
1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C475/C475M - 12, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
 - .2 ASTM C631 - 09, Standard Specification for Bonding Compounds for Interior Gypsum Plastering
 - .3 ASTM C645 - 11a, Standard Specification for Nonstructural Steel Framing Members
 - .4 ASTM C754 - 11, Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products
 - .5 ASTM C840 - 11, Standard Specification for Application and Finishing of Gypsum Board
 - .6 ASTM C843 - 99(2012), Standard Specification for Application of Gypsum Veneer Plaster
 - .7 ASTM C954 - 11, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033" (0.84 mm) to 0.112" (2.84 mm) in Thickness
 - .8 ASTM C1047 - 10a, Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
 - .9 ASTM C1178/C1178M - 11, Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel
 - .10 ASTM C1396/C1396M - 11, Standard Specification for Gypsum Board
 - .11 ASTM D1056 - 07, Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
 - .12 ASTM E119 - 12a, Standard Test Methods for Fire Tests of Building Construction and Materials
- .3 Gypsum Association (GA)
 - .1 GA-214-10, Recommended levels Gypsum Board Finish
- .4 South Air Quality Management District, California State (SCAQMD)
 - .1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications
- .5 UL-Underwriters' Laboratories/ULC-Underwriters' Laboratories of Canada (UL/ULC)
 - .1 CAN/ULC-S101-07-EN, Standard Methods of Fire Endurance Tests of Building Construction and Materials

1.2 Design Criteria

- .1 Maximum deflection to avoid cracking of panels, joints and applied finishes: 1/360th of span (ceilings) and 1/240th of span (partitions).
- .2 Fire resistance: as per code requirements, standards mentioned below and the **drawings**.

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- .3 Partitions to carry a load of 195 kg/m² uniformly distributed, for wall mounted cabinets and shelves.
 - .4 Non-suspended ceilings: supporting elements (stud partitions) as indicated – not designed to support weight of someone walking over it.
 - .5 Comply with NBC Section 4.1.10.3 (Loads on walls acting as Guards) for all wall areas adjacent to a floor level above ground level – See **drawings**.

1.3 Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
- .2 **Shop drawings:**
 - .1 Submit shop drawings of all ceilings, including all disciplines' work. Show clearly ceiling suspension location and details.
 - .2 Show location of control and and other required joints whether they are indicated or not on **drawings**.

1.4 Delivery, Handling and Storage

- .1 Deliver materials to job site in good condition, uniform shape and size, in original wrapping bearing name and trade mark of manufacturer.
- .2 Store under waterproof cover on pallets or plank platforms held off the ground by means of plank or timber skids, protected from the sun rays and contamination due to corrosion or other damage from work on site, and in such a manner as to avoid deflection.
- .3 Handle with care, avoiding chipping of edges or any damage to the boards.

1.5 Environmental Requirements

- .1 Maintain a uniform temperature during the installation of gypsum board, between 13°C and 21°C.
- .2 Provide sufficient ventilation to eliminate excess humidity.
- .3 Wherever necessary, erect sealed dust screens to limit propagation of dust in the immediate work area. Seal off grilles, diffusers and other openings.

1.6 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 Interior Steel Stud System, Galvanized, Regular

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- .1 **System:** as per CAN/CGSB-7.1 and ASTM C645.
 - .2 **Channel stud framing:** in "U", "ST" studs, depths as shown on drawings, roll formed from galvanized steel of min. 0.455 mm (26 ga for partitions lower than 3000mm) or 0.836 mm (20 ga for partitions higher than 3000mm and for all partitions supporting moisture resistant gypsum board) base metal thickness, or more, as required according to heights shown, with flanges minimum 40 mm wide, or as indicated on drawings; hot-dipped galvanized finish; studs must be conceived as to allow the fixation of gypsum boards with screws and must knock out service holes at 406 mm between axes, or as indicated.
 - .3 **Top and bottom channel tracks:** in widths to suit stud size, with 63.5 mm high flanges or as indicated; base metal thickness and finish as the studs, or as indicated. Where integral coved bases are called for either in resilient flooring or special flooring, provide 141 mm high flanges.
 - .4 **Top tracks for deflection:** similar to regular tracks with perforated flanges of 63.5 mm, allowing a vertical movement of 25 mm; width as needed.
 - .5 **Metal furring:** same finish and material as studs, 22 mm deep, 0.455 mm (26 ga) or 0.836 mm (20 ga) base metal thickness, or as indicated, galvanized steel channels for screw attachment of gypsum board.
 - .6 **Metal furring, resilient:** same material and finish as the stud framing, 12.7 mm deep, 0.455 mm (26 ga) base metal thickness, galvanized steel resilient channel, coated with rust inhibitive coating.
 - .7 **Reinforcing for steel stud system, galvanized:** stiffeners in metal channels or other forms, size to suit installation, 1.367 mm (16 ga) base metal thickness, or as indicated, or as required, made of the same material as the studs, with the same galvanized finish.
 - .8 **Backer plates for steel stud system, galvanized:** plates of appropriate dimensions, 1.367 mm (16 ga) base metal thickness, or as indicated or required, made of the same material as the studs, with the same galvanized finish.

2.2 Steel Stud System for Shaftwalls, Galvanized

- .1 **Channel stud framing in "CH":** similar to, but with special shape to accept shaftwall gypsum panels, as indicated.

2.3 Suspension System for Gypsum Ceilings, Standard

- .1 **Cold roll runner channels:** 38 mm high, 12.7 mm wide, of 1.367 mm (16 ga) base metal thickness, or as indicated.
 - .2 **Channel stud framing:** Steel Stud System above.
 - .3 **Furring channels:** Steel Stud System above.
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- .4 **Hangers:** galvanized soft annealed steel wire, with minimum 3.51 mm (10 ga) diameter.

2.4 Board Material

- .1 **Gypsum board, fire-resistive:** as per ASTM C1396/C1396M, fire-resistive (Type X) 16 mm thick 1220 mm or 1370 mm wide x maximum practical length, ends square cut, edges tapered, for general use.
- .2 **Gypsum board:** as per ASTM C1396/C1396M, 16 mm and 13mm thick 1220 mm or 1370 mm wide x maximum practical length, ends square cut, edges tapered, for general use.
- .3 **Gypsum board for shaftwalls, fire-resistive:** as per ASTM C1396/C1396M, 25.4 mm thick, 610 mm wide by maximum practical length, ends square cut.
- .4 **High moisture and mold resistant gypsum board, fire-resistive:** composed of a proprietary glass fibre treated gypsum core integrally bonded to a smooth metallic fibreglass mat surfacing on both sides, as per ASTM C1177/C1177M and C1396/C1396M, fire-resistive (Type X) 16 mm thick, 1220 mm wide by maximum practical length, ends square cut, edges tapered; for use in humid areas.

2.5 Fasteners

- .1 **Fasteners for drywall work:** nails, screws and staples, as per ASTM C954; flat head counter-sunk screws, with anti-corrosion coating and anti-pull ribs in the case of lightweight concrete panels.
- .2 **Fasteners for metal furrings and other elements, interior:** masonry anchors, galvanized, with countersunk heads, of appropriate length, penetrating at least 38 mm into the concrete.

2.6 Adhesives

- .1 Adhesives shall respect the VOC limits of maximum 250 g/L as established by SCAQMD Rule 1168 and be exempt of urea formaldehyde.
- .2 **All-purpose adhesive for construction:** polyurethane based adhesive, of high bonding strength, or based on other ecological products, without solvent.
- .3 **Adhesive for plaster work:** a vinyl acetate homopolymer emulsion, as per ASTM C631.

2.7 Accessories

- .1 **Corner and casing beads:** outside and inside corners and "L" , "J" trims, as per ASTM C1047 and QQ-S-775-d, type 1, grade "e", in 0.5 mm base metal thickness commercial grade sheet steel, galvanized finish, with paper trims, as indicated, and perforated flanges and with corners coated with a protection coating, or in high impact resistant copolymer, with high quality, dense fibre paper face and self-adhesive joint tape back, or in prepainted aluminum. Select as required.
- .2 **Expansion joint:** zinc moulding as per ASTM C1047, creating a 6.4mm joint, opening protected

by removable plastic tape, length 3048mm, zinc exceeding ASTM B69. Finish as per manufacturer's recommendations. Provide expansion joints every 9 m maximum, unless otherwise specified. Refer to the plans for any particular location.

- .3 **Architectural Z Shadow Bead** : Made from rust proof, dent resistant PVC meeting ASTM specifications D3678, D1784, C1047 and achieving a Class A rating for flame spread and smoke developed when tested under ASTM E84. Creates sharp reveal edges when butting to the wood column, beam, bridging, deck and other finished interior architectural wood components. Dimensions as per **drawings** and as per adjacent gypsum board.
- .4 **Gypsum plaster**: as per ASTM C475, asbestos-free, regular joint compound, for general use (27 kg packages). **Light type compound (23 kg) is prohibited.**
- .5 **Gypsum plaster, chemically set**: as per ASTM C475, asbestos-free, plastering and joint compound, with 1-2 hr setting time and very high bonding quality.
- .6 **Joint tape, regular, twill fibre**: cross-fibre paper tape, for general use with all gypsum board, except as indicated.
- .7 Sealants: **Section 07 92 00.**
- .8 Fire and smoke protection : See **Section 07 80 00.**

2.8 Protective wall panelling

- .1 Interior wall surface protection system : Vinyl / Acrylic wall protection system with components tested to Canadian Required CAN/ULC S102.2, "Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies" with results listed below:
 - 1. Flame spread: 10
 - 2. Smoke developed: 45
- .2 Thickness: 1.02mm
- .3 Size and profile: 1220 mm X 3050 mm (vertical joints at 3050 mm minimum)
- .4 Impact strength: as per: ASTM F476
- .5 Chemical and stain resistance: as per ASTM D543
- .6 Colour: Solid colour White, texture : Suede

2.9 Protective wall panelling Accessories

- .1 All components: adhesive, caulk and all trim (vertical joint trim, inside and outside corners trim) must be provide by the same manufacturer as a complete package.
- .2 Compatibility of color: provide wall protections components that are color and texture matched.

3.0 EXECUTION

3.1 General

- .1 Installation to comply with best practices of the trade, to the manufacturers' recommendations and

as per ASTM C754 and C840.

- .2 Provide for all fastenings and bracings required by applicable codes and standards for ceilings to resist applicable seismic forces for the zone pertinent to the project.
- .3 Condition drywall board to the ambient temperature of work, prior to installation for **4 days**, or as per manufacturer's instructions.
- .4 Do not start work before all uncertainties are clarified. Do not install drywall board prior to approval of all bucks, anchors, blocking and electrical and mechanical installations.
- .5 Allow tolerances for structural deflection, to prevent transmission of structural loads to studs. Coordinate with **Structure**.
- .6 Determine the location of control joints before erecting the studs - See **control joints, construction and other joints** below. Cut joints clean at junctions with existing surfaces or dissimilar materials. Install a backer rod and seal with caulking (see **Section 07 92 00**).
- .7 Cutting and installation of drywall board around penetrations through partitions of all mechanical and electrical services as well as structural elements shall be accurate and executed with precision to provide uniform 6 mm wide joints and permit proper application of backer rod and caulking of joints for complete seal-up. Review all **Mechanical** and **Electrical drawings** to be conversant with all equipment that goes through gypsum board partitions and ceilings, if any, and make provision for installation of sealant. Also, provide for structural deflection. All joints shall be caulked on both sides of partitions with caulking compound (see Sections **07 80 00** and **07 92 00**).
- .8 When power tools are used for cutting boards, they should be of low velocity type and be equipped with a sealed dust collecting device to avoid spreading of dust.
- .9 Extend drywall partitions to underside of structure and apply sealant where indicated.
- .10 At junctions with door frames and vision panels, perform work so that walls maintain uniform thickness.
- .11 Coordinate with other Sections for built-ins or surface mounted items, such as door frames, electrical panels, lighting fixtures, mechanical services, access panels, service panels, accessories, fire hose cabinets as well as for sealing against air and smoke passage, etc. Provide adequate reinforcing and support for such items. Refer to **details**.
- .12 Wherever a fire-resistance is called for on drawings or as per code requirements, provide assemblies with materials that comply with ASTM E119 and CAN/ULC-S101 and acceptable to the authorities having jurisdiction.
- .13 Install all trims and accessories related to the work of this Section, whether shown on drawings or not.
- .14 Coordinate with the Departmental Representative to foresee easily removable modules in partitions and ceiling for late installation of large size equipment, as indicated.

- .15 Install shaftwall system as indicated, if applicable.

3.2 Metal Stud and Furring Installation

- .1 Align partition tracks at floor and ceiling and secure at 600 mm o.c. maximum, or less to prevent cracking.
- .2 Install studs vertically at about 406 mm spacing, or as indicated, taking into account the spacing to leave between boards, according to their type.
- .3 Studs should not be at more than 50 mm from abutting walls, and at each side of openings and corners.
- .4 Cross brace steel studs to provide rigid installation as required.
- .5 Brace adequately those partitions which do not reach the underside of the structure, extending studs to the structure if necessary.
- .6 Erect metal studding plumb and level, to a tolerance of 1:1200.
- .7 Attach studs to bottom tracks and horizontal bracings using screws. Do not attach studs permanently to top track where partitions are carried up to the underside of the structure, the steel deck or the concrete slab. Do not leave in place temporary attachments.
- .8 Do not pierce the top of steel deck ribs at roof level.
- .9 Provide stiffeners at each row of studs at each 1220 mm of height and at 150 mm below the structure, or as required. Provide stiffeners, as indicated.
- .10 Coordinate with Sections **06 20 00**, **06 40 00** and others for the installation of backer plates at top and bottom of wall hung cabinets or other elements, as well as at other locations, if any.
- .11 Provide adequate backer plates secured between studs for attachment of fixtures, trims, accessories, hardware (such as doorstop), and electrical/mechanical equipment, etc., as indicated or required. See **details**. Refer also to **Mechanical** and **Electrical** drawings for additional requirements, etc.
- .12 When partitions are carried to underside of structure, or where indicated, use 64 mm or larger leg interlocking or simple tracks, or deflection tracks, as indicated. Provide clearance for deflections, minimum 20 mm or as indicated. Coordinate with **Structure**. See **details**.
- .13 Ensure simultaneous erection of studs with installation of service lines. When erecting studs, ensure web openings are lining up.
- .14 Ensure simultaneous erection of studs with installation of door/vision panel frames and special supports or anchorage for work specified in other Sections as well as wall mounted mechanical and electrical items.

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- .15 Provide two studs face to face, extending from floor to ceiling or structure, as indicated, at door jambs and all openings wider than regular stud spacing. Secure studs together, using column clips or other approved method of fastening placed alongside frame anchor clips.
 - .16 Erect track at door/vision panel head or at sills of sidelight/vision panels, return grilles, and where required to accommodate intermediate studs. Reinforce tracks at the head of double or heavy doors, or large opening with a horizontally placed stud. 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.
 - .17 Frame or furr openings 100 mm x 100 mm or greater, and around access and service plates, etc. on four sides. Extend framing or furring into reveals. Check clearances with equipment suppliers. Leave 12.7 mm clearance around ducts, etc.
 - .18 Furr duct shafts, beams, columns, pipes and exposed services where indicated.
 - .19 Install electrical boxes staggered when specified on both sides of partitions. Install vapour proof electrical boxes and seal perimeter to make them air-tight in exterior walls and to improve acoustical efficiency of partitions walls.
 - .20 Install resilient furring where indicated.
 - .21 Provide flat sheet strips to close underside of steel deck flutes, to fix top channel tracks properly.

3.3 Suspended and Furred Ceilings and Bulkheads

- .1 Coordinate with **Structure, Mechanical and Electrical** and adapt installation as required.
- .2 Do not erect ceiling suspension system until work above ceiling has been reviewed by the Departmental Representative, especially air diffusers, lighting fixtures, sprinkler heads, etc. Connection and sealing of air diffuser collars to ductwork above ceiling must be completed prior to installation of all gypsum board installation.
- .3 Install work level to tolerance of 1:1200.
- .4 Install bulkheads using same steel stud system as for partitions (c/c distance, base metal thickness, size as required), or as indicated.
- .5 Erect hangers and runner channels for suspended gypsum board ceilings at 1220 mm maximum spacing and furring at 406 mm except if indicated otherwise. Or, install the "T" grid as recommended by the manufacturer.
- .6 Double the supporting elements, with independent suspension, at the ceiling control joints, leaving a 12.7 mm space between them.
- .7 Provide, in both directions, additional "T"s or runner channels and ceiling suspension hangers around light fixtures, diffusers and other openings, within 152 mm of each corner, except

otherwise indicated. Provide additional hangers for fixtures and equipment as per seismic resistance requirements.

- .8 Suspension shall be fixed to the structure, and not to equipment or other surfaces, nor bent around them. A trapeze, composed of steel angles 32 mm x 32 mm back to back, or a similar device, should be used when the regular suspension grid is obstructed.
- .9 Unless otherwise indicated, frame with furring channels perimeter of openings for access panels, light fixtures, diffusers, grilles, and other openings, as required, and install all components supplied by others as indicated on drawings.
- .10 Furr out or provide stud support for gypsum board faced vertical bulkheads within or at termination of ceilings.
- .11 Frame above suspended ceilings for fire resistive gypsum board in firestopping assemblies, as indicated.
- .12 Install perimeter reveal trims of suspended ceilings as specified and as indicated.
- .13 Install shaft wall construction on ducts as indicated.
- .14 Install all accessories and supports as indicated on **drawings**.
- .15 Install acoustic insulators on the suspension system and accessories according to the procedures recommended by the manufacturer, for review by the Departmental Representative.

3.4 Board Application

- .1 Unless otherwise indicated, use single or double layers of gypsum board of maximum size and fix to metal framing on each stud, using screw fasteners, at maximum 305 mm o.c. vertically, or less as per manufacturer's recommendations, and as per stud spacing horizontally.
- .2 Ensure that fasteners are installed not closer than 10 mm from board edges, or the opposite edge of the stud behind the panel.
- .3 Install wall panels vertically to reduce butting joints.
- .4 When double layers are indicated, the backer boards may be of "utility" category of the same type as the exterior layer.
- .5 Stagger joints when panels are superimposed or applied in double layers.
- .6 Do not install electrical or communication boxes back to back, but stagger them by 460 mm minimum.
- .7 Except as indicated otherwise, abut the boards against each other on four sides, without forcing them;

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- .8 Leave a gap of 6 mm below the panels at floor level, at the junction of adjacent concrete or steel surfaces, or at integral bases applied on separate boards. See **details**.
 - .9 Ensure that the boards and the vertical joints between the boards are supported by continuous metal elements, adequately fixed, except at the junction with the structure, the steel deck, or the concrete slab above.
 - .10 Avoid joints along door frames or other openings in walls or ceilings. These joints should be at least 305 mm from the frames, in all directions.
 - .11 Joints between boards on one face or the other of the partitions must coincide with different studs.
 - .12 Finish neatly all openings and internal and external angles, and all extremities at junctions with other surfaces, with all necessary corner and casing beads and other mouldings and accessories and joint compound. In general, do not use exposed "J" or "L" trims; use only concealed casing or corner beads, fully embedded in joint compound. Use single length piece per location as much as possible and make sure it does not happen on tapered edges or is not deeper than the gypsum board. See article "**Joint and Surface Treatment**" below.
 - .13 Install "Z" trims between board and exposed structural elements as per drawings.
 - .14 Erect "J" or "L" trims straight, plumb or level, rigid and at proper location. Use full length material where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure, using contact adhesive for full length.
 - .15 Wherever fixtures or appliances are installed or recessed into fire resistant partitions, such fixtures or appliances must be enclosed all around by drywall enclosures of equal fire resistance to the construction in which they are located. Coordinate with **Mechanical** and **Electrical**.
 - .16 Extend partitions to suspended ceiling height, approximately 152 mm beyond, or to the structural slab or to the steel deck, according to **details**.
 - .17 Maintain clearance under structural elements to avoid transmission of structural loads to studs.
 - .18 Install trims and build bases to receive special coved flooring as indicated.

3.5 Joint and Surface Treatment

- .1 Tape and fill all drywall board joints below and above suspended ceiling, up to structure, and execute to Level 4 or Level 5 (high quality) finish, below and 150 mm above the ceiling, as per ASTM C840 and GA-214 of the Gypsum Association, and according to the following prescriptions:
 - .1 Level 4: for flat (GL.1) and velvety (GL.2) paints (ceilings, and where indicated on walls).
 - .2 Level 5: for semi-gloss (GL.5) and glossy (GL.6 or higher) paints and special coatings, and for gypsum substrates without a paper face, and where light is intense.
- .2 Prepare surfaces to receive plaster as per ASTM C843, where indicated.
- .3 Ensure backer sheets, screeds, beads and accessories are in place and conduits, pipes, cables

and outlets are properly plugged, capped or covered before commencing work.

- .4 Do not apply reinforcing tape or sheet, or plaster, on stainless steel elements.
- .5 Before applying joint compound on substrates other than those with facings of paper or composite materials containing paper, or on gypsum or plaster surfaces to be repaired, prepare the surface with bonding agent, punctually (at joints, corners, fastener heads and accessories) or entirely, according to the finish level chosen.
- .6 Fill the joints between the panels with three (3) layers of a joint compound and seal with a joint tape, embedded in the first layer of joint compound.
- .7 In case of Level 5 finish, mix joint compound slightly thinner than for joint taping, and apply a thin coat to entire gypsum surface using trowel or drywall broad knife to fill surface texture differences, and remove variations and tool marks.
- .8 Install 250 mm long joint tapes at 45°, perpendicular to the diagonals, at all corners of openings larger than 100 mm x 100 mm (corners of doors, windows and recessed items, which shall be reinforced as described **above**) and at all changes of width or depth, to avoid cracking. Install these tapes before applying the trims.
- .9 Install corner beads and other trim with joint compound, cover them with two additional layers, and feather out onto panel faces, using the products for joint treatment appropriate for the type of boards installed.
- .10 Fill screw head depressions with joint compound and taping to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed. Apply the same joint compound used for the second and third layers of the board joint treatment, to fill screw heads.
- .11 Apply the same joint compound used for the second and third layers of joint treatment of boards, at junctions of dissimilar materials (metal/block or gypsum), as indicated; feather out the joint compound at the edges of plates and frames of doors and of mechanical and electrical elements recessed in walls and ceilings, which will receive special coatings.
- .12 Always allow one layer of joint compound to dry or set completely before applying the subsequent layer.
- .13 Remove ridges and other imperfections by light sanding or wiping with damp cloth to make the surface smooth. Do not sand adjacent surfaces.
- .14 Changes in the thickness due to joint treatment must not be perceivable.
- .15 Completed installation to be level or plumb, free from waves and other defects and ready to receive the finish (paint, special coating or other finishes).
- .16 Ensure no trace of plaster or other remnants remain on metal surfaces.

3.6 Control, Construction and Other Joints

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- .1 At control, construction and other types of joints ensure that two studs are installed, back to back, with a 12.7 mm space between them, as required above, and that the transversal elements including top and bottom tracks are also interrupted.
 - .2 At the ceilings ensure that the boards on the two sides of the joints are supported independently from each other.
 - .3 Install control joint trims with staples and joint compound at walls and ceilings; do not caulk and seal.
 - .4 On surfaces to receive special coatings, and where indicated, construct construction joints.
 - .5 Unless otherwise indicated, install control joints at:
 - .1 Maximum 9 m apart on walls horizontally and vertically.
 - .2 Maximum 9 m apart on ceilings without perimeter relief, in both directions.
 - .3 Maximum 15 m apart in ceilings with perimeter relief, in both directions.
 - .4 Maximum 5 m apart on walls to receive ceramic cladding.
 - .5 At changes of support substrate on the same plane.
 - .6 In line with frames of doors or vision panels, or other openings, horizontally and/or vertically, if board joints cannot be avoided at such locations – See **Steel Studs and Furrings** above.
 - .7 At "T", "L" or "U" intersections at ceilings or elsewhere, as indicated.
 - .8 In line with column axes, if so indicated on **drawings**.
 - .9 At other locations show on **drawings**.
 - .6 Install joints on both sides of partitions at the same location, and use independent supporting elements on each side of the joint, including top and bottom tracks, or attach boards to only one of the double studs on the opposite side.
 - .7 In case of surfaces with fire resistance, or where indicated, for acoustical reasons, fill the space between the studs or the supports with a fire resisting insulation, or increase the spacing between the studs and add two 15.8 mm gypsum thicknesses attached to only one of the studs, as indicated.
 - .8 Construct other special joints as indicated on drawings.
 - .9 Obtain the Departmental Representative's approval for the locations of these joints at beginning of work.

3.7 Insulation and Caulking

- .1 Where indicated, install acoustical insulation in partitions, including door frames in those partitions, as per manufacturer's instructions. The insulation should fill the entire cavity between the boards when the studs are 92 mm deep or less, but should be only lightly compressed. In deeper partitions ensure insulation bats are well held in place.
 - .2 Install two continuous insulating acoustical strips under floor track and above top track, as well as
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between studs and walls against which they abut, and at recessed bases as indicated, for sound and dust insulation.

- .3 Install gasket strips at edges of gypsum board or casing beads abutting metal window or exterior door frames to provide thermal break.
- .4 Apply 13 mm diameter bead of acoustical sealant continuously around perimeter of each face of partition, to seal gypsum board and adjacent surface junction where partitions abut fixed building components.
- .5 Seal full perimeter of cut-outs around all electrical and other boxes, ducts, and where so indicated from the interior side of the gypsum board. Refer also to electrical details.
- .6 Wherever visible, uses sealant, or sealant which shall be painted. If mildew resistance is required and as indicated use sealant with fungus resistance.
- .7 Apply insulation and caulking at fire and smoke protection assemblies related to drywall work.
- .8 Wherever shown on **drawings**, achieve air-tightness with the required materials at the top of drywall partitions meeting structure. Use strip gaskets, and/or closures as indicated.
- .9 In the case of acoustic partitions caulk each layer of gypsum around perimeter walls, penetrations and where required, and have the work inspected by the Departmental Representative before installing the next layer.

3.8 Access Panels and Doors

- .1 Install access panels and doors, as specified in **Section 08 31 00** and indicated in **Mechanical** and **Electrical** drawings to have access or connect to electrical and mechanical fixtures specified in their respective Sections. Coordinate with **Mechanical** and **Electrical**. Refer to wall types for fire-rated walls.
- .2 Rigidly secure access panel and door frames to furring or stud systems.

3.9 Installation Elements

- .1 Install as per manufacturer's recommendations.
 - .2 Take care not to damage the surfaces during handling. Lift units carefully with suitable devices.
 - .3 Install units plumb and level.
 - .4 Pre-drill fastener holes in components. Clean fastener holes to remove dirt and oil.
 - .5 Fasten units with screws (through the face or from the back), bolting or welding as recommended by the manufacturer.
 - .6 Do not use pneumatic staple guns. Countersink screw heads below adjoining finished surface.
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- .7 Fasten not less than 8 mm from edge or end.
- .8 Cover screw heads with joint compound to produce, smooth, flush and level surfaces.
- .9 Immediately prior to installing each unit, "butter" the back of each unit with joint plaster as necessary. Press units tightly against backing and ensure that all voids between the back of each unit and the backing are completely filled. Immediately remove all excess plaster from affected surfaces.
- .10 Where units are suspended, use enough suspension points as recommended by the manufacturer.
- .11 Cement together butt joints with construction adhesive.
- .12 All other prescriptions, for gypsum board installation, as **above**.

3.10 Protective wall panelling installation

- .1 Verification of conditions: Examine the areas and conditions under which the work is to be performed and identify the conditions that are detrimental to the good or timely purpose.
- .2 Do not proceed until unsatisfactory conditions have been corrected.
- .3 Surface Preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by the manufacturer's instructions.
- .4 Protection: Take all necessary measures to avoid material damage during installation as required in the manufacturer's installation instructions.
- .5 Install the work in this section in strict accordance with the manufacturer's recommendations, using approved adhesive.
- .6 The temperature at the time of installation should be between 65-75 ° F (18-24 ° C) and be maintained for at least 48 hours after installation to allow proper adhesive put in place.
- .7 The relative humidity should not exceed 80%.
- .8 Do not expose the wallcovering directly to the sun during or after installation. This will cause the surface temperature to rise, which in turn causes bubbles and delamination.

3.11 Field Quality Control

- .1 Before starting work, participate in a training meeting with the Departmental Representative, in order to establish the procedures and the quality level of the installation required.
- .2 Notify Departmental Representative before covering metal studs, and especially to approve the location of control joints.

3.12 **Cleaning**

- .1 Perform cleaning as per **Section 01 74 11**.
- .2 On completion remove excess materials, leave space clean and dust free.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C635/C635M - 12, Standard Specification for Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
 - .2 ASTM C636/C636M - 08, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
 - .3 ASTM E84 - 12c, Standard Test Method for Surface Burning Characteristics of Building Materials
 - .4 ASTM E580/E580M - 11b, Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Subject to Earthquake Ground Motions
 - .5 ASTM E662 - 13, Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
 - .6 ASTM E1264 - 08e1, Standard Classification for Acoustical Ceiling Products
 - .7 ASTM E1477 - 98a(2008), Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers
- .3 UL-Underwriters' Laboratories/ULC-Underwriters' Laboratories of Canada (UL/ULC)
 - .1 CAN/ULC-S102-10- EN, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - .2 CAN/ULC-S702-09-AM1- EN, Standard for Thermal Insulation Mineral Fibre, for Buildings
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN / CGSB-92.1- M89, Sound Absorptive Prefabricated Acoustical Units.
- .5 CSA International
 - .1 CSA C22.2 No.9.0- 96 (R2011), General Requirements for Luminaires.
 - .2 CAN / CSA-C22.2 No.74- 96 (R2010), Equipment for Use with Electric Discharge Lamps.
- .6 Ceiling Systems Installation Handbook (CISCA)
- .7 American National Standard Institute (ANSI)/Illuminating Engineering Society of North America (IESNA)
 - .1 ANSI/IESNA RP-1-04, American National Standard Practice for Office Lighting.

1.2 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 **Shop drawings :**
 - .1 Submit reflected ceiling plans for all ceilings.
 - .2 Shop drawings shall clearly indicate the layout of the ceiling suspension system, spacing and anchorage of suspension elements, interlocking of main runners and cross runners, the location of adjustable tees, changes of level (transition details),

location and sizes of mechanical and electrical elements, light fixture support method, the suspension method for acoustic baffles, lateral support elements and accessories.

- .2 **Certificates of Conformity** : confirm that Work is executed in accordance with drawings and specifications, as well as with manufacturer's instructions, including seismic resistance requirements.

1.3 Sample

- .1 Submit samples in accordance with **Section 01 33 00** - Submittal Procedures.
- .2 Submit a sample of each type of acoustic panel and each type of fastener specified for anchoring the panels

1.4 Additional materials

- .1 Supply 2% of each type and colour of acoustic tiles and suspension system.

1.5 Environmental Conditions

- .1 Allow work generating humidity to dry before starting the work, and do not start before dust-generating activities have ceased.
- .2 Maintain uniform temperature between 15°C and 29°C and relative humidity between 20% and 40% before and during installation.
- .3 Before using materials, store in the rooms where ceilings are to be installed for 48 hours.

1.6 Handling and Storage

- .1 Deliver materials in their original packaging and containers, with the manufacturer's seal and labels intact.
- .2 Store materials with care, avoiding scratches, warping or damage of any kind. Store in a dry, weather protected storage. Protect them against dirt and constraints due to excessive loads or impact.
- .3 Replace damaged materials with no charge to the Owner. Warped or folded metallic elements shall be rejected.

1.7 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 See **Section 05 50 00** for description of basic metal materials and finishes, and welding procedures.

2.2 Suspension System, Standard, for Acoustical Ceilings

- .1 Intermediate or heavy duty system as needed, as per ASTM C635, non fire-rated, commercial quality cold rolled steel sheet, hot dipped galvanized, with two-directional 24 mm high exposed. Tee bar grid (main and cross Tees). Components die cut.
- .2 Main Tee with double web 43 mm high rolled cap on exposed face.
- .3 Cross Tee similar, with web extended to form positive interlock with main Tee webs.
- .4 Lower flange extended and offset to provide flush intersection.
- .5 Perimeter trims with an "L" shaped angle, same finish as the Tees.
- .6 Exposed face of flange finished in low sheen baked enamel to match colour of tile or panel.

2.3 Acoustic tiles:

- .1 Wet formed mineral fiber tiles with transparent acoustic membrane, 610 x 610 x 19 mm, square edges, fine textured pattern, factory applied latex paint finish, 0.70 CRB, Class A, 0.9 light reflection.
- .2 Color: white.

3.0 EXECUTION

3.1 General

- .1 Do not use the ceiling system to provide lateral support for walls or partitions.
- .2 Do not erect ceiling suspension system nor proceed with the installation of ceiling panels until electrical and mechanical work above ceiling has been inspected and approved by the Departmental Representative, who has also reviewed the exact position of the suspension grid.
- .3 Clean white cotton gloves must be worn during tile handling and installation.
- .4 Commence installation after affected areas are enclosed, moisture and dust generating activities completed and humidity producing surfaces are completely dried. Do not start work until satisfactory conditions are present.
- .5 Before installing the materials, store them for 48 hours in the area where they will be used.
- .6 Ensure all acoustical units installed in a given area come from the same production batch.

3.2 Coordination

- .1 See **Mechanical** and **Electrical** for the location and height of lighting, ventilation, sprinklers, sound and fire protection systems.

- .2 Ensure perimeter of rooms is painted at least 100 mm above the suspended ceiling line.

3.3 Installation of Suspension Systems

- .1 Install suspension assembly strictly to manufacturer's printed instructions and to comply with requirements of ASTM C636.
- .2 Attach the hangers to the structure above with fasteners compatible with the latter.
- .3 Unless otherwise indicated, install wire hangers at maximum 610 mm spacing and at 305 mm (Category C) from the ends of each Tee, main and cross, with a maximum vertical of 1:6.
- .4 Each vertical wire shall be attached to the ceiling suspension member and to the support above with a minimum of three turns on themselves on a distance of 76 mm at not less than 305 mm above the acoustic elements, with a connection device capable of carrying not less than a 45.4 kg allowable load.
- .5 Suspension wires shall not hang more than one in six out of plumb unless counter sloping wires are provided.
- .6 Wires shall not attach to or bend around interfering material or equipment. A trapeze or equivalent device shall be used where obstructions preclude direct suspension. Trapeze suspensions shall be a minimum of back-to-back 32 mm cold-rolled channels for spans exceeding 1220 mm.
- .7 Layout of suspension grid to be according to reflected ceiling plan.
- .8 Install the wall-ceiling mouldings to define the exact height of the ceiling, and allow a clearance of minimum 9.5 mm between the grid member resting on the mouldings and the vertical surface. Increase this clearance to 12.7 mm when walls or partitions are attached to the ceiling grid.
- .9 Install "T" or "L" mouldings at all openings for mechanical and electrical elements as well as where ceiling levels change, in a similar manner as for perimeter mouldings.
- .10 Interlock cross runner to main runner to provide rigid assembly.
- .11 Ends of support profiles and the transverse profiles must be stabilized with respect to each other to prevent them from separating. These stabilizing systems must be recommended by their manufacturer and approved by the Departmental Representative.
- .12 Air diffusers and fixtures of matching ceiling grid dimensions shall be supported by their own support.
- .13 Where light fixtures are not supported independently, add supplemental hangers within 150 mm of each corner and at maximum 600 mm o.c. around perimeter of fixture, as well as fix the fixtures to the grid system with minimum 2 attachment devices, each with a capacity of 100% of the lighting fixture weight acting in any direction.
- .14 Completed assembly to support superimposed loads, such as lighting fixtures, speakers, service panels, diffusers, grilles, etc.

.15 Finished ceiling system to be level within 1:1200.

.16 Install removable Tee's in sufficient quantity to ensure access to the ceiling space up to an area 10% of the suspended ceiling. Identify location of these Tee's on shop drawings.

3.4 **Cleaning**

.1 Perform cleaning as per **Section 01 74 11**.

.2 Touch up scratches, abrasions, voids and other defects in painted surfaces.

.3 Clean all exposed surfaces with non-solvent-based, non-abrasive commercial cleaner, following manufacturer's recommendations.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American Society for Testing and Materials (ASTM):
 - .1 ASTM D2047 - 11, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
 - .2 ASTM D3389 - 10 - Standard Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform, Double Head Abrader)
 - .3 ASTM E84 - 12c, Standard Test Method for Surface Burning Characteristics of Building Materials
 - .4 ASTM E648 - 10e1 - Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
 - .5 ASTM E662 - 13 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials
 - .6 ASTM E2180 -07(2012) - Standard Test Method for Determining the Activity of Incorporated Antimicrobial Agent(s) in Polymeric or Hydrophobic Materials
 - .7 ASTM F150 - 06, Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring
 - .8 ASTM F1700 - 04(2010) - Standard Specification for Solid Vinyl Floor Tile
 - .9 ASTM F1859 - 12, Standard Specification for Rubber Sheet Floor Covering Without Backing
 - .10 ASTM F1861 - 08(2012)e1, Standard Specification for Resilient Wall Base
 - .11 ASTM F1913 - 04(2010), Standard Specification for Vinyl Sheet Floor Covering Without Backing
 - .12 ASTM G21- 09 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- .3 Canadian Standards Association (CSA)
 - .1 CSA B651-12 - Accessible Design for the Built Environment.
- .4 European Standards:
 - .1 DIN 51130 – 2010 – Testing of floor coverings – Determination of the anti-slip property – Workrooms and fields of activities with slip danger, walking method – Ramp test (*For reference – Standard withdrawn*)
 - .2 EN 660 – 1999 – Resilient floor coverings – Determination of wear resistance (Parts 1 & 2)
 - .3 EN 685 – 2007 – Resilient, textile and laminate floorings - Classification
- .5 International Organization for Standardization (ISO):
 - .1 ISO140-7 – 1998 - Measurement of sound insulation in buildings and of building elements – Part 7: Field measurement of impact sound insulation of floors
 - .2 ISO 1817 – 2011 – Rubber, vulcanized or thermoplastic – Determination of the effect of liquids
 - .3 ISO 10581 – 2013 – Resilient floor coverings. Homogeneous poly(vinyl chloride) floor covering - Specifications.

- .6 Underwriter's Laboratories of Canada
 - .1 CAN/ULC-S102 – 10 – EN - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies

1.2 Action and Informational Submittals

- .1 Provide submittals in accordance with Section 01 33 00 and the following requirements:
 - .1 **Shop drawings:** show general layout of sheets and location of joints and position of integrated art work.
 - .2 **Submit samples:** of all specified products in all colour and finish choices in accordance with Section 01 33 00 - Submittal Procedures.
 - .3 **Submit a sample:** of each flooring, 300 x 300 mm, and of each resilient baseboard, 300 mm long.
 - .4 **Technical data:** submit manufacturer's printed product literature, specifications and data sheets and include product characteristics, performance criteria, finish and limitations.
 - .5 **Extra Materials, special tools and spare parts:** supply 2% of each type and colour of resilient flooring, baseboards, transition trims and related adhesives and primers.

1.3 Delivery and Storage

- .1 Sheet products shall be delivered in rolls of maximum length and width produced by the manufacturer.
- .2 Store rolls vertically.

1.4 Environmental Requirements

- .1 Maintain minimum 20°C air temperature at flooring installation area for 72 hours before, during and for 48 hours after installation.
- .2 Unwrap floor covering and allow it to acclimatize in installation area for 24 hours before application.
- .3 Keep sheet flooring rolls in an upright position during acclimatization period.

1.5 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with Section 01 74 19.

2.0 PRODUCTS

2.1 General

- .1 Ensure compatibility of flooring products with primers, adhesives and all other materials specified herein, as well as any other materials within or applied to the substrate.
- .2 Primers to be as per the resilient flooring manufacturer's recommendations.

2.6 Linoleum sheet resilient flooring

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- .1 Homogenous floor covering made from natural ingredients with high performance finish. General qualities meets or exceeds all technical requirements set forth in ASTM F 2034 Standard Specification for linoleum Sheet Flooring, Type I, naturally anti-static. The finish must be robust and high performance and the colours must be vibrant and stable. The product must require no initial maintenance or polymer application: it must be occupancy ready following installation. The surface must be repairable and refreshable. The product must have the following characteristics:
 - .1 2.5 mm thickness (roll dimensions of 2000mm x 32,000mm), plan for minimum number of joints.
 - .2 Flammability Class 1 (ASTM E648); smoke density < 450 (ASTM E662); resistant to cigarette and solder burns.
 - .3 Slip resistance (static coefficient of friction) Neolite dry 0.99, Neolite wet 0.88, ≥ 0.5 (ASTM D2047).
 - .4 VOC content: Greenguard Gold and Greenguard certified for low VOC emissions.
 - .5 Resistant to bacteria, fungi and micro-organism activity (ASTM E2180, ASTM G21).
 - .6 Sound absorption of 10 dB (ISO 140).
 - .2 Colors: product chart must contain a large choice of textures and colours, including a large choice of bright, solid colours (including dark grey, medium grey, greige, light grey, deep turquoise, light turquoise, moss green, light green, sun yellow and orange).
 - .1 Texture: subtle soft fiber design combined with a plain background creating a semi-plain design with dirt hiding properties.
 - .3 6 Colours, to be selected by the Departmental Representative:
 - .4 Artwork water jet cut into linoleum sheet resilient flooring: Provide 3 additional Colours, to be selected by the Departmental Representative. The different shapes will be water jet cut from the same linoleum sheet resilient flooring product and inserted into the main flooring. Digital drawing of artwork will be provided by Departmental Representative.
 - .5 Floor Adhesive: Two component polyurethane adhesive as per flooring manufacturer's recommendations.

2.8 Resilient Baseboard

- .1 Rubber base with toe: as per ASTM F1861, group 1 (solid) and CAN / CSA A126.5, top set coved, in continuous rolls, 102 mm high, 3.2 mm thick, 36.5 m long, with end stops and pre-molded protruding corners (inside and outside). Plan for minimum number of joints.
 - .1 Provide 6 colors to match the adjacent flooring colours.
 - .2 Adhesive: water repellent, recommended by the baseboard manufacturer, compatible with the substrate

2.9 Finishing Mortar

- .1 Finishing mortar for screeds, for spaces around penetrations through concrete floors, for finishing screed at the edge of foot grilles, for creating the drainage slopes (1 to 2%) in the rooms where floor drains are specified: accelerated drying mortar, ready for use. With or without aggregates as recommended by the manufacturer, or as approved by the Departmental Representative.

2.10 Accessories

- .1 Transition moulding or finishing Trim 1 between resilient flooring and floor finishes levelled with subfloor: 2.5 mm height vinyl profiled strips to match height and colour of adjacent flooring. Align the installation on the door frame stopper. ADA compliant.
- .2 **Stainless steel threshold** : Anodised matte aluminium extrusion between resilient flooring and exposed concrete: 3.5 mm height. Align the installation on the door frame stopper. ADA compliant.

3.0 EXECUTION

3.1 General

- .1 Do not start until other trades have finished their work.
- .2 Solidly pack all open spaces around floor penetrations with finishing mortar.
- .3 Prime the substrate, if required, in accordance with manufacturer's instructions.
- .4 Use adhesives as recommended by the manufacturer of each product.
- .5 Install linoleum sheet resilient flooring as per flooring manufacturer's written instructions. The installer must be experienced and possess the skills to achieve good seams.
- .6 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.
- .7 Install transition or finishing trims at junctions of resilient flooring with dissimilar materials. Ensure that height changes between surfaces conform to section 4.3.2 - Changes in Level, of CSA B651-12.
- .8 Install flooring throughout the floor areas prior to the installation of built-in furniture.
- .9 Install flooring on access doors, where indicated, maintaining the continuity of appearance.
- .10 Interrupt resilient flooring at expansion joints.
- .11 Cut flooring with care and fit neatly along walls, columns and around fixed objects.

3.2 Examination

- .1 Examine surfaces to receive finishes for acceptability of structural stability, levelness, texture, moisture content, cleanliness, etc.
- .2 Ensure that temperature and ventilation are adequate.
- .3 Notify in writing deficiencies to Departmental Representative prior to commencing work, and do not commence work until all conditions which may adversely affect the quality of the work have been corrected.

3.3 Preparation of Surfaces

- .1 Prepare floor to remove all detritus, projections, oils, adhesives and other contaminants, and obtain a clean, level surface. If required, apply a thin coat of finishing mortar to level the surface.
- .2 Prime surfaces as recommended by manufacturers of flooring adhesives and flooring. Allow to dry for 24 hours before installation of flooring.

3.5 Installation - General

- .1 The installation of linoleum sheet resilient flooring should be carried out in accordance with the national code of practice for the installation of resilient floor coverings if applicable. Areas to receive flooring should be clean, free from other trades, fully enclosed and weather tight. Subfloors should be clean, smooth, sound and permanently dry.
- .2 Areas to receive flooring shall be adequately lit to allow for proper inspection of the substrate, installation and for final inspection.
- .3 It is essential that the laying area is at a steady temperature of minimum 17 °C, 48 hours before, during and 48 hours after installation. The material and adhesive should be conditioned in the same environment for at least 48 hours prior to the installation. Where national codes of practice exist they take precedence over these guidelines.
- .3 Take the linoleum sheet resilient flooring rolls off the pallets.
- .4 Conduct moisture tests on all substrates prior to starting installation.
- .5 Ensure that all recommendations for substrate and jobsite conditions are met prior to beginning the installation. Beginning the installation is an implied acceptance of site conditions by the contractor.
- .6 Prior to installation rolls should be checked to ensure that the correct colour, batch number and quantity have been received and that the material is in good condition.
- .7 Use material from the same batch/dye lot and install in sequence. The use of different production batches will always result in visible shade differences. The batch number is clearly marked on the material packaging and must be checked before commencement of installation.
- .8 Do not reverse sheets lay for seaming.
- .9 Install one length of sheet at a time, making sure to place the material into wet adhesive and roll afterwards with a 60 to 75 kg roller.

3.6 Adhesive selection and application

- .1 Use adhesive recommended by linoleum sheet resilient flooring's manufacturer.
- .2 Conduct an adhesive bond test before starting the installation to assist in identifying both the working characteristics of the adhesive (waiting and working time) for the site conditions, and also any potential bonding problems.

- .3 Use a trowel to apply the adhesive. Trowels will wear during use, ensure that the trowel has got the proper and specified notch.

3.7 Installation

1. Measure the area to be installed and determine the direction in which the material will be installed and seam placement. Seams must be a minimum of 15 cm away from any subfloor joints such as days joints, saw cuts, etc.
2. Cut the sheet material to the required length and then back roll each cut length before scribing in the ends to release any roll tension from the winding of the sheet linoleum.
3. Linoleum sheet resilient flooring should be laid and rolled with a 60 - 75 kg roller within the open time of the adhesive. It is therefore important to only spread sufficient adhesive that can be covered within the open time of the adhesive. The adhesive must be spread evenly over the entire floor area with particular attention to edges – this will ensure that the sheet is fully bonded at the perimeters. Remove fresh adhesive residue immediately with a clean white damp cloth. Dried adhesive residue can be removed with a clean white cloth and soapy water.
4. Seams should be formed to leave a closed butt joint. However, when cutting seams in linoleum sheet, allowance must be made for a fractional expansion in the width of the hessian backed material as it picks up moisture from the adhesive. This expansion is minute and will be halted by the curing of the special linoleum adhesive, but unless allowed for in cutting, the seams will peak and fail.
5. Cut a true edge on the first sheet with a straight edge. Leave this sheet overlapping the second sheet (± 2 cm). Spread the adhesive with the recommended trowel and lay the sheet into the wet adhesive. After adhering, immediately roll the flooring in both directions using a 60 - 75 kg roller starting across the width and then lengthwise. The natural “roll curl” at the end of each cut should be manually relaxed to remove the tension in the material that is caused by being stored in a roll. Score the second sheet by running the scribe along the true edge. Make sure the scribe is vertical and pressed against the true edge. Cut through with straight and hooked blades, keeping the waste to the outside of the cutting hand and thereby giving a slight undercut. Adhere the second sheet and roll the seam with a hand roller. Repeat the same procedure for each sheet, completing one sheet at a time until the job is completed.
6. A correctly cut seam will close tightly during the curing of the adhesive and will not open up during the life of the linoleum.

3.9 Cleaning

- .1 As work progresses, remove any excess adhesive from floors, bases and walls with care.
- .2 Remove marks and dirt completely while they are still wet with a clean white cloth dampened with detergent. Do not use acetone or similar products to clean the floor.
- .3 Perform initial cleaning as per Section 01 74 11 and following the flooring manufacturer's written instructions.

3.10 Protection of Finished Work

- .1 Protect new flooring with adequate panels or boards until just before final inspection.
- .2 Prohibit traffic on floor for 48 hours after application.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM D6207 03(2011), Standard Test Method for Dimensional Stability of Fabrics to Changes in Humidity and Temperature
 - .2 ASTM E84 - 12c, Standard Test Method for Surface Burning Characteristics of Building Materials
- .3 UL-Underwriters' Laboratories/ULC-Underwriters' Laboratories of Canada (UL/ULC)
 - .1 CAN/ULC-S102 – 10 – EN - Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - .1 CAN/ULC-S702-97, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-M86 (R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-92.1-M89, Sound Absorptive Prefabricated Acoustical Units.
- .5 CSA Group (CSA)
 - .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).

1.2 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 The shop-drawings must clearly indicate the layout of the panels, the modes and the location of the fixings.
 - .2 The data sheets must contain an acoustic absorption report produced by a recognized laboratory.
 - .3 Submit colour charts.

1.3 Samples

- .1 Submit samples in accordance with **Section 01 33 00** - Submittal Procedures.
- .2 Submit a sample of each type of acoustic panel and each type of fastener specified for anchoring the panels.

1.4 Additional material

- .1 Provide materials, maintenance and replacement materials in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 2 additional acoustic panels of each type of panel and fabricated from the same lot as those installed.

1.5 Environmental Conditions

- .1 Commence installation after affected areas are enclosed, dust generating activities completed and humidity producing surfaces are completely dried.
- .2 Maintain uniform minimum temperature of 15°C and humidity of 20-40% before and during installation.
- .3 Before installing the materials have them in the area where they will be used for 48 hours.
- .4 The installing Contractor must have at least five years of experience in this field and must employ qualified and experienced personnel.

1.6 Handling and Storage

- .1 Deliver materials in their original packaging and containers, with the manufacturer's seal and labels undamaged.
- .2 Handle and store materials with care, avoiding damage. Store in a dry, weather protected storage. Protect them against dirt and constraints due to excessive loads or impact.
- .3 Replace damaged materials with no charge to the Departmental Representative. It is forbidden to straighten warped or folded metallic elements.
- .4 Fabric covered panels shall be packaged in cartons or wooden crates. They shall be tightly packed and protected from damage in transit. Panels shall be stored in manufacturer's original containers in a dry protected area until they are ready for installation. Panels shall not be stacked back to face in handling.

1.7 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 See **drawings** for panel dimensions and types.
- .2 **Acoustical Panels:** prefabricated acoustic panel, with a flame spread less than 25 in accordance with ASTM E-84, consisting of CCTGA type rigid fiberglass with a minimum density of 96 kgs./m³, borders and anchors chemically hardened. Covered on all surfaces with polyester fabric.

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- .1 **Suspended type (cubbies area) AP4 and AP5** : thickness of 50mm, square edges. Installed with an inverted "T" anchoring system fixed on reinforced hardened surfaces at the back of the panels to ensure a robust support and suspended from the ceiling.
 - .1 Mechanically anchored, secured with at least four (4) arched eyelet fasteners and as per manufacturer's recommendation.
 - .2 Suspension cable: Galvanized steel pre-formed aviation cable, fasteners, eyelets and rings suitable for attachment and as per manufacturer's recommendation.
 - .3 Typical dimensions: 1220 x 1220 mm (AP4), See drawings.
 - .4 Typical dimensions: 1220 x 1830 mm (AP5), See drawings.
 - .2 **Celling mount (playrooms) AP1, AP2 and AP3** : thickness of 50mm, square edges. Installed with an inverted " Z Bar " anchoring system.
 - .1 Mechanically fastened with 20 gauge galvanized steel fasteners and as per manufacturer's recommendation. 50mm x 50mm fastener fixed on fixed on reinforced hardened surfaces at the back of the panels to ensure a robust support. 50 mm x 127 mm attachment fasteners fixed to the ceiling.
 - .2 Typical dimensions: 610 x 610 mm (AP1), See drawings.
 - .3 Typical dimensions: 610 x 610 mm (AP2), See drawings.
 - .4 Typical dimensions: 1220 x 610 mm (AP3), See drawings.
 - .3 **Fabric:** 100% polyester (100% recycled), meet or exceed ACT standards for performance, glued on all surfaces with a rear fold of ± 25 mm.
 - .1 The corners of the fabric will be heat sealed to prevent fraying.
 - .2 13.1 +/- 1oz linear yard
 - .3 Available in a large selection of bright solid colours
 - .4 5 Colors to be chosen by Departmental Representative, location as per drawings.

2.2 Acoustic tile ceilings

- .1 Refer to **Section 09 58 00** – Integrated ceiling assemblies.

3.0 EXECUTION

3.1 General

- .1 Before commencing the installation, plan the exact positioning of all panels and anchors and coordinate with architectural, mechanical and electrical drawings and the positioning of electrical conduits, sprinklers, apparatus and equipment. lighting and fans on site. Validate the positioning by the Departmental Representative before beginning the installation.

- .2 Ensure all units installed in an area come from the same production package.
- .3 Install panels in accordance with manufacturer's recommendations ensuring a robust installation and clear alignment of panels and anchors.
- .4 The mechanical anchors must be anchored in the ceiling structure. They must be square and aligned.
- .5 Clean white cotton gloves must be worn during tile handling and installation.
- .6 Once panel installation is complete, make the necessary adjustments to ensure all joints are properly aligned and the installation is clean and neat.

3.4 Cleaning

- .1 Perform cleaning as per **Section 01 74 21**.
- .2 Clean all exposed surfaces with non-solvent-based, non-abrasive commercial cleaner, following manufacturers's recommendations.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 Master Painters Institute (MPI)
 - .1 The Master Painters Institute (MPI) / Architectural Painting Specification Manual (ASM) - [current edition].
 - .2 Standard GPS-1-12, MPI Green Performance Standard.
 - .3 Standard GPS-2-12, MPI Green Performance Standard.
 - .4 Master Painters Institute (MPI)

MPI # 11	Latex, Exterior Semi-Gloss (MPI Gloss Level 5)
MPI # 149	Primer Sealer, Interior, Institutional Low Odor/VOC
MPI # 147	Latex, Interior, Institutional Low Odor/VOC, Semi-Gloss (MPI Gloss Level 5)
MPI# 143	Latex, Interior, Institutional Low Odor/VOC, Flat (MPI Gloss Level 1)
MPI # 129	Varnish, Water Based, Clear, (MPI Semi-Gloss Level 5)
MPI # 108	Epoxy, High Build, Low Gloss
MPI # 79	Primer, Alkyd, Anti-Corrosive for Metal
MPI # 134	Primer, galvanized water based
MPI # 52	Latex, Interior, (MPI Gloss Level 3)
- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act (CEPA) (1999), c.33.
- .4 Environmental Protection Agency (EPA)
 - .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
 - .2 SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Society for Protective Coatings (SSPC)
 - .1 SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.
- .7 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act (TDGA) (1992), c.34.
- .8 National Fire Code of Canada.
- .9 Green Seal (GS)
 - .1 GS-11, Green Seal Standard for Paints and Coatings
- .10 South Coast Air Quality Management District (SQAQMD), rule # 1113, November 1996.

- .11 American Architectural Manufacturers Association.
 - .1 AAMA 613-08, Voluntary Performance Requirements and Test Procedures for Organic Coatings on Plastic Profiles.

1.2 Quality assurance

- .1 The Contractor must be able to demonstrate that he has at least five (5) years of experience in performing similar work. Provide, upon request, a list of the last three comparable projects, including the name and location of the project, the quoting contract authority and the name of the project manager.
- .2 Painting must be done by skilled worker holding a "Tradesman Certificate of Competency". Apprentices may also be hired on the condition that they work under the direct supervision of a qualified worker, in accordance with the regulations governing this trade.
- .3 Comply with the latest MPI requirements for exterior painting, including those for surface preparation and the application of primer or paint primer.
- .4 The products used, whether primary or printing products, paints, coatings, varnishes, dyes, lacquers, fillers, thinners, solvents and others, must be included in the approved products list given in the MPI Painting Specification Manual. all products forming the chosen paint system must come from the same manufacturer.
- .5 Other paint products such as linseed oil, shellac and turpentine must be compatible with other coating products used as needed and of high quality. They must come from an approved manufacturer listed in the MPI Painting Specification Manual.
- .6 Maintain purchase slips, invoices and other documents to establish, at the request of the Departmental Representative, the conformity of the work with the requirements of the specified MPI.
- .7 Quality standard:
 - .1 Walls: no visible defects at a distance of 1000 mm at a 90 ° angle to the surface being examined.
 - .2 The color and gloss of the topcoat must be uniform over the entire surface being examined.

1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
- .2 Submit Material Safety Data Sheets required under the Workplace Hazardous Materials Information System (WHMIS), which must be in accordance with WHMIS.
- .3 Submit a complete file for all products used. Indicate all the products that make up each system, specifying the following information for each:
 - .1 The name, type and use of the product.

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- .2 Manufacturer's product number.
 - .3 Color numbers.
 - .4 Product designation according to the MPI Environmental Choice program classification.
 - .5 Material Safety Data Sheets (MSDS) of the manufacturer of each product.
 - .6 Green Seal VOC data and their chemical compositions.
- .4 Submit required samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .5 Provide a 200 x 300 mm sample panel of each specified paint, stain or finish required of each color, texture and gloss or luster degree required in accordance with the requirements of the MPI Painting Specification Manual, using the materials the following media:
 - .1 Use a 3 mm thick steel plate for products applied to a metal substrate.
 - .2 Use 13 mm thick Russian birch plywood board for paint and varnish products applied to wood.
 - .4 Use 13 mm thick plasterboard for products applied to drywall and other smooth surfaces.
 - .5 Use 13 mm thick OSB board for OSB applied products.
 - .6 Use a sample of glulam exposed wood deck for varnish for structural elements.
 - .6 Once accepted, the samples will be the standard for the quality of the work for the relevant surfaces on site.
 - .7 Submit samples of all available colours, when colour range is limited.

1.4 Quality control

- .1 At the request of the Departmental Representative, prepare the surfaces, zones, rooms or elements designated according to the requirements of this section and apply (for each colour combination) the paint, the product or the coating prescribed according to the colours, gloss or luster degree, texture and workmanship specified in the MPI Painting Specification Manual for review and approval of the work. Once accepted, the designated areas, areas, parts or components will be the standard for product and implementation quality for similar in-situ surfaces.

1.5 Additional Materials

- .1 Provide materials, maintenance and / or replacement materials required by Section 01 78 00 – Closeout Submittals.
- .2 Submit a four liter container of each type and color of finish. Identify the color and type of paint according to the color list and paint system specified.

1.6 Handling and Storage

- .1 Store materials in one place designated by the Departmental Representative. Keep the storage area clean and tidy, and the temperature between 10° and 26°C, or in accordance with manufacturer's recommendations.
- .2 Store packaged materials, undamaged, in their original wrapping or containers with manufacturers' labels and seals intact. Manufacturers' labels shall indicate the name of the manufacturer, type of paint,

colour, and instructions for reducing.

- .3 Supply all metal and/or plastic containers and drop cloths required to protect the floors in those spaces where paint will be stored and mixed.
- .4 Leave those spaces clean and in their original state at the end of the work, cleaning all traces of paint. Remove and dispose of all detritus at the end of each work day.

1.7 Job Conditions

- .1 Do not apply finishes in areas where dust is being generated.
- .2 Maintain product, surface and ambient air temperature at a minimum of 10°C for latex based paints and minimum of 7°C for solvent based paints.
- .3 Maintain ambient relative humidity below 80% during application.
- .4 If the temperature drops below the minimum listed above during the **24 hours** before the application of the painting, provide adequate heating to obtain the specified minimum temperatures.
- .5 Provide adequate mechanical ventilation during the application of the painting and the curing time.
- .6 Provide proper fire-extinguishers, functioning adequately and in sufficient numbers according to fire protection safety measures.
- .7 Do not permit installation of fixtures and fittings until materials are cured.
- .8 Work under adequate ambient illumination, similar to final lighting conditions.
- .9 Take protective measures for safety during application.

1.8 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 Materials

- .1 Use only products listed on the MPI qualified products lists and conforming to the standards mentioned in the systems below.
- .2 All paint materials to conform to regulatory requirements for surface burning characteristics.
- .3 All paint to be lead free.
- .4 Paint, lacquer and varnish materials for each coating system to be products of a single manufacturer.

- .5 All various colours and sheen shall be approved by the Departmental Representative before work starts, and must match the colours specified by the Departmental Representative.
- .6 Varnishes shall be resistant to yellowing, scratches, water, alcohol, grease, oil, non abrasive household cleaners. Floor varnishes shall also be resistant to wear, impact, and abrasion.

2.2 Mixes and Colouring

- .1 The coloring of the products must be done before the delivery of the products on the site. This operation cannot be carried out on site without the written authorization of the Departmental Representative.
- .2 Mix paste, powder or catalytic curing paints carefully following manufacturer's written instructions.
- .3 The amount of thinner added to the paint, if any, must not exceed that recommended by the manufacturer. Kerosene or any other organic solvent of the same type should not be used to dilute water paints.
- .4 Dilute spray paint thoroughly following manufacturer's instructions. If the necessary instructions do not appear on the container, obtain written instructions from the manufacturer and send a copy to the Departmental Representative.
- .5 Before and during application, thoroughly shake the paint in its container to loosen the agglutinated materials, to ensure complete dispersion of the deposited pigments, and to preserve the uniformity of the color and gloss of the applied paint.

2.3 Colours

- .1 Allow for up to **10 interior colours**: 2 field colours and 8 accent colours. Colour chart to be provided to the Contractor by the Departmental Representative.
- .2 Note that doors and frames may have colours different from adjacent walls.
- .3 Allow for different colours on adjacent wall surfaces.
- .4 See **drawings** for paint finish locations.

2.4 Gloss level (luster)

- .1 The gloss levels of the painted surfaces must respect the nomenclature of the finishing products.

Gloss Level	Gloss @ 60 degrees	Sheen @ 85 degrees
GL 1 – Matte Finish (Flat)	Max. 5	Max. 10
GL 2 – Velvet-Like Finish	Max. 10	10 to 35
GL 3 – Eggshell Finish	10 to 25	10 to 35
GL 4 – Satin-Like Finish (Pearl, Melamine)	20 to 35	Min. 35
GL 5 – Traditional Semi-Gloss Finish	35 to 70	
GL 6 – Traditional Gloss	70 to 85	
GL 7 – High Gloss Finish	More than 85	

2.5 Exterior painting systems

- .1 **System no. 1:** EXT 5.1Q Alkyd GL 5 finish (over surface tolerant primer).
EXT 5.1C Water based light industrial GL 5 coating (over alkyd primer).
For exterior metals, piles
- .1 1 undercoat primer-sealer, anti-rust alkyd paint for metal surfaces only, solvent-based product, gloss finish
- .1 MPI # 79 Primer, Alkyd, Anti-Corrosive for Metal
- .2 2 finish coats, 100% acrylic latex, for exterior surface exterior 100% acrylic latex paint, for exterior surface, water-based product, semi-gloss finish
- .1 MPI # 11 Latex, Exterior Semi-Gloss (GL5)

2.6 Interior Painting Systems

- .1 Paint the following interior surfaces as prescribed by the MPI Painting Manual. .
- .2 Color: at the discretion of the Departmental Representative, primer color depending on the color of the finish coat.
- .3 **System no. 2:** INT 3.3A GL 5 – GL 1 Latex finish.
For interior partition systems, gypsum board, concrete- smooth surfaces:
- .1 1 Undercoat Primer-Sealer Interior 100% Acrylic Latex, water-based, GS-11 certified.
- .1 MPI # 149 Primer Sealer, Interior, Institutional Low Odor/VOC (GL1)
- .2 2 Finish coats, 100% Acrylic Latex Interior, water-based, GS-11 and ONGC 1.209 certified.
- .1 Wall: MPI # 147 Latex, Interior, Institutional Low Odor/VOC, (GL 5)
- .2 Ceiling: MPI # 143 Latex, Interior, Institutional Low Odor/VOC, Flat (GL 1)
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- .4 **System no. 3: INT 6.1F Water based varnish, clear GL5 finish**
 For all visible wooden structural elements, bridging, deck, beam and column:
- .1 2 Finish coats, Oil and water based Stain coatings, exceptionally clear, non-yellowing wood plaster, offering the durability of an alkyd Varnish while having the characteristics of application and cleaning of a water-based varnish. U.V. resistant, eco-friendly, water repellent, low VOC product, non-flammable and easily washable with mild soap.
- .1 MPI # 129 Varnish, Water Based, Clear, (GL5)
- .5 **System no. 4: INT 3.2C Epoxy finish (GL3)**
 For concrete floors, concrete stairs finishing, exterior anti-skid grating stair treads nosings and exterior ramps top and bottoms
- .1 3 High build Low-Gloss Polyamide-Epoxy Coatings, corrosion resistant, 1:1 blend ratio, , two elements, infinite colour capability.
- .1 MPI # 108 Epoxy, High Build, Low Gloss (GL3)
- .6 **System No. 5: INT 6.3P Water based light industrial GL 5 coating**
 INT 6.4N Water based light industrial GL 5 coating.
 For interior doors and wood frames, woodwork, plywood, millwork
- .1 3 Finish coats, interior latex varnish acrylic/urethane, low-VOC water-based varnish
- .1 MPI # 129 (GL5) Varnish, Water Based, Clear, (GL5)
- .2 Paste filler / vinyl sealer (where required)
- .7 **System No. 6: INT 5.1E Alkyd**
 INT 5.1Q Latex GL 5 finish (over alkyd primer)
 For interior metal doors and frames, metal work, stairs structure, metal landings and sprinklers conduits
- .1 1 undercoat primer-sealer, anti-rust alkyd paint for metal surfaces only, solvent-based product
- .1 MPI # 79 Primer, Alkyd, Anti-Corrosive for Metal
- .2 2 finish coats, exterior 100% acrylic latex paint, water-based product
- .1 MPI # 11 Latex, Exterior Semi-Gloss (GL5)
- .8 **System No. 7: INT 5.3B Water based light industrial coating**
 INT 5.3A Latex GL3 finish.
 For interior and exposed galvanized metal, pipes, conduits and ducts
- .1 1 undercoat latex based primer specially formulated for surfaces of aluminium and galvanized metal.
- .1 MPI # 134 Primer, galvanized water based
- .2 2 finish coats, interior 100% acrylic latex paint, water-based product
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.1 MPI # 52 Latex, Interior (GL3)

3.0 EXECUTION

3.1 Examination and Coordination

- .1 Coordinate with subsequent trades, to ensure that other related work does not commence before finishes are completely cured.
- .2 Ensure substrates are prepared adequately; if they are factory primed, ensure primers are compatible with paint finish system.
- .3 Schedule work to be completed before installation of equipment, fixtures, fitting and application of other finishes for floors, walls and ceilings. Do the necessary repairs to painted surfaces after the installation of the latter. Coordinate with applicable installers.

3.2 Preparation of Surfaces

- .1 Prepare and prime all surfaces as per manufacturer's instructions, and in conformity with MPI standards.
- .2 Ensure galvanized steel and zinc coated surfaces are adequately degreased before painting.
- .3 For repairs required for concrete screed: see **Section 09 65 00**

3.3 General

- .1 Carry out preparation, priming, finishing, protection and cleaning work in accordance with best trade practice and the manufacturers' instructions as well as applicable standards in order to provide quality work in all aspects.
- .2 Ensure that all defects have been repaired adequately and surfaces are clean and in proper condition and all other factors, such as temperature and ventilation, are appropriate for the work. Notify the Departmental Representative of any conditions that are not satisfactory.
- .3 Do not commence application before ensuring that the joint sealers and plaster products are dry and cured, ready to receive the finish.
- .4 Check humidity level of the substrate by appropriate apparatus in the Departmental Representative's presence. Do not apply finish if the rate of relative humidity is higher than 15%.
- .5 Protect all surfaces, including surfaces to receive sealants, from paint splatters and other damage resulting from the work. Use protective drop cloths and non-staining removable masking tape in sufficient quantities.
- .6 Cover surfaces to receive sealants. Do not apply finishes on sealants, unless they are compatible. Modified latex elastomer sealants can receive paint, but only 3 weeks after application.

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- .7 Protect adequately or remove hardware pieces and all other prefinished adjacent elements, such as apparatus, equipment or accessories, using drop cloths, masking tape or other appropriate means. After the painting is complete, clean and touch-up adjacent objects to return them to their initial state.
 - .8 Paint the walls and the ceilings before installing new mechanical and electrical equipment, touch-up painted surfaces after their installation.
 - .9 Paint surfaces not mentioned in the painting system in accordance with the manufacturer's instructions.
 - .10 Paint edges of openings made in gypsum panels before installing access panels or mechanical and electrical equipment, if applicable.
 - .11 Make sure that the ambient illumination is similar to the building permanent lightening conditions.
 - .12 Allow proper cure time between applications of subsequent layers or coats.
 - .13 Match finished work to approved samples; obtain uniform thickness, sheen, colour, pattern and texture; and make free from defects detrimental to appearance or performance.
 - .14 Touch up and refinish deficiencies. If finished work is unsatisfactory to the Departmental Representative, redo the entirety of unaccepted surfaces.
 - .15 Use only clean equipment in good working order.
 - .16 Paint glazing beads and trims before installation of the glazing.
 - .17 Paint backer boards before installation of mechanical and electrical equipment.
 - .18 Remove all movable items, finish the substrate and reinstall when completely dry. If these are to be finished, paint them separately, before reinstalling.
 - .19 Do not paint over labels, name plates, and instruction plates.
 - .20 All miscellaneous unfinished exposed surfaces, not shown on drawings or mentioned specifically, will also be painted, interior/exterior, unless otherwise indicated.
 - .21 All primed or non primed exposed miscellaneous steel items shall be painted.
 - .22 All stainless steel, aluminum and pre-finished items shall not be painted.
 - .23 See **Mechanical and Electrical** for electromechanical elements to be painted.
 - .24 All primed or non primed exposed steel surfaces shall be painted, interior or exterior, unless otherwise indicated.
 - .25 Galvanized or zinc-wiped steel surfaces shall not be painted or coated, interior or exterior, unless otherwise indicated.

- .26 Painting shall cover all the substrates indicated.
- .27 Where indicated, exposed structural elements, factory primed, shall be painted. Touch-up galvanized or primed structural elements elsewhere.
- .28 Wood varnish or lacquer shall be factory applied, in a shop specialized in wood work, in a controlled environment.
- .29 All gypsum board surfaces including walls, bulkheads, etc., above ceilings shall receive a prime coat of paint.

3.4 Application

- .1 All paint shall be applied evenly without streaks, runs, misses, brush marks or other defects. The film must adhere uniformly and firmly.
- .2 Unless otherwise indicated, paint all exposed surfaces as specified, applying the required number of coats as per the **Painting System**. Apply additional finishing coats if defects in the base coats still show through. Ask the Departmental Representative to inspect work before applying final finishing coat.
- .3 Consult the Departmental Representative for surfaces not mentioned in the specification.
- .4 Apply an additional primer coat to all embedded structural elements.
- .5 Use only clean equipment in good working order.
- .6 Always sand and dust between subsequent coats and remove defects visible from distance up to 1500 mm.
- .7 Finish all surfaces with a roller, including doors and frames.
- .8 Finish bottoms, edges, tops and cutouts of doors and touch-up after installation, as specified for door surfaces.
- .9 Apply at least **two (2)** coats of paint over the primer and base coats if applicable, for all new surfaces to be painted, unless indicated otherwise. If necessary, add more coats to cover imperfections.
- .10 Apply additional finish coats if defects are still visible after the application of the base coats. Request the work to be inspected before applying the last coat.
- .11 Paint all unfinished metal inserts in concrete or other surfaces in such a manner as to match the background texture and sheen, to the Departmental Representative's satisfaction.-
- .12 Do not paint over sealants in general, except if they are compatible and only when they have set completely.

3.5 Mechanical and Electrical Equipment

- .1 Paint according to the Departmental Representative's standards all unfinished equipment, piping, conduits, hangers, etc. occurring in finished areas where no suspended ceilings are installed, and do not paint them above the suspended ceilings or in utility areas such as mechanical or electrical rooms; colour and texture to match adjacent surfaces, except as noted otherwise - See **Mechanical** and **Electrical drawings** to locate equipment to be painted. Above ceiling spaces are not considered finished areas, but equipment therein is not considered to be exposed.
- .2 Paint inside of ductwork where visible (at grills, diffusers and other openings) with primer and one coat of matt black paint.
- .3 Paint all primed steel covers over pits provided by **Mechanical**.
- .4 Follow Departmental Representative's standards for identification colours of equipment and piping.
- .5 Leave pre-finished equipment, piping, conduits, hangers, etc., in original finish and touch up scratches and marks in unfinished areas.
- .6 Paint disconnect switches for fire alarm system and exit light systems in red paint.
- .7 Remove all cover plates and other removable mechanical and electrical equipment prior to painting, and reinstall after all paint is completely dry.
- .8 See **Mechanical** and **Electrical** to avoid accidents or damages.

3.6 Cleaning

- .1 Perform cleaning as per **Section 01 74 11**
- .2 During work, clean all paint marks and droppings with appropriate solvents recommended by the manufacturer. Repair surfaces marked or damaged by paint.
- .3 Upon completion of painting, remove all paint marks and protection from floors, hardware, etc., so as to leave all surfaces clean and in perfect condition.

End of Section