Part 1 General

1.1 RELATED SECTIONS

.1 Section 21 13 13 Wet Pipe Sprinkler and Standpipe.

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM C35-01(2005), Standard Specification for Inorganic Aggregates for Use in Gypsum Plaster.
- .2 ASTM C206-03, Standard Specification for Finishing Hydrated Lime.
- .3 ASTM C841-03, Standard Specification for Installation of Interior Lathing and Furring.
- .4 ASTM C842-05, Standard Specification for Application of Interior Gypsum Plaster.

.2 Canadian Standards Association (CSA International)

- .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 QUALITY ASSURANCE

.1 Mock-up: construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Locate where directed by Departmental Representative.

.3 Before application of each plaster coat, at location designated by Departmental Representative prepare 2 m2 representative sample plastering coat.

.4 Allow 48hours for inspection of mock-up by Departmental Representative before proceeding with plaster work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store, and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

- .1 Ensure bagged materials are delivered to site and stored in original containers.
- .2 Ensure loose material is delivered, clean, and stored to prevent contamination by foreign material.
- .3 Protect material from damage by moisture and freezing.

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 AMBIENT CONDITIONS

.1 Do plaster work when ambient temperature is between 13 degrees C and 21 degrees C under conditions specified in ASTM C842.

.2 Ventilate and heat to facilitate proper application and curing of plaster in accordance with Section 01 51 00 - Temporary Utilities.

.1 Ensure that high temperatures do not effect plaster drying process when spotlights are used during repair of existing plaster.

.3 Maintain air moisture content at 15% relative humidity to facilitate proper curing of plaster and minimize cracking.

.1 Keep records of actual air moisture content for specified period of cure.

Part 2 Products

2.1 MATERIALS

.1 Metal Lath: use galvanized, rust free metal lath to conform to ASTM C841, of type and weight to suit plaster system and support spacing.

.2 Lime:

.1 Hydrated Lime: to ASTM C206.

.2 Lime putty: ASTM C1489.

.3 Gypsum Plaster: to ASTM C842.

.4 Gauging plaster, Plaster of Paris and Gypsum Keene's Cement (anhydrous calcined gypsum) to ASTM C842.

.5 Cement: to CAN/CSA-A3000.

.6 Portland Cement: to CAN/CSA-A3000.

.7 Sand: to ASTM C35. Clean, sharp, free from deleterious matter.

.8 Water: potable, free of substances that would affect set of plaster.

.9 Admixtures: use only with written approval of Departmental Representative.

2.2 MIXES

.1 New finish plaster should match the existing plaster as closely as possible, in colour and texture.

.2 Plaster mix:

.1 Base coat: exterior grade, premixed plastering cement and reinforced with 0.3% to 0.5% by weight chopped glass fibre, 25 mm to 75 mm long.

.2 Brown coat: exterior grade, premixed, white finishing plaster.

.3 Finishing coat: exterior grade, premixed, finishing plaster.

.3 Mix plaster in accordance with ASTM C842 - premixed plaster manufacturer's written recommendations.

.4 Accurately maintain measuring proportions from batch to batch.

.5 Have materials batch mixed.

.6 Keep mixing tools and bins free of hardened residue.

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Examine and report in writing to Departmental Representative areas of deteriorated plaster not previously identified.

.2 Obtain Departmental Representative's approval and instructions for repair and replacement of plaster before proceeding with repair work.

3.2 PROTECTION

.1 Protect any fittings and surfaces adjacent to work by covering or masking.

3.3 PREPARATION

.1 Remove existing lath in areas as indicated on drawings and as required for the installation of sprinkler pipes, hangers and sprinkler heads.

.2 Bevel edges of existing plaster to accept new plaster repair.

.3 Obtain approval from Departmental Representative of preparation work prior to proceeding with installation.

3.4 INSTALLATION

.1 Installation of lath.

.1 Remove and replace damaged lath, and install new galvanized metal lath as indicated on drawings.

.2 Lath spacing and supports: Same as existing original.

.2 Install metal to ASTM C842.

3.5 APPLICATION

.1 Ensure that plaster finish follows original methods to maintain appearance of original work.

.2 Do plaster work to ASTM C842, unless otherwise specified.

.3 Scratch Coat:

.1 Apply specified scratch coat, thickness 10 mm minimum, with trowel, using sufficient pressure to force it between gaps of lath. Ensure even surface.

.2 Scratch surface with broom when initial set is obtained.

.3 Keep scratch coat damp for 3 days.

.4 Cure scratch coat 10 days in ventilated surroundings.

.4 Intermediate brown coat:

.1 Wet scratch coat before application of brown coat.

.2 Apply brown coat to 6 mm thickness.

.3 Keep brown coat damp for 2 days.

.4 Cure 7 days.

.5 Finish coat:

.1 Wet intermediate brown coat thoroughly. Eliminate standing water from surface.

.2 Apply specified finish coat to minimum 4 mm thickness.

.3 Smooth finish coat with metal trowel to achieve desired texture and appearance to match adjacent exiting plaster surfaces.

.4 Cure 7 days.

.5 Trowel patch work to smooth surface, even with adjacent work.

3.6 CLEANING

.1 Remove droppings and splashings immediately, using clean sponge and water.

3.7 PROTECTION

.1 Protect finished adjoining work, during execution of plaster work, with polyethylene sheets or building paper.

.2 Remove surplus material, tools, equipment and debris from work area on completion of work.

3.8 CURING

.1 Cure plaster for 14 days.

.2 Maintain temperature between 13 and 21 degrees C.

.3 Maintain relative humidity between 30 % and 40 %.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 08 99 - Rough Carpentry for Minor Works

.2 Section 07 92 00 - Joint Sealants

.3 Section 09 91 23 - Interior Painting

1.2 REFERENCES

.1 Association of the Wall and Ceiling Industries (AWCI) International

.1 Recommended Specification on Levels of Gypsum Board Finish

.2 ASTM International (ASTM)

.1 ASTM C475-02 (2007), Specification for Joint Compound and Joint Tape for Finishing Gypsum Board

.2 ASTM C645-09a, Specification for Nonstructural Steel Framing Members

.3 ASTM C754-09a, Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products

.4 ASTM C840-08, Specification for Application and Finishing of Gypsum Board

.5 ASTM C1002-07, Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs

.6 ASTM C1047-10, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base

.7 ASTM C 1396-09a, Standard Specification for Gypsum Board

.8 ASTM E119-09c, Standard Test Methods for Fire Tests of Building Construction and Materials

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40, Primer, Structural Steel, Oil Alkyd Type.

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102-03, Surface Burning Characteristics of Building Materials and Assemblies

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in original packages, containers or bundles bearing manufacturers' brand name and identification.

.2 Store materials inside, level, under cover. Keep dry. Protect from weather, other elements and damage from construction operations and other causes.

.3 Handle gypsum boards to prevent damage to edges, ends or surfaces. Protect metal accessories and trim from being bent or damaged.

.4 Waste management and disposal requirements: Refer to Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

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.

Part 2 Products

2.1 FRAMING MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C 645, stud size indicated, roll formed from hot dipped galvanized steel sheet, for screw attachment of gypsum board. Knock-out service holes at 450 mm centres. Minimum base steel thickness as follows:

.1 General interior framing: 0.455 mm, except where indicated otherwise.

.2 Interior framing scheduled for jamb studs: 0.836 mm.

.3 Steel Thickness: For the purposes of this specification, thicknesses provided will be minimum base steel thicknesses in accordance with CSA S136 and determined by the following table:

Designation Thickness	Minimum Base Steel Thickness		Gauge No. (For reference Only)	Colour
(mils)	(in)	(mm)	Ga	
18	0.0179	0.455	25	Not Painted
33	0.0329	0.836	20	White
43	0.0428	1.087	18	Yellow
54	0.0538	1.367	16	Green

.2 Floor and ceiling tracks: to ASTM C 645, in widths to suit stud sizes, 50 mm flange height, except provide floor tracks with extended leg to accommodate concrete topping in areas identified to receive concrete topping.

.3 Metal channel stiffener: 38 x 19 mm size, 1.2 mm thick cold rolled steel, coated with rust inhibitive coating.

.4 Drywall furring channels: 1.37 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.5 Deflection systems:

.1 Single track: consisting of 50 mm deep leg ceiling track, 38 mm x 1.6 mm thick U-channel, and 38 x 38 mm x 1. 6 mm thick U-channel support clips. U channel installed continuous through top knock-out service hole, maximum 300 mm from top track, with support clip at each stud location.

2.2 PANEL MATERIALS

.1 Interior Gypsum Board: to ASTM C 1396/C 1396M, standard and Type X, thickness 16 mm unless otherwise indicated, 1200 mm wide x maximum practical length, ends square cut, long edges beveled.

2.3 SHAFTWALL ASSEMBLIES

.1 General:

.1 Fire-resistance rating: as indicated.

.2 Meet or exceed requirements of applicable ULC or WHC design.

.2 Framing: Manufacturer's standard profile for repetitive members, corner and end members, and fire-resistance-rated assembly indicated.

.1 Depth: indicated.

.2 Minimum Base-Metal Thickness: 0.455 mm.

.3 Runner Tracks: Manufacturer's standard J-profile track with manufacturer's standard long-leg length, but at least 50 mm long and matching studs in depth.

.1 Minimum Base-Metal Thickness: Matching steel studs.

.4 Firestop Tracks: Provide firestop track at head of shaft wall on each floor level as required, or as recommended by shaftwall assembly manufacturer.

.1 Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire-resistance-rated assembly indicated.

.2 Thickness not less than indicated for studs and in width to accommodate depth of studs.

.5 Unfinished side: Gypsum Shaftliner Board, Type X to ASTM C 1396/C 1396M; manufacturer's proprietary fire-resistive liner panels with paper faces, 25 mm thick.

.6 Finished side: Interior gypsum board, Type X, thickness indicated, number of layers indicated.

.7 Track Fasteners: Power-driven fasteners of size and material required to withstand loading conditions imposed on shaft wall assemblies without exceeding allowable design stress of track, fasteners, or structural substrates in which anchors are embedded.

2.4 SUSPENSION SYSTEMS

.1 Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 1.59 mm diameter wire, or double strand of 1.21 mm diameter wire.

.2 Hanger Attachments to Concrete:

.1 Anchors: Fabricated from corrosion-resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E 488 by an independent testing agency.

.1 Type: Post-installed, chemical anchor.

.3 Wire Hangers: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 4.12 mm in diameter.

.4 Flat Hangers: Steel sheet, minimum 25 by 5 mm by length required.

.5 Carrying Channels: Cold-rolled, commercial-steel sheet with a base-metal thickness of 1.37 mm and minimum 13 mm wide flanges.

.6 Furring Channels (Furring Members):

.1 Cold-Rolled Channels: 1.37 mm uncoated-steel thickness, with minimum 13 mm wide flanges, 19 mm deep.

.2 Steel Studs: to ASTM C645.

2.5 ACCESSORIES

.1 Steel drill screws: to ASTM C1002.

.2 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, zinc-coated by hot-dip process, 0.455 mm base thickness, laminated to paper tape, one piece length per location.

.3 Sheet metal backing: 1.0 mm thick cold rolled steel, hot dipped galvanized.

.4 Laminating Adhesive: Adhesive recommended for directly adhering gypsum panels to continuous substrate, asbestos free.

.5 Joint compound: to ASTM C475, asbestos-free.

.6 Joint Tape:

.1 Interior Gypsum Board: Paper, except where fibreglass mesh tape is indicated.

.7 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.

.8 Sealants: in accordance with Section 07 92 00 - Joint Sealants.

Part 3 Execution

3.1 ERECTION - FRAMING

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum. Screw fasten to concrete or steel structure.

.2 Install dampproof course under stud shoe tracks of partitions on slabs on grade.

.3 Place studs vertically at 400 mm oc unless indicated otherwise, and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs at 1200 mm oc as required to provide rigid installation to manufacturer's instructions.

.4 Erect metal studding to tolerance of 1:1000.

.5 Attach studs to bottom track only for walls extending to underside of structure using screws. Attach studs to bottom and ceiling track for walls not extending to underside of structure.

.6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.

.8 Provide two studs extending from floor to ceiling at each side of door openings and openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips.

.9 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.10 Provide backing, blocking, or 38 mm stud or furring channel secured between studs for attachment of, but not limited to, the following items attached to steel stud partitions. Type of backing or blocking to suit weight of wall mounted item.

- .1 Stair handrails.
- .2 Wall mounted door stops.
- .3 Wall and ceiling mounted speakers

.11 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.12 Extend partitions to underside of structure, except where noted otherwise on drawings.

.13 Maintain clearance under beams and structural elements occurring above steel stud partitions to avoid transmission of structural loads to studs.

.14 Install deflection system at interior partitions.

.15 Install continuous insulating strips to isolate studs from uninsulated surfaces.

.16 Frame openings and around built-in equipment, cabinets, access panels, and other equipment or accessories, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.

.17 Frame perimeter of openings for access panels, light fixtures, diffusers, and grilles with furring channels.

.18 Install wall furring for gypsum board wall finishes in accordance with ASTM C840, except where specified otherwise.

.19 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

.20 Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.

.21 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

3.2 INSTALLATION - GYPSUM BOARD, GENERAL

.1 Do application and finishing of gypsum board in accordance with ASTM C840 except where specified otherwise.

.2 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

.3 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.4 Install work level to tolerance of 1:1200.

.5 Extend gypsum board to underside of structure except where indicated otherwise. Allow for 25 mm deflection.

3.3 APPLICATION

.1 Do not apply gypsum board until bucks, anchors, blocking, sound attenuation, electrical and mechanical work is approved.

.2 Apply single and multi-layer gypsum board to metal furring or framing using screw fasteners for both layers in multi-layer applications, unless specified otherwise. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.

.1 Exception: Apply gypsum board on fire rated and sound rated partitions prior to application of gypsum board on ceilings.

.2 Apply gypsum board vertically or horizontally on walls, unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.

.1 Stagger abutting end joints not less than one framing member in alternate courses of panels.

.2 At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.

.3 On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

.4 Fastening Methods: Apply gypsum panels to supports with steel drill screws.

.5 Comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fasteners have been installed.

.2 Multi-Layer Application:

.1 On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 400 mm minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.

.2 On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.

.3 On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

.4 Fastening Methods: Fasten base layers and face layers separately to supports with screws, except where laminating adhesive is indicated.

.5 Comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set or fasteners have been installed.

.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.

3.4 INSTALLATION - SHAFTWALL ASSEMBLIES

.1 General: Install gypsum board shaft wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and ASTM C 754 other than stud-spacing requirements.

.2 Do not bridge building expansion joints with shaft wall assemblies; frame both sides of expansion joints with furring and other support.

.3 Install supplementary framing in gypsum board shaft wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment, services, heavy trim, furnishings, wall-mounted door stops, and similar items that cannot be supported directly by shaft wall assembly framing.

.1 Reinforcing: Where handrails directly attach to gypsum board shaft wall assemblies, provide galvanized steel reinforcing strip, accurately positioned and secured behind at least one layer of face panel.

.4 Penetrations: At penetrations in shaft wall, maintain fire-resistance rating of shaft wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, and similar items.

.5 Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.

.6 Firestop Tracks: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.

.7 Control Joints: Install control joints according to ASTM C 840 and in locations approved by Departmental Representative while maintaining fire-resistance rating of gypsum board shaft wall assemblies.

.8 Installation Tolerance: Install each framing member so fastening surfaces vary not more than 3 mm from the plane formed by faces of adjacent framing.

3.5 INSTALLATION - ACCESSORIES

.1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure with joint compound for full length.

.2 Install casing beads around perimeter of suspended ceilings.

.3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

.4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

.5 Install mouldings and trim where indicated.

.6 Control Joints:

- .1 Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.
- .2 Provide continuous polyethylene dust barrier behind and across control joints.
- .3 Locate control joints at changes in substrate construction, at approximate 10 m spacing on walls, at approximate 15 m spacing on ceilings, and where indicated.
- .4 Install control joints straight and true.

.7 Expansion Joints:

- .1 Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.
- .2 Install expansion joint straight and true.
- .3 Splice corners and intersections together and secure to each member with 3 screws.

.8 Install access doors to electrical and mechanical fixtures specified in respective sections.

- .1 Rigidly secure frames to furring or framing systems.

.9 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.

3.6 GYSPUM BOARD FINISHING

.1 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.

.2 Where a fire resistance rating is required for the gypsum board assembly, details of construction and finishing shall be in accordance with reports of fire test assemblies that have met the fire-rating requirement, regardless of finish level specified below.

.3 Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

.4 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 Level 0 - No finishing

.1 No taping, finishing or accessories required.

.2 Location: temporary construction, behind solid paneling where fire or smoke seal is not required.

.2 Level 1 - One coat application

.1 Joints and interior angles: tape embedded in joint compound. Surface free of excess joint compound. Tool marks and ridges are acceptable.

.2 Location: gypsum board above ceilings, and interior side of exterior walls above finished ceilings.

.3 Level 4 - Three coat application

.1 Joints and interior angles: tape embedded in joint compound and three separate coats of joint compound applied over joints, angles, fastener heads, and accessories. Joint compound shall be smooth and free of tool marks and ridges.

.2 Location: where gypsum board is to be painted, except as noted below.

.4 Level 5 - Three coat application plus skim coat

.1 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.

.2 Location: in public areas, and where gypsum board is to be painted with gloss, semi gloss, enamel or non-textured flat paints.

.5 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.

.6 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

.7 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

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

.9 Mix joint compound slightly thinner than for joint taping.

.10 Apply thin coat to entire surface using trowel or drywall broadknife to fill surface texture differences, variations or tool marks.

.11 Allow skim coat to dry completely.

.12 Remove ridges by light sanding or wiping with damp cloth.

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

3.7 SCHEDULES

.1 Construct fire rated assemblies where indicated, and to ULC Design number as noted on Drawings.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 51 29 - Metal Stairs and Ladders

.2 Section 06 40 00 - Architectural Woodwork

.3 Section 09 21 16 - Gypsum Board Assemblies

1.2 REFERENCES

.1 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33

.2 Environmental Protection Agency (EPA)

.1 EPA Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 - 1995, (for Surface Coatings)

.3 Green Seal

.1 GC-03, Anti-Corrosive Paints, Second Edition (January 7, 1997)

.2 GS-11, Paints, First Edition (May 20, 1993)

.4 Master Painters Institute (MPI)

.1 MPI Architectural Painting Specifications Manual.

.5 National Fire Code of Canada

.6 Society for Protective Coatings (SSPC)

.1 Systems and Specifications, SSPC Painting Manual

.7 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113, Architectural Coatings. Rules in affect January 1, 2004

.8 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 QUALITY ASSURANCE

.1 Qualifications:

.1 Conform to latest MPI requirements for interior painting work including preparation and priming.

1.4 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Action Submittals:

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit product data for the use and application of paint thinner.

.2 Samples:

.1 Submit full range colour sample chips to indicate where colour availability is restricted.

.2 Submit three drawdowns of each product and colour combination. Drawdowns shall be applied using 4 mil WFT drawdown bar on Leneta form WD plain white coated cards size 100 x 150 mm, mounted on 216 x 280 mm sheets.

.3 When approved, sample panels shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.4 Label each card with the following:

.1 Job name.

.2 Date.

.3 Product name.

.4 Product number.

.5 Colour number as stated in the colour schedule.

.6 Name, address, and phone number of the supplying facility.

.5 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.

.3 Informational Submittals:

.1 Test reports: submit certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.

.1 Lead, cadmium and chromium: presence of and amounts.

.2 Mercury: presence of and amounts.

.3 Organochlorines and PCBs: presence of and amounts.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation and application instructions.

.4 Submit Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS). Indicate VOCs during application and curing.

1.5 CLOSEOUT SUBMITTALS

.1 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

.4 MPI Environmentally Friendly classification system rating.

1.6 MAINTENANCE

.1 Extra Materials:

.1 Deliver to extra materials from same production run as products installed. Package products with protective covering and identify with descriptive labels. Comply with Section 01 78 00 - Closeout Submittals.

.2 Quantity: provide one four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

.3 Delivery, storage and protection: comply with Departmental Representative requirements for delivery and storage of extra materials.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.

.2 Acceptance at Site:

.1 Identify products and materials with labels indicating:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Storage and Protection:

.1 Provide and maintain dry, temperature controlled, secure storage.

.2 Store materials and supplies away from heat generating devices.

.3 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.

.7 Remove paint materials from storage only in quantities required for same day use.

.8 Fire Safety Requirements:

.1 Provide one 9 kg fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

.9 Waste management and disposal requirements: Refer to Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

1.8 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.

.2 Provide continuous ventilation for seven days after completion of application of paint.

.3 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.

.4 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless pre-approved written approval by Departmental Representative, paint inspection agency authority, and product manufacturer, perform no painting when:

.1 Ambient air and substrate temperatures are below 10 degrees C.

.2 Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.

.4 The relative humidity is above 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.

.5 Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.

.2 Perform painting work when maximum moisture content of the substrate is below:

.1 15% for wood.

.2 12% for gypsum board.

.3 12% for concrete and CMU. Allow new concrete and masonry to cure minimum 28 days.

.3 Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.4 Additional interior application requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

Part 2 Products

2.1 SUSTAINABILITY REQUIREMENTS

.1 Primers, paints, sealers, coatings and wood finishes: VOC quantities lower than limits stated in Green Seal's Standards GC-03 and GS-11 and SCAQMD Rule #1113. Maximum VOC content per Section 01 81 13 - LEED Product Requirements.

2.2 MATERIALS

.1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Grade: MPI Premium Grade coating systems.

.3 Provide paint materials for paint systems from single manufacturer.

.4 Conform to latest MPI requirements for interior painting work including preparation and priming.

.5 Paints and finishing materials: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required.

2.3 COLOURS

.1 Departmental Representative will provide Colour Schedule after Contract award.

.1 Allow for 20% of colours to be medium or deep tone.

.2 Allow for typically no more than two colours per room.

.2 Where specific products are available in restricted range of colours, selection based on limited range.

.3 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.4 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Departmental Representative for tinting of painting materials.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.

.4 Thin paint for spraying in accordance with paint manufacturer's instructions.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.5 GLOSS/SHEEN RATINGS

.1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level G1 - Matte Finish (flat)	Max. 5	Max. 10
Gloss Level G2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level G3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level G4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level G5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level G6 - Traditional Gloss	70 to 85	
Gloss Level G7 - High Gloss Finish	More than 85	

.2 Gloss level ratings of painted surfaces as indicated.

2.6 INTERIOR PAINTING SYSTEMS

.1 Concrete vertical surfaces:

.1 INT 3.1C - High Performance Architectural Latex, G5 finish.

.2 Concrete horizontal surfaces: Concrete floors to be finished with site installed carpet tile:

.1 INT 3.2G - Waterborne Concrete Floor Sealer.

.3 Concrete horizontal surfaces: exposed concrete floors (Finish FL_), and depression under entrance floor grilles:

.1 INT 3.1G - Epoxy-Modified Latex: three coats, G5 finish, MPI #215.

.4 Concrete masonry units (CMU): smooth face block:

.1 INT 4.2D - High Performance Architectural Latex, G5 finish: all areas except as otherwise indicated.

.5 Structural steel and metal fabrications: not limited to columns, beams, joists, stair stringers, and balustrades:

.1 INT 5.1RR - High Performance Architectural Latex (over anti-corrosive metal primer), G5 finish.

.6 Galvanized metal: not limited to doors, frames, railings (high traffic) scheduled for paint finish.

.1 INT 5.3M – High Performance Architectural Latex (over water-borne galvanized primer), G5 finish.

.7 Galvanized metal: not limited to pipes, overhead decking, and ducts (low traffic).

.1 INT 5.3H - Waterborne Dry Fall Finish.

.8 Dressed lumber: including but not limited to solid wood doors, casings, mouldings:

.1 Shop-primed and finished as specified in Section 06 40 00 – Architectural Woodwork.

.9 Dressed lumber: including but not limited to composite wood doors, casings, mouldings:

.1 Shop-primed and finished as specified in Section 06 40 00 – Architectural Woodwork.

.2 Shop-primed and site finished MDF panels above door portals: paint out to match colour and sheen of adjacent wall finishes.

.10 Wood paneling and casework:

.1 INT 6.4E – Polyurethane Varnish (over stain), G4 finish.

.11 Electrical and telecom backboards:

.1 INT 6.4S – High Performance Architectural Latex, G5 finish.

.12 Gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:

.1 INT 9.2B - High Performance Architectural Latex.

.1 Typical Walls: G3 finish.

.2 Typical Ceilings: G2 finish.

.3 Wet and Service Areas: G5 finish.

.13 Bituminous coated surfaces: cast iron pipe, concrete, etc.:

.1 INT 10.2A - Latex, G5 finish.

2.7 SOURCE QUALITY CONTROL

.1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846.

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846.

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

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

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:

.1 Stucco, plaster and gypsum board: 12%.

.2 Concrete: 12%.

.3 Concrete Block: 12%.

.4 Wood: 15%.

3.4 PREPARATION

.1 Protection:

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.2 Surface Preparation:

.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to

undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.

.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.

.3 Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly.

.5 Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.

.6 Use trigger operated spray nozzles for water hoses.

.7 Minimize use of mineral spirits or organic solvents to clean up water-based paints.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.5 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.

.1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.

.2 Apply wood filler to nail holes and cracks.

.3 Tint filler to match stains for stained woodwork.

.6 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.

.1 Galvanized steel at wet areas: to SSPC-SP7 – sweep blast.

.2 Unpassivated zinc-coated metal: apply cold phosphate surface treatment to SSPC-PT2.

.3 Passivated zinc-coated metal (white rusted): power wire brush to scuff galvanizing thoroughly, and solvent clean to SSPC-SP1.

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

.8 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

3.5 APPLICATION

.1 Method of application to be as approved by Departmental Representative.

.1 Apply paint by brush, except apply paint on wall and ceiling surfaces by roller or spray application.

.2 Apply varnish and lacquer by brush.

.3 Apply stain by wiping.

.4 Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in uniform layer using brush and/or roller type suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of 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.

.5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.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.

.11 Reseal cut edges of wood doors, and seal unfinished tops and bottoms of wood doors with three coats of polyurethane sealer.

.12 Paint wall surfaces behind convectors before installation of convector covers. Touch up walls after covers are installed.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Paint primed mechanical and electrical items with two coats of paint to match adjacent wall or ceiling surface, unless otherwise indicated or directed, including but not necessarily limited to the following items:

- .1 Convectors
- .2 Conduit and raceways, fittings, pull boxes
- .3 Diffusers
- .4 Ductwork
- .5 Grilles
- .6 Hangers
- .7 Heaters
- .8 Fire hose cabinets
- .9 Fire extinguisher cabinets
- .10 Stacks
- .11 Vents
- .12 Insulated and bare pipes

.2 Use heat resistant epoxy paint on surfaces where operating surface temperature exceeds 65 deg C.

.3 Factory painted finishes: Touch up scratches and marks with paint as supplied by manufacturer of equipment.

.4 Do not paint over nameplates.

.5 Keep sprinkler heads free of paint.

.6 Paint inside of ductwork, and trenches where visible behind grilles, louvers, registers and diffusers with primer and one coat of matte white or black paint, as directed by Departmental Representative.

.7 Paint inside surfaces of light coves white, unless otherwise indicated.

.8 Prime and paint air diffusers with two coats of same paint colour and sheen as ducts or ceiling, as directed by Departmental Representative.

.9 Coordinate painting of pipes and coverings before identification banding is installed.

.10 Paint fire protection piping in mechanical rooms colour as specified in Division 21, or as directed by Departmental Representative.

.11 Paint disconnect switches for fire alarm system and exit light systems in red enamel.

.12 Paint natural gas piping colour as specified in Division 22, or as directed by Departmental Representative.

.13 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.

.14 Do not paint interior transformers and substation equipment.

3.7 SITE TOLERANCES

.1 Standard of Acceptance:

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 FIELD QUALITY CONTROL

.1 Interior painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and local Painting Contractor's Association. Painting contractor shall notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.

.2 Interior surfaces requiring painting shall be inspected by Paint Inspection Agency who shall notify Departmental Representative and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.

.3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non-MPI listed products or systems are to be used, paint or coating manufacturer shall provide as part of this 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.

.4 Field inspection of painting operations to be carried out be independent inspection firm as designated by Departmental Representative.

.5 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.6 Cooperate with inspection firm and provide access to areas of work.

.7 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Departmental Representative.

3.9 CLEANING

.1 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

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 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 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