1.5 **SITE CONDITIONS**

.1 Do not install Work of this Section outside of the following environmental ranges without the Consultant's and Product manufacturer's written acceptance:
- .1 Ambient air and surface temperature: 15^0C to 45^0C.
- .2 Precipitation: None.

.2 Install temporary protection and facilities to maintain the Product manufacturer's, and specified, environmental requirements for 7 Days before, during, and 7 Days after installation.

2 Products

2.1 **MATERIALS**

.1 Cement: Portland cement to meet specified requirements of CAN/CSA A3000, Normal or High-Early strength. Use white portland cement in white matrix.

.2 Sand: To meet specified requirements of CSA A23.1, sharp, screened, washed. Use white sand in white matrix.

.3 Water: Potable, free from acids, alkalies, oil, or organic materials.

.4 Divider Strips: To match existing material and size.

.5 Topping:
- .1 Marble Chips: To meet specified requirements of Terrazzo, Tile and Marble Association of Canada, match existing size gradation and colour.
- .2 Colour pigments: Pure mineral, alkali-resistant, non-fading, colour to match existing.

.6 Cleaner: To meet specified requirements of #1000 Series of Terrazzo, Tile and Marble Association of Canada.

.7 Sealer: To meet specified requirements of #2000 Series of Terrazzo, Tile and Marble Association of Canada.

.8 Floor Finish: To meet specified requirements of Type #3001 of Terrazzo, Tile and Marble Association of Canada.

.9 Curing Agent: Non-staining, maximum moisture retention 0.015 grams, to meet specified requirements of Terrazzo, Tile and Marble Association of Canada.

2.2 **MIXES**

.1 Underbed:
- .1 One part cement to four parts sand by volume.

.2 Add water to product stiff mix, but use no more than four gals/80 lb. bag of cement to make workable.

.2 Topping:

.1 Marble chip aggregate and cement mixed dry with colour pigments to match existing. Grind a small area to determine the true colours of existing terrazzo and chip gradation.

.2 Water shall not exceed 18 L /bag of cement.

.3 Prepare topping by mechanical mixing with materials added in the following order: one-half of aggregate, total of cement, water, remaining aggregate.

3 Execution

3.1 EXAMINATION

.1 Ensure that environmental conditions and backing surfaces have been provided according to specified requirements. Do not proceed with work until satisfied that installation will meet specified standard.

3.2 PREPARATION

.1 Take extreme care that surfaces adjacent to terrazzo work are protected from staining by terrazzo materials, and that slurry is not tracked into other building areas any time during installation.

.2 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.

.3 Sweep backing surfaces clean of all loose materials, and remove the debris. Clean off contaminants which would cause a defective installation.

.4 Locate and prepare for equipment or accessories recessed in finished terrazzo work.

.5 Cut terrazzo at panel joints where repair/extension is required.

3.3 INSTALLATION

.1 General:

.1 Installation shall match existing type. Profile of base shall match existing. Where bases are of different profiles, install new base of profile to match finished installation.

.2 When patching terrazzo, extend area to nearest divider strip in all directions.

.2 Underbed for Bonded Installation:

.1 Wet backing surfaces with water, remove excess, and when surface water has dried, slush into soaked backing a neat portland cement grout.

.2 Immediately following application of grout, place underbed, spread evenly, and screed to true levels to receive specified topping.

.3 Divider Strips:
- .1 Install divider strips in underbed while it is still semi-plastic.
- .2 Locate divider strips accurately. Set them straight, aligned, to line up with existing and at correct level; make junctions tight; and firmly trowel them along edges into underbed to ensure anchorage.
- .3 Set edging strips at junctions with other floor finishes to provide precisely for their thicknesses and finished levels after grinding. At openings set edging strips under doors.
- .4 Extend divider strips at right angles across borders.

.4 Placing of Topping:
- .1 Let underbed cure for at least 24 hours.
- .2 Wet top of underbed with water, remove excess, and when surface water had dried slush into soaked underbed a neat Portland cement grout of same colour cement and pigment as for matrix.
- .3 Apply topping to slurry or underbed while it is still wet.

3.4 TOPPING

.1 Standard Finish:
- .1 Into wet topping surface of floors, sprinkle wet aggregate of same materials in same proportions as specified for topping.
- .2 Apply so that finish surfaces match existing.

.2 Surface Preparation:
- .1 After finish aggregates are added, immediately roll floor topping with a heavy roller to compact and to remove excess water and cement. Pack bases.
- .2 Hand trowel all terrazzo surfaces to expose divider strips level with topping.

.3 Curing:
- .1 Cure topping for a minimum of six days following placing.
- .2 Cure to ensure that topping is kept damp until cement is hydrated.
- .3 Use wet mats or sand, paper or plastic sheets, or liquid curing compound.

3.5 FINISHING

.1 Grind terrazzo surfaces by machine. Hand rub places inaccessible to grinding machines.

.2 Constantly flood surfaces with water during grinding.

.3 For initial grinding, use 24 to 60 grit carborundum stones.

.4 After initial grinding, wash surfaces clean, remove all residue from holes and voids, and thoroughly rinse with only water.

.5 Trowel plastic grout, of same mix and colour as matrix, into holes and voids of wetted surface, and remove excess. When grout begins to set, work it into holes and voids with burlap or excelsior pads, and remove excess.

.6 Cure grout for a minimum of 48 hours as specified above for curing.

.7 Give final grinding with 120 grit stones and water.

.8 Wash off surfaces thoroughly after grinding.

.9 Provide carborundum strips on landings at stariwells as shown on drawings.

3.6 SITE TOLERANCES

.1 Finish surfaces shall be level or straight within a tolerance of 1.6 mm between division strips.

3.7 REPAIR

.1 Before Project completion, remove and replace defective, off-colour, and damaged work. Defective work shall include areas where distribution of surface aggregate is visually different from surrounding area. Removed areas shall be completely bounded by divider strips or edges. Regrout and regrind surfaces left with open fissures and holes.

3.8 CLEANING

.1 Scrub terrazzo surfaces with an abundance of clean water. Use machine scrubbers where possible for floors.

.2 Rinse with clean water and allow to dry.

.3 Remove dust with heavy-duty vacuum cleaner.

.4 If further cleaning is required, use Terrazzo, Tile and Marble Association of Canada #1001 cleaner in accordance with their specifications.

.5 Sealing:

- .1 As soon as possible after final cleaning, apply a coat of sealer. Wipe off excess before it dries.
- .2 Just before completion of Project, clean terrazzo, as specified above, and apply a second coat of sealer as before.
- .3 Apply two coats of floor finish.

3.9 **PROTECTION**

.1 Prevent all traffic and work on newly laid floors by barricading areas for at least 24 hours following installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 04 21 13 – Masonry

.3 Section 09 22 16 – Non-structural Metal Framing.

.4 Supply of access doors for mechanical and electrical devices in mechanical and electrical sections.

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

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

.16 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.

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 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard packaging material in appropriate on-site for recycling.

.3 Divert unused gypsum from landfill to gypsum recycling facility for disposal approved by Consultant.

.4 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.5 Divert unused wood materials from landfill to recycling facility.

.6 Divert unused paint and caulking material from landfill to official hazardous material collections site approved by Consultant.

.7 Do not dispose of unused paint and caulking materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 MATERIALS

.1 Standard board: to ASTM C36/C36M, 16 mm or 19 mm thick or as indicated, tapered edges.

.2 Standard board: to ASTM C36/C36M, X Rated, 16 mm or 19 mm thick or as indicated, tapered edges.

.3 Water-resistant board: to ASTM C630/C630M, 13 mm water resistant, tapered edges (WRGB in Finish Schedule).

.4 Abuse resistant/Fire rated: to CSA A82.27-M1977 Fire-Rated Type X, 5/8" thick, "Abuse Resistant Fire Code" gypsum board panels, tapered edges, by CGC, Fibrerock interior AquaTuff and CertainTeed, AirRenew Extreme Abuse Resistant Type X Gypsum Board with M2Tech. All gypsum board to have anti-microbial and anti-mould properties.

.5 All gypsum board to have Anti-Microbial and Anti Mold properties.

.6 Nails: to ASTM C514.

.7 Steel drill screws: to ASTM C1002.

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

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

.10 Concrete Anchors: Phillips Red Head TW-614 or equivalent. Do not use powder activated fasteners for ceiling support.

.11 Tie Wire: #16 ga. galvanized soft annealed steel wire.

.12 Caulking: Acoustical sealant.

.13 38 mm thick mineral wool batts ULC labeled, if indicated on drawings.

.14 Casing beads, corner beads, control joints and edge trim: to ASTM C1047, 0.5 mm base thickness commercial sheet steel with G90 zinc finish, perforated flanges, and one piece length per location.

.15 Sealants: in accordance with Section 07 92 10 - Joint Sealing.

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

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

2.2 ACOUSTIC WALL ASSEMBLY AND NOISE BARRIER CEILING MATERIALS

.1 **Location: Music Practice Rooms**:

.2 Acoustic insulation inside partitions: AFB Acoustic Fire Bat by Roxul or equivalent product by Fibrex, or Quietzone by Owens Corning.

.3 Steel deck closures: Emseal 25V Expanding Foam Sealant sized and shaped to fit flutes.

.4 Acoustic Insulation: mineral fibre acoustical batt insulation, as specified under Section 07210. Thickness of 90% of wall assembly cavity depth; Acceptable products:

.1 Fibrex ‘Sound Attenuation Fire Batt (SAFB)’
.2 Johns Manville ‘Sound-SHIELD’.
.3 Roxul ‘AFB’.
.4 Owens-Corning ‘QuietZone’.
.5 CertainTeed Canada Inc., Sustainable Insulation NoiseReducer Sound Attenuation Batts.

.5 Acoustical sealant: CAN/CGSB-19.21-M87; non-skinning acoustic sealant, non-hardening type.

.6 Acoustical compound: pre-mixed perlite plaster.

.7 Fasteners: use mechanical fasteners to secure batts into position as recommended by 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 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C840 except where specified otherwise.

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

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

3.2 APPLICATION

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

.2 Apply single layer gypsum board to metal furring or framing using screw fasteners and laminating adhesive. 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.

.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.

.3 Apply concrete board where wall tiles are to be applied and adjacent to sinks or showers. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.

.4 Apply gypsum board to concrete block surfaces, where indicated, using laminating adhesive.

.5 Apply type X gypsum board where indicated, in accordance with U.L.C. requirements and with supplement to the National Building Code of Canada to obtain the required fire protection, fire rating and fire separation.

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

.7 Where indicated on drawings, staple blanket to wallboard in accordance with ULC design requirements. Blanket shall be continuous and tightly fitted between studs and at perimeter.

.8 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.

.9 Install gypsum board with face side out.

.10 Do not install damaged or damp boards.

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

.12 Where a floor or roof structural member interferes with an interior partition wall at which a smoke or fire separation is required, a gypsum board enclosure with a fire rating not less than required for the wall must be provided to continue the required, a gypsum board

enclosure with a fire rating not less than required for the wall must be provided to continue the required separation to the floor or roof above (typical)

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 at 150 mm on centre[using contact adhesive for full length.

.2 Install casing beads around perimeter of suspended ceilings.

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

.4 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 approximate 10 m spacing on long corridor runs at approximate 15 m spacing on ceilings.

.7 Install control joints straight and true.

.8 Construct expansion joints at building expansion and construction joints. Provide continuous dust barrier.

.9 Install expansion joint straight and true.

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

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

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

.13 Seal with acoustical sealant at ceilings, floors, wall intersections and all penetrations such as electrical outlets.

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

.1 Rigidly secure frames to furring or framing systems.

.15 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.

.16 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.

.17 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.

.18 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.

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

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

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

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

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

.24 Allow skim coat to dry completely.

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

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

1.2 REFERENCES

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

.1 ASTM C645-[00], Specification for Nonstructural Steel Framing Members.

.2 ASTM C754-[00], 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-[97], Primer, Structural Steel, Oil Alkyd Type.

.3 Environmental Choice Program (ECP).

.1 CCD-047a -[98], Paints - Surface Coatings.

.2 CCD-048-[98], Surface Coatings - Recycled Water-borne.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material in appropriate on-site bins for recycling.

.3 Divert unused metal materials from landfill to metal recycling facility approved by Consultant.

.4 Divert unused gypsum materials from landfill to recycling facility approved by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Non-load bearing channel stud framing: to ASTM C645, roll formed from 0.59mm thickness hot dipped galvanized steel sheet, for screw attachment of gypsum lath and metal lath. Knock-out service holes at 150 mm centres.

.2 Floor and ceiling tracks: to ASTM C645, in widths to suit stud sizes, 30 mm legs for floor track, 50 mm for ceiling track.

.3 Metal channel stiffener: 38 mm size, 2 mm thick cold rolled galvanized steel.

.4 Metal Accessories: CSA A82.30-1965 (R-1971).

.5 “Unistrut” support channel framing, by Tyco Electrical and Metal Products.

Part 3 Execution

3.1 ERECTION

.1 Align partition tracks at floor and ceiling and secure at 600 mm on centre maximum.

.2 Place studs vertically at 400 mm on centre 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.

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

.4 Attach studs to bottom track using screws.

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

.6 Install steel frames and anchor frames securely to studs using minimum of three (3) anchors per jamb for jambs up to 2100 mm high and a minimum of four (4) anchors per jambs for jambs over 2100 mm high.

.7 Provide two (2) studs at each side of openings wider than stud centre specified.

.8 Install, cut to length, piece of runner horizontally over door frames and at top and bottom of rough opening in glazed partitions.

.9 Provide 38 mm x 89 mm vertical and horizontal wood studs secured between metal studs for attachments of bathroom fixtures, accessories, cabinet work, and other fixtures, including grab bars, towel rails, attached to steel stud partitions.

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

.11 Extend all partitions to underside of deck above for sound and fire separation.

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

3.2 CEILING FURRING TO CANOPIES & CEILING PANELS

.1 Provide to all interior and exterior canopies where shown to receive wood slat or plywood finishes.

.2 Framing channel to be model P1000 (1-5/8”) ; 12 ga.

.3 For exterior locations provide with 4 m dia. Holes at 500 o.c. for drainage and hot dip galvanize.

.4 Provide shop drawings for layouts.

.5 Refer to drawings for locations.

3.3 CEILING FURRING

.1 Install runners level to tolerance of 3 mm over 3.5 m. Provide runners at interruptions of continuity and change in direction.

.2 Frame with furring channels, perimeter of openings to accommodate access panels, light fixtures, diffusers, grilles, etc.

.3 Furr for bulkheads within or at termination or ceilings.

.4 Install furring channels at 400 mm o.c. maximum.

3.4 WALL FURRING

.1 Install steel furring, as indicated.

.2 Frame opening and around built-in equipment on four (4) sides with channels.

.3 Box-in beads, columns, pipes, and around exposed services.

3.5 FIRE RATED ASSEMBLIES

.1 If required, install Metal Stud System and Furring in accordance with appropriate ULC Design and with supplement to the National Building Code of Canada 1985.

3.6 CLEANING

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 07 92 10 – Joint Sealing.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI)

.1 ANSI A108.1-[99], Specification for the Installation of Ceramic Tile (Includes ANSI A108.1A-C, 108.4-.13, A118.1-.10, ANSI A136.1).

.2 CTI A118.3-[92], Specification for Chemical Resistant, Water Cleanable Tile Setting and Grouting Epoxy and Water Cleanable Tile Setting Epoxy Adhesive (included in ANSI A108.1).

.3 CTI A118.4-[92], Specification for Latex Portland Cement Mortar (included in ANSI A108.1).

.4 CTI A118.5-[92], Specification for Chemical Resistant Furan Resin Mortars and Grounts for Tile Installation (included in ANSI A108.1).

.5 CTI A118.6-[92], Specification for Ceramic Tile Grounts (included in ANSI A108.1).

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

.1 ASTM C144-[99], Specification for Aggregate for Masonry Mortar.

.2 ASTM C 207-[91(1997)], Specification for Hydrated Lime for Masonry Purposes.

.3 ASTM C847-[95(2000)], Specification for Metal Lath.

.4 ASTM C979-[99], Specification for Pigments for Integrally Coloured Concrete.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.2 CGSB 71-GP-22M-[78], Adhesive, Organic, for Installation of Ceramic Wall Tile.

.3 CAN/CGSB-75.1-[M88], Tile, Ceramic.

.4 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.4 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-[98], Cementitious Materials Compendium (Consists of A5-98, A8-98, A23.5-98, A362-98, A363-98, A456.1-98, A456.2-98, A456.3-98).

.2 CSA A123.3-[98], Asphalt Saturated Organic Roofing Felt.

.5 Terrazzo Tile and Marble Association of Canada (TTMAC)

.1 Tile Specification Guide 09300 [2000], Tile Installation Manual.

.2 Tile Maintenance Guide [2000].

1.3 PRODUCT DATA

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

.2 Include manufacturer's information on:

.1 Ceramic tile, marked to show each type, size, and shape required.
.2 Chemical resistant mortar and grout (Epoxy and Furan).
.3 Cementitious backer unit.
.4 Dry-set Portland cement mortar and grout.
.5 Divider strip.
.6 Elastomeric membrane and bond coat.
.7 Reinforcing tape.
.8 Levelling compound.
.9 Latex-Portland cement mortar and grout.
.10 Commercial Portland cement grout.
.11 Organic adhesive.
.12 Slip resistant tile.
.13 Waterproofing isolation membrane.
.14 Fasteners.

1.4 SAMPLES

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

.2 Base tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

.3 Floor tile: submit 300 x 300 mm sample panels of each colour, texture, size, and pattern of tile.

.4 Trim shapes, bullnose cap and cove including bullnose cap and base pieces at internal and external corners of vertical surfaces, each type, colour, and size.

.5 Adhere tile samples to 11 mm thick plywood and grout joints to represent project installation.

.6 Prepare a 2 m x 3m Mock up sample on site to ensure demonstration of installation details and quality control.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in containers with labels legible and intact and grade-seals unbroken.

.2 Store material so as to prevent damage or contamination.

.3 Store materials in a dry area, protected from freezing, staining and damage.

.4 Store cementitious materials on a dry surface.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal recyclable packaging material in appropriate on-site for recycling.

.3 Unused adhesive, sealant and coating materials must be disposed of at an official hazardous material collections site as approved by the Consultant.

.4 Unused adhesive, sealant and coating materials must not be disposed of into the sewer system, into streams, lakes, onto the ground or in other location where it will pose a health or environmental hazard.

.5 Broken ceramic materials must be diverted from landfill to a local facility as approved by Consultant.

1.7 ENVIRONMENTAL CONDITIONS

.1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12° C for 48 h before, during, and 48 h after, installation.

.2 Do not install tiles at temperatures less than 12° C or above 38° C.

.3 Do not apply epoxy mortar and grouts at temperatures below 15° C or above 25° C.

1.8 EXTENDED WARRANTY

.1 Submit a warranty for entire wall tile installation , covering materials and labour and the repair or replacement of defective work in accordance with Stipulated Sum Contract, PDSB-1998, but for three (3) years total.

Part 2 Products

2.1 FLOOR TILE

.1 Porcelain tile (PT) : to CAN/CGSB-75.1. Include bullnose base & fitted corners; include all pieces and trims. Designation Por.1: 300 mm x 300 mm porcelain tile.

.1 Acceptable materials:

.1 "City View" dist. by Daltile Co. Ltd.

.2 "Vitra Dotti" distributed by Centura

.2 Including (sit-on) bullnose base and fitted corners as approved by Consultant. Size 100 mm x 200 mm, (sit-on) bullnose base trim and inside cove corner and outside cove corner pieces all in matte finish. Standard base with mitered corners is unacceptable.

.3 Include porcelain non-slip stair treads with molded nosing incorporating non-slip edging.

.4 Samples to be provided to Consultant at the outset of the project.

.5 Contractor to consider order time for some tiles.

.6 Allow for 1 field colour from manufacturer's full line "stock colours" and two accent tile and base colours from manufacturer's full line. Price Group 2 & 3.

.7 Locations: Refer to drawings and Room Finish Schedule.

.2 Designation CMT: 50 x 50 porcelain mosaic floor tile to CAN/CGSB-75.1.. Locations: Floor in showers.

.1 Acceptable materials: Winburn Canada distributed by Olympia Tile, Dal 'Keystone' by Dal-tile and American Olean full mosaic collection, including 'Egyptstone' Series.

.2 Allow 1 colour from manufacturer's full range.

.3 Include cove base, top slope edges, fitted corners; include all pieces and trims. Contractors to fit around bullnose block walls.

2.2 WALL TILE

.1 Ceramic tile: to CAN/CGSB-75.1, Type 5, Class MR 4, 106 x 106 x 6 mm size, cushion edges, glazed surface, coved base pattern, allow for two (2) colors as selected, for Thin-set application.

.2 Acceptable Materials: "Vitra, Color Wall", by Centura or "Maple Leaf Spectrum Type V", by Olympia Tile.

.3 Locations: Refer to drawings and schedule.

2.3 TRIM SHAPES

.1 Conform to applicable requirements of adjoining floor and wall tile.

.2 Use slip resistant trim shapes for horizontal surfaces of showers, overflow ledges, recessed steps, shower curbs, drying area curbs, and stools.

.3 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.

.4 Internal and External Corners: Provide trim shapes as follows where indicated.

.1 Bullnose shapes for external corners including edges.

.2 Coved shapes for internal corners.

.3 Special shapes for:

.1 Base to floor internal corners to provide integral coved vertical and horizontal joint.

.2 Base to floor external corners to provide bullnose vertical edge with integral coved horizontal joint. Use as stop at bottom of openings having bullnose return to wall.

.3 Wall top edge internal corners to provide integral coved vertical joint with bullnose top edge.

.4 Wall top edge external corners to provide bullnose vertical and horizontal joint edge.

.5 Provide cove and bullnose shapes for countertops and where indicated and required to complete tile work.

2.4 MORTAR AND ADHESIVE MATERIALS

.1 Walls: Mortarcrete Latex Mortar conforming to ANS1A118.4-1973, manufactured by L & M Ceramo Inc.

.2 Floors:

.1 Cement Mortar: Mixture of 1 part Portland cement, 4 parts dry sand and 1/10 hydraulic lime. Materials shall conform to the following:

.2 Portland Cement: To CAN3-A, Type 10.

.3 Hydrated Lime: To ASTM C-206 or 207, Type 5.

.4 Sand: To CSA A82.56, passing 1.6 mm sieve.

.5 Water: Potable, containing no contaminants which cause efflorescence.

.6 Thin Set Mortar: field mixed, blended sand-Portland cement-latex mortar, "Kerabond/Keralastic by Mapei.

.1 Acceptable Alternates: "Laticrete 4237 distributed by Ceratec Inc., or Flextile 52 thin set.

.2 Latex Additive: "Cemtex" by Master Builders, Laticrete 2022" distributed by Ceratec Inc.,

2.5 GROUT

.1 Colouring Pigments:

.1 Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.

.2 Grout to be grey in colour.

.3 Job coloured grout are not acceptable.

.4 Use in Commercial Portland Cement Grout, Dry-Set Grout, and Latex-Portland Cement Grout.

.5 Colour shall be selected by Consultant from Manufacturer's standard colour range.

.2 Chemical-Resistant Grout for Walls:

.1 Epoxy grout: to ANSI A108.1, having quality, colour and characteristics to match epoxy bond coat. Adhesive and grout by same manufacturer.

.2 Epoxy Grout: "Latapoxy SP-100" Stainless, chemical resistant epoxy grout by Laticrete International. Colour from manufacturer's full range. Alternate: Kerapoxy by Mapei.

.3 Floors:

.1 Polymer modified grout as manufactured by MAPEI.

2.6 ACCESSORIES

.1 Floor Porcelain Tile Control Joints: by Schluter Systems

.1 Typical along all corridors, provide flush floor control joints by Schluter, model BWS 100G-3/8". Acceptable alternates by Bengard Manufacturing.

.2 Reinforcing mesh: 50 x 50 x 1.6 x 1.6 mm galvanized steel wire mesh, welded fabric design, in flat sheets.

.3 Cleavage plane: polyethylene film to CGSB 51-34.

.4 Metal lath: to ASTM C847 painted finish, 10 mm rib at 2.17 kg/m^2.

.5 Transition Strips: purpose made metal extrusion; stainless steel type.

.6 Reducer Strips: purpose made metal extrusion; stainless steel type; maximum slope of 1:2.

.7 Prefabricated Movement Joints: purpose made, having a Shore A Hardness not less than 60 and elasticity of plus or minus 40 percent when used in accordance to TTMAC Detail 301EJ.

.8 Sealant: in accordance with Section 07 92 10 - Joint Sealing.

.9 Floor sealer and protective coating: to tile and grout manufacturers recommendations.

.10 Thresholds: marble, 13 mm thick, rounded edges, honed finish to exposed surfaces, size to suit door opening and frame width.

2.7 MIXES

.1 Portland Cement:

.1 Scratch coat: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand, 1 part water, [and latex additive where required]. Adjust water volume depending on water content of sand.

.2 Slurry bond coat: portland cement and water mixed to creamy paste. Latex additive may be included.

.3 Mortar bed for floors: 1 part portland cement, 4 parts sand, 1 part water. Adjust water volume depending on water content of sand. [Latex additive may be included].

.4 Mortar bed for walls and ceilings: 1 part portland cement, 1/5 to 1/2 parts hydrated lime to suit job conditions, 4 parts sand and 1 part water. Adjust water volume depending on water content of sand. [Latex additive may be included].

.5 Levelling coat: 1 part portland cement, 4 parts sand, minimum 1/10 part latex additive, 1 part water including latex additive.

.6 Bond or setting coat: 1 part portland cement, 1/3 part hydrated lime, 1 part water.

.7 Measure mortar ingredients by volume.

.2 Dry set mortar: mix to manufacturer's instructions.

.3 Organic adhesive: pre-mixed.

.4 Mix bond and levelling coats, and grout to manufacturer's instructions.

.5 Adjust water volumes to suit water content of sand.

2.8 PATCHING AND LEVELING COMPOUND

.1 Portland cement base, acrylic polymer compound, manufactured specifically for resurfacing and levelling concrete floors. Products containing gypsum are not acceptable.

.2 Have not less than the following physical properties:

.1 Compressive strength - 25 MPa.

.2 Tensile strength - 7 MPa.

.3 Flexural strength - 7 MPa.

.4 Density - 1.9.

.3 Capable of being applied in layers up to 50 mm thick, being brought to feather edge, and being trowelled to smooth finish.

.4 Ready for use in 48 hours after application.

2.9 CLEANING COMPOUNDS

.1 Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and levelling compounds and elastomeric waterproofing membrane and coat.

.2 Materials containing acid or caustic material are not acceptable.

Part 3 Execution

3.1 WORKMANSHIP

.1 Do tile work in accordance with TTMAC Tile Installation Manual 2000, "Ceramic Tile", except where specified otherwise.

.2 Apply tile or backing coats to clean and sound surfaces.

.3 Fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even. Do not split tiles.

.4 Maximum surface tolerance 1:800.

.5 Make joints between tile uniform and approximately 1.5 mm wide, plumb, straight, true, even and flush with adjacent tile. Ensure sheet layout not visible after installation. Align patterns.

.6 Lay out tiles so perimeter tiles are minimum 1/2 size.

.7 Install floor tiles as per pattern. Layout and install flash cove tile first, before floor tile, ensuring a flush edge on the horizontal surface by feathering to masonry walls as required to produce a straight line on the floor. Install floor tiles to pattern supplied by Consultant

at a later date. Contact consultant to review when approximately no more than 10 sq. m has been installed.

.8 Sound tiles after setting and replace hollow-sounding units to obtain full bond.

.9 Make internal angles square, external angles rounded.

.10 Make internal angles square, external angles chamfered at 45° with narrow tile strip.

.11 Construct cove base, as described using all special pieces available for inside and outside corners.

.12 For Floors: Use bull nose edged tiles at termination of wall tiles, except where tiles abut projecting surface or differing plane.

.13 Seal grouted joints with sealer.

.14 Keep building expansion joints free of mortar or grout.

.15 For Walls: Use round edged tiles at termination of wall tile panels, except where panel abuts projecting surface or differing plane.

.16 Install divider strips at junction of tile flooring and dissimilar materials.

.17 Allow minimum 24 h after installation of tiles, before grouting.

.18 Clean installed tile surfaces after installation and grouting cured.

3.2 FLOOR TILE

.1 Install in accordance with TTMAC to applicable thinset detail.

3.3 FLOOR SEALER AND PROTECTIVE COATING

.1 Apply in accordance with manufacturer's instructions.

3.4 CONTROL JOINT

.1 Provide flush control joints by Schluter, model BWS 100G-3/8. Acceptable alternates by Bengard Manufacturing. Allow for control joints every 5 metres along corridors and at each corner of intersecting corridors.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

.3 Section 06 10 10/06101 - Rough Carpentry: Wood strapping.

.4 Fabrication: to ASTM 365-78 and CAN/GSB-92.1-M77.

.5 Installation: to ASTM C636-76, except where specified otherwise.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM E1264-[98], Classification for Acoustical Ceiling Products.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

.2 CAN/CGSB-92.1-[M89], Sound Absorptive Prefabricated Acoustical Units.

.3 Canadian Standards Association (CSA)

.1 CSA B111-[74(R1998)], Wire Nails, Spikes and Staples.

.4 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S102-[88(R2000)], Surface Burning Characteristics of Building Materials.

1.3 SAMPLES

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

.2 Submit two each 300 x 300 mm samples of each individual tile and grid type in accordance with Section 01340.

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.

1.5 DESIGN CRITERIA

.1 Maximum deflection 1/360 of span to ASTM 365-78 deflection test.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan

1.7 ENVIRONMENTAL REQUIREMENTS

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

.2 Maintain uniform minimum temperature of [15]^{0}C and humidity of [20] - [40] % before and during installation.

.3 Store materials in work area [48] hours prior to installation.

1.8 EXTRA MATERIALS

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

.2 Provide acoustical units amounting to [2] % 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 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

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

.2 Acoustic Ceiling Panels, Designation LAP: Acoustic Ceiling Panels, wet formed mineral fibre panels, by Armstrong World Industries Canada Inc., Mississauga. Colour: White; Types as noted below:

.3 **Panel Types**:

.1 Type 1: LAP 1: 600 x 1200 mm x 15.9 mm thick; 'Fine Fissured' with medium texture, Square Lay-In, #1729; Location: For use at classroom areas and any additional areas as indicated.

.2 Type 2: LAP 2: 600 x 1200 mm; 'Fine Fissured (Fireguard)' with medium texture, Square Lay-In, #1830. Location: For use at main corridor areas requiring smoke separation and any additional areas as indicated.

.4 Acceptable alternates: similar purpose-designed high humidity ceiling panels by CGC Interiors, BPB Canada Inc. and Certainteed.

.5 **Suspension system Type 1**: 23.8 mm (15/16") "Prelude XL" exposed tee bar grid, including wall moulding, by Armstrong. Colour: white. Acceptable alternate: similar suspension system by CGC Interiors, Oakville, Chicago Metal Corp. and Certainteed. Grid sizes to suit ceiling panel types as shown on drawings.

.6 Suspension System for Radiant Panel Heaters: not applicable to this project.

.7 Hangers: 2.6 mm galvanized soft annealed steel wire.

.8 Accessories: splices, clips, retainers, etc., to complement suspension system components.

.9 Adhesive: low VOC type recommended by acoustic unit manufacturer.

.10 Staples, nails and screws: to CSA B111 non-corrosive finish as recommended by acoustic unit manufacturer.

.11 Hold down clips: purpose made clips to secure tile to suspension system, approved for use in fire-rated systems.

Part 3 Execution

3.1 EXAMINATION

.1 Do not install acoustical panels and tiles until work above ceiling has been inspected by Consultant.

3.2 INSTALLATION

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

.2 Install acoustic units parallel to building lines with edge unit not less than 50% of unit width.

.3 Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.

.4 Support suspension system main runners at 1200 oc maximum with hangers from structure. Assembly shall support super-imposed loads. Maximum permissible deflection, 1/360 of span.

.5 Attach cross member to main runner to provide rigid assembly.

.6 Install suspension assembly to manufacturer's written instructions.

.7 Install flush edge moulding at junction of acoustic unit ceiling and other materials around entire length of joint. Secure to construction. Butt joints neatly, square and true in alignment.

.8 Set acoustic units in place.

.9 Set all ceiling levels by the use of transit or laser level.

.10 Ensure all installations are clean upon owner acceptance. Be responsible for monitoring damage and soiling after installation and before owner occupancy. Prior to owner takeover, replace all tiles with damage, blemishes or soiling whether caused by subcontractor handling or post installation above-ceiling adjustments, balancing, cabling, etc.

.11 Provide for Owner twenty-four (24) complete, undamaged ceiling tiles of each type, sealed and boxed. Leave in location as directed by Architect.

3.3 INTERFACE WITH OTHER WORK

.1 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.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 03 30 00 – Cast-in-Place Concrete.

.3 Section 03 35 05 – Concrete Floor Hardeners.

1.2 REFERENCES

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

.1 ASTM F1066-[99], Specification for Vinyl Composition Floor Tile.

.2 ASTM F1344-[00], Specification for Rubber Tile.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-25.20-[95], Surface Sealer for Floors.

.2 CAN/CGSB-25.21-[95], Detergent-Resistant Floor Polish.

1.3 SAMPLES

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

.2 Submit duplicate tile in size specified.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.2 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling.

.3 Dispose of unused finish and adhesive materials at official hazardous material collections site approved by Consultant.

.4 Do not dispose of unused finish and adhesive materials into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Maintain air temperature and structural base temperature at flooring installation area above 20°C for 48 hours before, during and for 7 days after installation.

1.6 EXTRA MATERIALS

.1 Provide 6 m^2 or 3% of each colour, pattern and type flooring material required for this project for maintenance use.

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

.3 Clearly identify each container of floor tile and each container of adhesive.

.4 Store where directed by Consultant.

Part 2 Products

2.1 MATERIALS

.1 Vinyl composition tile (VCT): to ASTM F1066, Composition 1 - non asbestos, 3 mm, 300 x 300 mm size.

.2 Allow for total of eight (8) colours from full line. Allow for 10% accent tile in pattern, to all rooms, to later issue in the Colour schedule. Note that only “through-colour” and “through-pattern” products will be acceptable.

.3 Acceptable Manufacturers:

- .1 Armstrong: Standard Excelon field & Multicolour accents.
- .2 Tarkett Azrock: Colorworks field & ‘Cosmopolitan’ and ‘Contemporary’ colour series for accents.
- .3 Amtico: Fortress.
- .4 Mannington: Essentials and Designer Essentials for field & Inspirations for accents.

.4 Resilient base (RR): rubber, top set coved, 3 mm thick, rubber, 100 mm high minimum 1200 mm long, including premoulded end stops and external corners. Acceptable materials: non-shrink Rubber Wall Base with toe as manufactured by Johnsonite, Roppe or approved alternates. Colours: Six (6) from full Johnsonite "Coloright" colour line.

.5 Stair Tread/ Riser combination: visually impaired Roundel Round Raised Disk pattern rubber one-piece tread/ riser combination VIRTR-Rd, as manufactured by Johnsonite, Roppe or approved alternates. Colour to be selected by consultant.

.6 Primers and adhesives: waterproof, recommended by flooring manufacturer for specific material on applicable substrate, above, at or below grade. Use Johnsonite 990 Solvent Free Environmentally Safe White Acrylic Cove Base Adhesive for rubber base. Use Roberts #2057 clear water resistant low odour adhesive for VCT or acceptable alternate approved during tender period by consultant. Submit data sheets for any alternate products considered.

.7 Sub-floor filler and leveller: white premix latex requiring water only to produce cementitious paste, as recommended by flooring manufacturer for use with their product.

.8 Metal edge strips: aluminum extruded, smooth, with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

.9 Polyethylene sheet: to CAN2 51.33-M77, Type 2, for protection.

.10 Nose filler: Epoxy caulking compound Johnsonite 930.

Part 3 Execution

3.1 INSPECTION

.1 Ensure concrete floors are dry, by using test methods recommended by tile manufacturer. Inspect for negative alkalinity, carbonization or dusting.

.2 Commencement of work indicates acceptance of conditions by flooring installer.

3.2 SUB-FLOOR TREATMENT

.1 Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

.2 Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

3.3 TILE APPLICATION

.1 Apply adhesive uniformly using recommended trowel in accordance with flooring manufacturer's instructions. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.2 Lay flooring with joints parallel to building lines to produce symmetrical tile pattern. Border tiles minimum half tile width.

.3 Install tiles in corridor as per pattern provided by Consultant. Pattern will be provided at a later date.

.4 Cut tile and fit neatly around fixed objects.

.5 Install flooring in pan type floor access covers. Maintain floor pattern.

.6 Terminate flooring at centerline of door in openings where adjacent floor finish or colour is dissimilar.

.7 Install metal edge strips at unprotected or exposed edges where flooring terminates.

.8 At doorways to incrapack units, extend tile and base fully into door opening to incrapak classroom.

.9 Install solid colour vinyl strips, manufactured for this purpose, to form gymnasium game lines, as indicated on drawings. Cut field tiles tight and smooth contour against game lines. Strips to be minimum of 300 mm long on curves and of indicated width and colour.

.10 Install solid colour vinyl strips, manufactured for this purpose, to indicate the hazardous zone around equipment in the STAC classroom. Cut field tiles tight and smooth contour against the solid coloured lines.

3.4 STAIR APPLICATION

.1 Areas to receive stair treads shall be clean, fully enclosed, weathertight, and maintained at a uniform temperature of at least 70°F for 24 hours before, during, and after the

installation in completed. The stair treads and adhesives shall be conditioned in the same manner. Stair steps shall be smooth, flat, level, permanently dry, clean and free of all foreign material, such as dust, paint, grease, oils, solvents, curing and hardening compounds, sealers, asphalt and old adhesive residue. An epoxy caulking nose filler shall be applied to ensure a tight fit and eliminate any open spaces between the step edge and stair tread nosing. Stair treads shall be trimmed to within 1/16" of the riser and stringer to allow for expansion. Adhesives shall be applied to the stair step surface and the back and nosing area of the stair tread. Stair treads shall be rolled, with a J-hand roller, after installation, to ensure proper bonding.

3.5 BASE APPLICATION

.1 Lay out base to keep number of joints at minimum. Use lengths as long as practicable and not less than minimum 500 mm long.

.2 Clean substrate and prime with one coat of adhesive.

.3 Apply adhesive to back of base.

.4 Set base against wall and floor surfaces tightly by using 3 kg hand roller.

.5 Install straight and level to variation of 1:1000.

.6 Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

.7 Miter internal corners. Use premoulded corner pieces at all external corners and ensure full adhesion through to ends of corner pieces. See detail for termination at door frames.

.8 Install toeless type base before installation of carpet on floors.

.9 Leave in the building one (1) complete carton of each of two (2) colours of floor tile and twelve (12) tiles of each of the remaining colours. Colours of extra tile to be specified by Consultant.

3.6 INITIAL MAINTANANCE AFTER INSTALLATION

.1 Broom sweep or vacuum thoroughly.

.2 Do not wet mop, wash, scrub, or strip the floor. These procedures will be done by the Owner.

3.7 PROTECTION OF FINISHED WORK

.1 Following broom sweeping, protect new floors with 0.15 mm thick Polyethylene cover and lay planking in all necessary traffic areas to minimize damage by other trades. Maintain until just before final inspection.

.2 Prohibit traffic on floor for 48 hours after installation.

3.8 PREPARATION FOR INSPECTION

.1 Only if so notified by Architect, and in the presence of the Owner, scrub the floor using a neutral detergent and a floor machine of 170-250 rpm capability equipped with a scrub brush or a scrubbing pad (3M blue or equal).

.2 Lightly rinse and allow to dry. Note: Do not flood the floor with rinse water, scrubbing, or stripping solutions. Final re-washing, if required, and waxing will be done by owner.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 40 00 - Architectural Woodwork.

.3 Section 05 12 23 – Structural Steel for Buildings.

.4 Section 05 50 00 – Metal Fabrications.

.5 Section 08 11 14 – Metal Doors and Frames.

.6 Section 09 91 27 – Finish and Colour Notes.

.7 Section 09 91 30 – Door and Room Finish Schedule.

1.2 REFERENCES

.1 Architectural Painting Specifications Manual, Master Painters Institute (MPI).

1.3 WARRANTY

.1 Upon completion of the work, contractor shall warrant that the work has been performed with respect to the standards and requirements incorporated in the MPI specification manual-latest edition.

1.4 ENVIRONMENTAL PERFORMANCE REQUIREMENTS

.1 Do not apply paint finish in areas where dust is being generated.

.2 Conform to requirements of MPI Manual.

.3 Comply with the requirements of Section 01 35 30- Health and Safety.

1.5 JOB MOCK-UP

.1 Complete a mock-up room to be reviewed and approved by Owner and Consultant for approval on application of block filler and finish paint coats.

1.6 SCHEDULING OF WORK

.1 Submit work schedule for various stages of painting to Consultant for approval. Submit schedule minimum of 72 hours in advance of proposed operations.

.2 Obtain written authorization from Consultant for any changes in work schedule.

.3 Schedule painting operations to prevent disruption of occupants in and about the building.

1.7 EXTRA MATERIALS

.1 Submit one - four litre can of each type and colour of [primer] [stain] [finish coating]. Identify colour and paint type in relation to established colour schedule and finish system.

.2 Deliver to Contractor and store where directed.

1.8 DELIVERY, HANDLING AND STORAGE

.1 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.

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

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

.4 Observe manufacturer's recommendations for storage and handling.

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

.6 Store materials and equipment in a well ventilated area with temperature range 7^0C to 30^0C.

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

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

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

.10 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.11 Fire Safety Requirements:

- .1 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.
- .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9 FINISHES AND COLOURS

.1 Review the requirements outlined in Section 099127, Finish Schedule and Colour Notes. A separate colour schedule will be issued after contract award.

.2 Allow for 10 colours total from all formulations for this project including room wall accent colours.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Paint, stain and wood preservative finishes and related materials (thinners, solvents, etc.,) are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from Provincial Ministries of Environment and Regional levels of Government.

.2 Material which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.3 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.4 To reduce the amount of contaminants entering waterways, sanitary/storm drain systems or into ground the following procedures shall be strictly adhered to:

.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 an approved legal manner in accordance with hazardous waste regulations.

.5 Empty paint cans are to be dry prior to disposal or recycling (where available).

.5 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility.

.6 Set aside and protect surplus and uncontaminated finish materials: galvanized touch up; wood stain, prefinished metal touch up paint. Deliver to or arrange collection by recycling organization for verifiable re-use or re-manufacturing.

.7 Close and seal tightly partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

Part 2 Products

2.1 MATERIALS

.1 Acceptable Manufacturer's: Where MPI code numbers are not referenced, use Products from one of the following manufacturers:

.1 Benjamin Moore & Co. Ltd.

.2 Canadian Industries Ltd.

.3 ICI (Glidden) Paints.

.4 Para Paints.

.5 Pratt & Lambert Inc.
.6 SICO Coatings.
.7 The Sherwin-Williams Company.

.2 Manufacturers of intumescent coatings having Product considered acceptable for use:

.1 A/D Fire Protection Systems Inc.
.2 Carboline.

.3 Paint materials for paint systems shall be products of a single manufacturer.

.4 Acceptable products: Per MPI Manual and as listed.

.5 Paint materials for each paint system to be products of a single manufacturer.

.6 Use low-VOC and low-odour paints only.

Part 3 Execution

3.1 GENERAL

.1 Prepare surfaces to receive paint per MPI Manual.

3.2 APPLICATION

.1 Sand and dust between each coat to remove defects visible from distance up to 1.5 m.

.2 Finish closets and alcoves as specified for adjoining rooms.

.3 Apply each coat at the proper consistency. Each coat of finish should be fully dry and hard before applying the next coat, unless the manufacturer’s instructions state otherwise.

.4 Method of application to be as approved by Consultant. Apply paint by brush and roller. Conform to manufacturer's application instructions unless specified otherwise.

.5 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 unless approved by Consultant.
.5 Remove runs, sags and brush marks from finished work and repaint.

.6 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.

.7 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Consultant.

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

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

.10 Sand and dust between coats to remove visible defects.

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

.12 Finish inside of cupboards and cabinets as specified for outside surfaces.

.13 Finish closets and alcoves as specified for adjoining rooms.

.14 Finish top, bottom, edges and cut-outs of doors after fitting as specified for door surfaces.

3.3 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Refer also to Finish Notes in Section 099127- Finish and Colour Notes.

.2 Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted. Do not paint white PVC covers on exposed mechanical water, drain and other lines

.3 Paint gas piping standard yellow where visible on roof or in service spaces. Do not paint gas meter or gas equipment in wall niche yellow—colour to later selection by Architect.

.4 Paint surfaces inside of ductwork and elsewhere behind grilles where visible using primer and one coat of matte black paint.

.5 Paint both sides and edges of plywood backboards for equipment before installation.

.6 Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.4 PAINT SYSTEMS

.1 System references listed are based on Chapters 4A and 4B of MPI Manual and are MPI Premium Grade, unless noted otherwise.

3.5 INTERIOR FINISHES

.1 Wood, where applicable:

- .1 Miscellaneous trim: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
- .2 Wood slat ceiling to Foyer 102: INT. 1-J Premium Grade; satin finish, Fire Retardent. Slats to be sealed and shop finished prior to installation. Refer also to Section 064000.
- .3 Casework and miscellaneous wood items:
  - .1 Exterior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
  - .2 Interior surfaces: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade
  - .3 Wood Benches and Upper Shelves: INT. 2-F, Stained Alkyd Satin Finish, Premium Grade.
  - .4 Gym Storage Shelves: INT. 3-A, Stain Finish, Custom Grade

.2 Gypsum board: INT.4-B, Latex Eggshell Finish, Premium Grade.

.3 Acoustical wall panels: INT. 6-A, Latex Flat Finish, Custom Grade.

.4 Concrete Block: INT.8-C -modified; Latex Semi-Gloss Finish, Premium Grade. Modified system refers to all work where 2 full coats of block filler shall be applied.

.5 Concrete Block (P-GF): Two-coats of 100% zero VOC epoxy, Premium Grade - shown on Room Finish Schedule as P-GF (Paint - Gloss) finish.

.6 Concrete Floors (S.CONC); refer to Section 033505 - Concrete Floor Hardeners and Sealers for liquid sealer.

.7 Concrete Floors (EWPM); refer to Section 099724 for epoxy floor finish.

.8 Exposed Cast in Place Concrete ceilings: INT. 8-A, Latex Flat Finish, Premium Grade

.9 Exposed Precast Concrete ceilings: INT. 8-A, Latex Flat Finish, Custom Grade

.10 Miscellaneous metal:

- .1 Primed: INT. 12-A, Alkyd Semi-Gloss Finish, Premium Grade
- .2 Galvanized: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade
- .3 INT. 12-G, Water based Epoxy finish, two coats on a rust inhibitive primer for all exposed steel on Stairs 1S1 & 1S2 including exposed steel nosing at porcelain tile stair landing, stair stringer, pickets and railings".

.11 Galvanized metal: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade

.12 Hollow Metal Doors and Frames: Without exception, all wipecoated Galvanized Hollow Metal Doors, Frames and Screens, interior and exterior shall be field cleaned with solvent, galvanized prime paint coated and then finished with INT. 13-A Premium Grade,

Gloss Finish. Base coat primer shall be submitted for review in advance or door/frame painting shall be rejected by Consultant. For exterior hollow metal frames, if any, adjacent to aluminum windows, provide finish coat as an exterior premium grade metallic gloss finish to match anodized windows or Aluminum Composite panels. Colour to be confirmed by Architect during construction.

.13 Gymnasium Painting:

.1 note that painting of gymnasium acoustic deck and structural steel is part of painting contract.

.2 Allow for single colour for deck and joists.

.3 Allow for complete painting of all hangers and equipment brackets including but not limited to basket ball baskstops, electrical pipe rails, mechanical equipment fan cages, etc.

.4 Allow for accent painting of 2 perimeter stripes to all walls and over proscenium, shown on drawings. Total of 2 accent colours for these stripes.

.14 Other Painting:

.1 Painting of Elevator/Lift doors and frame is part of this contract.

.2 In the following rooms with exposed metal deck including mechanical rooms and storage rooms:

.1 Allow for single colour for deck and joists.

.2 Allow for complete painting of all hangers and equipment brackets including but not limited to, electrical and mechanical equipment, etc.

.3 painting deck/floor slab and structural steel is part of painting contract.

.15 Corridor Graphic Silouette Painting:

.1 Provide the single colour silhouette image in one location of corridor as shown on drawing A17.

.2 Consultant can provide the digital file of images to be transcribed if required.

3.6 EXTERIOR PAINTING

.1 Wood Soffits and Column Inserts: Refer to Section 06 20 13.

.2 Pavement markings: EXT. 7-A, Zone Marking Alkyd Finish, Premium Grade.

.3 Concrete columns at front entrance: EXT. 6F, Two component epoxy finish, Premium Grade.

.4 Miscellaneous metal:

.1 Primed: EXT. 11-A-Gloss, Premium Grade

.2 Galvanized: Touch up any welds, cuts or damage with ‘Galvafroid’ Paint by W.R. Meadows prior to prime and finish coats.; Finish System EXT. 12-A-Gloss, Premium Grade

.5 Galvanized Structural Steel: Touch up any welds, cuts or damage with 'Galvafroid' Paint by W.R. Meadows prior to prime and finish coats.; Finish System: EXT. 12-A-Gloss, Premium Grade.

.6 Steel - high heat: EXT. 15-A

.7 Paint exterior vents and louvres located in masonry to match adjacent masonry in colour.

3.7 INSPECTIONS

.1 Provide Architect with all formulations at outset of project.

.2 Provide inspections by representative of the Master Painters Institute (MPI) in compliance with the terms of the Canadian Painting Contractors Association Inspection and Guarantee Program.

.3 Cooperate at all times with the paint inspection agency in the performance of their duties as required as part of the work of this Section.

.4 MPI inspection costs to be paid from Cash Allowance.

END OF SECTION

Part 1 General

1.1 GENERAL FINISH NOTES

.1 The Material and Colour Schedule will be issued by the Consultant after tender. It shall be read in conjunction with the Drawings, Specifications, Room Schedule and Door Schedule. Colour and material references named will be based on one manufacturer, as carried by the Contractor or, in the case that no specific manufacturer is carried, based on the Consultant's choice.

.2 Approved alternative manufacturers will be acceptable only as indicated in the specifications. However, approved alternate products submitted must match the products named in the Specification to the Consultant's selection. Alternate products other than those named in the specifications will not be allowed unless previously approved by the Consultant.

.3 Consult Consultant prior to painting any surface not included in the formulae as listed.

.4 Final colour for exterior painted surfaces and prominent interior areas shall be approved on the job site by the Consultant.

.5 Paint samples: Contractor to submit paint samples for all areas required to "Match Adjacent Finish".

.6 All similar paint formulations are to be identical when dry. Variations in tone, texture or sheen shall not be accepted.

.7 Submit two 300 mm x 300 mm paint samples of each colour required for approval by the Architect.

.8 Exact locations of accent paint called for in the Material and Colour Schedule, to be issued after Contract award, not specifically identified on the drawings are to be verified on site with the Consultant.

1.2 EXTERIOR FINISH NOTES

.1 All exposed metal (doors, frames, lintels, stairs, handrails, mechanical equipment, etc.) to be painted except for prefinished metal louvres, stainless steel, and aluminum. Mechanical equipment is to be painted whether delivered to the site prepainted or not (exhaust fans, goosenecks, exhaust stacks, supports, HVAC units, HRU units, etc.). Colours to match adjacent material-generally either to match brick or tan to match flashing or siding material. Do not paint exposed white PVC pipe covers on interior. Architect will advise on jobsite which other items mentioned above, if any, do not require painting.

.2 All unfinished metal work provided by landscaping is to be painted by Section 099122-Painting.

1.3 INTERIOR FINISH NOTES

.1 All heating units, recessed convectors, grilles, pipes, access panels, hangers and miscellaneous exposed metal work (except stainless steel or anodized aluminum) to be painted to match the surfaces on which they occur unless noted otherwise on the colour schedule, prefinished in suitable colour or directed by the Consultant. If prefinished equipment is damaged, it shall be re-painted. Painting to be by formulations specified in Section 09 91 12- Painting.

.2 All interior fitments, casework, millwork, etc. to be melamine unless otherwise noted. Refer to Sections for specific requirements regarding materials, construction, finishes and hardware. Note that drawer and cupboard interiors are to be considered as exposed surfaces and will therefore be finished.

.3 Do not paint over nameplates, identification tags, etc.

.4 Make good all existing surfaces and finishes that are damaged during construction.

END OF SECTION

PART 1 - GENERAL

1.1 General Notes

1. Find the **Room Finish Schedule** on the following pages

2. **This schedule MUST be read in conjunction with a complete set of drawings** to ascertain all details and finished surfaces that may not be listed on the schedule.

3. Refer to interior elevations, plans sections and reflected ceiling plans to coordinate finish notes and extents of materials.

4. Refer to various specifications sections for different types of materials including, but not limited to:
   - .1 flooring materials such as resilient tile
   - .2 ceiling materials such as Lay-In Acoustical panel (LAP)
   - .3 Acoustical wall treatment

5. Abbreviations Legend:

Code	Reference
ASD	Acoustic Steel Deck
CMT	Porcelain Mosaic Floor Tile
CPT	Carpet Tile
CW	Curtain Wall
CWT	Ceramic Wall Tile
CB	Concrete Block
EWPM	Exposed Waterproof Membrane (refer to Section 09 97 24)
GWB	Gypsum Board
HAP	Hanging Acoustic Panels
LAP	Lay-in Acoustic Panel
P.GF	Paint - Gloss Finish
POR	Porcelain Tile
P	Paint
RR	Resilient Rubber
RSTR	Rubber Stair Tread & Riser
S.CONC	Sealed Concrete (refer to Section 03 35 05)
VCT	Vinyl Composite Tile
WRGB	Water-Resistant Gypsum Board

END OF SECTION

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
GROUND FLOOR									
A100	SPRINKLER ROOM	EPWM	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT, ETC.
A101	ORTHO WR	POR	POR	CB	CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
A102	CORRIDOR	TER	TER	CB	P	LAP	-	2530	
A103	ELEVATOR	VCT	-	-	-	LAP	-	-	REFER TO SPECIFICATIONS FOR FINISHES BY MANUFACTURER
A104	ELEVATOR MACHINE CLOSET	EPWM	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT, ETC.
A105	SUMP ROOM	EPWM	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT, ETC.
184	EX. CORRIDOR	EX.NEW TER	EX.NEW TER	CB	P	LAP	-	2530	
SECOND FLOOR									
A201	STORAGE ROOM	VCT	RR	CB	P	EXP	P	-	PAINT STRUCTURE INCL. MECH. DUCTS, SUPPORTS, CONDUIT, ETC.
A202	UNIVERSAL TOILET ROOM	POR	POR	CB	CWT	GYP	P	2600	CWT FLOOR TO CEILING. REFER TO INTERIOR ELEVATION FOR LOCATION OF CWT.
A203	CORRIDOR	VCT	RR	CB	P	LAP	-	2530	
A204	ELEVATOR	VCT	-	-	-	LAP	-	-	REFER TO SPECIFICATIONS FOR FINISHES BY MANUFACTURER
X280	EX. CORRIDOR	EX.NEW VCT	RR	EX.NEW CB	P	LAP	-	2530	
ABBREVIATIONS:									
	LVT - Luxury Vinyl Tile	RR - Resilient Rubber base			P - Paint			CWT - Ceramic Wall Tile	

ROOM FINISH SCHEDULE		FLOOR		WALL		CEILING			REMARKS
NO.	NAME	FIN.	BASE	MAT'L	FIN.	MAT'L	FIN.	HEIGHT(mm)	
	CPT Carpet Tile	S.CONC - Sealed Concrete			EXP - Exposed			LAP - Lay-In Acoustic Ceiling Tile	
	SF - Resilient Sheet Flooring	GYP - Gypsum Wall Board			EPWM- Epoxy Flooring			ACT - Acoustic Ceiling Tile	
	POR - Porcelain Tile	CB - Concrete Block			TER - Terrazzo				

1 General

1. SUMMARY

.1 Section Includes:
- .1 Compliance with requirements of the sections of Division 1 of the specifications.
- .2 Requirements for providing the concrete floor sealer parts of the Work.

2. SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's technical data, installation instructions, maintenance instructions and general recommendations for concrete floor sealer.

.2 Samples:
- .1 Provide samples as specified in section 01 33 00 Samples, supplemented as follows:
  - .1 Submit 300 mm x 300 mm square sample of concrete floor sealer applied to a smooth trowel finish concrete paver.
  - .2 Submit each type of sample in triplicate.
  - .3 Modify and resubmit samples as many times as may be necessary to obtain Consultant’s approval.

.3 Closeout Documents:
- .1 Provide manuals that contain the floor sealer manufacturer's maintenance and repair manual. The maintenance and repair manuals shall give specific warning of maintenance practices, Products and materials which may cause damage and disfigurement.

3. QUALITY ASSURANCE

.1 Single Source Responsibility:
- .1 Obtain concrete floor sealer Products from the same manufacturer with not less than ten (10) years of successful experience in manufacturing and installing principal materials described in this section. Contractor must have completed at least five projects of similar size and complexity. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

.2 Pre-installation Meeting:
- .1 Hold a pre-installation meeting at the Place of the Work.

.3 Mock-up:
- .1 At site, under manufacturer's supervision, apply for approval 9 m2 of each type of complete floor finish in area designated, to match submitted samples. When approved, site applied sample to be standard for appearance, texture, workmanship, etc. All Work to conform to this sample.

4. DELIVERY, STORAGE AND HANDLING

.1 Deliver Products to the Place of the Work. Check material for completeness and shipping damage prior to job start.

.2 All materials must be factory pre-weighed and pre-packaged in single, easy to manage batches to eliminate on site mixing errors. No on site weighing or volumetric measurements allowed.

.3 Store Products in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 16° and 32°C.

5. PROJECT CONDITIONS

.1 Environmental Requirements:
- .1 Concrete substrate must be properly cured for a minimum of 30 days.

.2 Temperature:
- .1 Maintain ambient temperature of not less than 18 deg.C/65 deg.F and a floor temperature of not less than 16 deg.C/60 deg.F from 7 days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.

.3 Moisture:
- .1 Ensure substrate is within moisture limits prescribed by concrete floor sealer manufacturer.

.4 Protection:
- .1 Areas to accept concrete floor sealer shall be free of other trades during, and for a period of 24 hours, after floor installation.

.5 Manufacturer’s Representative:
- .1 Manufacturer's representative must be on job site at start of installation.

6. WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate packaging material for recycling in accordance with the Waste Management Plan.

.2 Remove from the Place of the Work and dispose of packaging materials at appropriate recycling facilities.

.3 Dispose of unused finish and adhesive materials at official hazardous material collections site.

7. WARRANTY

.1 Furnish a single, written warranty covering both material and workmanship for a period of three (3) full years from date of Substantial Performance of the Work. The Warranty shall cover defects such as cracking, delamination under impact and under heavy loaded carts and under thermal shock, and excessive wear.

2 Products

1. MATERIALS

.1 Manufacturers:
  .1 The specifications are based on Products manufactured by Sika Canada Inc. Products by Duochem Inc, division of Corrosion Services, CPD Construction Products, Niagara Protective Coatings, Selby/Ucrete,. Stonhard Ltd. Euclid or other approved manufacture may be approved on condition of being able to furnish evidence of equivalency or better to the specified Products.

.2 Concrete Floor Sealer System (EWPM)
  .1 General:
    .1 Two-component, clear, water based mat epoxy coating, Sika MRW roller applied two coat system on a sealed/primed substrate.
  .2 Characteristics
    .1 Seamless and very easy to clean.
    .2 Abrasion and chemical resistant.
    .3 No odour typical of solvent based coatings
  .3 Minimum Technical requirements
    .1 Solids content: 100% by weight, 100% by volume.
    .2 Pot life90 mins.
    .3 Application method: Brush, or roller.
    .4 Number of coats: Two.
    .5 Dry film thickness per coat: as per manufacturer's instructions
    .6 Cleaning solvent: Warm water.
    .7 Cure time: Touch dry: 4-5 hours.
      .1 Hard dry: 16-18 hours.
      .2 Complete cure: 7 days.
    .8 Recoat time: 16 hours.
  .4 Minimum Physical properties
    .1 Abrasion resistance: 175 mg loss per ASTM D 4060 CS-17 wheels 1000 revolutions 1000 gr/wheel.
    .2 Tensile strength 2.1 MPa per ASTM D 2370 (2.8 mils D.F.T.)
  .5 Primer: as recommended by manufacturer.

3 Execution

1. WORKMANSHIP

.1 General
  .1 Handle, mix and apply Products as per the Product manufacturer's printed surface preparation and application specifications, and as specified in this specification section 09 97 24.
  .2 Application tools and equipment shall be as per the Product manufacturer's printed requirements.

2. PREPARATION

.1 Prepare concrete by sanding smooth and for removal of bond inhibiting substances.

.2 Apply as per manufacturer's instructions.

3. **APPLICATION**

.1 Apply concrete sealer as indicated.
.2 Rolling direction of each coat shall be the same.

4. **FIELD QUALITY CONTROL**

.1 The Owner reserves the right to invoke the following material testing procedure at any time, and any number of times during period of flooring application.

.2 The Owner may engage service of an independent testing laboratory to sample materials being used on the jobsite. Samples of material will be taken, identified and sealed, and certified in presence of Contractor.

.3 Testing laboratory will perform tests for any of characteristics specified, using applicable testing procedures referenced herein, or if none referenced, in manufacturer's product data.

.4 If test results show materials being used do not comply with specified requirements, the Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

5. **CURING, PROTECTION AND CLEANING**

.1 Cure concrete floor sealing materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

.2 Protect concrete floor sealing from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. Contractor is responsible for protection and cleaning of surfaces after final coats.

.3 Cleaning: Remove temporary covering and clean flooring just prior to final inspection. Use cleaning materials and procedures recommended by the concrete floor sealer manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop Drawings:

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

.3 Samples:

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

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site packaging materials at appropriate recycling facilities.

.2 Dispose of recyclable packaging material in appropriate on-site bin for recycling.

Part 2 Products

2.1 MATERIALS

.1 Tackboard (TB) - natural coloured cork tackboard:

.1 Single layer cork sheet 6 mm thick; natural color, on 6 mm particle board to CAN 3.188.1-M78, Grade R.

.2 Extruded aluminum trim No. 205, 1.5 mm wall thickness, mitered, clear anodized finish

.3 Concealed steel fastenings (1 coat CGSB 1-GP-81e baked primer) to toggle bolts. Do not fasten to wall with adhesive.

.4 Size: 1200 H x 3600 Long. Due to oversize dimension, construct with single centre seam in materials using No. 207 divider bar.

.5 Acceptable manufacturer: Architectural School Products, Global, Claridge Products Inc., Martack Specialties Limited or approved alternates meeting or exceeding these specifications.

.2 White Board (WB) - "Vit-Rite: Rite on, Wipe off" model as manufactured by Architectural School Products, Mississauga.

.1 Wall mounted whiteboard; porcelain enameled 22 ga. steel on 11 mm fiberboard core on 28 ga. zinc coated steel back up sheet.

.2 Color: White. Flush trim No. 205, marker tray No. 212, 89 mm deep, minimum, Display Rail No. 200, KWIK Grip.

.3 Provide all hardware and fasteners suitable for secure recessed mounting.

.4 Size, as per drawings.

.5 Acceptable manufacturer: Architectural School Products, Global, Claridge Products Inc., Martack Specialties Limited or approved alternates meeting or exceeding these specifications.

.3 Safety Release Coat Hook:

.1 High strength polycarbonate coat hook with safety release weight under downward pressure to not exceed 12 kg (26 lbs.)

.2 Supply all suitable mounting hardware for a vandal proof, secure installation using stainless steel sleeve bolts on partition doors or panels. Do not supply standard Robertson or Phillips head screws.

.3 Colours: Allow for three (3) colours from Manufacturers standard line

.4 Acceptable Materials: "HenkelHook" as manufactured/distributed by Henkel Diversified Inc, London ON, tel (519) 641-5872.

.5 Alternate Acceptable product by "Frost" distributed by Architectural School Products.

.6 Locations:

.1 Coat hooks to be mounted in ALL barrier free washrooms and shall be safety release style and mounted on the side wall

.2 Refer to drawings for quantity and locations.

.7 Samples: submit test data and samples for review as specified in Section 013330 – Submittal Procedures.

Part 3 Execution

3.1 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.

3.2 INSTALLATION

.1 Install where indicated on drawings and as per manufacturer's instructions.

3.3 DEMONSTRATION AND TRAINING

.1 Provide demonstration of operation to the Owner and his representatives.

.2 Provide training for operation, maintenance and repairs.

3.4 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean surfaces after installation using manufacturer's recommended cleaning procedures.

.3 Clean aluminum with damp rag and approved non-abrasive cleaner.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 08 80 50 - Glazing: Mirrors.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM B456-[95], Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 ASTM A653/A653M-[99], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM A924/A924M-[99], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.81-[M90], Air Drying and Baking Alkyd Primer for Vehicles and Equipment.

.2 CAN/CGSB-1.88-[92], Gloss Alkyd Enamel, Air Drying and Baking.

.3 CAN/CGSB-12.5-[M86], Mirrors, Silvered.

.4 CGSB 31-GP-107Ma-[90], Non-inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-[95], Barrier-Free Design.

.2 CAN/CSA-G164-[M92], Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 SHOP DRAWINGS

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

.2 Shop drawings of units for use by the handicapped shall be distinctly marked and cross-referenced to the corresponding article in the specifications.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

Part 2 Products

2.1 MATERIALS

.1 Ferrous Steel: Sheet, cold-rolled furniture steel, double annealed, mill stretched and leveled, and fully pickled. Otherwise, steel shall be hot-rolled or cold-rolled of alloy to suit needs of fabrication, use, and appearance.

.2 Galvanized Steel: For sheet, Z275 zinc coating designation in accordance with ASTM Specification A525. For irregular sections, hot dip galvanized to comply with CSA G164.

.3 Stainless steel sheet metal: to ASTM A167, Type 304, with No. 4 finish.

.4 Anchors and Fastenings: Where exposed, use stainless steel and otherwise to match metal anchored. Where non-exposed, use the same as that specified for exposed, or use galvanized steel. Anchors and fastenings shall be of the type appropriate for the substrate to which accessory unit is secured.

2.2 COMPONENTS

.1 Towel Bars (TWB): Model B530 (peened finish) by Bobrick or ASI 3800-Series by ASI Group Canada:

.1 16 ga., 32 mm O.D. by 750 mm long with concealed mounting hardware.
.2 Install at 1000 mm above finish floor level.
.3 Location: refer to drawings
.4 Acceptable Alternatives: Watrous

.2 Folding Shower Seats (FSS): Model B5181 by Bobrick or F974-P by Frost or ASI 8206 by ASI Group Canada:

.1 One in the handicapped shower stall, with s.s. retaining clips.
.2 Location: refer to drawings

.3 Handicapped Grab Bars (GB, GBL & GBV): Model 1001-24”, 1001-42” and 1003-30”x30” by Frost or ASI 3801-24P, ASI 3801-36P, and ASI 3807-4P by ASI Group Canada or alternates by Bobrick:

.1 Two (2) bars per water closet stall: one 600 mm long bar behind water closet and one 750 mm x 750 mm L shaped grab bar beside water closet 1050mm mounted as per O.B.C. requirements.
.2 One in each shower stall: model FP (peened finish) 900 mm long L shaped grab bar, mounted as per O.B.C. requirements. Refer to interior elevation drawings.
.3 all bars to have concealed mounting hardware
.4 Location: refer to drawings.
.5 all bars to withstand horizontal and vertical pull of 2.2 kN

.4 Handicapped Grab Bars - Flip-Up (GBF):

.1 18 gauge stainless steel, 38 mm diameter, 800 mm long flip-up grab bar with white wall mounting bracket, automatic locking system.

.2 Model: Flip-up by Dunleavy Cordun Associates (Tel: 905-470-6685)

.3 If locking grab bar not required, provide ASI 3513P & ASI 3513-25P, by ASI Group Canada (with toilet paper holder) or Frost F-1055-FTS (with toilet paper holder).

.4 Location: refer to drawings

.5 Hand Dryers (HD): refer to Electrical specifications.

.6 Purse/Convenience Shelves (CS): Model B298x18 by Bobrick or Frost F-950-18 or ASI 0692-818 by ASI Group Canada:

.1 Location: refer to drawings

.7 Shower Rod and Curtain (SR+C):

.1 Rod: No. B6047 extra heavy duty, by Bobrick or Frost F-1145-S or ASI 1204 by ASI Group Canada, 18 gauge stainless steel

.2 Curtain: 8 gauge vinyl fabric No. B204-3 (1780mm width) B204-1 shower curtain hook by Bobrick or ASI 1200-V and 1200-SHU by ASI Group Canada; 1830 mm high, 300 mm wider than opening.

.3 Location: refer to drawings

.8 Paper Towel Dispensers (PTD): Model B2860 by Bobrick or Frost Model 109-605 or ASI 8523A by ASI Group Canada:

.1 Location: refer to drawings

.2 Confirm final positioning in room with Consultant.

.9 Sanitary Napkin Disposal (SN): Model Bobrick B-254 or Frost F-622 or ASI 0473-1A by ASI Group Canada:

.1 Quantity & Location: Washrooms: Refer to drawings

.10 Toilet Tissue Dispenser (TD): Model Frost F-159

.1 Quantity: 1 per toilet fixture.

.11 Mirrors:

.1 Fixed Mirrors (designation Type M):

.1 Best quality, 6 mm thick float glass, with concealed tamperproof clip fasteners.

.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.

.3 Sizes: each unit 457 mm x 610 mm.

.4 Locations: as shown on Drawings.

.5 Acceptable Materials: Frost ‘Stock series’ model 941TG Tempered Glass; 18” x 24” each.

.6 Acceptable alternate: Model 5440 by Twin Cee; or "Tamperproof" model by Pilkington Ford or ASI 0620 by ASI Group Canada.

.2 Fixed Mirrors (designation Type ML):

.1 Best quality, 6 mm thick float glass complete with concealed, tamperproof clip fasteners

.2 24 ga., Type 302 or 304 No 4 finish stainless steel frames on all edges and galvanized iron backing with concealed mounts.

.3 Sizes: each unit 610 mm x 1520 mm.

.4 Location: refer to drawings

.5 Acceptable Materials: Bobrick Model B-290 2460; 24" x 60" each.

.6 Acceptable alternate: equivalent size and details by Bobrick or Twin Cee or ASI 0600 by ASI Group Canada.

.3 Handicapped Mirrors (designation Type TM):

.1 Tilt mirror

.2 Acceptable Materials: Frost 'Stock series' model 941FG Tempered Glass; Bobrick 290 series or Frost F974FT series or ASI 0535 by ASI Group Canada.

.3 18" x 24" each.

.4 Location: refer to drawings

.5 Frames: Type 302 or 304 No. 4 finish stainless steel.

.6 Mirror Cushioning: PVC pressure-sensitive foamed tape, 6 mm thick with adhesive on one side.

.12 Soap Dispensers (SD): Supplied and installed by Owner.

.13 Soap Dispensers (Recessed): Model B-4063 by Bobrick or ASI 9326 by ASI Group Canada.

.1 Location: refer to drawings

.14 Acceptable Alternates to those items 2.2.1 – 2.2.15 listed above as manufactured by Bradley Corp. & Supplied by Wentworth Assoc. Ltd 905 627-7070 or Frost Products Ltd. meeting or exceeding these specifications.

2.3 FABRICATION

.1 Construction**:** Fabricate with materials, component sizes, metal gauges, reinforcing, anchors and fasteners of adequate strength to withstand intended use.

.2 Where specified as frameless, provide stainless steel accessories with one-piece fronts having 90 degree formed returns at their edges and openings.

.3 Where accessory fronts are framed, frame edges, both inside and outside, with 90 degree formed returns continuously welded and ground smooth at the corners. Doors shall also have 90 degree formed returns as specified.

.4 Unless otherwise specified, hinges shall be semi-concealed stainless steel piano hinges extending full-length of hinged element. Provide hinged elements with concealed, mechanically-retained rubber bumpers for silent closing, and shall close flush with faces of fronts or frames.

.5 Ensure that work will remain free of warping, buckling, opening of joints and seams, distortion and permanent deformation.

.6 No exposed fixings permitted. Cut edges and openings square and smooth. Chamfer corners of edges and cut-outs 1.6 mm.

.7 Assembly: Accurately cut, machine and fit joints, corners, copes and mitres so that junctions between components fit together tightly and in true planes.

.8 Fasten work with concealed methods, unless otherwise indicated on Drawings.

.9 Weld all connections where possible, bolt where not possible and cut off bolts flush with nuts. Countersunk bolt heads, and provide method to prevent loosening of nuts. Ream holes drilled for fastening.

.10 Welded joints shall be tight, flush, and in true planes with base metals. Make welds continuous at joints where entry of water into voids of members or assemblies is possible.

.11 Provide for differential movements within assemblies and at junctions of assemblies with surrounding work.

.12 Welds in exposed locations shall be ground and polished smooth.

.13 Finish Work**:** Provide holes and connections for related work installed under other Sections of this specification, if applicable.

.14 Cleanly and smoothly finish exposed edges of materials, including holes.

Part 3 Execution

3.1 INSPECTION OF SECTION

.1 Take site measurements to ensure that work is fabricated to fit surrounding construction around obstructions and projects in place, or as shown on drawings, and to suit service locations.

3.2 INSTALLATION

.1 Install all accessories in accordance with manufacturers' instructions at their recommended mounting heights unless noted otherwise on drawings.

.2 Securely fasten accessories plumb, true, square, straight, level, and accurately and tightly fitted together and to surrounding work. Install in locations shown and specified herein. Mounting heights as shown or in accordance with the OBC in the case of barrier-free accessories.

.3 Work shall include anchor bolts, bolts, washers and nuts, lag screws, expansion shields, toggles, straps, sleeve brackets, clips, and other items necessary for secure installation, as required by loading and by Jurisdictional Authorities.

.4 Attach work at wood by screws through countersunk holes in metal.

.5 Attach work to masonry with lead plugs and non-corrosive fastenings, to support load with a safety factor of 3. Perform all drilling necessary to install the work.

.6 Insulate between dissimilar metals or between metals and masonry or concrete with bituminous paint, to prevent electrolysis.

.7 Coordinate installation with the work of other trades adjacent to accessories to achieve the reveals or other edge conditions shown, where their front faces are flush with the finished wall surfaces.

.8 Owner to supply and install remainder of washroom accessories not specified here (toilet paper dispensers, etc.). Cooperate with Owner as required.

3.3 CLEANING UP AND ADJUSTMENT

.1 Upon completion of work, or when directed, remove all traces of protective coatings or paper.

.2 Test mechanisms, hinges, locks and latches, and where necessary, adjust and lubricate and ensure that accessories are in perfect working order.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work: Protection of openings; temporary power and lighting.

.2 Section 01 52 00 – Construction Facilities: Protection of openings; temporary power and lighting.

.3 Section 03 30 00 - Cast-in-Place Concrete: Elevator pit, elevator motor and pump foundation, and grouting thresholds

.4 Section 05 50 00 - Metal Fabrications: Divider beams, support for entrances and rails, hoisting beam at top of hoistway.

.5 Section 04 21 13 – Masonry: Masonry hoistway enclosure, building-in and grouting hoistway door frames, grouting thresholds.

.6 Section 05 50 00 – Metal Fabrications: Divider beams, support for entrances and rails, hoisting beam at top of hoistway.

.7 Division 26: Electrical service to main disconnect in elevator machine room; machine room; machine room and pit receptacles with ground-fault current protection; lighting in machine room and pit; wiring for telephone service to machine room, cab telephone wiring.

1.2 SUMMARY

.1 This specification is based on a Model 3500 Deep Front hydraulic elevator as manufactured by Vertechs Elevators.

.2 Acceptable Alternates: Elevators meeting or exceeding these base specifications by Otis, Thyssen Krupp, Kone, Delta Elevator and Southwestern Elevators, or others providing they meet this specification and complete data is submitted to the Architect's office not later than 4 business days prior to close of Tender and approved and formally accepted in writing by the Consultant during the tender period.

1.3 REFERENCES

.1 ADAAG, Americans with Disabilities Act Accessibility Guidelines.

.2 ANSI/NFPA 70, National Electrical Code.

.3 ANSI/NFPA 80, Fire Doors and Windows.

.4 ANSI/UL 10B, Fire Tests of Door Assemblies.

.5 CAN/CSA C22.1, Canadian Electrical Code.

.6 CAN/CSA-B44, Safety Code for Elevators and Escalators.

.7 Model Building Codes.

.8 Ontario Building Code and all other local applicable codes.

.9 American National Standards Institute (ANSI)

.1 ANSI/NEMA MG1-[1993], Motors and Generators.

.10 Canadian Standards Association (CSA)

.1 CAN/CSA-B44-[M94], Safety Code for Elevators.

.2 CAN/CSA-B651-[95], Barrier-Free Design - Public Safety.

.11 National Building Code (NBC)

1.4 SYSTEM DESCRIPTION

.1 Performance Requirements for Elevators:

.1 Quantity & Elevator Numbers: 1 Elevator

.2 Type: Twin telescopic hydraulic cylinders without well holes

.3 Number of Stops: 2 Front Only

.4 Number of Openings: 2 at front

.5 Rise: As per drawings

.6 Rated Capacity/Speed: 3500 pounds, 150/ fpm

.7 Minimum Car Inside: Front Opening: Model 3500 Deep Front: 6’ 8” deep x 5’ 8 1/2” wide (2032 mm x 1740 mm)

.8 Inside Cab Height: 8’0”(2438 mm); Height Under Ceiling: 7’ 9” (2362mm)

.9 Entrance Width & Type: Model 3500: Single-Slide Door 3’ 6” x 7’ 0” (1067 mm x 2135 mm)

.10 Main Power Supply: 600 Volts + or - 5% of normal, 3 Phase, with a separate equipment grounding conductor.

.11 Lighting Power Supply: 120 Volts, 1 Phase, 15 Amp, 60 Hz.

.12 Stopping Accuracy: ±1/4" (6.4 mm) under any loading condition or direction of travel.

.13 Door Opening Time for 7ft. painted hoist way and car doors: Model 3500: 4.0 seconds – Single Slide 42” door.

.2 Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

.3 Provide microprocessor-based control system, which utilizes on-board diagnostics for servicing, trouble-shooting, and adjusting without requiring the use of an outside service tool. If an on-board diagnostic system is not provided, a handheld service tool (or laptop), owner’s license, operation manual, and tool instructions must be provided in addition to the control system.

.4 Car Operating Features

.1 Full Collective Operation.

.2 Single Speed Fan.

.3 On/Off Light Switch.

.4 Solid State Starting

.5 Remote elevator monitoring REM® ready.

.6 Car-Stall Protection.

.7 Top of Car Inspection.

.5 Door Control Features:

.1 Closed Loop Door Operator is a closed loop, microprocessor based door operator system. The door operator will facilitate smooth operation under varying environmental influences such as, temperature, wind, friction, and component variation. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. The Closed Loop Door Operator control system shall not require machine room door control equipment.

.2 Door noise not to exceed 58dBA.

.3 Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

.4 Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.

.5 Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.

.6 Primary door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening. Under normal operation and for any door position, the system shall detect as a blockage an opaque object that is equal to or greater than 1.3 inches (33 mm) in diameter when inserted between the car doors at vertical positions from within 1 inch (25 mm) above the sill to 71 inches (1800 mm) above the sill. Under degraded conditions (one or more blocked or failed beams), the primary protection shall detect opaque objects that are equal to or greater than 4" (100 mm) in diameter for the same vertical coverage. If the system performance is degraded to the point that the 4" object cannot be detected, the system shall maintain the doors open or permit closing only under nudging force conditions.

.7 The door reopening device shall also include a secondary, three dimensional, triangular infrared multi-beam array projecting across the door opening and extending into the hoistway door zone. The door opening device will cause the doors to reopen when it detects a person(s) or object(s) entering or exiting the car in the area between the hoistway doors or the entryway area adjacent to the hoistway doors.

.8 The size of the secondary protection zone shall vary as the door positions vary during opening and closing. The width of the zone shall be approximately one-third the size of the separation between the doors (or door and strike plate for single-slide doors) and shall be approximately centered in the door separation. In order to minimize detection of hallway passers-by who are not entering the

elevator, the maximum zone penetration into the entryway shall not exceed 20" for any door separation. Normal penetration depth into the entryway from the car doors shall be ~14" for a door separation of 42". The penetration shall reduce proportionally as the doors close. At door separations of 18" or less the secondary protection system may cease its normal operation since the depth of the zone recedes to where it is inside the hoistway doors. The vertical coverage of the secondary protection shall be ~19" (480 mm) above the sill to ~55" (1400 mm) above the sill (mid-thigh to shoulder of a typical adult).

.9 The secondary protection shall have an anti-nuisance feature which will ignore detection in the secondary zone after continual detection occurs for a significant time period in the secondary zone without corresponding detection in the primary protection zone; i.e. a person/object is in the entryway but does not enter. Normal secondary protection shall be re-enabled whenever detection occurs in the primary zone.

.10 The reaction time of the door detector sub-system shall not exceed 60 milliseconds when both primary and secondary protection capabilities are active; nor 40 milliseconds when the secondary protection is disabled.

.11 Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

.6 Provide equipment according to Seismic zone: zone 0

.7 Design and construct elevator in accordance with CAN/CSA-B44, local codes and regulations.

1.5 SUBMITTALS

.1 Product Data: Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.1 Signal and operating fixtures, operating panels and indicators.

.2 Cab design, dimensions and layout.

.3 Hoistway-door and frame details.

.4 Electrical characteristics and connection requirements.

.5 Expected heat dissipation of elevator equipment in machine room (BTU).

.2 Shop Drawings: Submit in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit shop drawings to indicate project layout, including details and the following information:

.1 Car, guide rails, buffers and other components in hoistway.

.2 Maximum rail bracket spacing.

.3 Maximum loads imposed on guide rails requiring load transfer to building structure.

.4 Loads on hoisting beams.

.5 Clearances and travel of car.

.6 Clear inside hoistway and pit dimensions.

.7 Location and sizes of access doors, hoistway entrances and frames.

.2 Operation and Maintenance Data

.1 Provide 4 copies manufacturer's standard operations and maintenance manual.

1.6 QUALITY ASSURANCE

.1 Manufacturer: Provide elevators manufactured by a firm with a minimum of 10 years experience in fabrication of elevators equivalent to those specified. Elevator manufacturer shall be ISO9002 certified.

.2 Installer: Elevators shall be installed by the manufacturer.

.3 Regulatory Requirements: Elevator system design and installation shall comply with the latest versions of CAN/CSA-B44 -00.

.1 Elevator shall be designed to meet to Americans with Disabilities Act Accessibility Guidelines (ADAAG)

.4 Permits and Inspections: Provide licenses and permits and perform required inspections and tests.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Manufacturer shall issue delivery schedule within 7 days of issuance of purchase order. Manufacturer shall maintain regular contact with the contractor and Consultant regarding expediting shop drawings and delivery.

.2 At least 3 weeks in advance of delivery, manufacturer’s representative shall visit the site to discuss site preparedness. Manufacturer’s rep. shall make a second visit one week in advance of the delivery and again liaise with General Contractor and Consultant to ensure site preparation.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Deposit packaging materials in appropriate container on site for recycling or reuse.

.2 Avoid using landfill waste disposal procedures when recycling facilities are available.

.3 Collect and separate plastic, paper packaging and corrugated cardboard.

.4 Dispose of corrugated cardboard, polystyrene and plastic packaging material in appropriate on-site bin.

1.9 WARRANTY

.1 The elevator warranty shall cover defective functionality, programming, materials and workmanship for a period of One Year from the date of Substantial Completion of the contract. The guarantee includes ordinary wear but excludes improper use, vandalism, abuse, and misuse by the owner.

1.10 MAINTENANCE SERVICE

.1 Included in the Tender price is the maintenance service consisting of regular examinations, adjustments and lubrication of the elevator equipment shall be provided by the elevator contractor for a period of three (3) years after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days and shall include emergency 24-hour callback service. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.

Part 2 Products

2.1 MATERIALS

.1 Materials: As required to achieve specified performance criteria; functionally compatible with adjacent materials and components.

2.2 EQUIPMENT: MACHINE ROOM COMPONENTS

.1 The hydraulic system shall be of compact design suitable for operation under the required pressure. The power component shall be mounted in the hydraulic-fluid storage tank. The control valve shall control flow for up and down directions hydraulically and shall include an integral check valve. A control section including control solenoids shall direct the main valve and control: up and down starting, acceleration, transition from full speed to leveling speed, up and down stops, pressure relief and manual lowering. All functions shall be fully adjustable for maximum smoothness and to meet contract conditions. System to be provided with a muffler, low-pressure switch and a shut-off valve.

.2 A microprocessor-based controller shall be provided, including necessary starting switches together with all relays, switches, solid-state components and hardware required for operation, including door operation, as described herein. A three (3) phase overload device shall be provided to protect the motor against overloading.

.3 A manual lowering feature shall permit lowering the elevator at slow speed in the event of power failure or for adjusting purposes.

.4 Pressure Switch

2.3 EQUIPMENT: HOISTWAY COMPONENTS

.1 Plunger(s) and Cylinder(s): Each cylinder shall be constructed of steel pipe of sufficient thickness and suitable for the operating pressure. The top of each cylinder shall be equipped with a cylinder head with a drip ring to collect any oil seepage as well as an internal guide ring and self-adjusting packing. Each plunger shall be constructed of selected steel tubing or pipe of proper diameter machined true and smooth with a fine polished finish. Each plunger shall be provided with a stop ring electrically welded to it to prevent the plunger from leaving the cylinder. Each plunger and cylinder shall be installed plumb and shall operate freely with minimum friction.

.2 Car Guide Rails: Tee-section steel rails with brackets and fasteners.

.3 Spring Buffer: Helical coil spring type.

.4 Wiring: Wiring for hoistway electrical devices included in scope of the elevator system, hall panels, pit emergency stop switch, and the traveling cable for the elevator car, operating telephone handset call system in Cab.

.5 Hoistway Entrances

.1 Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of 14-gauge (2 mm) sheet steel. Additional sill angle support will be provided with 4'0" and 4'6" two speed opening door arrangements. Sills shall be extruded aluminum.

.2 Doors: Entrance doors shall be of hollow metal construction with vertical internal channel reinforcements.

.3 Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour.

.4 Entrance Finish: Prime white paint, baked enamel. All doors & frames, suitable for finish painting.

.5 Entrance Markings: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille adjacent. Markings shall be provided on both sides of the entrance.

.6 Sight Guards: Black sight guards will be furnished with any metal finish door. Powder paint matching sight guards will be furnished with powder paint doors.

2.4 EQUIPMENT: CAR COMPONENTS

.1 Car Frame: A suitable car frame shall be provided with adequate bracing to support the platform and car enclosure. The buffer striking plate on the underside of the car-frame platform assembly must fully compress the spring buffer mounted in the pit before the plunger reaches its lower limit of travel.

.2 Platform, Heavy Loading Type: The car platform shall be arranged to accommodate one-piece loads weighing up to 25% of the rated capacity, such as wheeled food carts, stretchers, x-ray equipment, etc. The platform shall be recessed 5/16" for flooring by others.

.3 Cab walls to have attached vertical non-removable panels, laminated front and back with plastic laminate.

.4 Car Door Finish: Car fronts and door finish can be independent elevators. Satin stainless steel

.5 Car top to be of wood material clad on both sides with a natural finish aluminum panel.

.6 Ceiling Type:

.1 Aluminum Eggcrate suspended ceiling shall consist of aluminum eggcrate diffusers set in frame of extruded aluminum with fluorescent lighting fixtures.

.7 Emergency Car Lighting: An emergency power unit employing a 6 volt, sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car and provide current to the emergency siren in the event of building power failure.

.8 Emergency Pulsating Siren: Siren mounted on top of the car that is activated when the Alarm button in the car operating panel is engaged. Siren shall have a rated sound pressure level of 80 dba at a distance of 3.0 m from the device. Siren shall respond with a delay of not more than 1 second after the switch or push button has been pressed

.9 Exhaust Fan: An exhaust fan shall be mounted on the car top.

.10 Utility Outlet: A 125V 15 amperes utility outlet with ground-fault circuit-interrupter protection shall be furnished on top of the cab.

.11 Handrail:

.1 Rectangular Tubular Metal Bar DH50 Handrails 1/2" (13 mm) x 1-1/2" (38 mm) in stainless steel.

.12 Threshold: aluminum.

2.5 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

.1 Car-Operating Panel: A panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. Raised markings **Braille** markings shall be provided for each push-button.

.2 Car Fixture Finish: satin stainless steel.

.1 Applied car operating panel shall be furnished. It shall contain a bank of round mechanical illuminated buttons marked to correspond to the landings served, an emergency call button, door open and door close buttons, and switches for lights, inspection and the exhaust fan. The emergency call button shall be connected to a bell that serves as an emergency signal. All buttons to have both raised and Braille markings. LED (red) button illumination with 1/8" projecting target. All buttons to be stain stainless steel.

.3 Car Position Indicator: A 16-segment, digital, vacuum fluorescent car position indicator shall be integral to the car operating panel.

.4 An ADA compliant communication device shall be provided which has been designed in response to ADAAG requirements integral with the car operating panel.

.5 Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.

.6 Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Raised markings shall be provided for each push-button. Otis series 5.

.7 Fixture Finish**: satin stainless steel.**

.8 Landing Passing Signal: A chime bell shall sound in the car to tell a passenger that the car is either stopping at or passing a floor served by the elevator.

.9 Security Lockout Key switches to disable activation of hall buttons.

Part 3 Execution

3.1 MANUFACTURERS INSTRUCTIONS

.1 Compliance: Comply with manufacturer=s written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions, and data sheet.

3.2 PREPARARTION

.1 Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.3 INSTALLATION

.1 Installation of all elevator components except as specifically provided for elsewhere by others.

3.4 SITE TESTS

.1 Perform and meet tests required by CAN/CSA-B44.

.2 Supply instruments and execute specific tests.

.3 Furnish test and approval certificates issued by jurisdictional authorities.

3.5 CLEANING

.1 Remove protective coverings from finished surfaces and components.

.2 Clean surfaces and components ready for inspection.

3.6 ADJUSTMENTS

.1 The elevator contractor shall make a final check of each elevator operation with the Owner or Owner’s representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

.2 Adjust door opening and closing times to suit handicapped users in accordance with Engineer's instructions.

.3 Adjust control system to cause elevators to answer hall calls during working day within performance criteria specified.

.4 Adjust for smooth acceleration and deceleration of car as so not to cause passenger discomfort.

.5 Adjust automatic floor levelling feature at each floor.

END OF SECTION

1. GENERAL

1.1. General Requirements

1. Conform to the requirements stated in the General Conditions, Supplementary General Conditions of this Specification and all addenda for all work, including work outside the property line including work within Regional and Municipal right of way unless otherwise noted.

1.2. Related Work

1.	Site Grading	Section 31 23 13
2.	Excavation, Trenching and Backfilling	Section 31 23 10
3.	Granular Base	Section 32 11 23
4.	Granular Sub-Base	Section 32 11 19
5.	Asphalt Paving	Section 32 12 16

1.3. References

1. ASTM D4791-10, Test Method for Flat or Elongated Particles in Coarse Aggregate.
2. Ontario Provincial Standard Specification 1001.

1.4. Samples

1. Submit samples in accordance with Section 01 33 00.
2. Allow continual sampling by Consultant during production.
3. Provide Consultant with access to source and processed material for sampling.
4. Install sampling facilities at discharge end of production conveyor, to allow Consultant to obtain representative samples of items being produced. Stop conveyor belt when requested by Consultant to permit full cross section sampling.

2. PRODUCTS

2.1. Materials

1. Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in deleterious manner for use intended.
2. Flat and elongated particles of coarse aggregate: to ASTM D4791.
    1. Greatest dimension to exceed five times least dimension.
3. Fine aggregates satisfying requirements of applicable section to be one, or blend of following.
    1. Natural sand.
    2. Manufactured sand.
    3. Screenings produced in crushing of quarried rock, boulders or gravel.
4. Coarse aggregates satisfying requirements of applicable section to be one of or blend of the following:
    1. Crushed rock.
    2. Gravel and crushed gravel composed of naturally formed particles of stone.

2.2. **Source Quality Control**

1. Inform Consultant of proposed source of aggregates and provide access for sampling at least four weeks prior to commencing production.
2. If, in opinion of Consultant, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.
3. Advise Consultant four weeks in advance of proposed change of material source.
4. Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

3. EXECUTION

3.1. **Preparation**

1. Aggregate source preparation
    1. Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as directed by Consultant.
    2. Where clearing is required, leave screen of trees between cleared area and roadways as directed.
    3. Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
    4. When excavation is completed, dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
    5. Trim and dress slopes and leave site in neat condition.
2. Processing
    1. Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
    2. Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Consultant.
    3. Wash aggregates to meet specifications. Use only approved equipment.
    4. When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.
3. Handling
    1. Handle aggregates to avoid segregation, contamination and degradation.
4. Stockpiling
    1. Stockpile aggregates on site in locations as indicated unless directed otherwise by Consultant. Do not stockpile on completed surfaces.
    2. Stockpile aggregates in sufficient quantities to meet project schedules.
    3. Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support materials and handling equipment.

4. Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into work.

5. Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

6. Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Consultant within 48 h of rejection.

7. Stockpile materials in uniform layers of thickness as follows:

    1. Max. 1.5 m for coarse aggregate and base course materials.

    2. Max. 1.5 m for fine aggregate and sub-base materials.

    3. Max. 1.5 m for other materials.

8. Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

9. Do not cone piles or spill material over edges of piles.

10. Do not use conveying stackers.

11. During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2. **Cleaning**

1. Leave aggregate stockpile site in tidy, well drained conditions, free of standing surface water.

2. Leave any unused aggregates in neat stockpiles as directed by Consultant.

END OF SECTION

Part 1 General

1.1 GEOTECHNICAL INVESTIGATION

.1 A copy of the Geotechnical Report and Borehole Logs and Chemical Analysis is enclosed on following pages.

PROJECT NAME: Geotechnical Investigation
Proposed Renovation to Allan A Martin Public School
Mississauga, Ontario
Prepared by: Forward Engineering & Associates Inc.
Proj. Ref. No. G7451

1.2 DISCLAIMER

.1 The Geotechnical Report is not part of the Contract Documents prepared by the Architect or his sub consultants. It is bound into the Specifications set for convenient reference only. The Geotechnical report was not prepared by or under the supervision of the Architect. While every effort has been made to attempt to provide comprehensive geotechnical information for the purposes of design and tendering, the Architect claims no responsibility for the accuracy of the information contained in the report.

.2 Refer to Section 00 21 13 – 'Instruction to Bidders', Examination of the Site.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

FORWARD ENGINEERING

& ASSOCIATES INC.

Geotechnical, Environmental, Inspection & Material Testing Services

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REPORT
GEOTECHNICAL INVESTIGATION

PROPOSED RENOVATION
ALLAN A. MARTIN PUBLIC SCHOOL
1390 OGDEN AVENUE
MISSISSAUGA, ONTARIO
L5E 2H8

PREPARED FOR:
PEEL DISTRICT SCHOOL BOARD
c/o
HOSSACK & ASSOCIATES ARCHITECTS
2150 Dunwin Drive, Unit 4
Mississauga, ON
L5L 5M8

December 04, 2024
Ref. No. G7451

Distribution: 1 PDF Copy – HOSSACK & ASSOCIATES ARCHITECTS
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INTRODUCTION

This report presents the results of the geotechnical investigation carried out by Forward Engineering & Associates Inc. for the proposed renovation to existing Allan A. Martin Public School located at 1390 Ogden Avenue, Mississauga, Ontario.

The location of the proposed addition in relation to the existing school building and site features is shown on Drawing No. 1. The approximate locations of the drilled boreholes and test pit conducted during this investigation are also presented on Drawing No. 1.

This investigation was authorized by Hossack Associates Architects, on behalf of the Peel District School Board (PDSB).

PURPOSE AND SCOPE

The objectives (purpose) of this investigation were to determine the following:

- The extent, depth, and properties of the predominant fill/soil strata as they affect the design and construction of the proposed addition.
- The dimensions and configurations of the existing foundation footings at select location(s).
- The short-term groundwater levels, if encountered.
- The appropriate geotechnical design criteria for the building foundations, excavations, backfill, slab construction, utilities, and pavement.

To achieve the above noted objectives, the field program of this investigation consisted of:

- Five [5] boreholes, drilled to a depth ranging from about 3.12 to 4.70 m below the **E**xisting **G**round **S**urface **L**evel (**EGSL**), and
- One [1] test pit, excavated to a depth of about 1.34 m below the EGSL.

On completion of the field and laboratory work, an engineering analysis was carried out and this report summary was prepared.

PROPOSED DEVELOPMENT

We understand that the proposed project entails a 2-storey addition with no basement, including new elevator and washrooms.

The location of the proposed addition in relation to the existing school building, and site features, is shown on Drawing No. 1.

FIELD AND LABORATORY TESTING

Field Works

Borehole Investigation:

The field work for the borehole investigation consisted of five [5] boreholes (Nos. 1 to 5), drilled on November 11, 2024, under the supervision of a member of our staff.

The drilled boreholes were located at the approximate locations shown on Drawing No. 1, and they extended to a depth ranging from about 3.12 to 4.70 m below the EGSL. Some of the boreholes were slightly relocated in the field from originally intended/planned location due to an existing underground utility and existing gate structure.

One [1] of the boreholes (BH/MW-4) was equipped with a Water Monitoring Well (WMW) to facilitate future measurements of the water level.

Soils were sampled in the boreholes following the Standard Penetration Test (SPT) method using a CME-55 Truck Mounted Auger Drill Rig using Rotary Drilling with Split Spoon Samplers.

The samples were logged in the field and appropriately stored in plastic bags and re-examined in more detail in the laboratory. The samples will be stored for a period of three months and then discarded, unless we are instructed differently.

Groundwater observations were made in the open boreholes, during and upon completion of the drilling operation. The results are recorded on the Log of Borehole sheets attached in Appendix A.

Elevations referred to in this report are metric and geodetic. The ground level elevations at the borehole locations were interpolated from the *Plan of Topography* dated August 24, 2009, by Tarasick McMillan Kubicki Ltd., and provided to us by the Client.

Test Pit Investigation:

The field work consisted of one [1] test pit (TP-1) carried out on November 17, 2024. The test pit was located at the approximate location shown on Drawing No. 1, and it extended to a depth of about 1.34 m below the EGSL.

The test pit results and findings are summarized in the forthcoming subsurface conditions section of this report. The documented Test Pit Observation sheet is enclosed in Appendix B.

Laboratory Testing

Laboratory testing consisted of determination of the in-situ moisture content of the retrieved and representative soil samples.

SITE CONDITIONS

Surface Conditions

Allan A. Martin Public School is located at 1390 Ogden Avenue, Mississauga, Ontario.

For this description it will be assumed that the north bearing is parallel to the nearest arterial, which is Cawthra Road.

The *subject site* (the area of the proposed addition), where the borehole and test pit investigation took place, is located on the south side of the building's east wing.

The *subject site* condition, as observed during our site visit November 11, 2024, is presented in the following *Table No. 1*.

Table 1 - Site Surface Observations

East Boundaries:	Ogden Avenue, followed by residential dwellings.
North Boundaries:	Existing Allan A. Martin Public School building.
West Boundaries:	School playground, followed by residential dwellings.
South Boundaries:	Residential dwellings and Delco Court.
Surface Coverage:	About two thirds of the *subject site* consists of asphalt pavement; and the remaining third consist of landscaping.
Ground Level:	The topography of the site is generally flat, with minor overall grade sloping down in the west direction.

Ditches:	None observed.
Berms/Stockpiles:	None observed.
Existing Structures:	School building (1 and 2 storey brick structure).
Basement:	The southeast wing of the school building which is adjacent to the *subject site* area does not have a basement.
Proposed/Intended Land Use:	Institutional (school building addition).

Subsurface Conditions

Borehole Investigation Findings:

The subsurface conditions encountered at the borehole locations are shown on the Log of Borehole sheets, presented in Appendix A, and can be summarized as follows:

Pavement	Pavement layer, consisting of about 90 to 120 mm of asphalt followed by about 75 to 150 mm of granular (crushed stones) fill base layer, was encountered at the surface of boreholes BH-3 to BH-5.
Topsoil/Organic Soil	A layer of Topsoil/Organic soil was encountered at the surface of BH-1 and BH-2, with a thickness ranging from about 125 to 150 mm. *It should be noted that the measurements of this layer are not considered accurate to be used for estimate purposes.*

Fill/Disturbed Soil	A layer of Fill/Disturbed soil was found below the pavement or topsoil in all the boreholes and extended to a depth ranging from about 0.46 to 0.76 m below the EGSL in boreholes No. 1 to 3 and 5. In borehole No. 4, however, the fill extended to a depth of about 1.7 m below EGSL. This stratum consisted mainly of brown sandy silt with occasional gravel. This stratum was found in moist state and in very loose to compact state of packing. *For detailed and more accurate depth and description of this layer, further investigation through test pits is recommended.*
Sandy Silt	Sandy Silt was encountered below the fill/disturbed soil layer in all the boreholes and extended to a depth ranging from about 2.62 to 3.28 m below the EGSL. In most of the boreholes this brown and rust brown stratum contained fine sand or fine gravel layer(s). This stratum was found in moist state in the upper zone, becoming wet with increased depth, and was observed to be in loose to dense state of packing.
Shale Till	Shale Till was encountered below the sandy silt layer in boreholes No. 1, 4 and 5 and extended to a depth ranging from about 3.05 to 4.57 m below the EGSL. This grey till was found in moist state and with hard consistency.

Weathered Shale	Hard, grey, and moist weathered shale was encountered below the sandy silt or shale till layers in all the boreholes and extended to the maximum explored depth of this investigation. Occasionally, this weathered shale contained limestone interbeds. *All the boreholes were terminated within the shale due to practical sampling and/or augur refusal.*
Groundwater	Groundwater level observations were made during and immediately upon the completion of the drilling investigation. The results are summarized in the following *Table 2a*, as shown:

Table 2a: Groundwater & Cave-in Observations Upon Completion of Drilling

Borehole No.	Borehole Depth (m)	Cave-in Depth Below EGSL (m)	Groundwater Depth Below EGSL (m)
BH-1	3.18	2.6	2.5
BH-2	3.12	2.7	2.5
BH -3	3.33	2.6	2.5
BH/MW-4	4.70	4.5	4.2
BH-5	4.70	4.0	3.0

The water level in BH/MW-4, which was equipped with a flush mounted monitoring well, was measured after the completion of the drilling operation, and our observations are recorded and presented in the following *Table 2b, as shown*.

Table2b: Groundwater Observation after Completion of Drilling

Date	BH/MW-2 Water Depth Below EGSL & (Elevation)
November 15, 2024	2.17 m (95.83 m)

It should be noted, however, that the groundwater levels are subject to seasonal fluctuations.

Test Pit Investigation Observations/Findings:

Findings of the test pit investigation are shown on the Test Pit Observation sheet, presented in Appendix B.

The Test Pit investigation findings can be summarized in the following *Table 3*:

Table 3–Test Pit Observation and Existing Footing Dimensions

Test Pit No.	Depth from EGSL to Top of Footing (mm)	Footing Thickness (mm)	Footing Projection (mm)	Test Pit Ground Surface Elevation (m)	Founding Soil Material
TP-1	1040	300	140	97.85	Sandy Silt

GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

Foundations

We understand that the proposed project entails a 2-storey addition with no basement, including a new elevator and washrooms (*additional footprint to the building*).

The Finished Floor Elevation (FFE) is to be similar to the existing building slab at 98.30 m. The underside footings of the elevator will be at Elevation 96.45 m.

Based on the encountered subsurface conditions, the proposed addition structure can be supported on conventional spread/strip footings established, below the fill/disturbed soil layer, on the undisturbed, native sandy silt stratum, at or below the depths/elevations presented in Table 4, shown below.

The size of the new strip/spread footings can be proportioned to the following bearing resistances:

Factored Bearing Resistance at Ultimate Limit State (ULS) = 225 kPa

Bearing Resistance at Serviceability Limit State (SLS) = 150 kPa

Table 4 - Foundation Depth and Elevation (at or below) for Strip/Spread Footing

Borehole No.	Surface Elevation (m)	Founding Depth (at/or below EGSL) (m)	Founding Elevation (at/or below) (m)
1	97.75	1.50	96.25
2	97.80	1.50	96.30
3	98.05	2.25	95.80
4	98.00	2.25	95.75
5	98.10	2.25	95.85

Foundation Notes:

It should be noted that the as-built vertical/horizontal alignment and conditions of existing underground services and buried structures should be established prior to the design/construction stage. In the areas of existing service trenches, the footings should be established below the invert of the existing services, in the original undisturbed soils, or could potentially, if practical, be bridged over the trench backfill (subject to review by a structural engineer).

Excavation for new footings shall start from the face of the existing structure to expose the existing footings and to match the founding depth of the new footing with the depth of the adjacent existing footings.

Adjacent footings, founded at different elevations, should be stepped at 10 to 7 (horizontal to vertical). If this condition cannot be met/complied with, underpinning of the existing footings will be required.

For frost protection requirements, all exterior footings, and footings in unheated areas, must have a minimum soil cover of 1.2 m.

Under no circumstances should the footings be constructed over loose, soft, or frozen subgrade soil or within ponded water. During winter construction, the footings must be adequately protected against the effects of frost.

Concrete should be placed without delay after excavation to avoid softening of the subgrade surface. Hand cleaning of footing bases should be carried out as directed by the field inspector.

Total settlements of the footings designed and constructed in accordance with the above recommended resistances at SLS should be less than the tolerable limits of 25 mm. The differential settlements are expected to be less than 19 mm.

Furthermore, the recommended bearing capacity and foundation elevations have been calculated from the limited borehole information and are intended for design purposes only.

More specific information, with respect to founding conditions between the boreholes will become available when the proposed construction is underway. Therefore, the encountered founding conditions must be verified in the field and all footings must be inspected by this office before placement of concrete.

Earthquake Considerations

For structural design seismic consideration, the seismic provisions of the Ontario Building Code (OBC 2024) outline the Classification of sites for Seismic Site Response in Table 4.1.8.4.-B of the National Building Code of Canada (NBC) 2020.

According to Table 4.1.8.4.-B of the code, and this investigation findings, the subject Seismic Site Class is selected as Class “C”.

Underground and Retaining Walls

Underground/retaining walls should be designed to resist a pressure "p", at any depth, "h" below the surface, as given by the expression.

$$p = \mathbf{0.45}[\gamma h + q]$$

Where: **0.45** is the earth pressure coefficient considered applicable
γ = **21.0** kN/m^3 is the unit weight of backfill
q = an allowance for surcharge

The above equation assumes that perimeter drains will be provided and that the backfill against the subsurface walls would be a free draining granular material.

Dewatering

The excavation for the footing foundations may need to be carried out within the wet sand/silt material.

If the final excavation level is not more than 0.6 m below the groundwater table, it is anticipated that the groundwater inflow can be controlled by conventional sump pumping techniques.

More positive groundwater control measures may be considered when the final excavation level is more than 0.6 m below the groundwater table.

The dewatering system, where needed, should be selected, designed and installed by a speciality contractor, and it will be most effective if it is installed and activated well in advance of the general excavation.

In addition, in order to protect the base surface from being disturbed, a mud slab may be constructed to provide a stable base condition for the construction operation.

Excavation and Backfill

After proper dewatering, as needed, no major problems should be encountered for the anticipated depth of excavation.

The excavation should be sloped at 45 degrees or flatter in accordance with the current Ontario Occupational Health and Safety Act. If this condition cannot be met, a shoring system is required.

The material to be used for backfilling under the floor slab, or in-service trenches, should be suitable for compaction, i.e., free of organics and with natural moisture content within 2 percent of the optimum moisture content. The backfill material should be compacted to at least 98 percent of the Standard Proctor Maximum Dry Density (SPMDD).

Selected on site excavated fill and native soils can be used as backfill under floor slabs or in-service trenches, provided the excavated materials are not allowed to become wet. The excavated materials will be lumpy and very sensitive to moisture content.

The backfill against the below grade walls, and narrow/confined spaces, should be free draining granular fill, preferably conforming to the Ontario Provincial Standard Specification for granular base course, Granular B.

Slab Construction and Permanent Drainage

The floor slab can be constructed following the standard slab-on-grade technique, provided that all topsoil/organic soil and fill/disturbed soil with organics, and the asphalt layer, should be removed, and the base should be thoroughly proof rolled.

Any soft spots revealed during proof-rolling should be sub-excavated, backfilled, and adequately compacted to 98 % of its SPMDD.

The floor slabs should rest on a well compacted layer of “19 mm clear stone” at least 150 mm thick when compacted. The stone bed would act as a barrier and prevent capillary rise of moisture from the subgrade to the floor slab.

No perimeter drainage will be required, if the floor slab is at least 150 mm above the exterior grade, which slopes away from the building at an inclination of 1 to 2 percent, to prevent surface ponding of water close to exterior walls. If this condition cannot be complied with, then perimeter drainage as shown on Drawing No. 2 should be provided.

In the area of the elevator pit, a drainage system as shown on Drawing No. 3 should be provided. Alternatively, the drainage system may be deleted, and the elevator pit must be designed as a waterproof/water-tight structure.

Underground Utilities

The problem areas of pavement settlement largely occur adjacent to manholes, catch basins and service crossings. The on-site materials would generally be difficult to compact in these areas, and it is therefore recommended that a sand backfill be used in confined areas.

The upper 1.0 m of the trench backfill should be compacted to 98 % SPMDD. Below this zone, a 95 % SPMDD compaction is considered acceptable.

The cover and bedding material for any buried utilities should consist of OPSS 1010 Granular A or B Type II, placed in accordance with pertinent Ontario Provincial Standard Drawings (OPSD's).

The bedding and cover material shall be placed in maximum 200 mm thick lifts and should be compacted to at least 98 percent of SPMDD. The cover material shall be a minimum 300 mm over the top of the pipe and compacted to 98 percent of SPMDD.

If wet or saturated conditions exist within any utility excavation, consideration should be given to using 19 mm diameter crushed clear stone wrapped in a geotextile filter fabric as pipe bedding.

Pavement Design

In the proposed pavement areas, any organic soil and/or fill with organics, and asphalt layer, must be removed, and the base shall be thoroughly proof-rolled. Any soft spots revealed during proof-rolling shall be sub-excavated and backfilled with suitable materials, compacted to at least 98 % SPMDD.

The subgrade soil is frost susceptible. The design of pavement is therefore mainly influenced by the need to minimize the effects of freezing and thawing. Consequently, the ground must not be unnecessarily disturbed.

The subgrade shall be sloped to facilitate drainage towards catch basins and the final subgrade shall be compacted before pavement is constructed.

It should be noted that the subgrade shall be dry and firm, not spongy, during compaction and during the construction of the [sub] base.

The subgrade will suffer strength regression if water is allowed to infiltrate into the mantle. Therefore, sub-drains shall be installed along the edge of all pavement areas to prevent surface water from infiltrating into the subgrade. Within the parking lots, sub-drains radiating from the catch basins shall also be installed. These sub-drains should be at least 3 m long in each direction and have inverts at least 0.75 m below the pavement surface.

All granular materials used in the construction of pavement shall be compacted to 98 % of Standard Proctor maximum dry density.

Based on the engineering properties of the subgrade soil, climatic conditions and the anticipated use of the pavement, typical flexible asphaltic pavement designs for this development are as follows:

Table 5 - Typical Flexible Asphaltic Pavement Design

Pavement Components	Heavy Duty	Medium Duty	Light Duty
Asphaltic Concrete	40 mm HL3	40 mm HL3	50 mm HL3
	60 mm HL8	40 mm HL8	
19 mm Crushed Limestone	150 mm	150 mm	150 mm
Granular B Sub-base	300 mm	200 mm	200 mm

If the proposed pavements are to be constructed during wet seasons, the moisture content in the subgrade will probably be above the optimum, and this will render its shear strength inadequate to support paving equipment traffic. In this case, the granular sub-base should consist of 50 mm Crusher-Run Limestone.

General Comments

This geotechnical report is provided on the basis of the terms of reference provided above and, on the assumption, that the design will be in accordance with the applicable codes and standards.

If there is any change in the design features relevant to the geotechnical analyses, or if any questions arise regarding the geotechnical aspects of the codes and standards, this office should be contacted to review the design.

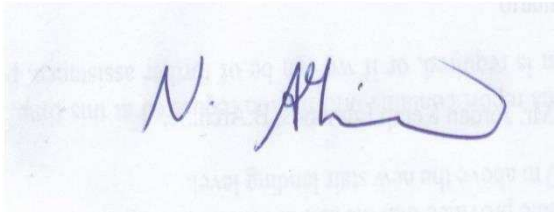
The comments given in this report are intended only for the guidance of design engineers.

Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results.

This concern specifically applies to the classification of the fill/organic/topsoil cover and the potential reuse of these soils on/off site. The prospective contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

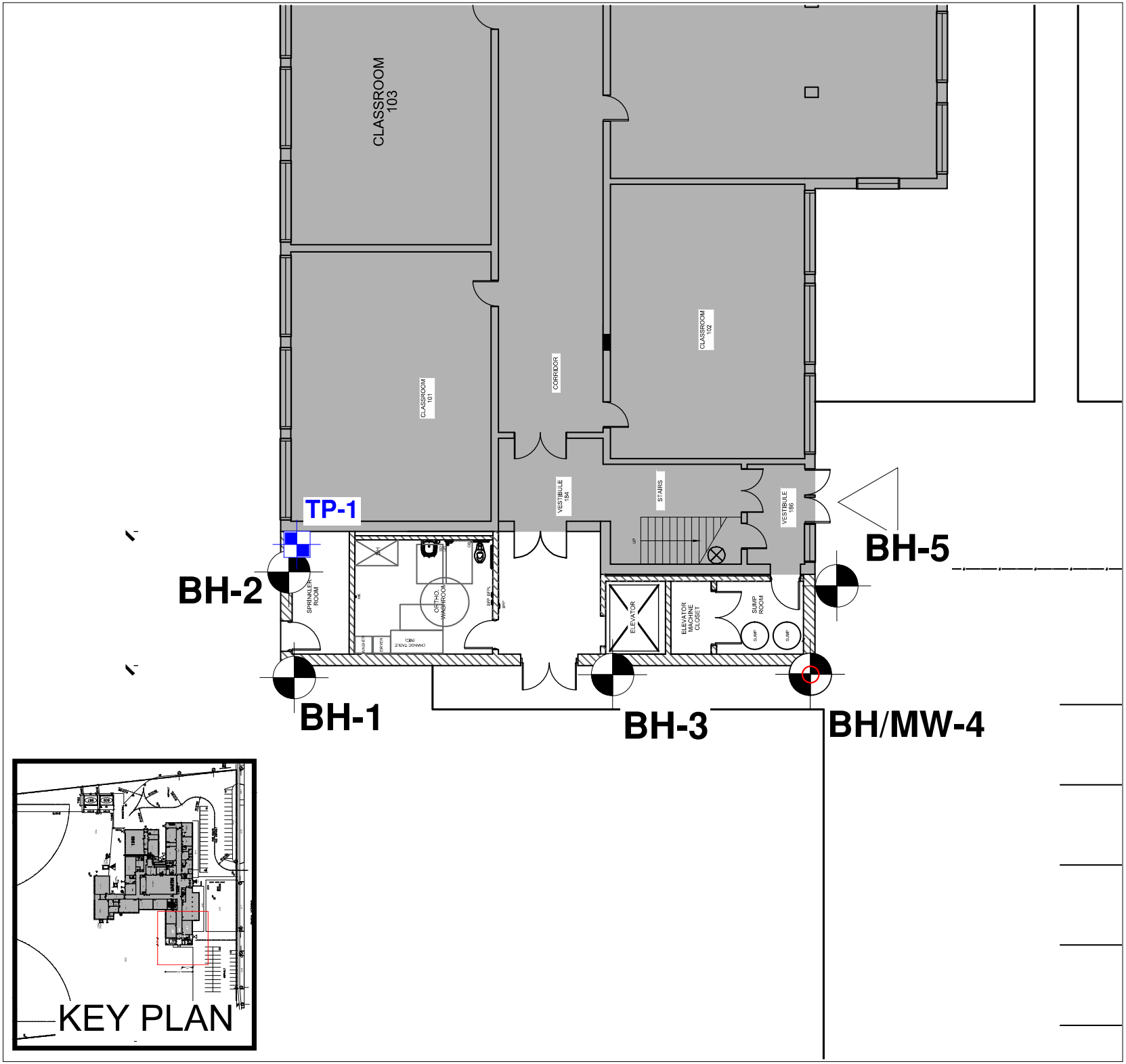
We trust this report contains information requested at this time. However, if any clarification is required, or if we can be of further assistance, please contact this office.

Yours truly,
Forward Engineering & Associates Inc.



Nasser Abdelghani, M.Sc., P.Eng.
Project Geotechnical Engineer

G. S. Semaan, M.Eng., P.Eng.
Principal



NOTES:

BH = BOREHOLE LOCATION

BH/MW = BOREHOLE/ MONITORING WELL LOCATION

TP = TEST PIT LOCATION

DRAWING No. 1

BOREHOLE & TEST PIT LOCATION PLAN

Rev.	DATE	REVISION / ISSUE
04		
03		
02		
01		

Project Name: PROPOSED ADDITION
ALLAN A. MARTIN PUBLIC SCHOOL

Address: 1390 OGDEN AVENUE,
MISSISSAUGA, ON.

PROJECT No.	:7451
DRAWING DATE	:NOV. 22, 2024
DRAWN BY: P.R.	PAGE 1 of 1
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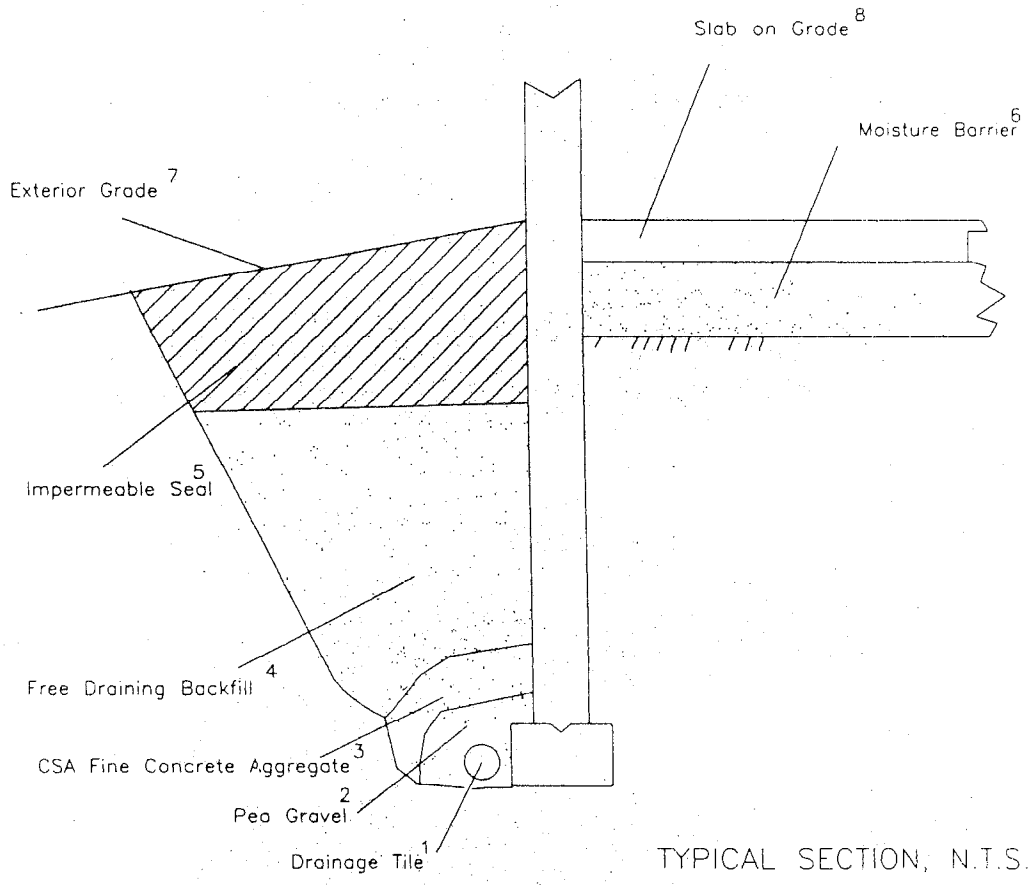
DRAINAGE AND BACKFILL RECOMMENDATIONS

(Not to Scale)



TYPICAL SECTION, N.T.S.

NOTES:

1. Drainage tile to consist of 100 (4") diam. Weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be minimum 150mm (6") below underside of floor slab.
2. Pea gravel 150mm (6") top and sides of drain. If drain is not on footing, 100 mm (4") of pea gravel below drain. Clear 20mm (3/4") crushed stone may be used provided it is covered by an approved porous membrane (Terrafix 270R or equivalent).
3. C.S.A. Fine aggregate to act as filter material. Minimum 300 mm (12") top and sides of tile drain. This may be replaced by an approved porous plastic membrane as indicated in 2.
4. Free draining backfill - Class B pit-run gravel or equivalent compacted to 93 – 95 % Standard Proctor Maximum Dry Density (SPMDD).
5. Impermeable backfill seal compacted clay, clay silt or equivalent. If original soil is free draining seal may be omitted.
6. Moisture barrier to consist of 20mm (3/4") compacted crushed stone. Layer to be 200mm (8") thick.
7. Exterior grade to slope away from wall.
8. Slab on grade should not be structurally connected to wall footing.
9. If the 20mm (3/4") stone requires surface blinding, use 6mm (1/4") stone chips.

DRAWING NO. 2