

1 GENERAL

1.1 Summary

- .1 Provide steel stud wall framing at interior locations.
- .2 Provide framing accessories and acoustic sealants for a complete installation.
- .3 For load bearing studs in exterior walls refer to Section 05120 Structural Steel Framing.
- .4 Comply with applicable LEED® requirements as outlined in Section 01015 LEED® Certification – Low Emitting Materials – Emission Limits Tables.

1.2 Related Sections

- .1 05120 Structural Steel Framing.
- .2 06100 Rough Carpentry.
- .3 07210 Building Insulation.
- .4 07270 Firestopping and Smoke Seals.
- .5 09250 Gypsum Board Assemblies.
- .6 Division 15 Mechanical.
- .7 Division 16 Electrical.

1.3 References

- .1 ASTM A568/A568M-06 Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
- .2 ASTM A653/A653M-05a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM A780-01, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
- .4 ASTM A1011/A1011M-05a, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
- .5 ASTM C645-04a Standard Specification for Nonstructural Steel Framing Members.
- .6 ASTM C754-04, Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- .7 ASTM C834-05, Standard Specification for Latex Sealants.

- .8 ASTM C1002-04, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
- .9 ASTM E119-05a, Standard Test Methods for Fire Tests of Building Construction and Materials.
- .10 ICBO Evaluation Services, Inc - Acceptance Criteria for Steel Studs and Joists, Approved October 2004, Effective Nov. 2004, Subject No. AC46.
- .11 B.C. Association of Wall and Ceiling Contractors (AWCC).
- .12 LEED® Canada-NC Green Building Rating System (Version 1.0).

1.4 System Description

- .1 System: Interior metal stud framing systems, plenums, furred ceilings, and soffits used in conjunction with sound insulation, and gypsum board systems.
- .2 Maximum Allowable Deflection: Design and size components for 1/120th deflection at 5 psf loading as indicated on Structural Drawings.
- .3 Accommodate construction tolerances, deflection of building structural members, and clearance of intended openings.

1.5 Submittals

- .1 Submit in accordance with the following Sections:
 - .1 01300 Submittal Procedures.
 - .2 011015 R002 Green Building Products Information Submittal Form.
- .2 Product Data:
 - .1 Manufacturer's published literature including each type of metal stud framing system and accessory. Show compliance with Specifications. Include installation instructions and procedures requiring special attention.
 - .2 Manufacturer's specifications and data needed to prove compliance with specified LEED® requirements.
- .3 Shop Drawings: Indicate details required for proper installation including gauges, typical cross sections, connections, anchorage to structure, fasteners, lateral bracing and components not indicated by Product Data submittal. Coordinate submittal with Division 15 Mechanical and Division 16 Electrical.
- .4 Fire and Sound tested assemblies demonstrating equivalency with ULC and WH test indicated.

1.6 Quality Assurance

- .1 Work of this Section subject to review by Consultant and Owner's Acoustical Consultant.
- .2 Work of this section shall conform to the Association of Wall and Ceiling Contractors (AWCC) Standards Manual.

- .3 Manufacturer Qualifications: Company specializing in work of this section, with minimum five (5) years documented experience.
- .4 Installer Qualifications: Company specializing in work of this section, with minimum three (3) years documented experience in commercial quality work of comparable scope.
- .5 Regulatory Requirements:
 - .1 Comply with local and provincial codes, ordinances, and other regulatory requirements.
 - .2 Comply with applicable ULC or WH tested design for fire-resistive assemblies.
- .6 Coordination:
 - .1 Coordinate installation of backing, blocking and bearing plates for casework, equipment, bathroom accessories, pocket doors, specialties, utilities, and other items required by other Sections, including Division 15 Mechanical and Division 16 Electrical.
 - .2 Coordinate work of this Section with Section 07270 Firestopping and Smoke Seals for firestopping installations prior to installation of gypsum board systems.

1.7 Delivery, Storage and Handling

- .1 Deliver in unopened containers or bundles, clearly labeled with manufacturer's name, brand, type, and grade. Verify undamaged conditions.
- .2 Protect steel studs, carrying and furring channels, lath and accessories from dampness and damage. Store under cover, off floor, on wood supports or pallets in dry well-ventilated space to protect from rusting and damage.

2 PRODUCTS

2.1 Materials

- .1 General: Metal Source: Post-consumer recycled content: Minimum 80%.
- .2 Provide products that are installed and can be maintained to ensure reusability. Aluminum products are to be 100% recyclable by manufacturer.
- .3 Comply with Contract Documents, References, Codes, and manufacturer's instructions. Where in conflict, follow more stringent requirements.
- .4 Non-Load Bearing - Light Gauge Framing Members: ASTM C645, formed from steel meeting requirements of ASTM A568, Grade 33, galvanized ASTM A525, G 40.
- .5 Steel Studs: 25 gauge minimum, 1-1/4 inch flanges, with 90 degree angle return leg 8mm (5/16 in.) long, punched webs (for mounting electrical conduit).
- .6 Runners: 25 gauge, 32mm (1-1/4 in.) flange minimum, faces knurled, except as otherwise indicated for top runners.

- .7 Reinforcement for Metal Stud Framing Faced with Wall Board on One Side Only: 16 ga. minimum, 19mm (3/4 in.) cold rolled channel, weighing 300 pounds per 1000 lineal feet, or 38mm (1-1/2 in.) cold rolled channel, weighing 475 pounds per 1000 lineal feet.

2.2 Deflection Tracks

- .1 At the top of full height steel stud framing provide allowance for overhead deflection as indicated on Structural Drawings and Specifications by using one of the following practices.
 - .1 Double track deflection system
 - .1 Utilize a continuous top 20 ga. deflection track and a second track nested into the outside track without attachment to it. The track-inside-a-track allows the stud at the top of the wall to be attached to the inside track to provide more uniform load transfer to the outside deflection track flange and to stabilize the studs against rotation.
 - .2 Each stud flange is to be stabilized to resist rotation of the stud by attaching the stud flange to the leg of the nested, inside, track.
 - .3 The inside track has sufficient stiffness to provide a uniform distribution of load to the outside deflection track.

2.3 Shaft Wall Systems

- .1 ULC rated assemblies to meet ratings as noted on drawings in accordance with ULC requirements.
- .2 Utilize all manufacturer recommended framing, liners and finish to achieve required rating.

2.4 Furring Channels

- .1 Furring: 25 ga. light gauge steel furring member for screw attachment of gypsum wallboard. Refer to sizes as noted on drawings.
- .2 Roll formed or break shape hot dipped galvanized steel having a G60 for exterior use, wiped coat zinc coating at ASTM A525 for interior application.

2.5 Accessories

- .1 Acoustic Gasket or Tape: Self-adhesive foam tape 6mm x 25mm (1/4 in. x 1 in.) closed cell neoprene and/or polyvinyl chloride.
- .2 Acoustic Sealant: Refer to Section 07920 Sealants.
- .3 Anchorage Devices: Powder activated fasteners as required to transfer design loads. fastener and charge from manufacturer's standard range to suit structural conditions, and fixing requirements and in accordance with manufacturer's recommendations. Ramset, Hilti or approved equivalent.
- .4 Fasteners: ASTM C1002, self-drilling, self-tapping framing screws, designed for gauge of framing.

- .5 Screws: Lengths as required to suit applications, self tapping corrosion resistant drywall screws.
- .6 Sheet Metal Backing Channel: Minimum 25 ga., 150mm (6 in.) wide with 38mm (1-1/2 in.) legs, notched and continuous between studs designed for wall supported items.

3 EXECUTION

3.1 Examination

- .1 Examine areas to receive non structural metal framing with Installer present.
- .2 Correct unsatisfactory conditions.
- .3 Start of work indicates acceptance of conditions as suitable for a satisfactory installation.

3.2 Preparation

- .1 Meet at project site with the installers of related work including for hollow metal frames, mechanical, and electrical work. Review areas of potential interference and conflicts. Coordinate layout and make provisions for interfacing work.
- .2 Protect installed finish work of other trades and surfaces to preclude damage from work of this Section.

3.3 Installation

- .1 Erect work in accordance with Contract Documents, References, Codes, and Manufacturer's instructions. Where in conflict, follow more stringent requirements.
- .2 Comply with ASTM C754 for installation of metal studs to receive gypsum board and other drywall systems.
- .3 Determine partition type and location from drawings, stud spacing, gauge, sizes of built-ins for rough openings, access panels locations and sizes. Erect in accordance with ASTM C 1007, manufacturer's written directions, and using mechanics skilled in this trade. Provide plumb, level, and true wall surfaces.
 - .1 Cut framing members by sawing or shearing. Do not torch cut.
 - .2 Fasten metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.
 - .3 Install framing members in one-piece lengths.
 - .4 Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed.
 - .5 Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
 - .6 Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

- .4 Erection Tolerances: Install framing level, plumb, and true to line to a maximum allowable tolerance variation of 1:960 (1/8 inch in 10 ft.) and as follows:
 - .1 Isolation of Stud Systems from Structure:
 - .1 At exterior concrete or concrete block walls, maintain 12mm (1/2 in.) gap between steel and exterior wall. Use polystyrene blocks glued to studs to maintain spacing top and bottom of framing.
 - .2 Where stud systems abut horizontal structural elements and underside of metal decking, install a deflection track system to prevent transfer of structural loads or movement to stud systems.
 - .3 Install deflection track at top of wall where required to accommodate minimum 25mm (1 in.) and maximum 38mm (1-1/2 in.) vertical deflection. Do not fasten together. Stagger joints.
 - .4 Provide continuous acoustic gasket between deflection track and concrete slab.
 - .5 Layout and align with bottom runners for plumb wall framing.
- .5 Runner Tracks:
 - .1 Install runner tracks at top and bottom, except where deflection tracks are indicated.
 - .2 Layout and align tracks accurately at base and top of studs to ensure plumb partitions.
 - .3 Secure with approved fastening method 50mm (2 in.) from each end not over 600mm (2 ft.) o.c. maximum.
 - .4 Size to match studs.
 - .5 Provide fasteners at corners and ends of tracks.
 - .6 Butt runner tracks at partition corners and intersections, except leave clearance where base course of gypsum board is to run through.
- .6 Studs:
 - .1 Except as otherwise detailed, comply with following:
 - .1 Erect studs to specified centers but not over 600mm (2 ft.) o.c., except install additional studs as detailed or required at partition intersections, corners or openings.
 - .2 Place studs against walls of dissimilar materials and secure in place with anchors or fasteners 900mm (3 ft.) o.c. maximum.
 - .3 In areas of possible water penetration place asphalt felt strip between runners, studs and adjacent surface.

- .4 Install runner tracks screwed through each stud flange or approved clinch fastener to attach studs at openings, partition intersections, corners, and where partitions support fixtures or casework.
 - .5 Provide continuous acoustic gasket between any stud and exterior concrete or concrete block wall.
- .7 Sound Retardant Partitions:
- .1 Install floor and ceiling track seated on two continuous strips of foamed tape. Lap tape at joints to ensure continuity. Fasten securely to concrete at maximum 600mm (2 ft.) o.c. using approved concrete fasteners.
 - .2 Where stud framing abuts concrete walls, install two continuous strips of foamed tape, lapping tape at joints to ensure continuity, and fasten to abutting walls using approved fasteners.
- .8 Double Stud Framing:
- .1 Install at door, window, and wall openings.
 - .2 Install double steel studs at door and window openings by boxing method, back to back, or nesting to suit pressed steel frame condition and provide the most stable installation.
 - .3 Attach one metal stud to jamb anchors in each side of metal frames with two screws per anchor.
 - .4 Install second stud in contact with the first stud, and attach gypsum board, and other types of base board materials to both studs with screws not over 200mm (8 in.) o.c., forming a column section.
 - .5 Install channel stiffener above door heads. Stiffener to run to closest stud adjacent to boxed jamb studs.
- .9 Shimming and Bracing:
- .1 Shim metal furring to provide true and level surface for application of wallboard.
 - .2 Cross brace chase partitions as recommended by manufacturer or approved by Consultant.
 - .3 Laterally brace metal studs with finish systems on side only or where finish system does not run full height of studs, as recommended by manufacturer, to meet lateral design loads.
- .10 Supplementary Framing and Backing:
- .1 Install continuous steel channel backing, notched between studs. Coordinate with requirements for support of wall mounted items including, shelving, plumbing fixtures, mechanical equipment, and other construction as required for the Work. Include supplementary framing where necessary to accommodate loading.

- .2 Install all backing for electrical, all rough openings for building in washroom accessories, mirrors, vanities, light cover reflectors, and access panels supplied and installed by others, or supplied and installed under this section. Coordinate with Section 06100 Rough Carpentry to provide solid wood backing for washroom accessories. Blocking to be sized and positioned to allow for sufficient installation tolerance of accessories.
- .11 Welding: Conform to provisions of the Standard Code of Welding in Building Construction and to Recommended Practices for Resistance Welding of the American Welding Society, for details of welding, inspection, and qualification of welding operators.

3.4 Installation - Furring

- .1 Install in vertical or horizontal pattern to suit conditions, centre at 600mm (2 ft.) or 400mm (16 in.) as required, or detailed to provide solid backing for applications of gypsum board, backer board or plywood backing board.
- .2 Fastening to substrates or structure to be by approved powder-activated or drill-in type fasteners satisfying AWCC requirements and recommendations of that manufacturer.
- .3 Install all backing for electrical, washroom accessories, mirrors, and build in chases and openings for access doors and built-ins installed under this section or supplied and installed by others.

3.5 Shaft Wall Systems

- .1 Install shaftwall assemblies in accordance with ULC or applicable manufacturer's instructions.

3.6 Repairs

- .1 Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed cold-formed metal framing with galvanized repair paint according to ASTM A780 and manufacturer's written instructions.

3.7 Cleaning

- .1 Promptly as work proceeds and at completion, clean up and remove from premises all rubbish and surplus materials resulting from work of this section.

END OF SECTION

1 GENERAL

1.1 Summary

- .1 Provide gypsum board assemblies with accessories for a complete installation as indicated and specified.
- .2 Provide tile backerboard, and exterior gypsum sheathing.
- .3 Provide finishing of gypsum board assemblies, including taping, filling, and sanding.
- .4 Provide plaster finish to exposed concrete ceiling as indicated, scheduled, and specified.
- .5 Comply with applicable LEED® requirements for allowable VOC levels for site applied adhesives, sealants, and coatings. Refer to Section 01015 LEED® Certification – Low Emitting Materials – Emission Limits Tables.
- .6 Prior to ordering products, make submittals using Section 01015 R002 Green Building Product Information Submittal Forms to ensure recycled content and local fabrication of products are maximized.
- .7 Refer to Section 05120 Structural Steel Framing for load bearing steel stud systems.

1.2 Related Sections

- .1 05120 Structural Steel Framing.
- .2 06100 Rough Carpentry.
- .3 07210 Building Insulation.
- .4 07270 Firestopping and Smoke Seals.
- .5 07920 Sealants.
- .6 09910 Non-Structural Metal Framing.
- .7 09900 Painting.

1.3 References

- .1 Work of this section shall conform to the Association of Wall & Ceiling Contractors of British Columbia (AWCC) Specifications Standard Manual.
- .2 ASTM C36/C36M-03e1, Standard Specification for Gypsum Board Assemblies.
- .3 ASTM C475/C475M-02, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- .4 ASTM C630/C630M-03, Standard Specification for Water-Resistant Gypsum Backing Board.
- .5 ASTM C840-04a, Standard Specification for Application and Finishing of Gypsum Board.

- .6 ASTM C931/C931M-04e1, Standard Specification for Exterior Gypsum Soffit Board.
- .7 ASTM E497-99, Standard Practice for Installing Sound-Isolating Lightweight Partitions.
- .8 CAN/CSA A82.27-M91, Gypsum Board Products.
- .9 CGSB 19-GP-21, Sealing and Bedding Compound for Acoustical Purposes.
- .10 LEED® Canada-NC Green Building Rating System (Version 1.0).
- .11 Underwriter Laboratories of Canada.

1.4 System Description

- .1 General: Provide assemblies complying with performance requirements specified, as demonstrated by pre-testing manufacturer's corresponding stock systems.
- .2 Fire-Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ULC by a testing and inspecting organization acceptable to authorities having jurisdiction.

1.5 Performance Requirements

- .1 Structural Performance Characteristics: Provide assemblies engineered to withstand the following lateral design loadings (air pressures), applied transiently and cyclically, for maximum heights of partitions required, within the following deflection limits, verified by pre-testing for deflection characteristics.
 - .1 Lateral loading of 5 psf.
 - .2 Wall Deflection Limit:
 - .1 Gypsum Board Partition Assemblies: L/240 of partition height.
 - .2 Gypsum Board Partition Assemblies with Tile Finish: L/360 of partition height.

1.6 Submittals

- .1 Submit in accordance with the following sections:
 - .1 01300 Submittals.
 - .2 01015 R002 Green Building Product Information Submittal Forms.
- .2 Product Data:
 - .1 Submit for Action. Describe the properties of items to be used in the Work.
 - .2 Provide information requested in Section 01015 LEED® Certification and Section 01300 Submittals.
 - .3 Indicate percentage of recycled content for each product specified.

- .3 Shop drawings:
 - .1 Submit for Action. Show fabrication and installation of Work. Include:
 - .1 Location of control and expansion joints.
 - .2 Reflected ceiling plans coordinating penetrations and ceiling-mounted items.
 - .3 Ceiling suspension assembly members.
 - 1. Method of attaching unit to building structure.
 - 2. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers and access panels.
 - 3. Soffit framing details

1.7 Quality Assurance

- .1 An installer trained in the use of the materials and equipment to be employed in Work.
- .2 Regulatory Requirements: Comply with applicable requirements of laws, codes, ordinances and regulations of Federal, Provincial and Municipal authorities having jurisdiction. Obtain necessary approvals from such authorities. Single Source Responsibility:
 - .1 Obtain materials from a single manufacturer for each different product required.
 - .1 Tested System: Provide products as required for their tested assemblies.
- .3 Pre-Installation Conference: Convene a pre-installation conference. Installer prior to start of Work. Familiarize installer with conditions at site and related Work.

1.8 Project Conditions

- .1 Environmental Requirements: Proceed with the Work in accordance with manufacturer's requirements and instructions and any agreements or restrictions of the Pre-Construction Conference, including the following.
 - .1 Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C840 and with gypsum board manufacturer's recommendations.
 - .2 Minimum Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 5°C (40°F) For adhesive attachment and finishing of gypsum board maintain not less than 10°C (50°F) for 48 hours prior to application and continuously thereafter until drying is complete.
 - .3 Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

1.9 Delivery, Storage and Handling

- .1 Deliver materials in manufacturer's original packaging with label indicating pertinent identifying information. Store materials in accordance with manufacturer's instructions in protected dry location off ground. Do not open packaging nor remove labels until time of installation.
 - .1 Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.
 - .2 Handle gypsum boards to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.10 Warranty

- .1 Provide manufacturer's written fifteen (15) month warranty as required by Owner.
- .2 Provide installer's written fifteen (15) month warranty as required by Owner.
- .3 Submit warranty in accordance with Section 01700 Project Closeout.

2 PRODUCTS

2.1 Manufacturers

- .1 CertainTeed/Westrock/BPB Canada Inc. www.bpb-na.com.
 - .1 MR 4: 15% recycled content by weight / 80% post industrial recycled content by weight.
 - .2 MR 5: Recycled Content Plant, Tachoma, Washington, USA, gypsum core mined in Invermere, B.C.
- .2 Georgia Pacific: Tile backer and exterior grade gypsum.
- .3 Or approved alternative.

2.2 Materials

- .1 Gypsum Wall Board – General:
 - .1 Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end joints.
- .2 Regular Gypsum Wall Board conforming to ASTM C 1396:
 - .1 Post Industrial Recycled Content: Minimum of 99%.
 - .2 Paper Backing: 90% Post Consumer recycled content minimum.
 - .3 Edges: Tapered and featured for pre-filling.
 - .4 Thickness: 12mm.

- .5 Products:
 - .1 "ProRoc" by BPB Canada Inc.
 - .2 Or approved alternative.
- .6 MR 4: SCS certified 99% recycled content overall.
- .3 Fire-Rated Type-X Gypsum Wall Board conforming to ASTM C 1396:
 - .1 Post Industrial Recycled Content: Minimum of 95%.
 - .2 Edges: Tapered and featured for pre-filling.
 - .3 Thickness: As indicated.
 - .4 Product: "ProRoc" Type X by BPB Canada Inc.
 - .1 MR 4: SCS certified 95% recycled content overall.
- .4 Cement Board - Tub and Shower Locations, Durock cement board: Supply and install to manufacturer's specifications.
 - .1 Post Industrial Recycled Content: Minimum of 95%.
 - .2 Edges: Tapered and featured for pre-filling.
 - .3 Thickness: As indicated.
 - .4 Products:
 - .1 Durock, by CGC.
 - .2 Or approved alternative.
- .5 Abuse-Resistant Gypsum Wall Board, Regular or Type X Conforming to ASTM D1037,
 - .1 Indentation Resistant: 45N.
 - .2 Edges: Tapered and featured for pre-filling.
 - .3 Thickness: As indicated.
 - .4 Products:
 - .1 "ProRoc" Abuse Resistant Gypsum by BPB Canada Inc.
 - .2 DensArmor Plus Paperless Drywall by Georgia Pacific.
 - .3 Or approved alternative.
- .6 Exterior Glass Mat Gypsum Sheathing: ASTM C1177 and CAN/ULC S102 Smoke Spread 0.

- .1 Post Industrial Recycled Content: Minimum of 95%.
- .2 Thickness: 1/2" minimum or as noted on drawings
- .3 Products:
 - .1 "Densglass Gold " by Georgia Pacific, or approved alternative.
 - .2 Or approved alternative.

2.3 Accessories

- .1 Steel Trim Accessories:
 - .1 General: Post Industrial Recycled Content: Minimum of 80%.
 - .1 Trim for interior installation complying with ASTM C 1047.
 - .2 Not less than 26 US gauge.
 - .3 Sheet steel coated with zinc by hot-dip or electrolytic processes.
 - .4 With perforated or expanded metal flanges.
 - .2 Corner and Casing Beads: Stops and corner beads: Square type. Corner and casing beads: Conceal in finished work.
 - .3 Edge Trim: "L" bead, "LC bead", "U" bead.
 - .4 One-Piece Control Joint: Formed with vee-shaped slot per Figure1 in ASTM C 1047, with slot opening covered with removable strip.
 - .5 Manufacturer: Subject to compliance with specifications:
 - .1 National Gypsum Co.
 - .2 United States Gypsum Co.
 - .3 Or approved alternative.
- .2 Joint Treatment Materials:
 - .1 General: Provide materials complying with ASTM C475, ASTM C840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.
 - .2 Joint Tape: Paper reinforcing tape, unless otherwise indicated.
 - .1 "G-P Tape" by Georgia-Pacific Corp.
 - .2 "Tapers Choice" by Gold Bond Building Products Div., National Gypsum Co.
 - .3 "PERF-A-TAPE Reinforcing Tape" by United States Gypsum Co.

- .3 Joint Compounds: Powder-based, job-mixed, joint compound products formulated for uses indicated.
 - .1 LEED® compliant: No-VOC products preferred, Low-VOC products (<2g/l) are acceptable.
 - .2 Manufacturer: Subject to compliance with specifications:
 - 1. Canadian Gypsum Company.
 - 2. BPB Canada Inc.
- .3 Screws: Provide materials complying with ASTM C1002 and gypsum board per manufacturers recommendations.
- .4 Acoustic Caulking: Provide acoustic sealant as specified in Section 07920 Sealants.
- .5 Plaster Finish:
 - .1 Base Coat: Purpose made pre-mixed Portland cement plaster base coat with float or textured finish to Consultant's selection.
 - .2 Top Coat: Purpose made pre-mixed finish coat in accordance with manufacturer's instructions (no colour shall be added to the plaster coat).
- .6 Wood Blocking: 25mm x 50mm (1" x 2") Hem-Fir or Douglas Fir-Larch Construction Grade.

3 EXECUTION

3.1 Examination

- .1 Examine areas to receive gypsum board assemblies with Installer present.
- .2 Correct unsatisfactory conditions.
- .3 Start of work indicates acceptance of conditions as suitable for a satisfactory installation.

3.2 Preparation

- .1 Review framing requirements, wall types, and requirements for fire rated separations and acoustic requirements prior to start of work.
- .2 Install supplementary framing, blocking, and bracing at terminations in work.
- .3 Ensure backing and blocking for fixtures, equipment, heavy trim, grab bars, toilet accessories, furnishings, casework, and similar work has been installed and approved before commencing Work of this Section.
- .4 Ensure plumbing, mechanical, electrical, and insulation and vapour barriers have been installed and approved prior to application of gypsum board assemblies.

- .5 Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of items having integral anchors embedded in concrete or masonry construction.
- .6 Ensure Owner and Consultant have signed off on mechanical and insulation prior to building operation.

3.3 Installation - General

- .1 Install in accordance with AWCC standards, reviewed Shop Drawings, and Code requirements.
- .2 Install systems in accordance with manufacturer's printed instructions.
- .3 Install additional framing, furring, runners, lath and beads, as required to form openings and frames for other work as indicated. Coordinate support system for proper support of framed work which is not indicated to be supported independently of metal furring system.
- .4 Isolation: Where metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate the work from structural movement sufficiently to prevent transfer of loading into the work from the building structure. Install slip or cushion type joints to absorb deflections but maintain lateral support.
 - .1 Frame both sides of control and expansion joints independently, and do not bridge joints with furring and framing or accessories.

3.4 Gypsum Board installation

- .1 Gypsum Board Application and Finishing Standard: Install and finish gypsum board to comply with ASTM C 840.
- .2 Locate either edge or end joints over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.
- .3 Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for a light contact at edges and ends with not more than 1.5 mm open space between boards. Do not force into place.
 - .1 Except where concealed application is indicated or required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. area, and may be limited to not less than 75 percent of full coverage.
 - .2 Fit gypsum board around ducts, pipes, and conduits.
- .4 Attachment:
 - .1 Fasteners: Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.
 - .2 Attach gypsum board to steel studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flange first.

- .3 Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cut-outs.
- .4 Single Layer Construction: Apply face layer to supports with screws.
- .5 Double Layer Construction: Fasten both base layers and face layers separately to supports with screws.
- .6 Triple Layer Construction: Fasten both base layers and face layers separately to supports with screws.
- .5 Ceiling:
 - .1 Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 610 mm in alternate courses of board.
 - .2 Install ceiling boards across framing in the manner which minimizes the number of end-butt joints, and which avoids end joints in the central area of each ceiling. Stagger end joints at least 610 mm inches.
 - .3 Steel Rigid Furring Channels:
 - .1 Single Layer Construction: Apply gypsum board prior to wall/partition board application to the greatest extent possible.
 - .2 Double Layer Construction: Apply base layer prior to application of base layer on walls/partitions; apply face layers in same sequence. Offset joints between layers at least 250 mm. Apply base layers at right angles to supports unless otherwise indicated.
- .6 Walls and Partitions:
 - .1 Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 610 mm in alternate courses of board.
 - .2 Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.
 - .3 Steel Studs:
 - .1 Single Layer Construction: Apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.
 - .2 Double Layer Construction: Apply base layer and face layers vertically (parallel to framing) with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.
 - .3 Triple Layer Construction: Apply base layer and face layers vertically (parallel to framing) with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

- .4 Z-Furring Members:
 - .1 Single Layer Construction: Apply gypsum board vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 - .2 Double Layer Construction: 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.
- .7 Hollow Metal Door Frames: Apply spot grout at each jamb anchor clip just before inserting board into frame.

3.5 Accessories

- .1 Where feasible, use same fasteners to anchor trim accessory flanges as required to fasten gypsum board to supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.
- .2 Corner Bead: Install at external corners.
- .3 Metal Edge Trim: Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed, and except where plastic trim is indicated. Provide "LC" type with face flange to receive joint compound except where "U" bead (semi-finishing type) is indicated.
- .4 Install "L" bead where edge trim can only be installed after gypsum board is installed.
- .5 Install control joints at locations indicated, or if not indicated, at spacings and locations required by referenced gypsum board application and finish standard, and reviewed by the Consultant for visual effect.
- .6 Control and Expansion Joints: Form at locations indicated, or if not indicated, at spacings and locations required by referenced gypsum board application and finish standard, and reviewed by the Consultant for visual effect. Provide for space between edges of boards to receive trim accessories.
 - .1 Where partitions intersect open concrete coffers, cut gypsum board to fit profile of coffers and allow 6 to 13 mm inch wide joint for sealant.
 - .2 Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 6 to 13 mm space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.
 - .3 Seal drywall construction at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim, and close off sound-flanking paths around or through construction, including sealing of partitions above acoustical ceilings.
- .7 Acoustical Sealant: Install in compliance with ASTM C 919 in joints, void, and penetrations of partitions to meet STC ratings indicated on Drawings.

3.6 Finishing

- .1 Finish gypsum board assemblies in accordance with Section 9.6 – Part 3 Item 12.2 of the AWCC Specifications Standards Manual and as follows:
 - .1 Level 1 for areas totally concealed from view in the finished work.
 - .2 Level 4 for balance of surfaces.
- .2 General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads and surface defects. Extent of joint treatment shall include both exposed and concealed work.
- .3 Pre-fill open joints and rounded or bevelled edges, if any, using setting-type joint compound.
- .4 Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.
- .5 Interior: Finish gypsum wallboard by applying the following joint compounds in 3 coats (not including pre-fill of openings in base), and sand between coats and after last coat:
 - .1 Embedding and First Coat: Setting-Type Joint Compound.
 - .2 Fill (Second) Coat: Setting-type joint compound.
 - .3 Finish (Third) Coat: Ready-mix drying-type all-purpose or topping compound.
- .6 Water-Resistant Gypsum Backing Board Base for Ceramic Tile: Comply with ASTM C 840 and manufacturer's recommendations for treatment of joints behind tile.
- .7 Glass Mesh Mortar Units for Ceramic Tile: Finish joints between units with fibreglass tape and joint compound to comply with gypsum board manufacturers and tile bond coat manufacturer. Refer to Section 09300 Tiling.

3.7 Cleaning and Protection

- .1 At end of each work day, recycle or dispose of unused material, debris and containers in accordance with Section 01560 Construction Waste Management.
- .2 Protect the Work so it will not deteriorate or be damaged. Remove protection at time of Substantial Completion.

END OF SECTION

1 GENERAL

1.1 Summary

- .1 Provide ceramic wall and floor tile, with mortar grout, sealers, and accessories for a complete installation.
- .2 Provide waterproof membrane at shower walls and floors and bathtub wall areas.
- .3 Provide stone tile and accessories to elevator floors for a complete installation.
- .4 Provide antifracture membrane where tiles over 200mm x 200mm (8 in. x 8 in.) in size.
- .5 Provide antifracture membrane at residential entries where tile is indicated.
- .6 Refer to Interior Finish Schedules.

1.2 Related Sections

- .1 09250 Gypsum Board Assemblies.
- .2 14210 Electric Traction Elevators.

1.3 References

- .1 ASTM C627-93(1999)e1, Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester.
- .2 ASTM C847-06, Standard Specification for Metal Lath.
- .3 CAN/CGSB 75.1-M88, Tile, Ceramic.
- .4 TTMAC Terrazzo and Tile and Marble Association of Canada, current edition.
- .5 LEED[®] Canada-NC Green Building Rating System (Version 1.0).

1.4 Project Conditions - Indoor Air Quality

- .1 Indoor Air Quality: Use methods and materials that minimize the generation and dispersal of contaminants. Protect adjacent areas from contamination. Provide temporary dust enclosures, barriers, and other means necessary to contain dust and other contaminants at their source.
- .2 Prior to start of work securely seal or install temporary filters to air supply and return ducts to prevent migration of dust and noise through the air system.

1.5 Submittals

- .1 Submit in accordance with the following sections:
 - .1 01300 Submittals.
 - .2 01015 R002 Green Building Product Information Submittal Forms.

- .2 Product Data:
 - .1 Submit the following for each type of product specified.
 - .2 VOC Data: Submit manufacturer's project literature for installation products. Submit MSDSDS highlighting VOC contents and hazardous components.
 - .3 When requested, submit invoice list of all paint materials ordered for project work to Consultant indicating manufacturer, types and quantities for verification and compliance with specification and design requirements.
- .3 Samples: Submit three (3) 200mm x 200mm (8 in. x 8 in.) samples of each type of tile specified.

1.6 Quality Assurance

- .1 Perform Work in accordance with recommendations as set out in the latest applicable edition of the Specification Guide 09 30 00 Tile Installation Manual as prepared by the Terrazzo, Tile and Marble Association of Canada (TTMAC).
- .2 Installer Qualifications: Tile work shall be performed by a Contractor listed with the Ceramic Tile Contractors and Industry Association (CTCIA) employing trained personnel with a minimum of five (5) years of local experience.
- .3 Mock-up:
 - .1 Mock-up one suite of each colour scheme specified using specified sealants and setting materials.
 - .2 Mock-up 10 sq. m (100 sq. ft.) of common area, locations as directed by Consultants.
 - .3 Fabricate mock-ups using materials in related sections. Indicate transitions to other flooring materials which will eventually be installed adjacent to tile.
 - .4 Align grout joints as they will appear in finished work.
 - .5 Do not proceed with balance of work until Consultant's approval is received.
 - .6 Mock-up may remain as part of finished work upon Consultant's approval.

1.7 Maintenance Data

- .1 Maintenance and Operation Manuals: Provide maintenance data for tile and related materials installed for incorporation into maintenance manual and submit in accordance with Section 01700 Project Closeout.

1.8 Environmental Requirements

- .1 Do not install tile or mortar beds when ambient air temperature and substrate temperature is less than 12 deg C (54 deg F) and maintain a substrate temperature level of not less than 10 deg C (50 deg F) or greater than 20 deg C (68 deg F) for a minimum of 24 hours before, during and a minimum of 72 hours after setting and grouting tile.

- .2 After initial set maintain temperature above 5 deg C (41 deg F) for 21 days before exposing tile to traffic.

2 PRODUCTS

2.1 Manufacturers

- .1 Subject to compliance with specifications the following manufacturers are acceptable for the systems listed:

- .1 Waterproof Membranes and Setting Materials:

- .1 Laticrete Systems.
- .2 Schluter Systems.
- .3 Mapei Inc.
- .4 Or approved alternative.

2.2 Ceramic And Porcelain Tile

- .1 Refer to Finish Schedule.
- .2 Tile: To CAN/CGSB-75.1-M88, with Type and Class to suit requirements for application.
- .3 Floor tiles shall be slip-resistant.
- .4 Baseboards shall have a cove base.
- .5 Tile Edge and Transition Trim: Pre-manufactured extruded aluminium mill finish transition trim, of height to suit tile and mortar bed thickness for use at exposed tile edges.
 - .1 Edge and transition trims by Schluter Systems as selected by Consultant.
- .6 Tile Backer Board: As specified in Section 09260 Gypsum Board Assemblies.
- .7 Tile Backer Board Joint Treatment: as recommended by tile backer board manufacturer.

2.3 Setting Materials

- .1 Portland Cement: To CSA A5/A8/A362-98 normal Portland Cement, Type 10, colour grey.
- .2 Sand: To ASTM C144-03, clean, washed, sharp, passing 16 mesh.
- .3 Water: Fresh, clean, potable, free from deleterious matter, acids or alkalis.
- .4 Adhesive: To CGSB 71-GP-22M, Type I (for wet areas); LEED®-compliant with VOCs not exceeding 65 grams per Litre:
 - .1 Ultramastic Eco by Mapei Inc. (VOCs: 61 grams per Litre).

- .5 Anti-fracture membrane: as recommended by tile manufacturer for application indicated.
Acceptable Products:
 - .1 'Ditra' matting by Schluter Systems
 - .2 Blue 92 Anti-fracture Membrane by Laticrete
 - .3 Or approved alternative.
- .6 Waterproof Membranes and Setting Materials:
 - .1 Laticrete Systems.
 - .2 Or approved alternative.
- .7 Thin Set Mortar: Pre-mixed mortar powder with Portland cement, sand.
 - .1 Kerabond mortar by Mapei Inc.
 - .2 LATICRETE 317 Floor N' Wall Thin-Set Mortar
 - .3 Or approved alternative.
- .8 Latex Additive for Mortar: Liquid formulated for use with cement mortar.
 - .1 Keralastic by Mapei Inc.
 - .2 3701 Mortar Admix by Laticrete
 - .3 Or approved alternative.
- .9 Grout for Tile: Coloured, sanded or unsanded as required, self curing, pre-mixed polymer-modified Portland cement grout with non-staining, non-fading mineral oxides unaffected by lime or cement, producing hard, durable, and impervious joints, colour as shown in Finish Schedules. Use Sanded grout for joints from 3mm (1/8 in.) to 19mm (5/8 in.). Unsanded grout for joints from 1.5mm (1/16 in.) to 3mm (1/8 in.). Acceptable Products:
 - .1 Kercolor S (sanded) and Kercolor U (unsanded) by Mapei Inc.
 - .2 Tri-Poly Fortified Sanded Grout (1500 Series) or Tri-Poly Fortified Unsanded Grout (1600 Series) by Laticrete
 - .3 Or approved alternative.
- .10 Sealer - For Floor Tile: 100 percent silicone, stain resistant, as approved by grout manufacturer:
 - .1 'Latasil Tile and Stone Sealant', by Laticrete or approved alternate
 - .2 Locations: as scheduled.

2.4 Mixes

- .1 Use new and uncontaminated materials from same source or manufacturer, uncut, mixed and applied in accordance with manufacturer's written instructions.
- .2 Mix waterproof mortar bed membrane components in accordance with manufacturer's written instructions.

3 EXECUTION

3.1 Examination

- .1 Examine areas to receive tile with Installer present.
- .2 Correct unsatisfactory conditions.
- .3 Start of work indicates acceptance of conditions as suitable for a satisfactory installation.

3.2 Preparation

- .1 Review mock-ups to ensure conformance with standard set.
- .2 Coordinate ceramic tile work with other interfacing trades to ensure timely installation of equipment and backing materials.
- .3 Prepare and prime surfaces as required and as recommended by manufacturers of adhesives and mortars to ensure good permanent bonds.

3.3 Installation - General

- .1 Install tile and settings materials in accordance with TTMAC Installation Manual detail and specification requirements and manufacturer's written recommendations to locations indicated on drawings and/or Finish schedules.
- .2 Layout tile work starting at room's centre line. Layout work so as to avoid tile width of less than half of a whole tile at each edge of the room.
- .3 Install mortar beds, and cement, thin set, and organic adhesive bond coats as noted or where scheduled in accordance with manufacturer's written instructions and TTMAC requirements.
- .4 Align wall and floor tile grout joints where tiles are sized to match.
- .5 Back-butter tiles larger than 200mm (8 in.) and apply tiles symmetrically. Ensure joints in tile are uniform in width, subject to normal tolerances for tile size, 3mm (1/8 in.) wide unless indicated otherwise. Plumb, straight and true with adjacent tile flush and in-line.
- .6 Grout tile joints a minimum of 24 hours (72 hours preferred) after tile installation using coloured grout specified with joints watertight, without voids, cracks or excess grout.
- .7 Seal grout joints in accordance with grout manufacturer's recommendations and specified sealant.

END OF SECTION

1 GENERAL

1.1 Summary

- .1 Provide metal acoustic suspension assemblies with accessories for a complete installation as indicated and specified.
- .2 Provide seismic restraint as required by Vancouver Building By-Law.
- .3 For exterior applications, coordinate work of this section with Section 05400 Structural Metal Stud Framing.

1.2 Related Sections

- .1 06420 Wood Panelling.
- .2 09250 Gypsum Wallboard Assemblies.
- .3 09110 Non-Structural Metal Framing.
- .4 Division 15 Mechanical.
- .5 Division 16 Electrical.

1.3 References

- .1 ASTM E580-00 Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Moderate Seismic Restraint.
- .2 ASTM C635-00, 'Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.'
- .3 ASTM C636-04, 'Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.'
- .4 LEED[®] Canada-NC Green Building Rating System (Version 1.0).
- .5 Vancouver Building By-Law.

1.4 Submittals

- .1 Submit in accordance with the following Sections:
 - .1 01300 Submittals.
 - .2 01015 R002 Green Building Products Information Submittal Form.
- .2 Product Data: For each product specified.
- .3 Shop Drawings:
 - .1 Submit ceiling plans for the Consultant's review, before installation.

- .2 Plans to show grid system, light fixtures, diffusers, grilles, access panels, insert locations and edge conditions if required.
- .4 Samples: Provide two (2) samples of each panel specified. Do not order materials until review is complete. Samples shall include each type of exposed ceiling materials.
- .5 Maintenance Materials: Prior to installation provide the Owner with 5% maintenance materials of ceiling tile, of the total area installed, including reinstalled areas.
- .6 Record Documents: Submit a list of each material incorporated into the work in accordance with Section 01300 Submittals.

1.5 Quality Assurance

- .1 Installer Qualifications: Work shall be done by qualified mechanics employed by an approved acoustical contractor and performed under the direct supervision of certified contractors representing members of the Acoustical Materials Association.

1.6 Delivery, Storage and Handling

- .1 Store materials in original containers with the manufacturer's labels and seals intact.
- .2 Protect from damage during handling and storage. Keep materials under dry cover, free from dampness, and raised above floor.

2 PRODUCTS

2.1 Manufacturers

- .1 Subject to compliance with specifications the following manufacturers are acceptable:
 - .1 Armstrong World Industries, distributed by Winroc Corporation, T: 604-853-1670 F: 604-853-6837.
 - .2 B P C O, T: 514-636-6810.
 - .3 CGC Inc, Contact Melodie Schwartzman T: 604-881-8000 F: 604-881-8015 C: 778-840-8012.
 - .4 E H Price Ltd, T: 204-669-4220.
 - .5 Or approved alternative.

2.2 Suspension Components

- .1 Grid: 15/16" T-bar grid.
 - .1 Systems shall meet requirements of ASTM C635, Intermediate Duty or Heavy Duty.
 - .2 Exposed surfaces shall be finished with factory-applied white baked enamel.
 - .3 Main runners and cross T's shall have one inch exposed face.

- .2 Hanger Wire: 12 gauge cold-rolled electro-galvanized steel.
- .3 Edge Molding: Channel section of cold-rolled electro-galvanized steel.
- .4 Hold-down Clips: As required by UL to prevent lifting of panels under unusual draft conditions.
- .5 Performance Standards: DX or DXL Systems by USG Interiors.

2.3 Ceiling Finishes

- .1 Gypsum: Refer to Section 09250 Gypsum Wallboard Assemblies.
- .2 Acoustical panels:
 - .1 Manufacturer: CGC.
 - .2 Model: To Consultant's future selection.
 - .3 Type: Rectangular lay-in exposed grid suspension.
 - .4 Dimensions: as indicated.
 - .5 Composition: Non combustible mineral fibre, with foil back.
 - .6 Pattern: as indicated.
 - .7 Colour: Factory white finish.
 - .8 Edges: Square edge.
 - .9 NRC rating: minimum 0.95.
 - .10 CAC min. rating: 30.
 - .11 Fire hazard rating: Class A; Flame Spread 25; Smoke Development 50.
 - .12 Light reflectance: TBD.
 - .13 Recycled Content: TBD.

3 EXECUTION

3.1 Examination

- .1 Examine areas to receive acoustical suspension with Installer present.
- .2 Correct unsatisfactory conditions.
- .3 Start of work indicates acceptance of conditions as suitable for a satisfactory installation.

3.2 Preparation

- .1 Coordinate with other trades in setting out and setting of metal items, insets, anchors, or other items as work proceeds.
- .2 Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid the use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.3 Installation

- .1 Install Work in accordance with Manufacturer's recommendations, reviewed Shop Drawings and Vancouver Building By-Law requirements. Installation shall meet requirements of ASTM C636. Where standards are in conflict the more stringent shall apply.
- .2 Lay out suspension system symmetrically about center lines of room unless shown otherwise by Drawings. Lay out system so use of tiles less than 1/2 size is minimized.
- .3 Maintain suspension system in true plane with straight, even joints.
- .4 Suspension system joints shall be straight and in alignment, and exposed surface flush and level. Wherever system abuts walls, columns, and other vertical surfaces, furnish and install appropriate molding.
- .5 Locate light fixtures, speakers, and mechanical diffusers and grilles symmetrically in room insofar as possible (unless shown otherwise). Locate fixtures, speakers, diffusers, and grilles within suspension grid spaces and centered at least one direction within grid.
- .6 Pay particular attention to required hanger wire placement and fixture protection. Individual component deflection not to exceed 1/360 of span.
- .7 Do not attach suspension system to adjustable folding partition headers.

3.4 Installation Lay-in Panels

- .1 Install materials in accordance with the manufacturer's printed instructions, and comply with governing regulations, fire resistance rating requirements as indicated, and industry standards applicable to the work.
- .2 Arrange acoustical units and orient units in the manner shown by reflected ceiling plans or as directed by the Consultant.

3.5 Cleaning

- .1 Promptly as work proceeds, and on completion, clean up and remove from premises all debris and surplus material resulting from this section.

END OF SECTION

1 GENERAL

1.1 Summary

- .1 Provide labor, materials, tools and other equipment, services and supervision required to complete all interior and exterior (including above roof) painting, coating and decorating work as indicated on Finish Schedules, Wall, Floor and Roof Assemblies and to the full extent of the drawings and specifications.
- .2 Surface preparation to receive painting and finishing is not included under this section of work, except for priming and back-priming and specific pre-treatments noted herein or specified in the Master Painters Institute (MPI) Painting Specification Manual.
- .3 Refer to drawings and Finish Schedules for type, location and extent of finishes required, and include all touch-ups and field painting necessary to complete work shown, scheduled or specified.
- .4 Surfaces shall receive Premium grade finish systems, 3 coats, except where MPI Manual indicates no Premium system in which case a 2 coat Custom system is acceptable.
- .5 Coordinate the work of this section closely with the work of Section 05500 Metal Fabrications and 07920 Sealants to ensure compatibility of primers and finish systems.
- .6 Provide documentation to assist in the LEED® certification for the project.
- .7 Work includes the cost of the Master Painters Institute's inspection service and warranty or maintenance bond as specified.
- .8 Paints and coatings, (defined as inside of the weatherproofing system and applied on-site) shall comply with the following criteria: Environmentally Friendly Products:
 - .1 Provide paints and coatings complying with VOC limits outlined in Section 01015 LEED® Certification - Low Emitting Materials - Emission Limits Tables.
 - .2 The Master Painter's Institute Manual and approved products list has introduced an environmentally friendly system to identify which of their systems meet the lowest VOC standards. This system is as follows:
 - .1 E 3 : Lowest level of VOC: <101 g/L
 - .2 E 2 : Next lowest level of VOC: 101 - 150 g/L
 - .3 E 1: Next lowest level of VOC: 151 - 200 g/L
 - .4 E 0: Outside range, N/A – Data unavailable.

- .9 Acceptable paints and coatings have been given an MPI Rating as outlined below. Ensure paints and coatings applied on interior of building comply with the following criteria:

PAINT TYPE	VOC LIMIT (g/L)	MPI RATING	COMMENTS
Interior Flat	50	E 3	
Interior Non-flat	150	E 2	
COATING TYPE	VOC LIMIT (g/L)	MPI RATING	COMMENTS
Primers, Sealers & Undercoaters	100	E 3	
Quick Dry Primers, Sealers & Undercoaters	100	E 3	
Quick Dry Enamels	50	E 3	
Stains, Interior	250	E 0	
Waterproofing Concrete/Masonry Sealers	100	E 3	

1.2 Related Sections

- .1 04200 Unit Masonry Assemblies.
- .2 05500 Metal Fabrications.
- .3 06100 Rough Carpentry.
- .4 06200 Finish Carpentry.
- .5 07620 Sheet Metal Flashing and Trim.
- .6 08110 Metal Doors and Frames.
- .7 08310 Access Doors and Panels.
- .8 09250 Gypsum Wallboard Assemblies.

1.3 References

- .1 South Coast Air Quality Management District (SCAQMD) Rule #1113, Amended July 13, 2007.
- .2 Green Seal Standard GS-11, First Edition, May 20, 1993.
- .3 Master Painters Institute (MPI) Architectural Painting Specification Manual, hereafter referred to as the MPI Manual. Copies of the Manual may be obtained from the following locations.
T: (604)298-7558. Approved Products list is available on-line at www.paintinfo.com.
- .4 LEED® Canada-NC Green Building Rating System (Version 1.0).
- .5 Vancouver Building By-Law.

1.4 System Description

- .1 Paint exposed surfaces in new construction affected by new work whether or not colors are designated in "schedules," except where a surface or material is specifically indicated not to be painted or is to remain natural.
 - .1 Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces.
 - .2 If color or finish is not designated, Consultant will select from standard colors or finishes available.
 - .3 Painting includes field painting exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.
- .2 Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
- .3 Prefinished items not to be painted include the following factory-finished components:
 - .1 Shower enclosures.
 - .2 Acoustic materials.
 - .3 Architectural woodwork and casework.
 - .4 Elevator equipment. Elevator equipment exposed to view to be painted the same colour (TBD). Elevator rooftop equipment to be painted the same colour (TBD).
 - .5 Finished mechanical and electrical equipment. Rooftop mechanical equipment to be painted uniform colour.
 - .6 Light fixtures.
 - .7 Switchgear.
 - .8 Distribution cabinets.
 - .9 Cladding materials.
- .4 Concealed surfaces not to be painted include wall or ceiling surfaces in the following generally inaccessible areas:
 - .1 Foundation spaces.
 - .2 Furred areas.
 - .3 Utility tunnels.
 - .4 Pipe spaces.
 - .5 Duct shafts.

- .6 Elevator shafts. Refer to Note 1.4.3.4.
- .5 Finished metal surfaces not to be painted include:
 - .1 Anodized aluminium.
 - .2 Copper and copper alloys.
 - .3 Stainless steel.
 - .4 Chromium plate.
- .6 Operating parts not to be painted include moving parts of operating equipment such as the following:
 - .1 Valve and damper operators.
 - .2 Linkages.
 - .3 Sensing devices.
 - .4 Motor and fan shafts.
 - .5 Door and window handles.
- .7 Labels: Do not paint over CSA, Underwriter's Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.
- .8 Coordination of Work: Review other sections in which primers are provided to ensure compatibility of the total systems for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
- .9 Notify Consultant of problems anticipated using the materials specified.

1.5 Submittals

- .1 Submit in accordance with the following sections:
 - .1 01300 Submittals.
 - .2 01015 R002 Green Building Product Information Submittal Forms.
- .2 Product data:
 - .1 For each product specified including two sets of Material Safety Data Sheets (MSDS) prior to commencement of work for review and for posting at job site as required.
 - .2 Provide an itemized list complete with manufacturer, paint type and color coding for each color used for Owner's later use in maintenance.
 - .3 When requested, submit invoice list of all paint materials ordered for project work to Paint Inspection Agency indicating manufacturer, types and quantities for verification and compliance with specification and design requirements.

- .3 Samples: Provide 300 mm x 300 mm (12" x 12") samples of colors and finishes selected for approval by Consultant.
- .4 Submit consent of surety with Bid Submission as proof of ability to supply a 100% two (2) year Maintenance Bond, if a local MPI Accredited Quality Assurance Association's guarantee option is not used.

1.6 Quality Assurance

- .1 Manufacturer Qualifications: A firm with five (5) years of proven experience in successfully producing work similar to that indicated for this Project, with a record of successful in-service performance, and with sufficient production capacity to produce required units without causing delay in the Work.
- .2 Installer Qualifications: Paint Contractor shall have a minimum of five (5) years proven satisfactory experience. Paint Contractor shall maintain a qualified crew of painters throughout duration of the work who shall be qualified to fully satisfy the requirements of this specification.
- .3 Only qualified journeymen who have a "Tradesman Qualification Certificate of Proficiency" shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.
- .4 Regulatory Requirements: Comply with all applicable requirements of the laws, codes, ordinances and regulations of Federal, Provincial and Municipal authorities having jurisdiction. Obtain necessary approvals from all such authorities.
- .5 Single Source Responsibility: Obtain materials from a single manufacturer for the complete system.
- .6 Mockups:
 - .1 Use the same installation methods and materials as required for the Work. Schedule construction so that it may be reviewed, and any necessary adjustments made, prior to commencing fabrication of the Work. When accepted, mock-up shall serve as the standard for materials, workmanship, and appearance throughout the Project.
 - .2 Prepare and paint designated surface, area, room or item (in each color scheme) to requirements specified, with specified paint or coating showing selected colors, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. Apply paint or coating in sufficient coats to obtain desired colour.
 - .3 Mock up three (3) full rooms.
 - .4 Mock up five (5) selected metal fabrication items, including metal stairs, bollards, handrails, and other items selected by Consultant.
 - .5 Consultant to select designated surfaces.
 - .6 When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

- .7 Accepted mock-ups in undisturbed condition at time of Substantial Performance may become part of completed unit of Work.
- .7 Pre-Installation Conferences: Conduct conferences at Project site.
- .8 Conform to the standards contained in the Master Painters Institute MPI Manual, latest edition.
- .9 Paint manufacturers and products used shall be as listed under the "Approved Products" section of the MPI Manual.
- .10 Field Inspections:
 - .1 Painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the Consultant and the Owner. The painting contractor shall notify the Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of the project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
 - .2 Surfaces requiring painting shall be inspected by the Paint Inspection Agency who shall notify the Consultant and Contractor in writing of defects or problems, prior to commencing painting work, or after the prime coat shows defects in the substrate.
 - .3 Painting and decorating work shall be inspected by a Paint Inspection Agency (inspector) acceptable to the specifying authority and the local MPI Accredited Quality Assurance Association. Notify the Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of the project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
 - .4 Surfaces requiring painting shall be inspected by the Paint Inspection Agency who shall notify the Consultant and Contractor in writing of defects or problems, prior to commencing painting work, or after the prime coat shows defects in the substrate.
 - .5 Do not apply paint finishes in areas where dust is being generated.

1.7 Delivery, Storage and Handling

- .1 General: Deliver materials in manufacturer's original packaging with label indicating pertinent information identifying the item. Store materials in accordance with manufacturer's instructions in a protected dry location off ground. Do not open packaging nor remove labels until time of installation. Label to include the following.
 - .1 Product name or title of material.
 - .2 Product description (generic classification or binder type).
 - .3 Manufacturer's stock number and date of manufacture.
 - .4 Contents by volume, for pigment and vehicle constituents.
 - .5 Thinning instructions.
 - .6 Application instructions.

- .7 Color name and number.
- .2 Storage and Protection:
 - .1 Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue. Keep storage area neat and orderly.
 - .2 Protect from freezing.
 - .3 Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.8 Project and Site Conditions

- .1 Environmental Requirements: Proceed with the Work in accordance with manufacturer's requirements and instructions and any agreements or restrictions of the Pre-Construction Meeting, including the following.
 - .1 Water Based Paint: Apply only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
 - .2 Snow, Rain, Fog, or Mist: Do not apply paint when the relative humidity exceeds 85 percent, at temperatures less than 5 deg F (3 deg C) above the dew point, or to damp or wet surfaces.
 - .3 Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

1.9 Warranty

- .1 Provide and pay for either of the following in accordance with MPI Painting Specification Manual requirements for painting, commencing at date of Substantial Performance.
 - .1 Local MPI Accredited Quality Assurance Association's 2 Year Guarantee or
- OR**
- .2 Furnish a 100% twenty-seven (27) month Maintenance Bond in accordance with MPI Architectural Painting Specification Manual requirements. Maintenance Bond shall warrant that all painting and decorating work has been performed in accordance with MPI Architectural Painting Specification Manual requirements. Include cost of bond in contract price.
 - .3 Painting and decorating contractor to provide maintenance bond consent from a reputable surety company licensed to do business in British Columbia, Canada. Cash or certified cheque are not acceptable in lieu of surety bond.

2 PRODUCTS

2.1 Materials - General

- .1 Material Quality: Provide the manufacturer's best quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- .2 Refer to Schedule at end of section.
- .3 Alternative and Equivalent Products
 - .1 Proposed alternative products will be assessed on their physical and aesthetic attributes.
 - .2 Only products and methods specified shall be used, or such products and methods approved as equivalent. Alternative or equivalent products and methods may be used only where approved in writing by Consultant.
 - .3 Submit request for approval, in duplicate, to Consultant. List specification section or drawing number and page, brand, model, and manufacturer of specified product and proposed product, with full supporting technical specifications, data, and samples and any other special requirements listed in the section.
- .4 Materials including primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, shall be selected from the MPI Painting Specification Manual "Approved Product" listing unless noted otherwise and shall be from a single manufacturer for each system used.
- .5 Other paint materials such as linseed oil, and shellac shall be the highest quality product of an approved manufacturer listed in the MPI Painting Specification Manual and shall be compatible with other coating materials as required.
- .6 Materials and paints shall be lead and mercury free and shall comply with low VOC content requirements of Authorities Having Jurisdiction.

2.2 Exterior Surfaces

- .1 Paint exterior surfaces in accordance with the following MPI Painting Specification Manual requirements. Refer to Finish Schedule for required Gloss:
- .2 Asphalt Surfaces: (zone/traffic marking for drive and parking areas)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBER(S)
EXT 2.1A	Latex zone/traffic marking finish.	97
EXT 2.1B	Alkyd zone/traffic marking finish.	32

.3 Concrete Vertical Surfaces: (including horizontal soffits)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBER(S)
EXT 3.1A	Latex finish.	3,10,15,11,119,
EXT 3.1B	Latex aggregate coating.	42,10,15,11,119
EXT 3.1C	W.B. Light Industrial Coating.	3,161,163,164,
EXT 3.1D	2 component epoxy finish (for chemical resistance).	77
EXT 3.1E	Epoxy-modified latex.	115,215,
EXT 3.1F	Elastomeric finish.	38,113
EXT 3.1G	Water repellent non-paintable finish.	117
EXT 3.1H	Water repellent paintable finish.	34
EXT 3.1N	Latex Aggregate.	41,42

.4 Concrete Horizontal Surfaces: (decks)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS
EXT 3.2A	Latex Floor Paint finish	68,60
EXT 3.2B	Acrylic deck Coating.	127
EXT 3.2C	Epoxy non-slip deck coating.	82
EXT 3.2D	Neoprene-Hypalon deck coating.	27,59
EXT 3.2E	Latex zone/traffic marking finish (for parking lines).	97
EXT 3.2F	Alkyd zone/traffic marking finish (for parking lines).	32

.5 Structural Steel and Metal Fabrications

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
EXT 5.1A	Quick dry [insert gloss] finish	76
EXT 5.1B	Zinc rich / High performance acrylic [insert gloss] finish.	19,110
EXT 5.1C	Alkyd metal primer / High performance acrylic finish	23,110
EXT 5.1D	Alkyd [insert gloss] finish	23,25,95,8,9,94
EXT 5.1F	2 component epoxy gloss finish.	101,115
EXT 5.1G	Zinc rich / 2 component aliphatic polyurethane finish	20,98,72
EXT 5.1H	Epoxy / 2 component aliphatic polyurethane finish	101,77,72
EXT 5.1J	High build epoxy / 2 component aliphatic polyurethane finish	101,98,72

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
EXT 5.1K	Aluminum paint finish.	23,25,95,1
EXT 5.1L	Polyurethane, Pigmented (over inorganic zinc rich primer and high build epoxy).	19,98,72
EXT 5.1V	Epoxy Deck Coating (with SRA).	101,108,82
EXT 5.1X	Epoxy (over self-priming epoxy with SRA).	120,82

- .6 Steel - High Heat: (heat exchangers, breeching, pipes, flues, stacks, temperature range as noted)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
EXT 5.2A	Heat resistant enamel finish, maximum 400° F (205° C).	21
EXT 5.2B	Heat resistant aluminum paint finish, maximum 800° F (427° C).	2
EXT 5.2C	Heat resistant inorganic zinc finish, maximum 750° F (400° C).	19
EXT 5.2D	High heat resistant aluminum paint finish, maximum 1100° F (593° C).	22

- .7 Galvanized Metal: (doors, frames, railings, misc. steel, pipes, overhead decking, ducts, gutters, flashing)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
EXT 5.3A	Latex [insert gloss] finish.	26,10,11,119
EXT 5.3B	Alkyd [insert gloss] finish.	26,8,9,94
EXT 5.3C	2 component epoxy finish.	101,77
EXT 5.3D	Wash primer / 2 component aliphatic polyurethane [insert gloss] finish (for high contact areas).	80,77,72
EXT 5.3E	Bituminous finish (for unexposed galvanized metal next to concrete, masonry)	35
EXT 5.3F	Aluminum paint finish (for low contact/traffic areas only).	26,1

- .8 Dressed Lumber: (wood soffits)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
EXT 6.3A	High performance acrylic [gloss][semi-gloss] finish.	5,7,110

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
EXT 6.3B	Alkyd [insert gloss] finish.	5,7,9,94
EXT 6.3C	Solid colour stain finish (not to be used for doors).	5,7,14
EXT 6.3D	Semi-transparent stain finish.	13
EXT 6.3E	Semi-transparent stain / alkyd varnish [insert gloss] finish.	13,28,29,30
EXT 6.3F	Natural stain finish	12
EXT 6.3G	Polyurethane, clear, 2 component.	28,29,30
EXT 6.3H	Polyurethane, pigmented.	78
EXT 6.3J	2 component polyurethane finish.	72
EXT 6.3K	Solid color stain, WB.	5,7,16
EXT 6.3M	Varnish, water based.	191,192,193,194,195,196,197
EXT 6.3N	Stain, semi-transparent, WB.	156

2.3 Interior Surfaces

- .1 Paint interior surfaces in accordance with the following MPI Painting Specification Manual requirements. Refer to Finish Schedule for Gloss.
- .2 Concrete Vertical Surfaces: (including horizontal soffits)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 3.1A	Latex [insert gloss] finish (over sealer).	3,43,44,52,53,54,114,
INT 3.1B	Latex aggregate [insert gloss] coating (over latex aggregate).	42,43,44,52,53,54,114,
INT 3.1C	High performance architectural latex [insert gloss] finish.	3,138,139,140,141
INT 3.1D	Alkyd [insert gloss] finish.	3,4748,49,51
INT 3.1E	Alkyd stipple [insert gloss] finish	43,44,52,53,54,114
INT 3.1F	2 component epoxy (tile-like) finish (for smooth concrete).	77
INT 3.1G	Epoxy modified latex [insert gloss] finish (for smooth concrete).	115,215
INT 3.1H	Multicolour finish	125,112,121
INT 3.1J	Water repellent paintable finish.	34
INT 3.1L	W.B. light industrial coating.	58
INT 3.1M	Institutional low odor/low VOC.	3,151,153,154
INT 3.1N	Latex aggregate.	41,42
INT 3.1P	Epoxy modified latex.	115,215

.3 Concrete Horizontal Surfaces: (floors and stairs)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 3.2A	Latex floor enamel finish.	68,60
INT 3.2B	Alkyd floor enamel gloss finish.	27,59
INT 3.2C	2 component epoxy [insert gloss] finish.	77
INT 3.2D	Pigmented 2 component polyurethane finish.	77,72
INT 3.2E	Concrete stain finish.	58
INT 3.2F	Concrete floor sealer, solvent based.	104
INT 3.2G	Waterborne concrete floor sealer.	99
INT 3.2H	Latex zone/traffic marking finish (for parking lines)	97
INT 3.2J	Alkyd zone/traffic marking finish (for parking lines).	32

.4 Concrete Masonry Units: (smooth and split face block and brick)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 4.2A	Latex [insert gloss] finish.	4,43,44,52,53,54,114
INT 4.2B	Latex aggregate [insert gloss] coating.	41,42
INT 4.2C	Alkyd [insert gloss] finish.	4,47,48,49,51
INT 4.2D	Alkyd aggregate [insert gloss] coating.	4,138,139,140,141
INT 4.2E	Alkyd stipple finish.	4,143,144,145,146,147,148,
INT 4.2F	2 component epoxy [insert gloss] (tile-like) finish (for dry environments).	4,77
INT 4.2G	2 component epoxy [insert gloss] (tile-like) finish (for wet environments).	116,77
INT 4.2H	Multicolour finish.	4,125,112,121
INT 4.2J	Epoxy modified latex (for dry environments).	4,115,215
INT 4.2K	High performance acrylic [insert gloss] finish).	4,151,153,154
INT 4.2L	Water repellent non-paintable finish (not for low density block).	117
INT 4.2M	Water repellent paintable finish (not for low density block).	34

.5 Structural Steel and Metal Fabrications:

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 5.1A	Quick dry [insert gloss] finish	76,81,96
INT 5.1B	High performance acrylic [insert gloss] finish.	107,151,153,154
INT 5.1C	W.B. dry fall finish.	79,76,118,131,133,155,158,266
INT 5.1CC	W.B. dry fall finish (over shop-applied Q.D.).	275,118,131,133,155,158,226
INT 5.1D	Alkyd dry fall finish.	79,76,55,89,225
INT 5.1DD	W.B. dry fall finish (over shop-applied Q.D.)	275,55,89,225
INT 5.1E	Alkyd [insert gloss] finish.	79,76,49,51
INT 5.1F	2 component polyurethane finish.	101,72
INT 5.1G	2 component aliphatic-polyurethane [insert gloss] finish.	101,108,72
INT 5.1H	Inorganic zinc / 2 component polyurethane finish.	19,108,72
INT 5.1J	Organic zinc / Epoxy / 2 component polyurethane finish.	20,77,72
INT 5.1K	Epoxy modified latex [insert gloss] finish.	107,115,2415
INT 5.1L	2 component epoxy [insert gloss] finish.	101,77
INT 5.1LL	Epoxy deck coating [insert gloss] finish (over self-prime).	010,77,82
INT 5.1M	Aluminum paint finish.	79,76,1

.6 Steel - High Heat: (boilers, furnaces, heat exchangers, pipes, flues, stacks, (temperature range as noted)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 5.2A	Heat resistant enamel finish, maximum 400° F (205° C).	21
INT 5.2B	Heat resistant aluminum paint finish, maximum 800° F (427° C).	2
INT 5.2C	Heat resistant inorganic zinc finish, maximum 750° F (400° C).	19
INT 5.2D	High heat resistant aluminum paint finish, maximum 1100° F (593° C).	22

.7 Galvanized Metal: (doors, frames, railings, misc. steel, pipes, overhead decking, ducts)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 5.3A	Latex [insert gloss] finish.	26,43,44,52,53,54,114
INT 5.3B	W.B. light industrial coating.	26,151,153,154
INT 5.3C	Alkyd [insert gloss] finish (over cementitious primer).	26,151,153,154
INT 5.3D	2 component epoxy [insert gloss] finish.	101,77
INT 5.3E	Wash primer / 2 component epoxy [insert gloss] finish.	80,101,77
INT 5.3F	Alkyd dry fall finish (for low contact/traffic areas only).	26,55,89,225
INT 5.3G	Aluminum paint finish.	26,1
INT 5.3H	W.B. dry fall (low contact/traffic).	131,133,158

.8 Aluminum:

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 5.4A	Alkyd [insert gloss on Premium Grade] finish.	80,47,48,49,51
INT 5.4B	2 component epoxy [insert gloss] finish.	80,77
INT 5.4C	component aliphatic polyurethane [insert gloss] finish.	80,77,72
INT 5.4D	Aluminum paint finish (for exposed aluminum).	80,1

.9 Copper:

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 5.5A	Alkyd [insert gloss on Premium Grade] finish.	80,47,48,49,51
INT 5.5B	2 component epoxy [insert gloss] finish.	80,77
INT 5.5C	2 component aliphatic polyurethane [insert gloss] finish.	80,77,72
INT 5.5D	Aluminum paint finish.	80,1

.10 Dressed Lumber: (including doors, door and window frames, casings, moldings)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 6.3A	Latex [semi-gloss][gloss] finish	39,138,139,140,141
INT 6.3B	Alkyd [semi-gloss][gloss] finish	45,47,48,51

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 6.3C	Semi-transparent stain finish	13
INT 6.3D	Semi-transparent stain / alkyd varnish [insert gloss] finish	90,102,88,74,75
INT 6.3E	Semi-transparent stain / polyurethane varnish [insert gloss] finish.	90,56,57,
INT 6.3F	Semi-transparent stain / lacquer [insert gloss] finish	90,84,85,86,87
INT 6.3G	Pigmented lacquer finish..	24,122,123,124
INT 6.3H	Clear lacquer [insert gloss] finish.	84,85,86,87
INT 6.3J	Clear alkyd varnish [insert gloss] finish.	88,102,74,75
INT 6.3K	Clear polyurethane varnish [insert gloss] finish..	56,57
INT 6.3L	2 component epoxy finish	77
INT 6.3M	Filled stain wax finish.	92
INT 6.3N	Oil resin sealer finish.	45,112,121
INT 6.3P	Multicolour finish.	45,151,153,154
INT 6.3Q	W.B. varnish, clear [insert gloss] finish.	128,129,130,181
INT 6.3R	Clear waterborne acrylic [insert gloss] finish.	63,64,67
INT 6.3S	Fire retardant, clear [insert gloss] finish (solvent based or water based).	62,66
INT 6.3T	Fire retardant clear [insert gloss] finish.	39,54,114
INT 6.3W	W.B. varnish, clear (over stain).	90,128,129,130,181

.11 Wood Paneling and Casework: (partitions, panels, shelving, millwork)

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 6.4A	Latex [semi-gloss][gloss] finish	45,43,44,52,53,54,114
INT 6.4B	Latex [egg shell][flat] finish (for low traffic areas).	45,47,48,49,51
INT 6.4C	Alkyd [semi-gloss][gloss] finish	13
INT 6.4D	Alkyd [flat][egg shell] finish (for low traffic areas).	90,102,88,73,74,75
INT 6.4E	Semi-transparent stain finish.	90,56,57
INT 6.4F	Semi-transparent stain / alkyd varnish [insert gloss] finish.	90,84,85,86,87
INT 6.4G	Semi-transparent stain / alkyd	102,88,73,74,75

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
	varnish [insert gloss] finish.	
INT 6.4H	Semi-transparent stain / lacquer [insert gloss] finish.	24,122,123,124
INT 6.4J	Clear alkyd varnish [insert gloss] finish.	56,57
INT 6.4K	Pigmented lacquer finish.	92
INT 6.4L	Clear polyurethane varnish [insert gloss] finish.	45,112,121
INT 6.4M	Filled stain wax finish.	128,129,130,181
INT 6.4N	Oil resin sealer finish.	45,151,153,154
INT 6.4P	Multicolour finish.	63,64,67
INT 6.4Q	Fire retardant, clear [insert gloss] finish.	62,66
INT 6.4R	High performance acrylic [insert gloss] finish.	39,54,114
INT 6.4S	Fire retardant pigmented [insert gloss] finish.	39
INT 6.4T	Fire retardant clear [insert gloss] finish.	39,143,144,145,146,147,148
INT 6.4U	W.B. varnish, clear.	90,128,129,130,181

.12 Plaster and Gypsum Board: (gypsum wallboard, drywall, "sheet rock type material")

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 9.2A	Latex [insert gloss] finish.	50,43,44,52,53,54,114
INT 9.2B	High performance acrylic [insert gloss] finish.	50,138,139,140,141
INT 9.2C	Alkyd [insert gloss] finish.	50,47,48,49,51
INT 9.2D	Alkyd stipple [insert gloss] finish.	-----
INT 9.2E	2 component epoxy [insert gloss] (tile-like) finish.	50,77
INT 9.2F	Epoxy modified latex [insert gloss] (tile-like) finish.	50,115,215
INT 9.2G	Multicolour finish.	125,112,121
INT 9.2H	Fire retardant solvent based [insert gloss] finish.	62 or 63
INT 9.2J	Fire retardant latex [insert gloss] finish.	67 or 64
INT 9.2M	Institutional low odor/low VOC.	149,134,144,145,146,147,148

.13 Acoustical Panels and Tiles:

FINISHING SYSTEM	DESCRIPTION	MPI PRODUCT NUMBERS(S)
INT 9.3A	Latex flat finish.	53
INT 9.3B	Latex [insert gloss] finish.	45,43,44,52,53,54,114
INT 9.3C	Alkyd flat finish.	49

3 EXECUTION

3.1 Preparation of Surfaces

- .1 Prepare surfaces in accordance with MPI Manual requirements unless indicated otherwise. Refer to the Manual for specific surface preparation requirements for each substrate material not included in the following.

3.2 Application

- .1 Do not paint unless substrates are acceptable and/or until environmental conditions (heating, ventilation, lighting and completion of other subtrade work) are acceptable for applications of products.
- .2 Paint surfaces requiring paint or stain finish to minimum MPI Manual finish requirements with application methods in accordance with best trade practices for type and application of materials used.
- .3 Use aggregate coating or a slip resistant additive in paint for surfaces as noted (e.g. stair treads/landings, handrails) where scheduled to be painted.
- .4 Continue paint finishes through behind wall mounted items.

3.3 Exterior Concrete Paint Coating – Surface Preparation

- .1 Concrete and masonry must be clean, structurally sound, and fully cured (28 days).
- .2 Remove mildew and fungus from surfaces before application of primer. If mildew or fungus are present, wash surfaces vigorously with a solution of 1 tablespoon of detergent and 1 to 2 pints of liquid bleach in 1 gallon of water (0.125 to 0.25 L/L). Rinse thoroughly with clean water. Treat severely infested substrates a second time after an interval of 1 to 2 weeks. Allow walls to dry a minimum of 24 hours before applying primer.
- .3 Pressure clean (minimum 2,100 psi) to remove dust, dirt, oil, grease, loose particles, laitance, foreign materials, peeling and aged coatings, and chalk. Allow surface to dry before proceeding (at least 24 hours or longer if surface is porous).
- .4 Remove fins and mortar droppings. Make sure that mortar joints are sound and free of voids and cracks. Ensure there are no gaps, cracks, or voids greater than 0.05mm (2 mils). Repair gaps, cracks, or voids greater than 0.05mm (2 mils). Repair delaminated stucco, brick, and concrete block.

- .5 Repair spalled and damaged concrete with Sonneborn Sonopatch 100, Sonopatch 200, or Gel Patch (refer to Form No. SC-229-1, 229-2, SC-274) or approved alternative. For thin surface defects (sacking) use Sonopatch TC or approved alternative.

3.4 Exterior Concrete Paint Coating - Detail Work

- .1 Apply Sonolastic 150 (see Form No. SJ-422) or approved alternative where appropriate on support columns and other details. Inspect expansion joints. Ensure there is no deteriorated sealant, adhesion loss, or non-elastomeric caulking in joints. Repair defective sealant or caulk with Sonolastic 150 or approved alternative.
- .2 Juncture Details: Apply and tool a liberal amount of Patching Compound or form a cant bead of Sonolastic 150 or approved alternative wherever there is a change in direction where two walls abut, and at column and wall intersections.
- .3 If movement is anticipated where dissimilar substrates join, such as stucco and concrete or brick and block, properly clean the joint and seal with Sonolastic 150 or approved alternative.
- .4 Inspect all through-wall penetrations, including electrical, lighting, signage, plumbing, HVAC, fire-sprinkler piping, for a watertight seal. Repair with Sonolastic 150 or approved alternative.
- .5 Cracks: Super Colorcoat VOC or approved alternative will seal and cover existing nonmoving hairline cracks less than 0.8 mm (1/32 in.). Larger settlement or moving cracks must be raked out, cleaned, and sealed with appropriate Sonneborn patching compound or approved alternative, sealant or caulk. For large openings, fill and restore with an appropriate Sonneborn Sonocrete patching material. Areas can be surface damp when Super Colorcoat VOC or approved alternative is applied.
- .6 Route out dynamic or moving cracks to a minimum of 6mm x 6mm (1/4 in. x 1/4 in.), then fill with Sonolastic 150 or approved alternative. Once sealant is tooled and cured, proceed with crack repair as described previously.
- .7 Do crack repair and treat back side of parapets in the same manner as exterior walls, terminating at roof counter flashings. If top of parapet wall is exposed masonry, apply a coat of Patching Compound to create a smooth, well-draining surface. Re-caulking of reglet may be required.

3.5 Exterior Concrete Paint Coating - Method of Application

- .1 Mix Super Colorcoat VOC or approved alternative thoroughly, then apply at correct coverage rate to properly prepared surfaces by brush, roller, or spray. Apply finish coat in a pinhole free, continuous membrane for waterproofing integrity.
- .2 Brush: Application by brushing is recommended for:
 - .1 Optimum filling of pores or bridging of hairline cracks;
 - .2 Coating brick or other masonry with recessed joints;
 - .3 Open-pored textured surfaces such as block.

- .3 On open-textured surfaces, thoroughly work coating into surface texture or pores to fill completely. Flow the coating onto surface using straight strokes. Use stiff-fiber or nylon short-bristled brush.
- .4 Roller - Super Colorcoat VOC or approved alternative: Using a fully loaded roller, apply coating to surface in a uniform manner. Stroke variations may result in uneven color and texture. Without using additional material, finish off area with strokes in one direction. Ensure proper distribution of aggregate. Do not over roll.
- .5 Roller - Colorflex: Use a quality 32mm (1-1/4 in.) nap roller cover (lamb's wool preferred). Completely saturate roller and keep it loaded with coating to build required mils. Never dry roll except for touch up. Roll coating in consistent fanlike pattern to achieve uniform mil thickness. Stroke variations may result in uneven color and texture.
- .6 Spray: When spraying concrete or smooth face block, always hold gun nozzle at a right angle to wall through entire pass.
 - .1 On irregular surfaces such as break-off or ribbed block, angle spray gun to coat areas between ribs. Obtain adequate coverage, particularly in depressions and rib tops and bottoms to ensure proper waterproofing.
 - .2 It may be necessary to apply Super Colorcoat VOC or approved alternative with a brush in recessed areas of ribbed block to ensure adequate protection. A spray and back-brush technique may be most efficient.
 - .3 In estimating quantity of material, take both coarse texture and increased surface area into account. For example, a ribbed block may have almost twice the surface area of a similar smooth-faced block. Coverage on all areas of the block must be as recommended under Coverage section.
 - .4 For spray equipment recommendations, refer to the equipment manufacturer. A 10 percent spray loss should be anticipated. On porous substrates, pin-holing is an indication of entrapped air. Back-rolling is required to eliminate pin-holing.
- .7 Drying Time: Minimum drying time between coats is 6 - 8 hours at 24 deg C (75 deg F) and 50 percent or less relative humidity. Cooler temperatures will extend drying time.
- .8 Ferrous metal shall be cleaned of oil, grease, and foreign matter with solvent. Prime within 3 hours after preparation. Sand and scrape metal to remove loose primer or rust.
- .9 Drywall surfaces must be completely dry and dust free. Seal skim-coated drywall with alkyd-based sealer. Seal textured and non-textured drywall surfaces with waterborne sealer provided surfaces are completely dry and dust free.
- .10 Film Thickness Test: Randomly verify wet film thickness complies with manufacturer's specifications with suitable gauge and dry film thickness with "Tooke" or other suitable dry film gauge.
- .11 Guarantee:
 - .1 The product Manufacturer shall issue a written and signed document in the name of the Owner, certifying the product will meet all the physical characteristics published by the

Manufacturer, for a period of ten (10) years with no dollar limit starting from the date of acceptance of the work.

- .2 The Contractor shall issue a written and signed document in the name of the Owner certifying that the work executed shall remain in place and free of any performance defect for a period of ten (10) years with no dollar limit starting from the date of acceptance of the work.

3.6 Field Quality Control / Standard of Acceptance

- .1 All surfaces, preparation and paint applications shall be inspected.
- .2 Painted exterior and interior surfaces shall be considered to lack uniformity and soundness if any of the following defects are apparent to the Painting Inspection Agency inspector:
 - .1 Brush / roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
 - .2 Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
 - .3 Damage due to touching before paint is sufficiently dry or any other contributory cause.
 - .4 Damage due to application on moist surfaces or caused by inadequate protection from the weather.
 - .5 Damage and/or contamination of paint due to blown contaminants (dust, spray paint, etc.).
- .3 Painted surfaces shall be considered unacceptable if any of the following are evident under natural lighting source for exterior surfaces and final lighting source (including daylight) for interior surfaces:
 - .1 Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 1000mm (39 in.).
 - .2 Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 1000mm (39 in.).
 - .3 Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.
 - .4 When the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
- .4 Painted surfaces rejected by the inspector shall be made good at the expense of the Contractor. Small affected areas may be touched up; large affected areas or areas without sufficient dry film thickness of paint shall be repainted. Runs, sags of damaged paint shall be removed by scraper or by sanding prior to application of paint.

3.7 Mechanical and Electrical Equipment

- .1 Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Color and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted.
- .2 Paint gas piping gas standard yellow where visible in service spaces.
- .3 Paint surfaces inside of ductwork, and elsewhere behind grilles, where visible, using primer and one coat of matte black paint.
- .4 Paint both sides and edges of plywood backboards for equipment before installation.
- .5 Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.8 Paint Schedule

- .1 Perform painting in accordance with the instructions of the selected paint manufacturers and in conformance with the systems specified.
- .2 Additional coats may be required to achieve acceptable color and coverage. Refer to the Finish Schedules for the required sheen.

3.9 Protection and Clean-Up

- .1 Protect newly painted exterior surfaces from elements condensation and contamination until paint coatings are completely dry. Erect barriers or screens and post signs to warn of or limit or direct traffic.
- .2 Remove spilled, splashed, splattered or over sprayed paint as work progresses, remove waste materials and keep area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

END OF SECTION