

GYPSUM BOARD ASSEMBLIES

1. GENERAL

1.1 Quality Control

- .1 Install work level to tolerance of 3 mm in 3000 mm (c" in 10'-0").
- .2 Select studs with maximum deflection of L/240 at lateral force of 480 Pa (10 psf) for maximum heights indicated.
- .3 Fire Test Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

1.2 Environmental Requirements

- .1 Install work only in areas closed and protected against weather, and maintained between 10°C and 21°C. In cold weather ensure that heat is introduced in sufficient time, before work commences, to bring surrounding materials up to these temperatures; and maintained until materials installed by this Section have cured.
- .2 Do not install work in any area unless satisfied that work in place has dried out, and that no further installation of damp materials is contemplated.

1.3 Delivery, Storage, and Handling

- .1 Deliver materials in original packages, containers, or bundles bearing brand name and identification of Manufacturer or supplier.
- .2 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. Stack gypsum panels flat to prevent sagging.

2. PRODUCTS

2.1 Materials

- .1 Gypsum Board, Paper Faced: ASTM C1396/C1396M, paper faced, regular and fire rated Type X core, 1200 mm (48") wide x maximum practical length, ends square cut, square edged base layer and taper edged face layer.
- .2 Steel Studs: ASTM C645, minimum 0.46 mm (0.018") base metal thickness, hot-dipped galvanized to ASTM A653/A653M G60 (Z180) zinc coating, roll formed, widths as indicated, with knock-out holes for mechanical and electrical services. Use 20 gauge studs for fibre reinforced panels.

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- .3 Floor and Ceiling Tracks: ASTM C645, minimum 0.46 mm (0.018") base metal thickness, hot-dipped galvanized to ASTM A653/A653M G60 (Z180) zinc coating, roll formed, width to suit studs.
- .4 Furring Runners and Channels: ASTM C645, minimum 0.46 mm (0.018") base metal thickness, hot-dipped galvanized to ASTM A653/A653M G60 (Z180) zinc coating, roll formed.
- .5 Hangers, Tie Wires, Inserts, Anchors: Manufacturer's standard.
- .6 Channel Bridging: 1.37 mm (0.0538") bare steel thickness, 38 mm (1½") deep with minimum 12.7 mm (½") wide flange.
- .7 Backing Plate: Galvanized steel sheet for blocking and bracing in length and width indicated, minimum base metal 0.45 mm (0.0179") 0.7 mm (0.027") 0.8 mm (0.0312") thick.

2.2 Accessories

- .1 Insulating Strip: Rubberized, moisture resistant 3 mm (c") thick foam strip, 12 mm (½") wide, with self sticking adhesive on one face, lengths as required.
- .2 Casing Beads, Corner Beads: 0.48 mm (25 gauge) hot dipped galvanized steel, perforated flanges, designed to be concealed with joint compound; one piece length per location.
- .3 Attachment Clips: Sized to suit acoustical ceiling grid members, complete with screws and other fastening system, Revoe Clips by Revoe Manufacturing Ltd.
- .4 Acoustical Sealant: Acoustical sealant by Tremco Ltd.
- .5 Joint and Laminating Compounds: As recommended by gypsum board and cement board manufacturer, high bond, low shrinkage and asbestos-free.
- .6 Joint Tape: 50 mm (2") wide reinforced tape, to suit intended use.
- .7 Acoustical Insulation: AFB by Roxul Inc., or SAFB by Fibrex, or other approved equivalents, width to match stud spacing.

3. EXECUTION

3.1 Installation - Partition and Wall Framing

- .1 Align partition top and bottom tracks and secure by screws at 600 mm (24") o.c. maximum.
- .2 Place studs vertically at 400 mm (16") oc, unless otherwise noted, and not more than 50 mm (2") from abutting walls, and at each side of openings and corners. Position studs in top and bottom tracks.

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- .3 Screw attach end studs to top and bottom tracks. Screw attach intermediate studs to bottom tracks. Secure intermediate studs to top tracks by crimping or by other means of fastening acceptable to Contract Administrator.
- .4 Continuously cross brace steel studs at 1500 mm (60") on centre to provide rigid installation to manufacturer's instructions.
- .5 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.
- .6 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm (2") apart using clips or other approved means of fastening placed alongside frame anchor clips.
- .7 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with Manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.
- .8 Frame openings and around built-in equipment, cabinets, access panels, on four sides. Extend framing into reveals. Check clearances with equipment suppliers.
- .9 Provide stud, furring channel, and backing plates secured between studs for attachment of fixtures, electrical boxes, grab bars, washroom accessories, and other items. Comply with details indicated and with stud and gypsum board Manufacturers' written recommendations.
- .10 Terminate partitions at ceiling height except where indicated otherwise.
- .11 Install continuous insulating strips to isolate studs from exterior window framing.
- .12 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
- .13 Apply two continuous beads of acoustical sealant at junctions of metal framing and structure, including bottom and top tracks, where partitions abut fixed building components. Fill junction completely and continuously from floor to ceiling, or to structure for full height partitions.
- .14 Frame for gypsum board faced vertical bulkheads within and at termination of ceilings.
- .15 Secure light lens support trims to substrate at 300 mm (12") centers. Loose lay light lens on support trims.

3.2 Installation – Attachment Clips

- .1 Place attachment clips over acoustic ceiling main/cross tee from top. Line up pre-drilled hole on clip with hole on main/cross tee and screw clip to main/cross tee with 1/2" wafer screw.

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- .2 Screw through pre-drilled holes in attachment clip into top track of stud partition. Do not screw through ceiling grid.
- .3 Do not damage ceiling grid system during installation of these clips.

3.3 Installation - Wall Furring

- .1 Space wall furring runners vertically at 600 mm (24") o.c., and secure through alternate flanges of runners. Shim runners as required to present a true, plumb line for application of gypsum board.
- .2 Locate furrings not more than 50 mm (2") away from all openings, interior corners, intersections, frames, jambs, control joints and the like.
- .3 At windows, doors or similar openings having returns, and around corners, install lengths of mitred and bent pieces of furring horizontally spaced approximately 600 mm (24") o.c. Form mitres by cutting the flanges and bending the web. Do not cut web to form corners.

3.4 Installation - Suspended Ceiling Framing

- .1 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.
- .2 Space framing members at 400 mm (16") centres.
- .3 Provide additional ceiling suspension hangers within 150 mm (6") of each corner and at maximum 600 mm (24") around perimeter of light fixtures and diffusers.
- .4 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

3.5 Installation - Gypsum Panels

- .1 Do not apply gypsum panels until bucks, anchors, blocking, electrical and mechanical work are approved.
- .2 Apply gypsum panels to furring or framing using screw fasteners, at 300 mm oc., and at closer spacings as required for fire resistance rated assemblies. Space fasteners in tile baker boards a maximum of 200 mm (8") o.c.
- .3 Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- .4 Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1.6 mm ($\frac{1}{16}$ ") of open space between panels. Do not force into place.

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- .5 Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- .6 Attach gypsum panels to framing provided at openings and cutouts.
- .7 Form control and expansion joints with space between edges of adjoining gypsum panels.
- .8 Cover both faces of steel stud partition framing with gypsum panels in concealed spaces.
 - .1 Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 0.7 m² (8 ft²) in area.
 - .2 Fit gypsum panels around ducts, pipes, and conduits.
 - .3 Where partitions intersect open joists and other structural members projecting below underside of slabs and decks, cut gypsum panels to fit profile formed by joists and other structural members; allow 6 mm to 10 mm (¼" to ⅜") wide joints to install sealant.
- .9 Gypsum board single layer application:
 - .1 On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
 - .2 On partitions and walls, apply gypsum panels parallel to framing, unless otherwise indicated or required by fire resistance rated assembly, and minimize end joints.
 - .3 Stagger abutting end joints not less than one framing member in alternate courses of board.
- .10 Gypsum board multilayer application – partitions and walls: Apply gypsum board indicated for base layers and face layers parallel to framing with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 - .1 Furring members: Apply base layer parallel to framing and face layer either vertically parallel or perpendicular to framing with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
- .11 Single layer fastening method: Fasten gypsum panels to supports with steel drill screws.
- .12 Multilayer fastening method: Fasten base layers with screws; fasten face layers with adhesive and supplementary fasteners, unless otherwise indicated or required by fire resistance rated assembly.

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3.6 Installation - Acoustical Insulation

- .1 Install acoustical insulation to partitions indicated. Provide continuous coverage between studs and run continuously from floor to ceiling, or to structure for full height partitions, over door frames and openings and around corners.
- .2 Pack acoustical insulation around cut openings in gypsum board, behind outlet boxes around plumbing, heating or structural items passing through the system and at abutting walls.
- .3 Secure acoustical insulation to one interior face of gypsum board with adhesive or mechanical fasteners or by other approved means.
- .4 For partitions receiving acoustical insulation, provide minimum two continuous beads of acoustical sealant at junctions between top and bottom tracks and the structure.

3.7 Installation - Fire Rated Assemblies

- .1 Construct fire rated assemblies where indicated, to requirements of authorities having jurisdiction.

3.8 Installation - Accessories

- .1 Erect casing beads, corner beads straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured by screw fasteners. Fit corners accurately, free from rough edges.
- .2 Provide corner beads at external corners of gypsum board partitions and where indicated.
- .3 Provide casing beads at gypsum board terminations, at gypsum board wall/ceiling junctions, where gypsum board butts against surfaces having no trim concealing junction and where indicated.
- .4 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint. Provide continuous polyethylene dust barrier behind and across control joints.

3.9 Installation - Access Doors

- .1 Install access doors to electrical and mechanical fixtures specified in respective Sections.
- .2 Rigidly secure frames to furring or framing systems.

3.10 Installation - Taping and Filling

- .1 Apply joint compounds and reinforcing tapes in accordance with Manufacturer's specifications.

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- .2 Fill joints, casing beads, corner beads, screwholes and depressions on gypsum board surfaces exposed to view to provide smooth seamless surfaces and square neat corners.
- .3 Apply joint compounds, after preceding coat has dried, free of tool marks and ridges and excess joint compound. Feather edge compounds onto surfaces of gypsum boards. After final coat has dried for at least 24 hours sand to leave smooth for decoration. Do not sand paper face of gypsum board.
 - .1 First Coat: Apply tape embedment coat in width to suit tape.
 - .2 Second Coat: Apply to 175 mm (7") wide, centred on joints and corners.
 - .3 Third Coat: Apply to 300 mm (12") wide, centred on joints and corners.
- .4 Joints, Three Coat Method: Fill gaps between boards with joint compound. Embed reinforcing tape in a first coat of joint compound. Apply two additional separate coats of joint compound. Let dry and sand smooth.
- .5 Internal Corners, Two Coat Method: Fill gaps between boards with joint compound. Embed creased reinforcing tape into a first coat of joint compound applied 50 mm (2") wide at each side of corner. Apply second coat of compound to one side of joint. Let dry and apply compound to other side. Let dry and sand smooth.
- .6 Fastener Heads and Accessories, Three Coat Method: Fill holes, depressions and nose of accessories with a three coat application of joint compound. Let dry and sand smooth.
- .7 Gypsum Board Above Finished Ceiling: Finish accessories, joints, and interior angles with tape and first coat of joint compound. Tool marks and ridges are acceptable, no other finishing required.

END OF SECTION

TILES

1. GENERAL

1.1 Quality Control

- .1 Perform work of this Section by a company that is a member in good standing of the Terrazzo Tile and Marble Association of Canada with proven, acceptable experience on installations of similar complexity and scope.
- .2 Materials and installation: To requirements of TTMAC 2006-2007 Specification Guide 09300 Tile Installation Manual.
- .3 Maintenance Seminars: Provide, to the City, training seminars, and recommendations on product maintenance procedures.
- .4 Pre-Installation Meeting: Two weeks prior to commencing work of this Section, arrange for Manufacturer's technical representative to visit the Site and review preparatory and installation procedures to be followed, conditions under which the work will be done, and inspect the surfaces to receive the work of this Section. Advise the Contract Administrator of the date and time of the meeting.
- .5 Manufacturer's Site Inspection: Have the Manufacturer's technical representative inspect the work at suitable intervals during application and at conclusion of the work of this Section, to ensure the work is correctly installed. When requested, submit manufacturer's inspection reports and verification that the work of this Section is correctly installed.
- .6 Source Limitations: Obtain each type of product from a single manufacturer.
- .7 Products: Provide like products from same production run. Install products in sequence from sequentially numbered dye lots.

1.2 Submittals

- .1 Product Data: Submit copies of manufacturer's product data for inclusion in the operating and maintenance manual.
 - .1 Performance criteria, compliance with appropriate reference standard, characteristics, limitations and warranties.
 - .2 Product transportation, storage, handling, and installation requirements.
- .2 Shop Drawings: Submit Shop Drawings in accordance with Division 1 Section Submittal Procedures.
 - .1 Tile layout, patterns, colour arrangement.
 - .2 Perimeter conditions, junctions with dissimilar materials.
 - .3 Setting details.

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- .3 Certificates:
 - .1 Submit Manufacturer's certificates stating that materials supplied are in accordance with this Specification.
 - .2 Submit Manufacturer's installation procedures.
- .4 Samples: 600 mm x 600 mm (24" x 24") size panel complete with approved grout colour; mounted to a 19 mm thick plywood backer.

1.3 Site Conditions

- .1 Do not install work of this Section outside of the following environmental ranges without the Contract Administrator's and product manufacturer's written acceptance:
 - .1 Mortars and Grouts, General: Ambient air and substrate temperature below 12°C or above 38°C.
 - .2 Install temporary protection and facilities to maintain the manufacturer's, and specified environmental requirements for 7 days before, during, and 7 days after installation.

1.4 Extra Materials

- .1 Provide 3% of each type and colour of tiles and accessories installed. Store the extra materials at locations as directed by the City. Extra stock shall be of same production run as installed materials. Include cost of extra stock in the Contract Price.

1.5 Sample Installation

- .1 Provide a 3 m x 3 m (10' x 10') representative installation of work of this Section on Site at location directed by Contract Administrator to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation. Remove rejected sample installation and provide additional sample installations until acceptance is given. Do not commence work until sample installation has been accepted. Accepted sample installation may form part of the completed work if undisturbed at time of Substantial Performance.
 - .1 Acceptance of sample installations does not constitute approval of deviations from the Contract Documents contained in sample installations unless such deviations are specifically approved by Contract Administrator in writing.

2. PRODUCTS

2.1 Tiles

- .1 Tiles:
 - .1 CT-1: 18" x 18", Atlas Concorde Extrema Trekking by Carrara Tile.

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- .2 CT-2: 12" x 12" sheets, Botticino Versailles by Carrara Tile.
- .3 CT-3: 12" x 24", Refin Olympia Avant Garde White by Carrara Tile.
- .4 CT-4: 2" x 6", Refin Olympia Avant Garde Green by Carrara Tile.
- .5 Slate Tiles: 16" x 16" San Francisco Gold by Carrara Tile.

2.2 Mortars And Grouts

- .1 Cement: CSA A3000, Type GU.
- .2 Sand: ASTM C144.
- .3 Polymer Additive: Keralastic by Mapei, 3701 by Laticrete International or Full Bond Additive TA867 by TEC Inc.
- .4 Thinset Mortar: ANSI A118.4, full strength adhesive, Kerabond/Keralastic by Mapei Inc., 4237/211 by Laticrete International, or Full Set TA370/XtraFlex TA872 by TEC Inc.
- .5 Medium Bed Mortar: Full strength additives, Granirapid/318 by Mapei Inc., 220/3701 by Laticrete International, or Medium Bed TA372/Acrylbond TA862 by TEC Inc.
- .6 Organic Adhesive: CGSB 71-GP-22M, Type 1.
- .7 Water: Potable and free of minerals and other contaminants which are detrimental to mortar and grout mixes.
- .8 Grout for Joints 3 mm and Less, Unsanded: ANSI A118.6, standard colours, Ker 800 by Mapei Inc., 600 Series by Laticrete, or AccuColour TA620 by TEC Inc.
- .9 Grout for Joints 3 mm and Over, Sanded: ANSI A118.6, standard colours, Ker 200 by Mapei Inc., 500 Series by Laticrete, or AccuColour TA650 by TEC Inc.
- .10 Grout Colours:
 - .1 For Tile Type CT-1: To match Smoke by Flextile.
 - .2 For Tile Types CT-2 and Type-3: To match Beige by Profix.
 - .3 For type Type CT-4: To match Anthracite 16 by Profix.
 - .4 For Slate Tile: To match Foseal by Profix.

2.3 Waterproofing Membrane

- .1 Waterproof Membrane: Polyurethane based, Mapelastic by Mapei Inc., 9235 by Laticrete, or Triple Flex TA324 by TEC Inc.

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- .2 Waterproofing Reinforcement: Woven glass fabric weighing 203 gm/sq.m.

2.4 Accessories

- .1 Joint Backing: Round, closed cell, foam rod, oversized by 30% to 50%, Shore A hardness of 20, tensile strength 140 to 200 kPa.
- .2 Tile Sealant Floor Joints: CAN/CGSB-19.24-M; THC 900 and primer by Tremco Ltd, colour to match adjacent grout.
- .3 Tile Sealant Remainder Of Work: CAN/CGSB-19.22-M; One-part mildew-resistant silicone; standard colours.
 - .1 786 Mildew Resistant Silicone Sealant by Dow Corning Inc.
 - .2 Tremsil 600 silicone sealant by Tremco Ltd.
- .4 Tile Edge Trims: Depths of trims to suit tile installation, by Schluter.
 - .1 Floor tile termination strips: Satin anodized aluminium, Schiene-AE
 - .2 Floor tile transition strips: Satin anodized aluminium, Reno-AEU.
 - .3 Inside wall corner: Vinyl finish, colour to match tile grout, Dilex-EKE.
 - .4 Outside wall corner and wall termination strips: Colour coated aluminium, colour to match tile grout, Jolly-AC.
 - .5 Stair Nosing: Extruded aluminium with slip resistant inserts, Trep-B.

2.5 Mixes

- .1 Levelling Coat, By Volume: 1 part Portland cement, 4 parts sand, and latex additive. Premixed mortar may be used in accordance with manufacturer's instructions.
- .2 Mortar Bed For Floors, By Volume: 1 part Portland cement, 4 parts sand, 1 part water and 1/10 part latex additive. Adjust water volume depending on moisture content of sand to obtain consistency and workability that will allow maximum compaction during tamping of the mortar bed, and achieve a minimum compressive strength of 15 MPa (2000 psi) after 28 days. Premixed mortar may be used in accordance with manufacturer's instructions.

3. EXECUTION

3.1 Examination

- .1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Contract Administrator. Commencement of work means acceptance of existing conditions.

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- .2 Ensure concrete floors are free of sealing and curing compounds.

3.2 Surface Preparation

- .1 Clean and dry surfaces thoroughly. Remove oil, wax, grease, dust, dirt, paint, tar, primers, form release agents, curing compound, and other foreign material from substrate surfaces which may prevent or reduce adhesion.
- .2 Neutralize any trace of strong acids or alkali from the substrate.
- .3 Ensure concrete floors scheduled to receive thin-set applied tile are steel trowelled to a fine broom finish. Ensure concrete slabs have been finished with a maximum permissible variation of 3 mm in 3000 mm (1/8" in 10') from the required plane and not more than 1.6 mm in 300 mm (1/16" in 12") when measured from high points in the surface.
- .4 Ensure concrete floors scheduled to receive tile applied over a bonded mortar bed have been screed finished. Verify substrate surface variation does not exceed 6 mm in 3000 mm (1/4" in 10').
- .5 Apply latex levelling coat as required to provide level and plumb surfaces to receive waterproofing membrane and tile, and to provide slope to drains.
 - .1 Vertical Surfaces: 3 mm in 3000 mm maximum.
 - .2 Horizontal Surfaces: 6 mm in 3000 mm from finished levels of the surface, or better.
 - .3 Slope to Drain: Minimum 2%.
- .6 Seal control joints in accordance with Section 7900 – Joint Sealants.

3.3 General Installation Requirements

- .1 Mix and install thin set mortar, adhesive, and grout components in accordance with manufacturer's recommended proportions and methods, to achieve maximum bond strength.
- .2 Install work to requirements of TTMAC 2006-2007 Specification Guide 093000 Tile Installation Manual.
 - .1 Wall And Floor Tile Expansion And Control Joints: 301MJ-2006.
 - .2 Wall Tile On Masonry Or Concrete – Thin-Set Method: 303W-2006.
 - .3 Floor Tile On Concrete Slab – Thin-Set Method: 311F-2006.
 - .4 Tile On Stairs: 318S-2006.
- .3 Lay out work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter is not less than 1/2 full size.

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- .4 Lay tiles with minimum 95% coverage with setting materials. Ensure corner and edges are fully supported by setting material. Avoid lippage. Set tile in place while mortar is wet and tacky, prior to skinning over.
- .5 Back butter tiles with raised or textured backs in notched straight lines. Lay tile on mortar, slide tile back and forth at 90 degree to the notches.
- .6 Keep two-thirds of the depth of grout joints free of setting material.
- .7 Set tiles in place and rap or beat with a beating block as necessary to ensure a proper bond and to level surface of tile. Align tile for uniform joints and allow to set until firm. Clean excess mortar from surface of tile with a wet cloth or sponge while mortar is fresh.
- .8 Adjust joints between tile uniform, plumb, straight, even, and true, with adjacent tile flush. Align grout joints in both directions unless indicated otherwise.
- .9 Align floor, base, and wall tile grout joints.
- .10 Install tile accessory fittings for a complete and fully coordinated tile assembly.
- .11 Install wall tile full height unless indicated otherwise.
- .12 Cut and fit tile neatly around piping, fittings, projections and around recesses items e.g. washroom accessories. Where surface mounted equipment and accessories are installed on tiled surfaces, extend tile over surfaces. Cut edges smooth, even, and free from chipping; chipped and broken edges are not acceptable.
- .13 Do not proceed with grouting until minimum 48 hours after tile has set, to prevent displacement of tiles.
- .14 Apply grout in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks, and excess grout. Thoroughly compact and tool floor grout. Finish grout flush to edge thickness of tile and remove excess grout with soft burlap or sponge moistened with clean water.
- .15 Provide reducer strips where uneven transitions between 6 mm and 12 mm ($\frac{1}{4}$ " and $\frac{1}{2}$ "") occur. Set trims in mortar.
- .16 Provide appropriately sized edge trims at inside corners, outside corners, exposed edges of tiles, transitions, and terminations. Set trims in mortar.
- .17 Uncoupling Membrane: Trowel apply unmodified bonding mortar to floor substrate with a V-notched trowel. Roll membrane into bonding mortar to achieve full contact. Do not fill dovetail-ribbed channels on underside of matting.

3.4 Waterproofing Membrane

- .1 Prepare substrates for waterproofing in accordance with tile waterproofing manufacturer's written directions and standards.

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- .2 Have work supervised during installation by a qualified representative of the manufacturer supplying the waterproofing materials.
- .3 Conform to manufacturer's instructions for installation of waterproofing system.
- .4 Over levelling coat, apply waterproofing in 2 coat application.
- .5 Reinforce all corners and changes in plane with 150 mm (6') wide strips of reinforcement and a second membrane application to completely seal the fabric. Let dry overnight.
- .6 Recoat membrane with third application of waterproofing paste where required to cover pinholes and any uncovered areas of reinforcement.
- .7 Work membrane carefully around all fixtures, drains and other openings and recesses to provide a complete waterproof seal.
- .8 Extend waterproof membrane over top of curbs and full height of curbs, on both sides.

3.5 Control Joints

- .1 Continue control, construction, and cold joints in the structural substrate up through the tile finish, and align with mortar joints where possible. Review joint locations on-site with the Contract Administrator.
- .2 Install joint widths to match grout joint widths, except where a minimum width is indicated.
- .3 Install control joints in the following typical locations:
 - .1 Aligned over substrate control joints.
 - .2 Aligned over changes in type of substrate.
 - .3 At the restraining perimeters such as walls and columns.
 - .4 Interior areas (not subject to sunlight): 6 mm minimum width, at 4800 mm o.c. maximum.
 - .5 Interior areas (subject to sunlight): 6 mm minimum width, at 3660 mm o.c. maximum.
 - .6 Exterior areas: 10 mm minimum width, at 3660 mm o.c. maximum.
 - .7 As indicated on the Contract Drawings.

3.6 Cleaning

- .1 Clean and polish floor and wall tile after grout has cured in accordance with TTMAC recommendations in the Maintenance Guide; do not use acid for cleaning.

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- .2 Re-point joints after cleaning as required to eliminate imperfections, then re-clean as necessary. Avoid scratching tile surfaces.

3.7 Joint Backing And Tile Sealant

- .1 Install joint backing under sealant as necessary.
- .2 Install tile sealant around piping and fittings extending through tiled surfaces.
- .3 Seal tile control joints.
- .4 Seal internal tile to tile junctions. Tool to a smooth, flush surface, free from air bubbles and contamination.

3.8 Protection

- .1 Prevent traffic over tiled areas, and protect tiled assemblies from weather, freezing, and water immersion, for 72 hours minimum, after final installation.
- .2 Prevent direct impact, vibration and heavy hammering on adjacent and opposite walls for 24 hours minimum, after final installation.

END OF SECTION

ACOUSTICAL CEILINGS

1. GENERAL

1.1 Quality Control

- .1 Installer: Trained and approved by the Manufacturer and having a minimum three (3) years experience in the installation of the work described in this Section and can show evidence of satisfactory completion of projects of similar size, scope and type. If requested, provide letter of certification from manufacturer stating that installer is certified applicator of its products, and is familiar with proper procedures and installation requirements required by the manufacturer.
- .2 Finish Ceiling System: Square with adjoining walls and level within 1:1000, in true plane, free from distorted, warped, soiled or damaged panels or grid.
- .3 Metal Suspension System Standard: Direct-hung metal suspension systems complying with ASTM C635 Intermediate Duty and C636 except as otherwise specified.
- .4 Deflection Limitation, Completed Ceiling: $L/360$ of span maximum deflection.
- .5 Pre-installation Meeting: Two weeks prior to commencing work of this Section, arrange for Manufacturer's technical representative to visit the site and review preparatory and installation procedures to be followed, conditions under which the work will be done, and inspect the surfaces to receive the work of this Section. Advise the Contract Administrator of the date and time of the meeting.
- .6 Manufacturer's Site Inspection: Have the Manufacturer's technical representative inspect the Work at suitable intervals during application and at conclusion of the work of this Section, to ensure the Work is correctly installed. When requested, submit manufacturer's inspection reports and verification that the work of this Section is correctly installed.
- .7 Sample Installation: Construct On-site a 10 x 10 m (30' x 30') minimum sample installation of each type acoustical ceiling. Modify sample installation as often as necessary to obtain Contract Administrator's acceptance. Accepted sample installation may become part of completed Work if undisturbed at time of Substantial Performance.
 - .1 Include electrical and mechanical fixtures in sample installation as directed by Contract Administrator.

1.2 Submittals

- .1 Product Data: For each type of product indicated.
- .2 Samples: For each component indicated and for each exposed finish required and of size indicated below.
 - .1 Acoustical Panel: Duplicate 150 mm (6") square samples of each type, colour, pattern, and texture.

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- .2 Exposed Suspension System Members, Mouldings, and Trim: Duplicate 300 mm (12") long samples of each type, finish, and color.
- .3 Maintenance Data: Submit maintenance instructions for insertion in operations and maintenance manuals, in accordance with Division 1 Sections. Instructions shall give specific warning of maintenance or cleaning practices or materials which may damage installed work. Include data sheets for maintenance products recommended by installer and names, addresses, and telephone numbers of local sources for products.

1.3 Delivery, Storage, and Handling

- .1 Deliver products to Project site in original, unopened packages and store in a fully enclosed, conditioned space, protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- .2 Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- .3 Handle products carefully to avoid chipping edges, bent or other damages.

1.4 Project Conditions

- .1 Do not install work until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.5 Coordination

- .1 Coordinate layout and installation of work of this Section with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.6 Extra Stock

- .1 Provide 2% of each type and colour of materials installed. Store the extra materials at locations as directed by the City. Extra stock shall be of same production run as installed materials. Include cost of extra stock in the Contract Price.

2. PRODUCTS

2.1 Materials

- .1 Acceptable Products: Products specified are products by the manufacturers specified. Products by other manufacturers similar in function, design, performance, and construction complying with requirements of this Section may be incorporated into the Work subject to Contract Administrator's acceptance.

ACOUSTICAL CEILINGS

- .2 Acoustical Panels (ACT): Asbestos free, wet felted mineral fibre, antimicrobial treated to inhibit growth of fungus, mould and mildew, moisture and sag resistant.
- .3 Exposed Main Runner: Hot dipped galvanized steel to ASTM A653/A653M minimum Z90 coating designation, 24 mm ($\frac{15}{16}$ ") exposed face and 38 mm ($1\frac{1}{2}$ ") high, bulb design with double web and separate exposed cap piece, maximum length, with reversible and integral splice. Prefinish runner in baked enamel, standard colour.
- .4 Exposed Cross Runner: Hot dipped galvanized steel to ASTM A653/A653M minimum Z90 coating designation, exposed face to match main runners, 38 mm ($1\frac{1}{2}$ ") high, of same fabrication as main runners, with override stepped ends to allow cross runner flange to sit on main runner flange providing flush exposed faces, and with positive interlock to main runner, grid module to suit acoustical panels. Finish to match main runners.
- .5 Main Runner Splices: Designed to lock lengths of main runners together so that joined lengths of runners function structurally as a single unit with runner faces at joint perfectly aligned and presenting a tight seam.
- .6 Anchors in Concrete: Post-installed carbon steel expansion anchors zinc plated to ASTM B633, with holes or loops for attaching hangers and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing in accordance with ASTM E488 or ASTM E1512 as applicable, conducted by a qualified testing and inspecting agency.
- .7 Wire Hangers, Braces and Ties: ASTM A641/A641M, Class 1 zinc coating, soft temper, minimum 2.6 mm (12 gauge).
- .8 Hanger Rods, Flat and Channel Hangers: Mild steel, zinc coated or protected with rust-inhibitive paint.
- .9 Angle Hangers: Angles with legs not less than 22 mm ($\frac{7}{8}$ ") wide; formed with 1 mm (0.04") thick, galvanized steel sheet to ASTM A653/A653M, Z275 coating designation; with bolted connections and 8 mm ($\frac{5}{16}$ ") diameter bolts.
- .10 Hold-Down Clips: Galvanized steel spring clips, Manufacturer's standard.
- .11 Edge Mouldings and Trim: In profile indicated or, if not indicated, manufacturer's standard mouldings for edges and penetrations that fit acoustical panel edge details and suspension systems; edges hemmed, formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
 - .1 Standard Moulding: Matching width and configuration of exposed runners.

ACOUSTICAL CEILINGS

3. EXECUTION

3.1 Examination

- .1 Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical panel ceilings.
- .2 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation

- .1 Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using border panels of less than half panel width, and comply with layout shown on reflected ceiling plans.

3.3 Installation - Hangers

- .1 Suspend ceiling hangers from building's structural members, independent of walls, pipes, ducts and metal decks.
- .2 Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
- .3 Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
- .4 Where ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers. Size supplemental suspension members and hangers to support ceiling loads within performance limits specified.
- .5 Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or fail due to age, corrosion, vibration or elevated temperatures.
- .6 Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not deteriorate or fail due to age, corrosion, vibration or elevated temperatures.
- .7 Space hangers maximum 1200 mm (48") oc along each runner supported directly from hangers, unless otherwise indicated; provide hangers not more than 150 mm (6") from ends of each runner.

ACOUSTICAL CEILINGS

- .8 Provide additional ceiling suspension hangers within 150 mm (6") of each corner and at maximum 600 mm (24") around perimeter of light fixtures and diffusers.

3.4 Installation – Mouldings and Trims

- .1 Install edge mouldings and trim of type at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
- .2 Screw attach mouldings to substrate at maximum 400 mm (16") centers and not more than 75 mm (3") from ends, levelling with ceiling suspension system to a tolerance of 3 mm in 3600 mm (c" in 12'). Miter corners accurately and connect securely.
- .3 Do not use exposed fasteners, including pop rivets, on mouldings and trim.

3.5 Installation - Runners

- .1 Use longest practical lengths of runners to minimize joints. Make joints square, tight, flush and reinforced with concealed splines. Assemble framework to form a rigid and interlocking system. Remove and replace dented, bent, or kinked members
- .2 Run main runners at right angles to length of light fixtures.
- .3 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

3.6 Installation – Acoustical Panels

- .1 Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge mouldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit. Terminate edges with moulding.
- .2 Square Edged Panels: Install panels with edges fully hidden from view by runner flanges and mouldings.
- .3 Install hold down clips to hold panels tight to grid system within 6000 mm (20'-0") of an exterior door and an operable window, space clips as recommended by panel manufacturer's written instructions.

3.7 Cleaning

- .1 Clean exposed surfaces of acoustical panel ceilings, including trim, edge mouldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touch up of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

RESILIENT FLOORING

1. GENERAL

1.1 Quality Control

- .1 Installer: Trained and approved by the manufacturer and having a minimum three (3) years experience in the installation of the Work described in this Section and can show evidence of satisfactory completion of projects of similar size, scope and type. If requested, provide letter of certification from manufacturer stating that installer is certified applicator of its products, and is familiar with proper procedures and installation requirements required by the manufacturer.
- .2 Maintenance Seminars: Provide, to the City, training seminars and recommendations on Product maintenance procedures.
- .3 Pre-Installation Meeting: Two weeks prior to commencing Work of this Section, arrange for Manufacturer's technical representative to visit the Site and review preparatory and installation procedures to be followed, conditions under which the Work will be done, and inspect the surfaces to receive the Work of this Section. Advise the Contract Administrator of the date and time of the meeting.
- .4 Manufacturer's Site Inspection: Have the Manufacturer's technical representative inspect the Work at suitable intervals during application and at conclusion of the Work of this Section, to ensure the Work is correctly installed. When requested, submit manufacturer's inspection reports and verification that the Work of this Section is correctly installed.
- .5 Source Limitations: Obtain each type of product from a single manufacturer.
- .6 Products: Provide like products from same production run. Install products in sequence from sequentially numbered dye lots.
- .7 Testing of Sub-Floors: Test floors that have been cured for minimum 28 days, and after preparation for Product installation is complete. Conduct testing simultaneously on floors free of sealer, curing compounds, oil, grease and other agents detrimental to the test and the Product performance, and in strict conformance with test kit manufacturer's written instructions. Locate test sites to cover representative installation areas. Do not proceed with Work when the test results do not conform to the specified allowable.
 - .1 Moisture Vapour Emission, Slabs On Grade: Test floors to ASTM F1869 using anhydrous calcium chloride method. Provide 3 test sites for floor area up to 93 m² (1000 ft²), add one test site for each additional 93 m² (1000 ft²) or fraction thereof.
 - .1 Sheet Linoleum and Vinyl Flooring: Maximum moisture content of 1.36 kg/93 m² (3 lbs/1000 ft²) per twenty four (24) hour.
 - .2 Alkalinity: Acceptable range of 5 to 9 on the pH scale. Test floors using distilled water and pH paper. Provide 6 test sites for floor area up to 93 sq.m. (1000 ft²), add 2 test site for each additional 93 m² (1000 ft²) or fraction thereof.

RESILIENT FLOORING

1.2 Submittals

- .1 Product Data: For each type of product indicated.
- .2 Samples: Duplicate samples:
 - .1 Heat-Welding Bead: Minimum 250 mm (10") long, of each color required.
- .3 Heat-Welded Seam Samples: For each flooring product and welding bead color and pattern combination required; with seam running lengthwise and in center of 150 mm x 250 mm (6" x 10) sample applied to a rigid backing and prepared by installer for this Project.
- .4 Maintenance Data: For floor coverings to include in maintenance manuals.

1.3 Delivery, Storage, And Handling

- .1 Store floor coverings and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 10°C or more than 32°C. Store rolls upright.

1.4 Project Conditions

- .1 Maintain temperatures within range recommended by manufacturer, but not less than 21°C or more than 29°C, in spaces to receive floor tile during the following time periods:
 - .1 48 hours before installation.
 - .2 During installation.
 - .3 48 hours after installation.
- .2 After post installation period, maintain temperatures within range recommended by manufacturer, but not less than 13°C or more than 35°C.
- .3 Close spaces to traffic during floor covering installation.
- .4 Close spaces to traffic for forty eight (48) hours after floor covering installation.
- .5 Install floor coverings after other finishing operations, including painting, have been completed.

1.5 Extra Materials

- .1 At commencement of Work of this Section, provide 2% of each type and colour of materials installed, neatly packaged in original containers, and clearly marked to identify Manufacturer's name, product name, colour, and pattern. Store the extra stock at locations as directed by the City. Extra stock shall be of same production run as installed materials. Include cost of extra stock in the Contract Price.

RESILIENT FLOORING

2. PRODUCTS

2.1 Resilient Flooring

- .1 Sheet Flooring, Vinyl: ASTM F1913, vinyl, 2.0 mm (0.080") thick, Eminent 3101 090 by Tarkett, heat welded seams.
- .2 Sheet Flooring, Linoleum: ASTM F2034, 2.5 mm (0.080"), heat welded seams.
 - .1 LINO-1: Marmoleum Real Bold Topshield 3202 Wine Barrel by Forbo.
 - .2 LINO-2: Marmoleum Real Authentic Topshield 3048 Graphite by Forbo.
 - .3 LINO-3: Marmorette 19092 Sand by Armstrong.
- .3 Resilient Base: 100 mm (4") high, 3 mm (1/8") thick, coved, coil stock, including premoulded end stops and external corners for coved base only.
 - .1 Type 1: Rubber, 194 by Amtico.
 - .2 Type 2: Rubber, 29 Moonrock by Johnsonite.

2.2 Installation Materials

- .1 Trowellable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by floor covering manufacturer for applications indicated.
- .2 Adhesives: Water-resistant type recommended by manufacturer to suit floor covering and substrate conditions indicated.
- .3 Heat Welding Bead: Solid-strand product of floor covering manufacturer.
 - .1 Color: As selected by Contract Administrator from manufacturer's full range to match floor covering.
- .4 Metal Edge Strips: Extruded aluminium with mill finish of width shown, of height required to protect exposed edges of floor coverings, and in maximum available lengths to minimize running joints.

3. EXECUTION

3.1 Examination

- .1 Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.
 - .1 Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor coverings.

RESILIENT FLOORING

- .2 Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Preparation

- .1 Prepare substrates in accordance with Manufacturer's written recommendations to ensure adhesion of floor coverings.
- .2 Remove substrate coatings and other substances that are incompatible with floor covering adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- .3 Use trowellable levelling and patching compound to fill cracks, holes, and depressions in substrates.
- .4 Move floor coverings and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
 - .1 Do not install floor coverings until they are same temperature as space where they are to be installed.
- .5 Sweep and vacuum clean substrates to be covered by floor coverings immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 Installation – Resilient Sheet Flooring

- .1 Unroll sheet floorings and allow them to stabilize before cutting and fitting.
- .2 Lay out vinyl floorings as follows:
 - .1 Maintain uniformity of floor covering direction.
 - .2 Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 150 mm (6") away from parallel joints in floor covering substrates.
 - .3 Match edges of floor coverings for color shading at seams.
 - .4 Avoid cross seams.
- .3 Scribe and cut floor coverings to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- .4 Extend floor coverings into toe spaces, door reveals, closets, and similar openings.
- .5 Maintain reference markers, holes, or openings that are in place or marked for future cutting by repeating on floor coverings as marked on substrates. Use chalk or other nonpermanent marking device.

RESILIENT FLOORING

- .6 Install floor coverings on covers for telephone and electrical ducts and similar items in installation areas. Maintain overall continuity of color and pattern with pieces of floor coverings installed on covers. Tightly adhere floor covering edges to substrates that abut covers and to cover perimeters.
- .7 Adhere floor coverings to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.
- .8 Heat-Welded Seams: Comply with ASTM F1516. Rout joints and use welding bead to permanently fuse sections into a continuous floor covering. Prepare, weld, and finish seams to produce surfaces flush with adjoining floor covering surfaces.

3.4 Installation – Resilient Base

- .1 Lay out base to keep number of joints at minimum. Base joints at maximum length available or at internal or premoulded corners.
- .2 Set base in adhesive tightly by using hand roller, against wall and floor surfaces.
- .3 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.
- .4 Cope internal corners. Use premoulded corner units for right angle external corners. Miter base for external corners of other angles. Wrap around toeless base at external corners.

3.5 Clearing And Protection

- .1 Perform the following operations immediately after completing floor covering installation:
 - .1 Remove adhesive and other blemishes from floor covering surfaces.
 - .2 Sweep and vacuum floor coverings thoroughly.
 - .3 Damp-mop floor coverings to remove marks and soil.
 - .1 Do not wash floor coverings until after time period recommended by manufacturer.
- .2 Protect floor coverings from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.
 - .1 Apply protective floor polish to surfaces that are free from soil, visible adhesive, and blemishes if recommended in writing by Manufacturer.
 - .2 Cover floor coverings with undyed, untreated building paper and ½” plywood protection sheets remove just prior to Substantial Performance.

RESILIENT FLOORING

- .3 Do not move heavy and sharp objects directly over floor coverings. Place plywood or hardboard panels over floor coverings and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION

CARPET TILES

1. GENERAL

1.1 Quality Control

- .1 Installer: Trained and approved by the manufacturer and having a minimum three (3) years experience in the installation of the Work described in this Section and can show evidence of satisfactory completion of projects of similar size, scope and type. If requested, provide letter of certification from manufacturer stating that installer is certified applicator of its products, and is familiar with proper procedures and installation requirements required by the Manufacturer.
- .2 Maintenance Seminars: Provide, to the City, training seminars and recommendations on product maintenance procedures.
- .3 Pre-Installation Meeting: Two (2) weeks prior to commencing Work of this Section, arrange for Manufacturer's technical representative to visit the Site and review preparatory and installation procedures to be followed, conditions under which the Work will be done, and inspect the surfaces to receive the Work of this Section. Advise the Contract Administrator of the date and time of the meeting.
- .4 Manufacturer's Site Inspection: Have the Manufacturer's technical representative inspect the Work at suitable intervals during application and at conclusion of the Work of this Section, to ensure the Work is correctly installed. When requested, submit Manufacturer's inspection reports and verification that the Work of this Section is correctly installed.
- .5 Source Limitations: Obtain each type of product from a single manufacturer.
- .6 Products: Provide like products from same production run. Install products in sequence from sequentially numbered dye lots.
- .7 Testing of Concrete Floors: Test floors that have been cured for minimum 28 days, and after preparation for product installation is complete. Conduct testing simultaneously on floors free of sealer, curing compounds, oil, grease and other agents detrimental to the test and the product performance, and in strict conformance with test kit Manufacturer's written instructions. Locate test sites to cover representative installation areas. Do not proceed with Work when the test results do not conform to the specified allowable.
 - .1 Alkalinity: Acceptable range of 5 to 9 on the pH scale. Test floors using distilled water and pH paper. Provide 6 test sites for floor area up to 93m² (1000 ft²), add 2 test site for each additional 93 m² (1000 ft²) or fraction thereof.

1.2 Submittals

- .1 Submit Shop Drawings showing proposed layout of seams and locations of edge strips for review before proceeding.
- .2 Submit four full size pieces of each type of carpet tiles, and full 300 mm (12" long carpet base for review.
- .3 Submit four 300 mm (12") long samples of edge strip.

CARPET TILES

- .4 Submit written certification from carpet manufacturer, stating that carpet furnished has been manufactured in accordance with these Specifications.
- .5 Submit three (3) copies of maintenance and cleaning instructions at the completion of Work. Instructions shall give specific warning of any maintenance or cleaning practice, or materials, which may damage or disfigure the carpet.

1.3 Waste Material Reclamation/Recycling

- .1 Collect, package and store carpet cut-offs and waste material for recycling in accordance with manufacturer's reclamation program. Include coat in the Contract Price.
- .2 Submittals:
 - .1 Manufacturer's description of reclamation and recycling process to recycle recovered carpets.
 - .2 Information on recycling carpet and indicate which portions of carpet are recyclable.
 - .3 Evidence that removed carpet has been transferred to Manufacturer's reclamation program.

1.4 Extra Stock

- .1 Provide 5% of uncut materials of each type and colour of carpet installed. Store the extra materials at locations as directed by the City. Extra stock shall be of same production run as installed materials. Include cost of extra stock in the Contract Price.

1.5 Sample Installation

- .1 Provide a 3 m x 3 m (10' X 10') representative sample installation of Work of this Section on Site at location directed by Contract Administrator to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation. Remove rejected sample installation and provide additional sample installations until acceptance is given. Do not commence Work until sample installation has been accepted. Accepted sample installation may form part of the completed Work if undisturbed at time of Substantial Performance.
 - .1 Acceptance of sample installations does not constitute approval of deviations from the Contract Documents contained in sample installations unless such deviations are specifically approved by Contract Administrator in writing.

2. PRODUCTS

2.1 Materials

- .1 Specified Product: Work of this Section is based on products specified. Products by other manufacturers similar in function, design, performance, and construction complying with requirements of this Section may be incorporated into the Work subject to Contract Administrator's acceptance.

CARPET TILES

- .2 Carpet Tiles: Haiku 02127, colour Oolong 23017 by C&A Floorcoverings.
- .3 Antimicrobial Treatment: AATCC 174, 99% reduction, 0% growth; incorporated into the backing laminate to inhibit the growth of fungi, mould and mildew.
- .4 Carpet Tile Adhesives and Primers: As recommended by the carpet manufacturer, pressure sensitive, non-flammable and non-water soluble when dry.
- .5 Base Cap: Vinyl, solid colour selected by Contract Administrator.
- .6 Edge Mouldings: Type acceptable to carpet manufacturer, Nap Lock Pinless by Ben Gard, silver finish.
- .7 Sub-Floor Filler and Levelling Compound: White premix latex requiring water only to produce cementitious paste.

2.2 Fabrication

- .1 Carpet Base: Bind carpet top edges with matching colour binding.

3. EXECUTION

3.1 Preparation

- .1 Examine the substrate over which Work is to be installed. Report unacceptable Work immediately. Do not commence Work until defects have been corrected.
- .2 Surfaces to receive Work shall be dry and clean. Examine concrete for evidence of excessive carbonation and dusting.
- .3 Remove oil, grease, paint, sealers and other material detrimental to installation.
- .4 If a curing membrane has been used on the concrete, ascertain its compatibility with the adhesive and subfloor filler. If incompatible, remove it by approved methods.
- .5 Grind ridges and high spots smooth and flush, fill and level cracks and depressions with subfloor filler.
- .6 Vacuum substrates prior to carpet installation.
- .7 Maintain material and ambient temperature at minimum 15°C for twenty four (24) hours before, during, and after installation.

3.2 Installation - General

- .1 Install carpet after other finishing Sections have completed their Work.
- .2 For large areas, commence installation near centre of area and work outward.
- .3 Instruct other Sections as to clearances at the bottom of door frames and elsewhere as required for proper carpet installation.

CARPET TILES

- .4 Where carpet is joined or stopped at doorways, locate the seam or edge moulding, as applicable, under the door in its closed position.
- .5 Neatly scribe and cut carpet at adjacent vertical surfaces and around appurtenances occurring in the floor.
- .6 Install carpet into access and cleanout covers where such are provided with a recess to receive floor finish materials.
- .7 Ensure that single and continuous areas are carpeted with material of the same dye batch. Ensure that any apparent direction of pile or pattern is the same on all widths.
- .8 Completed Work: Flat and even, free of ripples, air bubbles, and other defects.
- .9 Butter cut edges during installation with liquid latex to prevent unravelling.
- .10 Provide carpet edge moulding where carpet meets other floor finish unless otherwise indicated.
- .11 Make cuts from back, using template for fitting around columns or at room perimeter.
- .12 Restrict traffic during installation. Upon completion of installation, do not allow traffic or movement of furniture onto carpet surface until installed area has been anchored at perimeter.

3.3 Installation – Carpet Tile

- .1 Install carpet tiles to achieve monolithic or quarter turn appearance as directed by Contract Administrator.
- .2 Commence Work in centre of area. Accurately lay chalk lines in the length and width of area.
- .3 Lay row of control tiles in adhesive along centre lines accurately and firmly in selected quadrant, in straight lines and square corners. Lay additional tiles within quadrant by stair-step technique.
- .4 Measure areas to ensure tight installation. Measure over 11 tiles to attain cumulative space gained over 10 joints. The gain must not be greater than 6 mm. Utilize this method in continual check of installation.
- .5 Frequently check tile joints for proper alignment. Do not install tiles that are out of true more than 1.5 mm.
- .6 Avoid excessive pressure on joining tiles causing tiles to peak or buckle. Brush back face pile and tip tile into place to avoid any pile being caught in joint.
- .7 Lay last whole tile closest to wall and perimeter cut tiles in adhesive. Accurately cut and tightly fit perimeter cut tiles against vertical fixed surface such as wall.

CARPET TILES

3.4 Installation - Carpet Base

- .1 Install carpet base with adhesive at locations shown or scheduled, including columns in carpeted areas scheduled to receive carpet base.
- .2 Provide continuous vinyl edge cap moulding at top of surface mounted carpet base. At recessed carpet base, provide bound edge only where carpet edge will be exposed in the completed installation.
- .3 Wrap carpet base around external corner and ensure that no joint occurs within 300 mm (12") of corner.
- .4 Cut and butt carpet at internal corner and ensure that no other joint occurs within 300 mm (12") of corner.
- .5 Ensure that no gaps or voids occur behind carpet base or cap moulding.

3.5 Cleaning

- .1 On completion of installation, vacuum clean all carpeted areas.
- .2 Clean and make good to the approval of the Contract Administrator surfaces soiled or otherwise damaged in connection with the Work of this Section. Pay the costs of replacing finishes that cannot be satisfactorily cleaned.

3.6 Warranty

- .1 Warrant the Work of this Section against defects in materials and workmanship for a period of five (5) years commencing from date of Substantial Performance. Defects shall include but not be limited to, shrinkage, excessive colour fading, unravelling, failure of adhesive bond, and a loss of more than 5% surface pile in any given area.

END OF SECTION

WALL COVERINGS

1. GENERAL

1.1 Quality Control

- .1 **Installer:** Trained and approved by the manufacturer and having a minimum three (3) years experience in the installation of the work described in this Section and can show evidence of satisfactory completion of projects of similar size, scope and type. If requested, provide letter of certification from manufacturer stating that installer is certified applicator of its products, and is familiar with proper procedures and installation requirements required by the manufacturer.
- .2 **Maintenance Seminars:** Provide, to the City, training seminars and recommendations on Product maintenance procedures.
- .3 **Pre-Installation Meeting:** Two weeks prior to commencing work of this Section, arrange for manufacturer's technical representative to visit the site and review preparatory and installation procedures to be followed, conditions under which the work will be done, and inspect the surfaces to receive the work of this Section. Advise the Contract Administrator of the date and time of the meeting.
- .4 **Source Limitations:** Obtain each type of product from a single manufacturer.
- .5 **Products:** Provide like Products from same production run. Install products in sequence from sequentially numbered dye lots.

1.2 Submittals

- .1 **Samples:** Three 200 mm x 300 mm (8" x 12") samples of each wall covering material.
- .2 **Maintenance Data:** Printed Manufacturer's maintenance instructions giving specific warnings of maintenance practices of substances, which may stain or otherwise damage the wall coverings.

1.3 Sample Installation

- .1 Apply each type of covering to a sample area on the project and obtain the approval of the Contract Administrator of such applications before proceeding. Locations of sample areas shall be as directed by the Contract Administrator.
- .2 Sample areas shall be full height, floor-to-ceiling, and shall include one outside corner and one covering material joint.
- .3 Promptly revise or replace coverings on sample areas at no additional cost to the City until approval of the Contract Administrator is obtained. The approved sample area installations shall be the standard for acceptance of the remaining work.

WALL COVERINGS

1.4 Storage

- .1 Store materials with manufacturer's seals and labels intact. Store materials flat in clean, dry storage area at temperatures over 10°C and normal humidity.

1.5 Project Conditions

- .1 Environmental Limitations: Do not commence work until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- .2 Lighting: Do not commence work until a lighting level of not less than 160 lux (15 fc) is provided on the surfaces to receive wall covering.
- .3 Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall covering manufacturer for full drying or curing.

1.6 Extra Stock

- .1 Provide minimum 2% of each type and colour of wall covering materials in unopened full rolls, and accessories installed. Store the extra materials at locations as directed by the City. Extra stock shall be of same production run as installed materials.
- .2 Include cost of extra stock in the Contract Price.

2. PRODUCTS

2.1 Materials

- .1 Wall Covering: Class A flame spread rating tested to ASTM E84, Vertical Pattern Silicate by Rogers. Standard colour.
- .2 Adhesive: Mildew resistant, nonstaining, strippable adhesive, for use with specific wall covering and substrate application, as recommended in writing by wall covering manufacturer.
- .3 Primer/Sealer: Mildew resistant primer/sealer, and recommended in writing by wall covering manufacturer for intended substrate.

3. EXECUTION

3.1 Inspection

- .1 Examine areas, which are to receive the work of this Section and proceed only if conditions are satisfactory. Report unsuitable substrates. Do not commence work until defects are corrected.

WALL COVERINGS

- .2 Substrates shall be smooth, dry, free of dust and dirt.

3.2 Preparation

- .1 Remove wall covering materials from packaging and acclimatize materials in the installation areas not less than twenty four (24) hours before installation.
- .2 Test surfaces for moisture and alkali content prior to application of wall covering. Moisture content shall be less than 4%. Neutralize and seal surfaces in accordance with manufacturer's directions.
- .3 Where substrate has been painted, apply a thin coat of adhesive over substrate and allow to dry for one hour.
- .4 Comply with manufacturer's written instructions for surface preparation.
- .5 Clean substrates of substances that could impair wall covering's bond, including mould, mildew, oil, grease, incompatible primers, dirt, and dust.
- .6 Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.
- .7 Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

3.3 Installation

- .1 Apply wall covering vertically in accordance with manufacturer's instructions free from tears, ripples or air pockets. Horizontal joints are not permitted except upon specific, written approval of the Contract Administrator.
- .2 Take special care to prevent grit, dirt, or other extraneous matter from being imbedded beneath the wall covering.
- .3 Spread adhesive in a uniform coat to back of material and apply material to wall within time recommended by adhesive manufacturer. Thoroughly wash excessive adhesive off material and adjacent surfaces as application progresses.
- .4 Maintain seams vertically straight without overlaps or gaps. Do not use strips narrower than 300 mm (12").
- .5 Do not make any joints within 75 mm (3") of an inside corner and 150 mm (6") of an outside corner when applying to two adjoining walls with same material.
- .6 On gypsum board construction, avoid scoring gypsum board face by using a metal strip cutting base.
- .7 Apply covering so that it will not cove or pull away from inside corners. Return fabric into peripheral reveals or recesses.

WALL COVERINGS

- .8 Neatly and carefully trim around fixtures, door frames and the like.
- .9 Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

3.4 Patching

- .1 Perform cutting, fitting and patching of wall covering material as required to accommodate fixtures, and other appurtenances occurring in surfaces to receive coverings.

END OF SECTION

FINISH PAINTING

1. GENERAL

1.1 Quality Control/Submittals

- .1 Perform painting Work by applicator with minimum five (5) years of proven, satisfactory and successful painting experience on projects of similar size and nature. Provide qualified crew of painters and full time review of Work by qualified supervisor for duration of Work.
- .2 Submit in writing list of proposed materials prepared by paint manufacturer, for approval at least sixty (60) days before materials are required. List shall bear Manufacturer's official certification that materials listed meet or exceed requirements specified herein. List shall contain following for record:
 - .1 Manufacturer's product number and application instructions
 - .2 Finish formula
 - .3 Product type
 - .4 CGSB number
 - .5 Colour number
 - .6 Maximum VOC classification
 - .7 Ecologo certification where applicable
- .3 Samples: Submit at least fifteen (15) days prior to painting Work commencing at the Site (and resubmit until approved), two identified (with Project Name, the finish, colour name and number, sheen and gloss values) samples of the following:
 - .1 Each specified colour in each specified finish coat material on minimum 150 mm x 300 mm coated stock card
 - .2 Each natural wood finish on minimum 150 mm x 300 mm samples of each specified wood species to receive the finish
- .4 Have the paint Manufacturer's representative visit Site prior to the commencement of painting operation to discuss painting and finishing procedures to be used, to analyze surface conditions, and to propose alternative recommendations should adverse conditions exist.
- .5 Have the paint Manufacturer visit Site at intervals during surface preparation and painting operations to ensure that proper surface preparation is performed, specified paint products are being used, proper number of coats are being applied, agreed finishing procedures are being used.

FINISH PAINTING

- .6 Product Manufacturer's Approval of Surfaces To Be Painted: Submit, prior to painting Work commencing, letters signed by the respective manufacturer(s) of products to be used stating that the representative has examined the various surfaces prior to application and that the surfaces and the environmental conditions are suitable to receive the specified finishes.
- .7 Product Manufacturer's Certification of Paint Application: Submit, on completion of painting, a letter or letters, signed by the respective Manufacturer(s) of products, stating that a Manufacturer's representative has inspected (at intervals) the preparation of surfaces and the application of paint products and that paint products have been applied satisfactorily and to the required coverage.

1.2 Environmental Requirements

- .1 Comply with requirements of WHMIS regarding use, handling, storage, and disposal of hazardous materials; and material safety data sheets acceptable to Ministry of Labour.
- .2 Provide paint products certified to meet the requirements of the Environmental Choice Program, Department of the Environment. Provide CSA Certification Reports that products proposed for use are certified under the Environmental Choice Program. Water based paints to be certified to ECP-07-89. Solvent based paints to be certified to ECP-12-89.
- .3 Arrange for ventilation system to be operated during application of paint. Ventilate area of Work by use of approved portable supply and exhaust fans. Provide continuous ventilation during and after application of paint. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of application of paint. Apply paint finishes only when temperature at location of installation can be satisfactorily maintained within Manufacturer's recommendations. Substrate and ambient temperature shall be within limits prescribed by Manufacturer.
- .4 Maintain minimum interior temperature of 18°C (65°F) during application and drying of paint and maintain until building occupancy occurs. Do not undertake exterior painting if air and surface temperature are expected to fall below 10°C (50°F) before coating has dried. Avoid painting during winds, weather conditions which may affect paint application or following rain. Wait until frost, dew, or condensation has evaporated.
- .5 Provide heating to maintain minimum temperatures recommended by Manufacturers.
- .6 Apply paint finish only in areas where dust is no longer being generated by related construction operations such that airborne particles will not affect the quality of the finished surface. Apply paint only when surface to be painted is dry, properly cured and adequately prepared.
- .7 Protect floors of storage areas by means of tarpaulins and metal pans.
- .8 Provide a fully charged, ULC 10:BC rated, 9 kg carbon dioxide fire extinguisher immediately adjacent to the storage area for the entire time materials are stored in the area.
- .9 Deposit waste rags in metal containers with tight fitting metal lids and remove from the building at the end of each working shift.

FINISH PAINTING

- .10 Keep solvents for brush and roller cleaning in tightly sealed containers when not in use. Do not allow brushes and rollers to stand in solvents in open containers overnight.

1.3 Painting And Finishing Work Standards

- .1 The best practices specified or recommended in CAN/CGSB-85.100 are to govern for painting methods and procedures, unless specified otherwise in this Section.

1.4 Colour Selections

- .1 The Contract Administrator will issue a schedule indicating colour(s), gloss value, and sheen. Colour may be selected from the lines of up to 3 manufacturers and an unlimited number of colours and gloss and sheen.

1.5 Extra Stock

- .1 At date of Substantial Performance, supply and deliver to a designated storage area at the Site, sealed, original, fresh containers of each paint and finish product applied, and in each colour, all labelled as specified in this Section.
- .2 Supply one litre of extra stock for products for which less than 45 litres were used, 4 litres of extra stock when from 45 to 180 litres were used, and 10 litres of extra stock when in excess of 180 litres were used.

2. PRODUCTS

2.1 Painting, Finishing And Coating Products

- .1 Unless otherwise specified, painting and protective coating products are specified in Part 3 of this Section and are the products of ICI/Glidden.
- .2 Painting and protective coating products fully equivalent to the ICI/Glidden products specified and supplied by the following manufacturers are acceptable:
 - .1 Sherwin Williams
 - .2 Benjamin Moore
 - .3 Pittsburgh Paints
- .3 Finishing products such as oils or putties not specified in this Section are to be premium quality and as recommended by the manufacturer of the paint or finish product it is associated with.
- .4 Unless otherwise specified, paint is to be ready-mixed. Where Site mixing is required for certain products, mix in strict accordance with the manufacturer's instructions to produce smooth flowing materials with an easy-brushing consistency.

FINISH PAINTING

- .5 Gloss value will be determined in accordance with ASTM D523, Tentative Method of Test For 60 Deg. Specular Gloss. Gloss values for terminology specified are as follows:
 - .1 Flat - less than 8
 - .2 Eggshell - 25 to 35
 - .3 Semi-gloss - 45 to 55
 - .4 Gloss - in excess of 85
- .6 On walls no defects shall be visible from a distance of 1000 mm at 90 degree to surface. On ceilings no defects shall be visible from floor to surface when viewed using final lighting source. Final coat shall exhibit uniformity of colour and uniformity of sheen across full surface area.
- .7 Paint Colours:
 - .1 Colour 1: To match 589 Sorrel by ICI.
 - .2 Colour 2: To match 744 LA Place by ICI.
 - .3 Colour 3: To match 749 Belicourt Castle by ICI.
 - .4 Colour 4: To match 797 Moonstone by ICI.
 - .5 Colour 5: To match 876 Wellington by ICI.
 - .6 Colour 6: To match 887 White Amber by ICI.
 - .7 Colour 7: To match 2013 White High-Hiding RM by ICI.
 - .8 Colour 8: To match SW4012 Platinum Grey by Sherwin Williams.

3. EXECUTION

3.1 Examination of Substrate

- .1 Examine surfaces to receive paint or protective coating to ensure that they are in the proper condition to be painted or coated. Commencement of painting and protective coating Work will be interpreted as acceptance of the surface to receive the Work. Correction of defective painting or protective coating Work resulting from application to unsatisfactory surfaces will be the responsibility of the painting contractor.

3.2 Special Conditions

- .1 Post "No Smoking" signs and ensure that spark-proof electrical equipment is used in areas where flammable painting products are applied or stored.

FINISH PAINTING

- .2 Post "Wet Paint" signs throughout freshly finished areas and remove when finishes are dry.
- .3 Prohibit traffic where possible, from areas where painting is being carried out until paint is cured.
- .4 Provide adequate ventilation. Where building is occupied, provide necessary air barrier to prevent fumes from entering occupied areas.
- .5 Prior to the application of special finishes, arrange for a meeting at the Site with the Contract Administrator and a representative of the special finishes manufacturers to discuss the condition of surfaces to receive painting, special finish, and application procedures.

3.3 Protection

- .1 Cover or mask surfaces adjacent to those receiving treatment and finishing to protect the Work of others from damage and soil. Mask instruction and specification plates and controls attached to equipment being painted.
- .2 Take particular care in storage and mixing areas to ensure that tarpaulins and metal pans protect floors.
- .3 Coordinate with the appropriate trades for the removal from finished surfaces, storage and reinstallation after finish Work is completed of finish hardware, switch and receptacle plates, escutcheons, luminaire frames and similar items.

3.4 Preparation of Surfaces

- .1 General
 - .1 Vacuum clean areas inside the building(s) immediately prior to commencing finishing work.
 - .2 Scrub mildewed surfaces with a solution of trisodium phosphate, bleach with a solution of one part sodium hydrochlorite (Javex) to three parts water, and rinse with clear water.
 - .3 Arrange for finishing hardware, electrical plates, accessories, and similar removable fittings on surfaces to be finished to be removed. Mask any other Work that is not removable.
 - .4 Prepare surfaces to be painted or coated such that the surfaces are thoroughly dry and free of chemicals, mortar splatters, organic matter, oil, grease, rust, scale, loose paint, and any other material, and such that the surfaces are in a proper condition to receive paint, stain, or other specified coating.
- .2 Cleaning Procedures:
 - .1 Surface preparation methods shall remove any contaminant that will interfere with full adhesion of protective painting and coating systems. Level of cleaning shall be based

FINISH PAINTING

- on Steel Structures Painting Council's (SSPC), recommended designations of metal cleaning procedures specified.
- .2 SSPC-SP1 (Solvent Cleaning): Use of solvents (such as mineral spirits, xylene, toluene) or cleaning action to remove oil, grease, and soil drawing and cutting compounds or similar solvent soluble contaminants. Do not use gasoline or benzene.
 - .3 SSPC-SP2 (Hand Tool Cleaning for mild exposure conditions): Use of scrapers, sandpaper, wire brushing or hand impact tools to remove loose mill scale, non-adherent rust and scaling paint or other foreign matter. Do not use hand tool cleaning procedure for areas subject to corrosive environment or on surfaces for vinyl chloride top coating. Remove weld flux and spatter to avoid localized paint failure.
 - .4 SSPC-SP3 (Power Tool Cleaning for use under severe exposure conditions or immersion applications): Use power sanders and wire brushes, impact tools, grinders and power chipping hammers to remove loose mill scale, loose rust, paint or other foreign matter. Do not allow excessive power tool cleaning.
 - .5 SSPC-SP5 (White Metal Blast Cleaning): Use when protective coating or environment is such that no rust, mill scale or other foreign matter can be tolerated on steel surface. Prime cleaned surfaces before any rusting occurs.
 - .6 SSPC-SP6 (Commercial Blast Cleaning): Use for moderate exposure conditions where high but not perfect degree of blast cleaning is required. Prime blast cleaned surfaces as soon as possible.
 - .7 SSPC-SP7 (Brush-Off Blast Cleaning): Use for ordinary exposure where environment is mild to permit tight mill scale, paint, and minor amounts of rust to remain on surface. An effective means to clean rusty galvanized metal siding and old finishes in poor condition.
- .3 Perform surface preparation work as follows:
- .1 Shop Finished Metal Work: SSPC-SP1, SSPC-SP2, or SSPC-SP3 as required.
 - .2 Shop Prime Coated Carbon Steel: SSPC-SP1, SSPC-SP2, or SSPC-SP3 as required.
 - .3 Shop Prime Coated Cast Iron and Centrifugally Cast Ductile Iron: SSPC-SP6.
 - .4 Non-Prime Coated Carbon Steel: SSPC-SP1 using Oakite 31 or equal, SSPC-SP2, or SSPC-SP3 as required.
 - .5 Non-Prime Coated Cast Iron and Centrifugally Cast Ductile Iron - SSPC-SP6.
 - .6 Submerged Carbon Steel, Black or Galvanized: SSPC-SP1 using Oakite 31 or equal, SSPC-SP2 or SSPC-SP3 as required.
 - .7 Submerged Cast Iron or Centrifugally Cast Ductile Iron: SSPC-SP6.

FINISH PAINTING

- .8 Galvanized Metal and Aluminium Above Grade: SSPC-SP1 using Oakite 31 or equal, and CGSB-85-GP-16.
- .9 Cut Surfaces of Field Cut Galvanized Metal: SSPC-SP3.
- .10 Copper - SSPC-SP1.
- .11 Bitumen or Tar Coated Surfaces - SSPC-SP1 and SSPC-SP2 as required.
- .12 Surfaces Subjected to High Heat Condition (140 Degrees C and Up): SSPC-SP5.
- .13 Plastic Surfaces, Including PVC - SSPC-SP1 and SSPC-SP2 as required.
- .14 Interior Concrete Block, Poured and/or Precast Concrete: CGSB-85-GP-31.
- .15 Canvas Insulation Jacket: SSPC-1.
- .16 Cement Board: CGSB 85-GP-33.
- .17 Aluminium, Stainless Steel, And Carbon Steel Underground: In accordance with paint or coating manufacturer's recommendations.
- .18 Ferrous Metal: Solvent clean to SSPC-SP1. Remove loose rust and prime bare metal with rust inhibitive steel primer. Touch-up damaged shop applied primer using compatible product. Provide full coat primer only if damage is extensive. Treat all weld areas with phosphoric acid (5% solution).
- .19 Structural Steel/Miscellaneous Steel (Previously Painted And Exposed By Alterations Work): Remove oil, grease, dirt, rust scale, loose mill scale, loose paint or coating by brush-off blast cleaning to SSPC-SP7 or by water blasting at minimum 215.4 kPa/sq cm (200 psi) at minimum flow rate of 0.25 l/sec (4 gal/min).
- .20 Metal Stacks, Breeching, and Piping: Blast clean to 37-50 µm (1.5-2 mil) profile using grit abrasive to SSPC-SP6.
- .21 Aluminium: On exterior products, allow to weather for 4 to 6 weeks and high-pressure steam or solvent wash to remove surface contamination. Remove thin oxide film or corrosion by power cleaning or hand clean such as sanding or scraping. For interior application, solvent clean to SSPC-SP1 to remove oil, grease, dirt, oxides and other foreign material.
- .22 Galvanized Steel (weathered): Remove dust, dirt, grease, oxides and other foreign material and clean to SSPC-SP1 prior to coating.
- .23 Hot Dipped Galvanized Steel (unweathered): Allow to weather minimum of 26 weeks and Xylene clean to SSPC-SP1 prior to coating to remove dust, dirt, grease, oxides and other foreign material. Remove silicates or similar surface treatments or any deposits of white rust by sanding or similar abrasive methods (bronze wool). Use of acetic acid to prepare galvanized surfaces is not acceptable.

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- .24 Woodwork for Painting: Seal all knots and sapwood in surfaces to receive paint with alcohol-based primer-sealer. Sand smooth rough surfaces of all woodwork to be finished and clean surfaces free of dust before applying first coat. Fill nail holes, splits and scratches with non-shrinking filler after first coat are dry. Remove salt deposits that may appear on wood surfaces treated with fire retarder.
- .25 Woodwork for Clear Finish or Stain: Sand smooth all woodwork to be finished and clean surfaces free of dust before applying first coat. Abrade surfaces with stiff brush to remove loose fibres and splinters. Fill nail holes, splits, and scratches with non-shrinking filler tinted to match local grain condition after first coat is dry. Sand lightly between coats with No. 220 sandpaper and remove dust. Remove salt deposits that may appear on wood surfaces treated with fire retarder.
- .26 Plastic (PVC): Solvent clean to SSPC SP1. Sand lightly with No. 120 sandpaper and remove dust.
- .27 Concrete Horizontal Surfaces: If concrete is less than 26 weeks old or has been previously painted, clean surface and etch with muriatic acid with extenders. Rinse out etching compound with clean water and tri-sodium-phosphate (TSP) to neutralize acidity of surface (pH 6.5-7.5). Rinse out with clean water 2 to 3 times and allow to dry. Verify that moisture content is less than 12% before proceeding with painting.
- .28 Concrete Vertical Surfaces: Use sand blasting, high pressure water blasting, high pressure water blasting with abrasives, vacuum blasting with abrasives or alternatively, needle guns or power grinders equipped with suitable grinding stone, to remove concrete, loose mortar, fins, projections and surface contaminants. Vacuum or blow down and remove dust and loose particles from surface.
- .29 Concrete Floors: Prepare in accordance with CGSB 85-GP-32M.
- .30 Concrete Block Masonry: Fill voids and cracks in masonry block wall to provide uniform surface for subsequent coats.
- .31 Gypsum Board: Examine surfaces after for imperfections showing through and fill small nicks or holes with patching compound and sand smooth. Examine surfaces after priming for imperfections showing through. Clean surfaces dry, free of dust, dirt, powdery residue, grease, oil, wax or any other contaminants. Sand and dust as necessary prior to painting.

3.5 General Application of Paint and Finishes

- .1 Verify by review of other Sections of this Specification, the extent of surfaces primed as part of the Work of other Sections, and include for priming of unprimed surfaces which are scheduled or specified to be painted.
- .2 Back prime fitments and similar Work as soon as it is delivered and before it is installed. Use exterior primer compatible with the finish coat for exterior Work, and enamel undercoat for interior Work to receive paint or enamel finishes. Prevent primer from running over faces.

FINISH PAINTING

- .3 Unless otherwise specified, apply paint by brush or rollers. Spray paint ceilings and exposed areas above the ceiling only when requested or approved by the Contract Administrator, and in other areas only when restricted to access and approved by the Contract Administrator. Discontinue spraying if prohibited by the Contract Administrator, because of inadequate coverage, overspray, paint fog drift, or disturbance to other Work.
- .4 Use only brushes for enamels for painting wood.
- .5 Provide finish uniform in sheen, colour, and texture, free from streaks, shiners and brush or roller marks or other defects. Apply materials in accordance with manufacturer' directions and specifications. Do not use adulterants.
- .6 Finishes and number of coats specified hereinafter in Finish Schedule are intended as minimum requirements guide only. Refer to Manufacturer's recommendations for exact instructions for thickness of coating to obtain optimum coverage and appearance. Some materials and colours may require additional coats and deeper colours may require use of Manufacturers' special tinted primers. Unless otherwise specified, provide three coats finish as minimum finish. Obtain colour chart giving colour schemes and gloss value for various areas from City. Colour chart shall give final selection of colours and surface textures of all finishes, and whether finishes are transparent (natural) or opaque (paint).
- .7 Advise when each applied paint coat can be inspected. Do not recoat without inspection. Tint each coat slightly to differentiate between applied coats. Sand smooth enamel and varnish undercoats prior to recoating. Apply primer coat soon after surface preparation is completed to prevent contamination of substrate.
- .8 Read Mechanical and Electrical Specifications for instruction on painting Mechanical and Electrical work and perform such work under supervision of respective Mechanical and Electrical Divisions. Finish paint primed mechanical equipment: heaters, convectors, radiators, wall fin perimeter induction units, fan coil units, and similar items. Prime and paint exposed, unfinished electrical raceways, fittings, outlet boxes, junction boxes, pull boxes, and similar items. Keep sprinkler heads free of paint. Take steps to protect gauges, identification plates, and similar items from being painted over or paint splattered. Remove grilles, covers, and access panels for mechanical and electrical systems from installed location and paint separately, if these items are not factory finished, paint Work to match surfaces they are seen against unless directed otherwise. Paint interior surfaces of air ducts visible through grilles and louvres, with 1 coat of flat black metal paint to limit of sight line.
- .9 Maintain at the Site at all times until the Work is completed, a moisture meter, hygrometer, and thermometer to verify surface and environmental conditions.
- .10 Perform painting and coating Work under supervision of an experienced foreman using clean equipment designed for the purpose used.
- .11 Unless otherwise specified, follow the specific instructions of the Manufacturer(s) of the products used.

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- .12 Apply finishing products to provide full coverage at a rate not to exceed that stated by the Manufacturer for applicable surface, free from perceptible defects, and with even colour, sheen, and texture. Vary the tone of each coat slightly to permit supervision identity.
- .13 Make clean, true junctions with no overlap between adjoining applications of finish coatings.
- .14 Leave all parts of mouldings and ornaments clean and true to details with no undue amount of coating in corners and depressions.
- .15 Use products of a single manufacturer in each coating application.
- .16 Apply each coat only after the preceding coat is dry and hard, or as otherwise directed by the product manufacturer.
- .17 Sand wood and metal surfaces lightly with No. 00 sandpaper between coats.
- .18 Use paint or finish thinners only where specified or directed by the paint manufacturer.
- .19 Apply paint and coatings only when the ambient temperature and the temperature of the surface to be painted exceed 4.4°C, except for materials and locations listed below where ambient and surface temperatures must exceed the temperatures stated:
 - .1 Latex paint for surfaces inside the building - 7°C.
 - .2 Latex paint for surfaces outside the building - 10°C.
 - .3 Enamels for all surfaces - 21°C.
- .20 Do not:
 - .1 Apply finishes in direct sunlight that raises surface temperature above that required for proper application and drying.
 - .2 Apply exterior finishes in rainy, foggy or windy weather.
 - .3 Apply exterior finishes when relative humidity exceeds 85%, when condensation has formed or is likely to form on the surface, nor immediately following rain, frost, or formation of dew.
 - .4 Apply finishes when dust is being raised.
 - .5 Apply finishes to cement board products, pipe and/or duct and/or equipment insulation, concrete or masonry surfaces that contain in excess of 12% moisture, or to wood products that contain in excess of 15% moisture except where the wood product would normally contain in excess of 15% moisture.
- .21 Paint the following items:
 - .1 Areas and surfaces indicated to be painted on finish schedules.

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- .2 Areas and surfaces indicated to be painted on detail drawings.
- .3 Exposed exterior and interior ferrous metal (black or galvanized steel, cast and ductile iron), including structural steel, miscellaneous metal work, hollow metal doors and frames, flashing, hangers and supports.
- .4 Concealed or exposed ferrous metal (black or galvanized) built into or fixed to dissimilar materials inside or outside building(s).
- .5 Exterior and interior wood surfaces where indicated.
- .6 Interior surfaces of poured concrete where indicated.
- .7 Interior faces of concrete block masonry Work.
- .8 All existing surfaces disturbed by work of this contract or contractor's forces
- .9 Prime paint as minimum walls etc. before installing electrical panels.
- .22 Unless otherwise specified, DO NOT apply paint or finish to the following:
 - .1 Finishing hardware.
 - .2 Equipment nameplates and other such identification.
 - .3 Switch, receptacle and other electrical device faceplates except if constructed of prime coat painted or galvanized steel, in which case they are to be painted.
 - .4 Lighting fixtures.
 - .5 Stainless steel.
 - .6 Chrome plated surfaces, and polished or lacquered brass or bronze surfaces.
 - .7 Underground piping and accessories.
 - .8 Surfaces factory coated with baked epoxy or enamel.
 - .9 Plastic laminate surfaces.
 - .10 Ceramic tile products, glazed or unglazed, including quarry tile.
 - .11 Manhole and catch basin covers.
 - .12 Covers or strainers associated with floor drains, cleanout terminations, and similar equipment.
 - .13 Recessed electrical boxes and similar recessed equipment unless they are not prime coat painted or galvanized.

FINISH PAINTING

- .14 Piping, ductwork, conduit and similar mechanical and electrical materials where concealed inside building(s) (except steel and copper pipe).
- .15 Exterior poured concrete and masonry surfaces.
- .16 Valve handles.
- .17 Control panels.
- .18 Circuit breakers, switches, receptacles, and similar electrical devices.
- .19 Caulked joints.
- .20 Prefinished sheet metal flashing.
- .21 Prefinished exterior wall louvres.
- .22 Prefinished exterior metal soffit.

3.6 Paint Formula:

- .1 Apply paint to surfaces with the following:
 - .1 Shop Finished Metal Work: Paint, unless otherwise specified, all shop finished metal cabinets, panels, equipment, machinery and similar items with one coat of semi-gloss alkyd melamine thermosetting metal finishing enamel or a similar semi-gloss thermosetting or air dried enamel approved by the Contract Administrator. Paint colour of electrical components, unless otherwise specified, is to be white to CGSB-513-201 with all paint from the same batch to ensure a uniform colour throughout. The Engineer from CGSB Standard Paint Colours, Section 5, 1-GP-12C, will select Colour(s) for all other equipment. Standard shop colours will not be acceptable unless approved in writing by the Contract Administrator.
 - .2 Metal Surfaces Designated for High Heat Condition:
 - .1 One coat Catha-Coat 304 Ethyl-Silicate Inorganic Zinc at 1.5 to 2.5 mils DFT.
 - .2 Two coats Devoe HT-10 Modified Silicone High Heat Coating at 1.0 mils DFT.
 - .3 Concrete Block and Poured Concrete Inside Building:
 - .1 One coat Glidden Ultra Block # 36250.
 - .2 Two coats DevGuard 4308 Alkyd Industrial Gloss Enamel at 1.5 to 2.0 mils DFT.
 - .4 Wood, Including Plywood for Paint Finish:
 - .1 One coat Glidden Alkyd Enamel Undercoat # 9431 at 1.0 to 1.5 mils DFT.

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- .2 Two coats DevGuard 4308 Alkyd Industrial Gloss Enamel at 1.5 to 2.0 mils DFT.
- .5 Interior Gypsum Board:
 - .1 One prime coat Glidden Ultra Latex Sealer # 36600 at 1.0 to 1.5 mils DFT.
 - .2 Two finish coats Glidden Ultra Latex Eggshell # 94900 at 1.0 to 2.0 mils DFT.
- .6 Wood Benches and Worktops:
 - .1 One coat of Glidden Interior / Exterior Spar Varnish at 1.0 to 1.5 mils DFT.
 - .2 One coat of Glidden Interior / Exterior Spar Varnish at 1.0 to 1.5 mils DFT.

3.7 Painting Cut and Patched Existing Painted Surfaces

- .1 Paint the entire plane of existing painted surfaces in which patching occurs to match the colour of adjacent similar surfaces. Do not paint existing adjacent walls which have not been patched unless specified otherwise.
- .2 Sand edges of the patched areas. Remove existing loose paint in previously painted areas and sand paint edges smooth.

3.8 Adjustment and Cleaning

- .1 Touch up and refinish minor defective Work. Refinish the entire surface where the finish is damaged or not acceptable, including areas exhibiting incomplete or unsatisfactory coverage. Patching will not be permitted.
- .2 Remove spilled or splattered finish materials from surfaces of Work performed under other Sections. Do not mar surfaces while removing.
- .3 Clean and make good surfaces soiled or otherwise damaged in connection with work of this Section. Pay the cost of replacing finishes or components that cannot be satisfactorily cleaned.
- .4 Upon completion, remove masking and clean adjacent surfaces free of over spray spatters, drips, smears and over spray.

3.9 Disposal of Paint Waste

- .1 Be responsible for removal and disposal of material and waste generated by this Section.
- .2 Remove empty and partly used containers from Site and recycle or dispose of as Hazardous Waste in accordance with local municipal, provincial, and federal environmental regulations. Provide proof of such action in form of receipts of tipping fees, disposal fees, or bills of lading, as applicable.

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- .3 Remove from Site peripheral items, such as clean up solvents, paintbrushes, rags, and similar items and dispose of where necessary in accordance with local municipal, provincial, and federal environmental regulations.
- .4 Do not rinse off of latex paints from brushes and rags under running water tap. While Work is ongoing, whether using latex or alkyd products, rinse off all brushes and rags in container with appropriate solvent (water or paint thinner). Leave such container in well-lit and well-ventilated area, away from any flammable conditions. Dispose of emulsion created in accordance with local municipal, provincial, and federal environmental regulations.
- .5 Wipe or drain clean empty containers. Allow remaining film to dry before disposal. Recycle metal containers and dispose of containers which are not recyclable. Ensure non-recyclable containers are acceptable to disposal recipient authority.
- .6 Dispose paint that cannot be recycled as hazardous waste. Generators of Hazardous Waste shall be registered and disposal shall be in accordance with regulations of authorities. When handling coating materials, approved vapour/particulate respirator shall be worn as protection from solvent vapours; dust respirators are not acceptable.
- .7 Remove cleanup solvents and recycle if possible.
- .8 Treat non-recyclable thinners and paint sludge as hazardous waste.

3.10 Warranty

- .1 Warrant Work against defects in material and quality of performance for a period of two (2) years.

END OF SECTION