

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C475/C475M-15, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C557-03 (2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .3 ASTM C645-14, Non-Structural Steel Framing Members.
 - .4 ASTM C754-15, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - .5 ASTM C840-13, Standard Specification for Application and Finishing of Gypsum Board.
 - .6 ASTM C954-11, 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.
 - .7 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.
 - .8 ASTM C1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .9 ASTM C1396/C1396M-06a, Standard Specification for Gypsum Wallboard.
- .2 Expanded Metal Mesh Association (EMMA)
 - .1 EMMA 557-15, Standards for Expanded Metal.
- .3 Gypsum Association (GA)
 - .1 GA-214-15, Recommended Levels of Finish for Gypsum Board, Glass Mat, and Fiber-Reinforced Gypsum Panels.
 - .2 GA-216-13, Application and Finishing of Gypsum Panel Products.
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S102-07, Standard Method of Fire Endurance Tests of Building Construction and Materials.

1.2 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; include product characteristics, performance criteria, physical size, finish, and limitations.

1.3 REGULATORY REQUIREMENTS

- .1 Conform to applicable code for fire rated assemblies in conjunction with Section 09 22 16 as follows:
 - .1 Fire resistance classifications to CAN/ULC S102.
 - .2 Fire rated Design Assembly No. as listed on Drawings.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Deliver materials to site in original packaging, labelled with manufacturer's name and identification.
- .3 Storage and Handling Requirements:
 - .1 Store gypsum board assemblies materials level off ground and indoors 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 from weather, elements and damage from construction operations.
 - .4 Handle gypsum boards to prevent damage to edges, ends or surfaces.
 - .5 Replace defective or damaged materials with new.

1.5 AMBIENT CONDITIONS

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

Part 2 Products

2.1 MATERIALS

- .1 Standard gypsum board: ASTM C1396/C1396M, Type X, thickness as shown on Drawings, 1200 mm wide x maximum practical length, ends square cut, edges square or bevelled.
- .2 Carrying Channels: Cold rolled steel to ASTM C645, galvanized.
- .3 Tie Wire: To ASTM C754.
- .4 Hangers: To ASTM C754, galvanized.
- .5 Steel drill screws: ASTM C1002.
- .6 Stud adhesive: ASTM C557.

- .7 Laminating compound: As recommended by manufacturer, asbestos-free.
- .8 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process, [0.5] mm base thickness, perforated flanges, one piece length per location.
- .9 Sealants: In accordance with Section 07 92 00 - Joint Sealants.
 - .1 Acoustic sealant: In accordance with Section 07 92 00 - Joint Sealants.
- .10 Joint tape: ASTM C475, 52 mm wide fibre paper tape.
- .11 Joint compound: ASTM C475, asbestos-free.

2.2 FRAMING MATERIALS

- .1 Studs and Tracks: As specified in Section 09 22 16.
- .2 Furring, framing, and accessories: ASTM C645.
- .3 Anchorage to substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application, and to rigidly secure materials in place.
 - .1 Tie wire: To ASTM C754.
 - .2 Hangers: To ASTM C754, galvanized.

2.3 STEEL MESH

- .1 To EMMA 557, flattened stainless steel mesh, style ¾-9F:
 - .1 Strand thickness: 3.05 mm (0.120 inch).
 - .2 Strand width: 4.2 mm (0.165 inch).
 - .3 Diamond opening: 14.3 x 42.9 mm (0.563 x 1.688 inch).
 - .4 Attachment: 4.8 mm (3/16 inch) steel pop rivets with 38 mm OD x 4.8 mm ID (1-1/2 inch OD x 3/16 inch ID) stainless steel fender washers, installed at 200 mm on centre.
 - .1 Screws are not acceptable for permanent attachment of security mesh.

2.4 FINISHES

- .1 Texture finish: Asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify conditions of substrates are acceptable for installation of gypsum board assemblies in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 ERECTION

- .1 Apply and finish gypsum board to ASTM C840 or GA-216 except where specified otherwise.
- .2 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, and other items.
- .3 Install furring channels parallel to, and at exact locations of, steel stud partition header track.
- .4 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .5 Furr above suspended ceilings for gypsum board fire and sound stops, and to form plenum areas as indicated.
- .6 Install wall furring for gypsum board wall finishes to ASTM C840, except where specified otherwise.
- .7 Install furring as required for fire resistance ratings indicated.
- .8 Furr openings and around built-in equipment, cabinets, and access panels on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .9 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .10 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 drywall screws.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical work, and mechanical work have been approved.
- .2 Apply single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- .3 Install fire rated gypsum board in accordance with applicable ULC design number.
- .4 Apply board using screws and stud adhesive on furring or framing.
- .5 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.
- .6 Install gypsum board with face side out.
- .7 Do not install damaged or damp boards.
- .8 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 INSTALLATION - GENERAL

- .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.
- .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 frames, to provide thermal break.
- .5 Splice corners and intersections together and secure to each member with 3 screws.
- .6 Install access doors to electrical and mechanical fixtures as specified in their respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .7 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.
- .8 Place corner beads at external corners.
 - .1 Use longest practical length.
 - .2 Place edge trim where gypsum board abuts dissimilar materials [and as indicated].
- .9 Finish gypsum board walls and ceilings to following levels in accordance with GA-214:
 - .1 Levels of finish:
 - .1 Level 1: Concealed areas: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.
 - .2 Level 2: Ceramic tile substrates: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .3 Level 5: GWB to be painted: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .10 Finish corner beads and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .11 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.

- .12 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .13 Completed installation is to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .14 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .15 Mix joint compound slightly thinner than for joint taping.
- .16 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
- .17 Allow skim coat to dry completely.
- .18 Remove ridges by light sanding or wiping with damp cloth.

3.5 ACOUSTIC ACCESSORIES INSTALLATION

- .1 Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
- .2 Apply two 12 mm beads of acoustic sealant to bottoms of floor tracks and tops of ceiling tracks.
- .3 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning, to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes and ducts in partitions where perimeter sealed with acoustic sealant.

3.6 STEEL MESH INSTALLATION

- .1 Install mesh on 'attack' side of room.
- .2 Support edges with anti-spread bracing, studs, or corners.
- .3 Align sheet edges at all vertical and horizontal seams on centre line of steel stud or anti-spread bracing. Secure sheets with specified rivets installed at 200 mm on centre.

3.7 TOLERANCES

- .1 Maximum variation of finished gypsum board surface from true flatness: 3 mm in 3 m, in any direction.

3.8 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: Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.9 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C645-14, Standard Specification for Nonstructural Steel Framing Members.
 - .2 ASTM C754-11, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.181-99, Ready-Mixed Zinc-Rich Coating.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 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. Include product characteristics, performance criteria, physical size, finish and limitations.

1.3 QUALITY ASSURANCE

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

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 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 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.

Part 2 Products

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: To ASTM C645, stud size as shown on drawings, roll formed from hot dipped galvanized steel sheet, for screw attachment of gypsum board.
 - .1 Base steel thickness unless otherwise indicated in drawings:
 - .1 General wall construction: Minimum 0.46 mm (25 gauge).
 - .2 Single studs at jambs: Minimum 0.91 mm (20 gauge).
 - .2 Knock-out service holes at 460 mm centres.
 - .3 Floor and ceiling tracks: In widths to suit stud sizes, 32 mm flange height.
- .2 Acoustical sealant: In accordance with Section 07 92 00 - Joint Sealants.
- .3 Touch-up primer for galvanized surfaces: CAN/CGSB 1.181.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify that conditions of substrate are acceptable for non-structural metal framing application in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 ERECTION

- .1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 400 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.
- .4 Erect metal studding to tolerance of 1:1000.
- .5 Attach studs to bottom track using screws.
- .6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.
- .8 Install heavy gauge single jamb studs at openings.

- .9 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.
- .10 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .11 Provide blocking, as specified in Section 06 10 00 – Rough Carpentry, secured between studs for attachment of items attached to steel stud partitions.
- .12 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .13 Extend partitions to ceiling height except where noted otherwise on drawings.
- .14 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
 - .1 Use double track slip joint.
- .15 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.3 CLEANING

- .1 Progress Cleaning: Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Leave Work area clean at end of each day.
- .3 Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .4 Waste Management: Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.4 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A137.1-2012, American National Standard Specifications for Ceramic Tile.
 - .2 ANSI A137.2-2013, American National Standard Specifications for Glass Tile.
- .2 ASTM International
 - .1 ASTM C979/C979M-10, Standard Specification for Pigments for Integrally Coloured Concrete.
- .3 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 Tile Specification Guide 09 30 00, Tile Installation Manual 2016-2017.

1.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data:
 - .1 Include manufacturer's information on:
 - .1 Glass tile, marked to show type, size, and shape required.
 - .2 Finishing strip.
 - .3 Bond coat.
 - .4 Latex cement mortar and grout.
- .3 Samples:
 - .1 Wall tile: Submit duplicate, full-sized samples of colour, texture, size, and pattern of tile proposed for installation.

1.3 QUALITY ASSURANCE

- .1 Conform to TTMAC Tile Installation Manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal: Remove waste material in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12°C for 48 hours before, during, and 48 hours after, installation.

- .2 Do not install tiles at temperatures less than 12°C or above 38°C.

1.6 MAINTENANCE

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

Part 2 Products

2.1 WALL TILE

- .1 Glass tile: To ANSI A137.2.
 - .1 Dimensions: Nominal 100 x 400 mm x 8 mm thick.
 - .2 MR rating 1 – impervious.
 - .3 Colour: Light grey-brown striated back-applied pattern.
 - .1 Confirm selection with Departmental Representative.

2.2 SURFACE PREPARATION MATERIALS

- .1 Primer: Low VOC, low viscosity primer as recommended by manufacturer to suit substrate and site conditions; provide proof of bonding ability of setting system where manufacturer recommends that primer is not necessary to installation.

2.3 BOND COAT

- .1 Glass tile mortar:
 - .1 Thin set interior installation: Polymer modified mortar, non-sag, bright white, unsanded, meeting shear bond strength requirements of ANSI A118.4.

2.4 GROUT

- .1 To ANSI A118.6 and ANSI A118.7, premium polymer-modified Portland cement-based grout, sanded, mould and mildew resistant.
 - .1 Flexural strength, 7 day: Minimum 6.9 MPa.
 - .2 Compressive strength: Minimum 20.7 MPa.
 - .3 Shrinkage, 7 day: Maximum 0.2%.
- .2 Colouring Pigments:
 - .1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.
 - .2 Colouring pigments to be added to grout by manufacturer.
 - .3 Job coloured grouts are not acceptable.

2.5 ACCESSORIES

- .1 Finishing profile strips: Extruded Type 304 brushed stainless steel, profile with square visible surface, integrated perforated anchoring leg, and integrated grout joint spacer; brushed finish.
- .2 Sealant: In accordance with Section 07 92 00 - Joint Sealants.

2.6 CLEANING COMPOUNDS

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

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 WORKMANSHIP

- .1 Perform tile work in accordance with TTMAC Tile Installation Manual, except where specified otherwise.
- .2 Apply tile to clean and sound surfaces.
- .3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .4 Maximum surface tolerance 1:800.
- .5 Knock down trowel ridges and back butter glass tile to ensure ridges are not visible through installed tile.
- .6 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .7 Remove excess mortar from tile joint areas so at least 2/3 of the tile depth remains for grouting.
- .8 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .9 Sound tiles after setting and replace hollow-sounding units to obtain full bond.
- .10 Install divider strips at junction of tile flooring and dissimilar materials.
- .11 Allow minimum 24 hours after installation of tiles, before grouting.
- .12 Clean installed tile surfaces after installation and grouting cured.

3.3 WALL TILE

- .1 Install in accordance with TTMAC detail 304W.

3.4 FLOOR SEALER AND PROTECTIVE COATING

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

3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

THIS SECTION IS PROVIDED FOR REFERENCE ONLY

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM A641/A641M-09a (2014) – Standard Specification for Zinc-Coated/Galvanized Carbon Steel Wire.
 - .2 ASTM C423-09a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .3 ASTM C635/C635M-13a, Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .4 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - .5 ASTM E1264-14, Standard Classification for Acoustical Ceiling Products.
 - .6 ASTM E1414/E1414M-11ae1 - Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
 - .7 ASTM E1477-98a (2013) - Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
 - .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Canadian Standards Association (CSA)
 - .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
- .4 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC S102-07, Surface Burning Characteristics of Building Materials and Assemblies.

1.2 SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications, and data sheets.

- .2 Submit WHMIS MSDS for products used on project.
- .3 Samples:
 - .1 Samples: Submit duplicate manufacturer samples illustrating material and finish of acoustic units.
 - .2 Samples: Submit duplicate samples of suspension system, 150 mm (6 inches) long.
- .4 Installation Data: Provide manufacturer's special installation requirements.
- .5 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Extra Stock Materials:
 - .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project.
 - .3 Ensure extra materials are from same production run as installed materials.
 - .4 Clearly identify each type of acoustic unit, including colour and texture.
 - .5 Deliver to Departmental Representative, upon completion of the work of this section.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver acoustical ceiling units to project site in unopened manufacturer's packaging. Store in enclosed space and protect from damage.
- .2 Protect on-site stored or installed absorptive material from moisture damage.
- .3 Store extra materials required for maintenance, where directed by Departmental Representative.

1.5 ENVIRONMENTAL REQUIREMENTS

- .1 Permit wet work to dry before beginning installation.
- .2 Maintain uniform minimum temperature of 15°C and relative humidity of 20% before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

Part 2 Products

2.1 MATERIALS

- .1 Acoustic Ceiling Tile Suspension System:
 - .1 Non-fire Rated Grid: ASTM C635/C635M, intermediate duty cold rolled steel with hot dipped galvanized coating; components die cut and interlocking.
 - .2 Fire Rated Grid: ASTM C635/C635M, intermediate duty cold rolled steel with hot dipped galvanized coating; listed by ULC/UL for use in fire-rated assembly; components die cut and interlocking.
 - .3 Grid Materials: Commercial quality cold rolled steel with galvanized coating.
 - .4 Edge Profile: 24 mm (15/16 inch) exposed 'T' for square lay-in tiles.
 - .5 Grid Finish: Painted white.
- .2 ACT-1: Acoustic units to CAN/CGSB 92.1 and ASTM E1264, Type IV, Form 2, Pattern E.
 - .1 Composition: Wet-formed mineral fibre with acoustically transparent membrane. Fire Class A.
 - .3 Texture: Smooth.
 - .4 Fire ratings to CAN/ULC S102:
 - .1 Flame spread: Maximum 25.
 - .2 Smoke developed: Maximum 50.
 - .5 Noise Reduction Coefficient (NRC) to ASTM C423: Minimum 0.85.
 - .6 Ceiling Attenuation Class (CAC): Minimum 35.
 - .7 Articulation class: 170.
 - .8 Light Reflectance (LR) range to ASTM E1477: 0.86.
 - .9 Edge type: Square lay-in.
 - .10 Colour: White.
 - .11 Size: 610 x 610 mm (24 x 24 inches).
 - .12 Thickness: Nominal 25 mm (1 inch).
- .3 Attachment devices: Size for five times design load indicated in ASTM C635/C635M, Table 1, Direct Hung, unless otherwise indicated.
- .4 Wire for hangers and ties: To ASTM A641/A641M, Class 1 zinc coating, soft annealed, with yield stress load at least 3 times design load, but not less than 12 gauge.
- .5 Staples, nails, and screws: To CSA B111, non-corrosive finish as recommended by acoustic unit manufacturer.
- .6 Hold down clips: Purpose made clips to secure tile to suspension system, approved for use in fire-rated systems.
- .7 Adhesive: Low VOC type recommended by acoustic unit manufacturer.
- .8 Touch-Up Paint: Type and colour to match acoustic and grid units.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify conditions of substrates are acceptable for acoustical ceiling tile and track installation in accordance with manufacturer's written instructions.
- .2 Ensure following work is completed before installation of ceilings begins.
 - .1 Plastering, gypsum board finishing, and painting: completed and dry.
 - .2 Mechanical, electrical, other work above ceiling: completed.
 - .3 Heating, ventilating and air-conditioning systems: installed and operating.
 - .4 Layout light fixture and sprinkler head penetrations at centre of panel width.
 - .5 Plan HVAC inlets and outlets to occur within centre of panel system or provide for equal distance on each side parallel to length of panels.
- .3 Do not install acoustical panels and tiles until work above ceiling has been reviewed by Departmental Representative.
- .4 Verify layout of hangers will not interfere with other work.
- .5 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans.

3.2 INSTALLATION

- .1 Manufacturer's Instructions: Comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.
- .3 Installation: To ASTM C636/C636M except where specified otherwise.
- .4 In fire-rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.
- .5 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers. Provide additional suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of each light fixtures and diffusers.
- .6 Finished ceiling system to be square with adjoining walls and level within 1:1000.
- .7 Expansion joints: As recommended by manufacturer.
- .8 Install acoustical units as indicated in reflected ceiling plan.
- .9 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.
- .10 Site finish cut tile edges with touch-up paint.

3.3 APPLICATION

- .1 Install acoustic units to clean, dry and firm substrate.
- .2 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width. Refer to reflected ceiling plan.
- .3 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

3.4 INTERFACE WITH OTHER WORK

- .1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

3.5 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management and Disposal: Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.6 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute/Electrostatic Discharge Association (ANSI/ESD)
 - .1 ANSI/ESD 20.20-07, Protection of Electrical and Electronic Parts, Assemblies and Equipment.
 - .2 ANSI/ESD STM 97.1-2006, Standard Test Method for the Protection of Electrostatic Discharge Susceptible Items - Floor Materials and Footwear - Resistance Measurement in Combination with a Person.
 - .3 ANSI/ESD STM 97.2-2006, Floor Materials and Footwear Voltage Measurement in Combination with a Person.
- .2 ASTM International
 - .1 ASTM D2047-11, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
 - .2 ASTM D2240-05 (2010), Standard Test Method for Rubber Property - Durometer Hardness.
 - .3 ASTM D3389-10, Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader).
 - .4 ASTM E662-12, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - .5 ASTM E1155-14/E1155M-14, Standard Test Method for Determining Floor Flatness and Floor Levelness Numbers.
 - .6 ASTM F150-06 (2013), Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring.
 - .7 ASTM F970-07 (2011), Standard Test Method for Static Load Limit.
 - .8 ASTM F1066-04 (2014)e1, Standard Specification for Vinyl Composition Floor Tile.
 - .9 ASTM F1700-13a, Standard Specification for Solid Vinyl Floor Tile.
 - .10 ASTM F1861-08 (2012)e1 – Standard Specification for Resilient Wall Base.
 - .11 ASTM F1913-04 (2014), Standard Specification for Vinyl Sheet Floor Covering Without Backing.
- .3 Canadian Standards Association (CSA)
 - .1 CSA B651-12, Accessibility for the Built Environment.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 SUBMITTALS

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

- .1 Submit manufacturer's instructions, printed product literature and data sheets for tile adhesive, subfloor patching compound. Include product characteristics, performance criteria, physical size, finish, and limitations.
- .2 Submit 2 copies of WHMIS MSDS for products to be installed.
- .3 Samples:
 - .1 Submit duplicate sample resilient vinyl tiles, full size, in proposed colours and patterns.
 - .2 Submit duplicate manufacturer's samples of sheet vinyl material, in proposed colours and patterns.
 - .3 Submit duplicate manufacturer's samples of base, demonstrating profiles.
 - .4 Submit duplicate manufacturer's samples of transition strip in proposed colours and finish.
- .4 Shop Drawings: Indicate:
 - .1 Seam layout.
 - .2 Cut-outs: Show locations where cut-outs are required.
- .5 Closeout Submittals:
 - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .1 Indicate required floor polish for static dissipative vinyl tile.

1.3 DELIVERY, STORAGE, AND HANDLING

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

1.4 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at flooring installation area above 20°C for 48 hours before, during, and 48 hours after installation.

1.5 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide extra materials of resilient sheet flooring in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide 15 m² of each colour, pattern and type flooring material required for project for maintenance use.
 - .3 Extra sheet materials in one piece and from same production run as installed materials.
 - .4 Identify each roll of sheet flooring.
 - .5 Deliver to Departmental Representative, upon completion of the work of this section.
 - .6 Store where directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Sheet vinyl: To ASTM F1913, homogeneous single-layered vinyl sheet, polyurethane reinforced to ASTM F410.
 - .1 Thickness: 2.0 mm.
 - .2 Static load limit to ASTM F970: Minimum 250 psi.
 - .3 Slip resistance to ASTM D2047: Minimum 0.6.
 - .4 Flame spread to ASTM E662: Class I.
 - .5 Smoke evolved to ASTM E662: 450 or less.
 - .6 Pattern and colour: As selected by Departmental Representative.
- .2 Static dissipative vinyl tile: To ASTM F150, and ASTM F1700 or ASTM F1066 Class 2, vinyl composition tile.
 - .1 Wear layer thickness: Minimum 3.2 mm.
 - .2 Total thickness: Minimum 3.2 mm.
 - .3 Slip resistance to ASTM D2047: Accessibility compliant.
 - .4 Static generation to ANSI ESD STM 97.2: Maximum 10 V at 12% RH with dissipative footwear.
 - .5 Accessories:
 - .1 Copper grounding strips, as recommended by tile manufacturer.
 - .2 Adhesive: Conductive, as recommended by tile manufacturer.
 - .3 Polish: Static dissipative, as recommended by tile manufacturer.
 - .6 Colour and pattern: As selected by Departmental Representative.
- .3 Resilient base: Continuous, top set, complete with premoulded end stops and external corners:
 - .1 Type: Rubber.
 - .2 Thickness: 3.2 mm.
 - .3 Height: 101.6 mm.
 - .4 Lengths: Cut lengths minimum 2400 mm.
 - .5 Profile:
 - .1 Cove with toe: For resilient floor.
 - .2 Straight (toeless): For carpeted floor.
 - .6 Colour: As selected by Departmental Representative.
- .4 Transition Mouldings: PVC.
 - .1 Hardness to ASTM D2240: Minimum 85 Shore A.
 - .2 Abrasion resistance to ASTM D3389: 0.22 mg/cycle.
 - .3 Slip resistance to ASTM D2047: ≥ 0.6 .
 - .4 Comply with accessibility requirements of CSA B651 for changes in level:
 - .1 0 to 6 mm vertical rise: Vertical transition strip permitted.

- .2 7 to 13 mm vertical rise: Bevelled transition, not to exceed 1:2 ratio for rise:run.
- .3 Over 13 mm vertical rise: Bevelled transition, not to exceed 1:12 ratio for rise:run.
- .5 Colour: To match resilient rubber base.
- .6 Carpet-to-Vinyl transition strips: Height to be determined from flooring materials.
 - .1 Exposed width: 16 mm (5/8 inch).
- .7 Carpet-to-unfinished floor reducer strips: To reduce from 6 mm (1/4 inch) height to 0 (zero) height.
- .5 Cove filler strip: PVC with additives and colourants, 32 mm (1-1/4 inch) radius.
- .6 Cove cap moulding: PVC with additives and colourants, rounded profile, for 2 mm coved sheet material, cap extends 7.5 mm over cove surface.
- .7 Primers and adhesives: Types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
- .8 Sub-floor filler and leveller: Self-levelling cementitious compound capable of bonding to properly prepared substrate surfaces.
 - .1 Compressive strength: Minimum 36.5 MPa (5300 psi) at 28 days.
 - .2 Capable of being walked on without damage after 3 hours.
 - .3 Capable of being coated after 24 hours at 21°C.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

- .1 Verify conditions of substrates are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate.
 - .2 Inform Departmental Representative of unacceptable conditions.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.
- .3 Confirm flatness of substrate by measurements taken in accordance with ASTM E1155/E1155M.
 - .1 Composite flatness (F_F): Minimum 36.
 - .2 Composite levelness (F_L): Minimum 20.

3.3 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 concrete slab to resilient flooring manufacturer's printed instructions.

3.4 APPLICATION: FLOORING

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel. 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 heat weld according to manufacturer's printed instructions.
- .5 As installation progresses, and after installation, roll flooring with 45 kg minimum roller to ensure full adhesion.
- .6 Cut flooring around fixed objects.
- .7 Install flooring in pan type floor access covers. Maintain floor pattern.
- .8 Continue flooring over areas that will be under built-in furniture.
- .9 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .10 Terminate flooring at centreline 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.
- .12 Coved base: Turn up flooring to form base. Back floor and wall junction with cove filler strip. Adhere cap strip to terminate base.
 - .1 Install coved base top cap level and straight.
 - .2 Inside corners: Cut away excess material to achieve net fit, and heat weld seam formed from cutting.
 - .3 Outside corners: Form corner with a butterfly piece, heat welded into place.

3.5 APPLICATION: BASE

- .1 Clean substrate.
- .2 Install preformed corners before installing straight pieces.
- .3 Use preformed corner units for corners.
- .4 Install resilient base in lengths as long as practicable, without gaps at seams, and with tops of adjacent pieces aligned.
- .5 Do not stretch resilient base during installation.
- .6 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .7 Install base straight and level, with base in continuous contact with horizontal and vertical substrates.
- .8 Scribe and fit to door frames and other obstructions. Use pre-moulded end pieces at flush door frames.

3.6 APPLICATION: TRANSITION STRIPS

- .1 Clean substrate.
- .2 Install strips with manufacturer's recommended adhesive.

3.7 CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management and Disposal: Remove waste material in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .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 printed instructions.

3.8 PROTECTION

- .1 Prohibit traffic on floor for 48 hours after installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Association of Textile Chemists and Colorists (AATCC)
 - .1 AATCC Test Method 134-2011, Electrostatic Propensity of Carpets.
- .2 ASTM International
 - .1 ATSM D5252-15, Standard Practice for the Operation of the Hexapod Tumble Drum Tester.
 - .2 ASTM E1155/E1155M-14, Standard Test Method for Determining Floor Flatness and Floor Levelness Numbers.
 - .3 ASTM F2170-11, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 4.129-93, Carpets for Commercial Use.
 - .2 CAN/CGSB 4.2 No. 76-94/ISO 2551:1981, IDT (R2013), Textile Test Methods - Machine-Made Textile Floor Coverings - Determination of Dimensional Changes Due to the Effects of Varied Water and Heat Conditions.
 - .3 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 2011.
 - .2 CRI Green Label Plus Indoor Air Quality Testing Program.
- .5 National Floor Covering Association of Canada (NFCA)
 - .1 Floor Covering Reference Manual, latest edition.
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S102.2-10, Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

1.2 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 and subfloor patching compound; include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit WHMIS MSDS.
- .3 Shop Drawings: Indicate:

- .1 Tile installation orientation.
- .2 Cut-outs: Show locations where cut-outs are required.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Submit duplicate samples of each type of carpet tile specified and duplicate tiles for each colour selected.
- .5 Certificates: Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .6 Manufacturer's Instructions: Submit manufacturer's installation and storage instructions.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Maintenance Data: Submit maintenance data for installed products for incorporation into O&M manual.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra stock materials: Deliver extra materials to Departmental Representative from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
 - .1 Quantity: Provide minimum 3% of gross installed area of carpet tile.

1.5 QUALITY ASSURANCE

- .1 Use material from same dye lot.

1.6 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 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 protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
 - .3 Store and protect carpet tile in original containers or wrapping with manufacturer's seals and labels intact.
 - .4 Store and protect carpet tile and accessories in location as directed by Departmental Representative.

- .5 Store carpet and adhesive at minimum temperature of 18°C and relative humidity of maximum 65% for minimum 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.

1.7 SITE 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°C from 48 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 48 hours after installation.
- .4 Install carpet after space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

Part 2 Products

2.1 PERFORMANCE

- .1 Pile Surface Appearance: Tufted loop.
- .2 Pile fibre: Nylon.
- .3 Colour and pattern: As selected by Departmental Representative.
- .4 Dyeing method: 100% solution dyed.
- .5 Primary backing: Non-woven synthetic.
- .6 Secondary backing: Thermoplastic polyolefin with fiberglass reinforcement.
- .7 Pile weight: Minimum 712 g/m².
- .8 Machine gauge: 50.4 rows/10 cm.
- .9 Density: Minimum 10.8 kilotex/cm².
- .10 Stitch count: 39.4 stitches/10 cm.
- .11 Pile height: Average 4.7 mm.
- .12 Modification ratio: Maximum 2.2.
- .13 Static control: 0.9 kV to AATCC 134.
- .14 Air quality: To CCI/CRI Green Label Plus requirements.
- .15 Tile size: 610 x 610 mm (24 x 24 inches).
- .16 Colour and pattern: Monochromatic grey/black.

- .1 Pattern type: Geometric.
- .2 Pattern scale: Medium.
- .17 Stain resistance: Manufacturer's standard treatment.
- .18 Installation pattern: Vertical ashlar.

2.2 ACCESSORIES

- .1 Resilient Base: Refer to Section 09 65 16 – Resilient Flooring.
- .2 Adhesive film tabs: Polyethylene film tabs with pressure sensitive adhesive, as recommended by carpet manufacturer.
- .3 Sub-floor filler and leveller: Self-levelling cementitious compound capable of bonding to properly prepared substrate surfaces.
 - .1 Compressive strength: Minimum 20.6 MPa (3000 psi) at 28 days.
 - .2 Capable of being walked on without damage after 3 hours.
 - .3 Capable of being coated after 24 hours at 21°C.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify conditions of substrates are acceptable for carpet tile installation in accordance with adhesive manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions.
 - .2 Proceed with installation only after unacceptable conditions have been remedied.
- .2 Confirm flatness of substrate by measurements taken in accordance with ASTM E1155/E1155M.
 - .1 Composite flatness (F_F): Minimum 25.
 - .2 Composite levelness (F_L): Minimum 20.
- .3 Moisture requirements:
 - .1 Relative humidity to ASTM F2170: < 95%.
- .4 pH requirements: pH range 5.0 to 12.0, checked at several locations on substrate.

3.2 PREPARATION

- .1 Subfloor Preparation:
 - .1 Inspect concrete and determine special care required to make it a suitable for carpet.
 - .2 Fill and level cracks 3 mm wide or protrusions over 0.8 mm with appropriate and compatible patching compound.
 - .3 Comply with manufacturer's written recommendations for maximum patch thickness.

- .4 Prime large patch areas with compatible primer.
- .5 Ensure concrete substrates are cured, clean, and dry.
- .6 Ensure concrete substrates are free of paint, dirt, grease, oil, curing or parting agents, and other contaminants, including sealers, that interfere with the bonding of adhesive.
- .7 Where powdery or porous concrete surface is encountered, apply primer compatible with adhesive to provide a suitable surface for glue-down installation.
- .2 Surface Preparation: Prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Section 01 71 00 - Examination and Preparation.
 - .1 Prepare floor surfaces in accordance with CRI Carpet Installation Standard.
- .3 Tile Carpeting Preparation:
 - .1 Pre-condition carpeting following manufacturer's written instructions.

3.3 INSTALLATION

- .1 Install carpet tiles in accordance with manufacturer's written instructions, and CRI Carpet Installation Standard and co-ordinate with Section 01 73 00 - Execution.
- .2 Co-ordinate tile carpeting work with work of other trades, for proper time and sequence to avoid construction delays.
- .3 Install carpet tile after finishing work is completed but before demountable office partitions and telephone and electrical pedestal outlets are installed.
- .4 Snugly join carpet tiles in completed installation.
 - .1 Measure distance covered by 11 carpet tiles (10 joints) and ensure distance complies with manufacturer specifications.
 - .2 Do not trap yarn between carpet tiles.
- .5 Ensure finished installation presents smooth wearing surface free from conspicuous seams, burring and other faults.
- .6 Ensure colour, pattern and texture match within visual areas.
- .7 Maintain constant pile direction.
- .8 Scribe tiles around architectural, mechanical, electrical, and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.
- .9 Extend carpet tiles into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .10 Install carpet tiles smooth and free from bubbles, puckers, and other defects.
- .11 Protect exposed carpet tile edges at transition to other flooring materials with suitable transition strips.

3.4 CLEANING

- .1 Progress Cleaning: Clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Vacuum carpets clean immediately after completion of installation, using commercial machine with face-beater element.
- .2 Waste Management: Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.5 PROTECTION

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

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C423-09a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - .2 ASTM C612-04, Mineral Fibre Block and Board Thermal Insulation.
 - .3 ASTM C665-12, Mineral-Fibre Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - .4 ASTM E90-04, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .5 ASTM E413-04, Classification for Rating Sound Insulation.
- .2 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC S102-07, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC S114-05, Test for Determination of Non-Combustibility in Building Materials.
 - .3 CAN/ULC S129-06, Standard Method of Test for Smoulder Resistance of Insulation (Basket Method).
 - .4 CAN/ULC S702-09, Standard for Mineral Fibre Thermal Insulation for Buildings.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheets.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets for products used in the Work.
- .3 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.3 QUALITY ASSURANCE

- .1 Health and Safety Requirements: Perform construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials in manufacturer's original containers clearly labeled with manufacturer's name, product identification, safety information, net weight of contents and expiration date.
- .2 Store material in a safe manner and where the temperatures are within range specified by manufacturer.
- .3 Remove empty containers from site daily.
- .4 Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.6 PROJECT CONDITIONS

- .1 Maintain environmental conditions of temperature, humidity, and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- .2 Ventilate area to receive insulation to maintain safe working conditions.
- .3 Protect workers as recommended by standards and manufacturer's recommendations.

Part 2 Products

2.1 BATT INSULATION

- .1 Acoustic batt insulation: To CAN/ULC S702, Type 1; non-combustible to CAN/ULC S114, lightweight, semi-rigid stone wool batt insulation.
 - .1 Surface burning characteristics to CAN/ULC S102:
 - .1 Flame spread: 0.
 - .2 Smoke developed: 0.
 - .2 Smoulder resistance: 0.09% to CAN/ULC S129.
 - .3 Density: To ASTM C612, 45 kg/m³.
 - .4 Corrosive resistance: To ASTM C665, corrosive to steel – Pass.
 - .5 Airborne sound transmission loss: To ASTM E90.
 - .6 Rating sound insulation: To ASTM E413.

.7 Sound absorption coefficients: To ASTM C423:

Thickness (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
25	0.14	0.25	0.65	0.90	1.01	1.01	0.70
38	0.18	0.44	0.94	1.04	1.02	1.03	0.85
50	0.28	0.60	1.09	1.09	1.05	1.07	0.95
76	0.52	0.96	1.18	1.07	1.05	1.05	1.05
102	0.86	1.11	1.20	1.07	1.08	1.07	1.10

2.2 PLENUM BARRIER

- .1 Plenum barrier insulation: Semi-rigid mineral wool insulation board to ASTM C612, Type IVA compliant; 38 mm (1-1/2 inch) thick.

- .1 Surface burning characteristics to CAN/ULC S102:

- .1 Flame spread: 0.
.2 Smoke developed: 0.

- .2 Density: To ASTM C612, minimum 128 kg/m³.

- .3 Corrosive resistance: To ASTM C665, corrosive to steel – Pass.

- .4 Sound absorption coefficients: To ASTM C423:

Thickness (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	NRC
25	0.07	0.32	0.77	1.04	1.05	1.05	0.8
38	0.18	0.48	0.96	1.09	1.05	1.05	0.9
50	0.26	0.68	1.12	1.1	1.03	1.04	1
76	0.63	0.95	1.14	1.01	1.03	1.04	1.05
102	1.03	1.07	1.12	1.04	1.07	1.08	1.1

- .2 Metal mounting track for plenum barrier: Roll-formed hot-dipped galvanized steel, minimum 0.455 mm (25 gauge) thickness, 41 mm (1-5/8 inch) width.
.3 Metal tape: Aluminum foil tape, self-adhering.
.4 Gasket: Polyethylene foam, 6 mm thick uncompressed.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 GENERAL

- .1 Install insulation after building substrate materials are dry.
- .2 Install insulation to maintain continuity of sound absorption between partitioned spaces.
- .3 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around doors and windows and other protrusions.
- .4 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
- .5 Offset both vertical and horizontal joints in multiple layer applications.
- .6 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

3.3 EXAMINATION

- .1 Examine substrates and immediately inform Departmental Representative in writing of defects.
- .2 Verify substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.
- .3 Verify acoustic and firestop sealants required at stud framing junctions with adjacent building components or at mechanical and electrical conduit and duct penetrations are installed.
- .4 Confirm mechanical, electrical, and telecommunications service lines in walls and ceilings to be insulated have been inspected.

3.4 BATT INSULATION INSTALLATION

- .1 Install acoustic insulation where indicated to maintain sound attenuation of separation in building elements and spaces.
- .2 Place acoustic blankets between studs ensuring friction fit, free of sags, folds, voids, or open joints that may let sound pass through.
- .3 Do not compress insulation excessively to fit voids.
- .4 Fit insulation closely around electrical boxes, pipes, ducts, frames, and other objects in or passing through insulation.

3.5 PLENUM BARRIER INSTALLATION

- .1 Install tracks to substrates, with foam gasket between tracks and substrate.
- .2 Mechanically attach mineral wool board to top and bottom mounting tracks with screws.
- .3 Tape vertical seams with foil tape.

3.6 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

- .2 Repair damage to adjacent materials caused by insulation installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .2 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual, 2014.
 - .2 MPI Maintenance Repainting Manual, 2015.
- .4 National Fire Code of Canada 2015.
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.2 SCHEDULING

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

1.3 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit product data and instructions for each paint and coating product to be used.
 - .2 Submit product data for the use and application of paint thinner.
 - .3 Submit Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS). Indicate VOCs during application.
- .3 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:
 - .1 3 mm plate steel for finishes over metal surfaces.

- .2 13 mm birch plywood for finishes over wood surfaces.
- .3 10 mm hardboard for finishes over wood surfaces.
- .4 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
- .5 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
- .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .4 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .5 Manufacturer's Instructions:
 - .1 Submit manufacturer's application instructions.
- .6 Closeout Submittals: Submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 MPI Environmentally Friendly classification system rating.

1.4 MOCK-UPS

- .1 Mock-ups: Apply mock-ups of each paint system indicated, in each colour and finish selected, to verify preliminary selections made under sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Departmental Representative will select surfaces to represent surfaces and conditions for application of each paint system specified.
 - .1 Vertical and Horizontal Surfaces: Provide samples of at least 9 m² (100 ft².).
 - .2 Other Items: Departmental Representative will designate items or areas required.
 - .3 Apply mock-up samples after permanent lighting and other environmental services have been activated.
 - .4 Final approval of colour selections will be based on mock-ups.
 - .1 If preliminary colour selections are not approved, apply additional mock-ups of additional colours selected by Departmental Representative at no added cost to contract.
 - .5 Approved mock-up may remain as part of finished work.

1.5 MAINTENANCE

- .1 Extra Materials:

- .1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.
- .2 Quantity: provide one – 4 litre can of each type and colour of primer and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Delivery, storage and protection: comply with Departmental Representative requirements for delivery and storage of extra materials.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.
- .2 Acceptance at Site:
 - .1 Identify products and materials with labels indicating:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
 - .1 Provide and maintain dry, temperature controlled, secure storage.
 - .2 Store materials and supplies away from heat generating devices.
 - .3 Store materials and equipment in well-ventilated area within temperature range 7°C to 30°C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
 - .1 Provide one 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.
- .9 Waste Management and Disposal:

- .1 Remove waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
- .4 Ensure emptied containers are sealed and stored safely.
- .5 Unused paint materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.
- .6 Paint and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .7 Material that cannot be reused is to be treated as hazardous waste and disposed of in an appropriate manner.
- .8 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .9 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
 - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
 - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .10 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .11 Set aside and protect surplus and uncontaminated finish materials: Deliver to or arrange collection by Departmental Representative for maintenance use.

1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Provide continuous ventilation for seven days after completion of application of paint.
 - .2 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
 - .3 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.
- .4 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless with written approval by product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10°C.
 - .2 Substrate temperature is above 32°C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
 - .2 Perform painting work when maximum moisture content of the substrate is below:
 - .1 Allow new concrete and masonry to cure minimum of 28 days.
 - .2 15% for wood.
 - .3 12% for gypsum board.
 - .3 Test for moisture using calibrated electronic Moisture Meter.
 - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when 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.
- .4 Additional interior application requirements:
 - .1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.
 - .2 Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 MATERIALS

- .1 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 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .5 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.
- .6 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

- .1 Selection of colours from manufacturer's full range of colours.
- .2 Where specific products are available in restricted range of colours, selection based on limited range.
- .3 Second coat in three-coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour-tinting operations prior to delivery of paint to site. 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.

2.4 GLOSS/SHEEN RATINGS

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

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

2.5 INTERIOR PAINTING SYSTEMS

- .1 Galvanized metal: Doors and door frames.
- .1 INT 5.3M – High performance architectural latex, G5 finish.
- .1 Coat 1: Water based primer, MPI #134.
- .2 Coats 2 and 3: HIPAC latex, MPI #141.
- .2 Gypsum wallboard.
- .1 INT 9.2B - High performance architectural latex, G4 finish.
- .1 Coat 1: Latex primer/sealer, MPI #50.
- .2 Coats 2 and 3: HIPAC latex, MPI #140.
- .3 Electrical backboards.
- .1 INT 6.4PP – Fire retardant coating, pigmented, waterborne, MPI #64.
- .1 Apply in accordance with manufacturer's instructions. Apply to all six sides of plywood electrical backboards.

2.6 INTERIOR REPAINTING

- .1 Galvanized metal: High contact/high traffic areas (doors, frames).
- .1 RIN 5.3J – High performance architectural latex, G5 finish.
- .1 Coat 1: Touch-up, MPI #141.
- .2 Coats 2 and 3: HIPAC latex, MPI #141.
- .2 Gypsum wallboard.
- .1 RIN 9.2B – High performance architectural latex, G4 finish.
- .1 Coat 1: Touch-up, MPI #140.
- .2 Coats 2 and 3: HIPAC latex, MPI #140.

2.7 SPECIAL COATINGS

- .1 Dry-erase coating: Non-isocyanate based, to provide surface suitable for use of dry-erase markers.
- .1 Colour: Clear.
- .2 Fire rating to ASTM E84:
- .1 Flame spread index: 15.
- .2 Smoke developed index: 5.
- .3 Sag resistance to ASTM D4400 Method 6.5.6: 4.4.
- .4 Flow and leveling to ASTM D2801: 9.
- .5 Crack resistance to ASTM D522: 4%.

- .6 Finish/Gloss to ASTM D523 on dry wall board:
 - .1 At 20°: 63.4.
 - .2 At 60°: 82.3.
 - .3 At 85°: 96.1.
- .7 Scrub resistance to ASTM D2486: > 5000 cycles.
- .8 Stain removal/washability to ASTM D3450: 98.3%.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

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

3.3 EXAMINATION

- .1 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 Do not commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable.
- .4 Assess degree of surface deterioration for areas to be repainted, using MPI identifiers and assessment criteria indicated in MPI Repainting Manual. MPI DSD ratings and descriptions are as follows:

Condition	Description
DSD-0	Sound Surface (includes visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (indicating fading; gloss reduction, slight surface contamination, minor pin holes, scratches).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, and staining).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required).

- .5 Where an assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .6 Maximum moisture content as follows:
 - .1 Gypsum board, stucco, and plaster: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.4 PREPARATION

- .1 Protection:
 - .1 Protect existing building surfaces and adjacent structures from paint splatters, 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:
 - .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 be 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.
 - .2 Wash surfaces with a biodegradable detergent and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and allow to dry thoroughly.
 - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

- .6 Use trigger operated spray nozzles for water hoses.
- .7 Many water-based paints cannot be removed with water once dried. 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 pre-treatment as soon as possible after cleaning and before deterioration occurs.
- .5 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .6 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 vacuum cleaning.
- .7 Touch up of shop primers with primer as specified.
- .8 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

3.5 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. Apply paint by brush and roller. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using 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 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

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

3.6 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.

3.7 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. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

END OF SECTION