

Part 1 General

Part 1.1 RELATED SECTIONS

- .1 Section 01 33 00 Submittal Procedures.
- .2 Section 01 45 00 Quality Control.
- .3 Section 01 61 00 Common Product Requirements.
- .4 Section 01 73 00 Execution Requirements.
- .5 Section 01 74 11 Cleaning.
- .6 Section 01 78 00 Closeout Submittals.
- .7 Section 02 41 99 - Demolition for Minor Works.
- .8 Section 04 05 00 - Common Work Results for Masonry.
- .9 Section 04 22 00 - Concrete Unit Masonry
- .10 Section 07 84 00 - Firestopping
- .11 Section 07 92 00 Joint Sealing.
- .12 Section 10 21 13 Plastic Toilet Compartments.
- .13 Section 10 28 10 Toilet and Bath Accessories.

Part 1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)
 - .1 ANSI A108.1[99], Specification for the Installation of Ceramic Tile (Includes ANSI A108.1AC, 108.4.13, A118.1.10, ANSI A136.1).
 - .2 CTI A118.3[92], Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).
 - .3 CTI A118.4[92], Specification for Latex Cement Mortar (included in ANSI A108.1).
 - .4 CTI A118.5[92], Specification for Chemical Resistant Furan Resin Mortars and Grouts for Tile Installation (included in ANSI A108.1).
 - .5 CTI A118.6[92], Specification for Ceramic Tile Grouts (included in ANSI A108.1).
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C144[04], Specification for Aggregate for Masonry Mortar.
 - .2 ASTM C207[06], Specification for Hydrated Lime for Masonry Purposes.
 - .3 ASTM C847[06], Specification for Metal Lath.
 - .4 ASTM C979[05], Specification for Pigments for Integrally Coloured Concrete.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB51.34[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

- .2 CGSB 71GP22M[78(AMEND.)], Adhesive, Organic, for Installation of Ceramic Wall Tile.
- .3 CAN/CGSB75.1[M88], Tile, Ceramic.
- .4 CAN/CGSB25.20[95], Surface Sealer for Floors.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA A123.3[05], Asphalt Saturated Organic Roofing Felt.
 - .2 CAN/CSAA3000[03(R2006)], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .5 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 Tile Specification Guide 09 30 00 2012/2014, Tile Installation Manual.
 - .2 Tile Maintenance Guide 2000.

Part 1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 Submittal Procedures.
- .2 Provide product data in accordance with Section 01 33 00 Submittal Procedures.
 - .1 Include manufacturer's information on:
 - .1 Ceramic tile, marked to show each type, size, and shape required.
 - .2 Chemical resistant mortar and grout (Epoxy and Furan).
 - .3 Cementitious backer unit.
 - .4 Dryset cement mortar and grout.
 - .5 Divider strip.
 - .6 Elastomeric membrane and bond coat.
 - .7 Reinforcing tape.
 - .8 Levelling compound.
 - .9 Latex cement mortar and grout.
 - .10 Commercial cement grout.
 - .11 Organic adhesive.
 - .12 Waterproofing isolation membrane.
 - .13 Fasteners.
 - .3 Provide samples in accordance with Section 01 33 00 Submittal Procedures.
 - .1 Wall tile: submit 300 x 450 mm sample panel of each colour, texture, size, and pattern of tile.
 - .2 Adhere tile samples to 13 mm thick plywood and grout joints to represent project installation.

Part 1.4 QUALITY ASSURANCE

- .1 Quality Assurance Submittals:
 - .1 Manufacturer's Instructions: manufacturer's installation instructions.
 - .2 Manufacturer's Field Reports: manufacturer's field reports specified.

Part 1.5 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C. for 48 hours before, during, and 48 hours after, installation.
- .2 Do not install tiles at temperatures less than 12 degrees C. or above 38 degrees C.
- .3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C. or above 25 degrees C.

Part 1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 Closeout Submittals.
 - .2 Provide minimum 2% of each type and colour of tile required for project for maintenance use. Store where directed.
 - .3 Maintenance material same production run as installed material.

Part 1.7 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

Part 2 Products

Part 2.1 WALL TILE (INTERIOR)

- .1 Interior Ceramic Tile: to CAN/CGSB75.1, Type 5, Class MR 4, 4" x 16" x 1/4" size, smooth surface, as indicated on drawings.
 - .1 **Standard of Acceptance: Ames Tile Soho Series, # SOHWG416, Gloss White.**
 - .1 Pattern: Stacked Bond per interior elevations.

Part 2.2 FLOOR TILE (INTERIOR)

- .1 Interior Porcelain Tile: to CAN/CGSB75.1, Type 4 – Through Body Porcelain, 24" x 24 Mosaic pattern, non-slip abrasive surface, as indicated on drawings.
 - .1 **Standard of Acceptance: Ames Tile Concrete Project, Colour to be selected from standard range of colours.**

Part 2.3 MORTAR AND ADHESIVE MATERIALS

- .1 Fiber reinforced, polymer modified thin set mortar
 - .1 **Standard of Acceptance:**
 - .1 **X77 Microtec by Ardex**

Part 2.4 GROUT

- .1 Epoxy grout and adhesive:
 - .1 100% solids epoxy grout.
 - .2 Solvent free, low VOC, two component system.
 - .3 Job coloured grout are not acceptable.
 - .1 Standard of Acceptance: Ardex WA**
 - .2 Color: To be Selected from manufacturer's standard range.**

Part 2.5 MIXES

- .1 Smoothing / Ramping Mortar:
 - .1 Rapid set, pre-tiling smoothing and ramping mortar
 - .1 Standard of Acceptance: Ardex AM 100**

Part 2.6 ACCESSORIES

- .1 Metal Trims:
 - .1 Interior Trims:
 - .1 Standard of Acceptance:
 - .1 Wall-to-wall, outside corners: Schluter Schiene, Satin anodized aluminum.
 - .2 Wall-to-floor transition: Schluter Schiene, Satin anodized aluminum.
 - .2 Exterior Trims:
 - .1 Vertical corners: Schluter Jolly AGSG, Bright Black Anodized Aluminum.
- .3 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.
- .4 Cleavage plane: polyethylene film to CGSB 5134.
- .5 Metal lath: to ASTM C847 galvanized finish, 10 mm rib at 2.17 kg/m².
- .6 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.
- .7 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 Sealants: maximum VOC limit 250 g/L to SCAQMD Rule 1168.
- .8 Floor sealer and protective coating: to CAN/CGSB25.20, Type 1 or 2 to tile and grout manufacturers recommendations.
- .9 Ceramic Accessories: soap holder; semi-recessed, 150 x 150 mm face dimension combination soap holder and grab bar, colour shall match surrounding wall tile.

Part 2.7 CLEANING COMPOUNDS

- .1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- .2 Materials containing acid or caustic material are not acceptable.

Part 3 Execution

Part 3.1 MANUFACTURER'S INSTRUCTIONS

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

Part 3.2 WORKMANSHIP

- .1 Do tile work in accordance with TTMAC Tile Installation Manual 2012/2014, "Ceramic Tile", except where specified otherwise.
- .2 Apply tile or backing coats to clean and sound surfaces.
- .3 Fit tile around corners, fitments, fixtures, drains and other built in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow sounding units to obtain full bond.
- .8 Use metal trims at all inside and outside corners and at floor-to-wall transitions.
- .9 Use metal trims at termination of wall tile panels.
- .10 Allow minimum 24 hours after installation of tiles, before grouting.
- .11 Clean installed tile surfaces after installation and grouting cured.
- .12 Make expansion joints at 20'-0" max, both directions and where indicated on drawings.

Part 3.3 WALL & FLOOR TILE

- .1 Install in accordance with TTMAC details.
- .2 Level substrate with smoothing / ramping mortar specified if required prior to tile installation.
- .3 Prime face of exterior cement board with one coat of waterproofing compound specified. Ensure cement board is securely fastened so that no deflection is present.
- .4 All exterior wall tiles to be back buttered. Spot mounted not acceptable.
- .5 All mortars to be applied in a unidirectional manner.

Part 3.4 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.

Part 3.5 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 45 00 - Quality Control.
- .3 Section 01 78 00 - Closeout Submittals.
- .4 Section 02 41 99 - Demolition for Minor Works.
- .5 Section 04 05 00 - Common Work Results for Masonry.
- .6 Section 04 22 00 - Concrete Unit Masonry

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C635/C635M-13a, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
 - .2 ASTM C636/C636M-13, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - .3 ASTM E1477-98a(2013), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Underwriter's Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for ceiling panels and ceiling suspension system and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 43 - Environmental Procedures.
- .3 Shop Drawings:
 - .1 Submit reflected ceiling plans for special grid patterns as indicated.
 - .2 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, change in level details, and acoustical unit support at ceiling fixture, lateral bracing and accessories.

- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Samples will be returned for inclusion into work.
 - .3 Submit duplicate full size samples of each type acoustical units.

1.4 DELIVERY, STORAGE AND HANDLING

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

Part 2 Products

2.1 MATERIALS

- .1 Grid Materials: To ASTM A 653, commercial quality cold rolled steel with hot-dipped galvanized coating.
 - .1 Support Channels and Hangers: To ASTM A 641, Class 1 zinc coating Galvanized steel; size and type to suit application and to manufactures recommendations.
 - .2 Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with 9/16 IN type exposed flange design; cross tee holes at 150mm (6 inch) o.c.; hanger with holes at 50mm (2 inch) o.c. with integral reversible splice. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
 - .3 Structural Classification: ASTM C 635 HD.
 - .4 Color: White.
 - .5 Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
 - .6 Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least time three design load, but not less than 12 gauge.

- .7 Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
- .8 Standard of Acceptance:
 - .1 Certainteed 9/16" Smoothline Bolt-Slot System, 1/4" Reveal, 9/16". Mitred design.
- .2 Accessories:
 - .1 Stabilizer bars, clips, splices, , hold down clips, purpose made metal clips required for suspended grid system; provide four (4) clips per tile.
 - .2 Perimeter Moldings Standard of Acceptance:
 - .1 Certainteed.; Product: 9/16" Shadow Moulding, No. SM1000. Color: White.

2.2 MANUFACTURERS - ACOUSTIC UNIT MATERIALS

- .1 Acoustical Ceiling Panels :
 - .1 Certainteed.
- .2 Substitutions: Not permitted.

2.3 MATERIALS

- .1 Acoustic Tile (**ACT-1**):
 - .1 Certainteed: Performa Adagio, Narrow Reveal Edge, 9/16" grid.
 - .1 Size: **24 x 24 inches**.
 - .2 Thickness: **1 1/2 inch**.
 - .3 Composition: Fibreglass/Mineral Fiber.
 - .4 Edges: Narrow Reveal for 9/16" grid
 - .5 Surface Colour: White.
 - .6 Surface Finish: Nubby Fabric
 - .7 Noise Reduction Coefficient (NRC) per ASTM C423 (E-400 mounting)
 - .1 0.90
 - .8 Articulation Class (AC) per ASTM E1111
 - .1 200
 - .9 Light Reflectance (LR) per ASTM E1477
 - .1 0.90 (Overtone)
 - .10 Ceiling Attenuation Class (CAC) per ASTM E1414
 - .1 36 [Adagio 2x2]
 - .11 Humidity Resistance
 - .1 Warranted to withstand relative humidity of up to 90% at 104°F without sagging, warping or delaminating for 10-years
 - .12 Flame Spread Classification per ASTM E84: Class A

2.4 ACCESSORIES

- .1 Acoustic Sealant for Perimeter Moldings: Specified in Section 07 92 00.
- .2 Touch-up Paint: Type and colour to match acoustic and grid units.

Part 3 Execution

3.1 EXAMINATION

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

3.2 INSTALLATION

- .1 Installation: in accordance with ASTM C636 except where specified otherwise.
- .2 Suspension System:
 - .1 Erect ceiling suspension system after work above ceiling has been inspected by Departmental Representative.
 - .2 Secure hangers to overhead structure using attachment methods as indicated.
 - .3 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.
 - .4 Lay out system as indicated on drawing 301, Reflected Ceiling Plan.
 - .5 Install wall moulding to provide correct ceiling height.
 - .6 Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles, microphones and speakers.
 - .7 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
 - .8 Interlock cross member to main runner to provide rigid assembly.
 - .9 Ensure finished ceiling system is square with adjoining walls and level within 1:1000.
- .3 Acoustic Panels:
 - .1 Install acoustical panels and tiles in ceiling suspension system.
 - .2 Co-ordinate ceiling work with work of other sections such as interior lighting, fire protection communication, and intrusion and detection systems.

3.3 CLEANING

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

3.4 PROTECTION

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Section 01 33 00 - Submittal Procedures.
- .3 Section 01 35 29.06 - Health and Safety Requirements.
- .4 Section 01 45 00 - Quality Control.
- .5 Section 01 61 00 - Common Product Requirements.
- .6 Section 01 78 00 - Closeout Submittals.
- .7 Section 05 50 00 – Metal Fabrications.
- .8 Section 09 97 19 - Painting Exterior Metal Surfaces

1.2 REFERENCES

- .1 The Master Painters Institute (MPI)
 - .1 Maintenance Repainting Manual, Master Painters Institute (MPI), including Identifiers, Evaluation, Systems, Preparation and Approved Product List.
- .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).

1.3 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Contractor: to have a minimum of five years proven satisfactory experience. Provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.
 - .2 Qualified journeypersons as defined by local jurisdiction to be engaged in repainting work.
 - .3 Apprentices: may be employed provided they work under the direct supervision of qualified journeyperson in accordance with applicable trade regulations.
- .2 Conform to latest MPI requirements for interior repainting work including cleaning, preparation and priming.
- .3 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents) shall be in accordance with the latest edition of the MPI Approved Product List and shall be from a single manufacturer for each system used.

- .4 Paint materials such as linseed oil, shellac, reducers and turpentine shall be the highest quality product of an approved manufacturer listed in MPI Maintenance Repainting Manual and shall be compatible with other coating materials as required.
- .5 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.
- .6 Standard of Acceptance: when viewed using final lighting source surfaces shall indicate the following:
 - .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.
 - .3 Final coat to exhibit uniformity of colour and sheen across full surface area.
- .7 Mock-ups: construct mock-ups in accordance with Section 01 45 00 - Quality Control
 - .1 Provide a mock-up in accordance with requirements of Section 01 45 00 - Quality Control to Departmental Representative.
 - .2 Prepare and repaint mock-up designated interior room, surface or item to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Maintenance Repainting Manual standards for review and approval.
 - .3 When approved, repainted room, surface and/or item shall become acceptable standard of finish quality and workmanship for similar on-site interior repainting work.

1.4 PERFORMANCE REQUIREMENTS

- .1 Environmental Performance Requirements:
 - .1 Provide paint products meeting MPI "Environmentally Friendly" E2 ratings based on VOC (EPA Method 24) content levels.
 - .2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 rating.

1.5 SCHEDULING

- .1 Submit work schedule for various stages of painting to Departmental Representative for approval. Submit schedule a minimum of 48 hours in advance of proposed operations.
- .2 Paint occupied facilities in accordance with approved schedule. Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.
- .3 Obtain written authorization from Departmental Representative for changes in work schedule.
- .4 Schedule repainting operations to prevent disruption by other trades if applicable and by occupants in and about building.

1.6 SUBMITTALS

- .1 Provide product data and manufacturer's installation/application instructions for each paint and coating product to be used in accordance with the requirements of Section 01 33 00 - Submittal Procedures.
- .2 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Submit full range colour sample chips for review and selection. Indicate where colour availability is restricted.
 - .2 Submit WHMIS MSDS - Material Safety Data Sheets for paint and coating materials in accordance with Section 02 81 01 - Hazardous Materials.
- .3 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 MPI Environmentally Friendly classification system rating.
 - .5 Manufacturer's Material Safety Data Sheets (MSDS).

1.7 DELIVERY, HANDLING AND STORAGE

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

- .1 Provide one 9kg 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 daily.
 - .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada.
- .2 Waste Management and Disposal:
- .1 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.
 - .2 Materials that cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.
 - .3 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.
 - .4 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into the ground the following procedures shall be strictly adhered to:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.
 - .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 an approved legal manner in accordance with hazardous waste regulations.
 - .5 Empty paint cans are to be dry prior to disposal or recycling (where available).
 - .6 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.
 - .5 Where paint recycling is available, collect waste materials by type and provide for delivery to recycling or collection facility.

1.8 SITE CONDITIONS

- .1 Heating, Ventilation and Lighting:
 - .1 Do not perform repainting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application and until paint has cured sufficiently.
 - .2 Ventilate enclosed spaces in accordance with Section 01 35 29.06. Where required, provide continuous ventilation for seven days after completion of application of paint.

- .3 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
- .4 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements. Use of gas-fired appliances is not permitted.
- .5 Do not perform painting work unless minimum lighting level of 323 Lux is provided on surfaces to be painted.
- .2 Temperature, Humidity and Substrate Moisture Content Levels:
 - .1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, do not perform repainting work when:
 - .1 Ambient air and substrate temperatures are below 10 degrees C.
 - .2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - .3 Relative humidity within area to be repainted is above 85%.
 - .2 Conduct moisture tests using properly calibrated electronic Moisture Meter, except use simple "cover patch test" on concrete floors to be repainted.
 - .3 Do not perform repainting 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.
 - .4 Test painted concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Surface and Environmental Conditions:
 - .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - .2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.
 - .3 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise pre-approved by specific coating manufacturer.
 - .4 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of the Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.9 MAINTENANCE

- .1 Extra Materials:
- .2 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
- .3 Submit one four litre can of each type and colour of stain finish coating. Identify type and colour in relation to established colour schedule and finish system.

Part 2 Products

2.1 MATERIALS

- .1 Paint materials listed in latest edition of MPI Approved Product List (APL) are acceptable for use on this project.
- .2 Where required by authorities having jurisdiction, paints and coatings to provide a fire resistant rating.
- .3 Paint materials for repaint systems to be products of single manufacturer.
- .4 Only qualified products with MPI "Environmentally Friendly" E2 or E3 rating are acceptable for use on this project.
- .5 Use only MPI listed L rated materials.
- .6 Paints, coatings, thinners, solvents, cleaners and other fluids used in repainting, to be as follows:
 - .1 Not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.
 - .2 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.
 - .3 Be manufactured without compounds which contribute to smog in lower atmosphere.
 - .4 Be manufactured where matter generating 'Biochemical Oxygen Demand' (BOD) in undiluted production plant effluent discharged to natural watercourse or a sewage treatment facility lacking secondary treatment does not exceed 15mg/L.
 - .5 Be manufactured where total suspended solids (TSS) content in undiluted production plant effluent discharged to natural watercourse or sewage treatment facility lacking secondary treatment does not exceed 15 mg/L.
- .7 Paints and coatings must not be formulated or manufactured with formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

2.2 COLOURS

- .1 Refer to Finishes Plan and Colour Schedule.
- .2 Selection of colours will be from manufacturers full range of colours.
- .3 Where specific products are available in restricted range of colours, selection will be based on limited range.
- .4 First coat in two coat (Premium) repaint 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 with Departmental Representative's written permission.

- .2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
- .3 Where thinner is used, addition not to exceed paint manufacturer's recommendations. Do not use kerosene or such organic solvents to thin water-based paints.
- .4 Thin paint for spraying in accordance with paint manufacturer' instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.
- .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 defined as sheen rating of applied paint, in accordance with following MPI gloss / sheen standard values:

Gloss Level Category	Units @ 60 Degrees	Units @ 85 Degrees
G1 - matte finish	0 to 5	maximum 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	minimum 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

- .2 Gloss level ratings of repainted surfaces [shall be as specified herein] [and] [as noted on Finish Schedule].

2.5 INTERIOR PAINTING SYSTEMS

- .1 RIN 5.3 - Galvanized Metal: (High Contact/High Traffic Areas (Doors, Frames, Railings,Pipes, Handrails, etc.). Low Contact/Low traffic areas (Overhead Decking, Pipes, Ducts,etc.)
 - .1 RIN 5.3B - High Performance Acrylic G4.
 - .2 RIN 5.3C - Alkyd G5.
 - .3 RIN 5.3D - 2 Component Epoxy G5
 - .4 RIN 5.3H - 2 Component Polyurethane.
 - .5 INT 5.3A - Quick dry enamel G5 finish. (If required only: Add Waterborne light industrial G5 clear (4) coating for doors and frames only).
- .2 RIN 6.3 - Dressed Lumber: (Including Doors, Door and Window Frames, Mouldings,etc.)
 - .1 RIN 6.3B - Alkyd (Semi-Gloss, Gloss).RIN
 - .2 6.3D - Semi-Transparent Stain/Alkyd Semi-Transparent Stain/Varnish G3,G4.
 - .3 RIN 6.3E - Semi-Transparent Stain/Polyurethane Varnish G4, G5.
 - .4 RIN 6.3H - Clear Lacquer G4, G5.
 - .5 RIN 6.3J - Clear Alkyd Varnish G4, G5.
 - .6 RIN 6.3K - Clear Polyurethane Varnish G4, G5.
 - .7 RIN 6.3L - 2 Component Epoxy.

- .8 RIN 6.3Q - High Performance Acrylic G4, G5.
- .9 RIN 6.3R - Waterborne Acrylic, Clear G4, G5.
- .3 RIN 6.4 - Wood Panelling and Casework: (Partitions, Panels, Shelving, Millwork, etc.).
 - .1 RIN 6.4C - Alkyd Semi-Gloss, Gloss.
 - .2 RIN 6.4F - Semi-Transparent Stain/Alkyd Varnish G4, G5.
 - .3 RIN 6.4G - Semi-Transparent Stain/Polyurethane Varnish G4, G5.
 - .4 RIN 6.4H - Semi-Transparent Stain/Lacquer G4, G5 Finish (over stain).
 - .5 RIN 6.4J - Clear Alkyd Varnish G4, G5.
 - .6 RIN 6.4L - Clear Polyurethane Varnish G4, G5.
 - .7 RIN 6.4Q - Waterborne Acrylic, Clear G4, G5.
 - .8 RIN 6.4R - High Performance Acrylic G4, G5.
- .4 RIN 6.5 - Wood Floors and Stairs:
 - .1 RIN 6.5A - Alkyd Floor Enamel.
 - .2 RIN 6.5B - Semi-Transparent Stain / Polyurethane Varnish G4, G5.
- .5 RIN 9.2 - Plaster and Gypsum Board: (gypsum wallboard, drywall, "sheet rock typematerial", etc.).
 - .1 RIN 9.2A - Latex G4, G5.
 - .2 RIN 9.2B - High Performance Acrylic G4, G5
 - .3 RIN 9.2C - Alkyd G4, G5 Finish.
 - .4 RIN 9.2J - 2 Component Polyurethane G4, G5.
 - .5 INT 9.2A - Latex G5 finish (over latex sealer) – All walls.
 - .6 INT 9.2C - Latex G5 finish (over latex sealer) – Washroom walls.
- .6 RIN 9.3 - Acoustic Panels and Tiles.
 - .1 RIN 9.3A - Latex Flat.
 - .2 .3 RIN 5.3D - 2 Component Epoxy G5.SPEC NOTE: Use the following subparagraph for LEED projects, if low-emitting materials are required for LEED Credit EQc4.2.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

- .1 Interior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project repainting specification and Finish Schedule (as well as plans and elevation drawings).

- .2 Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
- .3 Where an assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.
- .4 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to Departmental Representative.

3.3 PREPARATION

- .1 Perform preparation and operations for interior painting in accordance with MPI Maintenance Repainting Manual requirements except where otherwise specified.
- .2 Apply paint materials in accordance with paint manufacturer's written application instructions.
- .3 Clean and prepare interior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - .1 Remove dust, dirt, and 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 stiff bristle brush to remove dirt, oil and surface contaminants.
 - .3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - .4 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.
 - .5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.
 - .6 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.
- .4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminants from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.
- .5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining

coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.

- .6 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.
- .7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from distance up to 1000mm.

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 and] General Contractor] [Project Manager] 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 and General Contractor. 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 and Inspection Agency.
- .4 Degree of surface deterioration (DSD) to be assessed using MPI Identifiers and Assessment criteria indicated in MPI Maintenance Repainting Manual. MPI DSD ratings and descriptions are as follows:

Condition	Description
DSD-0	Sound Surface (includes visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (indicating fading; gloss reduction, slight surface contamination, minor pin holes scratches).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, and staining).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required).

3.5 PROTECTION

- .1 Protect existing surfaces and adjacent fixtures and furnishings from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.
- .2 Protect items that are permanently attached such as Fire Labels on doors and frames.
- .3 Protect factory finished products and equipment.
- .4 Protect general public and building occupants in and about building.
- .5 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and surface mounted equipment, fittings and fastenings prior to undertaking re-painting operations. Store items and re-install after painting is completed.

- .6 Move and cover furniture and portable equipment as necessary to carry out repainting operations. Replace as painting operations progress.
- .7 As repainting operations progress, place "WET PAINT" signs in occupied areas to approval of Departmental Representative.

3.6 APPLICATION

- .1 Apply paint by method that is best suited for substrate being repainted using brush roller, air sprayer and/or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise. Methods of application as pre-approved by Departmental Representative before commencing work.
- .2 Brush and Roller Application:
 - .1 Apply paint in 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 free of roller tracking and heavy stipple unless approved by Departmental Representative.
 - .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 by continuous mechanical agitation or intermittent agitation frequently as necessary.
 - .3 Apply paint in uniform layer, with overlapping at edges of spray pattern.
 - .4 Back roll spray applications and brush out runs and sags immediately.
 - .5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by Departmental Representative.
- .5 Apply paint coats in continuous manner and allow surfaces to dry and properly cure between coats for minimum time period as recommended by manufacturer. Minimum dry film thickness of coats not less than that recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.
- .6 Sand and dust between coats to remove visible defects.
- .7 Repaint surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
- .8 Repaint top, bottom, and vertical edges of doors to be repainted.

- .9 Repaint inside of cupboards and cabinets as specified for outside surfaces.
- .10 Repaint closets and alcoves to match existing, unless otherwise scheduled or noted.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

- .1 Unless otherwise noted, repainting to include exposed to view / previously painted mechanical and electrical equipment and components (panels, conduits, piping, hangers, and ductwork.).
- .2 Touch up scratches and marks and repaint such mechanical and electrical equipment and components with colour, and sheen finish to match existing unless otherwise noted or scheduled.
- .3 Do not paint over name plates or instruction labels.
- .4 Leave unfinished exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish.
- .5 Keep sprinkler heads free of paint.
- .6 Do not paint interior transformers and substation equipment.
- .7 Standard of Acceptance: when viewed using natural prevailing sunlight at peak period of day (mid-day) on surface viewed, surfaces to indicate following:
 - .1 Walls: no defects visible from distance of 1000 mm at 90 degrees to surface.
 - .2 Soffits: no defects visible from grade at 45 degrees to surface.
 - .3 Final coat to exhibit uniformity of colour and sheen across full surface area.

3.8 FIELD QUALITY CONTROL

- .1 Inspection:
- .2 Advise Departmental Representative and Paint Inspection Agency when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
- .3 Co-operate with Paint Inspection Agency and provide access to areas of work.

3.9 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning, supplemented as follows:
 - .1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
 - .2 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris.
 - .3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.
 - .4 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as other cleaning and protective

materials (e.g. rags, drop cloths, and masking papers), paints, thinners, paint removers/strippers in accordance with safety requirements of authorities having jurisdiction and as noted herein.

- .5 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Sediment remaining from cleaning operations to be recycled or disposed of in manner acceptable to authorities having jurisdiction.
- .6 Recycle paint and coatings in excess of repainting requirements as specified.

3.10 RESTORATION

- .1 Clean and re-install hardware items removed before undertaken painting operations.
- .2 Remove protective coverings and warning signs as soon as practical after operations cease.
- .3 Remove paint splashings on affected exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.
- .4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.
- .5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

END OF SECTION

1. General

1.1. RELATED REQUIREMENTS

1. Section 01 33 00 - Submittal Procedures.
2. Section 01 35 29.06 - Health and Safety Requirements.
3. Section 01 45 00 - Quality Control.
4. Section 01 78 00 - Closeout Submittals.
5. Section 05 50 00 – Metal Fabrications
6. Section 09 91 23.01 – Interior Re-Painting

1.2. REFERENCES

1. Environmental Choice Program (ECP)
 1. CCD04798(R2005), Architectural Surface Coatings.
 2. CCD04898(R2006), Surface Coatings Recycled Waterborne.
2. Federal Standard (FS)
 1. FED-STD595B89, Colours Used in Government Procurement.
3. The Society for Protective Coatings (SSPC)
 1. SSPCSP 182(R2004), Solvent Cleaning.
 2. SSPCSP 282(R2004), Hand Tool Cleaning.
 3. SSPCSP 382(R2004), Power Tool Cleaning.
 4. SSPCSP 6/NACE No. 3 07, Commercial Blast Cleaning.
 5. SSPCSP 7/NACE No. 4 07, Brushoff Blast Cleaning.
 6. SSPCVis 89, Visual Standard for Abrasive Blast Cleaned Steel (Standard Reference Photographs) Editorial Changes September 1, 2000 (Steel Structures Painting Manual, Chapter 2 Surface Preparation Specs.).
 7. SSPC-SP 10/NACE No. 2-07, Near White Blast Cleaning.
 8. SSPC-PA 2 04, Measurement of Dry Coat Thickness with Magnetic Gauges.
 9. SSPC Good Painting Practices, Volume 1, 4th Edition.

1.3. 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 painting exterior metal surfaces and include product characteristics, performance criteria, physical size, finish and limitations.
 2. Submit 2 copies of WHMIS MSDS to Contract Administrator.
3. Samples:
 1. Submit for review and acceptance of each unit.
 2. Samples will be returned for inclusion into work.

4. Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
5. Test Reports:
 1. Submit test reports showing compliance with specified performance characteristics and physical properties and in accordance with Section 01 45 00 Quality Control.

1.4. QUALITY ASSURANCE

1. Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
2. Reports: Painting Contractor to take thickness measurements of intermediate and finish coats to confirm that specified Dry Film Thickness (DFT) is achieved in accordance to manufacturer's specifications.
3. Contractor Qualifications: Company specializing in the application of the Products specifies in this section with minimum three (3) years documented experience.

1.5. DELIVERY, STORAGE AND HANDLING

1. Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
2. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labeled with manufacturer's name and address.

2. Products

2.1. MATERIALS

1. Paint:
 1. Primer: epoxy, exterior; first coat. G5 finish, 3-4mil DFT.
 - .1 **Standard of Acceptance:**
 - .1 Macropoxy 646 Fast Cure Epoxy Part , by Sherwin Williams or approved equal in accordance with B7.
 2. Finish Coat: aliphatic urethane, final coat. G4 finish. 3-4mil DFT.
 - .1 **Standard of Acceptance:**
 - .1 Corothane II Low VOC Polyurethane, by Sherwin Williams or approved equal in accordance with B7.
 3. Sand for sandblasting: to SSPC (Steel Structures Painting Council).

3. Execution

3.1. EXAMINATION

1. Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for painting exterior metal surfaces installation in accordance with manufacturer's written instructions.

1. Visually inspect substrate in presence of prior to the commencement of any work.
2. Inform Contract Administrator of unacceptable conditions immediately upon discovery.
3. Proceed with installation only after unacceptable conditions have been remedied. Commencement of work signifies acceptance of the substrate condition.

3.2. PREPARATION

1. Existing Metal Surfaces Preparation:

1. Existing metal surfaces indicated on drawings to be abrasive blasted.
2. Blast abrasive media shall be free of corrosion producing contaminants and oil. The type of blast abrasive media, hardness and grit size shall be such so as to achieve a surface profile, onto which the paint system is to be applied, which is compatible with the requirements of the paint system specified.
3. Surfaces adjacent to areas to be abrasive blast cleaned shall be protected from damage during surface preparation.
4. All existing structural steel surfaces to be surface prepared and painted shall be high pressure water washed with the water nozzle located not more than 300 mm from the surface. The water pressure shall be a minimum of 15 MPa. The high pressure water wash shall be undertaken to remove existing surface elements prior to blasting.
5. Structural steel shall be abrasive blast cleaned to the requirements of SSPC-SP10 / NACE No. 2, Near-White Blast Cleaning providing a surface profile ranging between 25 μm and 75 μm , or better as required by the coating system manufacturer.
6. No rust scale shall remain within designated areas. Any areas shielded or hidden from the effects of abrasive blast cleaning shall be surface prepared manually or by other demonstrated practical means satisfactory to the Departmental Representative. The abrasive blast cleaning shall be undertaken so as no damage occurs to adjacent areas. The quality of blast cleaning shall be evaluated using the criteria provided in SSPC-VIS 1, Guide and Reference Photographs for Steel Surfaces Prepared by Abrasive Blast Cleaning. Freshly prepared steel surfaces shall be painted as quickly as possible, however, if the freshly prepared steel flash rusts, the steel shall be re-blasted to the requirements of SSPC-SP7 / NACE No. 4, Brush-Off Blast Cleaning. Surface preparation of areas difficult to access, shall be carried out to the extent practical as detailed in the Contractor's submission for areas difficult to access. The surface preparation standard for these areas shall be based on reasonable effort demonstrated in the field and found to be acceptable by the Departmental Representative

New metal surfaces Preparation:

1. Clean surfaces of new metal to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and foreign substances in accordance with the following:

1. Commercial blast cleaning: to SSPCSP 6.
2. Solvent cleaning: to SSPCSP 1.
3. Hand tool cleaning: to SSPCSP 2.
4. Power tool cleaning: to SSPCSP 3.
5. Brushoff blast cleaning: to SSPCSP 7.
6. Near White Blast Cleaning: to SSPC-SP 10/NACE No. 2.
7. Galvanized metal cleaner:
 - .1 Standard of Acceptance:
 - .1 #4110 Paint Prep Cleaner from Hi Lite Solutions
 - Compressed air to be free of water and oil before reaching nozzle.
2. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, by blowing with clean dry compressed air, or by vacuum cleaning.
3. Prior to starting paint application ensure degree of cleanliness of surfaces is to SSPCV is 1.
 1. Apply primer, paint, or pretreatment after surface has been cleaned and before deterioration of surface occurs.
 2. Clean surfaces again if rusting occurs after completion of surface preparation.
4. Mixing paint:
 1. Do not dilute or thin paint for brush application.
 2. Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.
 3. Do not mix or keep paint in suspension by means of air bubbling through paint.
 4. Thin paint for spraying according to manufacturer's written instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.
5. Number of paint coats: 4.
 1. New metal surfaces.
 1. Shop: 2 primer coats to minimum dry film thickness of 35 microns per coat.
 2. Field: 2 alkyd enamel coats to minimum dry film thickness of 25 microns per coat.

1.2. APPLICATION

1. Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
2. Apply paint by spraying only. Brushing may be used for touch-ups on final finish coat. Use sheepskins or daubers when no other method is practical in places of difficult access.
3. Use dipping or roller coating method of application when specifically authorized by Contract Administrator in writing.
4. Caulk open seams at contact surfaces of built up members with material approved by Contract Administrator, before second undercoat of primer is applied.
5. Where surface to be painted is not under cover, do not apply paint when:

1. Air temperature is below 5 degrees C or when temperature is expected to drop to 0 degrees C before paint has dried.
2. Temperature of surface is over 40 degrees C unless paint is specifically formulated for application at high temperatures.
3. Fog or mist occur at site; it is raining or snowing; there is danger of rain or snow; relative humidity is above 85%.
4. Surface to be painted is wet, damp or frosted.
5. Previous coat is not dry.
6. Supply cover when paint must be applied in damp or cold weather. Supply, shelter, or heat surface and surrounding air to comply with temperature and humidity conditions specified. Protect until paint is dry or until weather conditions are suitable.
7. Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.
8. Apply each coat of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
9. Brush application (only when components are not accessible for spray application):
 1. Work paint into cracks, crevices and corners and paint surfaces not accessible to brushes by spray, daubers or sheepskins.
 2. Brush out runs and sags.
 3. Remove runs, sags and brush marks from finished work and repaint.
10. 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. Provide traps or separators to remove oil and water from compressed air and drain periodically during operations.
 3. Keep paint ingredients properly mixed in spray pots or containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 4. Apply paint in uniform layer, with overlapping at edges of spray pattern.
 5. Brush out immediately runs and sags.
 6. Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray. In areas not accessible to spray gun, use brushes, daubers or sheepskins.
 7. Remove runs, sags and brush marks from finished work and repaint.
11. Shop painting:
 1. Do shop painting after fabrication and before damage to surface occurs from weather or other exposure.
 2. Spray paint contact surfaces of field assembled, bolted, friction type joints with primer coat only. Do not brush primer after spraying.
 3. Do not paint metal surfaces which are to be embedded in concrete.
 4. Paint metal surfaces to be in contact with wood with either full paint coats specified or three shop coats of specified primer.

5. Do not paint metal within 50 mm of edge to be welded. Give unprotected steel one coat of approved primer or protective coating after shop fabrication is completed.
 6. Remove weld spatter before painting. Remove weld slag and flux to be repainted.
 7. 'Stripe' all weld joints with primer prior to applying intermediate paint coats.
 8. Protect machine finished or similar surfaces that are not to be painted but that do require protection, with coating of rust inhibitive petroleum, molybdenum disulphide.
 9. Copy previous erection marks and weight marks on areas that have been shop painted.
12. Field painting:
1. Paint steel structures as soon as practical after erection.
 2. Touch up metal which has been shop coated with same type of paint and to same thickness as shop coat. This touchup to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.
 3. Field paint surfaces (other than joint contact surfaces) which are accessible before erection but which are not to be accessible after erection.
 4. Apply final coat of paint after concrete work is completed or as directed by Contract Administrator. If concreting or other operations damage paint, clean and repaint damaged area. Remove concrete spatter and droppings before paint is applied.
 5. Where painting does not meet with requirements of specifications, and when so directed by Contract Administrator, remove defective paint, thoroughly clean affected surfaces and repaint in accordance with these specifications.
13. Handling painted metal:
1. Handle painted metal after paint has dried, or when necessary for handling for painting or stacking for drying.
 2. Scrape off and touch up paint which is damaged in handling, with same number of coats and kinds of paint as were previously applied to metal.

1.3. FIELD QUALITY CONTROL

1. Site Tests, Inspections:
 1. Upon completion of the painting procedures test for dry film reading and evaluate the results as per SSPCPA 2.

1.4. CLEANING

1. Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

1.5. PROTECTION

1. Protect painted surfaces from damage during construction.
2. Protection of surfaces:
 1. Protect surfaces not to receive paint.

2. Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats of paint. Remove contaminants from surface and apply paint immediately.
3. Protect cleaned and freshly painted surfaces from dust.
3. Repair damage to adjacent materials caused by painting exterior metal surface application installation.

END OF SECTION