

PART 1- GENERAL

1.1 REFERENCES

- .1 ASTM International
 - .1 ASTM C 1396/C 1396M-09a, Standard Specification for Gypsum Wallboard.
 - .2 ASTM C 475/C 475M-02, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .3 ASTM C 514-04 e1, Standard Specification for Nails for the Application of Gypsum Board.
 - .4 ASTM C 645-09a, Standard Specification for Nonstructural Steel Framing Members.
 - .5 ASTM C 754-09a, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - .6 ASTM C 840-08, Standard Specification for Application and Finishing of Gypsum Board.
 - .7 ASTM C 1002-07, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .8 ASTM C 1047-10, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
- .2 CSA International
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CSA O121-08 (R2013), Douglas Fir Plywood.
 - .3 CAN/CSA-Z809-08 (R2013), Sustainable Forest Management.
- .3 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-2007, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.2 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: mold and moisture-resistant, high impact gypsum board, joint compound and sealants. Include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit manufacturer's instructions, printed product literature and data sheets for acoustic sealant and include product characteristics, performance criteria, physical size, finish and limitations.Wood Certification: submit [vendor's] [manufacturer's]
Chain-of-Custody Certificate number for CAN/CSA-Z809.

1.3 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 and level. 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 partition materials from nicks, scratches, and blemishes.
 - .5 Replace defective or damaged materials with new.

1.4 AMBIENT CONDITIONS

- .1 Maintain temperature 10 degrees C minimum, 21 degrees C maximum, for 48 hours prior to and during application of gypsum boards and joint treatment, and for 48 hours minimum after completion of joint treatment.
- .2 Apply board and joint treatment to dry, frost free surfaces.
- .3 Ventilation: ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Channel stud framing.
 - .1 For partitions.
 - .1 Non-load bearing channel stud framing: to ASTM C 645, stud size as indicated, 20 gauge 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 C 645, 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.
- .2 Metal furring runners, hangers, tie wires, inserts and anchors.
- .3 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
- .4 Panel materials.
 - .1 High performance, very high impact (VHI) interior gypsum board panels with moisture and mold resistance, consisting of a

non-combustible, moisture and mold resistant core encased in inorganic moisture resistant fiberglass mat face and back.

- .1 Mold resistance to ASTM D 3273: best possible score of 10.
 - .2 Permeance, perms: >10.
 - .3 Water absorption (% of weight): <5.
 - .4 Surface water absorption: <1.6 grams.
 - .5 Abrasion resistance to ASTM C1629: Level 3.
 - .6 Indentation resistance to ASTM C1629: Level 1.
 - .7 Soft body impact to ASTM C1629: Level 3.
 - .8 Hard body impact to ASTM C1629: Level 2.
 - .9 Non-combustible core per ASTM E136.
 - .10 Surface burning characteristics per ASTM E84: flame spread 0, smoke developed 5.
 - .11 Thickness: 16 mm.
 - .12 Regular, 1200 mm wide x maximum practical length.
- .2 Acceptable Material: USG Sheetrock Brand, Glass-Mat Panels Mold Tough VHI Firecode X, or approved equal.
- .5 Accessories.
 - .1 Gypsum wallboard casing beads, corner beads and edge trim: to ASTM C 1047, zinc-coated, 0.5 mm base thickness, perforated flanges, one piece length per location.
 - .2 Joint compound:
 - .1 Compound providing a high strength bond with low shrinkage.
 - .2 Finish when dry: hard, plaster-like.
 - .3 Unaffected by humidity.
 - .4 Flammability: 0
 - .5 Acceptable material: Setting Type Joint Compound Durabond 90, or approved equal.
 - .3 Fasteners:
 - .1 Steel tapping screws: to ASTM C 1002.
 - .4 Sealant for edges, ends, cut-outs which expose gypsum core.
 - .1 Water-resistant sealant, of type recommended by molds and moisture resistant gypsum board manufacturer.
 - .5 Acoustical sealant: (at Compressor Room ceiling)
 - .1 Latex based sound caulk.
 - .2 Testing and classification: meets ASTM C834 Standard Specification for Latex-Based Sealing Compounds.
 - .3 Non-sagging.
 - .4 Remains flexible when dry.
 - .5 High adhesion.
 - .6 Surface burning characteristics:
 - .1 Flame spread: 0.
 - .2 Smoke developed: 0.
 - .7 Solids: 73% +/-3%.
 - .8 pH: 8.5 – 9.5.
 - .9 Acceptable material: USG Sheetrock Brand Acoustical Sealant.
 - .6 Sound isolation clips: (at Compressor Room ceiling)
- .6 Backboard material:
 - .1 Douglas fir plywood, good-one-side, 19mm thick, flame spread rating 150, size: 4500mm long x 1220mm high.
 - .2 Hardwood edges with mitred corners.

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.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 ERECTION OF FRAMING

- .1 Install steel framing members to receive screw-attached gypsum board in accordance with ASTM C 754 and gypsum board manufacturer's written instructions.
- .2 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.
- .3 Place studs vertically at maximum 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 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 attached to steel stud partitions.
- .10 Install steel studs or furring channel between studs for attaching electrical and other boxes.
- .11 Extend partitions to height indicated.
- .12 Maintain clearance under beams to avoid transmission of structural loads to studs. Use double track slip joint.

3.3 ERECTION OF GYPSUM BOARD AND ACCESSORIES

- .13 Install continuous insulating strips to isolate studs from uninsulated surfaces.
- .1 Do application and finishing of gypsum board in accordance with ASTM C 840 and in accordance with gypsum board manufacturer's written instructions.
 - .1 Gap at floor: minimum 6mm.
- .2 Apply gypsum board after bucks, anchors, blocking, electrical and mechanical work is approved.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840. Do not attach to steel deck.
- .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 At Compressor Room ceiling, install with sound isolation clips and apply acoustical sealant at perimeter and at all penetrations.
 - .1 Install in accordance with product manufacturer's instructions.
- .6 Install work level to tolerance of 1:1200.
- .7 Frame with furring channels, perimeter of openings for access panels, diffusers and grilles.
- .8 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .9 Install wall furring for gypsum board wall finishes to ASTM C 840, except where specified otherwise.

3.4 INSTALLATION GYPSUM BOARD AND ACCESSORIES

- .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 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.
- .5 Finish corner beads and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .6 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.

- .7 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

3.5 INSTALLATION PLYWOOD BACKBOARD

- .1 Provide equipment backboard for mounting equipment as indicated. Use 19 mm thick douglas fir plywood, good-one-side, hardwood edges with mitred corners for full perimeter, on 22 x 32 mm metal hat-shaped furring channels, 1.15 mm thick (18 gauge) securely attached to concrete block wall. Set furring channels vertically and space at 300 mm on centre for full length of backboard.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.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 74 11 - Cleaning.

3.7 PROTECTION

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

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 307, Tensile Strength of Chemical-Resistant Mortars, Grouts and Monolithic Surfacing.
 - .2 ASTM C 413, Absorption of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacing.
 - .3 ASTM C 579, Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
 - .4 ASTM C 1583, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).
 - .5 ASTM D 696, Coefficient of Linear Thermal Expansion of Plastics.
 - .6 ASTM D 2240-05, Standard Test Method for Rubber Property-Durometer Hardness.
 - .7 ASTM D 4258, Surface Cleaning Concrete for Coating.
 - .8 ASTM D 4259, Abrading Concrete.
 - .9 ASTM D 4414, Measurement of Wet Film Thickness by Notch Gages.
 - .10 ASTM E 1907, Standard Guide to Methods of Evaluating Moisture Conditions of Concrete Floors to Receive Resilient Floor Covering.
- .2 American Concrete Institute (ACI)
 - .1 ACI 302.2R, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
- .3 International Concrete Repair Institute (ICRI)
 - .1 ICRI Guideline 03732, Selecting and Specifying Concrete Surface Preparation for Sealers, coatings and Polymer Overlays.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product data:
 - .1 Submit manufacturer's product data sheet for each product, including physical properties and colours:
 - .1 Flooring material.
 - .2 Curb material.
 - .3 Cove mortar material.
 - .4 Primer for cove base.
 - .5 Sealant.
 - .6 Transition strip.
 - .2 Submit MSDS.
 - .3 Submit flooring manufacturer's detailed written installation instructions for all of the above products.
 - .4 Submit flooring manufacturer's Typical Installation Details.
- .3 Submit documentation verifying that flooring materials specified in this

Section are CFIA (Canadian Food Inspection Agency) compliant.

- .4 Submit a letter of certification written by the flooring manufacturer that states the installer is a current approved applicator fully trained in the installation of the specified materials.
- .5 Samples:
 - .1 Flooring material: submit sample representative of specified material, finish and selected colour.
 - .2 Transition strip: submit duplicate 150 mm long sample.

1.3 CLOSEOUT SUBMITTALS

- .1 Provide closeout submittals in accordance with Section 01 78 00 - Closeout Submittals.
 - .1 Provide maintenance data including procedures and materials for:
 - .1 General cleaning.
 - .2 Stain removal.
 - .3 Recommended schedule for cleaning.

1.4 QUALITY ASSURANCE

- .1 Qualifications.
 - .1 Applicator: Use applicator experienced in application of specified materials for a minimum of five (5) years on projects of similar size and complexity. Provide list of completed projects including project name and location, name of architect, name of material manufacturer, and approximate quantity of materials applied.
 - .2 Applicator's Personnel: Employ only persons trained for application of specified materials. Installer must be an approved applicator of the flooring material manufacturer.
- .2 Pre-application Meeting.
 - .1 Requirement for manufacturer's technical representative field services:
 - .1 Provide manufacturer's field services consisting of product use and installation recommendations in accordance with manufacturer's instructions.
 - .2 Convene a pre-application meeting when surface preparation has been completed and is acceptable to installers prior to start of application of floor coating.
 - .3 Provide two (2) weeks' notice for meeting and ensure manufacturer's representative is available to attend.
 - .4 Require attendance of parties directly affecting work of this Section, including Departmental Representative, Contractor, applicator, and flooring product manufacturer's technical representative.
 - .5 Review: completed surface preparation, materials, priming materials, application floor to wall cove detail, curb detail, edge termination details, other typical details, curing, protection, and coordination with other work.
 - .6 Have on site at time of meeting:
 - .1 Copy of reviewed product data for all components.
 - .2 Copy of flooring manufacturer's written installation instructions for all products.

- .3 Copy of flooring manufacturer's Typical Installation Details.
- .4 All materials and accessories required to complete the work.

- .3 Alternative installation procedures and recommendations must be submitted in writing and approved by the Departmental representative before commencement of the work.
- .4 Verification of cured thickness.
 - .1 Verify the cured thickness of the floor system at random locations.
 - .2 Fill test locations flush with surrounding floor tolerance

1.5 WARRANTY

- .1 Flooring applicator and flooring system manufacturer to submit a written warranty, signed and issued in the name of the owner, warranting the work of this Section against defects in materials and workmanship for a period of five (5) years from date of project Substantial Performance. The warranty must state that materials and labour will be provided as required to perform for repairs to the flooring system to the extent that manufacturing or installation caused defects.
 - .1 The warranty must cover the total cost of repair(s) during the entire warranty period including materials and labour/installation.
 - .2 The warranty must be transferable, at no extra cost, to subsequent building owners.
 - .3 The warranty certificate must reflect these requirements.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials to job site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number, and date of manufacture.
 - .1 Record and retain for future reference, the batch numbers of all materials used.
- .3 Store materials inside, in dry location, away from heavy traffic areas.
- .4 Ensure materials remain in original wrapping and containers until used.
- .5 Deliver and store materials in manner to prevent damage.
 - .1 Store indoors in a dry location where temperature is between 15 and 21 degrees C.
 - .2 Do not store in direct sunlight or high heat conditions.
 - .3 Keep containers sealed until ready for use.
 - .4 Do not subject material to freezing; do not apply material that has been subjected to freezing. Material subjected to freezing shall be separated from inventory and destroyed by mixing all three components. The solid reacted product shall be disposed of in environmentally sound and regulatory compliant manner.

- .6 Protect materials during handling and application to prevent damage or contamination.
- .7 Condition materials for use at a temperature range between 15 and 21 degrees C for 24 hours prior to application.

1.7 ENVIRONMENTAL REQUIREMENTS

- .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.
- .2 Ventilation:
 - .1 Provided ventilation in accordance with flooring material manufacturer's instructions.
- .3 Temperature:
 - .1 Maintain room temperature at 20 degrees C for 48 hours prior to, during, and for 48 hours following installation or until cured.
 - .2 At the time of application ensure the minimum substrate temperature is above 7 degrees C and the substrate temperature is 3 degrees C above the measured dew point.
- .4 Humidity:
 - .1 Do not apply materials if relative humidity is above 85 percent or within 3 degrees C of dew point at time of application.
- .5 Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and cure period of the flooring.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Flooring:
 - .1 Trowel grade, heavy duty, phthalate-free, water-dispersed polyurethane-based/cement and aggregate screed, texture aggregate surface, resistance to blistering.
 - .2 Thickness: minimum 6 mm.
 - .3 Properties:
 - .1 Compressive strength:
 - .1 ASTM C 579, 38 Mpa.
 - .2 Tensile Strength:
 - .1 ASTM C 307, 4.2 MPa.
 - .3 Coefficient of Thermal Expansion:
 - .1 ASTM D 696, 2.6×10^{-5} mm/mm/°C.
 - .4 Density:
 - .1 ASTM C 905, 2.12 kg/L.
 - .5 Surface hardness:
 - .1 ASTM D 2240, Shore D: 81.
 - .6 Flexural Strength:
 - .1 ASTM C 580, 9.9 MPa.

- .7 Flexural Modulus:
 - .1 ASTM C 580, 2,913 MPa.
 - .8 Abrasion Resistance:
 - .1 ASTM D 4060, 0.22 g, H-17/1,000 cycles/1000 g.
 - .9 Bond Strength:
 - .1 ASTM D 4541, 2.8 MPa (substrate failure).
 - .10 Coefficient of Friction:
 - .1 ASTM D 1894-61T, steel 0.3, rubber 0.7.
 - .11 Colour: RAL 7038 – Agate Grey.
 - .4 Acceptable material: Sikafloor-19 NA PurCem, Advanced Generation Heavy Duty and Thermal Shock Resistant, Trowel Grade Polyurethane/Cement Screed.
- .2 Cove base mortar:
- .1 Vertical grade, phthalate-free, water-dispersed polyurethane-based/cement and aggregate mortar for use in detailing and coving works, finely-textured, smooth aggregate surface, integral with flooring.
 - .2 Thickness: 6 mm minimum.
 - .3 Height: varies, as indicated.
 - .4 Properties:
 - .1 Density:
 - .1 ASTM C 905, 2.13 kg/L.
 - .2 Compressive strength:
 - .1 ASTM C 579, 24 hours 25 MPa, 7 days 34 MPa, 28 days 35 MPa.
 - .3 Tensile strength
 - .1 ASTM C 307, 3.89 MPa.
 - .4 Flexural strength:
 - .1 ASTM C 580, 9.8 MPa.
 - .5 Bond strength:
 - .1 ASTM D 4541, 3.0 (substrate failure).
 - .6 Thermal compatibility:
 - .1 ASTM C 884, Pass.
 - .7 Surface hardness, Shore D:
 - .1 ASTM D 2240, 85.
 - .8 Indentation:
 - .1 MIL-PRF-24613 ~ 0%.
 - .9 Abrasion resistance:
 - .1 ASTM D 4060
 - .1 H-17/1000 cycles/1000 g: 0.17g.
 - .2 H-22/1000 cycles/1000 g: 2.65g.
 - .10 Coefficient of friction:
 - .1 ASTM D 1894-61T, steel 0.25, rubber 0.85.
 - .11 Coefficient of thermal expansion:
 - .1 ASTM D 696, 2.6×10^{-5} mm/mm/°C.
 - .12 Resistance to fungi growth:
 - .1 ASTM G 21, Rated 0 (no growth).
 - .13 Resistance to mold growth:
 - .1 ASTM D 3273, Rated 10 (highest resistance).
 - .14 Colour: RAL 2038 - Agate Grey.
 - .5 Acceptable material: Sikafloor-29 NA PurCem, Advanced Generation High Strength Polyurethane/Cement Coving and Detailing Mortar.
 - .6 Primer for cove base:

- .1 100% solids, two-component, moisture tolerant epoxy adhesive.
 - .2 Properties: at 23 degrees C and 50% RH.
 - .1 Density:
 - .1 1.03 kg/L.
 - .2 Bond strength:
 - .1 2.7 MPa concrete failure.
 - .3 Compressive strength:
 - .1 57.2 MPa.
 - .4 Flexural strength:
 - .1 110.3 MPa.
 - .5 Tensile strength:
 - .1 45.5 MPa
 - .3 Acceptable material: Sikafloor Vertical Epoxy Primer, Adhesive Primer for Vertical Coving and Detailing Mortars.
- .3 Edge terminations.
 - .1 Materials and methods as recommended by troweled urethane flooring manufacturer.
 - .4 Transition strips: at all changes in flooring material.
 - .1 Stainless steel of type recommended by troweled urethane flooring manufacturer.
 - .5 Sealing compound.
 - .1 One-component, moisture-cured, polyurethane-based, non-sag sealant.
 - .2 Acceptable material: Sikaflex 1a.
 - .6 Accessory materials:
 - .1 For filling joints, cracks, depressions or any other surface irregularities.
 - .1 Product materials recommended by the flooring system materials manufacturer.
 - .2 For moving cracks and expansion joints, must be extended across the flooring system and filled with a flexible product.
 - .1 Acceptable materials: Sikaflex 2C NS/SL or Sikaflex 1C SL as recommended by the flooring system materials manufacturer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations and specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 A flooring product manufacturer's technical representative shall be available on three days' notice at the request of the Departmental Representative to provide technical recommendations prior to and during the installation of the flooring system.

3.2 DEMOLITION

- .1 Where new heavy duty troweled urethane concrete flooring is required, remove existing epoxy-type floor finish down to concrete.
- .2 Where existing epoxy-type floor is to remain, but new cove base mortar is required:
 - .1 Remove existing epoxy-type base as indicated and make allowance for "keying-in" requirement.

3.3 EXAMINATION / INSPECTION

- .1 Examine and test substrate surfaces to receive new flooring and cove base finish.
- .2 Notify Departmental Representative if surfaces are not acceptable.
- .3 Do not begin surface preparation or application until unacceptable conditions have been corrected.
- .4 Testing requirements following Surface Preparation:
 - .1 When the surface preparation, as noted below is complete and before the application of the flooring begins, complete the following test procedures to confirm the suitability of the concrete.
 - .1 Determine if the surface texture of the concrete is comparable to I.C.R.I. Texture CSP 3-6.
 - .2 Determine the tensile bond strength of the concrete before application begins in accordance with ASTM C 1583. Minimum acceptable test result is 1.5 Mpa (210 psi).
 - .3 Determine the Dew Point of the surface to be coated before application. The Contractor must monitor the Dew Point during application and initial cure. The surface must be at least 3 degrees C above the measured Dew Point at all times during application and cure.

3.4 SURFACE PREPARATION

- .1 Prepare concrete surfaces in accordance with manufacturer's instructions and ASTM D 4258. Concrete surface must be dry, clean and sound.
- .2 Remove dirt, oil, grease, wax, laitance, curing compounds, water-soluble concrete hardeners, and other surface contaminants.
- .3 Remove sealers, finishes, and paints.
- .4 Remove unsound concrete by scarifying, sand blasting, shot blasting, or high pressure water blasting.
- .5 Chemical surface preparation:
 - .1 Do not prepare surface using chemical means (acid etching).
- .6 Mechanical surface preparation:
 - .1 Mechanically abrade concrete surface in accordance with manufacturer's instructions.
 - .2 Leave concrete surface with an aggressive texture to obtain uniform finish.
 - .3 Remove concrete dust.

- .4 Conform to ASTM D 4259.
- .5 Surface profile shall conform to IRCI Guideline 03732 CSP 3-6.
- .7 Remove all projections and other conditions which could affect the installation of the flooring.
- .8 Protect adjacent surfaces, fixtures and equipment with a drop cloth or adequately cover to prevent damage from splatter, spillage or any other damage resulting from work of this trade.
- .9 Repairs to concrete substrate:
 - .1 Fill holes and level irregularities using profiling mortar of type recommended by flooring materials manufacturer.
 - .2 Repair and treat control joints and surface cracks using flooring manufacturer's recommended materials and installation details.
- .10 Retaining groove.
 - .1 Place a retaining groove 100 mm away from all edges, drains and termination points. The retaining groove must be 8mm wide and the depth twice the thickness of the floor finish.
- .11 Edge terminations:
 - .1 All edges that do not terminate against a wall or curb must be "keyed" to avoid feathered edges. All through floor penetrations such as drains require a keyed edge.
 - .1 Cut grooves in the concrete to a depth and width of 15mm.
 - .2 Edge details by manufacturer.
 - .3 Protect all free edges with materials and installation methods recommended by troweled urethane flooring manufacturer.
 - .4 Never feathered edge; always turn into an anchor groove.
- .12 Moving cracks and expansion joints must be extended across the flooring system and filled with a flexible product, of type recommended by flooring system manufacturer.
- .13 Transition strips:
 - .1 Install at all changes in flooring material.
 - .2 Install in accordance with troweled urethane flooring manufacturer's instructions.

3.5 INSTALLATION

- .1 Floors:
 - .1 Mix and install materials in accordance with manufacturer's instruction, and where possible under direction of manufacturer's representative.
 - .2 Do not add thinners to materials.
 - .3 Thickness of topping minimum 6 mm.
- .2 Radius Cove Bases:
 - .1 Apply specified vertical adhesive primer to cleaned and prepared curb surfaces.
 - .2 Mix and install cove base materials in accordance with manufacturer's instruction, and where possible under direction of

manufacturer's representative.

.3 Do not add thinners to materials.

.4 Thickness 6 mm.

.5 Trowel-apply, spread and compact mortar on vertical surfaces to provide an integral seal at the floor and wall interface.

.6 Close any voids while mortar is still workable in accordance with manufacturer's recommendations.

.7 Edge terminations:

.1 All edges that do not terminate against a wall or curb must be "keyed" to avoid "feather-edges".

.1 Cut grooves in concrete to 15mm depth and width.

.2 Edge details by manufacturer.

.3 Protect all free edges with materials and installation methods recommended by troweled urethane concrete flooring manufacturer.

.4 Never "feather-edge"; always turn into an anchor groove.

.2 Apply specified sealant to top edge of cove base.

.3 Finished work shall match approved samples, be uniform in thickness, sheen, colour, and texture. The finished surface must:

.1 Not have porous areas.

.2 Be free from defects detrimental to appearance and/or performance of the product

.4 Follow manufacturer's submitted recommendations and instructions on terminations and connections to walls, drains, doorways, columns etc.

.5 Provide adequate temporary protection until flooring is fully cured. Protect finished floor from damage based on air temperature of 20 degrees C.

.1 Foot traffic: 12 hours.

.2 Light traffic: 18 hours.

.3 Full cure: 5 days.

3.6 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

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

.2 Manufacturer's field services technical representative must be present at Pre-application Meeting as referenced in this Section.

.2 Verify the cured thickness of the floor.

.1 Verify the cured thickness of the floor system at random locations. Fill test locations flush with surrounding floor tolerance

3.7 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 Remove masking and covering used to protect adjacent surfaces.

.3 Remove equipment, remaining materials and debris from job site and

dispose of them in according with local rules and regulations. Leave area in clean condition.

3.8 PROTECTION

- .1 Protect completed floor from damage by trade traffic by suitable means as required.
- .2 Protect completed work from contact with water until cured, approximately sixteen hours at 20 degrees C.
- .3 Protect completed flooring from chemical exposure until fully cured, approximately five days at 20 degrees C.
- .4

PART 1 - GENERAL

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|--|----|--|
| <u>1.1 REFERENCES</u> | .1 | Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS). |
| | .2 | The Master Painters Institute (MPI)
.1 Architectural Painting Specification Manual - current edition.
.2 Maintenance Repainting Manual - current edition. |
| <u>1.2 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Submit in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Product Data and Installation Instructions:
.1 Submit manufacturer's printed product literature data sheets and installation instructions for each paint and coating product (primers top coats and other as indicated). Include MPI product number, product characteristics, performance criteria, physical size, finish limitations and installation instructions.
.2 Submit electronic copies of WHMIS MSDS for all products. |
| <u>1.3 CLOSEOUT SUBMITTALS</u> | .1 | Closeout Submittals:
.1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
.1 Submit records of products used. List products in relation to finish system and include following:
.1 Product name, type and use (i.e. materials and location).
.2 Manufacturer's product number.
.3 Colour code numbers.
.4 Manufacturer's Material Safety Data Sheets (MSDS). |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u> | .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 Provide and maintain dry, temperature controlled, secure storage.
.2 Store painting materials and supplies away from heat generating devices.
.3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer. |

- .4 Fire Safety Requirements:
 - .1 Supply 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.

1.5 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
 - .2 Provide minimum lighting level of 323 Lux on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.
 - .2 Test surfaces for alkalinity as required.
 - .3 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits and,
 - .4 Do not perform painting work when maximum moisture content of substrate exceeds:
 - .1 12% for concrete and masonry (concrete block).
 - .2 12% for gypsum board.
 - .5 Test painted concrete, masonry and plaster surface
- .3 Additional application requirements:
 - .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.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Supply paint materials for paint systems from single manufacturer.
- .2 Conform to latest MPI requirements for painting work including preparation and priming.
- .3 Materials in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual "Approved Product" listing.
- .4 Compliance requirements: approved for use by Canadian Food Inspection Agency (CFIA).

- .5 Colours:
- .1 To be selected from manufacturer's standard range, maximum four colours.
 - .2 Submit colour samples for review.
- .6 Mixing and tinting:
- .1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations. Use and add thinner in accordance with paint manufacturer's recommendations.
 - .1 Do not use kerosene or similar organic solvents to thin water-based paints.
 - .2 Thin paint for spraying in accordance with paint manufacturer's written recommendations.
 - .3 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.
- .7 Gloss/sheen ratings:
- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

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

- .2 Gloss level ratings of painted surfaces as indicated.
- .8 Interior painting:
- .1 Galvanized Metal: doors and frames, misc. steel, pipes, ducts
 - .1 Prime in accordance with paint manufacturer's instructions.
 - .2 Clean surfaces with oil and grease emulsifier.
 - .3 Top coat: MPI #141 and 153, light industrial coating, direct-to-metal primer/finish coat, rust inhibition for superior corrosion control, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Ultra Spec HP, D.T.M Acrylic Semi-Gloss FP29, or approved equal.
 - .2 Shop-primed Metal:

- .1 Clean surfaces with oil and grease emulsifier.
- .2 Top coat: MPI #141 and 153, light industrial coating, direct-to-metal primer/finish coat, rust inhibition for superior corrosion control, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Ultra Spec HP, D.T.M Acrylic Semi-Gloss FP29, or approved equal.
- .3 Concrete horizontal surfaces: floor zone/traffic lines
 - .1 Top coat: MPI#97, fast-drying, latex interior/exterior traffic paint, two coats.
 - .1 Colour: Safety Yellow.
 - .2 Acceptable material: INSL-X Latex Traffic Paint, TP3224 09F, or approved equal.
- .4 Concrete horizontal surfaces: floors
 - .1 Prepare surfaces in accordance with paint product manufacturer's instructions.
 - .2 Primer: compliant as Industrial Maintenance Coating, moisture tolerant quick set epoxy sealer.
 - .1 Acceptable material: Corotech V156, or approved equal.
 - .3 Top coat: compliant as Industrial Maintenance coating, waterborne amine epoxy, abrasion and impact resistant, two coats.
 - .1 Colour: Grey, selected from standard range.
 - .4 Acceptable material: Corotech V440, or approved equal
- .5 Concrete masonry units: smooth block.
 - .1 Block filler: MPI#4, interior/exterior grade high build latex block filler, one coat.
 - .1 Acceptable material: Benjamin Moore Ultra Spec Hi-Build Masonry Block Filler K571, or approved equal.
 - .2 Primer: top coat self-priming.
 - .3 Top coat: MPI #141, high performance architectural, 100% acrylic latex semi-gloss finish, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Aura Waterborne Interior Paint Semi-Gloss Finish K528, or approved equal.
- .6 Concrete:
 - .1 Primer: top coat self-priming.
 - .2 Top coat: MPI #141, high performance architectural, waterborne 100% acrylic latex semi-gloss finish, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Aura Waterborne Interior Paint Semi-Gloss Finish K528, or approved equal.
- .7 Gypsum board: gypsum wallboard, drywall, "sheet rock" type material, etc.
 - .1 Primer: top coat self-priming.
 - .2 Top coat: MPI #141, high performance architectural, waterborne 100% acrylic latex semi-gloss finish, two coats.

- .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Aura Waterborne Interior Paint Semi-Gloss Finish K528, or approved equal.
 - .8 Plaster:
 - .1 Primer: top coat self-priming.
 - .2 Top coat: MPI #141, high performance architectural, waterborne 100% acrylic latex semi-gloss finish, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Aura Waterborne Interior Paint Semi-Gloss Finish K528, or approved equal.
- .9 Interior re-painting:
 - .1 Previously painted Concrete masonry units: smooth block.
 - .1 Top coat: MPI #141, high performance architectural, waterborne 100% acrylic latex semi-gloss finish, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Aura Waterborne Interior Paint Semi-Gloss Finish K528, or approved equal.
 - .2 Previously painted Gypsum board: gypsum wallboard, drywall, "sheet rock" type material, etc.
 - .1 Top coat: MPI #141, high performance architectural, waterborne 100% acrylic latex semi-gloss finish, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Aura Waterborne Interior Paint Semi-Gloss Finish K528, or approved equal.
 - .3 Previously painted metal.
 - .1 Prime in accordance with paint manufacturer's instructions.
 - .2 Clean surfaces with oil and grease emulsifier.
 - .3 Top coat: MPI #141 and 153, light industrial coating, direct-to-metal primer/finish coat, rust inhibition for superior corrosion control, two coats.
 - .1 Colour: to be selected from manufacturer's standard range.
 - .2 Acceptable material: Benjamin Moore Ultra Spec HP, D.T.M Acrylic Semi-Gloss FP29, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL

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

- .2 Perform preparation and operations for interior painting in accordance with MPI - Architectural Painting Specifications Manual and MPI - Maintenance Repainting Manual except where specified otherwise.

3.2 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted.
- .2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.3 PREPARATION

- .1 Protection of in-place conditions:
 - .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.
 - .3 Protect factory finished products and equipment.
- .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 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.
 - .4 Clean and prepare surfaces in accordance with MPI - Architectural Painting Specification Manual and coating manufacturer's recommendations.
 - .5 Previously painted surfaces:
 - .1 Clean and prepare surfaces in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual specific requirements and coating manufacturer's recommendations.
 - .2 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths.
 - .3 Remove any peeling or scaling paint and sand to feather edges. Glossy areas should be dulled
 - .4 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using stiff bristle brush to remove dirt, oil and surface contaminants.
 - .5 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .6 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.

.7 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.

.8 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.6 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.

.7 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.

.8 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.

.9 Touch up of shop primers with primer as specified.

3.4 EXISTING CONDITIONS

.1 Prior to commencing work, examine site conditions and existing interior substrates to be repainted. Report in writing to Departmental Representative damages, defects, or unsatisfactory or unfavourable conditions or surfaces that will adversely affect this 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" and report findings to Departmental Representative. Maximum moisture content not to exceed specified limits.

.3 Do not commence until such adverse conditions and defects have been corrected and surfaces and conditions are acceptable to Painting Subcontractor.

3.5 APPLICATION

.1 Clean and prepare surfaces in accordance with paint product manufacturer's instructions.

.2 Paint only after prepared surfaces have been accepted.

.3 Use method of application approved by Departmental Representative.
.1 Conform to manufacturer's application recommendations.

.4 Apply coats of paint in continuous film of uniform thickness.
.1 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

cabinets and projecting ledges.

- .8 Finish alcoves as specified for adjoining rooms.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
- .10 Mechanical/Electrical Equipment:
 - .1 Paint conduits, piping, hangers, ductwork and other mechanical and electrical equipment exposed in finished areas, except as indicated.
 - .2 Do not paint over nameplates.
 - .3 Paint both sides and edges of backboards before installation.
 - .1 Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .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 74 11 - Cleaning.
- .3 Place paint products defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.