

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Waste Management And Disposal.

1.2 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C36/C36M-01, Specification for Gypsum Wallboard.
 - .2 ASTM C79/C79M-01, Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.
 - .3 ASTM C442/C442M-01, Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.
 - .4 ASTM C475-01, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .5 ASTM C514-01, Specification for Nails for the Application of Gypsum Board.
 - .6 ASTM C557-99, Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .7 ASTM C630/C630M-01, Specification for Water-Resistant Gypsum Backing Board.
 - .8 ASTM C840-01, Specification for Application and Finishing of Gypsum Board.
 - .9 ASTM C954-00, 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.
 - .10 ASTM C1002-01, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .11 ASTM C1047-99, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .12 ASTM C1280-99, Specification for Application of Gypsum Sheathing Board.
- .2 Association of the Wall and Ceilings Industries International (AWEI)
- .3 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.
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-1988 (R2000), Surface Burning Characteristics of Building Materials and Assemblies.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver materials in original packages, containers or bundles bearing manufacturers brand name and identification.
- .2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.
- .3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

1.4 SITE ENVIRONMENTAL REQUIREMENTS

- .1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours 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.

1.5 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 300 x 300 mm size samples of gypsum board and 300 mm long samples of corner and casing beads.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Departmental Representative.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .5 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

- .1 Standard board: to ASTM C36/C36M regular, 16 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges squared.

- .2 Gypsum sheathing board: to ASTM C79/C79M, regular, 16 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length.
- .3 Backing board and coreboard: to ASTM C442/C442M regular, 16 mm thick and Type X, 16 mm thick, squared edges.
- .4 Water-resistant board: to ASTM C630/C630M regular, 16 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length.
- .5 Metal furring runners, hangers, tie wires, inserts, anchors: galvanized.
- .6 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .7 Resilient drywall furring : 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .8 Nails: to ASTM C514.
- .9 Steel drill screws: to ASTM C1002.
- .10 Stud adhesive: to CAN/CGSB-71.25 / ASTM C557.
- .11 Laminating compound: as recommended by manufacturer, asbestos-free.
- .12 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by electrolytic process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .13 Sealants: in accordance with Section 07 92 00 - Joint Sealing.
- .14 Acoustic sealant: purpose type.
- .15 Polyethylene: to CAN/CGSB-51.34, Type 2.
- .16 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.
- .17 Joint compound: to ASTM C475, asbestos-free.

2.2 FINISHES

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

Part 3 Execution

3.1 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C1280.

- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install work level to tolerance of 1:1200.
- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, 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 between the layers of gypsum board, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.2**APPLICATION**

- .1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.
- .2 Apply single double layer gypsum board to metal furring or framing using screw fasteners for first layer. Maximum spacing of screws 300 mm on centre.
 - .1 Single-Layer Application:
 - .1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.
 - .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 single layer gypsum board to concrete block surfaces, where indicated, using laminating adhesive.
 - .1 Comply with gypsum board manufacturer's recommendations.
 - .2 Brace or fasten gypsum board until fastening adhesive has set.
 - .3 Mechanically fasten gypsum board at top and bottom of each sheet.
- .4 Apply water-resistant gypsum board adjacent to slop sinks janitors closets. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads.
- .5 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.
- .6 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.
- .7 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.
- .8 Install gypsum board with face side out.
- .9 Do not install damaged or damp boards.
- .10 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

3.3 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.
- .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 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .6 Provide continuous polyethylene dust barrier behind and across control joints.

- .7 Locate control joints at changes in substrate construction, at approximate 10 m spacing on long corridor runs, at approximate 15 m spacing on ceilings.
- .8 Install control joints straight and true.
- .9 Construct expansion joints, at building expansion and construction joints. Provide continuous dust barrier.
- .10 Install expansion joint straight and true.
- .11 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .12 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .13 Splice corners and intersections together and secure to each member with 3 screws.
- .14 Install access doors to electrical and mechanical fixtures specified in respective sections.
- .1 Rigidly secure frames to furring or framing systems.
- .15 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.
- .16 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:
 - .1 Levels of finish:
 - .1 Level 3 (Above Ceiling Only): Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .2 Level 4 (Typical): Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
- .17 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .18 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .19 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .20 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .21 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
- .22 Mix joint compound slightly thinner than for joint taping.

- .23 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.
- .24 Allow skim coat to dry completely.
- .25 Remove ridges by light sanding or wiping with damp cloth.
- .26 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.
- .27 At existing salvaged door frames originally installed with 12.7 mm gypsum wall board, mitre and scribe new 15.7 mm board along the edges to accommodate the existing door frame. Patch and make ready for paint.

3.4 SCHEDULES

- .1 Construct fire rated assemblies where indicated.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Related Sections:
 - .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section 01 35 29.06 - Health and Safety Requirements.
 - .3 Section 01 45 00 - Quality Control.
 - .4 Section 01 74 21 - Waste Management and Disposal.
 - .5 Section 01 78 00 - Closeout Submittals.
 - .6 Section 02 81 01 - Hazardous Materials.
 - .7 Section 09 53 00.01 - Acoustical Suspension: Suspension system.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C423-02a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - .2 ASTM E1264-98, Standard Classification for Acoustical Ceiling Products.
 - .3 ASTM E1477-98a (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 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 full size samples of each type acoustical units.

1.4 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by Canadian Certification Organization accredited by Standards Council of Canada.
- .2 Mock-up:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

- .2 Construct mock-up 10 m² minimum of each type acoustical tile ceiling including one inside corner and one outside corner.
- .3 Construct mock-up where directed.
- .4 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with ceiling work.
- .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.
- .3 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 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 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction /Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

1.6 ENVIRONMENTAL REQUIREMENTS

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

1.7 EXTRA MATERIALS

- .1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide acoustical units amounting to 2% of gross ceiling area for each pattern and type required for project. Deliver to Departmental Representative, upon completion of the work of this section.
- .3 Ensure extra materials are from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.

2.1 MATERIALS

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1 / ASTM E1264. Purpose made ceiling panel with perimeter reveal edge. Refer to Reflected Ceiling Plans for grid and tile sizes.
- .2 610 x 610 Ceiling tile to be #2195 Minatone Cortega 24" x 24" x 5/8" for 9/16" grid. Cut the tiles edges to fit existing grid.
 - .1 Type III.
 - .2 Class A.
 - .3 Pattern E.
 - .4 Textures: lightly textured nodular lay-in panels.
 - .5 Flame spread Classification Class A, or less in accordance with CAN/ULC-S102.
 - .6 Smoke developed accordance with CAN/ULC-S102.
 - .7 Noise Reduction Coefficient (NRC) designation of 0.60. Sound Absorption Average (SAA) of 0.9 to ASTM C423.
 - .8 Ceiling Attenuation Class (CAC) rating 35, in accordance with ASTM E1264
 - .9 Light Reflectance (LR) coefficient of 0.82 and Light Reflectance Designation of LR-1 to ASTM E1477.
 - .10 Edge type: reveal edge.
 - .11 Colour: White.
 - .12 Size 19 mm x 610 mm x 1220 mm thick. (Metric units)

Part 3 Execution**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 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width. Refer to reflected ceiling plan.
- .2 Scribe acoustic units to fit adjacent work. Butt joints tight terminate edges with ceiling suspension trim.

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.

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END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 – Submittal Procedures
- .2 Section 01 61 00 - Common Product Requirements.
- .3 Section 01 74 21 -Waste Management and Disposal.
- .4 Section 09 51 13 Acoustical Panel Ceilings.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C635-04, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636/C636M-06, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

1.3 DESIGN REQUIREMENTS

- .1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit drawings stamped and signed by professional Departmental Representative registered or licensed in Province of Saskatchewan, 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 and acoustical unit support at ceiling fixture, lateral bracing and accessories.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit one representative model of each type ceiling suspension system.
 - .2 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Waste Management and Disposal.

1.6 MAINTENANCE

- .1 Furnish additional material equal to 1% of ceiling area. Store at location as directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Heavy duty double web suspension system to ASTM C635.
- .2 Main Runners:
 - .1 Manufactured from 0.5 mm thick steel, 23.8 mm wide by 38.1 mm high by 3.65 m long with factory punched cross tee slots, hanger holes and integral bayonet-style end couplings.
 - .2 Capped with steel capping affixed to 23.8 mm flange.
 - .3 Coated with factory applied standard colour finish.
- .3 Cross Tees:
 - .1 Manufactured from 0.5 mm thick steel, 23.8 mm wide by 38.1 mm high by 2.44 m long with factory punched cross tee slots and hanger holes.
 - .2 Capped identical to main runners.
 - .3 Coated identical to main runners.
- .4 Perimeter Treatment Components:
 - .1 Angle mouldings: manufactured from 0.5 mm thick steel, 23.8 mm wide by 38.1 mm high by 3.65 m long with steel capped hammered edges; finished identical to main runners and cross tees.
 - .2 Channel mouldings: manufactured from 0.45 mm thick steel with factory applied standard white baked on enamel paint finish. Moulding to match ceiling grid system.
- .5 Basic materials for suspension system: commercial quality cold rolled steel, zinc coated, mill finished.
- .6 Exposed tee bar grid components: 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.
- .7 Hanger wire: galvanized soft annealed steel wire:
 - .1 3.6 mm diameter for access tile ceilings.
- .8 Hanger inserts: purpose made.
- .9 Carrying channels: 38 x 38 mm channel, of 3 mm thick galvanized steel.
- .10 Accessories: splices, clips, wire ties, retainers and wall moulding reveal, to complement suspension system components, as recommended by system manufacturer.

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 INSTALLATION

- .1 Installation: in accordance with ASTM C636 except where specified otherwise.
- .2 Install suspension system to manufacturer's instructions.
- .3 Do not erect ceiling suspension system until work above ceiling has been inspected by Departmental Representative.
- .4 Secure hangers to overhead structure using attachment methods as indicated.
- .5 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
- .6 Lay out centre line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width and according to reflected ceiling plan.
- .7 Ensure suspension system is co-ordinated with location of related components.
- .8 Install wall moulding to provide correct ceiling height.
- .9 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.
- .10 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .11 Interlock cross member to main runner to provide rigid assembly.
- .12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
- .13 Install access splines to provide 50 percent ceiling access.
- .14 Finished ceiling system to be square with adjoining walls and level within 1:1000.
- .15 Expansion joints:
 - .1 Erect two main runners parallel, 25 mm apart, on building expansion joint line. Lay in strip of acoustic tile/board, painted black, 25% narrower than space between 2 'T' bars.
 - .2 Supply and install "Z" shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25 mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.

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3.3

CLEANING

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Touch up scratches, abrasions, voids and other defects in painted surfaces.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 01 78 00 - Closeout Submittals.

1.2 SUBMITTALS

- .1 Provide submittals, product data and samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit duplicate 300 x 300 mm sample pieces of sheet material, 300 mm long base.
- .2 Closeout Submittals:
 - .1 Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 DELIVERY, STORAGE AND HANDLING

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

1.4 SPECIAL CONDITIONS

- .1 Schedule the work with the NCO IC so as to ensure continuity of the police operation. Maintain the security of the building throughout the project.
- .2 Provide all labour to remove and replace furniture, storage cabinets, etc, to accommodate flooring replacement. Store articles as directed by NCO IC.
- .3 All removal and reinstallation of existing baseboard and / or quarter round shall be part of the contract and shall be included as part of the tendered price. No extra will be allowed for failure to include this work.
- .4 Provide all labour, material and equipment necessary to remove the existing floor covering, baseboard, and / or quarter round and apply new floor covering with baseboard and quarter round as applicable.

1.5 MAINTENANCE

- .1 Extra Materials:

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

Part 2 Products

2.1 MATERIALS

- .1 Sheet vinyl with backing: to ASTM F1303, commercial. Random multi-sized vinyl chips embedded in a vinyl matrix. Colors and pattern detail are dispersed throughout the thickness of the wear layer. Color pigments are insoluble in water and resistant to cleaning agents and light.
 - .1 Type II - PVC binder content 34%.
 - .2 Grade: 1, Class A.
 - .3 Backing: A-fibrous (Non-asbestos formulated).
 - .4 Pattern: flush.
 - .5 Colour: selected by Architect from manufacturer's standard colour range.
 - .6 Thickness: 2.0 mm overall / 1.27 mm wear layer.
 - .7 Size: 1.83 m wide by 28.8 m long.
 - .8 Shipping Weight: 3.3 kg / sq m.
 - .9 Fire test data: ASTM E648 Class 1 – 0.45 watts / sq cm or more.
 - .10 Smoke test data: ASTM E 652 450 or less
- .2 Resilient base: continuous, top set, complete with premoulded end stops and external corners:
 - .1 Type: rubber.
 - .2 Style: cove.
 - .3 Thickness: 3.17 mm.
 - .4 Height: 101.6 mm.
- .3 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
 - .1 Cove base adhesives:
 - .1 Adhesive: maximum VOC limit 50 g/L to SCAQMD Rule 1168.
- .4 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.
- .5 Metal edge strips:

- .1 Aluminum extruded, smooth, mill finish with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .6 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.
- .1 Sealer: maximum VOC limit 100 g/L to SCAQMD Rule 1113.

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 SITE VERIFICATION OF CONDITIONS

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

3.3 PREPARATION

- .1 Remove existing 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 Apply levelling material to resilient flooring manufacturer's printed instructions.

3.4 APPLICATION: FLOORING

- .1 Provide high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Do not let contaminated air recirculate through district or whole building air distribution system.
- .2 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .3 Lay flooring with seams parallel to building lines to produce a minimum number of seams.
- .4 Run sheets in direction of traffic. Double cut sheet joints and continuously seal, heat weld according to manufacturer's printed instructions.
- .5 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's printed instructions.

- .6 As installation progresses and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .7 Cut flooring around fixed objects.
- .8 Install feature strips and floor markings where indicated. Fit joints tightly.
- .9 Install flooring in pan type floor access covers. Maintain floor pattern.
- .10 Continue flooring over areas which will be under furniture.
- .11 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .12 Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .13 Install metal edge strips at unprotected or exposed edges where flooring terminates.

3.5 APPLICATION: BASE

- .1 Lay out base to keep number of joints at minimum.
- .2 Clean substrate and prime with one coat of adhesive.
- .3 Apply adhesive to back of base.
- .4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.
- .5 Install straight and level to variation of 1:1000.
- .6 Scribe and fit to door frames and other obstructions. Use 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.

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 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Remove excess adhesive from floor, base and wall surfaces without damage.

- .3 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.8 PROTECTION

- .1 Protect new floors from time of final set of adhesive and after initial waxing until final inspection.
- .2 Prohibit traffic on floor for 24 hours after installation.
- .3 Use only water-based coating for linoleum.

3.9 SCHEDULES

- .1 Co-ordinate work schedule to maintain the police force in full operation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Waste Management And Disposal.
- .3 Section 01 78 00 - Closeout Submittals.

1.2 SUBMITTALS

- .1 Submit control submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit verification to demonstrate compliance with CAN/ULCS102 and CAN/ULCS102.2.
- .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) 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.
- .5 Submit report outlining proposed dust control measures.
- .6 Submit carpet schedule using same room designations indicated on drawings.
- .7 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.
- .8 Submit certification and description of carpet reclamation and recycling process.

1.3 PRODUCT DATA

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data sheet for each carpet, adhesive, carpet protection and subfloor 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.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 609 x 609 mm pieces of each type carpet tile specified.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 Submit maintenance data: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.
- .3 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.
- .4 Reclamation agencies' records indicating receipt and disposition of use carpet.
- .5 Certification: Reclamation Agency to verify in writing that used carpet was removed and recycled in accordance with carpet manufacturers' 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 the installation of these types of materials.
 - .2 Certified by carpet manufacturer prior to bid submission.
 - .3 Must not sub-contract labour without written approval of 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 Department of Consumers and Corporate Affairs regulations under "Hazardous Products Act", Part II of the Schedule, tested to CAN/CGSB-4.2-No.27.6.
- .2 Indoor Air Quality: compliance with CRI/CCI Green Label 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 carpet tile products indicate nominal dimensions of tile and indicate installation direction.
- .2 Packaging, labelling, packing and marking details: original from manufacturer.
- .3 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.
- .4 Store carpeting and accessories in location as directed by Departmental Representative. Store carpet and adhesive at minimum temperature of 18°C and relative humidity of maximum 65% for minimum of 48 hours before installation.
- .5 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.
- .6 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.

1.9 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 and packaging material in appropriate on-site container for recycling in accordance with Waste Management Plan.
- .3 Vacuum used carpet before removal.
- .4 Maintain possession of removed used carpet.
- .5 Remove used broadloom in large pieces, roll tightly and pack in container to minimize dust.
- .6 Sort only clean, dry carpet materials for reclamation. Clean is defined as carpet free from demolition debris, asbestos contamination, garbage and tack strips.
- .7 Immediately remove used carpet from site and transport to reclamation point.

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer. Prepare moisture testing and provide report to Departmental Representative.
- .2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .3 Test existing floor levelling compound and adhesive for presence of asbestos contamination. Notify Departmental Representative for additional instructions where asbestos is discovered.
- .4 Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

1.11 EXTRA MATERIALS

- .1 Provide extra materials of carpet, carpet base, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide five (5) m² of each colour, pattern and type of carpeting.
- .3 Extra materials to be from same production run as installed materials.
- .4 Identify each package of carpet and each container of adhesive.
- .5 Deliver to site and store where directed.

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 Patterns and colours from manufacturer's standard range.
- .2 Carpet Tile Dimensions: 609 x 609 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 450, when tested to ASTM E-662, maximum flame spread rating 25. Passes CPSC FF 1.-70 (ASTM D-2859).
 - .3 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute's IAQ requirements.
 - .4 EPP Certification: Platinum EPP (NSF-140)
 - .5 Total product recycled content: 16-50% (Post consumer: 10%)
- .4 Performance rating: to ASTM 3936.
- .5 Construction: Patterned loop.
- .6 Pile Surface Appearance:
 - .1 Level loop: patterned.
- .7 Pile fibre: to CAN/CGSB-4.129.
 - .1 Nylon: TDX 100% Type 6.6 CF or BCF.
- .8 Gauge: 50.4 rows / 10 cm.
- .9 Stitch Rate: 47,2 pu / 10 cm. (ASTM D - 418, Sec. 12)
- .10 Tuft Density: High Density / Polymeric barrier system.

- .11 Pile Height: 4.7 mm.
- .12 Kilotex Rating: 13.1.
- .13 Density Factor: 1041 kg / cu m. (ASTM D 1667)
- .14 Total Weight: RS / Non RS – 4527 / 4473 g / sq cm.
- .15 Colourization: solution dyed.
- .16 Tuft Gauge: 1/10 to 1/12.
- .17 Colourfastness to light: to CAN/CGSB-4.2No.18.3.
- .18 Colour Fastness to Atmospheric Fading: to AATCC 129 and AATCC 23.
- .19 Primary Backing: 100% recycled content, woven synthetic.
- .20 Precoat: Soil / Stain Protection - Ensure. 100% vinyl non-aqueous closed cell polymer.
- .21 Secondary Backing: 100% recycled content with Tru Bloc (Barrier System)
- .22 Adhesive: mill applied releasable dry adhesive.
- .23 Wear Warranty: 15 year Limited.
- .24 Backing Warranty: Lifetime Limited.

2.3 ACCESSORIES

- .1 Adhesive:
 - .1 Pressure sensitive type: recommended by carpet manufacturer for direct glue down installation of modular carpet or speciality backed carpets.
 - .2 Low VOC content in accordance with CRI requirements: Total volatile organic compounds 10.0 mg / sq m; formaldehyde: 2-Ethyl-11-Hexanol 2.5 mg / sq m / hr.
- .2 Carpet protection: non-staining heavy duty kraft paper or 4 mil polyethylene sheet.
- .3 Concrete floor sealer: to CAN/CGSB-25.20, Type 1.
- .4 Subfloor patching compound: Self levelling consistency - Portland cement base filler, mix with latex and water to form a cementitious paste.

Part 3 Execution

3.1 DEMOLITION

- .1 Remove and divert carpet for recycling in accordance with Section 01 74 21 - Waste Management and Disposal, and with Waste Reduction Workplan.

3.2 SUB-FLOOR TREATMENT

- .1 Concrete 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 levelled 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 MODULAR CARPET

- .1 Apply acrylic release type adhesive and install modular carpet in accordance with manufacturer's written instructions.
- .2 Lay modular carpet with butt seams.
- .3 Roll modular carpet with appropriate roller for complete contact of carpet with mill-applied quick release adhesive to sub-floor.

3.5 BASE INSTALLATION

- .1 Install cove base at junction of floor and wall.

3.6 PROTECTION OF FINISHED WORK

- .1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.

END OF SECTION

PART 1 - GENERAL

1.1 Related Sections

- .1 Division One
- .2 Section 02 41 99 – Demolition for Minor Works
- .3 Section 06 08 99 – Rough Carpentry for Minor Works
- .4 Section 09 21 16 – Gypsum Board Assemblies

1.2 Related Requirements

- .1 Concrete sealer shall be compatible with pedestal adhesive, see Division 3.
- .2 Division 26 Section - Grounding for connection to ground of access flooring understructure.

1.3 Environmental Conditions for Storage and Installation

- .1 Area to receive and store access floor materials shall be enclosed and maintained at ambient temperatures between 35° to 95° F and relative humidity levels between 20 to 80%. All floor panels shall be stored at ambient temperatures between 50° to 90° F for at least 24 hours before installation begins. All areas of installation shall be enclosed and maintained at ambient temperature between 50° to 90° F and at relative humidity levels between 20% to 80% and shall remain within these environmental limits throughout occupancy.

1.4 References

- .1 CISCA (Ceilings & Interior Systems Construction Association) - "Recommended Test Procedures for Access Floors" shall be used as a guideline when presenting load performance product information.

1.5 Performance Certification

- .1 Product tests shall be witnessed and certified by independent engineering and testing laboratory based in the U.S. with a minimum of five years experience testing access floor components in accordance CISCA "Recommended Test Procedures for Access Floors".

1.6 Performance Requirements

- .1 Design Load: Panel supported on actual understructure (the system) shall be capable of supporting a safe working load or design load of 454 Kg. This rating signifies that the system will withstand not only a concentrated load placed on a one square inch area at any location on the panel without yielding but also demonstrate the ability to withstand an overload capacity of two times its rating (i.e. a safety factor of 2).
- .2 Safety Factor: Panel supported on actual understructure (the system) shall be capable of withstanding a minimum of (2) two times the design load anywhere on the panel without failure. Failure is defined as the point at which the system will no longer accept the load.

- .3 Rolling Load: Panel supported on actual understructure (the system) shall be able to withstand the following rolling loads at any location on the panel without developing a local and overall surface deformation greater than 0.1 mm. Note: wheel 1 and wheel 2 tests shall be performed on two separate panels.

Wheel 1:	Size: 76 mm dia x 46 mm wide	Load: 454 Kg	Passes: 10
Wheel 2:	Size: 152 dia x 50 mm wide	Load: 272 Kg	Passes: 10,000

- .4 Impact Load: Panel supported on actual understructure (the system) shall be capable of supporting an impact load of 68 Kg dropped from a height of 305 mm onto a 64.5 square mm area (using a round or square indenter) at any location on the panel.
- .5 Panel Drop Test: Panel shall be capable of being dropped face up onto to a concrete slab from a height of 915 mm, after which it shall continue to meet all load performance requirements as previously defined.
- .6 Panel Cutout: Panel with an 200 mm diameter interior cutout supported on actual understructure shall be capable of maintaining its design load strength anywhere on the panel without the use of additional supports.
- .7 Flammability: System shall meet *Class A* Flame spread requirements for flame spread and smoke development. Tests shall be performed in accordance with ASTM-E84-1998, Standard Test Method for Surface Burning Characteristics for Building Materials.
- .8 Axial Load: Pedestal support assembly shall provide a minimum 2270 Kg axial load without permanent deformation.
- .9 Overturning Moment: Pedestal support assembly shall provide an average overturning moment of 1000 in-lbs. when glued to a clean, sound, uncoated concrete surface. ICBO number for the specific system or structural calculations shall be required attesting to the lateral stability of the system under seismic conditions.
- .10 Stringer Concentrated Load: Stringer shall be capable of withstanding a concentrated load of 136 Kg placed in its midspan on a one square inch area using a round or square indenter without exceeding a permanent set of 0.254 mm after the load is removed.

1.7 Design Requirements:

- .1 Access floor system, where indicated on the design documents, shall consist of modular and removable steel clad wood core panels supported by adjustable height support pedestal assemblies with bolted (snap on) stringers.
- .2 Panel shall be easily removed by one person with a suction cup lifting device and shall be interchangeable except where cut for special conditions.
- .3 Quantities, finished floor heights (FFH) and location of accessories shall be as specified on the contract drawings.

1.8 Submittals for Review

- .1 Detail sheets, for each proposed product type, which provide the necessary information to describe the product and its performance.
- .2 Test reports, certified by an independent testing laboratory with a minimum of five year's experience testing access floor components in accordance CISCA Recommended Test Procedures, certifying that component parts perform as specified.

PART 2 - PRODUCTS

2.1 Support Components - Pedestals:

- .1 Pedestal assemblies shall be corrosive resistant, all steel welded construction, and shall provide an adjustment range of +/- 25 mm for finished floor heights 152 mm or greater.
- .2 Pedestal assemblies shall provide a means of leveling and locking the assembly at a selected height, which requires deliberate action to change height setting and prevents vibration displacement.
- .3 Hot dip galvanized steel pedestal head designed to accept a bolted (Snap) stringer grid shall be welded to a threaded rod which includes a specially designed adjusting nut. The nut shall provide location lugs to engage the pedestal base assembly, such that deliberate action is required to change the height setting.
- .4 Threaded rod shall provide a specially designed anti-rotation device, such that when the head assembly is engaged in the base assembly, the head cannot freely rotate (for FFH of 152 mm or greater). Note: This prevents the assembly from inadvertently losing its leveling adjustment when panels are removed from the installation during use.
- .5 Hot dip galvanized pedestal base assembly shall consist of a formed steel plate with no less than 400 mm of bearing area, welded to a 22 mm square steel tube and shall be designed to engage the head assembly.

2.2 Stringers:

- .1 Manufacturer's modular steel stringer system, designed and fabricated to interlock with pedestal head and to form a grid pattern with members under each edge of each floor panel and with a pedestal under each corner of each floor panel. Protect steel components against corrosion with manufacturer's standard hot dipped galvanized finish.
- .2 Provide stringers that support each edge of each full panel where required to meet design load criteria. Gasket tape shall be factory applied to top surface of grid to provide a quiet sound absorbing seal.
- .3 Bolt-on stringers: System of 610 mm stringers connected to pedestals with self-threading fasteners accessible from above. Grid shall be hot dipped galvanized steel and be capable of supporting a 1.33 kN point load at stringers center span, with a permanent set not to average more than 0.25mm.

2.3 Panel Components

- .1 Wood core panels shall be steel covered composite core panels consisting of 25 mm thick high density particleboard or medium density fiberboard core, laminated to top and bottom face sheets of hot dip galvanized steel sheet. Enclose edges of core with upturned, die formed edge of bottom sheet.
- .2 Fabrication Tolerances: Fabricate panels to the following tolerances with squareness tolerances expressed as the difference between diagonal measurements from corner to corner.
 - .1 Plus or minus 0.38mm of required size
 - .2 Squareness tolerance of plus or minus 0.50mm unless tolerances are otherwise indicated for a specific panel type.
- .3 Perforated Airflow Panels: Perforated steel airflow panels designed for static loads of 454 Kg shall be interchangeable with standard field panels and shall have 25% open surface area with the following air distribution capability:
 - .1 Panel without damper: 784 cfm at 0.1-inch of H₂O (static pressure).
 - .2 Panel with damper at 100% open position: 652 cfm at 0.1-inch of H₂O (static pressure).
- .4 Grate Airflow Panels: Die cast aluminum grate panels designed for static and rolling loads shall be interchangeable with standard field panels. Grate panels shall have 56% open area with the following air distribution capability without a damper: 1884 cfm at 0.1-inch of H₂O (static pressure). Grate panels shall have the following load bearing capacities:
 - .1 Design Load: Panel supported on actual understructure shall be capable of supporting a safe working or design load of 1000 lbs. placed on a one square inch area, using a round or square indenter, at any location on the panel without yielding.
 - .2 Safety Factor: (2) Times Design Load
 - .3 Impact load: 45 Kg.
 - .4 Rolling Load: Grate panel and supporting understructure shall be able to withstand the following rolling loads at any location on the panel without developing a local and overall surface deformation greater than 0.10 mm. Note: wheel 1 and wheel 2 tests shall be performed on two separate panels.

Wheel 1: Size: 76 mm dia x 46 mm wide	Load: 454 Kg	Passes: 10
Wheel 2: Size: 152 dia x 50 mm wide	Load: 272 Kg	Passes: 10,000

2.4 Accessories

- .1 UL listed Power, Voice & Data Servicenters shall be provided in locations as detailed on the contract drawings. High capacity 286 mm square PVD Servicenters shall be capable of accommodating four duplex receptacles and three knockouts for standard voice/data faceplates or Tate voice/data interface plates (or grommeted interface plates). Standard capacity 186 by 176 mm PVD Servicenters shall be capable of accommodating two duplex receptacles and two Tate voice/data interface plates (or grommeted interface plates). The service outlet box shall be a drop-in design having a hinged Lexan lid with carpet insert and Lexan frame with tapered edge. Service outlet box lid shall be capable of withstanding without failure a load of 363 Kg.
- .2 Provide manufacturer's standard steps, ramps, fascia plate, perimeter support, and grommets where indicated on the contract drawings.

- .3 Provide two (2) panel lifting devices.
- .4 When applicable provide manufacturer's standard underfloor air systems components (including grilles and diffusers) where indicated on the contract drawings.

1.5 Finishes

- .1 Finish the surface of floor panels with floor covering material as indicated on the contract drawings. Where floor coverings are by the access floor manufacturer, the type, color and pattern shall be selected from manufacturer's standard. All areas to be furnished with laminated floor panels must be maintained at ambient temperatures between 50° to 90° F and at relative humidity levels between 20% to 80%, and shall remain within these ranges through installation and occupancy.
 - .1 Plastic Laminate: High-pressure laminate floor covering shall meet requirements of NEMA LD3, and shall conform with one of the following grades: Grade HDH (1/8" / 3.0mm) or Grade HDM (1/16" / 1.5mm). Manufacturer's standard edging shall be inter-locked with top sheet and captured by up-turned edge of bottom steel sheet.
 - .2 High-pressure laminate floor coverings shall have an edge condition that is integral to the tile. Separate edge trim pieces are not acceptable.
 - .3 Surface to Ground Resistance of Standard High Pressure Laminate Anti-Static Covering: Average test values shall be within the range of 1,000,000 ohms (1.0×10^6) to 20,000 megaohms (2.0×10^{10} ohms), as determined by testing in accordance with the test method for conductive flooring specified in Chapter 3 of NFPA 99, but modified to place one electrode on the floor surface and to attach one electrode to the understructure. Resistance shall be tested at 500 volts.
 - .4 Panels to be provided bare, with standard hot dipped galvanized finish.

PART 3 - EXECUTION

3.1 Preparation

- .1 Examine structural subfloor for unevenness, irregularities and dampness that would affect the quality and execution of the work. Do not proceed with installation until structural floor surfaces are level, clean, and dry as completed by others.
- .2 Concrete sealers, if used, shall be identified and proven to be compatible with pedestal adhesive. Verify that adhesive achieves bond to slab before commencing work.
- .3 Verify dimensions on contract drawings, including level of interfaces including abutting floor, ledges and doorsills.
- .4 The General Contractor shall provide clear access, dry subfloor area free of construction debris and other trades throughout installation of access floor system.
- .5 Area to receive and store access floor materials shall be enclosed and maintained at ambient temperatures between 35° to 95° F and relative humidity levels between 20 to 80%. At least

24 hrs. before installation begins, all floor panels shall be stored at ambient temperatures between 50° to 90° F and relative humidity levels between 20% to 80% and shall remain within these environmental limits throughout occupancy.

1.2 Installation

- .1 Pedestal locations shall be established from approved shop drawings so that mechanical and electrical work can be installed without interfering with pedestal installation.
- .2 Installation of access floor shall be coordinated with other trades to maintain the integrity of the installed system. All traffic on access floor shall be controlled by access floor installer. No traffic but that of access floor installers shall be permitted on any floor area for 24 hours to allow the pedestal adhesive to set. Access floor panels shall not be removed by other trades for 72 hours after their installation.
- .3 Floor system and accessories shall be installed under the supervision of the manufacturer's authorized representative and according to manufacturer's recommendations.
- .4 No dust or debris producing operations by other trades shall be allowed in areas where access floor is being installed to ensure proper bonding of pedestals to subfloor.
- .5 Access floor installer shall keep the subfloor broom clean as installation progresses.
- .6 Partially completed floors shall be braced against shifting to maintain the integrity of the installed system where required.
- .7 Additional pedestals as needed shall support panels where floor is disrupted by columns, walls, and perimeter cutouts.
- .8 Understructure shall be aligned such that all uncut panels are interchangeable and fit snugly but do not bind when placed in alternate positions.
- .9 Finished floor shall be level, not varying more than 0.062" in 10 feet or 0.125" overall.
- .10 Inspect system prior to application of floor covering and replace any flooring panels that are cracked, broken and structurally damaged and do not comply with specified requirements.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 41-GP-30M-82, Wall Coverings, Vinyl-Coated Fabrics.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .4 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-03, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.2 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 Submit WHMIS MSDS - Material Safety Data Sheets. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for vinyl-coated fabric wall coverings. Indicate VOC content.
 - .2 Submit complete written description, including total fabric weight, name of fabric backing, tensile strength, tear strength and fire rating characteristics.
- .3 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Due to product lead times, order material immediately upon approval of wall covering from Departmental Representative.
 - .2 Submit duplicate 280 x 215 mm samples of colours and textures of wall coverings.
- .4 Closeout Submittals:
 - .1 Provide maintenance data for vinyl-coated fabric wall covering in accordance with Section 01 78 00 - Closeout Submittals.

1.3 QUALITY ASSURANCE

- .1 Field Sample:
 - .1 Before commencing application, prepare wall and apply samples of wall covering from current production run of materials selected to show evidence there are no roller marks or other imperfections which may occur during manufacturing process of wall covering to three full wall panels, for Departmental Representative approval.

1.4 DELIVERY, HANDLING AND STORAGE

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

.2 Waste Management and Disposal:

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 AMBIENT CONDITIONS

- .1 Temperature: maintain air temperature and structural base temperature at wall covering installation area above 20 degrees C and relative humidity below 40% for 72 hours before, during and 72 hours after installation.
- .2 Ventilation:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
- .2 Provide continuous ventilation during and after coating application.

1.6 MAINTENANCE

- .1 Extra Materials:
- .1 Provide extra materials of vinyl coated fabric wall covering, adhesives and cleaners in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 3 m² of full width material of each pattern, texture and colour of vinyl-coated fabric wall covering.
- .3 Provide sufficient adhesive to install extra material vinyl-coated fabric wall covering provided.
- .4 Extra materials from same production run/and or dye lot as installed materials.
- .5 Identify rolls of vinyl-coated fabric wall coverings and containers of adhesives.
- .6 Deliver to Departmental Representative, upon completion of work of this section.
- .7 Store where directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Soraya Type 11 21 oz by Len-Tex Corporation, or approved alternate.
- .2 Wall covering: to CGSB 41-GP-30M, Type 2 1380 mm width, 2 colours as later selected. Surface burning characteristics in accordance with CAN/ULC-S102, Total weight – 640 G PLM (21 oz).
- .3 Sealer: type recommended by covering manufacturer.
- .1 Sealer: maximum VOC limit 250 g/L.
- .4 Sizing: type recommended by covering manufacturer.
- .5 Adhesive: as recommended by covering manufacturer.
- .1 Adhesives: maximum VOC limit 50 g/L.

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 PREPARATION

- .1 Unwrap wall covering when ventilation conditions are accelerated. Allow 24 hours acclimation in installation before application.
- .2 Prepare surfaces according to covering manufacturer's instructions.
- .3 Work penetrating substrate to be completed before installing covering.
- .4 Seal and size surfaces to receive covering.

3.3 INSTALLATION

- .1 Installation sequence:
 - .1 Use rolls in consecutive numerical sequence of manufacture.
 - .2 Place strip panels consecutively in exact order they are cut from roll; including spaces above or below windows, doors or similar penetrations.
 - .3 Reverse alternate strips except on match patterns.
- .2 Trim additional salvage where required to achieve colour and pattern match at seams.
- .3 Apply adhesive to fabric back or substrate as recommended by manufacturer.
- .4 Hang non-matched patterns by overlapping edges and double cutting through both thicknesses with metal back-up strip to prevent cutting substrate.
- .5 Wrap fabric 150 mm beyond inside and outside corners. No cutting at corners permitted, unless pattern or colour changes.
- .6 No horizontal seams permitted.
- .7 Install covering before installation of plumbing fixtures, electrical equipment,[casings, bases and cabinets.
- .8 Remove excess adhesive along finished seams immediately after strips of wall covering is applied. As work progresses ensure clean warm water is used for final rinsing of wall covering and leave clean.
- .9 Leave completed work smooth, clean, without wrinkles, gaps, overlaps or air pockets.

3.4 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 Clean surfaces to covering manufacturer's written instructions.

3.5 PROTECTION

- .1 Protect finished surfaces and exterior corners from damage until final inspection.

3.6 SCHEDULES

- .1 Refer to Room Finish Schedule.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Related Sections:
 - .1 Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
 - .2 Section 01 33 00 - Submittal Procedures.
 - .3 Section 01 45 00 - Quality Control.
 - .4 Section 01 61 00 - Common Product Requirements.
 - .5 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .6 Section 01 78 00 - Closeout Submittals.
 - .7 Section 02 81 01 - Hazardous Materials.

1.2 REFERENCES

- .1 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual, 2004.
- .2 National Fire Code of Canada - 2005
- .3 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

1.3 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: minimum of five years proven satisfactory experience.
 - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
 - .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.
- .2 Mock-Ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .1 Provide 300 mm x 300 mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
 - .2 Mock-up will be used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
 - .3 Locate where directed.
 - .4 Allow 24 hours for inspection of mock-up before proceeding with work.
 - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

.3 Pre-Installation Meeting:

- .1 Convene pre-installation meeting one week prior to beginning work of this Section in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

- .1 Verify project requirements.
- .2 Review installation and substrate conditions.
- .3 Coordination with other building subtrades.
- .4 Review manufacturer's installation instructions and warranty requirements.

.4 Health and Safety:

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.4 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.

1.5 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 oak plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 16 mm gypsum board for finishes over gypsum board and other smooth surfaces.

- .5 13 mm plywood for finishes over wood surfaces.
- .3 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .4 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - .1 Lead, cadmium and chromium: presence of and amounts.
 - .2 Mercury: presence of and amounts.
 - .3 Organochlorines and PCBs: presence of and amounts.
- .5 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .6 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation and application instructions.
- .7 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers]
 - .4 MPI Environmentally Friendly classification system rating.

1.6 MAINTENANCE

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

1.7 DELIVERY, STORAGE AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.
- .2 Acceptance at Site:
 - .1 Identify products and materials with labels indicating:
 - .1 Manufacturer's name and address.
 - .2 Type of paint or coating.
 - .3 Compliance with applicable standard.
 - .4 Colour number in accordance with established colour schedule.
- .3 Remove damaged, opened and rejected materials from site.
- .4 Storage and Protection:

- .1 Provide and maintain dry, temperature controlled, secure storage.
- .2 Store materials and supplies away from heat generating devices.
- .3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
- .5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.
- .7 Remove paint materials from storage only in quantities required for same day use.
- .8 Fire Safety Requirements:
 - .1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.
 - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
- .9 Waste Management and Disposal:
 - .1 Separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
 - .3 Place materials defined as hazardous or toxic in designated containers.
 - .4 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.
 - .5 Ensure emptied containers are sealed and stored safely.
 - .6 Unused paint materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.
 - .7 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.
 - .9 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .10 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).
- .11 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .12 Set aside and protect surplus and uncontaminated finish materials. Deliver to or arrange collection by individuals or organizations for verifiable re-use or re-manufacturing.

1.8 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .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 Specifying body or 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 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - .6 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 Materials and resources in accordance with Section 01 47 15 - Sustainable Requirements: Construction.
- .2 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .3 Provide paint materials for paint systems from single manufacturer.
- .4 Only qualified products with E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .5 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .6 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .7 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.
- .8 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.

- .9 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .10 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
 - .1 Water-based.
 - .2 non-flammable, biodegradable.
 - .3 Manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 Manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .11 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .12 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .13 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.
- .14 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .15 Recycled water-borne surface coatings to contain 50 % post-consumer material by volume.
- .16 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 Departmental Representative will provide Colour Schedule after Contract award.
- .2 Colour schedule will be based upon selection of one base colour and one accent colour.
- .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 Concrete masonry units: smooth and split face block and brick:
 - .1 INT 4.2A - Latex level 3 finish.
- .2 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
 - .1 INT 6.3D - Alkyd varnish level 6 finish (over stain).
- .3 Wood paneling and casework: partitions, panels, shelving, millwork:
 - .1 INT 6.4D - Alkyd varnish level 6 finish (over stain).
- .4 Plastic: lumber, panels, trims, fabrications, vinyl wall covering, PVA/PVC materials:
 - .1 INT 6.8E - Latex level 3 finish.

- .5 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:

- .1 INT 9.2A - Latex level 3 finish (over latex sealer).

2.6 SOURCE QUALITY CONTROL

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

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

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

3.3 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Stucco, plaster and gypsum board: 12%.
 - .2 Concrete: 12%.
 - .3 Clay and Concrete Block/Brick: 12%.
 - .4 Wood: 15%.

PREPARATION

- .1 Protection:
 - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
 - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
 - .3 Protect factory finished products and equipment.
 - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation:
 - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
 - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
 - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths.
 - .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 pre-treatment 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 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 airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in uniform layer using brush and/or roller type suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - .4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished work and repaint.
- .3 Spray application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

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

3.6 MECHANICAL// ELECTRICAL EQUIPMENT

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

3.7 SITE TOLERANCES

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

3.8 FIELD QUALITY CONTROL

- .1 Interior painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and local Painting Contractor's Association. Painting contractor shall notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
- .2 Interior surfaces requiring painting shall be inspected by Paint Inspection Agency who shall notify Departmental Representative and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
- .3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.
- .4 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
- .5 Field inspection of painting operations to be carried out by independent inspection firm as designated by Departmental Representative.
- .6 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .7 Cooperate with inspection firm and provide access to areas of work.
- .8 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.

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