

PART 1 - GENERAL1.1 RELATED
REQUIREMENTS

- .1 09 22 16 - Non-structural Metal Framing.
- .2 09 91 23 - Interior Painting.

1.2 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 ASTM International
 - .1 ASTM 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 - EXECUTION3.1 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.
- .2 Do not proceed with gypsum board installation until wall framing has been inspected by the Departmental Representative and written consent has been provided.

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.
- .7 Do not install damaged or damp boards.
- .8 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.4 INSTALLATION

- .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.

3.7 SCHEDULES

- .1 As indicated.

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS
- .1 Section 07 21 16 - Blanket Insulation.
 - .2 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 - GENERAL

- 1.1 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

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- 2.1 CERAMIC WALL TILE .1 Ceramic Mosaic Wall Tile: mesh mounted wall tile. Mosaic pattern to consist of rectangular tiles, in a brick pattern, tile size 15mm x 98mm. Finish to be brushed stainless steel.
- 2.2 PORCELAIN WALL TILE.1 Porcelain Wall Tile: rectangular, solid colour, high gloss finish, size 250mm x 750 mm. Tile to contain 9% pre-consumer recycled content. Colour variation to V1. Colour to be medium green-grey, selected by Departmental Representative from manufacturer's standard line of finishes.
- .2 Porcelain Wall Tile: rectangular, subtle marble pattern, high gloss finish, size 610mm x 915 mm. Tile to contain 9% pre-consumer recycled content. Colour variation to V2. Colour to be light yellow-beige, selected by Departmental Representative from manufacturer's standard line of finishes.
- 2.3 PORCELAIN FLOOR TILE.1 Porcelain tile: 400mm x 800mm x 11 mm size, slip resistant surface to R10, matte finish, striated grained pattern with a natural limestone appearance, charcoal grey colour as selected by Departmental Representative from manufacturer's standard line of finishes.
- .2 Porcelain tile: 305mm x 610mm x 11 mm size, slip resistant surface to R10, scratched finish, striated grained pattern with a natural limestone appearance, beige colour as selected by Departmental Representative from manufacturer's standard line of finishes.
- 2.4 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.
- 2.5 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.
- 2.6 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.

2.7 ACCESSORIES

.5 Transition Strips: purpose made metal extrusion; anodized aluminum type to suit thickness of tile and specific applications.

2.8 CLEANING COMPOUNDS

.1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.

.2 Materials containing acid or caustic material are not acceptable.

PART 3 - EXECUTION

3.1 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

- 1.1 Related Sections .1 Section 09 53 00.01 - Acoustical Suspension.
- 1.2 References .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.
- 1.3 Submittals .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.
- 1.4 Delivery, Storage and Handling .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 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 1:
 - .1 Type III, Form 1 or 2, Pattern G for acoustical unit Type 1. Type XII, Form 2, Pattern E or G for acoustical unit Type 2.
 - .2 Class A.
 - .3 Mineral wool: Slag wool fibre, minimum 75% recycled content for acoustical unit Type 1. Fiberglass for acoustical unit Type 2.
 - .4 Size: 508mm x 1524mm 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 of .7 to ASTM C423.
 - .9 Sound Absorption Average (SAA) of 0.9 minimum to ASTM C4 23.
 - .10 Ceiling Attenuation Class(CAC) of 35 minimum to ASTM E 1414-00a.
 - .11 Light Reflectance (LR) range of .85 to ASTM E1477.
 - .12 Edge type Square.
 - .13 Colour white.
 - .14 Shape flat.
 - .15 Surface coverings: low VOC, solvent-free water based latex paint, factory applied.

- .2 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

3.1 Examination

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

3.2 Installation

- .1 Install acoustical panels and tiles in ceiling suspension system.

3.3 Application

- .1 Refer to reflected ceiling plan.

- .2 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.
- 3.4 Interface with Other Work .1 Co-ordinate ceiling work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.
- 3.5 Schedule .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 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.
.3 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture and lateral bracing and accessories.
- .4 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be returned for inclusion into work.
.3 Submit 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 QUALITY
ASSURANCE

- .1 Fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 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 - PRODUCTS2.1 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. 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.

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- .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 and Certification Organizations tested design requirements.
- .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 as indicated acceptable to Departmental Representative .
- .6 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .7 Lay out system according to reflected ceiling plan.
- .8 Ensure suspension system is co-ordinated with location of related components.

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- .9 Install wall moulding to provide correct ceiling height.
 - .10 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers .
 - .11 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.
 - .12 Attach cross member to main runner to provide rigid assembly.
 - .13 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
 - .14 Install access splines to provide 50% ceiling access.
 - .15 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.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
 - .1 Touch up scratches, abrasions, voids and other defects in painted surfaces.

3.4 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

- 1.1 Related Sections
- .1 Section 09 65 19 - Resilient Tile Flooring.
 - .1 Section 09 68 13 - Tile Carpeting.
 - .2 Section 09 69 00 - Access Flooring.
- 1.2 References
- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM F 1303-04, Standard Specification for Sheet Vinyl Floor Covering with Backing.
- 1.3 Samples
- .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.
- 1.4 Closeout Submittals
- .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.5 Extra Materials
- .1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Provide 5 m² 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.
- 1.6 Environmental Requirements
- .1 Maintain air temperature and structural base temperature at flooring installation area above 20° for 48 hours before, during and 48 hours after installation.
- 1.7 Waste Management and Disposal
- .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: as indicated.
- .2 Feature strips: of same material and thickness as adjacent work mm wide, in colour indicated 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.
- .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.

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- .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 - GENERAL

- 1.1 RELATED SECTIONS
- .1 Section 09 65 16 - Resilient Sheet Flooring.
 - .2 Section 09 68 13 - Tile Carpeting.
- 1.2 REFERENCES
- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM F 1066-04, Standard Specification for Vinyl Composition Floor Tile.
 - .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-25.20-95, Surface Sealer for Floors.
 - .2 CAN/CGSB-25.21-95, Detergent-Resistant Floor Polish.
 - .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
 - .4 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.
- 1.3 ACTION AND INFORMATIONAL 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.
 - .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate tile in size specified and 300 mm long base.
 - .4 Closeout Submittals:
 - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.4 DELIVERY, STORAGE AND HANDLING
- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- 1.5 ENVIRONMENTAL REQUIREMENTS
- .1 Maintain air temperature and structural base temperature at flooring installation area above [20] degrees C for 48 hours before, during and for 48 hours after installation.
- 1.6 MAINTENANCE
- .1 Extra Materials:
 - .1 Provide maintenance materials of resilient tile

flooring, base and adhesive in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 1 m² of each colour, pattern and type flooring material required for this project for maintenance use.

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

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

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

.6 Store where directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Vinyl tile ("Luxury Vinyl Tile"): to ASTM F 1066, Class 3 - surface patterned, embossed, 2.2 mm, 1221 x 178 mm size, in woodgrain pattern, colour selected by Departmental Representative.
- .2 Static dissipative tile: to ASTM F 1066, Class 2 - through pattern, 3.2 mm, 305 mm x 305 mm size, colour and pattern selected by Departmental Representative.
- .3 Finish:
- .1 Vinyl tile ("Luxury Vinyl Tile"): Factory prefinished.
- .2 Static dissipative tile: applied on site per manufacturers written instructions.
- .4 Resilient base: to vinyl, minimum 1200 mm length and 100 mm high x 3.2 mm thick, including premoulded end stops and external corners for coved base only, of colour selected by Departmental Representative.
- .5 Primers and adhesives: waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade.
- .1 Flooring adhesives:
- .1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.
- .2 Cove base adhesives:
- .1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.
- .6 Sub-floor filler and leveller: white premix latex requiring water only to produce cementitious paste as recommended by flooring manufacturer for use with their product.

PART 3 - EXECUTION

3.1 MANUFACTURER'S

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product

INSTRUCTIONS

technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSPECTION

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

3.3 SUB-FLOOR TREATMENT

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

3.4 TILE APPLICATION

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.
- .2 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.
- .4 Install flooring to ashlar/staggered pattern with continuous joints flowing with direction of mottle and parallel to length of room, as indicated.
- .5 As installation progresses, and after installation, roll flooring in 2 directions with 45 kg minimum roller to ensure full adhesion.
- .6 Cut tile and fit neatly around fixed objects.
- .7 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

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- .8 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 BASE APPLICATION

- .1 Lay out base to keep number of joints at minimum. Base joints at maximum length available
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .7 Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles, minimum [300] mm each leg. Wrap around toeless base at external corners.
- .8 Install toeless type base before installation of carpet on floors.

3.6 FIELD QUALITY CONTROL

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

3.7 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 instructions. In carpeted areas clean, seal and wax base surface before carpet installation.

3.8 PROTECTION

- .1 Protect new floors from time of final set of adhesive until final inspection.
- .2 Prohibit traffic on floor for 48 hours after installation.

3.9 SCHEDULE

- .1 Refer to drawings.

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 09 65 16 - Resilient Sheet Flooring.
- .2 Section 09 65 19 - Resilient Tile Flooring
- .3 Section 09 69 00 - Access Flooring.

1.2 REFERENCES

- .1 American Association of Textile Chemists and Colorists (AATCC)
 - .1 AATCC 16, Color Fastness to Light.
 - .2 AATCC 23, Color Fastness to Burn Gas Fumes.
 - .3 AATCC 129, Color Fastness to Ozone in the Atmosphere Under High Humidities.
 - .4 AATCC 134, Electrostatic Propensity of Carpet.
 - .5 AATCC 171, Hot Water Extraction for colourization, dimensional stability and permanency of finishes.
 - .6 AATCC 175, Stain Resistance: Pile Floor Coverings.
 - .7 AATCC 189, Fluorine Content of Carpet Fibers.
 - .8 AATCC 165, Colorfastness to Crocking.
- .2 American Society for Testing and Materials (ASTM International)
 - .1 ASTM D1055, Specification for Flexible Cellular Materials - Latex Foam.
 - .2 ASTM D1335, Tuft Bind of Pile Floor Coverings
 - .3 ASTM D1667, Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
 - .4 ASTM D3936, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
 - .5 ASTM D5252, Standard Practice for the Operation of the Hexapod Drum Tester.
 - .6 ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - .7 ASTM E662, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No.27.6-M91, Textile Test Methods-Flame Resistance-Methemine Tablet Test for Textile Floor Coverings.
 - .2 CAN/CGSB-4.2 No.77.1-94/ISO 4919, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.
 - .3 Aachner/ISO 2551 Dimensional Stability.
 - .3 CAN/CGSB-4.129, CAN/CGSB-4.161M, Carpets for Commercial Use.
 - .4 CAN/CGSB-25.20, Surface Sealer Floors
 - .5 CAN/CGSB-4.2 No.18.8 Colourfastness of Light.
- .4 Carpet and Rug Institute (CRI)
 - .1 CRI-104-96, Standard Installation of Commercial Carpet.
 - .2 IAQ Carpet Testing Program.

- .5 National Floor Covering Association (NFCA)
 - .1 Floor Covering Specification Manual
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102.2, Surface Burning Characteristics of Flooring, Floor Covering.

1.3 TESTING, SUBMITTALS AND SAMPLES

- .1 TESTING:
 - .1 At the time of product delivery to the work site, the Contractor must turn over a representative sampling range of materials for testing to the Departmental Representative.
Note: The Departmental Representative shall have full authority to select materials for testing from an unrestricted range of unopened, original containers or wrappings with Manufacturer's seals and labels intact, after materials have been delivered to the work site.
 - .2 The following tests may be requested to be carried out by an independent laboratory and /or by the Departmental Representative. This list is representative only and should not be considered comprehensive. Although date may not be mentioned below, it is understood that the latest testing date is to be used (eg: AATCC-16-2004). Other tests may requested/conducted at the sole discretion of the Departmental Representative.
 - .1 AATCC 16, Color Fastness to Light, minimum L5 after 40 hours.
 - .2 Testing against CAN/CGSB-4.129M, CAN/CGSB-4.161M, one quality in construction only for a light, medium and dark colour.
 - .3 Aachner/ISO 2551 Dimensional Stability, maximum 0.15 % change.
 - .4 ASTM D 3936, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering. Minimum 3 lbs per inch/5 Newtons /cm.
 - .5 Pile Density (calculation not test) - minimum 9.5 Kilotex. Provide calculations of determined kilotex.
 - .6 Appearance Retention Hexapod Drum Test, ASTM D5252 for 12,000 cycles, minimum rating of 3.0 using CRI TM-101 Reference Scales.
 - .7 AATCC 175, Stain Resistance: Pile Floor Coverings. minimum 2 washings to simulate removal of topical treatments by hot water extraction, followed by: AATCC 175, minimum of 8 using AATCC Red Dye 40 Reference Scale.
 - .8 Soil Resistance: An average of 3 fluorine analyses AATCC 189 of a single composite sample to be a minimum of 300 ppm fluorine by weight when new and an average of 3 fluorine analyses using AATCC 189 to be a maximum of 200 ppm fluorine by weight after 2 AATCC 171 (HWE) cleanings.
 - .9 CAN/CGSB 4.2 method 77.1/ISO 4919 Carpet-Determination of Tuft withdrawal Force - minimum 35 N force.
 - .10 CAN/CGSB 4.2, No. 27.6-M91, Textile Test Methods- Flame Resistance - Methemine Tablet Test for Textile Floor

- Coverings, sampling by CAN/CGSB-4.155, as required under the Hazardous Products Act.
- .11 Maximum flame spread rating 300, maximum smoke developed classification 500, when tested to CAN/ULC-S102.2.
 - .12 Smoke Density: (ASTM E-662) <450.
 - .13 AATCC 134, Electrostatic Propensity of Carpet: maximum 3500 v at 20% RH and 22°C
 - .14 AATCC 165 Colourfastness to Crocking, greater than or equal to Grey Scale 4 wet, dry.
 - .15 AATCC 171 Carpets: Cleaning of: Hot water extraction method followed by AATCC 175 Stain resistance Pile Floor coverings. Rating to AATCC red 40 Stain scale.
 - .16 AATCC 164, Colorfastness to Oxides of Nitrogen in the Atmosphere under High Humidity for 3 cycles. Rating to AATCC Gray Scale for Colour Change.
- .3 Testing to be conducted by an independent testing agency accredited to do the specified tests, by the Standards Council of Canada or by the U.S. National Institute of Science and Technology's National Voluntary Accreditation Program (NVLAP).
 - .4 To be considered independent, a testing agency shall not in any way be involved or have an interest in the manufacture or sale of the product being tested.
- .2 SUBMITTALS:
- .1 Submit control submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit verification to demonstrate compliance with CAN/ULC S102.2.
 - .3 Submit proof that carpet has been tested and passed the Indoor Air Quality (IAQ) Carpet Testing Program requirements of the Carpet and Rug Institute (CRI) Green Label Plus Indoor Air Quality Test Program and the Canadian Carpet Institute (CCI).
 - .4 Submit report verifying that tuft bind meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No. 77.1/ISO 4919.
 - .5 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.
 - .6 Submit certification and description of carpet reclamation and recycling process.
 - .7 Annex A, completed indicating all information on carpet: product/supplier; nylon: supplier/type/percentages if more than one type; list of colours: colour names/descriptions
- .3 SAMPLES:
- .1 Submit duplicate architectural product folders of standard range carpet goods, which include samples of full range of colours as well as the following:
 - .1 One full size tile sample to indicate texture, colour and patterning.

1.4 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 00 10 - General Instructions.
- .2 Submit product data sheet for each carpet, adhesive including "peel and stick" type, carpet protection and sub floor filler patching compound.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets acceptable to Labour Canada and Health Canada for carpet adhesive and seam adhesive. Indicate VOC content.
- .4 Submit data on specified products, describing physical and performance characteristics, sizes, patterns, colours and methods of installation.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit maintenance data in accordance with Section 01 00 10 - General Instructions: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.
- .2 Schedule of carpet reclamation activities indicating following:
 - .1 Detailed sequence of removal work.
 - .2 Inventory of items to be removed and reclaimed.
 - .3 Proposed packing and transportation measures.
- .3 Reclamation agencies' records indicating receipt and disposition of used carpet.
- .4 Certification: Reclamation Agency to verify in writing that used carpet was removed and recycled in accordance with fibre manufacturer's reclamation program.
 - .1 Record off-site removal of debris and materials and provide following information regarding removed materials:
 - .1 Time and date of removal.
 - .2 Type of material.
 - .3 Weight and quantity of materials.
 - .4 Final destination of materials.

1.6 QUALIFICATIONS

- .1 Installer Qualifications
 - .1 Flooring contractor requirements:
 - .1 Specialty contractor normally engaged in this type of work, with prior experience in installation of these types of materials.
 - .2 Certified by carpet manufacturer for carpet installation.
 - .3 Must not sub-contract labour without written approval of the Departmental Representative.
 - .2 Be responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturers written instructions.

1.7 REGULATORY REQUIREMENTS

- .1 Prequalification: compliance with Health Canada regulations under "Hazardous Products Act", Part II of the Schedule, tested to CAN/CGSB 4.2-No.27.6.
- .2 Indoor Air Quality: compliance with CRI/CCI Green Label Plus Indoor Air Quality Program, CRI/CCI-IAQ requirements for maximum total volatile chemicals released into air. Label each carpet product with CRI/CCI-IAQ label.

1.8 DELIVERY, STORAGE AND HANDLING

- .1 Label packaged materials. For modular carpet products indicate nominal dimensions of tile and indicate installation direction if any.
- .2 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.
- .3 Store carpeting and accessories in location as directed by Departmental Representative. Store carpet and adhesive at minimum temperature of 18 degrees C and relative humidity of maximum 65% for minimum of 48 hours before installation.
- .4 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.
- .5 Store materials in area of installation for minimum period of 48 hours prior to installation.
- .6 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.
- .7 Refer to 3.9 Additional Materials

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Not required.

1.10 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS

- .1 Not required.

1.11 WARRANTY

- .1 Carpet Tile: Provide a 10 year warranty for wear beyond 10% of pile fibre and static control.

1.12 SCHEDULE

- .1 The carpet must be delivered on site within 4 weeks (20 working days) of approval of the submitted carpet selection by the Departmental Representative.

Part 2 Products

2.1 MANUFACTURERS

- .1 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute IAQ requirements.

2.2 MODULAR CARPET

- .1 Project Requirements:
 - Type 1: Field Carpet: tufted, multi-colour linear patterned loop.
 - Type 2: Accent Carpet, solid colour, no graphic pattern. A total of two accent carpets in different colours will be utilized - refer to drawings for locations and quantity.
- .2 Carpet Tile Dimensions:
 - .1 Type 1: minimum 500 mm x 500 mm; maximum 610 mm x 610 mm.
 - .2 Type 2: minimum 500 mm x 500 mm; maximum 610 mm x 610 mm.
- .3 Carpet: to CAN/CGSB 4.129 and as follows:
 - .1 Certified for flammability to Health Canada regulations under "Hazardous Products (Carpet) Regulations" Part II of the Schedule.
 - .2 Maximum flame spread rating 300, maximum smoke developed classification 500 when tested to CAN/ULC-S102.2.
 - .3 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute's IAQ requirements. Carpet is to be CRI Green Label Plus Certified.
 - .4 Performance rating to ASTM D 5417.
 - .5 Smoke Density (ASTM E-662) <450.
- .4 Construction:
 - .1 Tufted-level Loop.
- .5 Pile Fibre: CAN/CGSB 4.129.
 - .1 100% first quality, bulk continuous filament nylon. Fibre shape to have maximum Modification Ratio of 2.2 for soil release capabilities.
 - .2 CRI Green Label Plus Certified.
- .6 Yarn Ply:
 - .1 Multiple Plies.
- .7 Pile Weight: Minimum 576 gm/m² (17 oz/sq yard)
- .8 Pile Density: minimum 10 Kilotex.
- .9 Yarn Dye Method:
 - .1 Field Carpet: 100% solution dyed.
 - .2 Accent Carpets: Solution Dyes or Yarn Dyed.
- .10 Colourization: multiple colour tones.
 - .1 Field Carpet: multiple colour tones, subtle combination of linear and geometric pattern, in shades of grey.
 - .2 Accent Carpets: solid or heathered texture, giving the appearance of a solid colour. Two colours required: purple and green, selected from the manufacturer's standard range of colours.

- .11 Colourfastness to Crocking AATCC 165 > or - than 4.0 wet, dry.
- .12 Primary Backing: non-woven.
- .13 Secondary Backing: PVC, polyolefin and other polymetric systems.
 - .1 Density: as per ASTM D 1667.
 - .2 Dimensional Stability: ISO 2551 (Aachner Test), maximum 0.15% change.
 - .3 Delamination: ASTM D3936: minimum 5N/cm
- .14 Colour, texture and pattern to be selected from bidder's standard range of carpet product.
 - .1 Pattern should be integrated within the face material and not applied after surface manufacturing.
 - .2 Multiple colour tones in medium colour (not light nor dark) to reduce the visible effects of soiling and staining.
 - .3 Field Carpet: Minimum 4 individual colours within one carpet tile (for field colour).
 - .4 Accent Tile: Minimum 1 colour or more to give the appearance of a solid colour
- .15 Installation:
 - .1 Type 1 Random / non-directional (installer places carpet on floor without any regard to arrows or patterning).
Type 2 and 3: Standard Lay (installer will have to follow arrows and manufacturer's instructions for all arrows in same direction (monolithic) or quarter turn or brick/ashlar.
 - .2 Contractor must verify and obtain written approval for installation with the Departmental Representative on-site prior to installation.
- .16 Adhesives
 - .1 Releasable, pressure sensitive adhesive to conform to carpet manufacturers specifications.
 - .2 Acrylic polymer emulsion, resin mixture, latex adhesive.
 - .3 Alternate adhesive method may be required to be used (eg: "peel and stick") at the discretion of the Departmental Representative. Method and materials to be recommended and approved by carpet supplier.
- .17 Recycling
 - .1 New Carpet: Must be eligible for recycling by the supplying mill or fibre producer within an existing program in place; submit program parameters.
- .18 Recycled Content:
 - .1 Total product recycled content: minimum of 50% recycled content.

2.4 SPECIAL REQUIREMENTS - ALL PRODUCTS

- .1 Soil Resistance: An average of 3 fluorine analyses AATCC 189 of a single composite sample to be a minimum of 300 ppm fluorine by weight when new and an average of 3 fluorine analyses of a single composite using AATCC 189 to be a maximum of 200 ppm fluorine by weight after 2 AATCC 171 (HWE) cleanings.

- .2 Stain Resistance: AATCC 171 minimum 2 washings tas per AATCC 171 to simulate removal of topical treatments by hot water extraction, followed by: AATC 175, minimum of 8 using AATCC Red 40 Reference Scale.
- .3 Appearance Retention: Hexapod Drum ASTM D5252 for 12,000 cycles, minimum rating of 3.0 using CRI TM-101 Reference Scales.
- .4 Permanent static control: to AATCC 134, 3500V maximum at 20% RH and 22°C.
- .5 CAN/CGSB 4.2, No. 27.6-M91, Textile Test Methods- Flame Resistance - Methemine Tablet Test for Textile Floor Coverings, sampling by CAN/CGSB-4.155, as required under the Hazardous Products Act.
- .6 AATCC 165 Colourfastness to Crocking, greater than or equal to 4 wet, dry.
- .7 AATCC 164, Colorfastness to Oxides of Nitrogen in the Atmosphere under High Humidity for 2 cycles. Minimum rating of 4 on AATCC Gray Scale for Colour Change.

2.5 ACCESSORIES

- .1 Base
 - .1 Carpet base: 100 mm high, roll goods material, colour, pattern and texture similar to adjoining carpet, serged edge. Sample to be approved by the Departmental Representative before installation, selected from three separate serging options.
- .2 Seaming tape: types recommended by carpet manufacturer for purpose intended.
- .3 Seaming sealer adhesive: type recommended by carpet manufacturer for purpose intended.
- .4 Carpet protection: non-staining heavy duty kraft paper.
- .5 Concrete floor sealer: to CAN/CGSB 25.20, type 1.
- .6 Sub floor patching compound: Portland cement base filler, mix with latex and water to form a cementations paste.

Part 3 Execution

3.1 DEMOLITION

- .1 Remove and return carpet for recycling. Provide a Reclamation Certificate, containing contact information (names, phone number and e-mail address) from the recycling facility, for existing carpet being removed and recycled.

3.2 SUB-FLOOR TREATMENT

- .1 Concrete, plywood sub-floor and wood floor boarding shall be inspected to determine special care required to make it a suitable foundation for carpet. Cracks 3 mm wide or protrusions over 0.8 mm will be filled and leveled with appropriate and compatible latex patching compound.
- .2 Do not exceed manufacturer's recommendations for patch thickness.
- .3 Large patch areas are to be primed with a compatible primer.
- .4 Concrete substrates shall be cured, clean and dry.
- .5 Concrete substrates shall be free of paint, dirt, grease, oil, curing or parting agents and other contaminants, including sealers that may interfere with the bonding of the adhesive.
- .6 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

3.3 PREPARATION

- .1 Prepare floor surfaces in accordance with CRI 104 Standard for Installation of Commercial Carpet.
- .2 Pre-condition carpeting following manufacturer's printed instructions.

3.4 INSTALLATION

- .1 Install carpeting using minimum of pieces.
- .2 Install in accordance with manufacturer's printed instructions and in accordance with Carpet and Rug Institute Standard for Installation of Commercial Carpet, CRI 104.
- .3 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.
- .4 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.
- .5 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.
- .6 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .7 Install carpet smooth and free of bubbles, puckers, and other defects.
- .8 Apply acrylic release type adhesive and install modular carpet tile in accordance with manufacturer's written instructions.
- .9 Lay modular carpet with butt seams.

- .10 Roll modular carpet with appropriate roller for complete contact of carpet with mill-applied adhesive to sub-floor.

3.5 SEAMS

- .1 Seal edges of cutouts as per manufacturer's recommendations.
- .2 Carpet visibility of seams and joints to acceptable industry standards.

3.6 BASE INSTALLATION

- .1 Install serged edge carpet base or vinyl base as required to match adjacent carpeting.
- .2 Attach carpet to wall with adhesive. Neatly fit against floor carpet.

3.7 PROTECTION OF FINISHED WORK

- .1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.
- .2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.
- .3 Install carpet protection to satisfaction of Departmental Representative.

3.8 ADDITIONAL MATERIALS

- .1 Provide additional materials as follows: 5% of the contract area.

PART 1 - GENERAL

- 1.1 RELATED REQUIREMENTS
- .1 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 Where mechanical anchors are required for seismic zones, provide same as required by project specific seismic calculations.

- .3 Threaded stud size 19mm diameter, steel.
- .4 Head assembly designed so that the panels are held in place with or without corner-lock fasteners.
- .5 Pedestal assembly shall provide an adjustment range of +/- 25mm when finished floor height is 152mm or more, adjustable at .4mm increments.
- .6 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.
- .7 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 - GENERAL1.1 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.

1.6 DELIVERY,
STORAGE AND
HANDLING

- .2 Quantity: provide one - one litre can of each type 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 four accent colours. No more than six 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.

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

2.3 MIXING AND TINTING

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

2.4 GLOSS/SHEEN RATINGS

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

	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10
Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

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

2.5 INTERIOR
PAINTING SYSTEMS

- .1 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 - EXECUTION3.1 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.

- .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.

3.6 MECHANICAL/
ELECTRICAL
EQUIPMENT

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

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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.