

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 – Shop Drawings, Product Data and Samples
- .2 Section 01 61 00 – Common Product Requirements
- .3 Section 01 71 00 – Examination and Preparation
- .4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal
- .5 Section 09 91 23 – Interior Painting

### **1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.
  - .2 ASTM C475/C475M-02(2007), Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .3 ASTM C514-04(2009)e1, Standard Specification for Nails for the Application of Gypsum Board.
  - .4 ASTM C645-09a, Standard Specification for Nonstructural Steel Framing Members.
  - .5 ASTM C754-09a, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
  - .6 ASTM C840-08, Standard Specification for Application and Finishing of Gypsum Board.
  - .7 ASTM C954-10, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.122 in. (2.84 mm) in Thickness.
  - .8 ASTM C1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
  - .9 ASTM C1047-10, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .10 ASTM C1178/C1178M-08, Standard Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .2 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .3 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-07, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 – Shop Drawings, Product Data and Samples.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for gypsum, framing, sealants and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Test and Evaluation Reports: submit test reports in accordance with Section 01 45 00 - Quality Control, from approved independent testing laboratory, certifying partition system complies with sound transmission rating, fire-resistance rating as specified.

- .4 Sustainable Design Submittals:
  - .1 Construction Waste Management: Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .1 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
  - .2 Recycled Content:
    - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
  - .3 Regional Materials: submit evidence that project incorporates required percentage 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
  - .4 Low-Emitting Materials:
    - .1 Submit listing of sealants used in building, comply with VOC and chemical component limits or restriction requirements.

#### 1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store materials inside, level, under cover. Protect from weather, damage from construction operations and other causes, in accordance with manufacturer's printed instructions. Handle materials to prevent damage to edges or surfaces. Protect metal accessories and trim from being bent or damaged.
  - .3 Store and protect partition materials from nicks, scratches, and blemishes.
  - .4 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74.21 - Construction/Demolition Waste Management and Disposal.

### PART 2 - PRODUCTS

#### 2.1 MATERIALS

- .1 Performance / Design Criteria:
  - .1 Partition assembly to be non-combustible construction, fire resistance rated where required.
  - .2 Minimum sound transmission class rating of installed panel partition to be STC 30, tested to ASTM E90.

- .2 Non-structural Metal Framing:
  - .1 Non-load bearing channel stud framing: to ASTM C645, 89 mm stud size, roll formed from 0.53 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
  - .2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 32 mm flange height.
  - .3 Metal channel stiffener: 19 x 1.4 mm thick cold rolled steel, coated with rust inhibitive coating.
- .3 Gypsum Board:
  - .1 Standard board: to ASTM C1396/C1396M regular, 12.7 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges tapered. Vinyl-faced board: to ASTM C1396/C1396M, Class I, regular, 12.7 mm thick and Type X, 16 mm thick, 1200 mm wide x maximum practical length, covered with minimum 0.15 mm thick wall covering having maximum flame spread: 25, fuel contributed: 35, smoke developed: 50 when tested to CAN/ULC-S102.
  - .2 Metal furring runners, hangers, tie wires, inserts, anchors: to suspended furring, ceilings.
  - .3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
  - .4 Steel drill tapping screws: to ASTM C514.
  - .5 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .4 Mineral Fiber Reinforced Cementitious Panels:
  - .1 Non-asbestos fiber cement panel manufactured in accordance with ASTM C1186, smooth one face 8mm thick, 1220mm x 2440mm with factory applied universal primer.
  - .2 Sealants: Refer to Section 07 92 00 – Joint Sealants.
  - .3 Fasteners: stainless steel, purpose made, self tapping.
  - .4 Adhesive: purpose made, waterproof, contact type, cured resilient without final set.

## 2.2 ACCESSORIES

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

## PART 3 - EXECUTION

### 3.1 EXAMINATION

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

### 3.2 ERECTION OF FRAMING

- .1 Install steel framing members to receive screw-attached gypsum board in accordance with ASTM C754 except where specified otherwise.
- .2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .3 Place studs vertically at 400 mm on centre and maximum of 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions.
- .4 Erect metal studding to tolerance of 1:1000.
- .5 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .6 Include two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.
- .7 Install heavy gauge single jamb studs at openings.
- .8 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .9 Include 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.
- .10 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .11 Extend partitions to ceiling height except where indicated.
- .12 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use double track slip joint.
- .13 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .14 Install insulating strip under studs and tracks around perimeter of sound control partitions.

### 3.3 ERECTION OF GYPSUM BOARD AND ACCESSORIES

- .1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.
- .2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .4 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .5 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .6 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .7 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .8 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.

- .9 Install acoustical insulation and sealant in sound rated partitions to correspond with tested assembly.
- .10 Install gypsum boards in direction that will minimize number of end-butt joints. Stagger end joints 250 mm minimum.

### 3.4 ERECTION OF MINERAL FIBER REINFORCED CEMENTITIOUS PANELS

- .1 Install materials in strict accordance with manufacturer's installation instructions.
- .2 Place fasteners no closer than 9.5mm from panel edges and 51mm from panel corners.
- .3 Install cavity vent strips along the bottom edge of framing or sheathing. Install furring over sheathing attaching to framing members.

### 3.5 APPLICATION

- .1 Apply gypsum board after bucks, anchors, blocking, sound attenuation, electrical and mechanical work are approved.
- .2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.
- .3 Arrange vinyl-faced gypsum board symmetrical about openings and wall areas, with butt joints aluminum/vinyl mouldings between joints.

### 3.6 INSTALLATION

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm on centre using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .5 Install access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .6 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .7 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .8 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .9 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

### **3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 55 – General Instructions.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.8 PROTECTION**

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

### **3.9 SCHEDULES**

- .1 Construct fire rated assemblies where indicated.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 – Shop Drawings, Product Data and Samples
- .2 Section 01 61 00 – Common Product Requirements
- .3 Section 01 71 00 – Examination and Preparation
- .4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal

### **1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM C635/C635M-07, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
  - .2 ASTM C636/C636M-08, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
  - .3 ASTM E1477-98a(2008), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Green Seal Environmental Standards (GS)
  - .1 GS-11-2008, 2nd Edition, Paints and Coatings.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
- .6 Underwriter's Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-2007, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Shop Drawings, Data Products and Samples.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for ceiling panels and ceiling suspension system and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements 01 35 43 - Environmental Procedures.
- .3 Engineering Certification:
  - .1 Submit documentation required to conform to the VBBL in respect to structural seismic requirement, including review and certification. Documents to be provided by Professional Engineer registered or licensed in the Province of BC, Canada.

#### 1.4 Shop Drawings:

- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of BC, 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, change in level details, and acoustical unit support at ceiling fixture lateral bracing and accessories.
- .2 Samples:
- .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate 300x300 mm samples of each type acoustical units.
- .3 Sustainable Design Submittals:
- .1 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
  - .2 Recycled Content:
    - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
  - .3 Regional Materials: submit evidence that project incorporates required percentage 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
  - .4 Low-Emitting Materials:
    - .1 Submit listing of touch-up paints used in building, comply with VOC and chemical component limits or restriction requirements.

#### 1.5 DELIVERY, STORAGE AND HANDLING

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

- .4 Store and protect acoustic ceiling materials from nicks, scratches, and blemishes.
- .5 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section.
- .5 Packaging Waste Management: remove for reuse of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

## PART 2 - PRODUCTS

### 2.1 COMPONENTS

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.
  - .1 Type water felted mineral fiber.
  - .2 Pattern non-directional, Class A.
  - .3 Flame spread rating of 25 or less in accordance with CAN/ULC-S102.
  - .4 Smoke developed 50 or less in accordance with CAN/ULC-S102.
  - .5 Noise Reduction Coefficient (NRC) designation of .55
  - .6 Light Reflectance (LR) range of .85 to ASTM E1477.
  - .7 Edge type square edge.
  - .8 Colour: white .
  - .9 Size 600 x 1200 x 15 mm thick.
  - .10 Shape flat.
- .2 Acoustical Suspension:
  - .1 Intermediate duty system to ASTM C635.
  - .2 Basic materials for suspension system: commercial quality cold rolled steel, zinc coated.
  - .3 Suspension system: non fire rated, two directional exposed tee bar grid.
  - .4 Exposed tee bar grid components: shop painted satin sheen, white colour. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.
  - .5 Hanger wire: galvanized soft annealed steel wire, 3.6 mm diameter for access tile ceilings.
  - .6 Hanger inserts: purpose made.
  - .7 Carrying channels: 38 mm channel, of 658 kgm per 1000 lineal m galvanized steel.
  - .8 Accessories: splices, clips, wire ties, retainers and wall moulding flush, to complement suspension system components, as recommended by system manufacturer.
- .3 Performance/Design Criteria:
  - .1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

### 2.2 ACCESSORIES

- .1 Touch-up paint: in accordance with manufacturer's recommendations for surface conditions:
  - .1 Paint: VOC limit 250 g/L maximum to GS-11.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

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

### **3.2 INSTALLATION**

- .1 Installation: in accordance with ASTM C636 except where specified otherwise.
- .2 Suspension System:
  - .1 Existing suspension system to be reused to be updated as required to current standards to carry new acoustical units, lighting units, and mechanical installations.
  - .2 All new and existing suspension systems re-used to conform to structural seismic load requirements of VBBL for the installation required. Existing systems to be upgraded as required.
  - .3 Erect ceiling suspension system after work above ceiling has been inspected by Departmental Representative.
  - .4 Secure hangers to overhead structure using attachment methods as indicated acceptable to Departmental Representative.
  - .5 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
  - .6 Lay out room perimeter system according to reflected ceiling plan.
  - .7 Install wall moulding to provide correct ceiling height.
  - .8 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.
  - .9 Support at light fixtures diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
  - .10 Interlock cross member to main runner to provide rigid assembly.
  - .11 Ensure finished ceiling system is square with adjoining walls and level within 1:1000.
- .3 Acoustic Panels:
  - .1 Install acoustical panels and tiles in ceiling suspension system.
  - .2 Co-ordinate ceiling work with work of other sections such as interior lighting, fire protection communication, and intrusion and detection systems.

### **3.3 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 55 - General Instructions.

- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

#### **3.4 PROTECTION**

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

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 09 65 16 – Resilient Flooring.

### **1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM D1335, Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings.
  - .2 ASTM D3936, Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
  - .3 ASTM E648, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
  - .4 ASTM E662, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-4.2 No.77.1/ISO 4919, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.
  - .2 CAN/CGSB-4.129, CAN/CGSB-4.161M, Carpets for Commercial Use.
- .3 Carpet and Rug Institute (CRI)
  - .1 CRI Carpet Installation Standard.
  - .2 CRI Green Label Indoor Air Quality Testing Program.
  - .3 CRI Green Label Plus Indoor Air Quality Testing Program.
- .4 Health Canada
  - .1 C.R.C., c.92310, Hazardous Products Act - Carpet Regulations, Part II of Schedule 1.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 National Floor Covering Association (NFCA)
  - .1 National Floor Covering Specification Manual 2007.
- .7 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
  - .2 CAN/ULC-S102.2, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

### **1.3 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-Installation Meetings:
  - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative to:
    - .1 Verify project requirements.
    - .2 Review installation and substrate conditions.

- .3 Co-ordination with other construction subtrades.
- .4 Review manufacturer's written installation instructions and warranty requirements.
- .2 Sequencing: Comply with manufacturer's written recommendations for sequencing construction operations.

#### 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for each carpet tile, adhesive, carpet protection, subfloor patching compound and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements.
- .3 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate samples of each type of carpet tile specified and duplicate tiles for each colour selected.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test and Evaluation Reports:
  - .1 Certified test reports showing compliance with specified performance characteristics and physical properties.
- .6 Manufacturer's Instructions: submit manufacturer's installation instructions.
- .7 Qualification Statements:
  - .1 Compliance: to CAN/ULC-S102 and CAN/ULC-S102.2.
  - .2 Testing: passes testing requirements of:
    - .1 Green Label Plus Indoor Air Quality Testing Program.
  - .3 Tuft bind: meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No.77.1/ISO 4919.

#### 1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit maintenance data for installed products for incorporation into manual.
- .3 Warranty Documentation: submit warranty documents specified.
  - .1 Manufacturer's warranty: submit, for Departmental Representative's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and does not limit other rights Owner may have under Contract Documents.

## 1.6 MAINTENANCE MATERIAL SUBMITTALS

- .1 Deliver to Owner extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittal.
  - .1 Provide 3% each type and colour of carpet tiles. Provide a minimum of one (1) box of each type and colour of carpet tile
  - .2 Delivery, storage and protection: comply with Owner's requirements for delivery and storage of extra materials.

## 1.7 QUALITY ASSURANCE

- .1 Regulatory Requirements:
  - .1 Conform to applicable code for carpet flammability requirements in accordance with CAN/ULC S102.2.
  - .2 PCH4 emitting carpets must be identified in submission with test data.
  - .3 Conform to NFPA 253 / ASTM E648 Class I for flooring radiant panel test (CRF: 0.45 watts/sq cm or greater).
  - .4 Conform to ASTM E662 / NFPA 258 for smoke density of less than 450 Flaming Mode.
- .2 Qualifications:
  - .1 Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years experience.
  - .2 Flooring Installer:
    - .1 Experienced in performing work of this Section who has specialized in installation of work similar to that required for this project.
    - .2 Certified by carpet manufacturer prior to tender submission.
    - .3 Must not sub-contract labour without written approval of Departmental Representative.
    - .4 Responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturer's written instructions.

## 1.8 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
  - .3 Store and protect carpet tile and adhesive in original containers or wrapping with manufacturer's seals and labels intact.
  - .4 Store and protect carpet tile and accessories in location as directed by Departmental Representative.
  - .5 Store carpet and adhesive at minimum temperature of 18 degrees C and relative humidity of maximum 65% for minimum of 48 hours before installation.

- .6 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.
- .7 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .8 Replace defective or damaged materials with new.

#### 1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Waste Reduction Workplan and Section 01 74 21 Construction/Demolition Waste Management and Disposal.
- .2 Do not dispose of unused sealant and adhesive materials into landfill. Divert materials to municipal hazardous materials depot approved by Departmental Representative.
- .3 Divert unused metal and wiring materials from landfill to metal recycling facility approved by Departmental Representative.
- .4 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .5 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material for recycling in accordance with Waste Reduction Workplan.

#### 1.10 SITE CONDITIONS

- .1 Ambient Conditions:
  - .1 Moisture: ensure substrate is within moisture limits and alkalinity limits recommended by manufacturer. Prepare moisture testing and provide report to Departmental Representative.
  - .2 Temperature: maintain ambient temperature of not less than 18 degrees C from 48 hours before installation to at least 48 hours after completion of work.
  - .3 Relative humidity: maintain between 10% and 65% for 48 hours before, during and 48 hours after installation.
  - .4 Ventilation:
    - .1 Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.
    - .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Facilities and Section 01 35 33 – Health and Safety Requirements.
    - .3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.
  - .5 Install carpet after space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

#### 1.11 WARRANTY

- .1 In addition to any other required warranties, provide the following written minimum guarantees or warranties to commence at Date of Substantial Performance, and details of guarantees or warranties that exceed noted minimum requirements.
- .2 By fibre manufacturer:
  - .1 Carpet Tile: Provide (15) years warranty for wear beyond 10% of pile fibre and static control.

- .3 By carpet manufacturer: Fifteen (15) year against unraveling, zippering, and delamination / deterioration of backing not to exclude wet or steam cleaning methods.
- .4 By carpet installer: One (1) year that all seams will remain sound and tight and carpet will not break away from adhesives.
- .5 By adhesive manufacturer: Fifteen (15) year, including labour and material, against adhesive failure.
- .6 Manufacturer's Warranty: Twenty-five (25) year non-prorated warranty.

## **PART 2 - PRODUCTS**

### **2.1 MATERIALS**

- .1 Manufacturers:
  - .1 Ensure manufacturer has minimum 10 years experience in manufacturing components similar to or exceeding requirements of project.
  - .2 Type 1: Field Carpet: Minimum of 3 coordinating styles in coordinating colours and patterns varying in scale are required.
  - .3 Colour, texture and pattern to be selected from bidder's standard range of carpet product. Pattern should be integrated within the face material and not applied after surface manufacturing. Minimum 8 individual colours within one carpet tile.
- .2 Sustainability Characteristics:
  - .1 Adhesives: VOC limit 50 g/L maximum.
  - .2 Primer / Sealer: in accordance with manufacturer's recommendations for surface conditions:
    - .1 VOC limit: 100 g/L maximum.
  - .3 Carpet and Accessories:
    - .1 Green Label Plus certified.
    - .2 Carpet must be 100% recyclable.
    - .3 NSF 140 Platinum Certified.
    - .4 30% minimum Post-consumer recycled content.
    - .5 MBDC Cradle to Cradle Silver Certified.

### **2.2 PERFORMANCE**

- .1 Flammability: certified for flammability to Health Canada regulations under "Hazardous Products - Carpet Regulations", Part II of Schedule 1:
- .2 Flame Spread: Rating 300 when tested to CAN/ULC – S102.2
- .3 Smoke Development: 500 when tested to CAN/ULC – S102.2.
- .4 Wear: maximum 10% of pile face fiber by weight for life of carpet.
- .5 Edge Ravel: none for life of carpet.
- .6 Static Generation: less than 3.5 kV per AATCC 134 for 10 years.
- .7 Tuft Bind: Tuft Lock: to ASTM D1335 and CAN/CGSB-4.129, minimum 35N for loop pile product.
- .8 De-lamination of Secondary Backing: Lamination Strength of Secondary Backing: to ASTM D3936, minimum acceptable peel strength of 1.6 kg/25 mm.

- .9 Stain resistance: to AATCC 175.
- .10 Soil Resistance: Fluorine Durability Level to AATCC 189.
- .11 Indoor Air Quality Certification: certified to CRI Green Label Plus IAQ requirements.
- .12 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute IAQ requirements. Performance rating to ASTM D5417.
- .13 Recycling new carpet: Must be eligible for recycling by the supplying mill or fibre producer within an existing program in place; submit program parameters.
- .14 Recycled Content: Total Recycled Content: minimum of 35% recycled content.
- .15 Colour fastness to light: CAN/CGSB 4.2 No. 18.3, AATCC 16E, minimum L5. Colour Fastness to Atmospheric Fading: to AATCC 129 and AATCC 23. Colour fastness to crocking AATCC 165 > or – than 4.0 wet, dry.

### 2.3 FABRICATION

- .1 Construction:
  - .1 Pattern loop.
- .2 Face fibre: to CAN/CGSB-4.129 Nylon 6.
- .3 Dyeing Method: 30% yarn, 100% solution dyed.
- .4 Tufted Carpet Backing: to CAN/CGSB-4.129.
  - .1 Primary backing: Polyolefin high performance thermoplastic compound with fibreglass reinforcing layer.
- .5 Tile Size: 610mm x 610mm.
- .6 Stitches: 10.
- .7 Gauge: 1/10.
- .8 Average Density: 259 kg/m<sup>3</sup>.
- .9 Finished Pile Thickness: 3.5mm minimum.
- .10 Total Thickness: 7 mm minimum.
- .11 Total Weight: minimum 4374 gm/m<sup>2</sup> for carpet tile with fiberglass or nylon reinforced vinyl composite secondary backing and 3187 gm/m<sup>2</sup> for carpet tile with polyolefin secondary backing.
- .12 GSA approved.

### 2.4 ACCESSORIES

- .1 Resilient Base (RB): ASTM 1861 continuous, top set, complete with premoulded end stops and external corners:
  - .1 Type: TP Thermoplastic Rubber
  - .2 Style: B Cove
  - .3 Thickness: 3.2mm thick, 6.35mm at toe
  - .4 Height: 100mm
  - .5 Lengths: roll
  - .6 Colour: as selected by Departmental Representative
  - .7 Rubber Cove Base

- .2 Rubber Base, primers and Adhesives: Waterproof, low-VOC emitting; types recommended by flooring manufacturer. Primers and adhesives to be water soluble on dry areas.
- .3 Vinyl Edge Strips:
  - .1 Beveled floor flange minimum 30 mm wide.
  - .2 Beveled surface to finish flush with carpet tile for tight joint and other side to floor finish.
  - .3 Colour: As selected by Departmental Representative.
- .4 Adhesive:
  - .1 Multi-purpose Adhesive Type: recommended by carpet tile manufacturer for direct glue down installation.
  - .2 Releasable Pressure Sensitive Type: recommended by carpet tile manufacturer for direct glue down installation of speciality backed carpet tiles.
  - .3 Mill-applied Adhesive Type: fully cured. Combination of pre-applied adhesive and tile to meet carpet only VOC emissions criteria of Carpet and Rug Institute Green Label Plus Indoor Air Quality Certification Program. Used at the discretion of the Departmental Representative.
  - .4 Pre-applied Adhesive: non-transferable.
  - .5 On site application VOC limit: 50 g/L maximum.
  - .6 Adhesive in compliance with CCD-152.
- .5 Transition Mouldings: Carpet edge / reducer strip.
- .6 Carpet protection: non-staining heavy duty kraft paper.
- .7 Concrete floor sealer / primer:
  - .1 As recommended by carpet manufacturer.
  - .2 VOC limit: 100 g/L maximum.
- .8 Subfloor patching compound: Portland cement base filler as recommended by carpet tile manufacturer.

### **PART 3 - EXECUTION**

#### **3.1 INSTALLERS**

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

#### **3.2 EXAMINATION**

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

### 3.3 PREPARATION

- .1 Subfloor Preparation:
  - .1 Inspect concrete and determine special care required to make it suitable for carpet.
  - .2 Fill and level cracks 3 mm wide or protrusions over 0.8 mm with appropriate and compatible patching compound.
  - .3 Comply with manufacturer's written recommendations for maximum patch thickness.
  - .4 Prime large patch areas with compatible primer.
  - .5 Ensure concrete substrates are cured, clean and dry.
  - .6 Ensure concrete substrates are free of paint, dirt, grease, oil, curing or parting agents, and other contaminants, including sealers, that interfere with the bonding of adhesive.
  - .7 Where powdery or porous concrete surface is encountered, apply primer compatible with adhesive to provide a suitable surface for glue-down installation.
- .2 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations.
  - .1 Prepare floor surfaces in accordance with CRI Carpet Installation Standard.
- .3 Tile Carpeting Preparation: Pre-condition carpeting: following manufacturer's written instructions.

### 3.4 INSTALLATION

- .1 Install carpet tiles in accordance with manufacturer's written instructions, and CRI Carpet Installation Standard.
- .2 Co-ordinate tile carpeting work with work of other trades, for proper time and sequence to avoid construction delays.
- .3 Install carpet tile after finishing work is completed but before demountable office partitions and telephone and electrical pedestal outlets are installed.
- .4 Install carpet tile as per manufacturer's recommendation. This can include quarter-turn 90 degree format, monolithic, random, quarter turn ashlar, horizontal, herringbone or vertical ashlar.
- .5 Snugly join carpet tiles in completed installation.
  - .1 Measure distance covered by 11 carpet tiles (10 joints) and ensure distance is in compliance with manufacturer specifications.
  - .2 Do not trap yarn between carpet tiles.
- .6 Apply thin film of pressure-sensitive adhesive according to manufacturer's recommendations.
- .7 Ensure finished installation presents smooth wearing surface free from conspicuous seams, burring and other faults.
- .8 Use material from same dye lot.
  - .1 Ensure colour, pattern and texture match within visual areas.
  - .2 Maintain constant pile direction.
- .9 Fit around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.
- .10 Install carpet tiles to underfloor duct system and to access covers.
- .11 Install carpeting in pan type floor access covers.
- .12 Extend carpet tiles into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

- .13 Install carpet tiles smooth and free from bubbles, puckers, and other defects.
- .14 Protect exposed carpet tile edges at transition to other flooring materials with suitable transition strips.
- .15 Install base per manufacturer's instructions.

### 3.5 APPLICATION: BASE

- .1 Lay out base to keep number of joints at minimum. Maintain minimum measurement of 450 mm between joints.
- .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 Mitre internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.

### 3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.
  - .2 Final Cleaning: upon completion remove and dispose of surplus materials, rubbish, tools and equipment in accordance with Section 01 11 55 – General Instructions.
    - .1 Vacuum carpets clean immediately after completion of installation.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.7 PROTECTION

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

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 33 00 – Shop Drawings, Data Products and Samples
- .2 Section 01 61 00 – Common Product Requirements
- .3 Section 01 71 00 – Examination and Preparation
- .4 Section 01 74 21 – Construction/Demolition Waste Management and Disposal

### **1.2 REFERENCES**

- .1 ASTM International
  - .1 ASTM D2047-04, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine.
  - .2 ASTM F1066-04, Standard Specification for Vinyl Composition Floor Tile.
  - .3 ASTM F1303-04(2009), Standard Specification for Sheet Vinyl Floor Covering with Backing.
- .2 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2007, Architectural Coatings.
  - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

### **1.3 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 – Shop Drawings, Product Data and Samples.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for flooring, adhesive, primer, sealer, and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 33 - Health and Safety Requirements, 01 35 43 - Environmental Procedures.
- .3 Samples:
  - .1 Submit for review and acceptance of each unit.
  - .2 Samples will be returned for inclusion into work.
  - .3 Submit duplicate 300 x 300 mm sample pieces of sheet material.
  - .4 Submit duplicate full size samples of each type of tile.
  - .5 Submit 300 mm long base and edge strips.
- .4 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.

- .2 Recycled Content:
  - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
  - .3 Regional Materials: submit evidence that project incorporates required percentage 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
  - .4 Low-Emitting Materials:
    - .1 Submit listing of adhesives primers and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

#### 1.4 CLOSEOUT SUBMITTALS

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

#### 1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect resilient flooring from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section.
- .5 Packaging Waste Management: remove for reuse of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

#### 1.6 SITE CONDITIONS

- .1 Ensure high ventilation rate, with maximum outside air, during installation.
  - .1 Vent directly to outside.
  - .2 Do not let contaminated air recirculate through a district or whole building air distribution system.
  - .3 Maintain extra ventilation for 1 month minimum after building occupation.

### PART 2 - PRODUCTS

#### 2.1 RESILIENT SHEET FLOORING MATERIALS

- .1 Linoleum sheet flooring: composed of natural ingredients which are mixed and calendered onto a jute backing:
  - .1 Pattern: marbled.
  - .2 Thickness: 2.0 mm.

- .3 Colour: as selected by Departmental Representative from manufacturer's standard colour range.
- .4 Slip resistance: static coefficient of friction to ASTM D2047.
- .5 Wear resistance to ASTM C501.

## 2.2 ACCESSORIES

- .1 Resilient base: continuous, top set, complete with premoulded end stops and external corners:
  - .1 Type: rubber, 3.0 mm thick.
  - .2 Style: straight and cove.
  - .3 Height: 101.6 mm.
  - .4 Lengths: cut lengths minimum 2400 mm.
  - .5 Colour: as selected by Departmental Representative from manufacturer's standard colour range.
- .2 Primers and adhesives: of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.
  - .1 Adhesives: VOC limit 50 g/L maximum to SCAQMD Rule 1168.
  - .2 Primer: in accordance with manufacturer's recommendations for surface conditions:
    - .1 VOC limit: 100 g/L maximum to SCAQMD Rule 1113
- .3 Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.
- .4 Metal edge strips: extruded aluminum, smooth, mill finish stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.
- .5 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Examine conditions, substrates and work to receive work of this Section, co-ordinate with Section 01 71 00 - Examination and Preparation.
- .2 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative.
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Departmental Representative.
- .3 Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

### 3.2 PREPARATION

- .1 Prepare for installation in accordance with manufacturer's written recommendations.
- .2 Remove sub-floor ridges and bumps and fill low spots, cracks, joints, holes and other defects with sub-floor filler.

- .3 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface.
  - .1 Prohibit traffic until filler is completely cured and dry.
- .4 Ensure existing vinyl flooring is removed by trained personnel.
- .5 Remove or treat existing adhesives to prevent residual bleeding through to new flooring or interfering with bonding of new adhesives.
- .6 Prime concrete slab as recommended by resilient flooring manufacturer's written instructions.

### 3.3 APPLICATION: FLOORING

- .1 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.
- .2 Resilient sheet flooring:
  - .1 Lay flooring with seams parallel to building lines to produce minimum number of seams.
  - .2 Border widths: 1/3 minimum width of full material.
- .3 Run sheets in direction of traffic. Double cut sheet joints heat weld according to manufacturer's written instructions.
- .4 Heat weld seams of linoleum sheet flooring in accordance with manufacturer's written instructions.
- .5 Resilient tile flooring:
  - .1 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern.
  - .2 Border tiles: half tile width minimum.
  - .3 Install flooring [to square grid pattern with joints aligned].
- .6 As installation progresses, and after installation roll flooring with 45 kg minimum roller to ensure full adhesion.
- .7 Cut flooring neatly around fixed objects.
- .8 Continue flooring over areas which will be under built-in furniture.
- .9 Continue flooring through areas to receive movable type partitions without interrupting floor pattern.
- .10 Terminate resilient flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- .11 Install metal edge strips at unprotected or exposed edges where flooring terminates.

### 3.4 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 using premoulded corner units for right angle external corners and formed straight base material for external corners of other angles.

- .8 Use toeless type base where floor finish will be carpet, coved type elsewhere.
- .9 Install toeless type base before installation of carpet on floors.

### 3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 11 55 – General Instructions.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 11 55 – General Instructions.
  - .1 Remove excess adhesive from floor, base and wall surfaces without damage.
  - .2 Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.
- .3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### 3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Protect new floors in accordance with manufacturer's printed instructions.
- .3 Repair damage to adjacent materials caused by resilient flooring installation.

END OF SECTION

## **PART 1 - GENERAL**

### **1.1 SUMMARY**

- .1 Section Includes:
  - .1 Material and installation of site applied paint finishes to new interior surfaces, including site painting of shop primed surfaces.
- .2 Related Sections:
  - .1 Section 01 21 99 – Partition for Minor Works
  - .2 Section 01 33 00 - Shop Drawings, Product Data and Samples
  - .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal
  - .4 Section 05 55 00 – Metal Fabrications
  - .5 Section 06 20 00 – Finish Carpeting
  - .6 Section 08 11 00 – Metal Doors and Frames
  - .7 Section 21 05 01 – Common Work Results – Mechanical
  - .8 Section 22 05 00 – Common Work Results – Plumbing
  - .9 Section 23 05 00 – Common Work Results – HVAC
  - .10 Section 2605 00 – Common Work Results – Electrical

### **1.2 REFERENCES**

- .1 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33
- .2 Environmental Protection Agency (EPA)
  - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings).
- .3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .4 Master Painters Institute (MPI)
  - .1 MPI Architectural Painting Specifications Manual, 2004.
- .5 National Fire Code of Canada - 1995
- .6 Society for Protective Coatings (SSPC)
  - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transport Canada (TC)
  - .1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34 .

### **1.3 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Contractor: minimum of five years proven satisfactory experience. Provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.
  - .2 Journeymen: qualified journeymen who have "Tradesman Qualification Certificate of Proficiency" engaged in painting work.
  - .3 Apprentices: working under direct supervision of qualified trades person in accordance with trade regulations.

- .2 Mock-Ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
    - .1 Provide 3000 mm x 3000 mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
    - .2 Mock-up will be used:
      - .1 To judge workmanship, substrate preparation, operation of equipment and material application and workmanship to MPI Architectural Painting Specification Manual standards.
    - .3 Locate where directed
    - .4 Allow 24 hours for inspection of mock-up before proceeding with work.
    - .5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.
- .3 Pre-Installation Meeting:
  - .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installations in accordance with Section 01 32 16.06 - Construction Progress Schedule - Critical Path Method (CPM).
    - .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:

#### 1.4 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 - Shop Drawings, Product Data and Samples.
- .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 - Shop Drawings, Product Data and Samples. 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 stain clear coating special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
    - .1 3 mm plate steel for finishes over metal surfaces.
    - .2 13 mm birch plywood for finishes over wood surfaces.
    - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
    - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
  - .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 stain 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 dry chemical fire extinguisher adjacent to storage area.
    - .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
    - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.
  - .9 Waste Management and Disposal:
    - .1 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 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
    - .4 Separate for recycling and place in designated containers Steel Metal Plastic waste in accordance with Waste Management Plan (WMP).
    - .5 Place materials defined as hazardous or toxic in designated containers.
    - .6 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal, regulations.
    - .7 Ensure emptied containers are sealed and stored safely.
    - .8 Unused paint coating materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.
    - .9 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
    - .10 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

- .11 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .12 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
  - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
  - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
  - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
  - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
  - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .13 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.
- .14 Set aside and protect surplus and uncontaminated finish materials: Deliver to or arrange collection by organizations for verifiable re-use or re-manufacturing.

## 1.8 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
  - .1 Ventilate enclosed spaces in accordance with Section 01 35 33 – Health and Safety Requirements.
  - .2 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.
  - .3 Provide continuous ventilation for seven days after completion of application of paint.
  - .4 Coordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
  - .5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
  - .6 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
  - .1 Unless pre-approved written approval by Paint Inspection Agency Authority and product manufacturer, perform no painting when:
    - .1 Ambient air and substrate temperatures are below 10 degrees C.
    - .2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
    - .3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
    - .4 The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.

- .5 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 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Provide paint materials for paint systems from single manufacturer.
- .3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Conform to latest MPI requirements for interior painting work including preparation and priming.
- .5 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.
- .6 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.
- .7 Provide paint products meeting MPI "Environmentally Friendly" E2 rating based on VOC (EPA Method 24) content levels.

- .8 Use MPI listed materials having minimum E2 rating where indoor air quality (odour) requirements exist.
- .9 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids:
  - .1 Water-based.
  - .2 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.
- .10 Formulate and manufacture water-borne surface coatings with no aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .11 Flash point: 61.0 degrees C or greater for water-borne surface coatings and recycled water-borne surface coatings.
- .12 Ensure manufacture and process of both water-borne surface coatings and recycled water-borne surface coatings does not release:
  - .1 Matter in undiluted production plant effluent generating 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to natural watercourse or sewage treatment facility lacking secondary treatment.
  - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to natural watercourse or a sewage treatment facility lacking secondary treatment.
- .13 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes to meet minimum "Environmentally Friendly" E2 rating.
- .14 Recycled water-borne surface coatings to contain 50% post-consumer material by volume.
- .15 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 for review.
- .2 Colour schedule will be based upon selection of five base colours and three accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.
- .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 and as noted on Finish Schedule.

## 2.5 INTERIOR PAINTING SYSTEMS

- .1 Asphalt surfaces: zone/traffic marking of interior drive and parking areas:
  - .1 INT 2.1A - Latex zone/traffic marking finish.
  - .2 INT 2.1B - Alkyd zone/traffic marking finish.
- .2 Concrete vertical surfaces: including horizontal soffits:
  - .1 INT 3.1C - High performance architectural latex gloss level 3 finish.
- .3 Concrete horizontal surfaces: floors and stairs:
  - .1 INT 3.2A - Latex floor enamel low gloss finish.
- .4 Cementitious composition board surfaces:
  - .1 INT 3.3B - High performance architectural latex gloss level 3 finish.
- .5 Clay masonry units: pressed and extruded brick:
  - .1 INT 4.1A - Latex gloss level 3 finish.

- .6 Concrete masonry units: smooth and split face block and brick:
  - .1 INT 4.2D - High performance architectural latex gloss level 3 finish.
- .7 Structural steel and metal fabrications: columns, beams, joists:
  - .1 INT 5.1A - Quick dry enamel semi-gloss finish.
- .8 Steel - high heat: (boilers, furnaces, heat exchangers, breeching, pipes, flues, stacks, etc., with temperature range as noted):
  - .1 INT 5.2A - Heat resistant enamel finish, maximum 205 degrees C.
- .9 Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
  - .1 INT 5.3B - Waterborne light industrial gloss level 6 coating.
- .10 Aluminum: unanodized:
  - .1 INT 5.4E - Waterborne light industrial gloss level 3 coating.
- .11 Copper:
  - .1 INT 5.5E - Waterborne light industrial gloss level 3 coating.
- .12 Stainless steel: unpolished:
  - .1 INT 5.6A - Waterborne light industrial gloss level 3 coating (over bonding primer).
- .13 Dimension lumber: columns, beams, exposed joists, underside of decking:
  - .1 INT 6.2B - High performance architectural latex gloss level 3 finish.
- .14 Dressed lumber: including doors, door and window frames, casings, mouldings:
  - .1 INT 6.3A - High performance architectural latex gloss level 3 finish.
- .15 Wood paneling and casework: partitions, panels, shelving, millwork:
  - .1 INT 6.4S - High performance architectural latex gloss level 3 finish.
- .16 Fibreglass: panels, trims, fabrications:
  - .1 INT 6.7C - Waterborne light industrial gloss level 3 coating.
  - .2 INT 6.7H - High performance acrylic latex gloss level 3 finish.
- .17 Plastic: lumber, panels, trims, fabrications, vinyl wall covering, PVA/PVC materials:
  - .1 INT 6.8A - High performance architectural latex gloss level 3 finish.
- .18 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
  - .1 INT 9.2B - High performance architectural latex gloss level 3 finish.
- .19 Acoustic panels and tiles:
  - .1 INT 9.3E High performance architectural latex gloss level 1 finish.
- .20 Canvas and cotton coverings.
  - .1 INT 10.1A - Latex gloss level 4 finish.

- .21 Bituminous coated surfaces: cast iron pipe, concrete, etc.:
  - .1 INT 10.2A - Latex gloss level 3 finish.

## 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%.

### 3.4 PREPARATION

- .1 Protection:
  - .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
  - .4 Protect passing pedestrians, building occupants and general public in and about the building.
- .2 Surface Preparation:
  - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or 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 and vacuum cleaning.
- .8 Touch up of shop primers with primer as specified.
- .9 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

### 3.5 APPLICATION

- .1 Method of application to be as approved by Departmental Representative. Apply paint by brush roller air sprayer airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
  - .1 Apply paint in uniform layer using brush and/or roller 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.

**END OF SECTION**