SECTION 09 30 00 – tiling

1. General
   1. SUMMARY
      1. The work in this section includes supply and installation for the following:

SPEC NOTE: Modify the following list to reflect the project requirements.

* + - 1. Ceramic Wall Tile.
      2. Ceramic Floor Tile.
      3. Porcelain Floor Tile.
      4. Quarry Tile.
      5. Waterproofing Membrane.
      6. Ant-Fracturing Membranes.
      7. Trims and accessories including edge strips, transition strips, movement joints stair nosings and other accessories required for a complete and finished installation.
  1. REFERENCE Standards
     1. American National Standards Institute/Ceramic Tile Institute (ANSI/CTI):
        1. ANSI/CTI A108.1‑2011, Specification for the Installation of Ceramic Tile: Collection of 20 ANSI/CTI A108, A118 and A136 Series of Standards on Tile Installation.
     2. American Society for Testing and Materials (ASTM):
        1. ASTM C241/C241M-09, Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic.
        2. ASTM C627‑10, Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson‑Type Floor Tester.
        3. ASTM C920‑11, Standard Specification for Elastomeric Joint Sealants.
        4. ASTM C1028‑07e1, Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull‑Meter Method.
        5. ASTM C1178/C1178M‑11, Standard Specification for Glass Mat Water‑Resistant Gypsum Backing Panel.
     3. Canadian General Standards Board (CGSB):
        1. CAN/CGSB‑75.1‑M88, Tile, Ceramic.
     4. Terrazzo, Tile and Marble Association of Canada (TTMAC):
        1. 2019-2021 Specification Guide 09 30 00, Tile Installation Manual.
        2. Hard Surface Maintenance Guide.
  2. EXAMINATION
     1. Examine all areas and conditions affecting work of this Section and report any discrepancies or defects which would affect finished results.
  3. SUBMITTALS
     1. Submit submittals in accordance with Section 01 33 00 – Submittal Procedures.
     2. Samples:
        1. Submit sample panel of each type and colour tile, 610mm x 610mm (24" x 24").
        2. Adhere to a rigid board with setting compound, grout and a dummy control joint showing sealant as specified. Identify samples by project number, date, name of sub-contractor and tile type.
        3. Tile and grout used in the building shall correspond to appearance of approved samples in all respects. Do not install tile until samples are approved.
        4. Upon Consultant's request submit samples of base, trim, and fittings.
     3. Material Lists:
        1. Prior to ordering any materials submit list of products to be used. Products proposed must be recommended by their manufacturer for purpose intended. Upon Consultant's request submit evidence of manufacturer's endorsement.
        2. Take care to ensure compatibility of all materials. Consult the manufacturers in case of doubt.
        3. The supplementary materials shall come from the same production batch as installed materials.
     4. Safety Data Sheets:
        1. Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on Site for reference by workers.
     5. Maintenance Instructions:
        1. Upon completion of the Work, furnish Consultant with copies of maintenance instructions, containing complete detailed and specific instructions for maintaining, preserving, and keeping clean the surfaces of this Work and in particular, giving adequate warning of maintenance practices of materials detrimental to the work of this Section for inclusion in the Operation and Maintenance Manual.
     6. Maintenance Materials:
        1. Supply five percent (5%) extra of each colour of tile and of each tile type for future repairs by the Owner.
        2. Place maintenance materials where directed by the Owner and store in their original containers.
  4. QUALITY ASSURANCE
     1. Subcontractor executing work of this Section shall employ installers having a minimum of five (5) years continuous experience in successful installation of work of type and quality shown and specified. Submit proof of experience upon Consultant's request.
     2. Work of this Section shall be executed by workers especially trained and experienced in this type of work. Have a full time, qualified representative at the Site to direct the work of this Section at all times.
     3. Ensure proper use of proprietary materials in strict accordance with the material manufacturer's directions. It shall be the responsibility of the material manufacturer or supplier to furnish these directions to the Contractor and to check periodically at the site to ensure that they are being carried out.
  5. PRE-INSTALLATION CONFERENCE
     1. Contractor shall hold pre-installation conference two (2) weeks prior to commencing work of this Section. Conference shall be attended by the Contractor, Owner, Consultant, concrete finishing subcontractor, tile installers and tile manufacturer's representative, setting bed and grout manufacturer's representative to discuss the following, but not limited to the following:
        1. Substrate conditions, non-structural cracks, structural cracks, and preparation requirements.
        2. Floor and wall surface irregularities and levelness tolerances, including all remedial requirements.
        3. Installation of anti-fracturing membranes and setting bed materials.
        4. Installation of tiles and grouting.
        5. Edge details and treatments.
        6. Installation of tile and grout sealers.
     2. Contractor shall ensure that manufacturer's representatives issues written installation instructions at the pre-installation conference, to all parties attending the pre-installation conference and the Consultant, for all tile types, setting beds, grouts and sealers required for the work of this Section.
     3. Contractor shall within seventy-two (72) hours of the pre-installation conference, prepare minutes of the conference, and issue minutes to all parties attending the pre-installation conference and the Consultant. Contractor shall clearly indicate required actions and by which party.

SPEC NOTE: Keep the following paragraph where tile design is difficult (mosaic installation for example). Delete the following where the tile installation is not common practice.

* 1. SITE MOCK-UP
     1. Install a 3048mm x 3048mm (10' x 10') dry sample areas of porcelain tiles, ceramic mosaic tiles and ceramic wall tile showing all colours of tiles and layout in areas designated later by the Consultant.
     2. After approval of tile colours and layout the Contractor shall set tile and grout including one caulked joint under the supervision of the material manufacturer's representative.
     3. Upon completion and approval, sample areas shall serve as a standard of quality for the balance of the work of this Section.
     4. Subsequent work carried out and not in the Consultant's opinion, equal to the quality standard as set by approved mock-up, shall be removed, and replaced at no additional cost to the Owner.
     5. It shall be the responsibility of the material manufacturer's representative to visit the site during installation, at intervals agreed upon with the Consultant to ensure proper use of proprietary materials and assist the Contractor as may be required and shall also submit a report to the Consultant of their findings after each site review to ensure their directions are being adhered to.
  2. DELIVERY, STORAGE, HANDLING AND PROTECTION
     1. Co-ordinate deliveries to comply with construction schedule and arrange ahead for off the ground, under cover storage location. Do not load any area beyond the design limits.
     2. Materials shall be carefully checked, unloaded, stored and handled to prevent damage. Protect materials with suitable non-staining waterproof coverings.
     3. Store material in original, undamaged containers or wrappings with manufacturer's seals and labels intact.
     4. Restrict traffic by other trades during installation.
     5. Provide adequate protection of completed tiled surfaces to prevent damage by other trades until final completion of this project. Minimum protection shall consist of 4 mil polyethylene sheets lapped 100mm (4") and taped.
     6. Heavily travelled areas shall have additional 13mm (1/2") thick fibreboard sheet protection with taped joints over polyethylene sheet protection as specified above.
     7. Protect exposed edges of floor tile with same thickness as tile x 100mm (4") wide tapered strip of plywood adhered to floor until adjoining floor finish is to be installed.
  3. SITE CONDITIONS
     1. Ambient Conditions: Apply tile after completion of work by other Sections is complete; to surfaces sufficiently dry, clean, firm, level, plumb and free from oil or wax or any other material deleterious to tile adhesion and as follows:
        1. Temperature: Maintain tile materials and substrate temperature between TTMAC recommended minimum and maximum temperature range; unless indicated otherwise by manufacturer, for forty-eight (48) hours before and during installation until materials are fully set and cured; provide additional heat during winter months or at any other time when there is a risk that surface temperatures may drop below minimum recommended temperatures.
        2. Ventilation: Maintain adequate ventilation where Work of this Section generates toxic gases or where there is a risk of raising relative humidity to levels that could damage building finishes and assemblies.
  4. WARRANTY
     1. Warrant the work of this Section against defects in materials and workmanship in accordance with the General Conditions, but for a period of five (5) years and agree to promptly make good defects which become evident during the warranty period without cost to the Owner.
     2. Defects shall include but not be limited to the following:
        1. Cracking and crazing.
        2. Discolouration and staining.
        3. Pitting, splitting.
        4. Deformation of tiles and grout.

1. Products
   1. PERFORMANCE REQUIREMENTS
      1. Dynamic Coefficient of Friction (DCOF): Tile installed on walkway surfaces having following values as determined by testing identical products per ANSI A137.1:
         1. Level Interior Wet Spaces: A minimum wet DCOF AcuTest Value of 0.42 or higher.
         2. Level Interior Dry Spaces: A minimum wet DCOF AcuTest Value of 0.42 or higher.
      2. Floor Level Tolerances: Provide materials to attain floor levelness tolerances required by this Section.
         1. Calculate quantity of materials based on the difference between the specified tolerance and the initial tolerance specified in Section 03 35 00 – Concrete Finishing.
         2. Measurements: As indicated in Section 03 35 00 – Concrete Finishing.
   2. MATERIALS

SPEC NOTE: Edit the following paragraphs below to reflect where this information is contained in the project manual.

* + 1. Floor Tiles and Bases (TL-#):
       1. Types, Sizes, Colours and Manufacturers: As indicated in Section 09 06 05 – Product and Finish Schedule.
    2. Wall Tiles and Mosaic Tiles (TL-#):
       1. Types, Sizes, Colours and Manufacturers: As indicated in Section 09 06 05 – Product and Finish Schedule.

SPEC NOTE: Use the following for “small – interior” applications of quarry tile, such as granite or marble accent flooring or trims.

SPEC NOTE: Use the following sections for applications of quarry tile that require more detial for the application:

**Section 04 43 13: cut stone veneer** – (exterior applications)

**Section 09 30 33 stone tiling** - for large applications of stone tile.

**Section 09 75 13 stone wall facing** - for large vertical slab application.

* + 1. Quarry Tile and Base (TL-#):
       1. Size, Finish, Model and Manufacturer: As indicated in Section 09 06 05 – Product and Finish Schedule.
    2. Control Joint Caulking:
       1. As supplied by the Grout Manufacturer.
       2. Colour: To match adjacent grout, as approved by the Consultant.
    3. Trims:
       1. Straight Edge Strips:
          1. Extruded clear satin anodized aluminum edge strips, 3mm (1/8”) wide at top edge; Height as required to suit tile installation; with integral perforated anchoring leg for setting the strip into the setting material.
          2. Basis of Design Materials: Schlüter Schiene AE by Schlüter.
       2. Stair Edge Trim:
          1. Extruded anodized aluminum, brushed nickel finish, height as indicated on Drawings; with integral perforated anchoring leg for setting the strip into the setting material.
          2. Basis-of-Design Materials: Schlüter Jolly ATGB.
       3. Transition Edge Strips:
          1. Extruded mill finished clear satin anodized aluminum edge strips; Height as required to suit tile installation, with integral perforated anchoring leg for setting the strip into the setting material and sloped transition.
          2. Basis of Design Materials: Schlüter Reno‑U by Schlüter.

SPEC NOTE: Delete when not required on the project.

* + - 1. Stair Nosing:
         1. Extruded thermoplastic rubber, heavy traffic use, slip resistant stair nosing set into extruded [aluminum support section] [stainless steel support section] with integral perforated anchoring leg for setting the assembly into the setting material; width [25mm (1”)] [50mm (2”)] x height to suit application; colour as selected by Consultant from standard range, first tread and last tread of a contrasting colour [; complete with [end caps] [and] [replacement inserts representing 20% of installation]:
         2. Basis of Design Materials: Schlüter Trep [SE] [S] [B] by Schlüter.
    1. Accessory Materials:
       1. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers and as follows:
          1. Job Site Cleaner: Phosphoric acid/nitric acid-based cleaning solution mixed in accordance with cleaner manufacturer's recommendations and as recommended by tile manufacturer.
          2. Maintenance Cleaner: Non-toxic, electrolytic, biodegradable, nonammonia containing, pH-controlled cleaning solution mixed in accordance with manufacturer's recommendations.
       2. Tile Backer Board: As Specified in Section 09 29 00 – Gypsum Board.
  1. MORTAR SETTING MATERIALS
     1. Manufacturers: Mortar and grout materials listed in this Section shall be of a uniform quality for each mortar, and grout component from a single manufacturer and each aggregate from one source or producer as follows:
        1. Flextile Ltd.
        2. MAPEI Inc.
        3. Custom Building Products Ltd.
        4. Laticrete International Inc.
     2. Surface Preparation Materials:
        1. Levelling Bed/Mortar Additive: Performance standard meeting requirements of ANSI A108.1, Type 2; Acceptable material:
           1. Mortar Bed with #43 Additive by Flextile Ltd.
           2. Mapecem Premix PL50 by MAPEI Inc.
           3. Level Quik Underlayment by by Custom Building Products.
           4. Laticrete 3701 Fortified Mortar Bed by Laticrete International Inc.
     3. Interior Thin Set Wall System: Dry set mortar meeting or exceeding the requirements of ANSI A108.1 formulated for thin set applications of ceramic biscuit tile, factory sanded mortar consisting of portland cement, sand and additives requiring only potable water to be added for installation:
        1. Acceptable mortar materials:
           1. #51 Floor and Wall Mix by Flextile Ltd.
           2. Kerabond by MAPEI Inc.
           3. Premium Blend Thinset by by Custom Building Products.
           4. Laticrete 317 Mortar by Laticrete International Inc.
     4. Interior Thin Set Floor System: Dry set mortar meeting or exceeding the requirements of ASTM C627 for Heavy installation using latex modified, portland cement mortar meeting requirements of ANSI A108.1:
        1. Acceptable mortar materials:
           1. #53 Floor Mix by Flextile Ltd.
           2. Kerabond by MAPEI Inc.
           3. Master Blend Thinset by by Custom Building Products.
           4. Laticrete 253 Thinset by Laticrete International Inc.

SPEC NOTE: Use the following in areas requiring high chemical and temperature resistance. Ex. Food courts, kitchens, food prep areas.

SPEC NOTE: Installers don’t like using this product as clean up and application is difficult – therefore prices for epoxy thin set is higher.

* + 1. Epoxy Adhesive Setting Materials: Thin set adhesive system using 100% solids epoxy resin and epoxy hardener meeting or exceeding the requirements for ANSI A108.1; stain proof, chemical resistant and having high temperature resistance, water cleanable.
       1. Acceptable materials:
          1. Flex Epoxy 100 Setting by Flextile Ltd.
          2. Ker 410 Kerapoxy Mortar by MAPEI Inc.
          3. 100% Solids Epoxy Mortar by by Custom Building Products.
          4. Latapoxy 300 by Laticrete International Inc.

SPEC NOTE: The following paragraph is for use with tile materials with **one side larger then 305mm (12”).**

* + 1. Large Format Tile Mortar: Medium bed, dry set polymer modified mortar system designed specifically for use with large format tile materials over 305mm x 305mm (12” x 12”), requiring only the addition of water, rated for extra heavy service installation:
       1. Acceptable mortar materials:
          1. #50 PM Medium Bed Thin Set Mortar by Flextile Ltd.
          2. Ultracontact by MAPEI Inc.
          3. Complete Contact by Custom Building Products.
          4. Laticrete Sure Set by Laticrete International Inc.

SPEC NOTE: Use the following where large slabs are scheduled, or where high-build applications are desired. Not commonly used anymore.

* + 1. Portland Cement Mortar (Thickset) Installation Materials: Meeting ANSI A108.1A.
       1. Reinforcing Wire Fabric: Galvanized, flat, welded wire fabric, 50mm x 50mm x 1.57mm (2” x 2” x 0.062”) diameter; comply with ASTM A1064 and ASTM A 82 except for minimum wire size.
       2. Latex Additive: Manufacturer's standard styrene-butadiene-rubber water emulsion, serving as replacement for all gaging water, of type specifically recommended by latex-additive manufacturer for use with field-mixed portland cement and aggregate mortar bed.
       3. Cement: Grey meeting requirements of CSA A3000.
       4. Sand: Meeting requirements of ASTM C778.
       5. Water: Potable.
       6. Hydrated Lime: Meeting requirements of ASTM C207.

SPEC NOTE: Use the following where voids above 2” are required to be filled, to allow levelling of final floor finish. This is common on interior reno projects where new tenants are moving into landlord base building.

SPEC NOTE: For thicknesses from 6mm (1/4") to 50mm (2") neat, and up to 100mm (4") when extended with 20% by weight of washed, clean, saturated surface-dry (ssd), 10mm (3/8") pea gravel.

* + 1. Screed Mortar: Accelerated-cure screed mortar suitable for unbonded applications, as an overlay to resurface horizontal concrete.
       1. Basis of Design Materials: Topcem Premix by MAPEI Inc.
       2. Screed Mortar Accessories:
          1. Acrylic Latex Admixture for use on Mortar Applications 25mm to 100mm thick:

One-component, concentrated, liquid latex admixture used to enhance the performance of cementitious repair mortars, and toppings.

Basis of Design Materials: Planicrete AC by MAPEI Inc.

* + - * 1. Reinforcing Wire Fabric:

Galvanized, flat, welded wire fabric, 50mm x 50mm x 1.57mm (2” x 2” x 0.062”) diameter; comply with ASTM A1064 and ASTM A 82 except for minimum wire size.

* 1. GROUT MATERIALS

SPEC NOTE: Modify the paragraph below to identify where the grout colours are listed in the project manual.

* + 1. Grout Colours: As indicated in Section 09 06 05 Product and Finish Schedule.
    2. Portland Cement Grout for Wall and Floor Joints ≤3mm (1/8”) Interior Only: factory blended polymer modified mixture meeting requirements of ANSI A108.1:
       1. Acceptable Materials:
          1. 500 Series Unsanded Grout by Flextile Ltd.
          2. Ker 800 Unsanded Grout by MAPEI Inc.
          3. Polyblend Unsanded Grout by Custom Building Products.
          4. Peracolor Grout Laticrete International Inc.
    3. Latex-Portland Cement Grout for Floors with Joints ≥3mm (1/8”) Interior or Exterior: factory blended stain resistant latex modifiers, portland cement and graded silica sand and dry-set grout and meeting requirements of A108.1:
       1. Acceptable Materials:
          1. 600/100 Series Sanded Grout by Flextile Ltd.
          2. Keracolour S Sanded Grout by MAPEI Inc.
          3. Polyblend Sanded Grout by Custom Building Products.
          4. Peracolor Grout Laticrete International Inc.

SPEC NOTE: Use the following with epoxy mortar, to provide an epoxy tile installation system. delete the following if epoxy mortar was deleted above.

* + 1. Epoxy Grout for Floors and Walls: Water cleanable, chemical resistant, factory blended modified portland cement compound with 100% epoxy additives and hardeners meeting requirements of ANSI A108.1:
       1. Acceptable Materials:
          1. Flex Epoxy 100 Grout by Flextile Ltd.
          2. Ker 400 Kerapoxy Grout by MAPEI Inc.
          3. 100% Solids Epoxy Grout by Custom Building Products.
          4. Spectralock Pro Premium Grout by Laticrete International Inc.
  1. MEMBRANES

SPEC NOTE: Use the following under floor tile installations in dry areas, with heavy foot traffic and/or under large tile applications.

* + 1. Crack Suppression Membranes: Load bearing, premanufactured self adhering lightweight fabric reinforced crack isolation membrane; nominal 1 mm thick manufactured to accommodate in-plane substrate movement in thin set applications meeting requirements of ANSI A108.1 and as follows:
       1. Acceptable Materials:
          1. 1000 Flexilastic Crack Isolation Membrane by Flextile Ltd.
          2. Mapeguard 2 by MAPEI Inc.
          3. Fracture Ban by Laticrete International Inc.

SPEC NOTE: Use the following under floor tile installations in **wet areas** – ex. Washrooms, kitchen spaces.

* + 1. Waterproofing Membranes: Load bearing, reinforced, liquid applied membrane; manufactured to accommodate flood testing and reduce the incidence of thermal shock cracking to tiling installations; meeting requirements of ANSI A108.1 and as follows:
       1. Acceptable Materials:
          1. Flex WP‑980 Waterproof and Crack Isolation Membrane by Flextile Ltd.
          2. Mapelastic 315 Waterproofing and Reinforcing Fabric by MAPEI Inc.
          3. Level Quik Waterproof and Anti‑Fracture Membrane by Custom Building Products.
          4. Hydroban Waterproofing by Laticrete International Inc.
  1. ACCESSORY MATERIALS
     1. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers and as follows:
        1. Job Site Cleaner: Phosphoric acid/nitric acid based cleaning solution mixed in accordance with cleaner manufacturer’s recommendations and as recommended by tile manufacturer. Separately
        2. Maintenance Cleaner: Non toxic, electrolytic, biodegradable, non ammonia containing, pH controlled cleaning solution mixed in accordance with manufacturer’s recommendations.

SPEC NOTE: Use the following when screed mortar is required on the project.

SPEC NOTE: Polyethylene sheet allows the substrate to move separately below the tile system of materials.

* + 1. Polyethylene Sheet Separator for Unbonded Application:
       1. Polyethylene Film: 0.10 mm thickness meeting the requirements of CAN/CGSB 51.34.
       2. Joint Tape: Pressure sensitive adhesive tape, type recommended by manufacturer, 50mm wide for lap joints and perimeter seals.

1. Execution
   1. EXAMINATION
      1. Maintain minimum temperature of 13 deg C at tile installation area for twenty-four (24) hours prior to curing and for twenty-four (24) hours after installation. Do not apply work to frozen surfaces.
      2. Examine carefully surfaces to which tile is to be installed and report any defects to the Consultant.
      3. Waterproofing Membranes:
         1. Prepare all surfaces of non-structural and structural cracks in strict accordance with the crack supression membrane manufacturer's written instructions.
         2. Prime and fill all surfaces of non-structural and structural cracks in strict accordance with the crack supression membrane manufacturer's written instructions.
      4. Commencement of installation shall signify complete acceptance of surfaces and conditions.
   2. PREPARATION
      1. Surface Preparation:
         1. Make backing surfaces level and true to a tolerance in plane of 3mm in 2439mm (±1/8” in 8’) for walls and 3mm in 3048mm (±1/8” in 10’) for floors using levelling bed mortar.
         2. Surfaces shall be structurally sound, well fastened, clean and free from dust, oil, grease, paint, tar, wax, curing agents, primers, sealers, form release agents or any deleterious substances that may act as bond barriers.
         3. Backing surfaces shall be dry and fully cured. Dampness must not exceed five percent (5%) by volume.
      2. Examine concrete substrate, repair as required to produce level, clean surface for new tile installation. Repair Work shall include levelling, filling, grinding or cutting, in accordance with Section 03 35 00.
      3. Work of other trades that are required before new tile installation (i.e. electrical conduit installed below ceramic tile) shall be installed, complete and approved before tile installation.

SPEC NOTE: Delete the following paragraph if anti-fracturing membranes were deleted in part 2 above.

* 1. installation membranes
     1. Install waterproofing membrane in accordance with waterproofing manufacturer's written instructions to produce a waterproof membrane of uniform thickness bonded securely to substrate.
     2. Do not install tile over waterproofing membrane until waterproofing has cured and been tested to determine that it is watertight.
  2. INSTALLATION - GENERAL
     1. Installation of the tile shall be by thin-set method, as indicated on the drawings and as specified herein:
        1. Install wall tile to moisture resistant wallboard in dry areas using latex modified thin-set setting bed and latex modified wall grout in strict accordance with tile manufacturers written installation instructions as per the pre-installation conference.
        2. Apply floor tile and prepare floor slabs in strict accordance with tile manufacturers written installation instructions as per the pre-installation conference.
     2. Unless otherwise specified, execute tile work according to the latest issue of Specification Guide 09 30 00, Tile Installation Manual - published by Terrazzo, Tile and Marble Association of Canada, as the minimum standard except as varied by this Specification.
     3. Thoroughly clean surfaces to which tile is to be applied.
     4. Back butter all floor tile.
     5. Neatly cut tile around fitments, fixtures, access panels, and the like. Splitting of tile is expressly prohibited except where no alternative is possible. Form intersections, corners and returns accurately.
     6. Finish surfaces flat and level or, sloped and graded as required.
     7. Joint Widths: Install tile with the following joint widths, unless indicated on drawings:

SPEC NOTE: Edit the following to reflect project requirements, and with selections made in part 2 above.

* + - 1. Ceramic Mosaic Tile: 1.6mm (1/16”)
      2. Wall Tile: 1.6mm (1/16”)
      3. Floor Tile: 6mm (1/4”), unless otherwise indicated on the Drawings.
      4. Quarry Tile: As per manufacturers recommendations.
      5. Make joints consistent width and alignment within tile area.
      6. Maintain 2/3 of grout joint depth free of setting material.
    1. Joints in base shall match floor patterns. Joints shall be watertight without voids, cracks, or excess grout.
    2. Lay out tile so that fields or patterns are centred on wall areas or architectural features and so that no tile less than 1/2 size occurs.
    3. Arrange and set recessed accessories in tile work so that they are evenly spaced, centred with joints, and set true with correct projection. Rigidly install accessories.
    4. Provide manufacturer's standard trim pieces at changes of direction and at terminations. Unless otherwise indicated provide the following corner and edge conditions:
       1. Internal horizontal corners: Coved.
       2. External vertical and horizontal corners: Bullnosed.
       3. Internal vertical corners and unexposed edges: Square.
    5. Install tiles in patterns and locations as indicated on drawings.
    6. Install wall tile full wall height unless shown otherwise.
    7. Coordinate work of this Section with work of other Sections for items requiring to be recessed into work of this Section.
    8. Sound tiles after setting and remove and replace tiles not fully bedded.
    9. Re-point joints after cleaning to eliminate imperfections. Avoid scratching tile surfaces.
    10. Finished tile work shall be clean and free of tiles which are pitted, chipped, cracked or scratched. All damaged tiles shall be removed and replaced.
    11. Where indicated on Drawings or as required, install continuous single piece metal edge trims centred under doors in closed position and other locations where tile meets other floor finishes.
  1. MORTAR APPLICATION METHOD

SPEC NOTE: The following is commonly used and with admixtures, this application method could be used on all substrates (vertical and horizontal) and for various tile types and sizes.

* + 1. Thin-Set Application Method:
       1. Install wall tile to gypsum wallboard and moisture resistant wallboard in dry areas using latex modified thin-set setting bed and latex modified wall grout in strict accordance with tile manufacturers written installation instructions as per the pre-installation conference.
       2. Apply floor tile and prepare floor slabs in strict accordance with tile manufacturers written installation instructions as per the pre-installation conference.

SPEC NOTE: Use the following if thick-set method was selected in part 2 above.

* + 1. Thick-Set Application Method:
       1. Install in accordance with the mortar manufacturer's recommendations and requirements indicated below for setting bed methods, installation methods related to types of subfloor construction, and grout installation methods and grout types.
       2. Where recommendations and methods conflict, the manufacturer's recommendations shall apply.
       3. Thickness of mortar bed: Between 32mm (1-1/4”) and 50mm (2”).
       4. Mortar and Bond Coat:
          1. Latex-Portland Cement Mortar: ANSI A108.1A (Wet Set Method).
          2. Latex Portland Cement Bond Coat: ANSI A108.5.
       5. Concrete Subfloors, Interior:
          1. Apply half of the mortar bed to slab and place reinforcing wire fabric. Lap joints 150mm (6”), and terminate reinforcing at movement joints.
          2. After placing mesh, apply balance of mortar bed. The mortar shall be rodded and compacted with a steel trowel.
          3. Wipe the back of each tile, with a damp sponge, to remove all dust or dirt immediately before applying bond coat to tiles
          4. Immediately after wiping tile backs, but prior to placing tile, the mortar shall be troweled to back of tile sheets for one hundred percent (100%) coverage to thickness of not less than 1.5mm (1/16”).
          5. Place tile onto the green mortar bed, maintaining 3mm (1/8”) wide joints for typical tile units and 6mm (¼”) wide joints for quarry tile units if any, and true accurate pattern as shown.
          6. Tamp tile with wood block and rubber mallet to produce finish levels of tile matching adjacent tile surfaces. Levelling of tile shall take place prior to mortar taking and initial set. Exercise care to quickly remove spillage from faces of tile using water. Rake out joints to depth required to receive grout as tile units are set. Maintain fully plastic bed throughout tile installation.
          7. Prohibit foot and wheel traffic on tiled floors for period of time as recommended by the mortar manufacturer.

SPEC NOTE: Use the following if screed mortar method was selected in part 2 above. Delete when not required on the project.

* + 1. Screed Mortar Application:
       1. Install sheet separators onto horizontal concrete slab to form an unbonded application of void filler insulation and flooring materials.
          1. Use sheets of largest practical size to minimize joints.

SPEC NOTE: Delete the following paragraph if void filler insulation is not required on the project, and it has been removed from section 07 21 13 – Board Insulation.

* + - 1. Install void filler insulation as indicated in Section 07 21 13, in locations which require a floor build up higher then 100mm (4”).
      2. Apply screed mortar on top of separation sheet and/or void filler insulation, to act as a floating installation, as recommended by manufacturer and as follows:
         1. Mixing:

As recommended by screed mortar manufacturer.

Mix Ratio of Additive in Screed Mortar: Two (2) parts additive to one (1) part water (2:1); Reducing shrinkage to wear surfaces.

* + - * 1. Install to a minimum thickness of 50mm (2”), unless otherwise identified on site as a thinner installation, to allow for flush installation of finish flooring materials, with adjacent finished floor.
        2. Set screed rails to quadrant off large areas for ease of application.
        3. Pre-place 50mm x 50mm (2” x 2”), 16 gauge galvanized welded wire mesh in the center of the floating toping to provide structural integrity.
        4. Pour screed mortar inside screed rails, overtop of welded wire mesh, maintaining a minimum thickness of 35mm (1-3/8").
  1. GROUTING
     1. Grout tiles in accordance with ANSI A108.10 and as specified herein.
     2. When grouting a fresh laid floor, make certain that traffic and grouting will not cause movement of floor in setting bed. Protect floor by using kneeling boards or gypsum board to defend floor against traffic while grouting.
     3. Mix grouts and install in strict accordance with the manufacturer's instructions.
     4. Excess grout shall be removed from the surface of tiles using the edge of a rubber float held at a 45 deg angle, moving it diagonally to the joints. Fill all gaps and air holes.
     5. Do not allow grout to harden on face of tile. Refer to manufacturer's instructions for thorough removal.
     6. Floors which required damp curing shall be cured for the required length of time using heavy kraft paper, not polyethylene sheets. Consult manufacturer for instructions.
  2. CONTROL JOINTS AND SEALING
     1. Control joints of a flexible caulking material shall be placed every 4877mm to 6096mm (16’ to 20') apart, directly over existing control joints and/or where indicated on drawings or as required in accordance with TTMAC Detail No. 301MJ-2019-2021, Details E, F and G, whichever is applicable. Control joints shall be placed around the floor perimeter at walls, around columns, and where tile abuts other hard materials or vertical surfaces. Saw cutting of tile after installation is prohibited. Tile shall be cut if required and installed along each side of control joints.
     2. Expansion joints must always be placed directly over all slab expansion joints in accordance with TTMAC Detail No. 301MJ-2019-2021, Details A and B, whichever is applicable.
     3. Locate expansion, control, contraction, and isolation joints, as indicated below, unless specifically indicated otherwise on the Drawings:

SPEC NOTE: Delete selections below not required on the project.

* + - 1. Interior: 4877mm (16’) maximum: 6mm (1/4") joint width.
      2. Exterior: 3658mm (12’) maximum: 10mm (3/8") joint width.
    1. Joints around fixtures, pipes or other fittings shall be sealed with a sealant. Refer to Section 07 92 00 – Joint Sealants for type of sealants to be used.
       1. Colour of sealant shall match grout as selected later by Consultant.
  1. CLEANING AND protection
     1. Clean tiled areas after grouting has cured, using compatible solutions and methods as recommended by the manufacturer.
     2. Remove grout residue from tile as soon as possible.
     3. Unglazed tile may be cleaned with acid solutions only when permitted by tile and grout manufacturer's written instructions, but no sooner than 10 days after installation.
     4. Protect metal surfaces, cast iron, and vitreous plumbing fixtures from effects of acid cleaning.
     5. Flush surface with clean water before and after cleaning.
     6. Leave finished installation clean and free of cracked, chipped, broken, unbonded, or other tile deficiencies.
  2. INSTALLATION SCHEDULE
     1. Install tiles according to TTMAC’s “Specification Guide 09 30 00 Tile Installation Manual 2019-2021”.
     2. Expansion and Control Joints: Movement Joints for Tile Installations: TTMAC Detail 301MJ-2019-2021.

SPEC NOTE: Modify the installation options identified below with project requirements. Delete installation options not required on the project.

* + 1. Wall Tile:
       1. Tile Installed Over Masonry or Concrete Walls – Thin-Set Method: TTMAC Detail 303W-2019-2021 Interior/Exterior.
       2. Tile Installed on Cementitious Backer Unit (CBU), Thin-Set Method/Walls, Detail A - Interior Wet/Dry Areas and Exterior Use: TTMAC Detail 305W-2019-2021.
       3. Tile Installed on Coated Glass Mat Backer Board, Detail B - Interior Wet/Dry Areas: TTMAC Detail 305W-2019-2021.

SPEC NOTE: Modify the installation options identified below with project requirements. Delete installation options not required on the project.

* + 1. Floor Tile:
       1. Tile Over Mortar Bed with Cleavage Membrane Interior Only: TTMAC Detail 309F-2019-2021.
       2. Tile Installed on Interior/Exterior Cement Mortar Bed on Concrete Slab: TTMAC Detail 310F-2019-2021; Detail A.
       3. Tile Bonded to Concrete Slab – Thin-Set Method, TTMAC Detail 311F-2019-2021; Detail A Interior/Exterior.
       4. Tile Applied Over Wood Sub-Floor in Dry Areas-Thin-Set Method, TTMAC Detail 313F-2019-2021; Detail A – Thin-Set on Plywood.
       5. Tile Applied Over Wood Sub-Floor in Dry Areas-Thin-Set Method, TTMAC Detail 313F-2019-2021; Detail B – Thin-Set on Backer Unit/Board.
       6. Tile Applied Over Wood Sub-Floor in Dry Areas-Thin-Set Method, TTMAC Detail 313F-2019-2021; Detail C – Mortar Bed with Cleavage Membrane.
       7. Install tile on stairs to TTMAC detail [318S [A] [B] [C] [D] [E]].
       8. Install tile to existing interior tile substrate to TTMAC detail [324RF].
       9. Install tile to exterior decks to TTMAC detail [325F [A] [B] [C] [D]].
       10. Large Format Tile on Interior Floors: TTMAC Detail 329LFT-2019-2021

END OF SECTION