Part 1 General

1.1 REFERENCES

.1 Aluminum Association

.1 Designation for Aluminum Finishes-[1997].

.2 American Society for Testing and Materials International, (ASTM)

.1 ASTM C36/C36M-[01], Specification for Gypsum Wallboard.

.2 ASTM C79/C79M-[01], Standard Specification for Treated Core and Non-treated Core Gypsum Sheathing Board.

.3 ASTM C442/C442M-[01], Specification for Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board.

.4 ASTM C475-[01], Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.5 ASTM C514-[01], Specification for Nails for the Application of Gypsum Board.

.6 ASTM C557-[99], Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing.

.7 ASTM C630/C630M-[01], Specification for Water-Resistant Gypsum Backing Board.

.8 ASTM C840-[01], Specification for Application and Finishing of Gypsum Board.

.9 ASTM C931/C931M-[01], Specification for Exterior Gypsum Soffit Board.

.10 ASTM C954-[00], Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.

.11 ASTM C960/C960M-[01], Specification for Pre-decorated Gypsum Board.

.12 ASTM C1002-[01], Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.13 ASTM C1047-[99], Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base.

.14 ASTM C1278-[11], Standard Specification for Fiber-Reinforced Gypsum Panel.

.15 ASTM C1280-[99], Specification for Application of Gypsum Sheathing Board.

.16 ASTM C1177-[01], Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.17 ASTM C1178/C1178M-[01], Specification for Glass Mat Water-Resistant Gypsum Backing Board.

.3 Association of the Wall and Ceilings Industries International (AWEI)

.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-71.25-[M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.

.5 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[1988(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.

.6 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SHOP DRAWINGS

.1 Submit fire rated partition assemblies, ULC Design No.'s to Contract Administrator for approval.

1.3 DELIVERY, STORAGE AND HANDLING

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

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

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

1.4 SITE ENVIRONMENTAL REQUIREMENTS

.1 Maintain temperature minimum 10 degrees C, maximum 21 degrees C for 48 hours prior to and during application of gypsum boards and joint treatment, and for at least 48 hours after completion of joint treatment.

.2 Apply board and joint treatment to dry, frost free surfaces.

.3 Ventilation: Ventilate building spaces as required to remove excess moisture that would prevent drying of joint treatment material immediately after its application.

1.5 QUALIFICATIONS

.1 Dry wall installers: minimum 5 years proven experience.

1.6 SAMPLES

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC’s.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 SHEET MATERIALS

.1 Standard gypsum board: to ASTM C36/C36M.

.1 Type and Thickness: 1/2” and 5/8” Type X, thickness as indicated, 48” wide maximum practical length, ends square cut, edges bevelled.

.2 Product: Subject to compliance with requirements, provide SHEETROCK® brand gypsum panels by Canadian Gypsum Company (or approved equal in accordance with B7).

.2 Abuse resistant gypsum board: to ASTM C1278/C1278M.

.1 Types and Thicknesses: 1/2” and 5/8” Type X, thickness as indicated, 48” wide x maximum practical length, ends square cut, edges bevelled.

.2 Panels to have reinforcing mesh and provide increased resistance to abrasion, indentation and penetration.

.3 Product: Subject to compliance with requirements, provide FIBEROCK® brand Abuse Resistant VHI interior gypsum panels by Canadian Gypsum Company (or approved equal in accordance with B7).

.3 Moisture and mold resistant gypsum board: to ASTM C 1396

.1 Type and Thickness: 1/2” thickness as indicated, 48” wide x maximum practical length, ends square cut, edges bevelled.

.2 Panels to have a moisture and mold-resistant gypsum core that is encased in moisture and mold-resistant, 100 percent recycled green face and brown back papers.

.3 Product: Subject to compliance with requirements, provide SHEETROCK® brand MOLD TOUGH™ gypsum panels by Canadian Gypsum Company (or approved equal in accordance with B7).

.4 Glass mat roof board: to ASTM C 1177.

.1 Type and Thickness: Type X, 5/8 inch thick, 48” x maximum practical length with square edge.

.2 Product: Subject to compliance with requirements, provide DENS DECK Brand Glass Mat Roof Board by Georgia Pacific (or approved equal in accordance with B7).

2.2 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.3 ACCESSORIES

.1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30 galvanized.

.2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.

.3 Resilient drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.

.4 Nails: to ASTM C514.

.5 Steel drill screws: to ASTM C1002.

.6 Stud adhesive: to CAN/CGSB-71.25.

.7 Laminating compound: as recommended by manufacturer, asbestos-free.

.8 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, metal, zinc-coated by hot-dip process 0.5 mm base thickness, perforated flanges, one piece length per

.9 Special Trim and Reveals: Extruded aluminum alloy 6063-T5, profiles as indicated.

.10 Polyethylene: to CAN/CGSB-51.34, Type 1.

.11 Insulating strip: rubberized, moisture resistant, 3 mm thick cork strip, 12 mm wide, with self-sticking permanent adhesive on one face, lengths as required.

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

.13 Sealants:

.1 In accordance with Section 07 92 00 - Joint Sealants.

.2 Acoustic sealant: in accordance with Section 07 92 00 - Joint Sealants.

.3 Sealant For Glass Mat Gypsum Sheathing Board: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials.

.4 Sealant for Glass-Mat Gypsum Sheathing Board: Silicone emulsion sealant complying with ASTM C 834, compatible with sheathing tape and sheathing.

.5 Sheathing Tape for Glass-Mat Gypsum Sheathing Board: Self –adhering, glass fiber tape, minimum 2” wide for use with silicone emulsion sealant in sealing joints in glass-mat gypsum sheathing board.

2.4 FINISHES

.1 Texture finish: asbestos-free [standard white] texture coating and primer-sealer, recommended by gypsum board manufacturer.

Part 3 Execution

3.1 ERECTION

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

.2 Do application of gypsum sheathing in accordance with ASTM C 1280.

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

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

.5 Install Work level to tolerance of 1:1200.

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

.7 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.

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

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

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

.11 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.

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

.13 Erect drywall resilient furring transversely across studs, joists, spaced maximum 600 mm on centre and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.

.14 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.2 APPLICATION

.1 Apply single layer gypsum board to metal, wood furring or framing using screw fasteners. Maximum spacing of screws 300 mm on centre.

.1 Single-Layer Application:

.1 Apply gypsum board on ceilings prior to application of walls in accordance with ASTM C840.

.2 Apply gypsum board vertically or horizontally, providing sheet lengths that will minimize end joints in accordance with ASTM C840.

.2 Double-Layer Application:

.1 Install gypsum board for base layer and exposed gypsum board for face layer.

.2 Apply base layer to ceilings prior to base layer application on walls; apply face layers in same sequence. Offset joints between layers at least 250 mm.

.3 Apply base layers at right angles to supports unless otherwise indicated.

.4 Apply base layer on walls and face layers vertically with joints of base layer over supports and face layer joints offset at least 250 mm with base layer joints.

.2 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, , in partitions where perimeter sealed with acoustic sealant.

.3 Install ceiling boards in direction that will minimize number of end-butt joints. Stagger end joints at least 250 mm.

.4 Install gypsum board on walls vertically to avoid end-butt joints. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs, except where local codes or fire-rated assemblies require vertical application.

.5 Install gypsum board with face side out.

.6 Do not install damaged or damp boards.

.7 Locate edge or end joints over supports. Stagger vertical joints over different studs on opposite sides of wall.

.8 Install glass mat water-resistant gypsum backing board behind ceramic tile finishes as indicated.

3.3 INSTALLATION

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

.2 Install casing beads around perimeter of suspended ceilings and where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.

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

.4 Construct control joints of preformed units two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.

.5 Provide continuous polyethylene dust barrier behind and across control joints.

.6 Locate control joints at changes in substrate construction, at approximate 10 m spacing on long corridor runs, at approximate 15 m spacing on ceilings.

.7 Install control joints straight and true. Construct expansion joints as detailed at building expansion and construction joints. Provide continuous dust barrier.

.8 Install expansion joint straight and true.

.9 Install cornice cap where gypsum board partitions do not extend to ceiling.

.10 Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm on centre.

.11 Splice corners and intersections together and secure to each member with 3 screws.

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

.1 Rigidly secure frames to furring or framing systems.

.13 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

.14 Gypsum Board Finish: finish gypsum board walls and ceilings to following levels in accordance with Association of the Wall and Ceiling Industries (AWCI) International Recommended Specification on Levels of Gypsum Board Finish:

.1 Levels of finish:

.1 Level 0: No tapping, finishing or accessories required.

.2 Level 1: Embed tape for joints and interior angles in joint compound. Surfaces to be free of excess joint compound; tool marks and ridges are acceptable.

.3 Level 2: Embed tape for joints and interior angles in joint compound and apply one separate coat of joint compound over joints, angles, fastener heads and accessories; surfaces free of excess joint compound; tool marks and ridges are acceptable.

.4 Level 3: Embed tape for joints and interior angles in joint compound and apply two separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.5 Level 4: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; surfaces smooth and free of tool marks and ridges.

.6 Level 5: Embed tape for joints and interior angles in joint compound and apply three separate coats of joint compound over joints, angles, fastener heads and accessories; apply a thin skim coat of joint compound to entire surface; surfaces smooth and free of tool marks and ridges.

.15 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

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

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

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

.19 Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

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

.21 Apply thin coat to entire surface using trowel or drywall broad knife to fill surface texture differences, variations or tool marks.

.22 Allow skim coat to dry completely.

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

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

3.4 ROOF BOARD INSTALLATION

.1 Install roofing board in accordance with manufacturer's written instructions, local code requirements and Underwriters Laboratories (UL) requirements for proper installation.

.1 In all areas of exposed metal deck, Contractor must ensure that all decking screws penetrating the steel deck are centred in the top flute only and are neatly aligned.

.2 Deck screws shall penetrate the steel deck by no more than 19 mm.

3.5 SCHEDULES

.1 Construct fire rated assemblies where indicated, seal penetrations, as per Section 07 84 00 – Firestopping.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

.1 ASTM C645, Specification for Nonstructural Steel Framing Members.

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

.2 Canadian General Standards Board (CGSB).

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

.3 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit duplicate 300 mm x 300 mm samples of cement parging on plywood and metal lath backup, showing the colour and texture of the parging finish.

.3 The accepted samples will become the standard for this project, and all parging Work will match the accepted samples.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle all material so as to prevent the inclusion of foreign materials and the damage of materials by water or breakage.

.2 Deliver and store packaged materials in original packages until ready for use. Packages or materials showing evidence of water or other damage will be rejected.

.3 All materials to be of the respective qualities specified herein. Deliver materials to the job in ample time to facilitate inspection and testing of the same.

1.4 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 MATERIALS

.1 Metal Studs and Runners:

.1 ASTM C645, "C" shaped, gauge:

.1 Provide 25 gauge studs, except as otherwise indicated or specified. Provide heavier gauge if required.

.2 At door [and borrowed light] frames, provide (2) 25 gauge minimum studs at each jamb. Where wall is indicated or specified to be typically framed with 20 gauge studs, provide (2) 20 gauge studs at each jamb.

.3 Provide 20 gauge studs at walls to receive cement backer board and water resistant gypsum board with ceramic tile facing.

.4 Provide 20 gauge studs at interior walls to receive abuse resistant gypsum board.

.5 Provide 14 gauge steel studs (600S162-68) where indicated.

.6 Provide 16 gauge steel studs (600S125-54) where indicated.

.7 Provide runner gauge as recommended by stud manufacturer.

.2 Depth of sections: As indicated.

.3 Corrosion protection: G40 hot-dipped galvanized coating per ASTM A525.

.2 Shaft Wall Supports:

.1 Conform to ASTM A446, Grade A, with G40 hot-dipped galvanized coating per ASTM A525.

.2 Studs:

.1 Shape: "CH", "J" or "E" or as standard with manufacturer.

.2 Gauge: As required to fulfill performance criteria, minimum 25 gauge. Provide 20 gauge for jamb and lintel components.

.3 Size: As indicated.

.4 J runners: 24 gauge, size as required for coordination with studs.

.3 Metal Furring Channels:

.1 Hat-shaped:

.1 ASTM C645, 7/8 inch high, 25 gauge, with G40 hot-dipped galvanized coating per ASTM A525.

.2 Provide 20 gauge at furring to receive tile backer board.

.3 Acceptable products: DWC-25 for ½" and 5/8" gypsum board and DWC-20 by USG.

.2 Z-shaped: ASTM C645, depths as indicated, 24 gauge minimum, with G40 hot-dipped galvanized coating per ASTM A525.

.3 Resilient: Manufacturer's standard type designed to reduce sound transmission; ½ inch deep, 25 gauge steel with G40 hot-dipped galvanized coating per ASTM A525.

2.2 CEILING AND SOFFIT SUPPORT MATERIALS

.1 Hanger Anchorage Devices: Screws, clips, bolts or other devices compatible with indicated structural anchorage for ceiling hangers and whose suitability has been proven through standard construction practices or by certified test data.

.2 Powder-Actuated Fasteners in Concrete: Fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers [and with capability to sustain, without failure, a load equal to 10x calculated loads].

.3 Post-tensioned Concrete Slabs:

.1 For inserts placed in post-tensioned concrete Work, maintain 3 inch clearance between inserts and prestressing strands.

.2 If insert is in conflict with strand, insert must be moved to avoid strand. Do not move strands to avoid inserts.]

.4 Hangers:

.1 Steel wire or rods, sizes to comply with requirements of ASTM C754 for ceiling or soffit area and loads to be supported.

.2 Wire: ASTM A 641, soft, Class 1 galvanized.

.3 Rods and flats:

.1 Mild steel components.

.2 Finish: Galvanized or painted with rust-inhibitive paint for interior Work; galvanized for exterior Work.

.5 Framing System:

.1 Main runners:

.1 Cold-rolled, "C" shaped steel channels, 16 gauge minimum.

.2 Finish: Galvanized with G40 hot-dip galvanized coating per ASTM A525 [for exterior Work]; galvanized or painted with rust-inhibitive paint for other interior Work.

.3 Form to required radius at curved ceilings.

.2 Cross furring: Hat-shaped steel furring channels, ASTM C645, 7/8 inch high, 25 gauge, galvanized.

.3 Furring anchorages: 16 gauge galvanized wire ties, manufacturer's standard wire-type clips, bolts, nails or screws recommended by furring manufacturer and complying with ASTM C754.

2.3 ACCESSORIES

.1 Acoustical sealant: to Section 07 92 00 – Joint Sealants.

.2 Insulating strip: rubberized, moisture resistant 3 mm thick cork foam strip, 12 mm wide, with self-sticking adhesive on one face, lengths as required.

.3 Dampproof course: closed cell, polyethylene foam, 6.3 mm thick, 89 mm wide.

Part 3 Execution

3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600 mm o.c maximum.

.2 Allow minimum deflection gap of 16.5 mm for double track **or** slotted single top track.

.3 Install damp proof course under stud shoe tracks of partitions on slabs on grade.

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

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

.6 Attach studs to bottom and ceiling track using screws.

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

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

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

.10 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.

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

.12 Provide 40 mm stud or furring channel secured between studs for attachment of fixtures behind lavatory basins, toilet and bathroom accessories, and other fixtures including grab bars and towel rails, attached to steel stud partitions.

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

.14 Extend partitions to ceiling height except where noted otherwise on drawings.

.15 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs.

.16 Install continuous insulating strips to isolate studs from uninsulated surfaces, where applicable.

.17 Install two continuous beads of acoustical sealant under studs and tracks around perimeter of sound control partitions.

3.2 HAT CHANNEL FURRING

.1 Attach hat-shaped furring channels either vertically or horizontally with fasteners through alternate wing flanges (staggered).

.2 Space furring channels at 24 inches on center, unless otherwise indicated. Where furring is indicated to receive backer board, water resistant gypsum board with ceramic tile, or veneer plaster, space at 16 inches on center.

.3 Install furring channels within 4 inches of floor line and ceiling line.]

3.3 Z-FURRING

.1 Securely attach narrow flanges of members to wall with concrete stub nails or power-driven fasteners, except as otherwise indicated.

.2 Sequence furring installation with installation of insulation.

3.4 CEILING AND SOFFIT SUPPORT SYSTEMS

.1 Secure hangers or rods to structural support by connecting directly to structure where possible; otherwise connect to inserts, clips or other anchorage devices or fasteners indicated.

.2 Space main runners, hangers and furring according to requirements of ASTM C754, except as otherwise indicated.

.3 Where spacing of structural members, or width of ducts or other equipment, prevents regular spacing of hangers, provide supplemental hangers and suspension members and reinforce nearest affected hangers to span extra distance.

.4 Attach directly to structural elements only; do not attach to metal deck. Loop hangers and wire-tie directly or provide anchors or inserts.

3.5 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM)

- .1 ASTM A446 – Specification for Steel Sheet, Zinc-Coated (galvanized) by the Hot Dip Process, Structural (physical) Quality
- .2 ASTM A641 - Specification for Steel Sheet, Zinc-Coated (galvanized) Carbon Steel Wire
- .3 ASTM C423 – Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
- .4 ASTM C635 – Standard Specification for Metal Suspension Systems for Acoustic Tile and Lay-in Panel Ceilings
- .5 ASTM C636 – Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
- .6 ASTM E84 – Test Method for Surface Burning Characteristics of Building Materials
- .7 ASTM E119 – Fire Test of Building Construction and Materials
- .8 ASTM E580 – Practice for Application of Ceiling Suspension Systems for Acoustic Tile and Lay-in Panels in Areas Requiring Seismic Restraint
- .9 ASTM E795 – Practice for Mounting Test Specimens During Sound Absorption Tests
- .10 ASTM E1111 – Test Method for Measuring Interzone Attenuation of Ceiling Systems
- .11 ASTM E1264 – Classification for Acoustic Ceiling Products
- .12 ASTM E1414 – Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
- .13 ASTM E1477 – Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating Sphere Reflectometer

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-92.1, Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA)

- .1 CSA B111, Wire Nails, Spikes and Staples.

.4 Underwriters Laboratories of Canada (ULC)

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

.5 Ceilings and Interior Systems Construction Association (CISCA):

- .1 CISCA Code of Practices.

.6 Canada Green Building Council (CaGBC)

- .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 ACOUSTICAL PANEL SYSTEM DESCRIPTION

.1 Performance Requirements:

.1 Provide acoustical ceiling assembly designed and tested to provide surface burning characteristics (ASTM E84) as follows:

.2 Flamespread: 0.

.3 Smoke Developed: 0.

.2 Provide acoustical ceiling system which has been manufactured, fabricated and installed to provide Noise Reduction Coefficient (NRC) rating as follows:

.1 .40 (NRC)

1.3 SUBMITTALS

.1 General: Submit listed submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit manufacturer's product data and installation instructions.

.3 Samples: Submit selection and verification samples: 6 inch × 6 inch (152 × 152 mm) sample for each wood fiber ceiling unit required, showing full range of exposed texture to be expected in completed Work.

.4 Quality Assurance/Control Submittals: Submit the following:

.1 Certificates: Submit manufacturer's certificate that products meet or exceed specified requirements.

1.4 REGULATORY REQUIREMENTS

.1 Fire-resistance rated floor/ceiling and roof/ceiling assembly: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Underwriters' Laboratories of Canada (ULC) label.

.1 Structural Cement-Fiber Unit-535X

1.5 QUALITY ASSURANCE

.1 Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

1.6 MOCK-UP

.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.

.2 Construct mock-up 10 m^2 minimum of each type acoustical tile ceiling including: one inside corner, one outside corner.

.3 Construct mock-up where directed.

.4 Allow 24 hours for inspection of mock-up by Contract Administrator before proceeding with ceiling Work.

.5 When accepted, mock-up will demonstrate minimum standard for this Work. Mock-up may remain as part of the finished Work.

1.7 DELIVERY, STORAGE & HANDLING

.1 Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

.1 Provide labels indicating brand name, style, size and thickness.

.2 Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

.1 Prevent soiling, physical damage or wetting.

.2 Store cartons open at each end to stabilize moisture content and temperature.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Permit wet Work to dry before commencement of installation.

.2 Maintain uniform minimum temperature of 15˚C and humidity of 20 - 40% before and during installation.

.3 Store materials in Work area 48 hours prior to installation.

1.9 COORDINATION

.1 Coordinate the installation of the acoustic ceiling system with any and all trades whose Work is impacted by that installation

1.10 EXTRA MATERIALS

.1 Provide extra materials of acoustic units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide acoustical units amounting to 5% of gross ceiling area for each pattern and type required for project.

.3 Extra materials to be from same production run as installed materials.

.4 Clearly identify each type of acoustic unit, including colour and texture.

.5 Deliver to Contract Administrator, upon completion of the Work of this section.

.6 Store where directed by Contract Administrator.

1.11 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for acoustical ceilings for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.12 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 ACOUSTICAL CEILING UNITS

.1 Acoustic units for suspended ceiling system: to CAN/CGSB-92.1.

.1 Acoustical Ceiling Panel (ACP) – Type 1

.1 Name: Ecophon Hygiene Advance A as manufactured by Certain-Teed (or approved equal in accordance with B7).

.2 Physical Characteristics

.1 Type: XII (per ASTM E1264)

.2 Form: 2 (per ASTM E1264)

.3 Pattern: G (per ASTM E1264)

.4 Size: 2'x4'

.5 Thickness: 3/4"

.6 Edge: Square

.7 Hygiene Advance

.8 PVF film heat-sealed at edge

.9 Hygiene Advance perimeter panel

.10 Laminated PVF film

.11 Finished Surface: PVF film

.12 Finished Surface Color: White 141

.13 Panel Backing: PVF film

.14 Core Composition: Glasswool

.15 Recycled Content: 71%

.16 1% (pre- consumer)

.17 70% (post-consumer)

.3 Suspension system: In accordance with 09 53 00.01 Acoustical Suspension.

.2 Performance Criteria

.1 Sound Absorption Rating per ISO 11654 (E-200 mounting)

.1 Hygiene Advance: Class B absorber

.2 Hygiene Advance perimeter panel: Class E absorber

.2 Noise Reduction Coefficient (NRC) per ASTM C423

.1 Hygiene Advance: 0.90 (E-400 mounting)

.2 Hygiene advance perimeter panel: N.A.

.3 Sound Absorption Average (SAA) per ASTM C423

.1 Hygiene Advance: 0.88 (E-400 mounting)

.2 Hygiene Advance perimeter panel: N.A.

.4 Light Reflectance (LR) per ASTM E1477

.1 0.73

.5 Humidity Resistance per ISO 4611

.1 Warranted to withstand relative humidity of up to 95% at 104ºF without sagging, warping or delaminating for 10-years

.6 Clean Room Classification per ISO 14644-1

.1 Class 3

.7 Clean-ability

.1 Manual wet cleaning with disinfecting chemicals

.2 High pressure washing (max. temperature 158°F)

.8 Canadian Food Inspection Agency

.1 Accepted Construction Product for use in food establishments operating under the authority of the CFIA.

.9 California Dept. of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-scale Environmental Chambers, including 2004 addenda

.1 Third-party certification of compliance

.1 Standard classroom model

2.2 ACOUSTICAL WALL PANEL SYSTEM

.1 Manufacturer: Tectum Inc. (or approved equal in accordance with B7).

.1 Contact: 105 South Sixth Street, Newark, OH 43055; Telephone: (888) 977-9691, (740) 345-9691; Fax: (800) 832-8869; E-mail: info@tectum.com; webSite: www.tectum.com.

.2 Proprietary Systems. Acoustical ceiling systems, including the following:

.1 Cementitious Wood Fibre Ceiling to be Tectum Bevel/Bevel Direct Attachment Panels (or approved equal in accordance with B7):

.1 Material: Aspen wood fibers bonded with inorganic hydraulic cement.

.2 Thickness: 1 inch (25.4 mm)

.3 Lengths: As indicated on drawings.

.4 Widths: As indicated on drawings.

.5 Color: Factory painted white.

.6 Mounting: Mount to wood furring as indicated on drawings.

.3 Accessories:

.1 Provide accessories as follows:

.1 Tectum Painted Head Drywall Screws:

.1 Material: Steel.

.2 Lengths: to suit panel thickness and installation method.

.3 Color: Natural

.2 Tectum Touch-Up Paint:

.1 Color: Natural

2.3 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Comply with the instructions and recommendations of the ceiling system manufacturer.

.1 Install materials in accordance with governing regulations, fire resistance rating requirements and industry standards applicable to Work.

.1 Comply with CISCA Code of Practices.

3.2 EXAMINATION

.1 Site Verification of Conditions:

.1 Examine surfaces scheduled to receive suspended or directly attached acoustical units for unevenness, irregularities and dampness that would affect quality and execution of Work.

.2 Do not proceed with installation of ceiling system until unacceptable conditions are corrected.

3.3 PREPARATION

.1 Unless otherwise directed by the reflected ceiling plan, measure the space in which the ceiling system is to be installed and establish a layout that balances border widths at oppoSite ends of the ceiling.

.2 When possible, coordinate the ceiling system layout to avoid the use of less than half width panels at the perimeter.

3.4 INSTALLATION - GENERAL

.1 Install acoustical panels and tiles in ceiling suspension system.

.2 Install the ceiling system in accordance with the following:

.1 Manufacturer's printed instructions

.2 ASTM C636

.3 Ceilings & Interior Systems Construction Association (CISCA) recommendations

.4 Applicable local code requirements

.5 Approved shop drawings

.3 In fire rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.5 INSTALLATION - ACOUSTICAL WALL PANEL SYSTEM

.1 General: Do not begin installation until materials sufficient to complete an entire room are received and prepared for installation.

.2 Measure each ceiling area and establish layout of acoustical units to balance border widths at oppoSite edges of each ceiling. Avoid use of less-than-half width units at borders.

.3 Supports to accept screws no greater than 24" (600 mm) o.c. Supports to run perpendicular to panel direction.

.4 Panel ends must fall over support. Panel ends are to be staggered.

.5 Screwed to supports, three screws per panel width for 23¾" (603 mm) panels and five screws per panel width for 47¾" (1213 mm) panels.

.6 Screw head to be flush with panel surface.

3.6 APPLICATION

.1 Install acoustical units parallel to building lines with edge unit not less than 50% of unit width. Refer to reflected ceiling plan.

.2 Scribe acoustic units to fit adjacent Work butt joints tight, terminate edges with moulding.

3.7 INTERFACE WITH OTHER WORK

.1 Coordinate with Section 09 53 00.01 – Acoustical Suspension.

.2 Co-ordinate ceiling Work to accommodate components of other sections, such as light fixtures, diffusers, speakers, sprinkler heads, to be built into acoustical ceiling components.

3.8 CLEANING

.1 Clean exposed surfaces of acoustical ceilings, trim, edge moldings and suspension members to comply with manufacturer's instructions for cleaning.

.2 Touch up any minor finish damage.

.3 Remove and replace Work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.9 PROTECTION

.1 Protect installed Work from damage due to subsequent construction activity, including temperature and humidity limitations and dust control, so that the Work will be without damage and deterioration at the time of acceptance by the City.

.2 Replace any and all damaged ceiling system components

3.10 COMMISSIONING

.1 Train user staff in the care, cleaning and replacement of acoustical ceiling tile.

.2 Acceptance of maintenance material turned over to The City.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

.1 ASTM C635, Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.

.2 ASTM C636, Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.

.2 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 DESIGN REQUIREMENTS

.1 Maximum deflection: 1/360th of span to ASTM C635 deflection test.

1.3 SUBMITTALS

.1 Submit reflected ceiling plans for special grid patterns as indicated.

.2 Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture lateral bracing and accessories.

.3 Submit one representative model of each type ceiling suspension system.

.4 Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.4 REGULATORY REQUIREMENTS

.1 Fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC’s.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 SUSPENSION SYSTEM

.1 Manufacturer: CertainTeed Ceilings (or approved equal in accordance with B7).

- .1 Product
  - .1 Name: 15/16” Classic
- .2 Physical Characteristics
  - .1 Structural Classification: Intermediate Duty (per ASTM C635)
  - .2 Double web design manufactured of hot-dipped galvanized steel
  - .3 Flange Size:
    - .1 15/16”
  - .4 Color: White
- .3 Components
  - .1 Main Runners
    - .1 Size: 12’
  - .2 Cross Tees
    - .1 Size: 4’
    - .2 Joinery: Hook
  - .3 Edge Molding
    - .1 Type: channel
    - .2 Profile: As selected by the Architect
- .4 Attachment Devices: Anchors sufficient for five-times design load indicated in ASTM C635 (Table 1). Wire for hangers of size and type to suit intended application, complying with ASTM C641, Class 1 zinc coating, not less than 12 gauge.

Part 3 Execution

3.1 INSTALLATION

.1 Installation: in accordance with ASTM C636 except where specified otherwise.

.2 Install suspension system to manufacturer's instructions.

.3 Do not erect ceiling suspension system until Work above ceiling has been inspected by Architect.

.4 Secure hangers to overhead structure using attachment methods acceptable to Architect.

.5 Install hangers spaced at maximum 1200 mm centres and within 150 mm from ends of main tees.

.6 Lay out system according to reflected ceiling plan.

.7 Ensure suspension system is co-ordinated with location of related components.

.8 Install wall moulding to provide correct ceiling height.

.9 Completed suspension system to support super-imposed loads, such as lighting fixtures diffusers grilles and speakers.

.10 Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.

.11 Interlock cross member to main runner to provide rigid assembly.

.12 Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.

.13 Install access splines to provide 10% ceiling access.

.14 Finished ceiling system to be square with adjoining walls and level within 1:1000.

3.2 CLEANING

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

END OF SECTION

Part 1 General

1.1 REFERENCES

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

- .1 ASTM F1861 – 08 (2012)e1 Standard Specification for Resilient Wall Base
- .2 ASTM F137 - 08 Standard Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus
- .3 ASTM F1515 - 03(2008) Standard Test Method for Measuring Light Stability of Resilient Flooring by Color Change
- .4 ASTM F925 – 02 (2008) Standard Test Method for Resistance to Chemicals of Resilient Flooring
- .5 ASTM E84 - 12c Standard Test Method for Surface Burning Characteristics of Building Materials
- .6 ASTM E648 - 10e1 Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
- .7 ASTM F925 – 02 (2008) Standard Test Method for Resistance to Chemicals of Resilient Flooring

.2 National Fire Protection Association (NFPA)

- .1 NFPA 253: Standard Method of Test For Critical Radiant Flux Of Floor Covering Systems Using A Radiant Heat Energy Source
- .2 NFPA 255: Standard Method of Test of Surface Burning Characteristics of Building Materials

.3 Canada Green Building Council (CaGBC)

- .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Product Data: For each type of product indicated.

.2 Samples for Initial Selection: For each type of product indicated.

.3 Samples for Verification: For each type of product indicated, in manufacturer's standard-size

.4 Samples but not less than 12” long (305 mm), of each resilient product color, texture, and pattern required.

.5 Product Schedule: For resilient base: Locations as indicated on Drawings**.**

.6 Submit WHIMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples, with the VOC levels highlighted.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Meet the requirements per Section 01 35 20 Leadership in Energy and Environmental Design – Sustainable Requirements.

.2 The VOC content of the adhesives, sealants, and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168 (effective date of January 2007). The following are the VOC limits from Rule 1168:

.1 Architectural Sealants – 250 g/L
.2 Non-membrane Roof Sealant – 300 g/L
.3 Roadway – 250 g/L
.4 Other Sealants – 420 g/L
.5 Non-porous Architectural Sealant Primer – 250 g/L
.6 Porous Architectural Sealant Primer – 775 g/L
.7 Modified Bituminous Sealant Primer – 500 g/L
.8 Other Sealant Primer – 750 g/L
.9 Indoor Carpet and Carpet Pad Adhesives – 50 g/L
.10 Wood Flooring Adhesives – 100 g/L
.11 Rubber Floor Adhesives – 60 g/L
.12 Subfloor Adhesives – 50 g/L
.13 Ceramic Tile Adhesives – 65 g/L
.14 VCT and Asphalt Tile Adhesives – 50 g/L
.15 Gypsum Board and Panel Adhesives – 50 g/L
.16 Cove Base Adhesive – 50 g/L
.17 Multipurpose Construction Adhesives – 70 g/L
.18 Structural Glazing Adhesive – 100 g/L
.19 PVC Welding – 510 g/L
.20 CPVC Welding – 490 g/L
.21 ABS Welding – 325 g/L
.22 Plastic Cement Welding – 250 g/L
.23 Adhesive Primer for Plastic – 550 g/L
.24 Contact Adhesive – 80 g/L
.25 Special Purpose Contact Adhesive – 250 g/L
.26 Structural Wood Member Adhesive – 140 g/L
.27 Sheet Applied Rubber Lining Operations – 850 g/L
.28 Top and Trim Adhesive – 250 g/L
.29 Metal to Metal Adhesive – 30 g/L
.30 Plastic Foams Adhesive – 50 g/L
.31 Porous Material Adhesive (except wood) – 50 g/L
.32 Wood Adhesive – 30 g/L
.33 Fiberglass Adhesive – 80 g/L
.34 Duct Sealants – 250 g/L

.3 Laminate Adhesives must contain no urea-formaldehyde.

1.4 QUALITY ASSURANCE

.1 Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

.1 Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

.2 Mockups: Provide resilient products with mockups specified in other Sections.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 degrees F or more than 90 degrees F.

1.6 PROJECT CONDITIONS

.1 Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 95 degrees F, in spaces to receive resilient products during the following time periods:

.1 48 hours before installation.

.2 During installation.

.3 48 hours after installation.

.2 Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 degrees F or more than 95 degrees F.

.3 Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

.1 Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

.1 Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Product

2.1 RESILIENT BASE

.1 Johnsonite BaseWorks™ Thermoset Rubber Wall Base (or approved equal in accordance with B7).

.1 Performance Characteristics

.1 Meets or exceeds the performance requirements for resistance to heat/light aging, chemicals, and dimensional stability when tested to the methods, as described, in ASTM F-1861.

.2 Flexibility: ASTM F 137 - Will not crack, break, or show any signs of fatigue when bent around a 1/4" (6.4 mm) diameter cylinder.

.3 Resistance to Light: ASTM F 1515 – Passes $\Delta E \leq 8.0$

.4 Chemical Resistance: ASTM F 925 Passed – Acetic Acid 5%, Isopropyl Alcohol 70%, Sodium Hydroxide 5%, Hydrochloric Acid 5%, Ammonia 5%, Phenol 5%, and Acid Sulfuric 5%.

.5 Fire Resistance:

.1 ASTM E 84/NFPA 255 (Flame/Smoke) – Class B, < 450

.2 ASTM E 648 (NFPA 253): Critical Radiant Flux – Class 1

.6 Chemical Resistance (ASTM F 925): Passed - 5% Acetic acid, 70% Isopropyl alcohol, Sodium hydroxide solution (5% NaOH), Hydrochloric acid solution (5% HCl), Sulfuric acid solution (5% H2SO4), Household ammonia solution (5% NH4OH), Household bleach (5.25% NaOCl), Disinfectant cleaner (5% active phenol)

.2 Material Requirement: Type TS rubber, vulcanized thermoset

.3 Manufacturing Method: Group I solid, homogeneous

.4 Style: Cove base with toe Butt to new or existing flooring.

.5 Minimum Thickness: 0.125 inch.

.6 Height: 4” (100 mm)

.7 Lengths: Cut to suit

.8 Outside Corners: Preformed.

.9 Inside Corners: Preformed.

.10 Finish: Low luster.

.11 Colour: to be Johnsonite 29 – Moon Rock.

.12 Locations: As indicated on drawings and on finish schedule.

2.2 RESILIENT VINYL STAIR NOSING:

.1 Johnsonite Rubber Stair Tread Without Riser (or approved equal in accordance with B7).

.1 Performance Characteristics:

.1 Manufactured from a homogeneous composition of polyvinyl chloride (PVC).

.2 Standard Stair Nosing complies with requirements for ASTM F 2169 Standard Specification for Resilient Stair Treads, Type TV, Class 1 and 2, Group 1 and 2.

.3 Slim Line Stair Nosing complies with requirements for ASTM F 2169 Standard Specification for Resilient Stair Treads, Type TV, Class 2.

.4 Hardness: ASTM D 2240 – Not less than 85 Shore A.

.5 Abrasion Resistance: ASTM D 3389 – 0.22 mg/cycle.

.6 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of 0.6 or greater.

.7 ASTM E 648, Standard Test Method for Critical Radiant Flux of 0.45 watts/cm^2 or greater, Class I.

.8 Square nose treads are hinged.

.9 Visually-Impaired treads meet ADA and are California Title 24 Accessibility requirements.

.2 Visually Impaired Vinyl Stair Nosing with co-extruded contrasting color insert:

.1 For Stair Nosing, visually impaired, top set, 2" height hinged Square Nose, 3 3/16" tread depth with 2" wide co-extruded contrasting color insert, 12' length

.1 Johnsonite VITSN Series (or approved equal);

.1 Colour to be: Johnsonite 38 Pewter.

2.3 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.4 INSTALLATION MATERIALS

.1 Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

.2 Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

.1 Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and as recommended by Johnsonite to meet Site conditions.:

.1 Rubber Base Adhesives: Not more than 50 g/L.

.2 Johnsonite #965 Flooring and Tread Adhesive.

.3 Johnsonite #945 Contact Bond Adhesive.

.4 Johnsonite #975 Two-Part Urethane Adhesive.

.5 Johnsonite #996 Two-Part Epoxy.

.2 Stair Tread and Nose Filler: Johnsonite #930 Two-Part Epoxy Caulking Compound to fill nosing substrates that do not conform to tread contours.

.3 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.

.4 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

.5 Provide transition/reducing strips tapered to meet abutting materials.

.6 Provide threshold of thickness and width as shown on the drawings.

.7 Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Contract Administrator from standard colors available.

.8 Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

Part 3 Execution

3.1 EXAMINATION

.1 Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

.2 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 resilient products.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

.2 Concrete Substrates for Resilient Stair Treads and Accessories: Prepare according to ASTM F 710.

.1 Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

.2 Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

.3 Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.

.4 Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

.5 Prepare Substrates according to ASTM F 710 including the following:

.1 Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

.1 Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.

– or –

.2 Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 80%.

.2 A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.

.3 Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

.6 Wood steps/substrates

.1 The substrate must be rigid, free of movement.

.2 Single wood and tongue and groove substrate should be covered with 1/4" (6.4 mm) or 1/2" (13 mm) APA approved underlayment plywood.

.1 Use 1/4" (6.4 mm) thick underlayment panels for boards with a face width of 3" (76 mm) or less.

.2 Use 1/2" (76 mm) thick underlayment panels for boards with a face width wider than 3" (76 mm).

.3 Do not install over OSB (Oriented Strand Board), particle board, chipboard, lauan or compoSite type underlayments.

.7 Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

.8 Floor covering shall not be installed over expansion joints.

.9 Do not install resilient products until they are same temperature as the space where they are to be installed.

.1 Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

.10 Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

.1 Comply with manufacturer's written instructions for installing resilient base.

.2 Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

.3 Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

.4 Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

.5 Do not stretch resilient base during installation.

.6 On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

.7 Preformed Corners: Install preformed corners before installing straight pieces.

.8 Job-Formed Corners:

.1 Outside Corners: Use straight pieces of maximum lengths possible. Form without producing discoloration (whitening) at bends.

.2 Inside Corners: Use straight pieces of maximum lengths possible.

3.4 RESILIENT STAIR TREAD AND NOSING INSTALLATION

.1 Comply with manufacturer's written instructions for installing resilient accessories.

.2 Resilient Stair Tread and Nosing:

.1 Use Johnsonite #930 Epoxy Caulking Compound to strengthen nosing and fill irregularities in substrates to conform to tread nosing.

.2 Tightly adhere to substrates throughout length of each piece.

.3 For treads installed as separate, equal-length units, install to produce a flush joint between units.

3.5 CLEANING AND PROTECTION

.1 Comply with manufacturer's written instructions for cleaning and protection of resilient products.

.2 Perform the following operations immediately after completing resilient product installation:

- .1 Remove adhesive and other blemishes from exposed surfaces.
- .2 Sweep and vacuum surfaces thoroughly.
- .3 Damp-mop surfaces to remove marks and soil.

.3 Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

.4 Cover resilient products until Substantial Completion.

END OF SECTION

PART 1 General

1.1 REFERENCES

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

- .1 ASTM F1303-[04], Standard Specification for Sheet Vinyl Floor Covering with Backing.
- .1 ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as measured by the James Machine.
- .2 ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).
- .3 ASTM D5116: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
- .4 ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- .5 ASTM E662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .6 ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- .7 ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- .8 ASTM F970: Standard Test Method for Static Load Limit.
- .9 ASTM F1344: Standard Specification for Rubber Floor Tile (Sections 7.1-7.6, 8.4-8.6).
- .10 ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- .11 ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

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

- .1 SCAQMD Rule 1113-[04], Architectural Coatings.
- .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.

.4 GREENGUARD Environmental Institute (GEI)

- .1 GREENGUARD Indoor Air Quality Certified®.
- .2 GREENGUARD Children and Schools Certified®.

.5 National Fire Protection Association

- .1 NFPA 101: Life Safety Code®.

.6 International Organization for Standardization (ISO)

- .1 ISO 9001: Quality Management Systems - Requirements.
- .2 ISO 14001: Environmental Management Systems - Requirements with Guidance for Use

.7 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Samples: Submit two samples, 12”x12” in size illustrating colour and pattern for each floor material for each colour specified.

.3 Submit two 12” long samples of base for each colour specified.

.4 Submit WHIMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 00 – Submittal Procedures, with the VOC levels highlighted.

1.3 QUALITY ASSURANCE

.1 Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.

.1 Critical Radiant Flux Classification: Class I, not less than 0.45 watts per square centimeter.

.2 Mockups: Provide resilient products with mockups specified in other Sections.

.3 During flooring installation, the flooring manufacturer representative and floor Contractor shall conduct on-Site meetings for installation procedures and techniques for the entire flooring installation.

1.4 REGULATORY REQUIREMENTS

.1 Conform to applicable code for flame/smoke rating.

1.5 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Meet the requirements per Section 01 35 20 Leadership in Energy and Environmental Design – Sustainable Requirements.

.2 The VOC content of the adhesives, sealants, and sealant primers used must be less than the VOC content limits of the State of California’s South Coast Air Quality Management District (SCAQMD) Rule #1168 (effective date of January 2007). The following are the VOC limits from Rule 1168:

.1 Architectural Sealants – 250 g/L
.2 Non-membrane Roof Sealant – 300 g/L
.3 Roadway – 250 g/L
.4 Other Sealants – 420 g/L
.5 Non-porous Architectural Sealant Primer – 250 g/L
.6 Porous Architectural Sealant Primer – 775 g/L
.7 Modified Bituminous Sealant Primer – 500 g/L
.8 Other Sealant Primer – 750 g/L
.9 Indoor Carpet and Carpet Pad Adhesives – 50 g/L
.10 Wood Flooring Adhesives – 100 g/L
.11 Rubber Floor Adhesives – 60 g/L

.12 Subfloor Adhesives – 50 g/L
.13 Ceramic Tile Adhesives – 65 g/L
.14 VCT and Asphalt Tile Adhesives – 50 g/L
.15 Gypsum Board and Panel Adhesives – 50 g/L
.16 Cove Base Adhesive – 50 g/L
.17 Multipurpose Construction Adhesives – 70 g/L
.18 Structural Glazing Adhesive – 100 g/L
.19 PVC Welding – 510 g/L
.20 CPVC Welding – 490 g/L
.21 ABS Welding – 325 g/L
.22 Plastic Cement Welding – 250 g/L
.23 Adhesive Primer for Plastic – 550 g/L
.24 Contact Adhesive – 80 g/L
.25 Special Purpose Contact Adhesive – 250 g/L
.26 Structural Wood Member Adhesive – 140 g/L
.27 Sheet Applied Rubber Lining Operations – 850 g/L
.28 Top and Trim Adhesive – 250 g/L
.29 Metal to Metal Adhesive – 30 g/L
.30 Plastic Foams Adhesive – 50 g/L
.31 Porous Material Adhesive (except wood) – 50 g/L
.32 Wood Adhesive – 30 g/L
.33 Fiberglass Adhesive – 80 g/L
.34 Duct Sealants – 250 g/L

.3 Laminate Adhesives must contain no urea-formaldehyde.

1.6 MAINTENANCE DATA

.1 Provide manufacturer's instructions covering care and maintenance of materials of this section as per Section 01 33 00 – Submittal Procedures.

.2 Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.8 EXTRA MATERIALS

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 2% or 250 sq ft of flooring, whichever is greater, and 250 sq ft of base, of each material specified.

.3 Extra materials one piece and from same production run as installed materials.

.4 Identify each roll of sheet flooring and each container of adhesive.

1.7 PROJECT CONDITIONS

.1 Install resilient products after other finishing operations, including painting, have been completed.

.2 Maintain ambient temperatures within range recommended by Manufacturer, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:

.1 48 hours before installation.

.2 During installation.

.3 48 hours after installation.

.3 Maintain the ambient relative humidity between 40% and 60% during installation.

.4 Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 13 degrees C or more than 29 degrees C.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

PART 2 Products

2.1 PRODUCT CONDITIONS

.1 Resilient flooring must:

.1 Meet or exceed all applicable governmental and industrial safety and performance standards; and

.2 Be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act (CEPA).

2.2 ACCEPTABLE MANUFACTURERS AND PRODUCTS:

.1 Acceptable Manufacturers:

.1 VS1 – Johnsonite iQ Optima Homogeneous Vinyl Sheet Flooring (or approved equal in accordance with B7) with the following physical characteristics:

.1 Complies with requirements for ASTM F 1913 Standard Specification for Vinyl Sheet Floor Covering without Backing.

.2 iQ construction: no wax, no finish for life of product.

.3 Roll/Sheet Width: 6'-6" (2 m)

.4 Wear layer/Overall thickness: .080" (2.0 mm).

.5 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of 0.6 or greater.

.6 ASTM F 970, Standard Test Method for Static Load Limit – 250 PSI.

.7 ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm2 or greater, Class I

.8 Contains 25% pre-consumer recycled content

.9 100% Recyclable

.10 NSF-332 Platinum Certified

.11 Phthalate-free (except for recycled material)

.12 iQ Natural contains 16% rapidly renewable content (Castor Oil) and 75% Natural Materials

.13 Colours to be (final colours to be approved by shop drawing):

.1 866 Sidewalk CG

.2 871 Arctic Winter

2.3 INSTALLATION MATERIALS

.1 Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation.

.2 Adhesives: As recommended by manufacturer to meet Site conditions.

.1 Johnsonite #925 Resilient Flooring Adhesive (or approved equal in accordance with B7).

.2 Johnsonite #975 Two-Part Urethane Adhesive (or approved equal in accordance with B7).

2.4 VINYL COVE BASE:

.1 Turn up and continue vinyl sheet flooring and cove base up sides of walls and up millwork to heights and locations as indicated on drawings.

2.5 ACCESSORIES:

.1 Edge protection strips: rubber with lip to extend under floor finish, with shoulder flush with top of adjacent flooring. Colours to be selected by Contract Administrator.

.1 Acceptable material: Johnsonite

.2 Primers and adhesives:

.1 Water-resistant, of type recommended by manufacturer for specific material on applicable substrate, above, on or below grade.

.2 For sheet flooring self-cove base use same adhesive used for flooring. Linoleum paste or cove base adhesives not acceptable for this application.

.3 Primers and adhesives to meet low VOC requirements.

.3 Subfloor filler and leveler:

.1 Cementitious underlayment, trowelable, non-shrink water-resistant, minimum compressive strength 4200 psi (29 MPa) after 28 day cure. Premix requiring only the addition of water.

.2 Use manufacturer's recommended primers on all surfaces to receive cementitious underlayment.

.3 Gypsum based products are not acceptable for sub-floor fillers and levelers.

.4 Acceptable material: Elsro Ardex K-55, Mapei Plani/Patch, EP Para-Patch System (or approved equal in accordance with B7).

.4 Heat weld threads: by same manufacturer as sheet flooring. Colours to be selected by Contract Administrator. Allow for multiple colour selection.

.5 Flooring protection: heavy duty, non-staining, kraft paper.

.6 Cove former: To be Erv Parent 1 1/4" radius cove former (or approved equal in accordance with B7).

.7 Cove Caping: To be Erv Parent-CHR3 aluminum cap (or approved equal in accordance with B7).

.1 Mechanically fasten to wall.

.8 Provide transition/reducing strips tapered to meet abutting materials.

.9 Provide threshold of thickness and width as shown on the drawings.

.10 Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Contract Administrator from standard colors available.

.11 Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

.12 Sealant (caulking): one component, mildew resistant silicone, as specified in Section 07 92 00 - Joint Sealants.

.1 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

.13 Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

2.6 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

PART 3 Execution

3.1 EXAMINATION

.1 Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

.2 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 resilient products.

.3 Verify that correct slopes have been provided to floor drains prior to installation of Resilient Sheet Flooring.

.4 Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Prepare substrates according to manufacturer's written instructions to ensure adhesion of Resilient Sheet Flooring.

.1 Dehumidification: After 28 day concrete cure, provide ten E1100 (or similar) dehumidifiers, running continuously, until concrete substrate is suitable for flooring application.

.1 Dehumidifiers to be drained by Contractor.

.2 Perform moisture tests as noted below. Proceed with installation only after substrates pass testing.

.2 Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

.3 Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

.4 Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.

.5 Prepare Substrates according to ASTM F 710 including the following:

.1 Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

.1 Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.

.2 –or –

.3 Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 80%.

.2 A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.

.3 Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

.2 Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

.3 Make transitions between different flooring materials smooth, level, and flush by building up subfloor with smooth gradual ramping of filler.

.4 Floor covering shall not be installed over expansion joints.

.5 Ensure sub-floor filler is fully bonded to substrates. Remove and replace unsound areas.

.6 Do not install resilient products until they are same temperature as the space where they are to be installed.

.1 Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

.7 Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT SHEET FLOORING INSTALLATION

.1 Comply with manufacturer's written instructions for installing resilient sheet flooring.

.2 Resilient Sheet Flooring:

.1 Install with adhesive as specified by the resilient sheet flooring manufacturer for the Site conditions and follow adhesive label for proper use.

.2 Install rolls in sequential order following roll numbers on the labels.

.3 Reverse sheets unless instructed otherwise in manufacturer’s installation instructions.

.4 Roll the flooring in both directions using a 100 pound three-section roller.

.5 Vinyl sheet flooring must be welded.

.1 Note: It is recommended to heat weld seams to provide a more sterile and water tight seam.

.6 Resilient Sheet Flooring may be flash coved.

.1 Use a cove filler strip.

.2 Net fit flooring material into the aluminum cove cap.

.7 Make level and good to be flush with abutting surfaces. Provide transition/reducing strips tapered to meet abutting materials.

3.4 RESILIENT SHEET FLOORING INSTALLATION AT DRAINS

.1 Comply with manufacturer’s written instructions for installation of resilient sheet flooring at floor drains and cleanouts.

.2 Ensure top of flooring meets flush with top of drain. Flooring must be sealed to all drain outlets and cleanouts to ensure a permanent watertight installation.

3.5 CLEANING AND PROTECTION

.1 Comply with manufacturer's written instructions for cleaning and protection of resilient products.

.2 Perform the following operations immediately after completing resilient product installation:

.1 Remove adhesive and other blemishes from exposed surfaces.

.2 Sweep and vacuum surfaces thoroughly.

.3 Damp-mop surfaces to remove marks and soil.

.3 Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

.1 No traffic for 24 hours after installation.

.2 No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

.4 Cover resilient products until Substantial Completion.

.5 Wait 72 hours after installation before performing initial cleaning.

.6 A regular maintenance program must be started after the initial cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

- .1 ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as measured by the James Machine.
- .2 ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).
- .3 ASTM D5116: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
- .4 ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- .5 ASTM E662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .6 ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- .7 ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- .8 ASTM F970: Standard Test Method for Static Load Limit.
- .9 ASTM F1344: Standard Specification for Rubber Floor Tile (Sections 7.1-7.6, 8.4-8.6).
- .10 ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- .11 ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

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

- .1 SCAQMD Rule 1113-[04], Architectural Coatings.
- .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.

.4 GREENGUARD Environmental Institute (GEI)

- .1 GREENGUARD Indoor Air Quality Certified®.
- .2 GREENGUARD Children and Schools Certified®.

.5 National Fire Protection Association

- .1 NFPA 101: Life Safety Code®.

.6 International Organization for Standardization (ISO)

- .1 ISO 9001: Quality Management Systems - Requirements.
- .2 ISO 14001: Environmental Management Systems - Requirements with Guidance for Use

.7 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Samples: Submit two samples, 12”x12” in size illustrating colour and pattern for each floor material for each colour specified.

.3 Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions

.4 Submit WHIMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples, with the VOC levels highlighted.

.5 LEED Submittals:

.1 Product Data for Credit EQ 4.1: For adhesives, include printed statement of VOC content and chemical components.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Meet the requirements per Section 01 35 20 Leadership in Energy and Environmental Design – Sustainable Requirements.

.2 The VOC content of the adhesives, sealants, and sealant primers used must be less than the VOC content limits of the State of California’s South Coast Air Quality Management District (SCAQMD) Rule #1168 (effective date of January 2007). The following are the VOC limits from Rule 1168:

.1 Architectural Sealants – 250 g/L
.2 Non-membrane Roof Sealant – 300 g/L
.3 Roadway – 250 g/L
.4 Other Sealants – 420 g/L
.5 Non-porous Architectural Sealant Primer – 250 g/L
.6 Porous Architectural Sealant Primer – 775 g/L
.7 Modified Bituminous Sealant Primer – 500 g/L
.8 Other Sealant Primer – 750 g/L
.9 Indoor Carpet and Carpet Pad Adhesives – 50 g/L
.10 Wood Flooring Adhesives – 100 g/L
.11 Rubber Floor Adhesives – 60 g/L
.12 Subfloor Adhesives – 50 g/L
.13 Ceramic Tile Adhesives – 65 g/L
.14 VCT and Asphalt Tile Adhesives – 50 g/L
.15 Gypsum Board and Panel Adhesives – 50 g/L
.16 Cove Base Adhesive – 50 g/L
.17 Multipurpose Construction Adhesives – 70 g/L
.18 Structural Glazing Adhesive – 100 g/L
.19 PVC Welding – 510 g/L
.20 CPVC Welding – 490 g/L

.21 ABS Welding – 325 g/L
.22 Plastic Cement Welding – 250 g/L
.23 Adhesive Primer for Plastic – 550 g/L
.24 Contact Adhesive – 80 g/L
.25 Special Purpose Contact Adhesive – 250 g/L
.26 Structural Wood Member Adhesive – 140 g/L
.27 Sheet Applied Rubber Lining Operations – 850 g/L
.28 Top and Trim Adhesive – 250 g/L
.29 Metal to Metal Adhesive – 30 g/L
.30 Plastic Foams Adhesive – 50 g/L
.31 Porous Material Adhesive (except wood) – 50 g/L
.32 Wood Adhesive – 30 g/L
.33 Fiberglass Adhesive – 80 g/L
.34 Duct Sealants – 250 g/L

.3 Laminate Adhesives must contain no urea-formaldehyde.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 2% or 250 sq' of flooring, whichever is greater, and 250 sq' of base, of each material specified.

.3 Extra materials one piece and from same production run as installed materials.

.4 Identify each roll of sheet flooring and each container of adhesive.

1.5 QUALITY ASSURANCE

.1 Manufacturer must be certified ISO 9001 and ISO 14001.

.2 Manufacturer must have experience in the manufacturing of specified flooring.

.3 Installer must have performed installations of the same scale in the last three (3) years.

.4 Installer to be recognized and approved by the flooring Manufacturer.

.5 Installation of mock-up is highly recommended and must be deemed acceptable by Contract Administrator. Mock-up is to be installed following the same procedures and utilizing the same specified materials that will be used for the actual project.

.6 During flooring installation, the flooring manufacturer representative and floor Contractor shall conduct on-Site meetings for installation procedures and techniques for the entire flooring installation.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Materials must be delivered in Manufacturer's original, unopened and undamaged containers with identification labels intact.

.2 Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

.3 Material need not suffer damage during handling (i.e. edge chipping, excessive warping, etc.).

.4 The Contractor shall be responsible for ensuring all Site conditions meet the requirements of the rubber athletic flooring Manufacturer.

.5 Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF (18ºC) and a maximum temperature of 100ºF (38ºC) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF (13ºC) in areas where Work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

.6 Installation to be carried out no sooner than the specified curing time of concrete subfloor (normal density concrete curing time is approximately 28 days for development of design strength). Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

.7 Moisture vapor emission content of the concrete slab must not exceed the tolerance of the adhesive used, when tested using the anhydrous calcium chloride test as per ASTM F1869 and/or using the in-situ probes test as per ASTM F2170. The pH of the concrete slab must be between 7 and 8.5.

.8 Installation of flooring will not commence unless all other trades in the building are completed. It is the Contractor’s responsibility to maintain a secure and clean working area before, during and after the installation of the flooring.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC’s.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.8 WARRANTY

.1 Provide Manufacturer’s current standard warranty.

.2 Resilient flooring is warranted to be free from manufacturing defects for a period of five (5) years from the date of purchase from the Manufacturer.

.3 Resilient flooring installation is warranted for a period of five (5) years from the date of purchase from the Manufacturer.

Part 2 Products

2.1 RESILIENT VINYL COMPOSITION TILE (VCT) FLOORING MATERIALS

.1 Gymnasium Floor: Armstrong Imperial Texture Standard EXCELON Tile Flooring (or approved equal in accordance with B7):

.1 Nominal total thickness: 1/8"/0.125in. (3.2mm)

.2 Tile Size: 12 in. x 12 in. (305 mm x 305 mm),

.3 Composition:

.1 Polyvinyl chloride resin binder, plasticizers, fillers, and pigments with colors and texture dispersed uniformly throughout its thickness.

.2 ASTM F 1066, Class 2 – through pattern.

.4 Colours to be (final colours to be approved by shop drawing):

.1 51860 Soft Cool Grey

.2 51927 Field Grey

2.2 SUBSTITUTIONS:

.1 Refer to Section B7 of Bid Opportunity 748-2013.

2.3 ADHESIVES AND SEALANTS

.1 For Tile Installation System, Full Spread: Provide Armstrong S-515 Resilient Tile Adhesive under the tile as recommended by the flooring manufacturer.

.2 For Tile High-Moisture Installation Warranty, Full Spread: Provide Armstrong S-515 Resilient Tile Adhesive under the tile as recommended by the flooring manufacturer.

.3 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.

.4 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

2.4 ACCESSORIES

.1 For patching, smoothing, and leveling monolithic subfloors (concrete), provide patch and underlayment as required.

.2 For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

.3 Provide transition/reducing strips tapered to meet abutting materials.

.4 Provide threshold of thickness and width as shown on the drawings.

.5 Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Contract Administrator from standard colors available.

.6 Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

2.5 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 EXAMINATION

.1 Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

.2 Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

.3 Report conditions contrary to Contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

.4 Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.2 PREPARATION

.1 Refer to Section 09 65 16 – Resilient Sheet Flooring for concrete substrate dehumidification process.

.2 Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with cement-based patch as recommended by the flooring manufacturer.

.3 Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents.

.4 For Tile Installation System, Full Spread or for Tile Installation System, Tile On , perform subfloor moisture testing in accordance with [ASTM F 2170, “Standard Test Method for Determining Relative Humidity in Concrete Slabs Using *in-situ* Probes”][ASTM F 1869,“Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete

Subfloor Using Anhydrous Calcium Chloride"] and Bond Tests as described at www.floorexpert.com to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 80%.][MVER shall not exceed 5 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained.

.5 For S-515 Tile Adhesive High-Moisture Installation Warranty, perform subfloor moisture testing in accordance with ASTM F 2170, "Standard Test Method for Determining Relative Humidity in Concrete Slabs Using *in-situ* Probes"][ASTM F 1869,"Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride"] and Bond Tests as described at www.floorexpert.com to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring. [Relative humidity shall not exceed 90%.][MVER shall not exceed 7 lbs./1000 sq. ft./24 hrs.] On installations where both the Percent Relative Humidity and the Moisture Vapor Emission Rate tests are conducted, results for both tests shall comply with the allowable limits listed above. Do not proceed with flooring installation until results of moisture tests are acceptable. All test results shall be documented and retained].

.6 Perform pH tests on concrete floors regardless of their age or grade level. All test results shall be documented and retained

.7 Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

.8 Account for differing thickness of flooring with leveling compound and ensure that top of all flooring types meet flush with one another.

3.3 RESILIENT TILE FLOORING INSTALLATION

.1 Install flooring in strict accordance with the procedures found in the Vinyl Composition Tile Installation System at www.floorexpert.com.

.2 Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

.3 If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.

.4 Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

.5 Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

.6 Game line Painting:

.1 All game lines that are to be painted onto vinyl composition tile must be applied in accordance with Manufacturer's current printed Line Painting Application Instructions.

.2 Game lines to be painted in accordance with game line drawings (by others). Refer to Section 11 66 23 – Gymnasium Equipment.

3.4 INSTALLATION OF ACCESSORIES

.1 Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

.2 Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

.3 Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

.4 Apply metal edge strips where shown on the drawings. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.5 REPAIR

.1 Repair material must be from the same dye lot as material supplied for initial installation.

.2 Repairs are to be performed by qualified installers/technicians only.

3.6 PROTECTION AND CLEANING

.1 Comply with manufacturer's written instructions for cleaning and protection of resilient products.

.2 Perform the following operations immediately after completing resilient product installation:

.1 Remove adhesive and other blemishes from exposed surfaces.

.2 Sweep and vacuum surfaces thoroughly.

.3 Damp-mop surfaces to remove marks and soil.

.3 Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

.1 No traffic for 24 hours after installation.

.2 No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

.4 Cover flooring until Substantial Completion.

.5 Wait 72 hours after installation before performing initial cleaning.

.6 A regular maintenance program must be started after the initial cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

- .1 ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor Surfaces as measured by the James Machine.
- .2 ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).
- .3 ASTM D5116: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
- .4 ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- .5 ASTM E662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .6 ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- .7 ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- .8 ASTM F970: Standard Test Method for Static Load Limit.
- .9 ASTM F1344: Standard Specification for Rubber Floor Tile (Sections 7.1-7.6, 8.4-8.6).
- .10 ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- .11 ASTM F2170: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

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

- .1 SCAQMD Rule 1113-[04], Architectural Coatings.
- .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.

.4 GREENGUARD Environmental Institute (GEI)

- .1 GREENGUARD Indoor Air Quality Certified®.
- .2 GREENGUARD Children and Schools Certified®.

.5 National Fire Protection Association

- .1 NFPA 101: Life Safety Code®.

.6 International Organization for Standardization (ISO)

- .1 ISO 9001: Quality Management Systems - Requirements.
- .2 ISO 14001: Environmental Management Systems - Requirements with Guidance for Use.

.7 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Samples: Submit two samples, 12”x12” in size illustrating colour and pattern for each floor material for each colour specified.

.3 Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions.

.4 Submit WHIMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples, with the VOC levels highlighted.

.5 LEED Submittals:

.1 Product Data for Credit EQ 4.1: For adhesives, include printed statement of VOC content and chemical components.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Meet the requirements per Section 01 35 20 Leadership in Energy and Environmental Design – Sustainable Requirements.

.2 The VOC content of the adhesives, sealants, and sealant primers used must be less than the VOC content limits of the State of California’s South Coast Air Quality Management District (SCAQMD) Rule #1168 (effective date of January 2007). The following are the VOC limits from Rule 1168:

.1 Architectural Sealants – 250 g/L
.2 Non-membrane Roof Sealant – 300 g/L
.3 Roadway – 250 g/L
.4 Other Sealants – 420 g/L
.5 Non-porous Architectural Sealant Primer – 250 g/L
.6 Porous Architectural Sealant Primer – 775 g/L
.7 Modified Bituminous Sealant Primer – 500 g/L
.8 Other Sealant Primer – 750 g/L
.9 Indoor Carpet and Carpet Pad Adhesives – 50 g/L
.10 Wood Flooring Adhesives – 100 g/L
.11 Rubber Floor Adhesives – 60 g/L
.12 Subfloor Adhesives – 50 g/L
.13 Ceramic Tile Adhesives – 65 g/L
.14 VCT and Asphalt Tile Adhesives – 50 g/L
.15 Gypsum Board and Panel Adhesives – 50 g/L
.16 Cove Base Adhesive – 50 g/L
.17 Multipurpose Construction Adhesives – 70 g/L
.18 Structural Glazing Adhesive – 100 g/L
.19 PVC Welding – 510 g/L
.20 CPVC Welding – 490 g/L

.21 ABS Welding – 325 g/L
.22 Plastic Cement Welding – 250 g/L
.23 Adhesive Primer for Plastic – 550 g/L
.24 Contact Adhesive – 80 g/L
.25 Special Purpose Contact Adhesive – 250 g/L
.26 Structural Wood Member Adhesive – 140 g/L
.27 Sheet Applied Rubber Lining Operations – 850 g/L
.28 Top and Trim Adhesive – 250 g/L
.29 Metal to Metal Adhesive – 30 g/L
.30 Plastic Foams Adhesive – 50 g/L
.31 Porous Material Adhesive (except wood) – 50 g/L
.32 Wood Adhesive – 30 g/L
.33 Fiberglass Adhesive – 80 g/L
.34 Duct Sealants – 250 g/L

.3 Laminate Adhesives must contain no urea-formaldehyde.

1.4 MAINTENANCE MATERIAL SUBMITTALS

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 2% or 250 sq' of flooring, whichever is greater, and 250 sq' of base, of each material specified.

.3 Extra materials one piece and from same production run as installed materials.

.4 Identify each roll of sheet flooring and each container of adhesive.

1.5 QUALITY ASSURANCE

.1 Manufacturer must be certified ISO 9001 and ISO 14001.

.2 Manufacturer must have experience in the manufacturing of specified flooring.

.3 Installer must have performed installations of the same scale in the last three (3) years.

.4 Installer to be recognized and approved by the flooring Manufacturer.

.5 Installation of mock-up is highly recommended and must be deemed acceptable by Contract Administrator. Mock-up is to be installed following the same procedures and utilizing the same specified materials that will be used for the actual project.

.6 During flooring installation, the flooring manufacturer representative and floor Contractor shall conduct on-Site meetings for installation procedures and techniques for the entire flooring installation.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Materials must be delivered in Manufacturer's original, unopened and undamaged containers with identification labels intact.

.2 Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by Manufacturer, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

.3 Material need not suffer damage during handling (i.e. edge chipping, excessive warping, etc.).

1.7 SITE CONDITIONS

.1 The Contractor shall be responsible for ensuring all Site conditions meet the requirements of the rubber athletic flooring Manufacturer.

.2 Maintain ambient temperatures within range recommended by Johnsonite, but not less than 65 deg F (18 deg C) or more than 85 deg F (29 deg C) in spaces to receive resilient products during the following time periods:

.1 48 hours before installation.

.2 During installation.

.3 48 hours after installation.

.3 Maintain the ambient relative humidity between 40% and 60% during installation.

.4 Until Substantial Completion, maintain ambient temperatures within range recommended by Manufacturer, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

.5 Installation to be carried out no sooner than the specified curing time of concrete subfloor (normal density concrete curing time is approximately 28 days for development of design strength). Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

.6 Moisture vapor emission content of the concrete slab must not exceed the tolerance of the adhesive used, when tested using the anhydrous calcium chloride test as per ASTM F1869 and/or using the in-situ probes test as per ASTM F2170. The pH of the concrete slab must be between 7 and 8.5.

.7 Installation of flooring will not commence unless all other trades in the building are completed. It is the Contractor’s responsibility to maintain a secure and clean working area before, during and after the installation of the flooring.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC’s.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.9 WARRANTY

.1 Provide Manufacturer's current standard warranty.

.2 Resilient rubber flooring is warranted to be free from manufacturing defects for a period of one (1) year from the date of shipment from the Manufacturer.

.3 Resilient rubber flooring is warranted against excessive wear under normal usage for a period of ten (10) years from the date installation.

Part 2 Products

2.1 RESILENT RUBBER TILE FLOORING MATERIALS

.1 Provide Johnsonite Solid Colour Rubber Tile Flooring (or approved equal in accordance with B7).

.1 Colour to be (final colours to be approved by shop drawing):

.1 63 Burnt Umber

.2 Nominal total thickness: 1/8"/0.125in. (3.2mm)

.3 Tile Size: 24 in. x 24 in. (610 mm x 610 mm)

.4 Texture: Raised Round with .025" (0.635 mm) Disk Height

.5 Composition:

.1 Complies with requirements for ASTM F 1344 Standard Specification for Rubber Floor Tile, Class 1-A and 1-B.

.2 Manufactured from a homogeneous composition of 100% synthetic rubber.

.3 ASTM D 2240 Standard Test Method for Rubber Property—Durometer Hardness: 65 Shore A.

.4 ASTM D 3389 Standard Test Method for Coated Fabrics Abrasion Resistance: < 1.00 gram weight loss.

.5 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring: Exceeds Federal Standards and A.D.A. requirements for slip-resistant.

.6 ASTM F 970, Standard Test Method for Static Load Limit – passes at 250 PSI.

.7 ASTM E 989, Standard Classification for Rating Impact Insulation (IIC) using ASTM E 492, Acoustical Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine – 40 IIC.

.8 ASTM E 648, Standard Test method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source – equal to or greater than 0.45 watts/cm2.

.9 SCS FloorScore® Certified and meets California Specifications Section 01350.

.10 Phthalate, chlorine and halogen free.

.11 NSF-332 Gold Certified.

.12 Johnsonite facilities are ISO 9001 and ISO 14001 Certified.

.13 Possible LEED contributions for Johnsonite Rubber Flooring include MR2; MR5; and EQ4.3.

2.2 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.3 INSTALLATION MATERIALS - RESILENT RUBBER TILE FLOORING

.1 Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation.

.2 Adhesives and sealants: As recommended by Johnsonite to meet Site conditions.

.1 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

.3 Edge protection strips: rubber with lip to extend under floor finish, with shoulder flush with top of adjacent flooring. Colours selected by Contract Administrator.

.4 Provide transition/reducing strips tapered to meet abutting materials.

.5 Provide threshold of thickness and width as shown on the drawings.

.6 Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Contract Administrator from standard colors available.

.7 Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

Part 3 Execution

3.1 EXAMINATION

.1 Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

.2 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 resilient products.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

.4 Concrete subfloors to be placed a minimum of twenty-eight (28) days prior to the installation of rubber flooring.

.5 Concrete subfloors on or below grade are installed over a suitable moisture retardant membrane.

.6 Water vapor membrane complies with specification in ASTM E1745.

.7 No concrete sealers or curing compounds are applied or mixed with the subfloors.

.8 HVAC (Heating, Ventilating and Air Conditioning) unit must be operational to reflect in-service conditions.

.9 Moisture and alkalinity tests must be performed. Moisture vapor emission content of the concrete slab must not exceed the tolerance of the adhesive used, when tested using the anhydrous calcium chloride test as per ASTM F1869 and/or using the in-situ probes test as per ASTM F2170. The pH of the concrete slab must be between 7 and 8.5.

.10 Smooth, dense finish, highly compacted with a tolerance of 1/8'' in a 10 ft radius (3.2 mm in 3.05 m radius). Floor Flatness (FF) and Floor Levelness (FL) numbers are not recognized.

3.2 PREPARATION

.1 Prepare substrates according to manufacturer's written instructions to ensure adhesion of Resilient Rubber Tile Flooring.

.1 Refer to Section 09 65 16 – Resilient Sheet Flooring for concrete substrate dehumidification process.

.2 Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

.3 Remove substrate paint, coatings and other substances that are incompatible with adhesives or contain soap, wax, oil, solvents, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

.4 Mechanically remove contamination on the substrate that may cause damage to the resilient flooring material. Permanent and non-permanent markers, pens, crayons, paint, etc., must not be used to write on the back of the flooring material or used to mark the substrate as they could bleed through and stain the flooring material.

.5 Prepare Substrates according to ASTM F 710 including the following:

.1 Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

.1 Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.

– or –

.2 Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 80%.

.2 A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.

.3 Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

.6 Wood subfloors must have a minimum 18" (45.7 cm) of cross-ventilated space beneath the bottom of the joist.

.1 The floor must be rigid, free of movement.

.2 Single wood and tongue and groove subfloors should be covered with ¼" (6.4 mm) or ½" (12.7 mm) APA approved underlayment plywood.

.1 Use ¼" (6.4 mm) thick underlayment panels for boards with a face width of 3" (76 mm) or less.

.2 Use ½" (12.7 mm) thick underlayment panels for boards with a face width wider than 3" (76 mm).

.3 Do not install over OSB (Oriented Strand Board), particle board, chipboard, or composite type underlayments.

.7 Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

.8 Floor covering shall not be installed over expansion joints.

.9 Do not install resilient products until they are same temperature as the space where they are to be installed.

.1 Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

.10 Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

.11 Account for differing thickness of flooring with leveling compound and ensure that top of all flooring types meet flush with one another.

3.3 RESILIENT RUBBER TILE FLOORING INSTALLATION

.1 Comply with manufacturer's written instructions for installing resilient tile flooring.

.2 Resilient Rubber Floor Tile:

.1 Install with adhesive specified by manufacturer for the Site conditions and follow adhesive label for proper use.

.2 Do not Quarter Turn tile.

.3 Roll the flooring in both directions using a 100 pound three-section roller.

3.4 REPAIR

.1 Repair material must be from the same dye lot as material supplied for initial installation.

.2 Repairs are to be performed by qualified installers/technicians only.

3.5 PROTECTION AND CLEANING

.1 Comply with manufacturer's written instructions for cleaning and protection of resilient products.

.2 Perform the following operations immediately after completing resilient product installation:

.1 Remove adhesive and other blemishes from exposed surfaces.

.2 Sweep and vacuum surfaces thoroughly.

.3 Damp-mop surfaces to remove marks and soil.

.3 Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

.1 No traffic for 24 hours after installation.

.2 No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

.4 Cover flooring until Substantial Completion.

.5 Wait 72 hours after installation before performing initial cleaning.

.6 A regular maintenance program must be started after the initial cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing & Materials (ASTM)

- .1 ASTM D2047: Standard Test Method for Static Coefficient of Friction of Polish-Coated Floor
- .2 Surfaces as measured by the James Machine.
- .3 ASTM D2240: Standard Test Method for Rubber Property (Durometer Hardness).
- .4 ASTM D5116: Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
- .5 ASTM E648: Standard Test Method for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.
- .6 ASTM E662: Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
- .7 ASTM E1745: Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
- .8 ASTM F970: Standard Test Method for Static Load Limit.
- .9 ASTM F1869: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- .10 ASTM G21: Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- .11 ASTM F710: Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.

.2 GREENGUARD Environmental Institute

- .1 GREENGUARD Indoor Air Quality Certified®.

.3 National Fire Protection Association

- .1 NFPA 101: Life Safety Code®.

.4 International Organization for Standardization (ISO)

- .1 ISO 9001: Requirements for Quality Management Systems.
- .2 ISO 14001: Requirements with Guidance for Use for Environmental Management Systems.

.5 Canada Green Building Council (CaGBC)

- .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 Provide samples, 12” x 12”, for verification of such characteristics as color, texture and finish for each specified rubber athletic product.

.3 As necessary, provide shop drawings prepared for project illustrating layouts, details, dimensions and other data.

.4 Provide samples of available gameline paint colors for selection and approval.

.5 Provide current subfloor preparation guidelines, as published by the Manufacturer.

.6 Provide current installation guidelines, as published by the Manufacturer.

.7 If specified, provide current gameline painting guidelines, as published by the Manufacturer.

.8 Submit WHIMIS MSDS – Material Safety Data Sheets in accordance with Section 01 33 23 - Shop Drawings, Product Data, and Samples, with the VOC levels highlighted.

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Meet the requirements per Section 01 35 20 Leadership in Energy and Environmental Design – Sustainable Requirements.

.2 The VOC content of the adhesives, sealants, and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168 (effective date of January 2007). The following are the VOC limits from Rule 1168:

.1 Architectural Sealants – 250 g/L
.2 Non-membrane Roof Sealant – 300 g/L
.3 Roadway – 250 g/L
.4 Other Sealants – 420 g/L
.5 Non-porous Architectural Sealant Primer – 250 g/L
.6 Porous Architectural Sealant Primer – 775 g/L
.7 Modified Bituminous Sealant Primer – 500 g/L
.8 Other Sealant Primer – 750 g/L
.9 Indoor Carpet and Carpet Pad Adhesives – 50 g/L
.10 Wood Flooring Adhesives – 100 g/L
.11 Rubber Floor Adhesives – 60 g/L
.12 Subfloor Adhesives – 50 g/L
.13 Ceramic Tile Adhesives – 65 g/L
.14 VCT and Asphalt Tile Adhesives – 50 g/L
.15 Gypsum Board and Panel Adhesives – 50 g/L
.16 Cove Base Adhesive – 50 g/L
.17 Multipurpose Construction Adhesives – 70 g/L
.18 Structural Glazing Adhesive – 100 g/L
.19 PVC Welding – 510 g/L
.20 CPVC Welding – 490 g/L
.21 ABS Welding – 325 g/L
.22 Plastic Cement Welding – 250 g/L
.23 Adhesive Primer for Plastic – 550 g/L
.24 Contact Adhesive – 80 g/L
.25 Special Purpose Contact Adhesive – 250 g/L
.26 Structural Wood Member Adhesive – 140 g/L
.27 Sheet Applied Rubber Lining Operations – 850 g/L

.28 Top and Trim Adhesive – 250 g/L
.29 Metal to Metal Adhesive – 30 g/L
.30 Plastic Foams Adhesive – 50 g/L
.31 Porous Material Adhesive (except wood) – 50 g/L
.32 Wood Adhesive – 30 g/L
.33 Fiberglass Adhesive – 80 g/L
.34 Duct Sealants – 250 g/L

.3 Laminate Adhesives must contain no urea-formaldehyde.

1.4 CLOSEOUT SUBMITTALS

.1 Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 - Closeout Submittals.

.2 Provide 2% or 250 sq' of flooring, whichever is greater, and 250 sq' of base, of each material specified.

.3 Extra materials one piece and from same production run as installed materials.

.4 Identify each roll of sheet flooring and each container of adhesive.

1.5 QUALITY ASSURANCE

.1 Manufacturer must be certified ISO 9001 and ISO 14001.

.2 Manufacturer must have experience in the manufacturing of prefabricated rubber athletic flooring.

.3 Installer must have performed installations of the same scale in the last three (3) years.

.4 Installer to be recognized and approved by the rubber athletic flooring Manufacturer.

.5 If specified, gamelines must be applied by professionals with proper experience and qualifications to effectively perform the Work.

.6 Installation of mock-up is highly recommended and must be deemed acceptable by The City and Contract Administrator. Mock-up is to be installed following the same procedures and utilizing the same specified materials that will be used for the actual project.

.7 During flooring installation, the flooring manufacturer representative and floor Contractor shall conduct on-Site meetings for installation procedures and techniques for the entire flooring installation.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Materials must be delivered in Manufacturer's original, unopened and undamaged containers with identification labels intact.

.2 Store material upright on a clean, dry, flat surface protected from all possible damage, and protect from exposure to harmful weather conditions.

.3 Recommended environmental condition for storage is a minimum of 55oF (13oC).

.4 Material need not suffer damage during handling (i.e. edge chipping, excessive warping, etc.).

1.7 SITE CONDITIONS

.1 The Contractor or shall be responsible for ensuring all Site conditions meet the requirements of the rubber athletic flooring Manufacturer.

.2 Maintain a stable room and subfloor temperature for a period of 48 hours prior, during and 48 hours after installation. Recommended range: 65oF to 86oF (18oC to 30oC).

.3 Installation to be carried out no sooner than the specified curing time of concrete subfloor (normal density concrete curing time is approximately 28 days for development of design strength).

.4 Moisture vapor emission content of the concrete slab must not exceed the tolerance of the adhesive used, when tested using the anhydrous calcium chloride test as per ASTM F1869.

.5 Installation of rubber athletic flooring will not commence unless all other trades in the building are completed. It is the Contractor's responsibility to maintain a secure and clean working area before, during and after the installation of rubber athletic flooring.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.9 WARRANTY

.1 Provide Manufacturer's current standard warranty.

.2 The rubber athletic flooring is warranted to be free from manufacturing defects for a period of three (3) years from the date of shipment from the Manufacturer.

.3 The rubber athletic flooring is warranted against excessive wear under normal usage for a period of ten (10) years from the date installation.

Part 2 Products

2.1 ACCEPTABLE MANUFACTURERS

.1 Mondo America Inc.:

North America Headquarters and Manufacturing Plant, 2655 Francis-Hughes, Laval, QC, Canada. Toll Free: USA 1 800 361-3747 or CAN: 1 800 663-8138 Toll Free anywhere in North America: 1 800 441-6645

2.2 ACCEPTABLE PRODUCTS

.1 Skate Flooring:

.1 MONDO RAMFLEX is prefabricated rubber athletic flooring, calendered and vulcanized with a base of natural and synthetic rubbers, stabilizing agents and pigmentation, as manufactured by MONDO AMERICA INC. (or approved equal in accordance with B7).

.1 Thickness: 1/4" (6 mm).

.2 Colours to be (final colours to be approved by shop drawing)

.1 707 Grey

.2 902 Tan

.3 Texture: hammered.

.4 Sheet Size: 6' (1.83m) wide x lengths as required.

2.3 SUBSTITUTIONS:

.1 Refer to Section 01 33 00 – Submittal Procedure, subsection 2.2.

2.4 PERFORMANCE

.1 Performance of the prefabricated rubber athletic flooring to conform to the following criteria:

.1 MONDO RAMFLEX

Performance Criteria	**Test Method**	**Result**
Tensile Strength	ASTM D412-06	≥ 500 psi
Elongation at Break	ASTM D412-06	≥ 150%
Hardness (Shore A)	ASTM D2240-05	80 ± 5 (Top Layer), 70 ± 5 (Bottom Layer)
Abrasion Resistance (H18 Wheel 1000 cycles 1000g load)	ASTM D3389-05	≤ 0.5 grams loss
Static Load Limit (250 Lbs)	ASTM F970-06	≤ 0.009 inch
Coefficient of Friction	ASTM D2047-04	Dry ≥ 0.80
Fungal Resistance Test	ASTM G21-96	No Growth
Chemical Resistance	ASTM F925-02	No Surface Attack
Critical Radiant Flux	ASTM E 648-06	≥ 0.45W/cm², Class 1
Optical Smoke Density	ASTM E662-06	< 450
GREENGUARD Certification		Yes

2.5 ACCESSORIES

.1 Provide adhesive certified by rubber athletic flooring manufacturer: PU 105 polyurethane adhesive. Refer to current guidelines on product mixing and use, as published by the Manufacturer. EP 55 epoxy adhesive may be used in areas that have not been specified for use with Mondo Everlay, and that will not be subject to impacts or dynamic loads such as bleachers.

.1 Do not use caulking that emits strong odors, contains toxic chemicals, or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off-gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

.2 Edge protection strips: rubber with lip to extend under floor finish, with shoulder flush with top of adjacent flooring. Colours selected by Contract Administrator

.3 Subfloor filler and leveler:

.1 Cementitious underlayment, trowelable, non-shrink water-resistant, minimum compressive strength 4200 psi (29 MPa) after 28 day cure. Premix requiring only the addition of water.

.2 Use manufacturer's recommended primers on all surfaces to receive cementitious underlayment.

.3 Gypsum based products are not acceptable for sub-floor fillers and levelers.

.4 Acceptable material: Elsro Ardex K-55, Mapei Plani/Patch, EP Para-Patch System.

.4 Provide transition/reducing strips tapered to meet abutting materials.

.5 Provide threshold of thickness and width as shown on the drawings.

.6 Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Contract Administrator from standard colors available.

.7 Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

2.6 SUBSTITUTIONS:

.1 Refer to Section B7 of Bid Opportunity 748-2013.

Part 3 Execution

3.1 EXAMINATION

.1 Concrete subfloors to be placed a minimum of twenty-eight (28) days prior to the installation of rubber athletic flooring.

.2 Concrete subfloors on or below grade are installed over a suitable moisture retardant membrane.

.3 Water vapor membrane complies with specification in ASTM E1745.

.4 No concrete sealers or curing compounds are applied or mixed with the subfloors.

.5 Moisture and alkalinity tests must be performed. Moisture content must not exceed the capacity of the specified adhesive (verify using the anhydrous calcium chloride test as per ASTM F1869) and pH level should be in the range of 7 to 8.5.

.6 Smooth, dense finish, highly compacted with a tolerance of 1/8'' in a 10 ft radius (3.2 mm in 3.05 m radius). Floor Flatness (FF) and Floor Levelness (FL) numbers are not recognized.

.7 Verify that correct slopes have been provided to floor drains prior to installation of rubber athletic flooring.

3.2 PREPARATION

.1 Subfloors:

.1 Prepare concrete subfloor in accordance with Manufacturer's current printed Subfloor preparation Guidelines.

.2 Refer to Section 09 65 16 – Resilient Sheet Flooring for concrete substrate dehumidification process.

.3 Prepare Substrates according to ASTM F 710 including the following:

.1 Moisture Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

.1 Perform anhydrous calcium chloride test, ASTM F 1869. Results must not exceed 5 lbs. Moisture Vapor Emission Rate per 1,000 sq. ft. in 24 hours.

– or –

.2 Perform relative humidity test using in situ probes, ASTM F 2170. Must not exceed 80%.

.2 A pH test for alkalinity must be conducted. Results should range between 7 and 9. If the test results are not within the acceptable range of 7 to 9, the installation must not proceed until the problem has been corrected.

.3 Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer.

.2 Account for differing thickness of flooring with leveling compound and ensure that top of all flooring types meet flush with one another.

3.3 INSTALLATION

.1 Installation of Sheet Goods:

.1 Install rubber athletic flooring in accordance with Manufacturer's current printed Installation Manual.

.2 Make transitions between different flooring materials smooth, level, and flush by building up subfloor with smooth gradual ramping of filler.

3.4 INSTALLATION AT DRAINS

.1 Comply with manufacturer's written instructions for installation of rubber athletic flooring.at floor drains and cleanouts.

.2 Scribe drain opening and cut flooring to fit. Ensure top of flooring meets flush with top of drain. Flooring must be sealed to all drain outlets and cleanouts to ensure a permanent watertight installation.

3.5 REPAIR

.1 Repair material must be from the same dye lot as material supplied for initial installation.

.2 Repairs are to be performed by qualified installers/technicians only.

3.6 CLEANING

.1 Comply with manufacturer's written instructions for cleaning and protection of resilient products.

.2 Perform the following operations immediately after completing resilient product installation:

.1 Remove adhesive and other blemishes from exposed surfaces.

.2 Sweep and vacuum surfaces thoroughly.

.3 Damp-mop surfaces to remove marks and soil.

.3 Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

.1 No traffic for 24 hours after installation.

.2 No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.

.4 Cover flooring until Substantial Completion.

.5 Wait 72 hours after installation before performing initial cleaning.

.6 For surfaces with newly applied line paint, allow 7 days for proper cure.

.7 A regular maintenance program must be started after the initial cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

.2 Environmental Protection Agency (EPA)

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

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 The Master Painters Institute (MPI)

.1 Contract Administratorural Painting Specification Manual - [February 2004].

.2 Standard GPS-1-[05], MPI Green Performance Standard for Painting and Coatings.

.5 National Fire Code of Canada.

.6 Society for Protective Coatings (SSPC)

.1 Systems and Specifications, SSPC Painting Manual [2005].

1.2 QUALITY ASSURANCE

.1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeyperson shall be engaged in painting Work. Apprentices may be employed provided they Work under the direct supervision of a qualified journeyperson in accordance with trade regulations.

.3 Conform to latest MPI requirements for exterior painting Work including preparation and priming.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) shall be in accordance with MPI Painting Specification Manual "Approved Products" listing and shall be from a single manufacturer for each system used.

.5 Other paint materials such as linseed oil, shellac, turpentine, etc. shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.

.6 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Contract Administrator.

.7 Standard of Acceptance:

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

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

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

1.3 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Provide paint products meeting MPI "Environmentally Friendly" E2 or E3 ratings based on VOC (EPA Method 24) content levels.

1.4 SCHEDULING OF WORK

.1 Submit Work schedule for various stages of painting to Contract Administrator for approval. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Obtain written authorization from Contract Administrator for changes in Work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.5 SUBMITTALS

.1 Submit product data and manufacturer's installation/application instructions for paints and coating products to be used and in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit WHMIS - MSDS - Material Safety Data Sheets.

.3 Upon completion, submit records of products used, records to be included in Operation and Maintenance Manuals. List products in relation to finish system and include the following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers.

.4 Manufacturer's Material Safety Data Sheets (MSDS).

.5 MPI Environmentally Friendly classification system rating.

.4 Submit manufacturer’s application instructions for each product specified.

.5 Submit duplicate 200 x 300 mm sample panels of each paint, stain, clear coating, with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:

.1 3 mm plate steel for finishes over metal surfaces.

.2 13 mm birch plywood for finishes over wood surfaces.

.3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.

.4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.6 When approved, samples shall become acceptable standard of quality for appropriate on-Site surface with one of each sample retained on-Site.

.7 Submit full range of available colours where colour availability is restricted.

1.6 QUALITY CONTROL

.1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.

.2 When requested by the Contract Administrator or Paint Inspection Agency, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and Workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and Workmanship for similar on-Site Work.

1.7 EXTRA MATERIALS

.1 Submit maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit 1 - 4 litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.

.3 Deliver to Contract Administrator and store where directed.

1.8 DELIVERY, HANDLING AND STORAGE

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

.2 Deliver and store materials in original containers, sealed, with labels intact.

.3 Labels shall clearly indicate:

.1 Manufacturer's name and address.
.2 Type of paint or coating.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.4 Remove damaged, opened and rejected materials from Site.

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

.6 Observe manufacturer's recommendations for storage and handling.

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

.8 Store materials and equipment in a well ventilated area with temperature range 7ºC to 30ºC.

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

.10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Contract Administrator. After completion of operations, return areas to clean condition to approval of Contract Administrator.

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

.12 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.13 Fire Safety Requirements:

.1 Provide one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.

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

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

.14 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

1.9 SITE REQUIREMENTS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Perform no painting Work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10ºC for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Provide temporary ventilating and heating equipment where permanent facilities are not available.

.5 Perform no painting Work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by Contract Administrator and, applied product manufacturer, perform no painting Work when:

.1 ambient air and substrate temperatures are below 10ºC.

.2 substrate temperature is over 32ºC unless paint is specifically formulated for application at high temperatures.

.3 substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 the relative humidity is above 85% or when dew point is less than 3ºC variance between air/surface temperature.

.5 rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at Site.

.2 Perform no painting Work when maximum moisture content of substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.2 15% for wood.

.3 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

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

.3 Surface and Environmental Conditions:

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

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

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

.4 Apply paint finishes only when conditions forecast for entire period of application fall within manufacturer's recommendations.

.5 Do not apply paint when:

.1 Temperature is expected to drop below 10ºC before paint has thoroughly cured.

.2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.

.3 Surface to be painted is wet, damp or frosted.

.6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of the Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC’s.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

.6 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.

.7 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.8 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.9 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.

.10 Empty paint cans are to be dry prior to disposal or recycling (where available).

Part 2 Products

2.1 MATERIALS

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

.2 Paint materials for each coating formula to be products of a single manufacturer.

.3 Low odour products: whenever possible, select products exhibiting low odour characteristics. If two products are otherwise equivalent, select the product with the lowest odour. Only qualified products with E2 or E3 "Environmentally Friendly" rating are acceptable for use on this project.

.4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:

.1 be water-based, water soluble, water clean-up.

.2 be non-flammable

.3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.

.4 be manufactured without compounds which contribute to smog in the lower atmosphere.

.5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.5 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.7 Water-borne surface coatings must have a flash point of 61.0ºC or greater.

.8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.9 Water-borne paints and stains, and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

.1 Colours are to be (final colours to be confirmed by Contract Administrator prior to ordering. Selection of colours will be from manufacturer's full range of colours).

.1 Wood Stain 1 (WS1): Sansin Naturals (0-Base) 1105 Harvest Gold

.2 Contract Administrator will provide Colour and Finish Schedule after Contract award.

.3 Where specific products are available in a restricted range of colours, selection will be based on the limited range.

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

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to Site. On-Site tinting of painting materials is allowed only with Contract Administrator's written permission.

.2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.

.3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.

.4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.

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

2.4 GLOSS/SHEEN RATINGS

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

Gloss Level /Category	Units @ 60E/	Units @ 85º
G1 - matte finish	0 to 5	max. 10
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 – gloss finish	70 to 85	
G7 - high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces shall be as specified herein.

2.5 EXTERIOR PAINTING SYSTEMS

.1 The following paint formulas requires a three coat finish as indicated in the MPI Contract Administratorural Painting Specifications Manual.

.2 Asphalt Surfaces: zone/traffic marking for drive and parking areas, etc.

.1 EXT 2.1B Alkyd zone/traffic marking finish.

.3 Concrete Vertical Surfaces: (including horizontal soffits)

.1 EXT 3.1A – Latex G4 finish

.4 Concrete Horizontal Surfaces:

.1 EXT 3.2D - Alkyd floor enamel G4 finish.

.5 Clay Masonry Units: (pressed and extruded brick)

.1 EXT 4.1A - Latex G4 finish.

.6 Concrete Masonry Units: smooth and split face block and brick

.1 EXT 4.2A - Latex G4 finish.

.7 Structural Steel and Metal Fabrications:

.1 EXT 5.1J - Pigmented polyurethane finish (over high build epoxy).

.8 Galvanized Metal: not chromate passivated

.1 EXT 5.3D - Pigmented polyurethane finish for use in high contact/high traffic areas.

.9 Glue Laminated Beams and Columns

.1 EXT 6.1D – Varnish (over stain)

.10 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.

.1 EXT 6.2P – Stain, semi-transparent, W.B.

.11 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.

.1 EXT 6.3N – Stain, semi-transparent, W.B.

.12 Wood Panelling: plywood siding, fascias, soffits, etc.

.1 EXT 6.4L – Stain, semi-transparent, W.B.

Part 3 Execution

3.1 GENERAL

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

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

3.2 EXISTING CONDITIONS

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

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

.3 Maximum moisture content as follows:

.1 Concrete: 12%.

.2 Clay and Concrete Block/Brick: 12%.

.3 Wood: 15%.

3.3 PROTECTION

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

.2 Cover or mask windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.

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

.4 Protect factory finished products and equipment.

.5 Protect passing pedestrians, building occupants and general public in and about the building.

.6 Remove electrical cover plates, light fixtures, surface hardware on doors, and all other surface mounted fittings, equipment and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.

.7 Cover or move exterior furniture and portable equipment around building as necessary to carry out painting operations. Replace as painting operations progress.

.8 As painting operations progress, place "WET PAINT" signs in areas of Work to approval of Contract Administrator.

3.4 CLEANING AND PREPARATION

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

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

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

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

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

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

.6 Use trigger operated spray nozzles for water hoses.

.7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.

.2 Prevent contamination of cleaned surfaces before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

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

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

.2 Apply wood filler to nail holes and cracks.

.3 Tint filler to match stains for stained woodwork.

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

.5 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes or blowing with clean dry compressed air.

.6 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.

.7 Do not apply paint until prepared surfaces have been accepted by Contract Administrator.

3.5 APPLICATION

.1 Method of application to be as approved by Contract Administrator. Apply paint by brush roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

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

.2 Work paint into cracks, crevices and corners.

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

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

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

.3 Spray Application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately runs and sags.

.5 Use brushes to Work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Contract Administrator.

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

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

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.6 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.3 Paint fire protection piping red.

.4 Do not paint over nameplates.

.5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.7 FIELD QUALITY CONTROL

.1 Field inspection of exterior painting operations to be carried out by Contract Administrator.

.2 Advise Contract Administrator when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.3 Co-operate with Contract Administrator and provide access to areas of Work.

3.8 RESTORATION

.1 Clean and re-install all hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect surfaces from paint droppings and dust to approval of Contract Administrator. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 35 20 – Leadership in Energy and Environmental Design Sustainable Requirements.

1.2 REFERENCES

.1 Environmental Protection Agency (EPA)

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

.2 Master Painters Institute (MPI)

.1 MPI Contract Administratorural Painting Specifications Manual.

.3 Society for Protective Coatings (SSPC)

.1 SSPC Painting Manual, Volume Two, Systems and Specifications Manual.

.4 National Fire Code of Canada.

.5 Canada Green Building Council (CaGBC)

.1 LEED Canada Reference Guide for Green Building Design and Construction 2009

.6 Green Seal Organization, GS-03 Anti-Corrosive Paints, Second Edition January 7, 1997

.1 GS-11 paints First Edition, May 20, 1993.

.7 South Coast Air Quality Management District, rule #1113 (effective date 2007).

1.3 QUALITY ASSURANCE

.1 Contractor shall have a minimum of five years proven satisfactory experience. When requested, provide a list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeymen shall be engaged in painting Work. Apprentices may be employed provided they Work under the direct supervision of a qualified journeyman in accordance with trade regulations.

.3 Conform to latest MPI requirements for interior painting Work including preparation and priming.

1.4 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Provide paint products meeting MPI "Environmentally Friendly" E2 or E3 ratings based on VOC (EPA Method 24) content levels.

.2 Where indoor air quality (odour) is a problem, use only MPI listed materials having a minimum E2 or E3 rating.

1.5 SCHEDULING

.1 Submit Work schedule for various stages of painting to Contract Administrator for approval. Submit schedule minimum of 48 hours in advance of proposed operations.

.2 Obtain written authorization from Contract Administrator for any changes in Work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.6 SUBMITTALS

.1 Submit product data and manufacturer's installation/application instructions for each paint and coating product.

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

.3 Submit WHMIS MSDS - Material Safety Data Sheets. Indicate VOCs during application and curing.

.4 Upon completion, submit records of products used, records to be included in Operating and Maintenance Manuals. List products in relation to finish system and include the following:

.1 Product name, type and use
.2 Manufacturer's product number
.3 Colour numbers
.4 MPI Environmentally Friendly Classification System Rating
.5 Manufacturer's Material Safety Data Sheets (MSDS)

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

.6 Submit duplicate 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards submitted on the following substrate materials:

.1 3 mm steel plate for finishes over metal surfaces.
.2 13 mm birch plywood for finishes over wood surfaces.
.3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.
.4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

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

.8 Submit completed LEED Product Check Sheets and supporting documentation for all Paints and Coatings.

1.1 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Paints and Coatings must conform to the following standards in order of descending importance:

.1 Green Seal Standard GS-11 Paints, First Edition, May 20, 1993.

.2 Green Seal Standard GC-03, Anti-Corrosive Paints, Second Edition, January 7, 1997.

.3 South Coast Air Quality Management District (SCAQMD) Rule #1113, Architectural Coatings; rules in effect as of January, 2007.

.4 The following is a list of applicable VOC limits

.1 Interior Flat Coating or Primer – 50 g/L

.2 Interior Non Flat Coating or Primer – 150 g/L

.3 Anti-Corrosive/Anti Rust Paint – 250 g/L

.4 Clear Wood Finishes: Lacquer – 550 g/L

.5 Clear Wood Finishes: Sanding Sealers – 350 g/L

.6 Clear Wood Finishes: Varnishes – 350 g/L

.7 Clear Brushing Lacquer- 680 g/L

.8 Floor coatings – 100 g/L

.9 Sealers and Undercoaters – 200 g/L

.10 Shellac: Clear – 730 g/L

.11 Shellac: Pigmented – 550 g/L

.12 Stain – 250 g/L

.13 Concrete Curing Compounds – 350 g/L

.14 Japans/Faux Finishing Coatings – 350 g/L

.15 Magnesite Cement Coatings – 450 g/L

.16 Pigmented Lacquer – 550 g/L

.17 Waterproofing Sealers – 250 g/L

.18 Waterproofing Concrete/masonry Sealers – 400 g/L

.19 Wood Preservatives – 350 g/L

.20 Low – Solids Coatings – 120 g/L (including water)

1.7 QUALITY CONTROL

.1 Provide mock-up in accordance with Section 01 45 00 - Quality Control.

.2 When requested by Contract Administrator, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and Workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and Workmanship for similar on-Site Work.

1.8 EXTRA MATERIALS

.1 Submit maintenance materials from same product run as products installed in accordance with Section 01 78 00 - Closeout Submittals. Package products with protective covering and identify with descriptive labels.

.2 Submit one - four litre can of each type and colour of finish coating. Identify colour and paint type in relation to established colour schedule and finish formula.

.3 Deliver to Contract Administrator and store where directed.

.4 Provide certificate signed by staff that extra materials have been received in order.

1.9 DELIVERY, HANDLING AND STORAGE

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

.2 Deliver and store materials in original containers, sealed, with labels intact.

.3 Labels shall clearly indicate:

.1 Manufacturer's name and address.
.2 Type of paint or coating.
.3 Compliance with applicable standard.
.4 Colour number in accordance with established colour schedule.

.4 Remove damaged, opened and rejected materials from Site.

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

.6 Observe manufacturer's recommendations for storage and handling.

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

.8 Store materials and equipment in a well ventilated area with temperature range 7º C to 30º C.

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

.10 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Contract Administrator. After completion of operations, return areas to clean condition to approval of Contract Administrator.

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

.12 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.13 Fire Safety Requirements:

.1 Provide minimum one 9 kg Type ABC dry chemical fire extinguisher adjacent to storage area.
.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from Site on a daily basis.

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

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

.6 Ensure emptied containers are sealed and stored safely.

.7 Unused paint, coating materials must be disposed of at official hazardous material collections Site as approved by Contract Administrator.

.8 Paint, stain and wood preservative finishes and related materials (thinners, and solvents) are regarded as hazardous products and are subject to regulations for disposal.

.9 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.10 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.11 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground follow these procedures:

.1 Retain cleaning water for water-based materials to allow sediments to be filtered out.

.2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

.3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.4 Dispose of contaminants in approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

1.11 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Perform no painting Work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate

temperatures above 10°C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Perform no painting Work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities shall be provided by Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by the specifying body, Paint Inspection Agency and the applied product manufacturer, perform no painting Work when:

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

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

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 The relative humidity is above 60% or when the dew point is less than 3°C variance between the air/surface temperature.

.2 Perform no painting Work when the maximum moisture content of the substrate exceeds:

.1 12% for concrete and masonry (clay and concrete brick/block).

.2 15% for wood.

.3 12% for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

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

.3 Surface and Environmental Conditions:

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

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

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

.4 Additional Interior Application Requirements:

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

.2 Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Contract Administrator such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 MATERIALS

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

.2 Paint materials for paint systems shall be products of a single manufacturer.

.3 Low odor products. Whenever possible, select products exhibiting low odor characteristics. If two products are otherwise equivalent, select the product with the lowest odor. Only qualified products with E2 or E3 ”Environmentally Friendly” rating are acceptable for use on this project.

.4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, shall:

.1 be water-based, water soluble, water clean-up.

.2 be non-flammable.

.3 be manufactured without compounds which contribute to ozone depletion in the upper atmosphere.

.4 be manufactured without compounds which contribute to smog in the lower atmosphere.

.5 do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.5 Water-borne surface coatings must be manufactured and transported in a manner that steps of process, including disposal of waste products arising therefrom, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.6 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.7 Water-borne surface coatings must have a flash point of 61.0°C or greater.

.8 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15 mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.9 Water-borne paints and stains, and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

2.2 COLOURS

.1 Colours are to be (final colours to be confirmed by Contract Administrator prior to ordering. Selection of colours will be from manufacturer's full range of colours).

.1 Paint Colour 1 (PT1): Benjamin Moore OC-65 Chantilly Lace

.2 Paint Colour 2 (PT2): Benjamin Moore 2025-40 Limelight

.3 Paint Colour 3 (PT3): Benjamin Moore OC-55 Paper White

.4 Wood Stain 1 (WS1): Sansin Naturals (0-Base) 1105 Harvest Gold

.5 Game line painting:

.1 Provide Low VOC game line paint for application to Vinyl Composition Tile. Colours to be determined by Contract Administrator.

.2 Refer to Section 09 65 19 – Resilient Tile Flooring and Section 11 66 23 – Gymnasium Equipment.

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

2.3 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to Site. On-Site tinting of painting materials is allowed only with Contract Administrator's written permission.

.2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.

.3 Where thinner is used, addition shall not exceed paint manufacturer's recommendations. Do not use kerosene or any such organic solvents to thin water-based paints.

.4 Thin paint for spraying according in strict accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Contract Administrator.

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

2.4 GLOSS/SHEEN RATINGS

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

Gloss Level Category	**Units @ 60**	**Units @ 85**
G1 - matte finish	max. 5	max. 10
G2 - velvet finish	max. 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces shall be as specified herein.

2.5 INTERIOR PAINTING SYSTEMS

.1 The following paint formulas requires a three coat finish as indicated in the MPI Contract Administratorural Painting Specifications Manual.

.2 Concrete Vertical Surfaces: including horizontal soffits

.1 INT 3.1A Latex G5 finish (over sealer).

.3 Concrete Horizontal Surfaces: floors and stairs

.1 INT 3.2B Alkyd floor enamel low gloss finish.

.4 Clay Masonry Units: pressed and extruded brick

.1 INT 4.1A Latex G5 finish.

.5 Concrete Masonry Units: smooth and split face block and brick.

.1 INT 4.2A Latex G5 finish.

.6 Structural Steel and Metal Fabrications: columns, beams, joists, etc.

.1 INT 5.1E Alkyd G5 finish.

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

.1 INT 5.3A Latex G5 finish.

.8 Dimension Lumber: columns, beams, exposed joists, underside of decking, etc.

.1 INT 6.2M Water-based Varnish G5 finish (over stain)

.9 Glue-Laminated Beams and Columns:

.1 INT6.1Q Water-based varnish G5 finish (over semi-transparent stain).

.10 Dressed Lumber: including doors, door and window frames casings, mouldings, etc.

.1 INT 6.3Q Water-based varnish G5 finish

.11 Wood Paneling:

.1 INT 6.4U Water-based varnish, clear G5 finish (over stain).

.12 Plaster and Gypsum Board: gypsum wallboard, drywall, “sheet rock type material”, etc and textured finishes:

.1 INT 9.2A Latex G5 finish (over latex sealer) for walls.
.2 INT 9.2A Latex G1 finish (over latex sealer) for ceilings.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 GENERAL

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

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

.3 Apply paint to all interior building materials unless otherwise noted. Ensure that all mechanical fastener penetrations are coated uniformly to match the underside of deck finish.

3.3 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage. If damaged, clean and restore such surfaces as directed by Contract Administrator.

.2 Cover or mask floors, windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.

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

.4 Protect factory finished products and equipment.

.5 Protect passing pedestrians, building occupants and general public in and about the building.

.6 Remove electrical cover plates, light fixtures, surface hardware on doors, door stops, bath accessories and other surface mounted fittings and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.

.7 As painting operations progress place “WET PAINT” signs in occupied areas to approval of Contract Administrator.

3.4 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Contract Administrator all damage, defects, unsatisfactory or unfavourable conditions before proceeding with Work.

.2 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple “cover patch test” and report findings to Contract Administrator. Do not proceed with Work until conditions fall within acceptable range as recommended by manufacturer.

.3 Maximum moisture content as follows:

.1 Plaster and wallboard: 12%

.2 Masonry/Concrete: 12%

.3 Concrete Block/Brick: 12%

.4 Wood: 15%

3.5 CLEANING AND PREPARATION

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

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

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

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

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

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

.6 Use trigger operated spray nozzles for water hoses.

.7 Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.

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

.3 Sand existing surfaces with intact, smooth, high gloss coatings to provide adequate adhesion for new finishes.

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

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

.2 Apply wood filler to nail holes and cracks.

.3 Tint filler to match stains for stained woodWork.

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

.6 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes blowing with clean dry compressed air, or vacuum cleaning.

.7 Touch up of shop primers with primer as specified in applicable section. Major touch-up including cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas, shall be by supplier of fabricated material.

.8 Do not apply paint until prepared surfaces have been accepted by Contract Administrator.

3.6 APPLICATION

.1 Method of application to be as approved by Contract Administrator. Apply paint by brush, roller, air sprayer, airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

- .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.
- .2 Work paint into cracks, crevices and corners.
- .3 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces shall be free of roller tracking and heavy stipple.
- .4 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
- .5 Remove runs, sags and brush marks from finished Work and repaint.

.3 Spray application:

- .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
- .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
- .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
- .4 Brush out immediately all runs and sags.
- .5 Use brushes to Work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Contract Administrator.

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

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

.7 Sand and dust between coats to remove visible defects.

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

.9 Finish closets and alcoves as specified for adjoining rooms.

.10 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

.1 In finished areas: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 In boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductWork and other mechanical and electrical equipment.

.3 In other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

.4 Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

.5 Do not paint over nameplates.

.6 Keep sprinkler heads free of paint.

.7 Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

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

.9 Paint all fire protection piping red.

.10 Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

.11 Do not paint interior transformers and substation equipment.

3.8 STRUCTURAL STEEL, JOISTS, DECKING

.1 Paint all structural steel, steel joists and steel decking with colour and finish as noted.

3.9 FIELD QUALITY CONTROL

.1 Field inspection of interior painting operations to be carried out by Contract Administrator.

.2 Advise Contract Administrator when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.3 Co-operate with Contract Administrator and provide access to all areas of the Work.

.4 Standard of Acceptance:

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

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

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

3.10 RESTORATION

.1 Clean and re-install all hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Contract Administrator Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Contract Administrator.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

- .1 D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension
- .2 D1653 – Standard Test Methods for Water Vapor Transmission of Organic Coating Films
- .3 D2240 – Standard Test Method for Rubber Property—Durometer Hardness
- .4 D2697 – Standard Test Method for Volume Nonvolatile Matter in Clear or Pigmented Coatings
- .5 D3359-90 – Standard Test Methods for Measuring Adhesion by Tape Test
- .6 D7089 - 06 Standard Practice for Determination of the Effectiveness of Anti-Graffiti Coating for Use on Concrete, Masonry and Natural Stone Surfaces by Pressure Washing

.2 Canada Green Building Council (CaGBC)

- .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 PERFORMANCE REQUIREMENTS

.1 Provide anti-graffiti coating system complying with the following:

- .1 System shall be a one coat, self priming system.
- .2 Permanent coating system. Coatings shall not require reapplication regardless of number of graffiti taggings during the life of the Five (5) year performance warranty period.
- .3 Capable of being cleaned to the Cleanability Level 1 per ASTM D7089-06 by low pressure (1500 to 5300 psi) water spray.
- .4 Show no signs of deterioration or change of appearance after graffiti removal during the warranty period. No ghosting staining or shadowing.
- .5 Capability of removing 100 percent of all types of paint and graffiti materials from treated surfaces without damaging the coating or the substrate.
- .6 Capable of withstanding a minimum of 10 cleaning cycles over the same area without measurable coating deterioration.
- .7 Volatile Organic Compounds (VOC): Less than 600 g/l allowed by EPA 63 FR 176:48448, Table I.
- .8 Meet the following test results for the following chemicals:
  - .1 5% Phosphoric Acid No effect after 72 hours
  - .2 5% Sulfuric Acid Solution No effect after 72 hours
  - .3 50% Sodium Hydroxide Solution No effect after 120 hours
  - .4 5.25% Sodium Hypochlorite No effect after 120 hours
  - .5 10% NIT No effect after 30 days
  - .6 100% Propanoic Acid No effect after 39 days

.7 Acetone No effect after 39 days
.8 Ethanol No effect after 39 days
.9 2-Propanol No effect after 39 days
.10 95OC Distilled Water No Effect after 1 hour
.11 Diesel Fuel No effect after 5 months
.12 Coconut Oil No effect after 29 days
.13 Olive Oil No effect after 29 days
.14 Safflower Oil No effect after 29 days

.9 Existing coatings must meet a minimum rating of 4A or 4B per ASTM D3359-90.

1.3 SUBMITTALS

.1 Product Data:

.1 Printed technical data for each product and system.
.2 Material List: A list of required coating materials including block fillers and primers. Identify each material by catalog number.
.3 VOC levels highlighted.
.4 Maintenance Data including graffiti removal techniques.
.5 Materials Safety Data Sheets (MSDS) for each product in system.

.2 Samples: Manufacturer's standard color chip book or sheet.

.3 Qualification Data: For Applicators specified in Quality Assurance Article demonstrating capabilities and experience. Include lists of completed projects with contact information and contact information of Contract Administrators and the City.

.4 Certification by manufacturer that products supplied comply with requirements indicated.

.1 Provide written report from a nationally recognized and certified Protective Coating Specialist of performance of the anti-graffiti coating system. Include; type of substrate, location, length of service, testing performed and results.
.2 Provide landfill review of product and specific disposal requirements.

.5 Adhesion test results.

.6 Mock-up

.7 Sample warranty.

1.4 QUALITY ASSURANCE

.1 Applicator Qualifications: Engage Manufacturer's approved or certified applicator that has completed anti-graffiti coating system applications similar in material and extent to those indicated for Project, and whose Work has a record of successful in-service performance.

.2 Source Limitations: Obtain base coatings, top coatings, and removal agent from a single manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to Site in original, unopened containers bearing manufacturer's name and label.

.2 Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

.1 Keep storage area neat and orderly. Remove waste daily. Take measures to ensure that Workers and Work areas are protected from fire and health hazards resulting from handling, mixing, and applying coatings.

1.6 SITE CONDITIONS

.1 Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 41 and 266 deg F (5 and 130 deg C).

.2 Do not apply coatings in snow, rain, fog, mist, or when temperatures are less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

.3 Provide adequate ventilation or respiratory equipment where natural ventilation is not sufficient.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC’s.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.8 WARRANTY

.1 System Performance Warranty: Provide written warranty signed by manufacturer against defects in materials. Defects are defined to include failure in the ability of graffiti to be removed.

.1 Warranty period: Minimum five (5) years from date of completion

Part 2 Products

2.1 GRAFFITI RESISTANT COATINGS

.1 Graffiti resistant coating product is selected as a standard of quality and based on manufacturer’s recommendations for execution. Application procedure and coverage

rates to be in conformance with submitted recommendation of application rates suggested, approved manufacturers standards and as a minimum that specified herein.

.2 Performance: Product shall penetrate the surface of the material to which it is applied. Anti-graffittiant to be unaffected by ultraviolet light, ozone, water deicers and acids.

.3 Anti-graffittiant :

.1 Water-based

.2 Colour: clear

.3 Acceptable Manufacturer and Product

.1 Trion Tensid AB AGS 3502 (or approved equal in accordance with B7).

.4 Locations:

.1 Apply graffiti resistant coating to exterior building face.

.1 Exclude brick

.2 Provide coating to 151.2 m^2 (1628 sq. ft.) applied from grade to the first 2438 mm (8’-0”) of cladding.

.3 Provide coating to 124.6 m^2 (1341 sq. ft.) applied from the intermediate roof to the first 2438 mm (8-0”’) of cladding. Area extends past the edges of the roof along the building face as shown on A201.

.4 Provide coating to 262.3 m^2 (2823 sq. ft.) applied from the high roof down to the uppermost 2438 mm (8’-0”) of cladding.

2.2 SUBSTITUTIONS

.1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 EXAMINATION

.1 Examine substrates and conditions, with Applicator present, under which anti-graffiti coatings will be applied for compliance with application requirements.

.1 Apply coatings after unsatisfactory conditions have been corrected.

.2 Start of application is construed as Applicator's acceptance of substrate.

.2 Coordination of Work: Review other sections in which primers or other coatings are provided to ensure compatibility of substrates.

.1 If a potential incompatibility of primers exists, obtain confirmation of primer's ability to be top coated with materials specified before proceeding.

.2 Notify Contract Administrator about anticipated problems before using the coatings specified over substrates primed by others.

.3 Existing coatings that do not meet ASTM D3359-90 with a minimum rating of 4A or 4B must be removed

3.2 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.3 PREPARATION

.1 Surface shall be free of adhesion affecting contaminants like grout or masonry smears, structurally sound, dry, clean, and free of dust, grime, oils/scale, rust, silicones, curing and/or parting compounds, alkali or acid residues.

.2 Complete all surrounding trade Work prior to product application.

.3 Protect the Work of other trades.

3.4 APPLICATION

.1 Apply coatings according to manufacturer's written instructions.

.1 Use applicators and techniques best suited for the material being applied. Use an airless spray for application except that brush or roller may be used on small areas.

.2 Apply coating in a manner that prevents runs, sags, drips, spills, and that covers surface without holidays (gaps).

.2 Do not use thinners unless approved in writing by Manufacturer.

.3 Open only enough material that can be used for current application. Unused materials left in pails must be sealed and protected following the manufacturer’s written instructions.

.4 Completed Work: Match approved Samples for color, texture, and coverage. Remove, refinish, or recoat Work that does not comply with specified requirements.

3.5 FIELD QUALITY CONTROL

.1 After repellent has dried, spray coated surfaces with water to verify coating coverage. Allow Contract Administrator to witness tests.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.7 PROTECTION

.1 Protect the Work of this section until Substantial Completion. Should area be defaced prior to complete coating cure, consult manufacturer for special cleaning instructions.

END OF SECTION