

Part 1 General

1.1 REFERENCES

- .1 Aluminum Association
 - .1 Designation for Aluminum Finishes-[1997].
- .2 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C36/C36M-[01], Specification for Gypsum Wallboard.
 - .2 ASTM C79/C79M-[01], Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.
 - .3 ASTM C442/C442M-[01], Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.
 - .4 ASTM C475-[01], Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - .5 ASTM C514-[01], Specification for Nails for the Application of Gypsum Board.
 - .6 ASTM C557-[99], Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.
 - .7 ASTM C630/C630M-[01], Specification for Water-Resistant Gypsum Backing Board.
 - .8 ASTM C840-[01], Specification for Application and Finishing of Gypsum Board.
 - .9 ASTM C931/C931M-[01], Specification for Exterior Gypsum Soffit Board.
 - .10 ASTM C954-[00], Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
 - .11 ASTM C960/C960M-[01], Specification for Pre-decorated Gypsum Board.
 - .12 ASTM C1002-[01], Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .13 ASTM C1047-[99], Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.
 - .14 ASTM C1278-[11], Standard Specification for Fiber-Reinforced Gypsum Panel.
 - .15 ASTM C1280-[99], Specification for Application of Gypsum Sheathing Board.
 - .16 ASTM C1177-[01], Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .17 ASTM C1178/C1178M-[01], Specification for Glass Mat Water-Resistant Gypsum Backing Board.
- .3 Association of the Wall and Ceilings Industries International (AWEI)
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-71.25-[M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .5 Underwriters' Laboratories of Canada (ULC)

- .1 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.
- .6 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009
- 1.2 SHOP DRAWINGS**
 - .1 Submit fire rated partition assemblies, ULC Design No.'s to Contract Administrator for approval.
- 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 QUALIFICATIONS**
 - .1 Dry wall installers: minimum 5 years proven experience.
- 1.6 SAMPLES**
 - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- 1.7 WASTE MANAGEMENT AND DISPOSAL**
 - .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning & Waste Management.
 - .2 Place materials defined as hazardous or toxic waste in designated containers.
 - .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
 - .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
 - .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 SHEET MATERIALS

- .1 Standard gypsum board: to ASTM C36/C36M.
 - .1 Type and Thickness: 1/2" and 5/8" Type X, thickness as indicated, 48" wide maximum practical length, ends square cut, edges bevelled.
 - .2 Product: Subject to compliance with requirements, provide SHEETROCK® brand gypsum panels by Canadian Gypsum Company (or approved equal in accordance with B7).
- .2 Abuse resistant gypsum board: to ASTM C1278/C1278M.
 - .1 Types and Thicknesses: 1/2" and 5/8" Type X, thickness as indicated, 48" wide x maximum practical length, ends square cut, edges bevelled.
 - .2 Panels to have reinforcing mesh and provide increased resistance to abrasion, indentation and penetration.
 - .3 Product: Subject to compliance with requirements, provide FIBEROCK® brand Abuse Resistant VHI interior gypsum panels by Canadian Gypsum Company (or approved equal in accordance with B7).
- .3 Moisture and mold resistant gypsum board: to ASTM C 1396
 - .1 Type and Thickness: 1/2" thickness as indicated, 48" wide x maximum practical length, ends square cut, edges bevelled.
 - .2 Panels to have a moisture and mold-resistant gypsum core that is encased in moisture and mold-resistant, 100 percent recycled green face and brown back papers.
 - .3 Product: Subject to compliance with requirements, provide SHEETROCK® brand MOLD TOUGH™ gypsum panels by Canadian Gypsum Company (or approved equal in accordance with B7).
- .4 Glass mat roof board: to ASTM C 1177.
 - .1 Type and Thickness: Type X, 5/8 inch thick, 48" x maximum practical length with square edge.
 - .2 Product: Subject to compliance with requirements, provide DENS DECK Brand Glass Mat Roof Board by Georgia Pacific (or approved equal in accordance with B7).

2.2 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes in the Bid Opportunity document.

2.3 ACCESSORIES

- .1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30 galvanized.
- .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.
- .7 Laminating compound: as recommended by manufacturer, asbestos-free.
- .8 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
- .9 Special Trim and Reveals: Extruded aluminum alloy 6063-T5, profiles as indicated.
- .10 Polyethylene: to CAN/CGSB-51.34, Type 1.
- .11 Insulating strip: rubberized, moisture resistant, 3 mm thick cork strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.
- .12 Joint compound: to ASTM C475, asbestos-free.
- .13 Sealants:
 - .1 In accordance with Section 07 92 00 - Joint Sealants.
 - .2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.
 - .3 Sealant For Glass Mat Gypsum Sheathing Board: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials.
 - .4 Sealant for Glass-Mat Gypsum Sheathing Board: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing.
 - .5 Sheathing Tape for Glass-Mat Gypsum Sheathing Board: Self –adhering, glass fiber tape, minimum 2” wide for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board.

2.4 FINISHES

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

Part 3 Execution

3.1 ERECTION

- .1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.
- .2 Do application of gypsum sheathing in accordance with ASTM C 1280.
- .3 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .4 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .5 Install Work level to tolerance of 1:1200.

- .6 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
- .7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .8 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .9 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
- .10 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.
- .11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Erect drywall resilient furring transversely across studs, joists, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.2 APPLICATION

- .1 Apply single layer gypsum board to metal, wood 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 in accordance with ASTM C840.
 - .2 Double-Layer Application:
 - .1 Install gypsum board for base layer and exposed gypsum board for face layer.
 - .2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.
 - .3 Apply base layers at right angles to supports unless otherwise indicated.
 - .4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
- .2 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 and in partitions where perimeter sealed with acoustic sealant.
- .3 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

- .4 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.
- .5 Install gypsum board with face side out.
- .6 Do not install damaged or damp boards.
- .7 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.
- .8 Install glass mat water-resistant gypsum backing board behind ceramic tile finishes as indicated.

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 using contact adhesive for full length.
- .2 Install casing beads around perimeter of suspended ceilings and where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .3 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.
- .4 Construct control joints of preformed units two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .5 Provide continuous polyethylene dust barrier behind and across control joints.
- .6 Locate control joints at changes in substrate construction, at approximate 10 m spacing on long corridor runs, at approximate 15 m spacing on ceilings.
- .7 Install control joints straight and true. Construct expansion joints as detailed at building expansion and construction joints. Provide continuous dust barrier.
- .8 Install expansion joint straight and true.
- .9 Install cornice cap where gypsum board partitions do not extend to ceiling.
- .10 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.
- .11 Splice corners and intersections together and secure to each member with 3 screws.
- .12 Install access doors to electrical and mechanical fixtures specified in respective sections.
 - .1 Rigidly secure frames to furring or framing systems.
- .13 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.

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- .14 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:
- .1 Levels of finish:
 - .1 Level 0: No taping, finishing or accessories required.
 - .2 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.
 - .3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.
 - .4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .5 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.
 - .6 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.
 - .15 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.
 - .16 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.
 - .17 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
 - .18 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.
 - .19 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.
 - .20 Mix joint compound slightly thinner than for joint taping.
 - .21 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.
 - .22 Allow skim coat to dry completely.
 - .23 Remove ridges by light sanding or wiping with damp cloth.
 - .24 Provide protection that ensures gypsum drywall Work will remain without damage or deterioration at time of substantial completion.

3.4 ROOF BOARD INSTALLATION

- .1 Install roofing board in accordance with manufacturer's written instructions, local code requirements and Underwriters Laboratories (UL) requirements for proper installation.
 - .1 In all areas of exposed metal deck, Contractor must ensure that all decking screws penetrating the steel deck are centred in the top flute only and are neatly aligned.
 - .2 Deck screws shall penetrate the steel deck by no more than 19 mm.

3.5 SCHEDULES

- .1 Construct fire rated assemblies where indicated, seal penetrations, as per Section 07 84 00 – Firestopping.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM C91-05: Masonry Cement.
- .2 ASTM C150-07: Portland Cement.
- .3 ASTM C207-06: Hydrated Lime for Masonry Purposes
- .4 ASTM C847-10a: Standard Specification for Metal Lath
- .5 ASTM C897-05(2009): Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters
- .6 ASTM C932-06: Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering
- .7 ASTM C1002-07 - Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
- .8 ASTM C1116/C116M-10a: Standard Specification for Fiber-Reinforced Concrete Canadian Standards Association (CSA)
- .9 CSA A3000-08: Cementitious materials compendium (Consists of A3001, A3002, A3003, A3004 and A3005), Includes Update No. 1 (2009), Update No. 2 (2010)
- .10 PCA (Portland Cement Association) - Portland Cement Plaster (Stucco) Manual

1.2 SUBMITTALS

- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit duplicate 300 mm x 300 mm samples of cement parging on plywood and metal lath backup, showing the colour and texture of the parging finish.
- .3 The accepted samples will become the standard for this project, and all parging Work will match the accepted samples.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle all material so as to prevent the inclusion of foreign materials and the damage of materials by water or breakage.
- .2 Deliver and store packaged materials in original packages until ready for use. Packages or materials showing evidence of water or other damage will be rejected.
- .3 All materials to be of the respective qualities specified herein. Deliver materials to the job in ample time to facilitate inspection and testing of the same.

1.4 SITE ENVIRONMENTAL REQUIREMENTS

- .1 Provide sufficient heat and ventilation to avoid freezing of parging and to permit proper curing. Take precautions required to prevent rapid and large changes in temperature for seven (7) days following application.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 - Cleaning and Waste Management.

Part 2 Products

2.1 CEMENTITIOUS MATERIALS

- .1 Cement: Type 10 Portland, conforming to CAN/CSA-A5; colour to be grey, unless noted otherwise.
- .2 Hydrated Lime: Normal finishing type hydrated lime.
- .3 Sand: To ASTM C897, Natural or manufactured, clean, sharp angular, freshwater washed and free of deleterious materials such as alkali, salt, silt, coal, or organic matter.
- .4 Fibres (to base coat mixes only - do not use in finish coats) : conforming to ASTM C 1116, 13 mm long.
- .5 Water: Clean potable fresh water, free from injurious amounts of oil, acid, alkali, organic matter and other deleterious substances.
- .6 Bonding Agents: to conform to ASTM C932, non-oxidizing, non-crystallizing, non-reemulsifiable.
- .7 Colour and texture to match accepted sample.

2.2 METAL ACCESSORIES

- .1 Parging Trim and Accessories: Where parging terminates against other materials in the same plane; or at right angles to other materials; or at openings through parging surface, and the edge is exposed to view, use a square casing bead of not less than 0.478 mm thick galvanized steel. At external corners use 19 mm corner beads of not less than 0.478 mm thick galvanized steel. At expansion/control joints use a one piece, 0.396 mm thick galvanized steel section, complete with perforated wings.
- .2 Metal Lath: fabricated from expanded sheet steel, galvanized, 9.5 mm diamond mesh metal lath. Weight of lath to be in accordance with ASTM C847 governed by support spacing, but in no case less than 1.6 kg. per square metre.
- .3 Screwed fasteners: 6.4 mm diameter, drilled self tapping galvanized or stainless steel "tapcon" screw anchors complete with PVC or galvanized steel discs approximately 38 mm diameter. Screws to be long enough to penetrate through insulation and into concrete backup minimum 32 mm.

2.3 PARGING MIXES

- .1 Parging: 1 part cement/ to 1/4 to 1 part lime/ 3 1/4 to 4 parts aggregate. Use bonding agent in the mixing water for both coats of parging, in accordance with manufacturer's recommendations.

Part 3 Execution

3.1 GENERAL

- .1 Conform to the Manitoba Building Code with regard to covering polystyrene insulation.

3.2 EXAMINATION

- .1 Examine all surfaces and Work of other trades, which might affect the Work of this Section, before proceeding with any Work.
- .2 Report any conditions which are unsatisfactory to the Contract Administrator in writing.
- .3 Do not proceed until all unsatisfactory conditions have been corrected. Starting Work implies acceptance of conditions.

3.3 FURRING AND LATHING

- .1 Cover perimeter insulation exposed above grade with metal lath.
- .2 Install metal lath over insulation using screw-on fasteners at 400 mm o.c. each way, and not less than 75 mm from all ends and edges. Do not over compress insulation.
- .3 Space and secure grounds as required to produce a true finished surface. Install them to provide control joints at 5 metre maximum intervals.
- .4 At corners where plaster is applied directly to board insulation, Install a 1.21 mm base metal thickness, Z275 galvanized, continuous sheet metal brake shape, bent 90o with 300 mm legs, and fastened through insulation, air/vapour barrier or waterproofing membrane, sheathing (where applicable) and into concrete back up, using galvanized or stainless steel screws at 400 mm oc on each side of corner, to provide a solid corner for fastening corner bead. Ensure corner is straight and true to line.

3.4 PARGING

- .1 Apply plaster over perimeter insulation in 2 coats, the first fully embedding the wire, and scored, the second providing a wood float finish. Install a total minimum thickness of 19 mm.
- .2 Apply the second coat while the first coat is still green.
- .3 Apply both coats without joints except at grounds and control joints.
- .4 Keep plaster continuously moist from the time of initial set until 72 hours after completion of the finish coat.
- .5 Colour and texture of finished surface to be a sand float finish to match accepted sample.

3.5 CLEANING AND PROTECTION

- .1 Upon completion of Work of this Section, remove all excess material and debris from site.
- .2 Clean all adjacent exposed surfaces which are splattered or marked with parging materials following manufacturer's recommendations to the satisfaction of the Contract Administrator.

- .3 Protect Work of this Section against damage by other trades for at least forty-eight (48) hours after application.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM F1861 – 08 (2012)e1 Standard Specification for Resilient Wall Base
 - .2 ASTM F137 - 08 Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus
 - .3 ASTM F1515 - 03(2008) Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change
 - .4 ASTM F925 – 02 (2008) Standard Test Method for Resistance to Chemicals of Resilient Flooring
 - .5 ASTM E84 - 12c Standard Test Method for Surface Burning Characteristics of Building Materials
 - .6 ASTM E648 - 10e1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
 - .7 ASTM F925 – 02 (2008) Standard Test Method for Resistance to Chemicals of Resilient Flooring
- .2 National Fire Protection Association (NFPA)
 - .1 NFPA 253: Standard Method of Test For Critical Radiant Flux Of Floor Covering Systems Using A Radiant Heat Energy Source
 - .2 NFPA 255: Standard Method of Test of Surface Burning Characteristics of Building Materials
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

- .1 Product Data: For each type of product indicated.
- .2 Samples for Initial Selection: For each type of product indicated.
- .3 Samples for Verification: For each type of product indicated, in manufacturer's standard-size
- .4 Samples but not less than 12" long (305 mm), of each resilient product color, texture, and pattern required.
- .5 Product Schedule: For resilient base: Locations as indicated on Drawings.
- .6 Submit WHIMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples, with the VOC levels highlighted.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- .1 The VOC content of the adhesives, sealants, and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management

District (SCAQMD) Rule #1168 (effective date of January 2007). The following are the VOC limits from Rule 1168:

- .1 Architectural Sealants – 250 g/L
 - .2 Non-membrane Roof Sealant – 300 g/L
 - .3 Roadway – 250 g/L
 - .4 Other Sealants – 420 g/L
 - .5 Non-porous Architectural Sealant Primer – 250 g/L
 - .6 Porous Architectural Sealant Primer – 775 g/L
 - .7 Modified Bituminous Sealant Primer – 500 g/L
 - .8 Other Sealant Primer – 750 g/L
 - .9 Indoor Carpet and Carpet Pad Adhesives – 50 g/L
 - .10 Wood Flooring Adhesives – 100 g/L
 - .11 Rubber Floor Adhesives – 60 g/L
 - .12 Subfloor Adhesives – 50 g/L
 - .13 Ceramic Tile Adhesives – 65 g/L
 - .14 VCT and Asphalt Tile Adhesives – 50 g/L
 - .15 Gypsum Board and Panel Adhesives – 50 g/L
 - .16 Cove Base Adhesive – 50 g/L
 - .17 Multipurpose Construction Adhesives – 70 g/L
 - .18 Structural Glazing Adhesive – 100 g/L
 - .19 PVC Welding – 510 g/L
 - .20 CPVC Welding – 490 g/L
 - .21 ABS Welding – 325 g/L
 - .22 Plastic Cement Welding – 250 g/L
 - .23 Adhesive Primer for Plastic – 550 g/L
 - .24 Contact Adhesive – 80 g/L
 - .25 Special Purpose Contact Adhesive – 250 g/L
 - .26 Structural Wood Member Adhesive – 140 g/L
 - .27 Sheet Applied Rubber Lining Operations – 850 g/L
 - .28 Top and Trim Adhesive – 250 g/L
 - .29 Metal to Metal Adhesive – 30 g/L
 - .30 Plastic Foams Adhesive – 50 g/L
 - .31 Porous Material Adhesive (except wood) – 50 g/L
 - .32 Wood Adhesive – 30 g/L
 - .33 Fiberglass Adhesive – 80 g/L
 - .34 Duct Sealants – 250 g/L
- .2 Laminate Adhesives must contain no urea-formaldehyde.

1.4 QUALITY ASSURANCE

- .1 Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - .1 Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- .2 Mockups: Provide resilient products with mockups specified in other Sections.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 degrees F or more than 90 degrees F.

1.6 PROJECT CONDITIONS

- .1 Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 95 degrees F, in spaces to receive resilient products during the following time periods:
 - .1 48 hours before installation.
 - .2 During installation.
 - .3 48 hours after installation.
- .2 Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.
- .3 Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

- .1 Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - .1 Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning & Waste Management.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Product

2.1 RESILIENT BASE

- .1 Johnsonite BaseWorks™ Thermoset Rubber Wall Base (or approved equal in accordance with B7).
 - .1 Performance Characteristics
 - .1 Meets or exceeds the performance requirements for resistance to heat/light aging, chemicals, and dimensional stability when tested to the methods, as described, in ASTM F-1861.

- .2 Flexibility: ASTM F 137 - Will not crack, break, or show any signs of fatigue when bent around a 1/4" (6.4 mm) diameter cylinder.
- .3 Resistance to Light: ASTM F 1515 – Passes $\Delta E \leq 8.0$
- .4 Chemical Resistance: ASTM F 925 Passed – Acetic Acid 5%, Isopropyl Alcohol 70%, Sodium Hydroxide 5%, Hydrochloric Acid 5%, Ammonia 5%, Phenol 5%, and Acid Sulfuric 5%.
- .5 Fire Resistance:
 - .1 ASTM E 84/NFPA 255 (Flame/Smoke) – Class B, < 450
 - .2 ASTM E 648 (NFPA 253): Critical Radiant Flux – Class 1
- .6 Chemical Resistance (ASTM F 925): Passed - 5% Acetic acid, 70% Isopropyl alcohol, Sodium hydroxide solution (5% NaOH), Hydrochloric acid solution (5% HCl), Sulfuric acid solution (5% H₂SO₄), Household ammonia solution (5% NH₄OH), Household bleach (5.25% NaOCl), Disinfectant cleaner (5% active phenol)
- .2 Material Requirement: Type TS rubber, vulcanized thermoset
- .3 Manufacturing Method: Group I solid, homogeneous
- .4 Style: Cove base with toe Butt to new or existing flooring.
- .5 Minimum Thickness: 0.125 inch.
- .6 Height: 4" (100 mm)
- .7 Lengths: Cut to suit
- .8 Outside Corners: Preformed.
- .9 Inside Corners: Preformed.
- .10 Finish: Low luster.
- .11 Colour: to be from manufacturer's standard colour range – as selected by Contract Administrator..
- .12 Locations: As indicated on drawings and on finish schedule.

2.2 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes in the Bid Opportunity document.

2.3 INSTALLATION MATERIALS

- .1 Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- .2 Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.
 - .1 Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and as recommended by Johnsonite to meet Site conditions.:
 - .1 Rubber Base Adhesives: Not more than 50 g/L.
 - .2 Johnsonite #965 Flooring and Tread Adhesive.
 - .3 Johnsonite #945 Contact Bond Adhesive.
 - .4 Johnsonite #975 Two-Part Urethane Adhesive.
 - .5 Johnsonite #996 Two-Part Epoxy.
- .3 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.

- .4 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .5 Provide transition/reducing strips tapered to meet abutting materials.

Part 3 Execution

3.1 EXAMINATION

- .1 Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- .2 Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- .1 Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

3.3 RESILIENT BASE INSTALLATION

- .1 Comply with manufacturer's written instructions for installing resilient base.
- .2 Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- .3 Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- .4 Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- .5 Do not stretch resilient base during installation.
- .6 On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- .7 Preformed Corners: Install preformed corners before installing straight pieces.

3.4 CLEANING AND PROTECTION

- .1 Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- .2 Perform the following operations immediately after completing resilient product installation:
 - .1 Remove adhesive and other blemishes from exposed surfaces.
 - .2 Sweep and vacuum surfaces thoroughly.
 - .3 Damp-mop surfaces to remove marks and soil.

- .3 Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- .4 Cover resilient products until Substantial Completion.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009
- .2 Environmental Protection Agency (EPA)
 - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 The Master Painters Institute (MPI)
 - .1 Contract Administratorural Painting Specification Manual - [February 2004].
 - .2 Standard GPS-1-[05], MPI Green Performance Standard for Painting and Coatings.
- .5 National Fire Code of Canada.
- .6 Society for Protective Coatings (SSPC)
 - .1 Systems and Specifications, SSPC Painting Manual [2005].

1.2 QUALITY ASSURANCE

- .1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeyperson shall be engaged in painting Work. Apprentices may be employed provided they Work under the direct supervision of a qualified journeyperson in accordance with trade regulations.
- .3 Conform to latest MPI requirements for exterior painting Work including preparation and priming.
- .4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with MPI Painting Specification Manual "Approved Products" listing and shall be from a single manufacturer for each system used.
- .5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.
- .6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Contract Administrator.
- .7 Standard of Acceptance:
 - .1 Walls: No defects visible from a distance of 1000 mm at 90° to surface.

- .2 Ceilings: No defects visible from floor at 45° to surface when viewed using final lighting source.
- .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- .1 Provide paint products meeting MPI "Environmentally Friendly" E2 or E3 ratings based on VOC (EPA Method 24) content levels.

1.4 SCHEDULING OF WORK

- .1 Submit Work schedule for various stages of painting to Contract Administrator for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Contract Administrator for changes in Work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.5 SUBMITTALS

- .1 Submit product data and manufacturer's installation/application instructions for paints and coating products to be used and in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit WHMIS - MSDS - Material Safety Data Sheets.
- .3 Upon completion, submit records of products used, records to be included in Operation and Maintenance Manuals. List products in relation to finish system and include the following:
 - .1 Product name, type and use.
 - .2 Manufacturer's product number.
 - .3 Colour numbers.
 - .4 Manufacturer's Material Safety Data Sheets (MSDS).
 - .5 MPI Environmentally Friendly classification system rating.
- .4 Submit manufacturer's application instructions for each product specified.
- .5 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating, with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:
 - .1 3 mm plate steel for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
- .6 When approved, samples shall become acceptable standard of quality for appropriate on-Site surface with one of each sample retained on-Site.
- .7 Submit full range of available colours where colour availability is restricted.

1.6 QUALITY CONTROL

- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.

- .2 When requested by the Contract Administrator or Paint Inspection Agency, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and Workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and Workmanship for similar on-Site Work.

1.7 EXTRA MATERIALS

- .1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Submit 1 - 4 litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.
- .3 Deliver to Contract Administrator and store where directed.

1.8 DELIVERY, HANDLING AND STORAGE

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver and store materials in original containers, sealed, with labels intact.
- .3 Labels shall clearly indicate:
 - .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.
- .4 Remove damaged, opened and rejected materials from Site.
- .5 Provide and maintain dry, temperature controlled, secure storage.
- .6 Observe manufacturer's recommendations for storage and handling.
- .7 Store materials and supplies away from heat generating devices.
- .8 Store materials and equipment in a well ventilated area with temperature range 7°C to 30°C.
- .9 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Contract Administrator. After completion of operations, return areas to clean condition to approval of Contract Administrator.
- .11 Remove paint materials from storage only in quantities required for same day use.
- .12 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .13 Fire Safety Requirements:

- .1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from Site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.
- .14 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.9 SITE REQUIREMENTS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Perform no painting Work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Provide temporary ventilating and heating equipment where permanent facilities are not available.
 - .5 Perform no painting Work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by Contract Administrator and, applied product manufacturer, perform no painting Work when:
 - .1 ambient air and substrate temperatures are below 10°C.
 - .2 substrate temperature is over 32°C unless paint is specifically formulated for application at high temperatures.
 - .3 substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
 - .4 the relative humidity is above 85% or when dew point is less than 3°C variance between air/surface temperature.
 - .5 rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at Site.
 - .2 Perform no painting Work when maximum moisture content of substrate exceeds:
 - .1 12% for concrete and masonry (clay and concrete brick/block).
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
 - .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
 - .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
 - .1 Apply paint finish only 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 only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
- .3 Apply paint only when previous coat of paint is dry or adequately cured.
- .4 Apply paint finishes only when conditions forecast for entire period of application fall within manufacturer's recommendations.
- .5 Do not apply paint when:
 - .1 Temperature is expected to drop below 10°C before paint has thoroughly cured.
 - .2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.
 - .3 Surface to be painted is wet, damp or frosted.
- .6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.
- .7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.
- .8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
- .9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of the Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.10 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning & Waste Management.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.
- .6 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.
- .7 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .8 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .9 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.
- .10 Empty paint cans are to be dry prior to disposal or recycling (where available).

Part 2 Products

2.1 MATERIALS

- .1 Paint materials listed in the latest edition of the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for each coating formula to be products of a single manufacturer.
- .3 Low odour products: whenever possible, select products exhibiting low odour characteristics. If two products are otherwise equivalent, select the product with the lowest odour. Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:
 - .1 be water-based, water soluble, water clean-up.
 - .2 be non-flammable
 - .3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 be manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).
- .6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .7 Water-borne surface coatings must have a flash point of 61.0°C or greater.
- .8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
 - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

- .1 Colours are to be (final colours to be confirmed by Contract Administrator prior to ordering. Selection of colours will be from manufacturer's full range of colours).
 - .1 Wood Sealant: Minwax 'Helmsman' Water-based Spar Urethane Semi-gloss [MPI G5]
- .2 Contract Administrator will provide Colour and Finish Schedule after Contract award.
- .3 Where specific products are available in a restricted range of colours, selection will be based on the limited range.

2.3 MIXING AND TINTING

- .1 Perform colour tinting operations prior to delivery of paint to Site. On-Site tinting of painting materials is allowed only with Contract Administrator's written permission.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.
- .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 shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level /Category	Units @ 60E/	Units @ 85°
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces shall be as specified herein.

2.5 EXTERIOR PAINTING SYSTEMS

- .1 The following paint formulas requires a three coat finish as indicated in the MPI Contract Administratoral Painting Specifications Manual.
- .2 Asphalt Surfaces: zone/traffic marking for drive and parking areas, etc.
 - .1 EXT 2.1B Alkyd zone/traffic marking finish.
- .3 Concrete Vertical Surfaces: (including horizontal soffits)
 - .1 EXT 3.1A – Latex G4 finish

- .4 Concrete Horizontal Surfaces:
 - .1 EXT 3.2D - Alkyd floor enamel G4 finish.
- .5 Clay Masonry Units: (pressed and extruded brick)
 - .1 EXT 4.1A - Latex G4 finish.
- .6 Concrete Masonry Units: smooth and split face block and brick
 - .1 EXT 4.2A - Latex G4 finish.
- .7 Structural Steel and Metal Fabrications:
 - .1 EXT 5.1J - Pigmented polyurethane finish (over high build epoxy).
- .8 Galvanized Metal: not chromate passivated
 - .1 EXT 5.3D - Pigmented polyurethane finish for use in high contact/high traffic areas.
- .9 Glue Laminated Beams and Columns
 - .1 EXT 6.1D – Varnish (over stain)
- .10 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.
 - .1 EXT 6.2N – Varnish, Exterior, Water-based, Clear
- .11 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.
 - .1 EXT 6.2N – Varnish, Exterior, Water-based, Clear
- .12 Wood Panelling: plywood siding, fascias, soffits, etc.
 - .1 EXT 6.2N – Varnish, Exterior, Water-based, Clear

Part 3 Execution

3.1 GENERAL

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

3.2 EXISTING CONDITIONS

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Contract Administrator damages, defects, unsatisfactory or unfavourable conditions before proceeding with Work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Contract Administrator. Do not proceed with Work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Concrete: 12%.

- .2 Clay and Concrete Block/Brick: 12%.
- .3 Wood: 15%.

3.3 PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint splatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Contract Administrator.
- .2 Cover or mask windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.
- .3 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .4 Protect factory finished products and equipment.
- .5 Protect passing pedestrians, building occupants and general public in and about the building.
- .6 Remove electrical cover plates, light fixtures, surface hardware on doors, and all other surface mounted fittings, equipment and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.
- .7 Cover or move exterior furniture and portable equipment around building as necessary to carry out painting operations. Replace as painting operations progress.
- .8 As painting operations progress, place "WET PAINT" signs in areas of Work to approval of Contract Administrator.

3.4 CLEANING AND PREPARATION

- .1 Clean and prepare exterior surfaces in accordance with MPI Painting Specification Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and other surface debris by 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. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.
- .2 Prevent contamination of cleaned surfaces before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.

- .3 Where possible, prime 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.
- .4 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.
- .5 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or blowing with clean dry compressed air.
- .6 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.
- .7 Do not apply paint until prepared surfaces have been accepted by Contract Administrator.

3.5 APPLICATION

- .1 Method of application to be as approved by Contract Administrator. Apply paint by brush roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types 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 shall be free of roller tracking and heavy stipple.
 - .5 Remove runs, sags and brush marks from finished Work and repaint.
- .3 Spray Application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out immediately runs and sags.
 - .5 Use brushes to Work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Contract Administrator.

- .5 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.
- .8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.
- .9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.
- .2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.
- .3 Paint fire protection piping red.
- .4 Do not paint over nameplates.
- .5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.7 FIELD QUALITY CONTROL

- .1 Field inspection of exterior painting operations to be carried out by Contract Administrator.
- .2 Advise Contract Administrator when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with Contract Administrator and provide access to areas of Work.

3.8 RESTORATION

- .1 Clean and re-install all 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 surfaces from paint droppings and dust to approval of Contract Administrator. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Environmental Protection Agency (EPA)
 - .1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).
- .2 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual.
 - .2 Green Performance Standard (GPS-1-08 and GPS-2-08).
- .3 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Volume Two, Systems and Specifications Manual.
- .4 National Fire Code of Canada.
- .5 Green Seal Organization, GS-03 Anti-Corrosive Paints, Second Edition January 7, 1997
 - .1 GS-11 paints First Edition, May 20, 1993.
- .6 South Coast Air Quality Management District, rule #1113 (effective date 2007).

1.2 QUALITY ASSURANCE

- .1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
- .2 Qualified journeymen shall be engaged in painting Work. Apprentices may be employed provided they Work under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .3 Conform to latest MPI requirements for interior painting Work including preparation and priming.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

- .1 Provide paint products meeting MPI Green Performance Standard (GPS-1-08 and GPS-2-08).
- .2 Provide paint products meeting MPI Environmentally Friendly E2 or E3 ratings based on VOC (EPA Method 24) content levels.

1.4 SCHEDULING

- .1 Submit Work schedule for various stages of painting to Contract Administrator for approval. Submit schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from Contract Administrator for any changes in Work schedule.
- .3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.5 SUBMITTALS

- .1 Submit product data and manufacturer's installation/application instructions for each paint and coating product.
- .2 Submit product data for the use and application of paint thinner.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets. Indicate VOCs during application and curing.
- .4 Upon completion, submit records of products used, records to be included in Operating and Maintenance Manuals. List products in relation to finish system and include the following:
 - .1 Product name, type and use
 - .2 Manufacturer's product number
 - .3 Colour numbers
 - .4 MPI Environmentally Friendly Classification System Rating
 - .5 Manufacturer's Material Safety Data Sheets (MSDS)
- .5 Submit full range colour sample chips to indicate where colour availability is restricted.
- .6 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 Painting Specification Manual standards submitted on the following substrate materials:
 - .1 3 mm steel plate for finishes over metal surfaces.
 - .2 13 mm birch plywood for finishes over wood surfaces.
 - .3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
 - .4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.
- .7 When approved, sample panels shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

1.6 QUALITY CONTROL

- .1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.
- .2 When requested by Contract Administrator, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site Work.

1.7 EXTRA MATERIALS

- .1 Submit maintenance materials from same product run as products installed in accordance with Section 01 78 00 - Closeout Submittals. Package products with protective covering and identify with descriptive labels.
- .2 Submit one - four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.
- .3 Deliver to Contract Administrator and store where directed.

- .4 Provide certificate signed by staff that extra materials have been received in order.

1.8 DELIVERY, HANDLING AND STORAGE

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver and store materials in original containers, sealed, with labels intact.
- .3 Labels shall clearly indicate:
 - .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.
- .4 Remove damaged, opened and rejected materials from site.
- .5 Provide and maintain dry, temperature controlled, secure storage.
- .6 Observe manufacturer's recommendations for storage and handling.
- .7 Store materials and supplies away from heat generating devices.
- .8 Store materials and equipment in a well ventilated area with temperature range 7° C to 30° C.
- .9 Store temperature sensitive products above minimum temperature as recommended by manufacturer.
- .10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Contract Administrator. After completion of operations, return areas to clean condition to approval of Contract Administrator.
- .11 Remove paint materials from storage only in quantities required for same day use.
- .12 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
- .13 Fire Safety Requirements:
 - .1 Provide minimum 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 the National Fire Code of Canada.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 00 – Cleaning and Waste Management.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .3 Place materials defined as hazardous or toxic in designated containers.
- .4 Ensure emptied containers are sealed and stored safely.
- .5 Unused paint, coating materials must be disposed of at official hazardous material collections site as approved by Contract Administrator.
- .6 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.
- .7 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
- .8 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
- .9 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).

1.10 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Ventilate enclosed spaces.
 - .2 Perform no painting Work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.
 - .3 Where required, provide continuous ventilation for seven days after completion of application of paint.
 - .4 Perform no painting Work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by Contractor.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by the specifying body, Paint Inspection Agency and the applied product manufacturer, perform no painting Work when:
 - .1 Ambient air and substrate temperatures are below 10°C.
 - .2 Substrate temperature is over 32°C unless paint is specifically formulated for application at high temperatures.
 - .3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.
 - .4 The relative humidity is above 60% or when the dew point is less than 3°C variance between the air/surface temperature.

- .2 Perform no painting Work when the maximum moisture content of the substrate exceeds:
 - .1 12% for concrete and masonry (clay and concrete brick/block).
 - .2 15% for wood.
 - .3 12% for plaster and gypsum board.
- .3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".
- .4 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
 - .1 Apply paint finish only 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 only to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint only when previous coat of paint is dry or adequately cured.
- .4 Additional Interior Application Requirements:
 - .1 Apply paint finishes only 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 Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 MATERIALS

- .1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.
- .2 Paint materials for paint systems shall be products of a single manufacturer.
- .3 Low odor products. Whenever possible, select products exhibiting low odor characteristics. If two products are otherwise equivalent, select the product with the lowest odor. Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.
- .4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:
 - .1 be water-based, water soluble, water clean-up.
 - .2 be non-flammable.
 - .3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.
 - .4 be manufactured without compounds which contribute to smog in the lower atmosphere.
 - .5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
- .5 Water-borne surface coatings must be manufactured and transported in a manner that steps of process, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for

facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

- .6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.
- .7 Water-borne surface coatings must have a flash point of 61.0°C or greater.
- .8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:
 - .1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
 - .2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.
- .9 Water-borne paints and stains, and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

- .1 Two (2) colours to be selected. Contract Administrator will provide Colour and Finish Schedule after Contract award.
- .2 Selection of colours will be from manufacturer's full range of colours.
- .3 Where specific products are available in a restricted range of colours, selection will be based on the limited range.
- .4 Second coat in a 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. On-site tinting of painting materials is allowed only with Contract Administrator's written permission.
- .2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.
- .4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.
- .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 shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level Category	Units @ 60 □	Units @ 85 □
G1 - matte finish	max. 5	max. 10
G2 - velvet finish	max. 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of painted surfaces shall be as specified herein.

2.5 INTERIOR PAINTING SYSTEMS

- .1 The following paint formulas requires a three coat finish as indicated in the MPI Architectural Painting Specifications Manual.
- .2 Concrete Vertical Surfaces: including horizontal soffits
- .1 INT 3.1A Latex G5 finish (over sealer).
- .3 Concrete Horizontal Surfaces: floors and stairs
- .1 INT 3.2B Alkyd floor enamel low gloss finish.
- .4 Concrete Horizontal Surfaces: bathroom, kitchen & vehicle storage floors
- .1 INT 3.2D Polyurethane, Pigmented (on Epoxy Base) G6 finish
- .5 Clay Masonry Units: pressed and extruded brick
- .1 INT 4.1A Latex G5 finish.
- .6 Concrete Masonry Units: smooth and split face block and brick.
- .1 INT 4.2A Latex G5 finish.
- .7 Structural Steel and Metal Fabrications: columns, beams, joists, etc.
- .1 INT 5.1E Alkyd G5 finish.
- .8 Galvanized Metal: doors, frames, railings, misc. steel, pipes, overhead decking, ducts, etc.
- .1 INT 5.3A Latex G5 finish.
- .9 Dimension Lumber: columns, beams, exposed joists, underside of decking, etc.
- .1 INT 6.2D Latex G5 finish (over latex primer).
- .10 Dressed Lumber: including doors, door and window frames casings, mouldings, etc.
- .1 INT 6.3T Latex G5 finish (over latex primer).
- .2 INT 6.3X Polyurethane, clear, moisture cured semi gloss finish.
- .3 INT 6.3Y Polyurethane, clear, moisture cured semi gloss finish (over stain).
- .11 Wood Paneling and Casework: partitions, panels, shelving, millwork, etc.
- .1 Transparent Finish over Stain: INT 6.4V Polyurethane, clear moisture cured semi gloss finish (over stain).
- .12 Wood Floors and Stairs: including hardwood flooring, etc.
- .1 INT 6.5B Polyurethane varnish gloss finish (over stain).

- .2 INT 6.5C Polyurethane varnish gloss finish.
- .13 Plaster and Gypsum Board: gypsum wallboard, drywall, "sheet rock type material", etc and textured finishes:
 - .1 INT 9.2A Latex G5 finish (over latex sealer) for walls.
 - .2 INT 9.2A Latex G1 finish (over latex sealer) for ceilings.
- .14 Canvas and Cotton coverings:
 - .1 INT 10.1B Alkyd G5 finish.

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 Painting Specifications Manual except where specified otherwise.
- .2 Apply all paint materials in accordance with paint manufacturer's written application instructions.
- .3 Apply paint to all interior building materials unless otherwise noted.

3.3 PROTECTION

- .1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage. If damaged, clean and restore such surfaces as directed by Contract Administrator.
- .2 Cover or mask floors, windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.
- .3 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .4 Protect factory finished products and equipment.
- .5 Protect passing pedestrians, building occupants and general public in and about the building.
- .6 Remove electrical cover plates, light fixtures, surface hardware on doors, door stops, bath accessories and other surface mounted fittings and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.
- .7 As painting operations progress place "WET PAINT" signs in occupied areas to approval of Contract Administrator.

3.4 EXAMINATION

- .1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Contract Administrator all damage, defects, unsatisfactory or unfavourable conditions before proceeding with Work.
- .2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to Contract Administrator. Do not proceed with Work until conditions fall within acceptable range as recommended by manufacturer.
- .3 Maximum moisture content as follows:
 - .1 Plaster and wallboard: 12%
 - .2 Masonry/Concrete: 12%
 - .3 Concrete Block/Brick: 12%
 - .4 Wood: 15%

3.5 CLEANING AND PREPARATION

- .1 Clean and prepare surfaces in accordance with MPI 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. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.
- .2 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.
- .3 Sand existing surfaces with intact, smooth, high gloss coatings to provide adequate adhesion for new finishes.
- .4 Where possible, prime 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.
- .5 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.

- .6 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air, or vacuum cleaning.
- .7 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.
- .8 Do not apply paint until prepared surfaces have been accepted by Contract Administrator.

3.6 APPLICATION

- .1 Method of application to be as approved by Contract Administrator. Apply paint by brush, roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.
- .2 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
 - .2 Work paint into cracks, crevices and corners.
 - .3 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.
 - .4 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.
 - .5 Remove runs, sags and brush marks from finished Work and repaint.
- .3 Spray application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out immediately all runs and sags.
 - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Contract Administrator.
- .5 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
- .7 Sand and dust between coats to remove visible defects.

- .8 Finish tops of cupboards, cabinets and projecting ledges, both above and below sight lines as specified for surrounding surfaces.
- .9 Finish closets and alcoves as specified for adjoining rooms.
- .10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

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

3.8 FIELD QUALITY CONTROL

- .1 Field inspection of interior painting operations to be carried out by Contract Administrator.
- .2 Advise Contract Administrator when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with Contract Administrator and provide access to all areas of the Work.
- .4 Standard of Acceptance:
 - .1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - .2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - .3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.9 RESTORATION

- .1 Clean and re-install all 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 Contract Administrator Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

END OF SECTION