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**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 06 10 00 – Rough Carpentry
- .4        Section 09 51 13 – acoustical Panel ceiling
- .5        Section 09 91 23 – Interior Painting

**1.2                REFERENCES**

- .1        American Society for Testing and Materials International, (ASTM)
  - .1        ASTM C36/C36M-01, Specification for Gypsum Wallboard.
  - .2        ASTM C475-01, Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
  - .3        ASTM C514-01, Specification for Nails for the Application of Gypsum Board.
  - .4        ASTM C557-99, Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
  - .5        ASTM C840-01, Specification for Application and Finishing of Gypsum Board.
  - .6        ASTM C954-00, Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.84 mm to 2.84 mm in Thickness.
  - .7        ASTM C1047-99, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
  - .8        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-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 300 x 300 mm size samples of 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 - 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 for recycling in accordance with Waste Management Plan.
- .4 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .5 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Departmental Representative.
- .6 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.

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**Part 2 Products**

**2.1 MATERIALS**

- .1 Standard board: to ASTM C36/C36M regular, 12.7 mm thick and Type X, 15.9 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges bevelled.
- .2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .3 Resilient drywall furring : 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- .4 Nails: to ASTM C514.
- .5 Steel drill screws: to ASTM C1002.
- .6 Stud adhesive: to CAN/CGSB-71.25 ASTM C557.
- .7 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process, 0.5 mm base thickness, perforated flanges, one piece length per location.
- .8 Sealants: in accordance with Section 07 92 00 - Joint Sealing.
- .9 Joint compound: to ASTM C475, asbestos-free.

**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 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .8 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

- .9 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.
- .10 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .11 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .12 Erect drywall resilient furring transversely across studs, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.

### 3.2 APPLICATION

- .1 Do not apply gypsum board until 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.
  - .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.
  - .3 Apply single layer gypsum board to concrete block surfaces, where required, 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 Exterior Soffits and Ceilings: Install exterior gypsum board perpendicular to supports; stagger end joints over supports. Install with 6 mm gap where boards abut other work.
- .5 Apply water-resistant gypsum board where wall tiles to be applied and adjacent to kitchen counters. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .6 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.
- .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 access doors to electrical and mechanical fixtures specified in respective sections.
  - .1 Rigidly secure frames to furring or framing systems.
- .5 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.
- .6 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 Above finish ceilings: Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.
    - .2 All other exposed areas: Level 5: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.
- .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 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .10 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
- .11 Remove ridges by light sanding or wiping with damp cloth.

- .12 Provide protection that ensures gypsum drywall work will remain without damage or deterioration at time of substantial completion.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1        Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2        Section 07 92 00 – Joint Sealants
- .3        Section 09 21 16 - Gypsum Board Assemblies.

**1.2                REFERENCES**

- .1        American Society for Testing and Materials International, (ASTM).
  - .1        ASTM C645-00, Specification for Nonstructural Steel Framing Members.
  - .2        ASTM C754-00, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .2        Canadian General Standards Board (CGSB).
  - .1        CAN/CGSB-1.40-97, Primer, Structural Steel, Oil Alkyd Type.

**1.3                QUALITY ASSURANCE**

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

**1.4                WASTE MANAGEMENT AND DISPOSAL**

- .1        Separate and recycle waste materials 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, and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.
- .4        Divert unused metal materials from landfill to metal recycling facility approved by PWGSC Representative.
- .5        Divert unused gypsum materials from landfill to recycling facility approved by PWGSC Representative.

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**Part 2            Products**

**2.1                MATERIALS**

- .1    Non-load bearing channel stud framing: to ASTM C645, 92 mm stud size, roll formed from 0.91 mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.
- .2    Stud sizes shall be as indicated on the drawings.
- .3    Acoustical sealant: to Section 07 92 00 – Joint Sealants.

**Part 3            Execution**

**3.1                ERECTION**

- .1    Align tracks at bulkhead and ceiling and secure at 400 mm on centre maximum.
- .2    Erect metal studding to tolerance of 1:1000.
- .3    Attach studs to track using screws.
- .4    Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.
- .5    Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .6    Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .7    Extend partitions to ceiling height except where noted otherwise on drawings.
- .8    Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .9    Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

**3.2                CLEANING**

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

**END OF SECTION**

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**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 35 43 - Environmental Procedures.
  - .4    Section 01 45 00 - Quality Control.
  - .5    Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .6    Section 01 78 00 - Closeout Submittals.
  - .7    Section 09 53 00.01 - Acoustical Suspension: Suspension system.

**1.2            REFERENCES**

- .1    American Society for Testing and Materials International (ASTM)
  - .1    ASTM E1264-98, Standard Classification for Acoustical Ceiling Products.
- .2    Canadian General Standards Board (CGSB)
  - .1    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    Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1    Material Safety Data Sheets (MSDS).
- .5    Underwriter's Laboratories of Canada (ULC)
  - .1    CAN/ULC-S102-2003, Surface Burning Characteristics of Building Materials and Assemblies.

**1.3            SUBMITTALS**

- .1    Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Submit duplicate 300 X 300 mm samples of each type acoustical units.

**1.4            QUALITY ASSURANCE**

- .1    Mock-up:
  - .1    Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2    Construct mock-up 10 m<sup>2</sup> minimum of each type acoustical panel 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 PWGSC 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.
- .2 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 PWGSC 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.
  - .3 Collect and separate for disposal corrugated cardboard packaging material for recycling in accordance with Waste Management Plan (WMP).
  - .4 Place materials defined as hazardous or toxic in designated containers in accordance with Section 01 35 43 - Environmental Procedures.
  - .5 Ensure emptied containers are sealed and stored safely in accordance with Section 01 35 43 - Environmental Procedures.
  - .6 Fold up metal banding, flatten and place in designated area for recycling.

## **1.6 ENVIRONMENTAL REQUIREMENTS**

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

## **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.
- .3 Ensure extra materials are from same production run as installed materials.
- .4 Clearly identify each type of acoustic unit, including colour and texture.

- .5 Deliver to PWGSC Representative upon completion of the work of this section.

## **Part 2 Products**

### **2.1 SUSTAINABLE REQUIREMENTS**

### **2.2 MATERIALS**

- .1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1 and ASTM E1264.
  - .1 Type 3.
  - .2 Class A.
  - .3 Cellulose fibre with minimum 25 % recycled content.
  - .4 Pattern non directional, Class A.
  - .5 Textures: smooth.
  - .6 Flame spread rating of 25 or less in accordance with CAN/ULC-S102.
  - .7 Smoke developed 50 or less in accordance with CAN/ULC-S102.
  - .8 Noise Reduction Coefficient (NRC) designation of .55.
  - .9 Ceiling Attenuation Class (CAC) rating 35, in accordance with ASTM E1264
  - .10 Light Reflectance (LR) range of .85 to ASTM E1477.
  - .11 Edge type dropped bevelled, also referred to as Tegular Tile.
  - .12 Colour white.
  - .13 Size 610 x 610 x 16 mm thick.
  - .14 Shape flat.
- .2 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

## **Part 3 Execution**

### **3.1 EXAMINATION**

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

**3.4 INTERFACE WITH OTHER WORK**

- .1 Co-ordinate with Section 09 53 00.01 - Acoustical Suspension.
- .2 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.

**SECTION**

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**Part 1           General**

**1.1           RELATED SECTIONS**

- .1       Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2       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 engineer registered or licensed in Province of Newfoundland and Labrador, 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 - Construction/Demolition Waste Management and Disposal.

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**Part 2 Products**

**2.1 MATERIALS**

- .1 Intermediate duty system to ASTM C635.
- .2 Basic materials for suspension system: zinc coated.
- .3 Suspension system: non fire rated, made up as follows:
  - .1 Two directional exposed tee bar grid.
  - .2 Face dimension 15mm, "Suprafine."
- .4 Exposed tee bar grid components: shop painted satin sheen white colour. Components die cut. Main tee with double web, rectangular bulb and 25 mm rolled cap on exposed face. Cross tee with rectangular bulb; web extended to form positive interlock with main tee webs; lower flange extended and offset to provide flush intersection.
- .5 Hanger wire: galvanized soft annealed steel wire:
  - .1 3.6 mm diameter for access tile ceilings.
- .6 Hanger inserts: purpose made.
- .7 Accessories: splices, clips, wire ties, retainers and wall moulding reveal, to complement suspension system components, as recommended by system manufacturer.

**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 INSTALLATION**

- .1 Installation: in accordance with ASTM C636 except where specified otherwise.
- .2 Install suspension system to manufacturer's instructions and Certification Organizations tested design requirements.
- .3 Do not erect ceiling suspension system until work above ceiling has been inspected by PWGSC Representative.
- .4 Secure hangers to overhead structure using attachment methods as indicated acceptable to PWGSC Representative.
- .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 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, 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 Finished ceiling system to be square with adjoining walls and level within 1:1000.

### **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**

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**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                REFERENCES**

- .1        American Association of Textile Chemists and Colorists (AATCC)
  - .1        AATCC 16-1998, Color Fastness to Light.
  - .2        AATCC 23-1999, Color Fastness to Burn Gas Fumes.
  - .3        AATCC 118-1997, Oil Repellency: Hydrocarbon Resistance Test.
  - .4        AATCC 129-2001, Colour Fastness to Ozone in the Atmosphere Under High Humidities.
  - .5        AATCC 134-2001, Electrostatic Propensity of Carpet.
  - .6        AATCC 171-2000, Carpets: Cleaning of; Hot Water Extraction Method.
  - .7        AATCC 174-1998, Antimicrobial Activity Assessment of Carpets.
  - .8        AATCC 175-1998, Stain Resistance: Pile Floor Coverings.
  - .9        AATCC 189-2001, Fluorine Content of Carpet Fibers.
- .2        American Society for Testing and Materials (ASTM International)
  - .1        ASTM D1055-97, Specification for Flexible Cellular Materials - Latex Foam.
  - .2        ASTM D1335-98, Tuft Bind of Pile Floor Coverings.
  - .3        ASTM D1667-97, Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
  - .4        ASTM D3936-00 Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
  - .5        ASTM D5252-98a, Standard Practice for the Operation of the Hexapod Drum Tester.
  - .6        ASTM D5417-99, Standard Practice for Operation of the Vettermann Drum Tester.
  - .7        ASTM E84-01, Test Method for Surface Burning Characteristics of Building Materials.
  - .8        ASTM E648-00, Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
  - .9        ASTM E662-01, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .3        Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-4.2 No.27.6-M91, Textile Test Methods - Flame Resistance - Methemine Tablet Test for Textile Floor Coverings.
- .2 CAN/CGSB-4.2 No.77.1-94/ISO 4919:1978, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.
- .3 CGSB 4-GP-36M-78, Carpet Underlay, Fiber Type.
- .4 CAN/CGSB-4.129-93(R1997), Carpets for Commercial Use.
- .5 CGSB 20-GP-23M-78, Cushion, Carpet, Flexible Polymeric Material.
- .6 CAN/CGSB-25.20-95, Surface Sealer Floors.
- .4 Carpet and Rug Institute (CRI)
  - .1 CRI-104-96, Standard Installation of Commercial Carpet.
  - .2 IAQ Carpet Testing Program.
- .5 National Floor Covering Association (NFCA)
  - .1 Floor Covering Specification Manual 1998.
- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S102-88(R2000), Surface Burning Characteristics of Building Materials and Assemblies.
  - .2 CAN/ULC-S102.2-88(R2000), Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

### **1.3 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 recycling process.

### **1.4 PRODUCT DATA**

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

- .2 Submit product data sheet for each carpet, undercushion, 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.

## **1.5 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate locations and lengths of seams for carpeted areas.
- .3 Indicate nap direction, open edges, special patterns, and other details required by Departmental Representative to clarify work.
- .4 Submit drawings showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required as well as direction of carpet pile and pattern, location of edge moldings and edge bindings to Departmental Representative for review prior to installation of carpet.

## **1.6 SAMPLES**

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate 675 x 900 mm pieces of each type carpet specified, duplicate 225 x 225 mm pieces for each colour selected, 300 mm square pieces of undercushion, 150 mm lengths of carpet gripper and binder bars base divider strips.

## **1.7 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 fibre 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.

## **1.8 QUALIFICATIONS**

- .1 Installer Qualifications:
  - .1 Flooring contractor requirements.
    - .1 Specialty contractor normally engaged in this type of work, with prior experience in installation of these types of materials.
    - .2 Certified by carpet manufacturer prior to tender 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.

## **1.9 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.

## **1.10 DELIVERY, STORAGE AND HANDLING**

- .1 Label packaged materials. For carpet tile products indicate nominal dimensions of tile and indicate installation direction.
- .2 Identify Packaging, labelling, packing and marking details.
- .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 Store materials in area of installation for minimum period of 48 hours prior to installation.
- .7 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.

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**1.11 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with Waste Reduction Workplan.
- .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 for recycling in accordance with Waste Management Plan.
- .4 Vacuum used carpet before removal.
- .5 Maintain possession of removed used carpet.
- .6 Remove used broom in large pieces, roll tightly carpet tile stack pack in cardboard boxes and pack in container trailer pallets. Use effective packing techniques to maximize amount of material in container. Do not stack carpet tile higher than 1800 mm high.
- .7 Sort only clean, dry carpet materials for reclamation. Clean is defined as carpet free from demolition debris, asbestos contamination, garbage and tack strips.
- .8 Immediately remove used carpet from site and transport to reclamation point.
- .9 Carpet undercushion: provide recycling of carpet padding where locally available or as designated by carpet reclamation program.

**1.12 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 Temperature: Maintain ambient temperature of not less than 18 °C from 48 hours before installation to at least 48 hours after completion of work.
- .3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.
- .4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .5 Ventilation:
  - .1 Departmental Representative will arrange for ventilation system to be operated during installation of carpet. Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.
  - .2 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities. Provide fans with HEPA filters.

- .3 Provide continuous ventilation during and after carpet application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of carpet installation.
- .6 Test existing floor levelling compound for presence of asbestos contamination. Notify Departmental Representative for additional instructions where asbestos is discovered.
- .7 Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

### **1.13 EXTRA MATERIALS**

- .1 Provide extra materials of carpet, carpet base, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 25% extra carpet tile 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 Departmental Representative and store where directed by Departmental Representative.

## **Part 2 Products**

### **2.1 MANUFACTURERS**

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

### **2.2 MODULAR CARPET**

- .1 Patterns and colours from manufacturers standard range.
- .2 Carpet Tile Dimensions: 610 x 610 mm.
- .3 Carpet: to CAN/CGSB-4.129 and as follows:
  - .1 Certified for flammability to Health Canada regulations under "Hazardous Products (Carpet) Regulations", Part II of the Schedule.
  - .2 Maximum flame spread rating 300, maximum smoke developed classification 500.
  - .3 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute's IAQ requirements.
- .4 Performance rating: to ASTM D5252 or ASTM D5417.
- .5 Construction: multi-level pattern loop.
- .6 Pile Surface Appearance:

- .1 Multi-level loop: sculptured.
- .7 Pile fibre: to CAN/CGSB-4.129.
  - .1 Nylon:
    - .1 Type: Nylon 6.
- .8 Yarn Ply: 2- ply.
- .9 Gauge: 47.24 per 10 cm.
- .10 Total thickness: 6.20 mm
- .11 Stitches per 10cm: 35.43
- .12 Tuft Density: 9.42 kilotex.
- .13 Yarn Dye Method: 100% solution dyed.
- .14 Total Weight: 576.40 g/m<sup>2</sup>.
- .15 Colourization: patterned, multiple colour tones.
- .16 Colourfastness to light: to CAN/CGSB-4.2No.18.3 AATCC 16E.
- .17 Colour Fastness to Atmospheric Fading: to AATCC 129 and AATCC 23.
- .18 Primary Backing: woven.
- .19 Precoat: non-PVC.
- .20 Secondary Backing: non-PVC, thermoplastic polyolefin recyclable composite compound with a fibreglass reinforcing layer.
  - .1 Density: as per ASTM D1667.
- .21 Adhesive: mill applied releasable dry adhesive.

## **2.3 SPECIAL REQUIREMENTS**

- .1 Permanent static control: to AATCC 134, 3500V maximum at 20%RH and 22°C.
- .2 Anti-microbial: to AATCC 174, 99% reduction, 0% growth.

## **2.4 ACCESSORIES**

- .1 Base:
  - .1 Carpet Base: 100mm high. Same material, colour, Pattern and texture as adjoining carpet. Bound exposed edge.
- .2 Seaming tape: types recommended by carpet manufacturer for purpose intended.
- .3 Adhesive:

- .1 Multi-purpose adhesive type: recommended by carpet manufacturer for direct glue down installation.
- .2 Pressure sensitive type: recommended by carpet manufacturer for direct glue down installation of modular carpet or speciality backed carpets.
- .4 Carpet protection: non-staining heavy duty kraft paper.
- .5 Concrete floor sealer: to CAN/CGSB-25.20, Type 1.
- .6 Subfloor patching compound: Portland cement base filler, mix with latex and water to form a cementitious paste.

### **Part 3 Execution**

#### **3.1 DEMOLITION**

- .1 Remove and divert return carpet for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with Waste Reduction Workplan. Coordinate with PWGSC Representative.

#### **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 polymer fortified patching compound.
- .2 Do not exceed manufacturer's recommendations for patch thickness.
- .3 Large patch areas are to 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 contaminates, including sealers, that may interfere with the bonding of the adhesive.
- .6 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

#### **3.3 PREPARATION**

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

#### **3.4 INSTALLATION**

- .1 Install carpeting using minimum of pieces.

- .2 Install in accordance with manufacturer's printed instructions and in accordance with Carpet and Rug Institute Standard for Installation of Commercial Carpet, CRI 104.
- .3 Install carpet after finishing work is completed but before demountable office partitions and telephone and electrical pedestal outlets are installed.
- .4 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.
- .5 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.
- .6 Adhesive seams and cross-joints. Seam edges must be sealed.
- .7 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter of rooms into recesses, and around projections.
- .8 Install carpeting to underfloor duct system and to access covers.
- .9 Install carpeting in pan type floor access covers.
- .10 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- .11 Install carpet smooth and free of bubbles, puckers, and other defects.

### **3.5 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 adhesive to sub-floor.

### **3.6 SEAMS**

- .1 Carpet visibility of seams and joints to acceptable industry standards.

### **3.7 BASE INSTALLATION**

- .1 Install bound edge carpet base to match adjacent carpeting.
- .2 Attach carpet to wall with adhesive. Neatly fit against floor carpet.

### **3.8 PROTECTION OF FINISHED WORK**

- .1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.
- .2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.

- .3      Install carpet protection to satisfaction of Departmental Representative.

**END OF SECTION**

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**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 35 29.06 - Health and Safety Requirements.
  - .4    Section 01 45 00 - Quality Control.
  - .5    Section 01 61 00 - Common Product Requirements.
  - .6    Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .7    Section 01 78 00 - Closeout Submittals.
  - .8    Section 09 21 16 - Gypsum Board Assemblies

**1.2                REFERENCES**

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

**1.3                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 16.07 - 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 PWGSC Representative for review. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from PWGSC 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 birch plywood for finishes over wood surfaces.
    - .3 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. Identify colour and paint type in relation to established colour schedule and finish system.
- .3 Delivery, storage and protection: comply with PWGSC 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 reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal .
  - .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .3 Collect and separate for disposal corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan (WMP).
- .4 Place materials defined as hazardous or toxic in designated containers.
- .5 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.
- .6 Ensure emptied containers are sealed and stored safely.
- .7 Unused paint materials must be disposed of at official hazardous material collections site as approved by PWGSC Representative.
- .8 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
- .9 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .10 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .11 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:
  - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out.
  - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
  - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
  - .4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.
  - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
- .12 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

## 1.8 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 PWGSC 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 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 PWGSC Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

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**Part 2        Products**

**2.1            MATERIALS**

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

## 2.2 COLOURS

- .1 PWGSC Representative will provide Colour Schedule after Contract award.
- .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 manufacturer's 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 PWGSC 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 @ 60 degrees | Sheen @ 85 degrees |
|--|--------------------|--------------------|
| Gloss Level 4 - Satin-Like Finish                | 20 to 35           | min. 35            |
| Gloss Level 5 - Traditional<br>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 Dressed lumber: including doors, door and window frames, casings, mouldings:
  - .1 INT 6.3T - Latex semi-gloss finish (over latex primer).
- .2 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:
  - .1 INT 9.2A - Latex G4 finish (over latex sealer).

## **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 PWGSC 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 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 PWGSC Representative.
  - .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
  - .3 Protect factory finished products and equipment.
  - .4 Protect building occupants in and about the building.
- .2 Surface Preparation:
  - .1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
  - .2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
  - .3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of PWGSC Representative.
- .3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
  - .1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air .
  - .2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
  - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
  - .4 Allow surfaces to drain completely and allow to dry thoroughly.
  - .5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
  - .6 Use trigger operated spray nozzles for water hoses.
  - .7 Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
- .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
- .5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
  - .1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.

- .2 Apply wood filler to nail holes and cracks.
- .3 Tint filler to match stains for stained woodwork.
- .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
- .7 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes.
- .8 Touch up of shop primers with primer as specified.
- .9 Do not apply paint until prepared surfaces have been accepted by PWGSC Representative.

### **3.5 APPLICATION**

- .1 Method of application to be as approved by PWGSC Representative. Apply paint by brush and/or roller. 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 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
- .4 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .5 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .6 Sand and dust between coats to remove visible defects.
- .7 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.
- .8 Finish inside of cupboards and cabinets as specified for outside surfaces.

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**3.6 FIELD QUALITY CONTROL**

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

**3.7 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 PWGSC Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by PWGSC Representative.

**END OF SECTION**