

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 61 00 - Common Product Requirements
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 02 41 99 - Demolition for Minor Works.
- .6 Section 05 50 00 – Metal Fabrications
- .7 Section 06 20 00 - Finish Carpentry.
- .8 Section 07 21 16 - Blanket Insulation.
- .9 Section 07 92 00 - Joint Sealing.
- .10 Section 08 11 00 - Metal Doors and Frames.
- .11 Section 09 21 16 - Gypsum Board Assemblies.
- .12 Section 09 51 99 - Acoustic Ceilings for Minor Works.
- .13 Section 09 91 93 – Interior Painting

1.2 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
 - .1 ASTM C475-12e1, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .2 ASTM C514-04(2014), Standard Specification for Nails for the Application of Gypsum Board.
 - .3 ASTM C557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .4 ASTM C840-13, Standard Specification for Application and Finishing of Gypsum Board.
 - .5 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.
 - .6 ASTM C1002-14, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

- .7 ASTM C1047-14a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .8 ASTM C1280-13a, Standard Specification for Application of Gypsum Sheathing.
- .9 ASTM C1177/C1177M-13, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .10 ASTM C1178/C1178M-13, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .11 ASTM C1396/C1396M-14a, Standard Specification for Gypsum Wallboard.
- .3 Association of the Wall and Ceilings Industries International (AWCI)
 - .1 AWCI Levels of Gypsum Board Finish.
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-07, Standard Method of Test of Surface Burning Characteristics of Building Materials and Assemblies.

1.3 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 gypsum board assemblies materials level, 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 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.

1.4 AMBIENT CONDITIONS

- .1 Maintain temperature 10 degrees C minimum, 21 degrees 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 surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

Part 2 Products

2.1 MATERIALS

- .1 Standard board: to ASTM C1396/C1396M 16mm thick Type X, 1200 mm wide x maximum practical length, ends square cut.

- .2 Metal furring runners, hangers, tie wires, inserts, anchors to ASTM C754.
- .3 Nails: to ASTM C514.
- .4 Steel drill screws: to ASTM C1002.
- .5 Stud adhesive: to CAN/CGSB-71.25 and ASTM C557.
- .6 Laminating compound: as recommended by manufacturer, asbestos-free.
- .7 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.
- .8 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .9 Joint compound: to ASTM C475, asbestos-free.

2.2 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 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.

3.2 ERECTION

- .1 Do application and finishing of gypsum board to ASTM C840 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C1280.
- .3 Install work level to tolerance of 1:1200.
- .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 Furr openings and around built-in equipment, cabinets, access panels on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .8 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

3.3 APPLICATION

- .1 Do not apply gypsum board until after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply single and/or double layer gypsum board as indicated to wood and/or metal framing using screw fasteners for first layer, laminating adhesive for second layer. Second layer joints to be offset from first layer. Maximum spacing of screws 300 mm on centre. Ensure no metal-to-metal contact of fasteners, conduits, etc.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C840.
 - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
- .3 Apply water-resistant gypsum board adjacent to showers, slop sinks, urinals, and washroom vanities. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .4 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. Install sealant according to Manufacturer's instructions.
- .5 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .6 Apply board using laminating adhesive on base layer of gypsum board.
- .7 Install gypsum board with face side out.
- .8 Do not install damaged or damp boards.
- .9 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 INSTALLATION

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

- .2 Splice corners and intersections together and secure to each member with 3 screws.
- .3 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .4 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.
- .5 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with AWCI Levels of Gypsum Board Finish:
 - .1 Levels of finish:
 - .1 Level 5: embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .6 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.
- .7 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.
- .8 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .9 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.6 PROTECTION

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

3.7 SCHEDULES

- .1 Construct fire rated assemblies where indicated.
- .2 Construct acoustically rated assemblies where indicated.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 01 45 00 - Quality Control
- .3 Section 01 61 00 - Common Product Requirements
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 02 41 99 - Demolition for Minor Works.
- .6 Section 05 50 00 – Metal Fabrications
- .7 Section 06 08 99 – Rough Carpentry for Minor Works
- .8 Section 06 20 00 – Finish Carpentry
- .9 Section 09 21 16 – Gypsum Board Assemblies.
- .10 Section 09 91 23 – Interior Painting

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.
 - .2 ASTM C475/C475M-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .3 ASTM C514-04(2009)e1, Standard Specification for Nails for the Application of Gypsum Board.
 - .4 ASTM C645-09a, Standard Specification for Nonstructural Steel Framing Members.
 - .5 ASTM C754-09a, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - .6 ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
 - .7 ASTM C954-10, 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 0.122 in. (2.84 mm) in Thickness.
 - .8 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .9 ASTM C1047-10, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .10 ASTM C1178/C1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .2 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-[07], Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum, framing, and sealants, and include product characteristics, performance criteria, physical size, finish and limitations.
- .1 Construction Waste Management: remove and recycle waste materials to appropriate facilities.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions.
 - .3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.
 - .4 Store and protect partition materials from nicks, scratches, and blemishes.
 - .5 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Performance / Design Criteria:
 - .1 Partition assembly to be of non-combustible construction and fire resistance rated. Refer to Drawings for wall types.
- .2 Non-structural Metal Framing:
 - .1 Non-load bearing channel stud framing: to SSMA standard, stud size and spacing as shown on Drawings, roll formed from either 14 or 18 gauge thickness (refer to Drawings), hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
 - .2 Floor and ceiling tracks: to SSMA standard, 18 gauge, in widths to suit stud sizes, 42 mm flange height.
 - .3 Metal channel stiffener: 19 x 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .3 Gypsum Board:

- .1 Standard board: to ASTM C1396/C1396M, regular, thickness as shown on Drawings. Type X gypsum board, thickness as shown on Drawings. 1200 mm wide x maximum practical length, ends square cut, edges tapered.
- .2 Metal furring runners, hangers, tie wires, inserts, anchors: to best suited standard for purpose intended.
- .3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .4 Steel tapping screws: to ASTM C514, ASTM C954 and ASTM C1002.
- .5 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, ABS, PVC, Zinc, metal, zinc-coated by hot-dip process, zinc-coated by electrolytic process, aluminum coated, phosphatized, 0.5 mm base thickness, perforated flanges, one piece length per location.

2.2 ACCESSORIES

- .1 Acoustical insulation: type recommended by manufacturer to achieve STC rating specified.
- .2 Sealants: in accordance with Section 07 92 00 - Joint Sealants, to ASTM C475.
 - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.
- .3 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

Part 3 Execution

3.1 EXAMINATION

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

3.2 ERECTION OF TYPICAL WALL FRAMING

- .1 Align and secure top and bottom runners at 600 mm (24 inches) on centre.
- .2 Place two (2) beads of acoustic sealant between runners and substrate to achieve an acoustic seal.
- .3 Place one (1) beads of acoustic sealant between studs and adjacent vertical surfaces to achieve an acoustic seal.
- .4 Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
- .5 Install studs vertically at 400 mm (16 inches) on centre, unless otherwise noted on Drawings.

- .6 Align stud web openings horizontally.
- .7 Secure studs to tracks using fastener method. Do not weld.
- .8 Stud Splicing: Not permissible.
- .9 Fabricate corners using a minimum of three studs.
- .10 Double stud at wall openings, door and window jambs, not more than 50 mm (2 inches) from each side of openings.
- .11 Brace stud framing assembly rigid.
- .12 Coordinate erection of studs with requirements of door frames and window frames; install supports and attachments.
- .13 Coordinate installation of wood bucks, anchors, and wood blocking with electrical and mechanical work to be placed within or behind stud framing.
- .14 Blocking: Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, opening frames, and all other wall mounted installations.
 - .1 Secure wood blocking to studs.
- .15 Refer to Drawings for indication of partitions extending to finished ceiling only and for partitions extending through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
- .16 Coordinate placement of insulation in stud spaces after stud frame erection.

3.5 ERECTION OF GYPSUM BOARD AND ACCESSORIES

- .17 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.
- .18 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .19 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .20 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers and grilles.
- .21 Install 19 x 64mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .22 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .23 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .24 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.
- .25 Install acoustical insulation and sealant in sound rated partitions to correspond with tested assembly.
- .26 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

3.4 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work has been approved.
- .2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
- .3 Apply water-resistant gypsum board where wall tiles or coating to be applied and adjacent to slop sinks. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.

3.5 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, to provide thermal break.
- .5 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .6 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.
- .7 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.
- .8 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.
- .9 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.6 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.

3.7 PROTECTION

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

3.8 SCHEDULES

- .1 Construct fire rated assemblies where indicated.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 61 00 - Common Product Requirements
- .4 Section 01 78 00 - Closeout Submittals.
- .5 Section 02 41 99 - Demolition for Minor Works.
- .6 Section 05 50 00 – Metal Fabrications
- .7 Section 06 20 00 - Finish Carpentry.
- .8 Section 07 21 16 - Blanket Insulation.
- .9 Section 07 92 00 - Joint Sealing.
- .10 Section 08 11 00 - Metal Doors and Frames.
- .11 Section 09 21 16 - Gypsum Board Assemblies.
- .12 Section 09 51 99 - Acoustic Ceilings for Minor Works.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C645-14, Specification for Nonstructural Steel Framing Members.
 - .2 ASTM C754-11, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.
- .3 Environmental Choice Program (ECP).
 - .1 CCD-047, Paints - Surface Coatings.
 - .2 CCD-048, Surface Coatings - Recycled Water-borne.

1.3 QUALITY ASSURANCE

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

- .3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

Part 2 Products

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C645, 92 mm stud size or as required, roll formed from 0.53mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460mm centres.
- .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32mm flange height.
- .3 Rigid structural support for gypsum wallboard assemblies to ASTM C 754:
 - .1 Furring Channel:
 - .1 Gauge: 18
 - .2 Size: 22mm or 38mm as required.
 - .2 Channel:
 - .3 Gauge: 16.
 - .4 Size: 19mm or 38mm as required.
- .1 Metal channel stiffener: 38mm x 13mm mm size, 1.4mm thick cold rolled steel, coated with rust inhibitive coating.
- .2 Wall Protection Material:
- .3 Acoustical sealant: to CAN/CGSB-19.21.
- .4 Insulating strip: rubberized, moisture resistant 3 mm thick cork or foam strip, 12 mm wide, with self sticking adhesive on one face, lengths as required.

Part 3 Execution

3.1 ERECTION

- .1 Align partition tracks at floor and ceiling and secure at 400mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 406mm on centre and not more than 50mm from abutting walls, and at each side of openings and corners. 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 and ceiling 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 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .9 Install heavy gauge single jamb studs at openings.
- .10 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .11 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .12 Provide 40mm 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.
- .13 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .14 Extend partitions to ceiling height except where noted otherwise on drawings.
- .15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use 50mm leg ceiling tracks.
- .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .17 Install two continuous beads of acoustical sealant or insulating strip under studs and tracks around perimeter of sound control partitions.

3.2 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 29.06 Health and Safety Requirements
- .3 Section 01 45 00 - Quality Control.
- .4 Section 01 61 00 - Common Product Requirements
- .5 Section 01 74 21 – Construction Demolition Waste Management and Disposal
- .6 Section 01 78 00 - Closeout Submittals.
- .7 Section 02 41 99 - Demolition for Minor Works.
- .8 Mechanical Divisions – Heating, Ventilating, and Air-Conditioning (HVAC), sprinklers
- .9 Electrical Divisions: Electrical work

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C635/C635M-13a, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - .3 ASTM 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-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for ceiling panels and ceiling suspension system and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures.
- .3 Shop Drawings:
 - .1 Submit reflected ceiling plans for special grid patterns as indicated.

- .2 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, change in level details, and acoustical unit support at ceiling fixture, lateral bracing and accessories.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate full size samples of each type acoustical units.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions.
 - .3 Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.
 - .4 Store and protect acoustic ceiling materials from nicks, scratches, and blemishes.
 - .5 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS GRID

- .1 Grid Materials: To ASTM A 653, commercial quality cold rolled steel with hot-dipped galvanized coating.
 - .1 Support Channels and Hangers: To ASTM A 641, Class 1 zinc coating Galvanized steel; size and type to suit application and to manufactures recommendations.
 - .2 Physical Characteristics
 - .1 Structural Classification: [Intermediate Duty] (per ASTM C635)
 - .2 Double web design manufactured of hot-dipped galvanized steel
 - .3 Flange Size: 15/16"
 - .4 Color: White
 - .3 Components
 - .1 Main Runners
 - .1 Size: 12'
 - .2 Edge Molding
 - .1 Type: angle
 - .4 Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and

penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.

- .5 Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
- .6 Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
- .7 Accessories:
 - .1 Stabilizer bars, clips, splices, hold down clips, purpose made metal clips required for suspended grid system; provide four (4) clips per tile.

2.2 MATERIALS ACT

- .1 Acoustic Tile (**ACT-1**):
 - .1 Size: 24" (610mm) x 48" (1220mm).
 - .2 Thickness: 1 1/2 inch (39mm)
 - .3 Composition: Composite: Fiberglass / Wet-felted mineral fiber
 - .4 Edges: Square
 - .5 Surface Colour: White.
 - .6 Surface Finish: Nubby Fabric
 - .7 Noise Reduction Coefficient (NRC) per ASTM C423 (E-400 mounting)
 - .1 0.95
 - .8 Articulation Class (AC) per ASTM E1111
 - .1 200
 - .9 Light Reflectance (LR) per ASTM E1477
 - .1 0.90
 - .10 Ceiling Attenuation Class (CAC) per ASTM E1414
 - .1 24
 - .11 Humidity Resistance
 - .1 Warranted to withstand relative humidity of up to 95% at 104°F without sagging, warping or delaminating for 10-years
 - .12 Flame Spread Classification per ASTM E84: Class A
- .2 Acoustic Tile (**ACT-2**):
 - .1 Size: 24" (310mm) x 48" (1220mm).
 - .2 Thickness: 1 inch (25mm)
 - .3 Composition: Composite: Fiberglass
 - .4 Edges: Square
 - .5 Surface Colour: White.
 - .6 Surface Finish: Nubby Fabric
 - .7 Noise Reduction Coefficient (NRC) per ASTM C423 (E-400 mounting)
 - .1 0.80
 - .8 Articulation Class (AC) per ASTM E1111
 - .1 190

- .9 Light Reflectance (LR) per ASTM E1477
 - .1 0.84
- .10 Ceiling Attenuation Class (CAC) per ASTM E1414
 - .1 42
- .11 Humidity Resistance
 - .1 Warranted to withstand relative humidity of up to 90% at 104°F without sagging, warping or delaminating for 10-years
- .12 Flame Spread Classification per ASTM E84: Class A

2.3 ACCESSORIES

- .1 Acoustic Sealant for Perimeter Moldings: Specified in Section 07 92 00.
- .2 Touch-up Paint: Type and colour to match acoustic and grid units.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Installation: in accordance with ASTM C636 except where specified otherwise.
- .2 Suspension System:
 - .1 Erect ceiling suspension system after work above ceiling has been inspected by Departmental Representative.
 - .2 Secure hangers to overhead structure using attachment methods as indicated.
 - .3 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
 - .4 Lay out system as indicated on Reflected Ceiling Plan.
 - .5 Install wall moulding to provide correct ceiling height.
 - .6 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles, microphones and speakers.
 - .7 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
 - .8 Interlock cross member to main runner to provide rigid assembly.

- .9 Ensure finished ceiling system is square with adjoining walls and level within 1:1000.
- .3 Acoustic Panels:
 - .1 Install acoustical panels and tiles in ceiling suspension system.
 - .2 Co-ordinate ceiling work with work of other sections such as interior lighting, fire protection communication, and intrusion and detection systems.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.4 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

1.2 RELATED SECTIONS

- .1 Section 01 14 00 - Work Restrictions.
- .2 Section 01 32 16.07 - Construction Progress Schedule – Bar (GANTT) Chart
- .3 Section 01 33 00 - Submittal Procedures.
- .4 Section 01 41 00 - Regulatory Requirements.
- .5 Section 01 51 00 - Temporary Utilities.
- .6 Section 01 52 00 - Construction Facilities
- .7 Section 01 56 00 - Temporary Barriers and Enclosures.
- .8 Section 01 71 00 – Examination and Preparation.
- .9 Section 01 73 00 - Execution Requirements.
- .10 Section 01 74 11 - Cleaning.
- .11 Section 01 78 00 – Closeout Submittals

1.3 REFERENCES

- .1 American Association of Textile Chemists and Colorists (AATCC)
 - .1 AATCC Test Method 16-2004, Colorfastness to Light.
 - .2 AATCC Test Method 23-2005, Colorfastness to Burn Gas Fumes.
 - .3 AATCC Test Method 129-2005, Colourfastness to Ozone in the Atmosphere Under High Humidities.
 - .4 AATCC Test Method 134-2006, Electrostatic Propensity of Carpets.
 - .5 AATCC Test Method 171-2005, Carpets: Cleaning of; Hot Water Extraction Method.
 - .6 AATCC Test Method 175-2008, Stain Resistance: Pile Floor Coverings.
 - .7 AATCC Test Method 189-2007, Fluorine Content of Carpet Fibers.
- .2 ASTM International
 - .1 ASTM D 297-93(2006), Standard Test Methods for Rubber Products-Chemical Analysis.
 - .2 ASTM D 1335-05, Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings.
 - .3 ASTM D 2661-08, Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe and Fittings.
 - .4 ASTM D 1667-05, Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
 - .5 ASTM D 3574-08, Standard Test Methods for Flexible Cellular Materials - Slab, Bonded, and Molded Urethane Foams.
 - .6 ASTM D 3936-05, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.

.3 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-4.2 No. 22-2004, Textile Test Methods - Colourfastness to Rubbing (Crocking).
- .2 CAN/CGSB-4.2 No.27.6M-2004, Textile Test Methods - Flame Resistance - Methemine Tablet Test for Textile Floor Coverings.
- .3 CAN/CGSB-4.2 No. 76-94/ISO 2551: 1981 , Textile Test Methods - Machine-Made Textile Floor Coverings - Determination of Dimensional Changes Due to the Effects of Varied Water and Heat Conditions.
- .4 CAN/CGSB-4.2 No.77.1-94/ISO 4919:2000 , Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.
- .5 CAN/CGSB-4.129-93(R1997), Carpets for Commercial Use.

.4 Carpet and Rug Institute (CRI)

- .1 CRI Carpet Installation Standard 2009.
- .2 CRI Green Label Indoor Air Quality Testing Program.
- .3 CRI Green Label Plus Indoor Air Quality Testing Program.

.5 Health Canada

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

.6 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

.7 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-S102.2-07, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00- Submittal Procedures
- .2 Product Data: Submit manufacturer's instructions, printed product literature and data sheets for each carpet tile, undercushion, adhesive, carpet protection, subfloor patching compound and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Information on shop drawings to indicate:
 - .1 Installation pattern as indicated: direction, open edges, special patterns.
 - .2 Cutouts: show locations where cutouts are required.
 - .3 Location of columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required as well as direction of carpet pile and pattern, location of edge moldings, and edge bindings to Consultant for review prior

.4 Samples:

- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.
- .3 Submit duplicate samples for each colour selected, vinyl or rubber base and flooring transition.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00- Submittal Procedures
- .2 Operation and Maintenance Data: submit operation and maintenance data for installed products for incorporation into manual, including suggested schedule for cleaning.
- .3 Warranty Documentation: submit warranty documents specified.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Extra stock materials in accordance with Section 01 78 00 – Closeout Submittals: deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 – Closeout Submittals.
 - .1 Quantity: provide minimum 5% of:
 - .1 Carpet tile: each colour, pattern and type of carpeting used.
 - .2 Adhesives
- .2 Delivery, storage and protection: comply with Owner's requirements for delivery and storage of extra materials.
- .3 Identify each package of carpet and each container of adhesive.

1.7 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Prequalification: compliance with Department of Consumers and Corporate Affairs regulations under "Hazardous Products Act", Part II of the Schedule, tested to CAN/CGSB-4.2-No.27.6 or latest.
 - .2 Indoor Air Quality: compliance with CRI/CCI Green Label Plus Indoor Air Quality Program, CRI/CCI-IAQ requirements for maximum total volatile chemicals released into air. Label each carpet product with CRI/CCI-IAQ label. Co-ordinate use of premises under direction of the Departmental Representative.
- .2 Qualifications:

.1 Manufacturer: capable of providing field service representation during construction and approving application method.

.2 Flooring Contractor:

.1 Experienced in performing work of this Section who has specialized in installation of work similar to that required for this project.

.2 Certified by Carpet Manufacturer prior to tender submission

.3 Must not sub-contract labour without written approval of Departmental Representative.

.4 Responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturers' written instructions.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with section 01 60 00 – common product requirements and with manufacturer's requirements.

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

.3 Storage and Handling Requirements:

.1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.3 Store and protect carpet tile and adhesive in original containers or wrapping with manufacturer's seals and labels intact.

.4 Store and protect carpet tile and accessories in location as directed by Departmental Representative.

.5 Store carpet and adhesive at minimum temperature of 18 degrees C and relative humidity of maximum 65% for minimum of 48 hours before installation.

.6 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

.7 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.8 Replace defective or damaged materials with new.

.9 Develop Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.10 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Waste Reduction Workplan in accordance with Section

01 74 21 - Construction/Demolition Waste Management and Disposal.

1.9 SITE CONDITIONS

- .1 Ambient Conditions:
 - .1 Moisture: ensure substrate is within moisture limits and alkalinity limits recommended by manufacturer. Prepare moisture testing and provide report to Departmental Representative.
 - .2 Temperature: maintain ambient temperature of not less than 18 degrees C from 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.
- .2 Ventilation:
 - .1 Departmental Representative will co-ordinate operation of ventilation system during installation of carpet. Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.
 - .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities. Provide fans with HEPA filters.
 - .3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.
- .3 Install carpet only after space is enclosed and weatherproof, wet-work within space is nominally dry, and work above ceilings is completed.
- .4 Test existing floor levelling compound for presence of asbestos contamination. Notify Consultant for additional instructions where asbestos is discovered.

1.10 WARRANTY

- .1 Manufacturer's warranty: provide printed, non-pro-rated warranty from the manufacturer for indicated period. If the product fails to perform as warranted when properly maintained, the failed area is to be repaired or replaced at the discretion of the manufacturer. The term of the carpet warranty to be twelve (12) years, or that which is greater and specified elsewhere, from dates of installation, and shall cover against:
 - .1 Excessive surface wear. Excessive wear means loss of pile fibre weight measured before and after use. Minimum Texture Appearance Retention Rating (T.A.R.R) of Severe.
 - .2 Edge Ravel
 - .3 Zippering
 - .4 Back Delamination
 - .5 Watermarking on any product NOT 100% loop construction
 - .6 Excessive static electricity, more than 3.0 kV when tested per AATCC 134 at a relative humidity of 20% at room temperature of 70F.

- .2 Chair pads are not required for carpet warranty coverage.
- .3 Manufacturer's extended carpet warranties to be sole source responsibility of the manufacturer.
- .4 Carpet warranties shall be signed and notarized by manufacturer's representative.

Part 2 Products

2.1 MATERIALS

- .1 Manufacturers:
 - .1 Ensure manufacturer has minimum 5 years' experience in manufacturing components similar to or exceeding requirements of project.
- .2 Description:
 - .1 Adhesives: VOC limit in accordance with
 - .2 Carpet and Accessories:
 - .1 Green Label Plus certified.
 - .2 40% minimum Post-industrial recycled content.

2.2 PERFORMANCE

- .1 Flammability: certified for flammability to Health Canada regulations under "Hazardous Products - Carpet Regulations", Part II of Schedule 1. Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .2 Flame Spread: maximum flame spread rating 300, maximum smoke developed classification 500, when tested to CAN/ULC-S102.2. Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .3 Smoke Development: 450 or less per ASTM E 662.
- .4 Dry Breaking Strength: to ASTM D 2661, minimum acceptable tear strength in both length and width: .1 11.3 kg for carpets installed by glue down installation.
- .5 Wear: maximum 10% of pile face fiber by weight for 10 years.
- .6 Edge Ravel: none for 10 years.
- .7 Static Resistance: permanent static control to AATCC 134, 3000 V maximum at 20% RH and 22 degrees C
- .8 Static Generation: less than 3.0 kV per AATCC 134 for 10 years.
- .9 Tuft Bind: Tuft Lock: to ASTM D 1335 CAN/CGSB-4.129, minimum acceptable 1.6 kilograms for cut pile product 3.6 for loop pile product.

- .10 Stain resistance: to AATCC 175, 8.
- .11 De-lamination of Secondary Backing: Lamination Strength of Secondary Backing: to ASTM D 3936, minimum acceptable peel strength of 1.6 kg/25 mm.
- .12 Soil Resistance: 350 ppm fluorine minimum Fluorine Durability Level to AATCC 189, drop oil and soil resistance to AATCC 118.
- .13 Colour Fastness:
 - .1 Colourfastness to light: to CAN/CGSB-4.2 No.18.3
 - .2 Colourfastness to atmosphere: to AATCC 129 and AATCC 23.
 - .3 Colourfastness to crocking: to CAN/CGSB-4.2 No. 22.

2.3 FABRICATION

- .1 EXISTING CARPET, BASE BUILDING CARPET AS SUPPLIED BY DEPARTMENTAL REPRESENTATIVES – OVERAGE AMOUNTS HELD BY CLIENT (base building): For use in patch, replace and full cover at construction areas. Refer to SCH-1 Room Finish Schedule for more direction on installation/locations.
 - .1 Type CPT-1: Patcraft, Mind's Eye Modular Tile, pattern #I0219, colour #00568 Recognition, size 600 mm x 600 mm.
Client records show an existing amount of approx. 2,078.7 yards available for use.
 - .2 Type CPT-2: Standard of Acceptance: Patcraft, Dazzle Modular Tile, pattern #I0119, colour #00512 Exquisite, size 600 mm x 600 mm.
Client records show an existing amount of approx. 298.48 yards available for use.
 - .3 Type CPT-3: Client records show an existing amount of : Patcraft, Razzle Modular Tile, pattern #I0118, colour #00512 Effervescent, size 600 mm x 600 mm.
Client records show an existing amount of approx. 186.55 yards available for use.
- .3 Face Construction: Multi-Level pattern loop
- .4 Pile Surface Appearance: Multi Level Loop: Sculptured.
- .5 Pile Fibre: to Can/CGSB-4.129.
 - .1 Nylon: BCF.
 - .1 Type: Nylon 6.
- .6 Face Fiber Content: Nylon
- .7 Face Fibre Denier: Minimum 18

- .8 Dyeing Method: Solution Dyed
- .9 Tufted Carpet Backing: to CAN/CGSB-4.129.
 - .1 Primary backing: Synthetic
- .10 Finished Pile Height: minimum 2.46mm to 2.95mm
- .11 Surface Pile Weight: minimum 474 g
- .12 Total Weight: 610 g/m³ (18 oz/yd²).

2.4 TILE CUSHION BACKING

- .1 Density: urethane 224 kg/m³; EVA and PVC 240 kg/m² to ASTM D 3574.
- .2 Compression force deflection, minimum: urethane 34.5 kN/m² to ASTM D 3574.
- .3 Compression deflection, minimum: EVA and PVC 48.3 kN/m² to ASTM D 1667.
- .4 Compression set at 50%, maximum: urethane 15% to ASTM D 3574.
- .5 Compression set at 25%, maximum: EVA and PVC 10% to ASTM D 3574.
- .6 Ash content, maximum: urethane 50%; EVA and PVC 50% to ASTM D 297.
- .7 Anti-microbial Resistance: to AATCC 174,
 - .1 2 mm minimum halo of inhibition for gram positive bacteria.
 - .2 1 mm minimum halo of inhibition for gram negative bacteria.
 - .3 Ensure no fungal growth.

2.5 ACCESSORIES:

- .1 Base: Vinyl, 102 mm high vinyl base with toe. To be 3.17mm thickness.
Colour to match existing base.
- .2 Edge Strip: Vinyl.
 - .1 Beveled floor flange minimum 50mm wide.
 - .2 Beveled surface to finish flush with carpet tile for tight joint and other side to floor finish.
 - .3 Colour to match vinyl wall base.
- .3 Adhesives:
 - .1 Microencapsulated tackifiers applied to 100% of material at time of manufacture. Procured, with no subfloor contamination or adhesive residues once removed.

- .3 Adhesive in compliance with CCD-152.
- .4 Transitional Mouldings, Flooring Transitions:
 - .1 Vinyl.
 - .2 Colour to match vinyl wall base.
 - .3 Transitions are required where the following finishes meet:
 - .1 Existing cobble stone to new carpet tile.
 - .2 Existing vinyl sheet to new carpet tile.
- .5 Carpet protection: non-staining heavy duty kraft paper or 0.15 mm thick polyethylene film.
- .6 Concrete floor sealer primer:
 - .1 As recommended by carpet manufacturer.
- .7 Subfloor patching compound: Portland cement base filler, mix with latex and water to form cementitious paste, as per carpet manufacturer's recommendation.

Part 3 Execution

3.1 INSTALLERS

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

3.2 EXAMINATION

- .1 Examine conditions, substrates and work to receive work of this Section, co-ordinate with Section 01 71 00 - Examination and Preparation.
- .2 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for carpet tile installation in accordance with manufacturer's written instructions.
 - .1 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.3 PREPARATION

- .1 Subfloor Preparation:
 - .1 Inspect concrete and determine special care required to make it a suitable for carpet.

- .2 Fill and level cracks 3 mm wide or protrusions over 0.8 mm with appropriate and compatible latex 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, grease, oil, curing or parting agents, and 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: following manufacturer's written instructions.
- .4 Demolition / Removal:
 - .1 Remove and divert return carpet for reuse recycling or reclamation in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and with Waste Reduction Workplan. Co-ordinate with Departmental Representative.
 - .2 Vacuum used/reclaimed carpet before removal.
 - .3 Carefully remove (salvage) used tiles and pack in container trailer pallets. Use effective packing techniques to maximize amount of material in container.
 - .4 Sort only clean, dry carpet tiles for reclamation. Clean is defined as carpet free from demolition debris, asbestos contamination, garbage, knife blades and tack strips.
 - .5 Carpet undercushion: provide recycling of carpet padding where locally available or as designated by carpet reclamation program.

3.4 INSTALLATION

- .1 Install carpet tiles in accordance with manufacturer's written instructions, and CRI Carpet Installation Standard and co-ordinate with Section 01 73 00-Execution Requirements.
- .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 Install carpet tile as per manufacturer's recommendation. This can include quarter-turn 90 degree format, monolithic, random, quarter turn ashlar, horizontal,

herringbone or vertical ashlar – installation pattern is to match adjacent carpet tile installation remaining in place.

- .5 Snugly join carpet tiles in completed installation.
 - .1 Measure distance covered by 11 carpet tiles (10 joints) and ensure distance is in compliance with manufacturer specifications.
 - .2 Do not trap yarn between carpet tiles.
- .6 Apply thin film of pressure-sensitive adhesive according to manufacturer's recommendations.
- .7 Ensure finished installation presents smooth wearing surface free from conspicuous seams, burring and other faults.
- .8 Use material from same dye lot.
 - .1 Ensure colour, pattern and texture match within visual areas.
 - .2 Maintain constant pile direction.
- .9 Fit around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.
- .10 Extend carpet tiles into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .11 Install carpet tiles smooth and free from bubbles, puckers, and other defects.
- .12 Protect exposed carpet tile edges at transition to other flooring materials with suitable transition strips.
- .13 Base Installation: As per Manufacturer's instructions.
 - .1 Allow coiled wall base to lay flat for at least 24 hours at 650 F prior to installation.
 - .2 For installations on porous wall surfaces, spread Approved adhesive to the ribbed surface (back) of the wall base with an 1/8" square-notched trowel. The adhesive should cover 80% of the back surface. Leave a 1/4" (6.35mm) uncovered space at the top of the wall base to prevent the adhesive from oozing onto the wall above the base when installed.
 - .3 Position wall base on wall surface and roll with hand roller. Always roll back to starting point to prevent stretching the wall base.
 - .4 Remove wet adhesive with a water dampened cloth. If adhesive has dried, use a cloth dampened with mineral spirits.
 - .5 Seal edges of cut-outs with latex method.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .1 Vacuum carpets clean immediately after completion of installation.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

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

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Prohibit traffic on carpet for period of 24 hours minimum 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.

3.7 ATTACHMENTS

- .1 Schedules: REFER TO ROOM FINISH SCHEDULE SCH-1

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 61 00 - Common Product Requirements
- .4 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Section 01 78 00 - Closeout Submittals.
- .6 Section 01 79 00 - Demonstration and Training.
- .7 Section 01 91 13 - General Commissioning (Cx) Requirements.

1.2 REFERENCES

- .1 Aluminum Association (AA).
 - .1 DAF 45-[03], Designation System for Aluminum Finishes.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
 - .2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel Air Drying and Baking.
 - .3 CAN/CGSB-1.104-[M91], Semigloss Alkyd Air Drying and Baking Enamel.
 - .4 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.
- .3 Environmental Choice Program (ECP).
 - .1 CCD-046-95, Adhesives.
 - .2 CCD-126h-95, Construction Film (Polyethylene Plastic Film Product).

1.3 SUMMARY AND SCOPE OF WORK

- 1. New access flooring panels to fit into existing understructure.
- 2. Various accessories, including, but not limited to cut outs, service outlets and electrical boxes.
- .3 For this installation, the existing floor pedestal system is to remain in place and new modular floor panels are to be installed to this exiting pedestal system. The new floor panels must be compatible to the existing floor pedestals and be of equal to or better quality of the existing floor panels being replaced.

1.4 SYSTEM DESCRIPTION & SCOPE OF WORK

- 1. Access Flooring System: Assemblies composed of modular floor panels that are fastened to adjustable height pedestals.

1.5 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide access flooring panels capable of supporting the following loads and stresses within limits and under conditions indicated, as demonstrated by testing manufacturer's current standard products according to referenced procedures in latest revised edition of Ceilings and Interior Systems Construction Associates (CISCA) "Recommended Test Procedures for Access Floors" referenced elsewhere in this section as CISCA/AF or, if not specified, manufacturers standard method.
1. Concentrated Loads: Provide floor panels capable of withstanding a concentrated design load of 1,250 lbf. (5560 N) with an average bottom-surface deflection under load not to exceed 0.100 inch (2.54) and a permanent top-surface set not to exceed 0.010 inch (0.25) according to CISCA/AF Section 1, "Concentrated Loads".
 2. Ultimate Load: Provide access flooring panels capable of withstanding a minimum ultimate load of two times the concentrated load without failing, according to CISCA/AF, Section 2, "Ultimate Loading".
 3. Rolling Loads: Provide access flooring panels capable of withstanding rolling loads of the following magnitude, with a combination of local and overall deformation not to exceed 0.040 inch (1.02) mm after exposure to rolling over CISCA/FA Path A or B, whichever path produced the greatest top surface deformation, , according to CISCA/AF, Section 3, "Rolling Loads".
 - a. CISCA/AF Wheel A Rolling Load: 1,000 lbf. (4448 N)
 - b. CISCA/AF Wheel 2 Rolling Load: 800 lbf. (3559 N)
 4. Uniform Load Test: Provide access floor panels capable of withstanding a uniform load of 500 lbf/ft² (23,940 N/M²) placed the over area one panel with a permanent set not to exceed 0.010 inch (0.25 mm) after the load is removed, according to CISCA/AF Section 7, "Uniform Load Test"
Note: The uniform load rating of an access floor panel shall not be confused with the "uniform live load" as specified for use in seismic calculations for seismic zone applications.
 5. Drop Impact Load Test: Provide access flooring system capable of withstanding a drop impact load of 150 lb. (68 kg) dropped from a height of 36 inches (914 mm) without a failure of the system, according to CISCA/AF Section 8, "Drop Impact Load Test".
 6. Panel Drop Test: Provide access floor panels capable of meeting all structural performance requirements specified, after the panel is dropped from a height of 36 inches onto a concrete surface.
- B. ESD-Control Properties:
1. Provide access flooring system with Panel-to-Understructure resistance of not more than 10 ohms as measured without floor coverings, according to test method as specified in ASTM F 150 – 98 with 500-V applied voltage with one electrode on the top face of the panel and one electrode attached to the tube of the pedestal.
 - a. Corner-Lock screw fasteners must have cutting teeth on bottom surface of screw head that will make positive contact with the steel body of the panel top sheet to assure electrical continuity between panel and

understructure to maintain compliance to required maximum resistance of 10 ohms

1.6 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Shop Drawings: Include complete layout of access flooring panel system based on field verified dimensions.
 - 2. Details and sections with descriptive notes indicating materials, finishes, fasteners, typical and special edge conditions, accessories and understructure.
 - 3. Detail Cut Sheets for each type of product indicated, including accessories, to show the information necessary to make a full evaluation of the entire flooring system.
 - 4. For installed products indicated to comply with seismic design loads, include calculated structural analysis data signed by the qualified engineer responsible for their preparation.
 - 5. Samples for Initial Selection: For each type of flooring material indicated and exposed finish indicated, submit samples in the form of manufacturers color charts consisting of actual units or sections of units showing full range of colors, textures and patterns.
- B. Product Certificates: For each type of access flooring system indicated, to certify that the flooring system meets the requirements of these written specifications and signed by a qualified employee of the manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, or performed by access flooring manufacturer and witnessed by a qualified testing agency, for each type of flooring material and exposed finish.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced installer who is approved by the access flooring manufacturer for installations of the type of access flooring indicated for this project.
- B. Source Limitations: Obtain access flooring panels through one source from a single manufacturer.
- C. Regulatory Requirements: Fabricate and install access flooring system to comply with NFPA 75 requirements for raised flooring.
- D. Provide floor panels that are clearly marked with manufacturer's name.
- E. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."
 - 1. Review connection with mechanical and electrical systems.
 - 2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Deliver access flooring components in original, unopened packages, clearly labeled with manufacturer's name and item description.
- B. Handle and store packages containing access flooring in a manner which avoids overloading building structure.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install access flooring until installation area is enclosed and has an ambient temperature of between 50 degrees Fahrenheit and 85 degrees Fahrenheit (10⁰ C to 29⁰ C) and a relative humidity of not less than 20 percent and not more than 80 percent.

1.10 COORDINATION

- A. Coordinate locations of mechanical and electrical work in under-floor cavity to prevent interferences with access flooring pedestals
- B. Do not proceed with installation of access flooring until after substantial completion of other performable construction within affected spaces.

1.11 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage and identified with labels clearly describing contents.
 - 1. Standard field panels – 2%

PART 2 - PRODUCTS

2.1 FLOOR PANELS AND UNDERSTRUCTURE

- A. Manufacturers: Subject to compliance with requirements, provide access flooring by ASM Modular Systems, Inc., consisting of MC125 access floor panels supported on a bolted stringer understructure.
- B. Floor Panels General: Provide modular panels complying with the following requirements, that are interchangeable with other standard field panels, and can be easily relocated by one person, using a lifting device, without disturbing adjacent panels or understructure. Installed panels with floor covering in place are to be free of exposed metal edges.
 - 1. Nominal Panel Size: 24" x 24" (610mm x 610mm) **site confirm size matches existing floor panels / floor pedestals prior to supplying product.**
 - 2. Fabrication Tolerances: Fabricate panels to the following tolerances with squareness tolerances expressed as the difference between diagonal measurements from corner to corner.
 - a. Size and Squareness: Plus or minus 0.015" (0.38 mm) of required size, with squareness tolerance of plus or minus 0.015" (0.38 mm).
 - b. Flatness: Plus or minus 0.020" (0.51 mm), measured on a diagonal on top of the panel.
 - 3. Panel Attachment to Understructure: By Bolting to pedestal head. Provide panels with holes in corners to align precisely with threaded holes in pedestal heads and to accept countersunk screws with heads flush with top of panel.
- C. Steel covered composite core panels: Fabricate panels with 1" thick high density particleboard core, laminated to top and bottom face sheets of hot dip galvanized steel. Enclose edges of core with upturned, die formed edge of bottom sheet. Provide panels with flame spread rating of 25 or less per ASTM E 84.

2.2 FLOOR PANEL COVERINGS

- A. General: Provide bare panels without wear-surface covering.

2.3 ACCESSORIES

- A. Service Cutouts: Fabricate cutouts in floor panels to accommodate cable penetrations and service outlets. Comply with requirements indicated for size, shape, number, and location. Provide reinforcement or additional support, if needed, to make panels with cutouts comply with standard performance requirements.
1. Fit cutouts with manufacturer's standard grommets in size indicated or, where size of cutouts exceeds maximum grommet size available, trim edge of cutouts with manufacture's standard plastic molding having tapered top flange. Furnish removable covers for grommets.
 2. Provide foam-rubber pads for sealing annular space formed in cutouts by cables. Trim edge of cutout with molding having a double-flanged internal edge for containing and supporting foam pads.
- B. Vertical Closures (Fascia): Where under floor cavity is not enclosed by abutting walls or other construction, provide manufacturer's standard metal closure plates with manufacturer's standard finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine sub-floor for any problems that would prevent a satisfactory installation of access floor, such as moisture and unevenness of top surface. Do not proceed with installation until sub-floor is clean, dry and level as completed by other trades.
- B. Verify field dimensions to contract drawings for size of area of installation, height and level of recessed slabs, door openings, ledges, etc.
- C. Floor Sealers: Verify that any concrete sealer that has been used is compatible with pedestal adhesive.
- D. Access To Installation Area: General Contractor shall provide clear access to installation area throughout entire duration of installation of access floor that is free of construction debris and other trades.
- E. Storage Of Materials: Area to receive and store access floor materials shall be enclosed and dry. Storage area shall be maintained at a temperature of not less than 40⁰ F and not more than 95⁰ F (4⁰ C to 35⁰ C), with a relative humidity level between 20% min. to 80% max.
- F. Area Of Installation: Shall be maintained throughout entire duration of installation of access floor at a temperature of 50⁰ F min. to 85⁰ F max. (10⁰ C to 29⁰ C) and at 20% min. to 80 % max. relative humidity.
 - .1 Prior to installation, all floor panels shall be stored for at least 24 hours in a dry enclosed area at no less than 40⁰ F and no more than 95⁰ F (4⁰ C to 35⁰ C).

3.2 INSTALLATION

- A. Install access floor system and accessories under supervision of the access flooring manufacturer's authorized representative to ensure rigid, firm installation that complies with performance requirements and is free of vibration, rocking, rattles and squeaks.
- B. Layout floor panel installation to keep the number of cut panels at the floor perimeter to a minimum.
- C. Install floor panels securely in place and properly seated with panel edges flush. Do not force panels into place.
- D. Scribe panels at perimeter to provide a close fit with adjoining construction with no voids greater than 1/8" (3 mm) where panels abut vertical surfaces.
- E. Install accessories according to Manufacturer's instructions.
- F. Clean up dust, dirt and construction debris caused by floor installation, and vacuum the sub-floor area, as installation of floor panel proceeds. Extend cleaning under installed panels as far as possible.
- H. Level installed access floor to within 0.10" (2.5 mm) over the entire access flooring area and within 0.060" (1.5 mm) of true level in any 10 ft. (3 M) distance.

3.3 ADJUSTING, CLEANING AND PROTECTION

- A. During installation, all traffic on access floor shall be directed by access floor installer.
 - 1. No traffic, other than access floor installer, shall be allowed on the floor area for 24 hours after installation to allow the pedestal adhesive to set.
 - 2. No access floor panels shall be removed by other trades for 72 hours after

installation.

- B. After completing installation, vacuum clean access flooring.
- C. Replace any flooring panels that are stained, scratched, or otherwise damaged or that do not comply with specified requirements.
- D. General contractor and/or owner shall provide and maintain suitable protection to prevent damage to completed access floor throughout entire duration of 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 Environmental Protection Agency (EPA)
- .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).
- .4 Master Painters Institute (MPI)
- .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Fire Code of Canada – 1995
- .6 Society for Protective Coatings (SSPC)
- .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transport Canada (TC)
- .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.2 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
 - .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.
- .2 Mock-Ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .1 Provide 1200 mm x 1200 mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.

- .2 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
 - .3 Locate where directed
 - .4 Allow 24 hours for inspection of mock- up before proceeding with work.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
- .3 Pre-Installation Meeting:
- .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations in accordance with Section 01 32 16.07 - Construction Progress Schedules – Bar (GANTT) Chart.
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.
 - .4 Construction requirements: in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

1.3 SCHEDULING

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

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 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 two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Health Canada / Workplace Hazardous Materials Information System. Indicate VOCs during application and curing in accordance with Section 01 47 15 – Sustainable Requirements: Construction.
- .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 stain clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
 - .5 10 mm cedar hardboard siding plywood for finishes over wood surfaces.
- .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Lead, cadmium and chromium: presence of and amounts.
 - .2 Mercury: presence of and amounts.
 - .3 Organochlorines and PCBs: presence of and amounts.
- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation and application instructions.
- .7 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.

1.5 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 - four litre can of each type and colour of primer stain and finish coating. Identify colour and paint type in relation to established colour schedule and finish system.
 - .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 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 with temperature range 7 degrees C to 30 degrees 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 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 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
 - .4 Separate for reuse and recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan (WMP).

- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
- .7 Ensure emptied containers are sealed and stored safely.
- .8 Unused paint and coating materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.
- .9 Paint, stain and wood preservative finishes 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.
- .10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .12 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).
- .13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .14 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by employees, individuals, or organizations for verifiable re-use or re- manufacturing.

1.7 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Perform no painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Provide continuous ventilation for seven days after completion of application of paint.
 - .4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.

- .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- .6 Provide minimum lighting level of 323 Lux on surfaces to be painted. Adequate lighting facilities shall be provided by the General Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless pre-approved written approval by product manufacturer, perform no painting when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - .5 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 12% for concrete and masonry (clay and concrete brick/block)
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
 - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
 - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .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.

Part 2 Products

2.1 MATERIALS

- .1 Materials and resources in accordance with this section.
- .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 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .7 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
- .8 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
 - .1 Be water-based, unless otherwise specified.
 - .2 non-flammable biodegradable.
 - .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .9 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .10 Flash point: 61.0 degrees C or greater for water- borne surface coatings and recycled water-borne surface coatings.
- .11 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.

- .12 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .13 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.
- .14 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 50.0ppm weight/weight total product.
 - .3 Cadmium in excess of 1.0ppm 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.
 - .6 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the 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.

2.2 COLOURS

- .1 Refer to Room Finish Schedule for location of Colour Schedule. Consultant may select colours from several manufacturers of other brands. Manufacturers of other brands shall colour match.
- .2 Colour schedule will be based upon selection of two base colours and three accent colours. No more than 4 colours will be selected for entire project and no more than 4 colours will be selected in each area.
- .3 Selection of colours – GC to provide full range of colours from chosen manufacturer for selection and approval by design consultant.
 - .1 P-1 – Light Grey Accent Paint
 - .2 P-2 – Deep Blue Green Accent Paint
 - .3 P-3 – To match existing wall paint.
 - .4 P-4 – To match existing ceiling paint.
- .4 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

- .5 First coat in two coat (Premium) repaint system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to site. 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 specified herein.
- .3 Reflectance values:
 - .1 Ceilings: >80%
 - .2 Walls: 50-70%

2.5 INTERIOR PAINTING SYSTEMS

- .1 Dressed lumber: including doors, casings, mouldings:
 - .1 INT 6.3W – 2 coats of waterborne clear acrylic with gloss level 5 finish over one coat of semi-transparent stain, wiped.
- .2 Plaster and gypsum board: gypsum wallboard, drywall, and textured finishes:
 - .1 INT 9.2B - High performance architectural latex gloss level 4 for walls and gloss level 1 for ceilings and bulkheads.
 - .2 INT 9.2F - Waterborne epoxy (tile-like) finish. One coat latex sealer/primer and two finish coats of 2-component waterborne epoxy paint to gloss level 5 for walls and gloss level 1 for ceilings and bulkheads.

2.6 SOURCE QUALITY CONTROL

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

Part 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

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 Maximum moisture content as follows:
 - .1 Concrete: 12%.
 - .2 Clay and Concrete Block/Brick:
 - .3 Wood: 15%.

3.4 PREPARATION

- .1 Protection:
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by 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 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 vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
 - .2 Apply wood filler to nail holes and cracks.
 - .3 Tint filler to match stains for stained woodwork.
- .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 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.

3.5 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. 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. Application by air sprayer or airless sprayer is permitted only with written approval from Departmental Representative.
 - .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 upon written approval from Departmental Representative:
 - .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 closets and alcoves as specified for adjoining rooms.
- .10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 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 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .5 Do not paint over nameplates.
- .6 Keep sprinkler heads free of paint.
- .7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.
- .8 Paint fire protection piping red.

- .9 Paint disconnect switches for fire alarm system and exit light systems in red enamel.
- .10 Paint natural gas piping yellow.
- .11 Paint 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.
- .12 Do not paint interior transformers and substation equipment.

3.7 SITE TOLERANCES

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

3.8 FIELD QUALITY CONTROL

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

END OF SECTION