic panels weighing less than 4.88 kg/m^2.

.5 Hanger wire: galvanized soft annealed tight 3-wrap steel wire:
.1 Minimum wire performance requirements:
.1 Wire: manufactured to ASTM A641.
.2 Tight 3 wrap wire, to ASTM C636: wire tie failure / pullout load: ≥ 160 kilogram-force.
.3 Yields: ≥ 190 kilogram-force.
.4 Ultimate load: ≥ 250 kilogram-force.
.5 Tensile strength: maximum 80 Ksi.
.6 3.6 mm diameter for access tile ceilings.
.7 2.6 mm diameter for other ceilings.
.8 Hanger inserts: purpose-made.
.9 Anchors: suitable to substrate and load requirements. Powder-actuated fasteners in concrete or steel not permitted.

2.03 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.

3 EXECUTION

3.01 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.

3.02 INSTALLATION

.1 Installation: in accordance with ASTM C636 except where specified otherwise.

.2 Suspension System:

.3 Installation: to ASTM C636/C636M except where specified otherwise.

.4 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.

.5 Coordinate and sequence work with other trades as required. Ensure suspension system is coordinated with location of other systems and components.

.6 Do not erect ceiling suspension system until work above ceiling has been inspected and approved by Departmental Representative.

.7 Secure hangers to overhead structure using attachment methods in accordance with shop drawings, Building Code requirements, and to the acceptance of authorities having jurisdiction.

.8 Install hangers spaced at maximum 914 mm centres and within 150 mm from ends of main tees.

.9 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width.

.10 Ensure suspension system is co-ordinated with location of related components.

.11 Install wall moulding to provide correct ceiling height.

.12 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.

.13 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.14 Interlock cross member to main runner to provide rigid assembly.

.15 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

.16 Install access splines to provide 25% ceiling access.

.17 Finished ceiling system to be square with adjoining walls and level within 1:1000.

.18 Apply acoustic caulking between top track and suspension system, to Section 07 92 00 - Joint Sealants.

.19 Expansion joints:
.1 Erect two main runners parallel, 25 mm apart, on building expansion joint line. Lay in strip of acoustic tile/board, painted colour as selected by Departmental Representative, 25% narrower than space between 2 'T' bars.
.2 Supply and install "Z" shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25 mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.

.20 Acoustic Panels:
.1 Install acoustical panels and tiles in ceiling suspension system.
.2 Coordinate ceiling work with work of other sections such as interior lighting, fire protection communication, and intrusion and detection systems.

3.03 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.04 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

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 03 35 00 – Concrete Finishing.

.2 Section 07 92 00 – Joint Sealants.

.3 Section 09 21 16 – Gypsum Board Assemblies.

1.02 REFERENCES

.1 ASTM International
  .1 ASTM F1066-04(2014)e1 Standard Specification for Vinyl Composition Floor Tile.
  .2 ASTM F1700-13a, Standard Specification for Solid Vinyl Floor Tile.
  .3 ASTM F1861-08(2012)e1, Standard Specification for Resilient Wall Base.

.2 Underwriters Laboratories of Canada (ULC):
  .1 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

.3 South Coast Air Quality Management District (SCAQMD)
  .1 SCAQMD Rule 1168-A2011, Adhesive and Sealant Applications.

1.03 ACTION AND INFORMATION SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for resilient tile flooring and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
  .1 Submit duplicate tiles in size specified, and 300 mm long base sample.

.4 LEED Submittals: Submit in accordance with Section 01 35 21 - LEED Requirements:
.1 Submit LEED submittal forms for Credit MR 4 – Recycled Content in accordance with Section 01 35 21 – LEED Requirements. Indicate the following:
.1 Recycled Content: provide listing of products incorporating recycled content. Include details of percentages of post-consumer and pre-consumer recycled content for materials and products. Indicate material and product costs.
.2 Submit LEED submittal forms for Credits MR 6 – Rapidly Renewable Materials in accordance with Section 01 35 21 – LEED Requirements. Indicate the following:
.1 Documentation identifying quantity of rapidly renewable content in flooring products.
.3 Submit LEED submittal forms for Credits EQ 4.1 – Low Emitting Materials, Adhesives and Sealants in accordance with Section 01 35 21 – LEED Requirements. Indicate the following:
.1 Adhesives: documentation identifying that VOC content is less than the VOC limits of State of California’s South Coast Air Quality Management District (SCAQMD) Rule #1168.
.4 Submit LEED submittal forms for Credits EQ 4.3 – Low Emitting Materials, Flooring Systems in accordance with Section 01 35 21 – LEED Requirements.
.1 Documentation identifying resilient flooring products are certified as compliant with the Floor Score standard by an independent third-party.

1.04 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 15 square feet of each colour, pattern and type flooring material required for this project for maintenance use.
.3 Extra materials from same production run as installed materials.
.4 Identify each container of floor tile and each container of adhesive.

.5 Deliver to Departmental Representative, upon completion of the work of this section.
.6 Store where directed by Departmental Representative.

1.05 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect specified materials from damage.
.3 Replace defective or damaged materials with new.

1.06 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.

1.07 WARRANTY

.1 For the work of this Section, the 12 month warranty period prescribed in Subsection GC 32.1 of General Conditions "C" is extended to 24 months.

2 PRODUCTS

2.01 MATERIALS

.1 Vinyl composition tile: Through-Colour/Pattern Wear, commercial use, withstands heavy foot and rolling load traffic; to ASTM F1700, Class III, Type B, 3 mm overall thickness, 305 x 305 mm tiles, as selected by Departmental Representative from manufacturer’s full range. FloorScore® Certified.

.2 Finish: Factory-prefinished.

.3 Resilient base: rubber, to ASTM F1861, coved, minimum 1200 mm length and 101 mm high x 3 mm thick, including pre-moulded end stops and external corners for coved base only, of colour selected by Departmental Representative.

.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 60 g/L to SCAQMD Rule 1168.
.2 Cove base adhesives:
.1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.5 Flooring protection: 46 Mil (1.2 mm) thick, heavy duty, non-staining, spill-resistant (protects floor against water, paint, mud, etc.) temporary floor protection.

.6 Sub-floor filler and leveller: [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.

.7 Metal edge strips: aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.8 Sealer and wax: types recommended by resilient flooring material manufacturer for material type and location.
.1 Sealer: maximum VOC limit 100 g/L to SCAQMD Rule 1113.

3 EXECUTION

3.01 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. Commencement of work means acceptance of conditions.

3.02 INSPECTION

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

3.03 SUB-FLOOR TREATMENT

.1 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. 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 slabs to flooring manufacturer's printed instructions.

3.04 TILE APPLICATION

.1 Provide high ventilation rate, with maximum outside air, during installation, and for 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

.2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.3 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.

.4 Install flooring with pattern grain parallel for units and parallel to length of room.

.5 As installation progresses, and after installation, roll flooring in 2 directions with 45 kg minimum roller 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.

3.05 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.

.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.

3.06 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
.1 Clean flooring and 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 and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.07 PROTECTION

.1 Protect new floors from time of final set of adhesive until final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 06 20 00 – Finish Carpentry.

1.02 REFERENCES

.1 ASTM International
  .1 ASTM D3936-12, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
  .2 ASTM E2471-05(2011)e1, Standard Test Method for Using Seeded-Agar for the Screening Assessment of Antimicrobial Activity In Carpets.

.2 Canada Green Building Council (CaGBC)
  .1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations

.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB 4.2 NO. 27.6-2015, Textile Test Methods - Flame Resistance - Methenamine Tablet Test for Textile Floor Coverings.
  .2 CAN/CGSB 4.2 NO. 77.1-94/ISO 4919: 1978 (R2012), Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.

.4 Carpet and Rug Institute (CRI)
  .1 CRI Carpet Installation Standard 2015.
  .2 CRI Green Label Indoor Air Quality Testing Program.
  .3 CRI Green Label Plus Indoor Air Quality Testing Program.

.5 Health Canada
  .1 C.R.C., c.923-10, Hazardous Products Act - Carpet Regulations, Part II of Schedule 1.

.6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (MSDS).

.7 National Floor Covering Association (NFCA)
  .1 National Floor Covering Specification Manual, current on-line edition.

.8 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-A2011, Adhesives and Sealants Applications.

.9 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
.2 CAN/ULC S102.2-10, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:
.1 Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Coordination with other construction subtrades.
.4 Review manufacturer's written installation instructions and warranty requirements.

.2 Sequencing: sequence with other work in accordance with Section 01 32 16.07. Comply with manufacturer's written recommendations for sequencing construction operations.

.1 Tile carpeting work shall be performed after painting and sealant applications are finished in affected floor areas. Install tile carpeting after work that may stain or damage tiles. Protect from construction damage.

.3 Scheduling: schedule with other work in accordance with Section 01 32 16.07.

1.04 ACTION AND INFORMATION SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for each carpet tile adhesive, and carpet protection 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 showing layout and orientation of tiles.
- .2 Information on shop drawings to indicate:
  - .1 Nap: direction, open edges, special patterns.
  - .2 Cutouts: show locations where cut-outs are required.
  - .3 Edgings: show location of edge moldings and edge bindings.

.4 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.
- .3 Submit duplicate samples of each type of carpet tile specified and duplicate tiles for each colour selected, 150 mm length binder bars, base and divider strips.

.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.

.7 Manufacturer's Instructions: submit manufacturer's installation and storage instructions.

.8 Manufacturers Reports:
.1 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance with specifications.

.9 Qualification Statements:
.1 Compliance: to CAN/ULC S102 and CAN/ULC S102.2.
.2 Testing: passes testing requirements of:
.1 Green Label Plus Indoor Air Quality Testing Program.
.3 Tuft bind: meets requirements when tested to CAN/CGSB 4.2 No.77.1.

.10 LEED Submittals: to Section 01 35 21, and as follows:
.1 At project start-up meeting, submit LEED Conformance Submittals for the following:
.1 Recycled content.
.2 Regional materials.
.3 Low VOC content.
.4 Green Label Certified Carpet.
.2 Submit LEED submittal forms for Credit MR 4 – Recycled Content. Indicate the following:
.1 Recycled Content: provide listing of products incorporating recycled content. Include details of percentages of post-consumer and pre-consumer recycled content for materials and products. Indicate material and product costs.
.3 Submit LEED submittal forms for Credits EQ 4.1 Low-Emitting Materials, Adhesives and Sealants. Indicate the following:
.1 Documentation identifying that VOC content is less than the VOC limits of South Coast Air Quality Management District (SCAQMD) Rule 1168, for indoor carpet adhesives.
.4 Submit LEED submittal forms for Credits EQ 4.3 Low-Emitting Materials, Flooring Systems. Indicate the following:
.1 Proof that carpet meets or exceeds the requirements of the Carpet and Rug Institutes(CRI) Green Label Plus Program and the Canadian Carpet Institute (CCI).
.2 Proof that carpet cushion meets or exceed the requirements of the Carpet and Rug Institute Green Label Program.

.3 Proof that carpet adhesive meets the requirements of EQ Credit 4.1 Low-Emitting Materials, Adhesives and Sealants for VOC content limit.

1.05 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.

1.06 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 full size units to a minimum 5% each of carpet tiles and base.
.2 Delivery, storage and protection: comply with Departmental Representative 's requirements for delivery and storage of extra materials. Protect from damage as required.

1.07 QUALITY ASSURANCE

.1 Regulatory Requirements: to Section 01 41 00 – Regulatory Requirements.
.1 Prequalification: compliance with Health Canada regulations under "Hazardous Products Act", Part II of Schedule 1.

.2 Qualifications:
.1 Manufacturer: capable of providing field service representation during construction and approving application method, and maintains ISO 9001 & 14001 Certified facilities.
.2 Flooring Installer:
.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 prior to tender submission.
.3 Must not 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.

1.08 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. Inspect tiles and replace damaged or defective tiles with new tiles.

.3 Storage and Handling Requirements:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
.3 Store and protect carpet tile and adhesive 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.

1.09 SITE CONDITIONS

.1 Ambient Conditions:
  .1 Moisture: ensure substrate is within moisture limits and alkalinity limits recommended by manufacturer. Prepare moisture testing and provide report to Departmental Representative.
  .2 Temperature: maintain ambient temperature of not less than 18 degrees C from 72 hours before installation to at least 48 hours after completion of work.
  .3 Relative humidity: maintain between 10% and 65% for 48 hours before, during and 72 hours after installation.
  .4 Ventilation:
    .1 Ventilate area of work by use of approved portable supply and exhaust fans.
    .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
    .3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.
  .5 Install carpet after space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

1.10 WARRANTY

.1 For the work of this Section, the 12 month warranty period prescribed in Subsection GC 32.1 of General Conditions "C" is extended to 24 months.

.2 Submit manufacturer’s warranty.

2 PRODUCTS

2.01 MATERIAL COMPONENTS

.1 Carpet tile construction shall meet or exceed the following criteria:
  .1 Fibre Content: 100% 6,6 nylon, bulk continuous filament, and permanently conductive fibres to control electrostatic propensity.
  .2 Dye Method: 100% Solution Dyed.
  .3 Pile Characteristics: tufted textured loop.
  .4 Tufted yarn weight: 509 g/m^2 minimum.

.5 Machine gauge: minimum 47.2 ends/10cm.
.6 Pile height: 3 mm.
.7 Pile thickness: 1.9 mm minimum.
.8 Stiches: 30.2 ends/10 cm minimum.
.9 Pile density: 267.7 g/m^3 minimum.
.10 Dye lots: mergeable.
.11 Tile size: 50 cm x 50 cm.
.12 Backing System:
.1 Manufacturers standard polyvinylchloride (PVC) or woven polypropylene backing.
.2 Maintaining a 100% true moisture barrier between the secondary backing and the substrate below.
.3 No delamination when tested to ASTM D3936 for lifetime of carpet.
.13 Colour and Pattern: Departmental Representative to select from manufacturer's standard colour and pattern ranges.
.14 Inherent Static Control less than 3.0 Kilovolts at 21°C and 20% relative humidity.
.15 Delimitation to ASTM D3936 to min 2.5 Lbs/in.
.16 Soil/Stain protection.
.17 Preservative protection.
.18 Mould protection, no mould or bacterial growth when tested to ASTM E2471.
.19 Indoor air quality: Green Label Plus; FloorScore® Certification.

2.02 ACCESSORIES

.1 Base: new base material and finish to match existing.

.2 Binder Bars: aluminum, clear anodic coating, designed for carpet being installed.

.3 Edge Strips:
.1 Metal:
.1 Hammered surface aluminum, designed for carpet being installed.
.2 Floor flange minimum 38 mm wide, face minimum 16 mm wide.
.3 Finish: clear anodic coating.

.4 Adhesive:
.1 Multi-purpose Adhesive Self-Release Type: recommended or supplied by carpet tile manufacturer for direct glue down installation.

.5 Transition Mouldings:
.1 Carpet edge / reducer strip: carpet tile manufacturer’s recommended or supplied aluminum mouldings, clear anodic finish, designed for carpet being installed.

.6 Carpet protection: 46 Mil (1.2 mm) thick, heavy duty, non-staining, spill-resistant (protects floor against water, paint, mud, etc.) temporary floor protection.

.7 Concrete floor primer as recommended or supplied by carpet tile manufacturer.

.8 Concrete patch and levelling materials as recommended or supplied by carpet tile manufacturer.

.9 Wood Base: to Section 06 20 00 – Finish Carpentry, finish as determined by Departmental Representative.

3 EXECUTION

3.01 INSTALLERS

.1 Use only experienced and qualified technicians to carry out assembly and installation of tile carpet.

3.02 EXAMINATION

.1 Examine conditions, substrates and work to receive work of this Section, coordinate with Section 01 71 00 - Examination and Preparation.

.2 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are 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 have been remedied. Proceeding with work means acceptance of conditions.

3.03 PREPARATION

.1 Comply with CRI 104, Site conditions: Floor Preparation and Carpet Manufacturers written installation instructions for preparing substrates indicated to receive carpet installation.

.2 Use trowel-applied leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions and protrusions in the substrate. Fill or level cracks, holes and depressions 3 mm wide or wider and protrusions more than 0.8mm, unless more stringent requirements are identified in the carpet tile manufacturer's written instructions.

.3 Trowel and float to produce a smooth, flat surface. Allow to cure properly.

.4 Remove coatings, including curing compounds and other substances from concrete subfloor that are not compatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents using mechanical methods recommended in writing by the carpet tile manufacturer.

.5 Broom and vacuum clean substrate to remove dust and other small particles. Cover prior to installing carpet tile.

.6 Substrate to have acceptable level of absorbency as per manufacturer's written instructions. After cleaning, examine substrates for acceptable levels of moisture, alkaline salts, carbonation, or dust before proceeding with installation.

.7 When underlayment has cured, clean substrate surface and allow to dry.

.8 To ensure requirements are achieved test cementitious substrate for porosity, moisture content and alkalinity.

.9 Tile Carpeting Preparation:
  .1 Pre-condition carpeting: remove carpet tiles from carton and allow to adjust to jobsite ambient conditions minimum 48 hours prior to installation.

.2 The labels on each carton indicate product style, pattern, color, run number and dye lot. Ensure that the style, pattern and colour match the specifications for each area of installation.Do not mix run numbers or dye lots in the same room.

3.04 INSTALLATION

.1 Install carpet tiles in accordance with manufacturer's written instructions, and CRI Carpet Installation Standard CRI 104. Install carpet tile using a minimum number of pieces of carpet tile required to achieve pattern and design intent.

.2 Coordinate tile carpeting work with work of other trades for proper time and sequence to avoid construction delays.

.3 Comply with carpet manufacturer’s printed installation instructions and details; install every carpet tile with full spread, releasable, pressure sensitive adhesive as per manufacturers written instructions.

.4 Ensure product and substrate temperature is 18 degrees Celsius minimum for direct glue-down installation. Adhesives to be applied in accordance with manufacturers written instructions.

.5 Install carpet tile pattern parallel to walls and boarders, in configuration and layout indicated in reviewed shop drawings.

.6 Install carpet tile smooth and free of bubbles, puckers and defect. Confirm carpet tile type, colour and pattern prior to installation. Maintain dye lot integrity. Do not mix dye lots in same area.

.7 Carpet tile cuts to be a clean cut (double cut if recommended by manufacturer). Fit carpet tile tight to intersection with vertical surfaces without gaps.

.8 All edge transition strips to be installed completely, conceal all exposed edges.

.9 Do not bridge building expansion joints with carpet tile.

.10 Install seams in accordance with carpet tile manufacturer's written instructions for seam locations and direction of carpet tile.

.11 Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosing.

.12 Bind or seal cut edges as per carpet tile manufacturer written instructions.

.13 Extend carpet tile into toe spaces, door reveals, closets, open bottomed obstructions, removable flanges, alcoves, and similar openings.

.14 Maintain all reference markers, openings and holes that are in place or marked for future cutting.

.15 Roll carpet tile for complete contact of carpet tile with adhesive and substrate.

.16 Base Installation: to Section 06 20 00 – Finish Carpentry, profile and finish as determined by Departmental Representative.

3.05 SITE QUALITY CONTROL

.1 Manufacturer's Field Services:
- .1 Coordinate 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 the Work of this Section depends, is complete but before installation begins.

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

.4 Obtain reports within 3 days of review and submit immediately to Departmental Representative.

3.06 CLEANING

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

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

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

.1 Vacuum carpets clean immediately after completion of installation.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.07 PROTECTION

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

.2 Prohibit traffic on carpet for period of 72 hours minimum after installation and until adhesive is cured.

.3 Install carpet protection as required.

.4 Repair damage to adjacent materials caused by tile carpeting installation.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal Fabrications.

.2 Section 05 51 00 – Metal Railings.

.3 Section 06 10 00 – Rough Carpentry.

.4 Section 06 20 00 - Finish Carpentry.

.5 Section 08 11 00 – Metal Doors and Frames.

.6 Section 08 14 16 - Flush Wood Doors.

.7 Section 09 21 16 – Gypsum Board Assemblies.

1.02 REFERENCES

.1 ASTM International Inc.
- .1 ASTM B117-16 Standard Practice for Operating Salt Spray (Fog) Apparatus.
- .2 ASTM C67-14 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- .3 ASTM C1305-08 Standard Test Method for Crack Bridging Ability of Liquid-Applied Waterproofing Membrane.
- .4 ASTM D16-16 Standard Terminology for Paint, Related Coatings, Materials, and Applications.
- .5 ASTM D610-08(2012) Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces.
- .6 ASTM D714-02(2009) Standard Test Method for Evaluating Degree of Blistering of Paints.
- .7 ASTM D968-15 Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive.
- .8 ASTM D1308-02(2013) Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
- .9 ASTM D2565-99(2008) Standard Practice for Xenon-Arc Exposure of Plastics Intended for Outdoor Applications.
- .10 ASTM D2794-93(2010) Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).
- .11 ASTM D3273-16 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

.12 ASTM D3274-09(2013) Standard Test Method for Evaluating Degree of Surface Disfigurement of Paint Films by Fungal or Algal Growth, or Soil and Dirt Accumulation.
.13 ASTM D6940-10 Standard Practice for Measuring Sifting Segregation Tendencies of Bulk Solids.
.14 ASTM E96/E96M-16 Standard Test Methods for Water Vapor Transmission of Materials.

.2 Canada Green Building Council (CaGBC)
.1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations

.3 .5 Green Seal Environmental Standards
.1 Standard GS-11, Paints, Coatings, Stains, and Sealers, Edition 3.2, October 26, 2015.
.2 Green Seal Standard GC-03, Anti-Corrosive Paints.

.4 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.5 Environmental Protection Agency (EPA)
.1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
.2 SW-846, Test Method for Evaluating Solid Waste, Physical/Chemical Methods.

.6 Master Painters Institute (MPI)
.1 Architectural Painting Specification Manual - 2017.
.2 Standard GPS-1-17, MPI Green Performance Standard.
.3 Standard GPS-2-17, MPI Green Performance Standard

.7 South Coast Air Quality Management District (SCAQMD), California State
.1 SCAQMD Rule 1113-16, Architectural Coatings.

.8 Society for Protective Coatings (SSPC)
.1 SSPC Painting Manual, Volumes 1 & 2, 2011 Edition.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Provide work schedule for various stages of painting to Departmental Representative for approval. Provide schedule minimum of 48 hours in advance of proposed operations.

.3 Obtain written authorization from Departmental Representative for changes in work schedule.

.4 Schedule new additions to existing building coordinate painting operations with other trades.

1.04 ACTION AND INFORMATION SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for paint and coating products and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit 2 copies of WHMIS MSDS.

.3 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be returned for inclusion into work.
.3 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating, and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards.

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

.5 LEED Canada submittals: in accordance with Section 01 35 21 - LEED Requirements.
.1 Recycled Content: .1 Provide 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 and post-industrial] content, and total cost of materials for project.
.2 Regional Materials: Provide evidence that project incorporates required percentage 20% 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.

.3 Low-Emitting Materials: Provide listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.05 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 numbers.
.4 MPI Environmentally Friendly classification system rating.

1.06 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:
.2 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
.3 Submit 1 four litre can of each type and colour of primer, stain and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.07 QUALITY ASSURANCE

.1 Painting Trade Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
.1 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
.2 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.

1.08 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 Provide and maintain dry, temperature controlled, secure storage.
- .2 Store painting materials and supplies away from heat generating devices.
- .3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer.

.4 Fire Safety Requirements:
- .1 Supply 1 x 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

1.09 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
- .2 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
- .3 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.

.2 Test concrete, masonry and plaster surfaces for alkalinity as required.
.3 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits.

.3 Additional application requirements:
.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 in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

2 PRODUCTS

2.01 MATERIALS

.1 Supply paint materials for paint systems from single manufacturer.

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

.3 Materials in accordance with MPI - Architectural Painting Specification Manual "Approved Product" listing.
.1 Only qualified products with E2 "Environmentally Friendly" ratings are acceptable for use on this project, Use E3 rated products where available
.2 Use only MPI listed L-rated materials.
.3 Recycled water borne surface coatings to contain 50% post consumer material by volume.
.4 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.

.4 Recycled water borne surface coatings must not contain:
.1 Lead in excess of 600.0 ppm weight/weight total solids.
.2 Mercury in excess of 50.0 ppm weight/weight total product.
.3 Cadmium in excess of 1.0 ppm weight/weight total product.

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

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

.5 VOC limits for architectural paints and coatings applied to interior surfaces in accordance with Green Seal Standard GS-11 and as follows:

.1 Interior Flat Coating or Primer: maximum VOC limit 50 g/L.

.2 Interior Non-Flat Coating or Primer: maximum VOC limit 150 g/L.

.6 VOC limits for anti-corrosive and anti-rust paints applied to interior ferrous metal substrates in accordance with Green Seal Standard GS-03 and as follows:

.1 Anti-Corrosive/Anti-Rust Paint: maximum VOC limit 250 g/L.

.7 VOC limits for wood finishes, floor coatings, stains, primers and shellacs applied to interior elements in accordance with SCAQMD Rule 113 and as follows:

.1 Clear Wood Finishes – Lacquer: maximum VOC limit 550 g/L.

.2 Clear Wood Finishes – Sanding Sealers: maximum VOC limit 350 g/L.

.3 Clear Wood Finishes – Varnish: maximum VOC limit 350 g/L.

.4 Clear Brushing Lacquer: maximum VOC limit 680 g/L.

.5 Floor Coatings: maximum VOC limit 100 g/L.

.6 Sealers and Undercoaters: maximum VOC limit 200 g/L.

.7 Shellac – Clear: maximum VOC limit 730 g/L.

.8 Shellac – Pigmented: maximum VOC limit 550 g/L.

.9 Stain: maximum VOC limit 250 g/L.

.10 Pigmented Lacquer: maximum VOC limit 550 g/L.

.11 Low-Solids Coatings: maximum VOC limit 120 g/L.

.8 Colours:

.1 Submit proposed Colour Schedule to Departmental Representative for review; do not order materials or proceed with work until selections have been reviewed and approved by Departmental Representative.

.2 Colours will be selected by Departmental Representative from manufacturer's full range; the number of different colours required for the project is not expected to exceed 4 colours overall; some rooms may require a feature wall painted a different colour than the remaining walls, so assume one feature wall per room space; associated painted trim to match adjacent wall.

.3 Minimum number of coats shall be three: primer and two topcoats, minimum, plus additional as required to achieve opaque, uniform colour.

.4 Second coat in three-coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

.9 Mixing and tinting:

.1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations. Obtain written approval from Departmental Representative for tinting of painting materials.

.2 Use and add thinner in accordance with paint manufacturer's recommendations.

.1 Do not use kerosene or similar organic solvents to thin water-based paints.

.3 Thin paint for spraying in accordance with paint manufacturer's written recommendations.

.4 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.

.10 Gloss/sheen ratings:

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

Description / Gloss Level	**Gloss @ 60 degrees**	**Sheen @ 85 degrees**
G1 - Matte Finish (flat)	Max. 5	Max. 10
G2 - Velvet-Like Finish	Max. 10	10 to 35
G3 - Eggshell Finish	10 to 25	10 to 35
G4 - Satin-Like Finish	20 to 35	min. 35
G5 - Traditional Semi-Gloss Finish	35 to 70	
G6 - Traditional Gloss	70 to 85	
G7 - High Gloss Finish	More than 85	

.2 Gloss level ratings of painted surfaces as indicated or otherwise specified.

.11 Exterior painting (all systems shall be 3-coat, with primer, first topcoat and second topcoat):
.1 Structural Steel and Metal Fabrications:
.1 EXT 5.1T - Polyurethane, (over h.b. self-priming epoxy).
.2 Galvanized Metal:
.1 EXT 5.3L - Polyurethane, Pigmented (over epoxy primer) designed for high-contact/traffic.
.3 Dressed Lumber:
.1 EXT 6.3H - Pigmented polyurethane finish.

.12 Interior painting (all systems shall be 3-coat, with primer, first topcoat and second topcoat):
.1 Exposed Aggregate Concrete Floors:
.1 INT 3.2C - Epoxy Finish.
.2 Structural Steel and Metal Fabrications:
.1 INT 5.1U - Polyurethane, Pigmented finish (over H.B. self-priming epoxy) finish.
.3 Galvanized Metal:
.1 INT 5.3M - High performance architectural latex, G6 gloss level (over W.B. galvanized primer) finish.
.4 Glue laminated beams and columns:
.1 INT 6.1S - Polyurethane, Clear Moisture cured G6 gloss level (over S.B. stain).
.5 Dimension lumber: columns, beams, exposed joists, underside of decking:
.1 INT 6.2N - Polyurethane, Clear, Moisture cured – G6 gloss level (over S.B. stain) finish.
.6 Plaster and gypsum board:
.1 INT 9.2B - High performance architectural latex G3 gloss level (over latex primer/sealer) finish.

3 EXECUTION

3.01 GENERAL

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

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

3.02 EXAMINATION

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

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

3.03 PREPARATION

.1 Protection of in-place conditions:
  .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.

.2 Surface Preparation:
  .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
  .4 Clean and prepare surfaces in accordance with MPI - Architectural Painting Specification Manual specific requirements and coating manufacturer's recommendations.

.5 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.

.6 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.

.7 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.

.8 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.

.9 Touch up of shop primers with primer as specified.

3.04 APPLICATION

.1 Paint only after prepared surfaces have been accepted by Departmental Representative.

.2 Use method of application approved by Departmental Representative.

.1 Conform to manufacturer's application recommendations.

.3 Apply coats of paint in continuous film of uniform thickness.

.1 Repaint thin spots or bare areas before next coat of paint is applied.

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

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

.6 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.

.7 Finish inside of cupboards and cabinets as specified for outside surfaces.

.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.

.10 Mechanical/Electrical Equipment:

.1 Paint ceiling-mounted return/supply diffusers; finish colour as selected by Consultant; confirm colour prior to ordering materials.

.2 Unless otherwise specified or noted, paint all "unfinished" conduits, piping, hangers, ductwork and other mechanical and electrical equipment with color and texture to match adjacent surfaces, in the following areas:

.1 where exposed-to-view in all exterior and interior areas.

.2 in all interior high humidity interior areas.

.3 in all boiler room, mechanical and electrical rooms.

.3 In 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 Paint the inside of all ductwork where visible behind louvers, grilles and diffusers for a minimum of 460 mm (18") or beyond sight line, whichever is greater, with primer and one coat of matt black (non-reflecting) paint.

.7 Paint the inside of light valances gloss white.

.8 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.9 Paint red or band all fire protection piping and sprinkler lines in accordance with mechanical specification requirements. Keep sprinkler heads free of paint.

.10 Paint yellow or band all natural gas piping in accordance with mechanical specification requirements.

.11 Back-prime and paint face and edges of plywood service panels for telephone and electrical equipment before installation to match adjacent wall surface. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.12 Paint exterior steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.05 CLEANING

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

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.4 Place paint, stains and primer defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.

3.06 PROTECTION

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

.2 Repair damage to adjacent materials caused by work of this Section.

END OF SECTION