

1 GENERAL

1.01 REFERENCE STANDARDS

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 475-02(2015), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C 514-04(2014), Standard Specification for Nails for the Application of Gypsum Board.
 - .3 ASTM C 557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .4 ASTM C 840-16, Standard Specification for Application and Finishing of Gypsum Board.
 - .5 ASTM C 954-15, 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 C 1002-14, 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 C 1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .8 ASTM C 1177/C 1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .9 ASTM C 1178/C 1178M-13, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
 - .10 ASTM C 1280-13a, 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 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum board assemblies and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit for review and acceptance of each component specified or

- necessary for complete installation. Include technical descriptive data.
- .2 Submit duplicate 300 x 300 mm size samples of vinyl faced gypsum board and 300 mm long samples of corner and casing beads vinyl mouldings shadow mould cornice cap textured finishes insulating strip.
- .3 Samples will be returned for inclusion into work.
- .4 Certifications:
 - .1 Submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

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 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 C 840-16:
 - .1 Store gypsum board assemblies materials level flat off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect gypsum board assemblies from nicks, scratches, and blemishes.
 - .3 Protect gypsum board from direct exposure to rain, snow, sunlight, or other excessive weather conditions.
 - .4 Protect ready mix joint compounds from freezing, exposure to extreme heat and direct sunlight.
 - .5 Protect from weather, elements and damage from construction operations.
 - .6 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .7 Protect prefinished aluminum surfaces with wrapping strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .8 Replace defective or damaged materials with new.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials in accordance with Section 01 74 19 - Waste Management and Disposal.

1.04 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 Gypsum Board: meeting the requirements of ASTM C1396/C1396M and as follows:
 - .2 Panel Size: Provide in maximum lengths and widths available that will minimize joints in each area and correspond with support system as indicated on drawings.
- .3 Regular Gypsum Board:
 - .1 Thickness: As indicated.
 - .2 Long Edges: Tapered.
 - .3 Location: Vertical surfaces, unless otherwise indicated.
- .4 Fire Resistant Type (Type C or X):
 - .1 Thickness: As indicated, 16 mm minimum.
 - .2 Long Edges: Tapered.
 - .3 Location: Where required for fire resistance rated assembly.
- .5 Sag Resistant Gypsum Board: ceiling board manufactured to have more sag resistance than regular type gypsum board:
 - .1 Thickness: As indicated.
 - .2 Long Edges: Tapered.
 - .3 Location: Ceiling surfaces.
- .6 Mould Resistant Gypsum Board, for use on ceilings and wall in washroom, wet work stations, and janitor areas: To ASTM C1396, and mould resistance to ASTM D3273.
 - .1 Thickness: As indicated, 13 mm minimum.
 - .2 Long Edges: Tapered.
 - .3 Location: Vertical surfaces, unless otherwise indicated.
- .7 Glass Mat Water Resistant Gypsum Backer Board (Interior Applications Only): Manufactured in accordance with ASTM C1178 to produce greater resistance to water penetration and to provide improved surface bonding characteristics for ceramic tile than standard gypsum board:
 - .1 Thickness: As indicated, minimum 13 mm x manufacturers maximum length and widths.
 - .2 Location: Substrate for ceramic tile.
- .8 Abuse Resistant Gypsum Board: Manufactured to produce greater resistance to surface indentation and impact penetration resistance than standard gypsum panels:
 - .1 Gypsum panels with glass fibre reinforced core, tapered edges, minimum 16 mm thickness, Type "X" or "C" ULC fire rating, conforming to ASTM C1396 and tested to the following performance ratings:

- .2 Indentation Resistance: ASTM D1037 or D5420 to provide 2.54 mm maximum indentation at 45 N.
- .3 Soft Body Impact Resistance: ASTM E695 to produce failure using a 22.7 kg bag when dropped from a minimum height of 838 mm.
 - .1 Locations: corridors
- .9 Sealants: in accordance with Section 07 92 00 - Joint Sealants.

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 C 840-16 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C 1280-13a.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C 840-16 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles,
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C 840-16, except where specified otherwise.

- .11 Furr openings and around built-in equipment, cabinets, 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 joists between layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 38 mm common nail 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.03 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single double layer gypsum board to wood metal furring or framing using screw fastenersstud adhesive for first layer, laminating adhesive screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C 840-16.
 - .2 Apply gypsum board on walls vertically or horizontally, providing sheet lengths that will minimize number of board edges or end joints.
 - .2 Double-Layer Application:
 - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
 - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
 - .3 Apply base layers at right angles to supports unless otherwise indicated.
 - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 Apply single double layer gypsum board to concrete concrete block surfaces, where indicated, using laminating adhesive.
 - .1 Comply with gypsum board manufacturer's recommendations.
 - .2 Brace or fasten gypsum board until fastening adhesive has set.
 - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Exterior Soffits and Ceilings: install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install with 6 mm gap where boards abut other work.
- .5 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions

- abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, , in partitions where perimeter sealed with acoustic sealant.
- .6 Arrange vinyl-faced gypsum board symmetrical about openings and wall areas, with butt joints aluminum/vinyl mouldings between joints.
 - .7 Apply board using stud adhesive on furring or framing laminating adhesive on base layer of gypsum board.
 - .8 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
 - .9 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.
 - .10 Install gypsum board with face side out.
 - .11 Do not install damaged or damp boards.
 - .12 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.04 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.
- .6 Construct control joints of preformed units 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 Locate control joints where indicated at changes in substrate construction at approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.
- .9 Install control joints straight and true.
- .10 Ensure that screws or nails are properly applied in process of attaching gypsum

- board to framing without damaging of gypsum board edges and ends.
- .11 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
 - .12 Install expansion joint straight and true.
 - .13 Install cornice cap where gypsum board partitions do not extend to ceiling.
 - .14 Splice corners and intersections together and secure to each member with 3 screws.
 - .15 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
 - .16 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.
 - .17 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
 - .18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board, invisible after surface finish is completed.
 - .19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
 - .20 Completed installation smooth, level or plumb, free from waves and other defects and ready for surface finish.
 - .21 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
 - .22 Mix joint compound slightly thinner than for joint taping.
 - .23 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
 - .24 Allow skim coat to dry completely.
 - .25 Remove ridges by light sanding or wiping with damp cloth.

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.

3.06 PROTECTION

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

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

- .1 ASTM International
 - .1 ASTM C 645, Standard Specification for Nonstructural Steel Framing Members.
 - .2 ASTM A 653/A 653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
 - .3 ASTM C 754, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Underwriter's Laboratories (UL) Environmental Standards
 - .1 UL-2768-2011, Architectural Surface Coatings.
- .3 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
 - .1 MPI #26, Primer, Galvanized Metal, Cementitious.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for metal framing and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit duplicate 300 mm long samples of non-structural metal framing.

1.03 QUALITY ASSURANCE

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

1.04 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.
- .3 Storage and Handling Requirements:

- .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect metal framing from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Waste Management and Disposal.

2 PRODUCTS

2.01 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C 645, mm stud size, roll formed from 0.53 0.91 mm thickness hot dipped zinc-coated (galvanized) steel sheet in accordance with ASTM A 653, Z180, for screw attachment of gypsum board lath.
 - .1 Knock-out service holes at 460 mm centres.
- .2 Floor and ceiling tracks: to ASTM C 645, in widths to suit stud sizes, and as follows:
 - .1 Slotted Deflection Track for Fire Separations: Premanufactured slotted top runner with 63 mm down standing legs and having 6 mm wide x 38 mm high slots spaced at 25 mm on centre along length of runner; tested and certified for use in fire rated wall construction.
 - .2 Double Runner Deflection Track: Outside runner using 50 mm 75 mm flanges; inner runner 33 mm; maintaining 25 mm minimum deflection space.
 - .3 Deep Leg Deflection Track: Top runner having 50 mm 75 mm down standing legs; maintaining 13 mm minimum deflection space.
 - .4 Base Runner: Bottom track with 33 mm upstanding legs.
- .3 Non-load bearing truss stud framing system: to consist of:
 - .1 Studs: mm size; truss-type bent rod web with double rod chords 12 x 6 mm x 1.2 mm channel chords; welded together at contact points.
 - .1 Make rod of minimum 4.5 mm diameter cold drawn steel wire having tensile strength of 620 MPa.
 - .2 Design studs for clip attachment of gypsum lath or wire tying of metal lath.
 - .2 Floor track: snap-in type formed to hold studs securely in place at 50 mm intervals; fabricated from 0.5 mm thick steel sheet; size to suit studs.
 - .3 Ceiling track: channel shaped track for use with stud shoes and 1.2 mm diameter double wire ties; size to suit studs.
 - .4 After fabrication apply one shop coat of MPI #26 primer to steel surfaces.
 - .1 Descale and clean surfaces before painting.

- .4 Furring Channels: Commercial steel sheet in accordance with ASTM A 653, Z180, hot dipped zinc-coated (galvanized), as follows:
 - .1 Hat Shaped, Rigid Furring Channels: ASTM C 645, 0.75 mm thickness x 22 mm deep.
 - .2 Resilient Furring Channels: 0.46 mm thickness x 13 mm deep members designed to reduce sound transmission having asymmetrical face attached to single flange by a slotted leg (web).
- .5 Curving Tracks: Commercial steel sheet with ASTM A 653, Z180, hot dipped zinc-coated (galvanized), complete with flexible sliding straps to allow for curvature indicated on drawings; width to suit framing, and as follows:
 - .1 Width: 65 mm 92 mm.
 - .2 Minimum base metal thickness: 0.75 mm.
- .6 Metal channel stiffener: x mm size, 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .7 Acoustical sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .8 Sealants: VOC limit 30 70 250 g/L maximum to SCAQMD Rule 1168 GS-36.
- .9 Insulating strip: rubberized, moisture resistant 3 mm thick cork foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

3 EXECUTION

3.01 EXAMINATION

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

3.02 ERECTION

- .1 Erect partitions in accordance with framing requirements of ASTM C 754.
- .2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .3 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .4 Place studs vertically at mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners.
 - .1 Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.

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- .5 Erect metal studding to tolerance of 1:1000.
 - .6 Attach studs to bottom ceiling track using screws crimp method pop rivets.
 - .7 Co-ordinate simultaneous erection of studs with installation of service lines. Align web openings when erecting studs.
 - .8 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
 - .9 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified.
 - .1 Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
 - .10 Install heavy gauge single jamb studs at openings.
 - .11 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs.
 - .1 Secure track to studs at each end, in accordance with manufacturer's instructions.
 - .2 Install intermediate studs above and below openings in same manner and spacing as wall studs.
 - .12 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
 - .13 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
 - .14 Install steel studs or furring channel between studs for attaching electrical and other boxes.
 - .15 Extend partitions to ceiling height except where noted otherwise on drawings.
 - .16 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
 - .1 Use 50 mm leg ceiling tracks. Use double track slip joint as indicated.
 - .17 Install continuous insulating strips to isolate studs from uninsulated surfaces.
 - .18 Install two continuous beads of acoustical sealant insulating strip under studs and tracks around perimeter of sound control partitions.
 - .19 Curved Partition Tracks:
 - .1 Cut top and bottom track (runners) through leg and web at 50 mm intervals for arc length. In cutting lengths of track, allow for uncut straight lengths minimum 300 mm at ends of arcs. Shape curving tracks to profiles indicated on drawings in accordance with manufacturer's instructions.
 - .2 Bend track to uniform curve and locate straight lengths so they form a

- true tangent to arcs.
- .3 Support outside (cut) leg of track by clinching steel sheet strip, 25 mm high, by thickness of track metal, to inside of cut legs using metal lock fasteners.
- .4 Begin and end arc with a stud and space intermediate studs equally along arcs at stud spacing recommended in writing by gypsum board manufacturer for radii indicated. On straight lengths of minimum 2 studs at ends of arcs, place studs at 150 mm on centre.

3.03 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 - Waste Management and Disposal.
 - .1 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 non-structural metal framing application.

END OF SECTION

1 General**1.01 REFERENCES**

- .1 Acoustic Materials Association (AMA):
 - .1 AMA111 Ceiling Sound Transmission Test by the TwoRoom Method
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - .2 ASTM C635 Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustic Tile and Layin Panel Ceilings
 - .3 ASTM C636 Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustic Tile and LayIn Panels
 - .4 ASTM A641/A641M Standard Specification for ZincCoated (Galvanized) Carbon Steel Wire
 - .5 ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
 - .6 ASTM E1111 Standard Test Method for Measuring the Interzone Attenuation of Ceiling Systems
 - .7 ASTM E1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
 - .8 ASTM E1264 Standard Classification for Acoustic Ceiling Products
- .3 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB92.1M, Sound Absorptive Prefabricated Acoustic Units
- .4 Underwriters Laboratories of Canada (ULC):
 - .1 CAN/ULCS10220 Surface Burning Characteristics of Building Materials and Assemblies

1.02 SUBMITTALS

- .1 Comply with requirements of Section 01 33 00.
- .2 Submit duplicate 150mm x 150mm samples of each type of acoustic board and 150mm long samples of exposed T-bar to the Departmental Representative.

1.03 DESIGN CRITERIA

- .1 Maximum deflection: $1/360^{\text{th}}$ of span to ASTM C635 deflection test.
- .2 Determine the superimposed loads which will be applied to suspension systems by components of the building other than the ceiling and ensure that adequate hangers are installed to support the additional loads in conjunction with the normal loads of the system.

1.04 PRODUCT HANDLING AND STORAGE

- .1 Deliver all materials in the manufacturer's original packaging, undamaged, with seals and labels intact.
- .2 Deliver acoustical materials to the area where they will be installed, after suitable conditions for installation have been established and will be maintained.
- .3 Maintain all materials in the manufacturer's original packaging, undamaged, with seals and labels intact.

1.05 ENVIRONMENTAL CONDITIONS

- .1 Do not install acoustic unit ceilings until the building is enclosed, sufficient heat is provided, overhead mechanical work is completed, tested and approved, and dust and moisture producing activities have been completed.
- .2 Maintain uniform temperatures of not less than 16°C, and relative humidity of not more than 40% from the time of installation onwards. Ensure that changes of temperature and humidity are not sudden.

2 Products**2.01 METAL SUSPENSION SYSTEM**

- .1 Metal Suspension System: Manufacturer's standard direct hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable ASTM C 635 requirements and as supplied by same materials supplier as acoustic panels for intermediate duty, exposed tee bar and as follows:
 - .1 Tee bar grid face width: 24 mm (15/16") and 15 mm (9/16") as appropriate for materials specified
 - .2 Module: Sized as appropriate to acoustic panel size
 - .3 Hangers, Braces and Ties: minimum 2.78 mm (0.109" (12 ga.)) Ø steel wire, galvanized
 - .4 Exposed Finish: Manufacturer's standard satin, white finish
 - .5 Corrosion Resistance: Hotdip galvanized or stainless steel components
 - .6 Acceptable materials: materials to match products specified, use only materials from same manufacturers of panel products
- .2 Attachment Devices: Size for five (5) times design load indicated in ASTM C 635, Table 1, Direct Hung, having corrosion protection for moderate service conditions, and as follows:
 - .1 Rod and Flat Hangers: Mild steel, zinc coated
 - .2 Angle Hangers: Minimum 22 mm (7/8") x 22 mm (7/8") x 1 mm (1/24") thick angles, Z275 (G90) galvanized steel sheet in accordance with ASTM A 653/A 653M; bolted connections using 8 mm (5/16") Ø bolts

2.02 EDGE MOULDINGS AND TRIM

- .1 Sheet Metal Edge Mouldings and Trim: Manufacturer's standard mouldings for edges and penetrations that fit specified acoustic panel edge and suspension system, and as follows:
 - .1 Provide stepped edge moulding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member for lay in panels with tegular edged materials.
 - .2 Provide edge mouldings fabricated to diameter required to fit circular penetrations exactly.
 - .3 Provide edge mouldings and trims that match width and configuration of exposed runners, including but not limited to, the following configurations:
 - .1 Sheet metal fillers: Light zinc coated sheet steel finished to match the Tbar.
 - .2 Shadow mould: Rolled sheet metal, one piece, having 19 mm ($\frac{3}{4}$ ") x 13 mm ($\frac{1}{2}$ ") flange and reveal.
 - .3 Wall moulding: Angle shape with a 22 mm ($\frac{7}{8}$ ") exposed face.

2.03 ACOUSTIC PANELS

- .1 Provide manufacturer's standard panels of configuration indicated that comply with CAN/CGSB92.1 and ASTM E1264, 610mm (24") x 1220mm (48") x 19mm ($\frac{3}{4}$ ") random fissured, non-tegular edged; white colour.
- .2 Surface burning properties, all types: Flame spread of 25 or less and smoke developed of 50 or less when tested in accordance with CAN/ULC S102, substantiated by ULC labels on materials supplied.

3 Execution**3.01 INSTALLATION**

- .1 Install ceiling suspension and acoustic panels in accordance with the manufacturer's instructions.
- .2 Install suspension systems in accordance with ASTM C636, insofar as it is consistent with other requirements of this specification.
- .3 Install ceilings in the indicated locations, level to within a tolerance of 3 mm ($\frac{1}{8}$ ") in 3600 mm (12').
- .4 Attach hangers directly to the structure wherever possible. Elsewhere attach them in VPairs, or to nested carrying channels suspended below the obstruction. Do not kink or bend suspension wires to fit around obstructions or to adjust ceiling height.
- .5 Do not attach ceilings to overhead ducts or pipes, do not allow suspension system to rest against or be deformed by ducts or pipes.
- .6 Do not use powder actuated fasteners. Ensure that fastening methods used cannot damage building structure.

- .7 Furnish additional hangers at lay-in electrical fixtures, one at each corner and, if required, stabilizer bars to prevent overloading or rotation of the suspension members.
- .8 Unless otherwise indicated centre pattern of board in room or area so that perimeter board not less than half the panel size.
- .9 Use a sheet metal filler where any face dimension of a piece of acoustic board, measured from centre of Tee to face of wall is less than 75 mm (3").

3.02 CLEANING AND ADJUSTING

- .1 Do not level ceilings by putting kinks in the suspension wires.
- .2 Clean soiled or discoloured surfaces of acoustic boards and exposed suspensions of installed ceilings.
- .3 Remove and replace units which are damaged or improperly installed.

END OF SECTION

1 GENERAL**1.01 REFERENCE STANDARDS**

- .1 ASTM International
 - .1 ASTM F 1303-04(2014), Standard Specification for Sheet Vinyl Floor Covering with Backing.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for resilient sheet flooring and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Samples:
 - .1 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base,nosing,feature strips,treads,edge strips.

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 and protect specified materials from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets,crates,padding,and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 19 - Waste Management and Disposal.

1.04 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Maintain air temperature and structural base temperature at flooring installation area above 20 degrees for 48 hours before, during and 48 hours after installation.

2 PRODUCTS

2.01 MATERIALS

- .1 Sheet vinyl with backing: to ASTM F 1303, commercial.
 - .1 Type: I - PVC binder content 90%.
 - .2 Grade: 2.
 - .3 Backing: A-fibrous (Non-asbestos formulated) .
 - .4 Pattern: embossed.
 - .5 Texture: multi coloured.
 - .6 Colour: as selected by Departmental Representative from manufacturers standard range; a maximum of three colours will be selected.
- .2 Resilient base: continuous, top set, complete with pre-moulded end stops and external corners:
 - .1 Type: rubber.
 - .2 Style: cove.
 - .3 Thickness: 2.36 mm.
 - .4 Height: 101.6 mm.
 - .5 Lengths: cut lengths minimum 2400 mm.
 - .6 Colour: as selected by Departmental Representative from manufacturers standard range; a maximum of three colours will be selected.
- .3 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
 - .1 Rubber floor 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.
- .4 Metal edge strips:
 - .1 Aluminum extruded, smooth, mill finish polished stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

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 sheet flooring installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative t.
 - .2 Inform Departmental Representative t 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 SITE VERIFICATION OF CONDITIONS

- .1 Ensure concrete floors are clean and dry by using test methods recommended

by flooring manufacturer.

3.03 PREPARATION

- .1 Remove existing resilient flooring.
- .2 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.
- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .4 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .5 Prime Seal concrete sub-floor to resilient flooring manufacturer's printed instructions.

3.04 APPLICATION: FLOORING

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least 1 month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .4 Run sheets in direction of traffic. Double cut sheet joints and continuously seal heat weld according to manufacturer's printed instructions.
- .5 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.
- .6 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .7 Cut flooring around fixed objects.
- .8 Install feature strips and floor markings where indicated. Fit joints tightly.
- .9 Install flooring in pan type floor access covers. Maintain floor pattern.
- .10 Continue flooring over areas which will be under built-in furniture.
- .11 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.

- .12 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .13 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.05 APPLICATION: BASE

- .1 Lay out base to keep number of joints at minimum.
- .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.
- .8 Use toeless type base where floor finish will be carpet, coved type elsewhere.
- .9 Install toeless type base before installation of carpet on floors.
- .10 Heat weld base in accordance with manufacturer's printed instructions.

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.

3.07 PROTECTION

- .1 Protect new floors from time of final set of adhesive after initial waxing until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.
- .3 Use only water-based coating for linoleum.

END OF SECTION

1 General**1.01 SECTION INCLUDES**

- .1 Seamless epoxy floor coating with 200mm high coved base as indicated and specified.

1.02 REFERENCES

- .1 ASTM C811-98(2003) - Practise for Surface Preparation of Concrete for Application of Chemical-Resistant Resin Monolithic Surfacing.
- .2 ASTM D570-98(2005) - Water Absorption of Plastics.
- .3 ASTM D638-03 - Tensile Properties of Plastics.
- .4 ASTM D695-02a - Compressive Properties of Rigid Plastics
- .5 ASTM D905-03 - Strength Properties of Adhesive Bonds in Shear by Compression Loading.
- .6 ASTM D1044-05 - Resistance of Transparent Plastics to Surface Abrasion.
- .7 ASTM D 2047 - Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine.
- .8 CAN/ULC S102-03 - Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.03 ADMINISTRATIVE REQUIREMENTS

- .1 Coordinate with other work having a direct bearing on work of this section
- .2 Prior to commencement of Work on site, convene a pre-installation conference to be attended by the Contractor, coating Subcontractor, manufacturer's technical representative, and Departmental Representative to review:
 - .1 Technical representative's schedule for reviewing Work.
 - .2 Product selections including colours, patterns, samples and mock-ups required, flooring accessories.
 - .3 Procedures and tests for verifying acceptability of substrate for application of products.
 - .4 Environmental requirements for installation
 - .5 Installation procedures
 - .6 Protection of finished Work.

1.04 SUBMITTALS

- .1 Comply with requirements of Section 01 33 00.
- .2 Submit copies of manufacturer's technical data, test reports, installation instructions and general recommendations.
- .3 Submit duplicate 300mm x 300mm colours samples from manufacturer's standard range.

- .4 Submit manufacturer's maintenance data for incorporation into Maintenance Manuals. Include manufacturer's printed data covering the care, cleaning and maintenance of epoxy finishes.

1.05 QUALITY ASSURANCE

- .1 Installer: Company licensed by the manufacturer for installation of their products, specializing in epoxy flooring application, including waterproof membrane, having trained applicators with minimum five (5) years proven experience for projects of similar size and complexity.
- .2 Manufacturer's Technical Representative: epoxy manufacturer shall provide a representative to inspect the surfaces to which the coatings will be applied and confirm with the Departmental Representative, in writing, that substrates are acceptable for application. This representative shall also carry out regular inspections to ensure installation meets manufacturer's requirements. Coordinate site inspections with Departmental Representative and provide written reports covering quality of installation and acceptance of completed work or corrections required. Manufacturer's representative shall visit site minimum of two times during installation and once upon completion.
- .3 Mock-up: prepare as 10 square meter mock-up of epoxy floor finish for review by Departmental Representative. Install in location indicated. Reviewed mock-up may be incorporated into final work.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- .1 Deliver all materials undamaged in original containers bearing manufacturer's seals and labels.
- .2 Store materials in a dry protected area, at a temperature of between 16° C and 32° C.

1.07 SITE CONDITIONS

- .1 Ensure all other finishing activities are completed prior to beginning any work.
- .2 Maintain ambient temperature of minimum 18° C and a floor temperature of minimum 16° C for at least seven (7) days prior to beginning installation and for at least 48 hours after completion of work. Maintain maximum relative humidity of 40%.
- .3 Take moisture readings to ensure that substrates are within limits prescribed by manufacturer.
- .4 Comply with requirements of Workplace hazardous Materials Information System (WHMIS) regarding the use, handling, storage and disposal of hazardous materials.
- .5 Provide adequate ventilation in areas of work during and for minimum 24 hours after completion.

2 Products**2.01 MATERIALS**

- .1 Seamless Epoxy: two-component flexible, flame retardant coating. Final floor finish to achieve a 0.6 minimum coefficient of friction, in both wet and dry conditions as tested in accordance with ASTM D2047.
- .2 Provide primers and accessories as required for a complete installation.
- .3 One colour will be chosen by the Departmental Representative from manufacturer's standard range.

3 Execution**3.01 INSPECTION / PREPARATION**

- .1 Inspect areas to receive epoxy flooring in conjunction with manufacturer's technical representative and ensure all substrates are acceptable to receive coatings. Provide written verification to Departmental Representative of acceptance or remedial work required. Do not begin any work until unacceptable conditions have been corrected.
- .2 Verify that concrete floors have cured for a minimum 28 days, are dry to a maximum moisture content of 7% and exhibit negative alkalinity, carbonization or dusting.
- .3 If curing compounds have been used, prepare concrete, including shot blasting if necessary, to remove bond inhibiting material.
- .4 Thoroughly clean all substrates to receive coatings of deleterious materials that would affect proper bonding and performance of floor coating.
- .5 Remove all fittings, fixtures, cover plates, surface hardware and other fastenings. Store items in secure location and re-install, undamaged, upon completion of installation.
- .6 Mask off and protect all adjacent surfaces and materials.
- .7 Ensure floor drains are set in correct elevations to provide flush finish with floor coating.

3.02 INSTALLATION

- .1 Apply primer to prepared substrates in accordance with manufacturer's instructions.
- .2 Prepare cracks in substrate as recommended by coating manufacturer.
- .3 Apply membrane in multiple coats to a dry thickness of between 2mm to 3mm. Provide an anti-slip finish.
- .4 Install 200mm coved base and return into wall.
- .5 Install all components in strict accordance with manufacturer's instructions and recommendations.

- .6 Follow all directions on inspection reports prepared by manufacturer's technical representative.

3.03 PROTECTION

- .1 Protect completed installation from all foot traffic for minimum 24 hours after completion of entire installation.
- .2 Monitor temperature and humidity to ensure conditions are within specified limits.

3.04 CLEANING

- .1 Clean adjacent surfaces and materials of excess floor material as recommended by flooring manufacturer. Ensure cleaners are compatible with surfaces being cleaned.
- .2 Clean flooring upon completion in accordance with manufacturer's instructions.
- .3 Remove all tools and equipment from site upon completion of work

END OF SECTION

1. General**1.1. SECTION INCLUDES**

1. Bolted stringer framing system.
2. Removable floor panels, ramps and handrails.
3. System electrostatic grounding.

1.2. REFERENCES

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ASTM E84 - Test Method for Surface Burning Characteristics of Building Materials.
3. CAN/ULC-S102.2 - Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
4. CISCA (Ceilings & Interior Systems Construction Association) - Recommended Test Procedures for Access Floors.
5. NFPA 75 - Standard for the Protection of Information Technology Equipment.

1.3. SYSTEM DESCRIPTION

1. Assembly: Stringer system.
2. Access flooring system to achieve finished floor elevation above building structural floor as indicated on Drawings.
3. Floor Panel Size: 600 x 600 mm.

1.4. PERFORMANCE REQUIREMENTS

1. Pedestals:
 1. Maximum Axial Load: 2 268 without permanent deformation.
 2. Ultimate Strength: Not less than twice design load.
 2. Floor Panels: Conform to the following:
 1. Live Load: 11.7 kPa.
 2. Maximum Deflection: 1 mm.
 3. Concentrated Load: 500 kg on 710 sq mm at any location with maximum deflection of 2.
 4. Permanent Deformation: 0.5 mm maximum at design load.
 5. Ultimate Strength: Not less than twice design load.
 6. Flame Spread: Class A in accordance with ASTM E84.
 3. Lateral Stability: Design system for lateral stability in all directions, with or without panels in place.
 4. Surface Electrical Resistance: Maximum 1 ohm per panel.
-

5. Access Flooring System: Test to Cisca Recommended Test Procedures for Access Floors for the following:
 1. Concentrated Load: Capable of withstanding concentrated load of 680 kilograms placed 6.5 sq. cm. area at the center of the base unit without yielding.
 2. Rolling Loads: Capable of withstanding the following rolling loads, with a combination of local and overall deformation not to exceed 1.015mm after exposure to rolling load over Cisca A/F Path A or B, whichever path produces the greatest top-surface deformation.
 1. Cisca A/F Wheel 1 Rolling Load: 453.5 kg.
 2. Cisca A/F Wheel 2 Rolling Load: 317.5 kg.

1.5. ADMINISTRATIVE REQUIREMENTS

1. Coordination: Coordinate with other work having a direct bearing on work of this section.
2. Pre-installation Meetings: Convene one (1) week prior to starting work of this section.

1.6. SUBMITTALS

1. Comply with requirements of Section 01 33 00.
2. Product Data: Provide data for grid system, panels, and accessories; electrical resistance characteristics and ground connection requirements.
3. Shop Drawings: Indicate floor layout, interruptions to grid, special sized panels panels requiring drilling or cut-out for services, appurtenances or interruptions, edge details, elevation differences and locations of perforated panels.
4. Installation Data: Manufacturer's installation requirements indicating special procedures and perimeter conditions requiring special attention.
5. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7. CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods [, and polishes and waxes].

1.8. MAINTENANCE MATERIAL SUBMITTALS

1. Extra Stock Materials:
 1. Provide four (4) of each size of floor panel.
 2. Provide four (4) spare.
 3. Panel Lifting Devices: Two (2) of manufacturer's standard type.
-

1.9. QUALITY ASSURANCE

1. Perform Work in accordance with NFPA 75
2. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
3. Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.
4. Design floor system structure layout for this project under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the Province of Alberta.

1.10. REGULATORY REQUIREMENTS

1. Conform to applicable code for flame resistance of panels and electrical ground resistance.
2. Electrical Grounding Connection: Listed and classified by testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

2. Products**2.1. SUPPORT COMPONENTS**

1. Bolted Stringers: Assembly to remain completely braced and rigid after a maximum of eight abutting panels are removed. Stringers to support a mid-span force of 0.66 kN minimum.

2.2. PANEL COMPONENTS

1. Floor Panels: Die formed galvanized sheet steel top welded to formed bottom pan filled internally with lightweight cementitious material. Cementitious material shall be totally encased in steel pane shell, except where cut for special conditions. Finish panel with electrically conductive epoxy paint.
2. Perforated Floor Panels: perforated steel airflow panels designed to support static loads; interchangeable with floor panels and capable of supporting concentrated loads of 4.45 Kn. Panels shall have 25% open surface area with the following air distribution capability:
 1. Panel with damper at 100% open surface: 15.6 cubic meters per minute..

2.3. ACCESSORIES

1. Plenum Dividers: Galvanized steel.
 2. Electrostatic Grounding Connectors: Solid copper.
 3. Cable Cutout Protection: Extruded polyvinyl chloride edging, 9mm thick, self-extinguishing.
 4. Grommets: PN K1010 Koldlok split air sealing grommets..
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5. Wall Base: Extruded plastic.
6. Sealant: type as specified in Section 07 90 00
7. Ramp: Same materials, structural strength, and construction as floor panels.
8. Hand Railings: Posts and rails of extruded aluminum; assembled with sleeved connections; cast metal end caps, floor sockets, collars, brackets, and fittings.

2.4. FABRICATION TOLERANCES

1. Floor Panel Flatness: Plus or minus 0.5mm in any direction.
2. Floor Panel Width or Length From Specified Size: Plus or minus 0.5mm.
3. Floor Panel Squareness: Plus or minus 0.8mm difference between opposite diagonal dimensions.

3. Execution

3.1. EXAMINATION

1. Verify field measurements are as shown on shop drawings.
2. Verify that required utilities are available, in proper location, and ready for use.

3.2. PREPARATION

1. Vacuum clean substrate surfaces.
2. Co-ordinate installation of access flooring system with installation of waterproof membrane on concrete substrate and adjacent walls. Refer to Section 07 13 24 for additional information.

3.3. INSTALLATION

1. Install components to manufacturer instructions.
 2. Secure pedestal base plate to subfloor with adhesive.
 3. Install additional pedestals where grid pattern is interrupted by room appurtenances or at cut-outs.
 4. Install perforated panels as indicated on shop drawings and where directed.
 5. Close field cut floor panels with edge trim.
 6. Cut holes in floor panels to accommodate Owner's equipment. Provide cable cut-out protection.
 7. Provide positive electrical earth grounding of entire floor assembly in accordance with NFPA 75.
 8. Install 90 grommets to locations determined on site.
 9. Refer to mechanical ventilation plan for placement of perforated panels and air flow requirements. A total of eleven perforated panels will be required.
 10. Install floor ramp and railings with edge trim and end closures. Provide lateral braces at ramp edges and other locations where pedestals are not braced..
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3.4. ERECTION TOLERANCES

1. Maximum Out of Level Floor Panel Tolerance: 1.6mm non-cumulative.

3.5. ADJUSTING

1. Adjust pedestals to achieve a level floor and to assure adjacent floor panel surfaces are flush.

3.6. PROTECTION OF FINISHED WORK

1. Do not permit traffic over unprotected floor surface.

END OF SECTION

1 GENERAL**1.01 REFERENCE STANDARDS**

- .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .2 Master Painters Institute (MPI)
 - .1 The Master Painters Institute (MPI)/Architectural Painting Specification Manual (ASM) - current edition.
 - .2 Standard GPS-1MPI Green Performance Standard.
 - .3 Standard GPS-2MPI Green Performance Standard.
- .3 National Research Council Canada (NRC)
 - .1 National Fire Code of Canada (NFC).
- .4 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

1.02 ADMINISTRATIVE REQUIREMENTS

- .1 Scheduling:
- .2 Submit work schedule for various stages of painting to Departmental Representative for review. Provide schedule minimum of 48 hours in advance of proposed operations.
- .3 Obtain written authorization from Departmental for changes in work schedule.
- .4 Schedule new additions to existing building coordinate painting operations with other trades.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Procedures.
 - .3 Confirm products to be used are in MPI's approved product list.
- .3 Upon completion, provide records of products used. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (MSDS).

- .4 Samples:
 - .1 Submit full range colour sample chips to indicate where colour availability is restricted.
 - .2 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .5 Test reports: Provide certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Lead, cadmium and chromium: presence of and amounts.
 - .2 Mercury: presence of and amounts.
 - .3 Organochlorines and PCBs: presence of and amounts.
- .6 Certificates: Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. MPI Gateway #.
- .7 Manufacturer's Instructions:
 - .1 Provide manufacturer's installation and application instructions.

1.04 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.

1.05 MAINTENANCE MATERIAL SUBMITTALS

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

1.06 QUALITY ASSURANCE

- .1 Qualifications:
- .2 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
- .3 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.

- .4 Apprentices: may be employed provided they work under direct supervision of qualified journeyman in accordance with trade regulations.
- .5 Conform to latest MPI requirements for exterior painting work including preparation and priming.
- .6 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
- .7 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
- .8 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.07 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.
 - .1 Labels: to indicate:
 - .1 Type of paint or coating.
 - .2 Compliance with applicable standard.
 - .3 Colour number in accordance with established colour schedule.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Observe manufacturer's recommendations for storage and handling.
 - .3 Store materials and supplies away from heat generating devices.
 - .4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
 - .5 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.
 - .6 Remove paint materials from storage only in quantities required for same day use.
 - .7 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - .8 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials

subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

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

1.08 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
 - .2 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .3 Provide minimum lighting level of 323 Lux on surfaces to be painted.
 - .1 Perform painting work when maximum moisture content of the substrate is below:
 - .1 12% for concrete and masonry (clay and concrete brick/block). Allow new concrete and masonry to cure minimum of 28 days.
 - .2 15% for hard wood.
 - .3 17% for soft wood.
 - .4 12% for plaster and gypsum board.
 - .2 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
 - .3 Test concrete, masonry and plaster surfaces for alkalinity as required.
 - .4 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - .3 Apply paint when previous coat of paint is dry or adequately cured.
 - .5 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .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 PERFORMANCE REQUIREMENTS**

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

2.02 MATERIALS

- .1 Only Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
- .6 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .7 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids to be:
 - .1 Be Water-based.
 - .2 Be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .3 Be manufactured without compounds which contribute to smog in the lower atmosphere.
 - .4 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigment.
- .8 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
 - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .10 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.
- .11 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 Hexavalent 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.

2.03 COLOURS

- .1 Departmental Representative will provide Colour Schedule after Contract award Submit proposed Colour Schedule to Departmental Representative for review.
- .2 Colour schedule will be based upon selection of 5 base colours and 3 accent colours. No more than 8 colours will be selected for entire project and no more than 3 colours will be selected in each area.
- .3 Selection of colours will be from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.
- .5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats, if requested by Departmental Representative DCC Representative Consultant
- .6 For deep and ultra deep colours; 4 coats may be required.

2.04 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Departmental Representative for tinting of painting materials.
- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer's instructions.
- .5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity. Strain as necessary.

2.05 GLOSS/SHEEN RATINGS

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

<u>Gloss @ 60 degrees</u>	<u>Sheen @ 85 degrees</u>	
Gloss Level 1 - Matte	Max. 5	Max. 10
Finish (flat)		

Gloss Level 2 - Velvet-Like Finish	Max. 10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

- .2 Gloss level ratings of painted surfaces as indicated and as noted on Finish Schedule.

2.06 SOURCE QUALITY CONTROL

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

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

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

3.02 GENERAL

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

3.03 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- .2 Interior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
 - .3 Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
 - .4 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.
 - .5 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Hard Wood: 15%.
 - .5 Soft Wood: 17%.

3.04 PREPARATION

- .1 Protection (not applicable to new painting work):
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
 - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation (not applicable to new painting work):
 - .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.

- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly.
 - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
 - .6 Use trigger operated spray nozzles for water hoses.
 - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - .1 Apply 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.
- .6 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.
- .7 Carried out during shop priming: clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air or vacuum cleaning.
- .8 Touch up of shop primers with primer as specified.
- .9 Do not apply paint until prepared surfaces have been accepted by Departmental Representative

3.05 EXISTING CONDITIONS

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

by manufacturer.

3.06 APPLICATION

- .1 Method of application to be as approved by Departmental Representative DCC Representative Consultant. Apply paint by brush roller air sprayer airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.

- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- .12 Wood, drywall, plaster, stucco, concrete, concrete masonry units and brick; if sprayed, must be back rolled.

3.07 MECHANICAL/ ELECTRICAL EQUIPMENT

- .1 Paint finished area exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as indicated.
- .2 Boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.
- .3 Other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.
- .4 Do not paint over nameplates.
- .5 Keep sprinkler heads free of paint.
- .6 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .7 Paint fire protection piping red.
- .8 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .9 Paint natural gas piping yellow.
- .10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.
- .11 Do not paint interior transformers and substation equipment.

3.08 SITE TOLERANCES

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

3.09 FIELD QUALITY CONTROL

- .1 Interior painting and decorating work to be inspected by a MPI Accredited Paint

Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor will notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.

- .2 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer will provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.
- .3 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .4 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.
- .5 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .6 Cooperate with inspection firm and provide access to areas of work.
- .7 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

3.10 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 19 - Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.11 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after

operations cease.

- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative DCC Representative Consultant. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative DCC Representative Consultant.

END OF SECTION

1 GENERAL**1.01 REFERENCE STANDARDS**

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.186-1996, High Performance Glazed Coating System, Interior.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.02 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, cleaning procedures.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate 400 x 200mm samples of each colour and finish coating applied to smooth hardboard.
- .4 Closeout Submittals:
 - .1 Provide maintenance data for coatings for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.03 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .1 Deliver and store materials in manner to prevent damage.
 - .2 Ensure materials remain in original wrapping and containers until used.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

1.04 SITE CONDITIONS

- .1 Safety:
 - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.
 - .2 Ensure no open flame heating devices are used.
 - .3 Discourage occupancy of treated space until volatile materials are no longer being emitted and there is no odour.
 - .4 Provide adequate respiratory protection to exposed individuals.
- .2 Ventilation:
 - .1 Provide ventilation continuously during and after coating application. Run

system 24 hours per day during application; provide continuous ventilation for 7 days after completion of application.

- .3 Temperature:
 - .1 Do not apply emulsion systems unless uniform minimum 10 degrees C air temperature at installation area for 24 hours prior to and after application.
 - .2 Maintain minimum temperature 10 degrees C within area of installation until final acceptance of building.

2 PRODUCTS

2.01 MATERIALS

- .1 Interior high build glazed coating materials: to CAN/CGSB-1.186 in colour selected by Departmental Representative.
 - .1 Maximum VOC limit 100 g/L to SCAQMD Rule 1113.
- .2 Filler coat: cementitious non-cementitious type.
 - .1 Maximum VOC limit 100 g/L to SCAQMD Rule 1113.
- .3 Glaze coat: clear pigmented, matte semi-gloss high gloss finish.
 - .1 Maximum VOC limit 100 g/L to SCAQMD Rule 1113.

2.02 MIXES

- .1 Mix coatings according to manufacturer's instructions.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

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

3.02 PREPARATION

- .1 Prepare surfaces in accordance with CAN/CGSB-1.186 and coating material manufacturer's instructions.
- .2 Mask surrounding surfaces to provide neat, clean juncture lines.
- .3 Protect adjacent surfaces and equipment from damage by overspray.

3.03 APPLICATION

- .1 Apply coating to produce smooth surface, uniform in sheen, colour and finish, free from marks, dirt, particles, runs, crawls, curling, holes, air pockets and other defects and to achieve smoothness index in accordance with CAN/CGSB-1.186. Total dry film thickness 6 mm.

- .2 Apply filler coats to porous surfaces.
- .3 Apply base by brush or spray coat in one two coats.
- .4 Apply intermediate coat to provide spotted embossed spotted veiling tone on tone decorative effect.
- .5 Apply top glaze coat.

3.04 FIELD QUALITY CONTROL

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

3.05 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
 - .1 Clean surfaces to coating manufacturer's printed instructions.

END OF SECTION