

PART 1 - GENERAL

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| <u>1.1 RELATED REQUIREMENTS</u> | .1 | 09 21 16 - Non-structural Level Framing. |
| | .2 | 09 91 23 - Interior Painting. |
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| <u>1.2 REFERENCES</u> | .1 | Aluminum Association (AA)
.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes. |
| | .2 | ASTM International
.1 ASTM C 475-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
.2 ASTM C 514-04(2009e1), Standard Specification for Nails for the Application of Gypsum Board.
.3 ASTM C 557-03(2009)e1, Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
.4 ASTM C 840-08, Standard Specification for Application and Finishing of Gypsum Board.
.5 ASTM C 954-07, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
.6 ASTM C 1002-07, 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.
.7 ASTM C 1047-09, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
.8 ASTM C 1280-99, Standard Specification for Application of Gypsum Sheathing.
.9 ASTM C 1177/C 1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
.10 ASTM C 1178/C 1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
.11 ASTM C 1396/C 1396M-09a, Standard Specification for Gypsum Wallboard. |
| | .3 | Association of the Wall and Ceilings Industries International (AWCI)
.1 AWCI Levels of Gypsum Board Finish-97. |
| | .4 | Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
.2 CAN/CGSB-71.25-M88, Adhesive, for Bonding Drywall to Wood Framing and Metal Studs. |
| | .5 | South Coast Air Quality Management District (SCAQMD), |

California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1113-A2007, Architectural Coatings.
.2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

- .6 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 ACTION AND
INFORMATIONAL
SUBMITTALS

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

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 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 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
.6 Replace defective or damaged materials with new.

1.5 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, frost free surfaces.
.3 Ventilation: ventilate building spaces as required to

remove excess moisture that would prevent drying of joint treatment material immediately after its application.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Standard board: to ASTM C 1396/C 1396M regular, thickness as indicated, 1200 mm wide x maximum practical length, ends square cut, edges squared.
- .2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .3 Resilient clips : 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .4 Nails: to ASTM C 514.
- .5 Steel drill screws: to ASTM C 1002.
- .6 Stud adhesive: to CAN/CGSB-71.25 ASTM C 557.
- .7 Casing beads, corner beads, control joints and edge trim: to ASTM C 1047, PVC, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .8 Vinyl mouldings: mouldings for joint treatment of vinyl-faced gypsum board, as supplied by gypsum board manufacturer.
- .9 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.
 - .2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
- .10 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .11 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.
- .12 Joint compound: to ASTM C 475, asbestos-free.

2.2 FINISHES

- .1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.
 - .1 Primer: VOC limit 50, 100 or 200 g/L maximum to GS-11 SCAQMD Rule 1113.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 ERECTION

- .1 Do application and finishing of gypsum board to ASTM C 840 except where specified otherwise.
- .2 Do application of gypsum sheathing to ASTM C 1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings to ASTM C 840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers and grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes to ASTM C 840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

- .13 Erect drywall resilient furring transversely across studs, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.3 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work have been approved.
- .2 Apply gypsum board (number of layers as indicated) to metal furring or framing using screw fasteners for first layer, screw fasteners for second layer. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls to ASTM C 840.
 - .2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints.
 - .2 Double-Layer Application:
 - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
 - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
 - .3 Apply base layers at right angles to supports unless otherwise indicated.
 - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .3 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.
- .4 Arrange vinyl-faced gypsum board symmetrical about openings and wall areas, with butt joints.
- .5 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.
- .6 Install gypsum board with face side out.

3.4 INSTALLATION

- .7 Do not install damaged or damp boards.
- .8 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.
- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.
- .6 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .7 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .8 Splice corners and intersections together and secure to each member with 3 screws.
- .9 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .10 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.
- .11 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.
- .12 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.

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

3.5 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

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.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM).
 - .1 ASTM C 645-00, Specification for Nonstructural Steel Framing Members.
 - .2 ASTM C 754-00, 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-047a -98, Paints - Surface Coatings.
 - .2 CCD-048-98, Surface Coatings - Recycled Water-borne.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site for recycling in accordance with Waste Management Plan.
- .3 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .4 Divert unused gypsum materials from landfill to recycling facility approved by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Non-load bearing channel stud framing: to ASTM C 645, stud size as indicated, roll formed, thickness as indicated, 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 ASTM C 645, in widths to suit stud sizes, 32 mm flange height.
- .3 Acoustical sealant: to ASTM C 919.

- .4 Insulating strip: rubberized, moisture resistant 3 mm thick 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 600 mm on centre maximum.
- .2 Install damp proof course under stud shoe tracks of partitions on slabs on grade.
- .3 Place studs vertically at 400 mm on centre and not more than 50 mm from abutting walls, and at each side of openings and corners. 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 tracks 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, 50 mm 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 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached

to steel stud partitions.

- .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 50 mm leg ceiling tracks. Use double track slip joint as indicated.
- .16 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .17 Install two continuous beads of acoustical sealant 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.

PART 1 - GENERAL1.1 RELATED
SECTIONS

- .1 07 92 00 - Joint Sealants.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
.1 ANSI A108.1-99, Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).
.2 CTI A118.3-92, Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
.3 CTI A118.4-92, Specification for Latex Cement Mortar (included in ANSI A108.1).
.4 CTI A118.5-92, Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).
.5 CTI A118.6-92, Specification for Ceramic Tile Grouts (included in ANSI A108.1).
- .2 American Society for Testing and Materials International (ASTM)
.1 ASTM C 144-04, Specification for Aggregate for Masonry Mortar.
.2 ASTM C 207-06, Specification for Hydrated Lime for Masonry Purposes.
.3 ASTM C 847-06, Specification for Metal Lath.
.4 ASTM C 979-05, Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
.2 CGSB 71-GP-22M-78(AMEND.), Adhesive, Organic, for Installation of Ceramic Wall Tile.
.3 CAN/CGSB-75.1-M88, Tile, Ceramic.
.4 CAN/CGSB-25.20-95, Surface Sealer for Floors.
- .4 South Coast Air Quality Management District (SCAQMD), California State
.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .5 Terrazzo Tile and Marble Association of Canada (TTMAC)
.1 Tile Specification Guide 09 30 00 2006/2007, Tile Installation Manual.
.2 Tile Maintenance Guide 2000.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Include manufacturer's information on:
 - .1 Ceramic tile, marked to show each type, size, and shape required.
 - .2 Chemical resistant mortar and grout (Epoxy and Furan).
 - .3 Cementitious backer unit.
 - .4 Dry-set cement mortar and grout.
 - .5 Divider strip.
 - .6 Elastomeric membrane and bond coat.
 - .7 Reinforcing tape.
 - .8 Levelling compound.
 - .9 Latex cement mortar and grout.
 - .10 Commercial cement grout.
 - .11 Organic adhesive.
 - .12 Slip resistant tile.
 - .13 Waterproofing isolation membrane.
 - .14 Fasteners.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Mosaic wall tiles: submit duplicate, 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.
 - .2 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

1.4 QUALITY ASSURANCE

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

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.6 AMBIENT CONDITIONS

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

PART 2 - PRODUCTS

- 2.1 Floor Tile .1 Porcelain tile: to CAN/CGSB-75.1, Class MR (02 -3.0%), size as indicated, slip resistant surface, pattern and colour as indicated on drawing ID06 Floor Finishes Plan
- 2.2 MORTAR AND ADHESIVE MATERIALS .1 Cement: to CSA-A5, type 10.
- .2 Sand: to ASTM C 144, passing 16 mesh.
- .3 Hydrated lime: to ASTM C 207, Type N NA S SA.
- .4 Latex additive: formulated for use in cement mortar and thin set bond coat.
- .5 Water: potable and free of minerals and chemicals which are detrimental to mortar and grout mixes.
- 2.3 BOND COAT .1 Organic adhesive: to CGSB 71-GP-22M, Type 1 2 ANSI A136.1.
- .1 Maximum VOC limit 65 g/L to SCAQMD Rule 1168.
- 2.4 GROUT .1 Colouring Pigments:
- .1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C 979.
- .2 Colouring pigments to be added to grout by manufacturer.
- .3 Job coloured grout are not acceptable.
- .4 Use in Commercial Cement Grout, Dry-Set Grout, and Latex Cement Grout.
- .2 Latex Cement Grout: to ANSI A108.1, fast curing, high early strength, polymer-modified, stain resistant, sanded mix for floors, unsanded mix for walls and floors with polished tiles commercial tile grout.
- 2.5 CLEANING COMPOUNDS .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

PART 3 - EXECUTION

- 3.1 MANUFACTURER'S INSTRUCTIONS .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- 3.2 WORKMANSHIP .1 Do tile work in accordance with TTMAC Tile Installation

Manual 2006/2007, "Ceramic Tile", except where specified otherwise.

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

3.4 CLEANING

- .1 Proceed in accordance with manufacturers written instructions.

PART 1 - GENERAL

<u>1.1 Related Sections</u>	.1	Not used.
<u>1.2 References</u>	.1	American Society for Testing and Materials International (ASTM) .1 ASTM C 423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method .2 ASTM E 1264-98, Standard Classification for Acoustical Ceiling Products. .3 ASTM E 1477-98a(2003), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
	.2	Canadian General Standards Board (CGSB) .1 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction and Amendment No. 1 1988. .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
	.3	Canadian Standards Association (CSA International) .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
	.4	Department of Justice Canada (Jus) .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33. .2 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
	.5	Health Canada/Workplace Hazardous Materials Information System (WHMIS) .1 Material Safety Data Sheets (MSDS).
	.6	Underwriter's Laboratories of Canada (ULC) .1 CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.
<u>1.3 Submittals</u>	.1	Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Submit duplicate 300 mm x 300 mm size samples of each type of acoustical units.
<u>1.4 Delivery, Storage and Handling</u>	.1	Protect on site stored or installed absorptive material from moisture damage.
	.2	Store extra materials required for maintenance, where directed by Departmental Representative.

- .3 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.

1.5 Environmental Requirements

- .1 Permit wet work to dry before beginning to install.
- .2 Maintain uniform minimum temperature of 15 degrees C and humidity of 20 -40 % before and during installation.
- .3 Store materials in work area 48 hours prior to installation.

PART 2 - PRODUCTS

2.1 Materials

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1 ASTM E 1264.
 - .1 Type III, Form 1 or 2, Pattern G.
 - .2 Class A.
 - .3 Mineral wool: Slag wool fibre, minimum 75% recycled content.
 - .4 Size: width and length to suit existing suspended ceiling x 19mm thick.
 - .5 Textures: smooth.
 - .6 Flame spread rating 25 in accordance with CAN/ULC-S102.
 - .7 Smoke developed 25 in accordance with CAN/ULC-S102.
 - .8 Noise Reduction Coefficient (NRC) designation:
 - .1 Acoustical unit Type 1: Noise Reduction Coefficient (NRC) designation of .75 to ASTM C423.
 - .2 Acoustical Unit Type 2: Noise Reduction Coefficient (NRC) designation of 1.0 to ASTM C423.
 - .9 Sound Absorption Average (SAA) of 0.9 minimum to ASTM C4 23.
 - .10 Light Reflectance (LR) range of .85 to ASTM E1477.
 - .11 Edge type bevelled.
 - .12 Colour white.
 - .13 Shape flat.
 - .14 Surface coverings: low VOC, solvent-free water based latex paint.
- .2 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

PART 3 - Execution

3.1 Examination

- .1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Departmental

Representative.

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| <u>3.2 Installation</u> | .1 | Install acoustical panels and tiles in ceiling suspension system. |
| <u>3.3 Application</u> | .1 | Refer to reflected ceiling plan. |
| | .2 | Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding. |
| <u>3.4 Interface with Other Work</u> | .1 | Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components. |
| <u>3.5 Schedule</u> | .1 | Refer to reflected ceiling plan. |

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 51 13 - Acoustical Panel Ceilings.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C 635/C 635M-07, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C 636/C 636M-08, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- .2 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - .2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

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 acoustical suspension and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario, Canada.
 - .2 Submit reflected ceiling plans for special grid patterns as indicated.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.

- .2 Samples will be returned for inclusion into work.
- .3 Submit one representative model of each type ceiling suspension system.
- .4 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for acoustical suspension for incorporation into manual.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect acoustical ceiling tiles and tracks from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

- .1 Design Requirements: maximum deflection: 1/360th of span to ASTM C 635/ASTM C635M deflection test.

2.2 MATERIALS

- .1 Intermediate duty system to ASTM C 635/ASTM C635M.
- .2 Basic materials for suspension system: commercial quality cold rolled steel.
- .3 Suspension system: non fire rated, made up as follows:
 - .1 2 directional exposed tee bar grid.
- .4 Exposed tee bar grid components: shop painted satin sheen white colour . Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.

- .5 Hanger wire: galvanized soft annealed steel wire:
 - .1 3.6 mm diameter for access tile ceilings.
- .6 Hanger inserts: purpose made.
- .7 Accessories: splices, clips, wire ties, retainers and wall moulding flush reveal, to complement suspension system components, as recommended by system 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 acoustical ceiling tile and track installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative .
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Installation: to ASTM C 636/C 636M except where specified otherwise.
- .3 Install suspension system to manufacturer's instructions.
- .4 Do not erect ceiling suspension system until work above ceiling has been inspected and approved by Departmental Representative.
- .5 Secure hangers to overhead structure using attachment methods acceptable to Departmental Representative.
- .6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .7 Ensure suspension system is co-ordinated with location of related components.
- .8 Install wall moulding to provide correct ceiling height.

- .9 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.
- .10 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.
- .11 Attach cross member to main runner to provide rigid assembly.
- .12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .13 Finished ceiling system to be square with adjoining walls and level within 1:1000.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 00 10 - General Instructions.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
 - .1 Touch up scratches, abrasions, voids and other defects in painted surfaces.
- .3 Waste Management: separate waste materials

3.4 PROTECTION

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

PART 1 - GENERAL

<u>1.1 Related Sections</u>	.1	Section 09 68 13 - Tile Carpeting.
	.2	Section 09 69 00 - Access Flooring.
<u>1.2 References</u>	.1	American Society for Testing and Materials (ASTM International) .1 ASTM F 1303-04, Standard Specification for Sheet Vinyl Floor Covering with Backing.
<u>1.3 Samples</u>	.1	Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
	.2	Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base and transition strips.
<u>1.4 Closeout Submittals</u>	.1	Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
<u>1.5 Extra Materials</u>	.1	Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
	.2	Provide 5 m ² of each colour, pattern and type flooring material required for project for maintenance use.
	.3	Extra materials to be in one piece and from same production run as installed materials.
	.4	Clearly identify each roll of sheet flooring and each container of adhesive.
	.5	Deliver to Departmental Representative, upon completion of the work of this section.
	.6	Store where directed by Departmental Representative.
<u>1.6 Environmental Requirements</u>	.1	Maintain air temperature and structural base temperature at flooring installation area above 20° for 48 hours before, during and 48 hours after installation.
<u>1.7 Waste Management and Disposal</u>	.1	Do not dispose of unused sealant and adhesive materials into landfill. Divert materials to municipal hazardous materials depot approved by Departmental Representative.
	.2	Divert unused metal and wiring materials from landfill

to metal recycling facility approved by Departmental Representative.

- .3 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .4 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.

PART 2 - PRODUCTS

2.1 Materials

- .1 Linoleum sheet flooring: composed of natural ingredients which are mixed and calendered onto a jute backing:
 - .1 Pattern: marbleized.
 - .2 Thickness: 3.2 mm.
 - .3 Colours: on drawings ID06 Floor Finishes Plan.
- .2 Feature strips: of same material and thickness as adjacent work mm wide, in colour indicated on drawings ID06 Floor Finishes Plan, selected by Departmental Representative.
- .3 Resilient base: continuous, top set, complete with premoulded end stops and external corners:
 - .1 Type: vinyl.
 - .2 Style: cove.
 - .3 Thickness: 2.03 2.36 3.17 mm.
 - .4 Height: 101.6 mm.
 - .5 Lengths: cut lengths minimum 2400 mm.
 - .6 Colour: as indicated on drawings ID06 Floor Finishes Plan.
- .4 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
- .5 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .6 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

PART 3 - EXECUTION

3.1 Site Verification of Conditions

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

3.2 Preparation

- .1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.
- .2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.
- .3 Old vinyl flooring to be removed by trained personnel (may contain asbestos).
- .4 Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.
- .5 Seal concrete slab to resilient flooring manufacturer's printed instructions.
- .6 Unroll resilient base 2 days prior to installation to allow for off-gassing.

3.3 Application: Flooring

- .1 Provide a high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to the outside. Do not let contaminated air recirculate through a district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 To minimize emissions from adhesives, use water-based, solvent-free styrene-butadiene-rubber adhesive for linoleum. Butadiene exposure may cause eye and nose irritation, headaches, dizziness, and vomiting.
- .3 Apply low VOC adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .4 Lay flooring with seams parallel to building lines to produce a minimum number of seams. Border widths minimum 1/3 width of full material.
- .5 Run sheets in direction of traffic. Double cut sheet joints and continuously seal heat weld according to manufacturer's printed instructions.
- .6 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.
- .7 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.

- .8 Cut flooring neatly around fixed objects.
- .9 Install feature strips and floor markings where indicated. Fit joints tightly.
- .10 Install flooring in pan type floor access covers. Maintain floor pattern.
- .11 Continue flooring over areas which will be under built-in furniture.
- .12 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .13 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .14 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.4 Cleaning

- .1 Remove excess adhesive from floor, base and wall surfaces without damage.
- .2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.5 Protection

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

3.6 Schedules

- .1 Refer to drawings.

PART 1 - GENERAL1.1 RELATED
REQUIREMENTS

- .1 Section 09 65 16 - Resilient Sheet Flooring.
- .2 Section 09 69 00 - Access Flooring.

1.2 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 Environmental Choice Program (ECP)

.1 CCD-152-2009, Flooring Products, Commercial Non-modular Textile Flooring.

.6 Health Canada

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

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

.1 Material Safety Data Sheets (MSDS).

.8 National Floor Covering Association (NFCA)

.1 National Floor Covering Specification Manual 2007.

.9 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-A2007, Architectural Coatings.

.2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.10 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.

1.3 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 each adhesive and floor patching compound and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

	.3	Samples: <ul style="list-style-type: none">.1 Submit for review and acceptance of each unit..2 Samples will be returned for inclusion into work..3 Submit duplicate samples of each type of carpet tile specified and duplicate tiles for each colour selected, 150 mm length binder bars base divider strips.
	.4	Sustainable Design Submittals: <ul style="list-style-type: none">.1 Low-Emitting Materials:<ul style="list-style-type: none">.1 Submit listing of adhesives used in building, showing compliance with VOC and chemical component limits or restriction requirements.
1.4 CLOSEOUT SUBMITTALS	.1	Submit in accordance with Section 01 78 00 Closeout Submittals.
	.2	Operation and Maintenance Data: submit operation and maintenance data for installed products for incorporation into manual.
1.5 DELIVERY, STORAGE AND HANDLING	.1	Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
	.2	Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
	.3	Storage and Handling Requirements: <ul style="list-style-type: none">.1 Store materials indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area..2 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer..3 Store and protect carpet tile and adhesive in original containers or wrapping with manufacturer's seals and labels intact..4 Store and protect carpet tile and accessories in location as directed by Departmental Representative..5 Store carpet and adhesive at minimum temperature of 18 degrees C and relative humidity of maximum 65% for minimum of 48 hours before installation..6 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness..7 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
	.4	Packaging Waste Management: remove for reuse and return

by manufacturer of pallets, crates, padding, and packaging materials.

1.6 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.
 - .4 Ventilation:
 - .1 Departmental Representative will co-ordinate operation of ventilation system during installation of carpet.
 - .2 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.

1.7 WARRANTY

- .1 Manufacturer's warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and does not limit other rights the Departmental Representative may have under the drawings and specifications.
- .2 Warranty period: 1 year, commencing on date of substantial performance of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Adhesives: VOC limit 50 g/L maximum to SCAQMD Rule 1168.
- .2 Sealer: in accordance with manufacturer's recommendations for surface conditions:
 - .1 VOC limit: 100 g/L maximum to SCAQMD Rule 1113.
- .4 Carpet and Base: provided by the Departmental Representative.

2.2 ACCESSORIES

- .1 Base: provided by Departmental Representative.
- .2 Adhesive:

- .1 Pressure Sensitive Type: recommended by carpet tile manufacturer for direct glue down installation of speciality backed carpet tiles.
- .2 On site application VOC limit: 50 150 g/L maximum to SCAQMD Rule 1168.
- .3 Adhesive in compliance with CCD-152.
- .3 Subfloor patching compound: Portland cement base filler, mix with latex and water to form cementitious paste.

PART 3 - EXECUTION

3.1 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 polymer fortified patching compound.
 - .3 Comply with manufacturer's written recommendations for maximum patch thickness.
 - .4 Prime large patch areas with compatible primer.
 - .5 Ensure concrete substrates are cured, clean and dry.
 - .6 Ensure concrete substrates are free of paint, dirt, grease, oil, curing or parting agents, and other contaminants, including sealers, that interfere with the bonding of adhesive.
 - .7 Where powdery or porous concrete surface is encountered, apply primer compatible with adhesive to provide a suitable surface for glue-down installation.
- .2 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations.
 - .1 Prepare floor surfaces in accordance with CRI Carpet Installation Standard.
- .3 Tile Carpeting Preparation:
 - .1 Pre-condition carpeting: following manufacturer's written instructions.
- .4 Demolition / Removal:
 - .1 Remove and divert carpet for reuse, recycling or reclamation in accordance with.
 - .2 Vacuum used carpet before removal.
 - .3 Remove 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.

3.2 INSTALLATION

- .1 Install carpet tiles in accordance with manufacturer's written instructions, and CRI Carpet Installation Standard.
- .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.
- .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 Install carpet tiles to access floor system and to access covers or service modules.
- .11 Extend carpet tiles into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .12 Install carpet tiles smooth and free from bubbles, puckers, and other defects.
- .13 Protect exposed carpet tile edges at transition to other flooring materials with suitable transition strips.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
 - .1 Vacuum carpets clean immediately after completion of installation.

3.4 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.

3.5 ATTACHMENTS

- .1 Schedules:
 - .1 Refer to drawings.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 09 65 16 - Resilient Sheet Flooring.
- .2 Section 09 68 13 - Tile Carpeting.

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 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Pedestals:
 - .1 Pedestal assembly to support a concentrated load of 22 kN without going out of alignment.
 - .2 Pedestals, when secured to subfloor, to resist a 0.09 kN force applied horizontally at top of pedestal.
 - .3 Ultimate load carrying capacity: not less than twice design strength.
 - .2 Stringers:
 - .1 Assembly to remain completely braced and rigid after a maximum of eight abutting panels are removed.
 - .2 Stringers to support a mid-span force of 0.66 kN.
 - .3 Floor Panels:
 - .1 Uniformly distributed load of 12 kPa: Maximum deflection of 1 mm.
 - .2 Concentrated load of 4.4kN applied over area of 25 x 25 mm at any location: maximum deflection of 2.54 mm.
 - .3 Rolling load of 2.2 kN on 76 mm diameter caster with bearing area of 1.27 mm² anywhere on panel without damage maximum deflection of 2.54 mm.

- .4 Permanent deflection: maximum 0.5 mm at design load.
- .5 Ultimate strength of the panel: provide safety factor of 3.0 times its design load without failure.
- .4 Allowable Tolerances:
 - .1 Flatness of floor panels: plus or minus 0.5 mm in any direction.
 - .2 Surface Dimension: plus or minus 0.5 mm of all panels.
 - .3 Finished floor level tolerance: plus or minus 3 mm for overall floor, and plus or minus 1 mm in 2000 mm in any direction.
 - .4 Squareness: plus or minus 0.5 mm in surface dimension and 0.25 mm measured diagonally.
- .5 Fire Resistance:
 - .1 Floor panels, less finished flooring: flame spread rating of 5; fuel contribution of 10 and smoke development of 15.
- .6 Electrical Resistance:
 - .1 From surface of floor covering through to understructure shall not exceed 2×10^4 ohms nor be less than 5×10^4 ohms.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:
 - .1 For caulking materials during application and curing.
 - .2 For adhesives.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Take measurements from finished area at site. Indicate where applicable following information:
 - .1 Layout of work.
 - .2 Sizes and details of components.
 - .3 Anchorage methods.
 - .4 Edge and fascia details.
 - .5 Elevation differences.
 - .6 Stair, handrail and ramp framing and details.
 - .7 Lateral bracing.
 - .8 Typical cutout details.
 - .9 Gasketting, return air details, supply air registers and perforated panels. Include air transfer capacity of grilles, registers and panels.
 - .10 Floor finishes.
 - .11 Location of connection to building

grounding electrode.

.3 Structural Computations:

.1 Submit data on earthquake resistance in the form of structural computations that have been signed and sealed by a qualified professional. Include structural computations, material properties and other information required for structural analysis and verifications that access flooring system will withstand earthquake loads indicated.

.3 Samples:

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

.2 Submit one full size sample consisting of 4 panels of complete access flooring system, including finishes.

.3 Submit one of each of following components.

.1 Quarter size floor panel.

.2 Pedestal.

.3 Stringer member.

.4 High pressure laminate.

.5 Fasteners.

.6 Cove base 300 mm long.

.7 Accessories.

.8 Handrail.

.4 Submit duplicate samples of each type floor covering.

.1 Colour chips from manufacturer's standard range of colours for specified floor covering material.

.5 Incorporate approved samples into finished installation. Identify and note locations.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.5 Manufacturers' Field Reports: submit copies of manufacturers field reports.

.6 Closeout Submittals:

.1 Provide operation and maintenance data for access flooring system for incorporation into manual specified in Sections 01 78 00 - Closeout Submittals.

1.5 QUALITY ASSURANCE

.1 Certificates:

.1 Submit certification, to demonstrate compliance of the access flooring system to specification and specified standards by submitting:

.1 CSA or ULC certification.

.2 Government or independent testing agency

test reports certifying that the product meets the standard.

.3 Letter of certification from a responsible official of the manufacturer.

.4 Method for testing access flooring in accordance with Ceilings and Interior Systems Construction Association (CISCA) standard test procedures. Have tests performed by an independent testing laboratory regularly engaged in testing of access floor components.

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

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

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site bins for recycling.

1.7 MAINTENANCE

.1 Extra Materials:

.1 Provide 10 spare floor panels complete with specified floor covering, 5 spare pedestals with associate stringers and components for maintenance use. Store where directed. Identify each box.

.2 Provide 1 floor panel lifting device and wall mounting bracket for lifting device , standard with access floor manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Panels:

.1 Cementitious core steel floor panel: die formed, reinforced steel top plate, bottom plate filled with cementitious silicate compound, 600 x 600 mm size panel, edge trim for carpet. Panel surface shall be factory standard bare concrete to suit carpet tile or resilient sheet flooring.

.2 Understructure:

.1 Pedestal assemblies: hot-dip galvanized steel.

.2 Base: minimum of 103 cm2 square inches, stamped

and/or embossed on its underside, adhered to the sub floor with an adhesive recommended by the access flooring manufacturer.

.3 Where mechanical anchors are required for seismic zones, provide same as required by project specific seismic calculations.

.4 Threaded stud size 19mm diameter, steel.

.5 Head assembly designed so that the panels are held in place with or without corner-lock fasteners.

.6 Pedestal assembly shall provide an adjustment range of +/- 25mm when finished floor height is 152mm or more, adjustable at .4mm increments.

.7 The assembly shall provide a mechanical means to lock the floor in a level plane and adjustments shall be capable of being made without special tools.

.8 For corner-lock system, the head of the all-steel assembly shall be designed to accept a metal fastener to mechanically lock the panels in place.

.3 Finish flooring:

.1 Resilient sheet flooring: refer to drawings.

.2 Carpet tile: refer to drawings.

.4 Fascia panels:

.1 Closure panels made up of:

.1 1.6 mm extruded aluminum.

.2 0.6 mm galvanized sheet steel.

.3 Plywood.

.4 Particle board.

.5 12 mm core encased with 0.6 mm galvanized sheet steel bonded to both faces.

.6 As indicated.

.2 Include corner pieces, trim, reinforcing and fixing angles required.

.3 Finish with baked enamel finish to match floor panels anodized finish.

.4 Steps: support system of same materials, structural strength and construction as floor panels. Include aluminum angle nosing, fascia/closure plate, tread finish.

.5 Ramps and support system: of same materials, structural strength, and construction as floor panels. Cover open joints with flush stainless steel cover plates. .
Terminate ramp with ramp shoe and threshold transition plate; include fascia/closure plate.

.6 Railings: posts and rails of extruded aluminum assembled with welded connections. Include cast metal

end caps, floor sockets and collars, brackets and fittings. Finish with anodized finish, colour selected by Departmental Representative.

2.2 ACCESSORIES

- .1 Panel lifting device: two, manufacturer's standard equipment, type recommended for each panel type. Include wall mounting bracket for panel lifter.
- .2 Adhesives: moisture resistant type as recommended by manufacturer of material to be bonded.
- .3 Cable cutout protection: closed cell neoprene sheet 9.5 mm thick, soft rubber.
- .4 Access grommets: textured plastic, sized to suit power and communication outlets colour black.
- .5 Modular power system, including in-floor service outlets for power, cable-sets and power distribution boxes in all locations as shown on drawings.
- .6 Plenum divider: aluminum plate, minimum
- .7 Plenum seal: closed cell neoprene,

2.3 FINISHES

- .1 Aluminum finishes:
 - .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 As fabricated or mill finish.
- .2 Metal finishes:
 - .1 Steel components:
 - .1 Exposed steel components: thoroughly clean surfaces, spray apply 1 coat CAN/CGSB-1.81 primer and two coats CAN/CGSB-1.88 type 2, gloss CAN/CGSB-1.104 type 2 semi-gloss paint, colour selected by Departmental Representative. Individually bake each coat.
 - .2 Concealed steel components: 1 coat CAN/CGSB-1.81 baked primer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install components to system manufacturer's instructions.

-
- .2 Pedestals and stringers:
 - .1 Arrange pedestal assemblies to meet grid spacing required.
 - .2 Bond pedestals base plate to structural floor with adhesive.
 - .3 When adhesive is cured no bond impairment acceptable when 178 N horizontal force is applied to 300 mm high pedestals. Install additional pedestal assemblies where grid pattern is disturbed by columns, walls, ramps, openings, and steps, and at cut-outs that impair floor load capacity.
 - .4 Install stringers rigidly brace floor pedestals four ways.
 - .3 Floor panels:
 - .1 Install floor panels and floor finish solidly on pedestals, level to maximum variation over entire floor of 1:2000.
 - .2 Install ramp panels similar to floor panels, securely fixed. Include shoe at top and bottom of ramp.
 - .3 Seal field cuts with plastic angles or channels. No exposed cut edges permitted.
 - .4 Provide floor and ramp complete with necessary edge trims, end closures and lateral bracing at step edges and other locations where pedestal is not braced four ways.
 - .4 Fascia panels:
 - .1 Install fascia panels at exposed sides and ramp sides.
 - .2 Secure panels to continuous angles mechanically secured to structural floor and to edge of floor panels.
 - .3 Install metal trim at intersection of fascia panels and access floor and at abutting walls and columns.
 - .5 Railings:
 - .1 Extend railing posts through floor panels to structural floor below, set into and secure to flanged fittings bolted to structural floor.
 - .2 Bolt posts in position at floor panels with retaining floor collar.
 - .3 Install railings at walls set into flanged fittings bolted to walls.
 - .4 Electrically insulate railings from, or directly ground to, access flooring system.
 - .6 Adjust floor panel system for smooth, quiet operation.

3.3 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Have manufacturer of products supplied under this Section review Work involved in handling,

installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance of Work with Contract.

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

.3 Schedule site visits to review Work at stages listed:

.1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.

.2 Twice during progress of Work at 25% and 60% complete.

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

.4 Obtain reports within three days of review and submit.

3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.
- .3 Clean aluminum with damp rag and approved non-abrasive cleaner.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 PROTECTION

- .1 Protect finished access floor with 0.15 mm thick polyethylene film, sealed at edges to prevent tearing.

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 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.

1.3 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 Section 01 33 00

- Submittal Procedures. Indicate VOCs during application and curing.

.3 Samples:

.1 Submit full range colour sample chips to indicate where colour availability is restricted.

.2 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:

.1 3 mm plate steel for finishes over metal surfaces.

.2 13 mm birch plywood for finishes over wood surfaces.

.3 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 hardboard 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 - one litre can of each type

1.6 DELIVERY, STORAGE AND HANDLING

- and colour of 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 Packing, Shipping, Handling and Unloading:
- .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.
- .2 Acceptance at Site:
- .1 Identify products and materials with labels indicating:
- .1 Manufacturer's name and address.
- .2 Type of paint or coating.
- .3 Compliance with applicable standard.
- .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:
- .1 Provide and maintain dry, temperature controlled, secure storage.
- .2 Store materials and supplies away from heat generating devices.
- .3 Store materials and equipment in well ventilated area 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 dry chemical fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .9 Waste Management and Disposal:
- .1 Remove from site and dispose of packaging

materials at appropriate recycling facilities.

.2 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).

.3 Separate for reuse and recycling and place in designated containers Steel, Metal, Plastic waste in accordance with Waste Management Plan (WMP).

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.

.6 Ensure emptied containers are sealed and stored safely.

.7 Unused paint materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.

.8 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.

.8 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.10 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.11 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).

.12 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

1.7 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Provide continuous ventilation for seven days after completion of application of paint.

- .3 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
 - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
 - .5 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Unless pre-approved written approval by Paint Inspection Agency Authority and 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 Allow new concrete and masonry to cure minimum of 28 days.
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
 - .3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
 - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
- .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality

of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.4 Additional interior application requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

.2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 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 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .9 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
 - .1 Water-based.
 - .2 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.

- .3 Manufactured without compounds which contribute to smog in the lower atmosphere.
- .4 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .10 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .11 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .12 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.
- .13 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .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 50.0 ppm weight/weight total product.
 - .3 Cadmium in excess of 1.0 ppm weight/weight total product.
 - .4 Hexavalent chromium in excess of 3.0 ppm weight/weight total product.
 - .5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

2.2 COLOURS

- .1 Submit proposed Colour Schedule to Departmental Representative for review.
- .2 Colour schedule will be based upon selection of two base colours and three accent colours. No more than five colours will be selected for entire project.
- .3 Selection of colours from manufacturers full range of colours.
- .4 Where specific products are available in restricted range of colours, selection based on limited range.

2.3 MIXING AND TINTING

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

- .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 Finish	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

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

2.5 INTERIOR
PAINTING SYSTEMS

- .1 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
 - .1 INT 9.2B - High performance architectural latex finish as indicated.

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 Stucco, plaster and gypsum board: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

3.4 PREPARATION

- .1 Protection:
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
 - .4 Protect building occupants 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 or air sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

3.6 MECHANICAL/ ELECTRICAL EQUIPMENT

- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .9 Finish inside of cupboards and cabinets as specified for outside surfaces.
- .10 Finish closets and alcoves as specified for adjoining rooms.
- .11 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- .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.

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

3.9 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.