SECTION 09 30 33 – stone tiling

1. General
   1. SUMMARY
      1. Work of this section includes thin set granite floor tile and base.
      2. Work of this Section includes removal and patch and repair and making good existing granite floor.
      3. Related Requirements:
         1. Section 03 35 00 – Concrete Finishing.
         2. Section 05 50 00 – Metal Fabrications.
         3. Section 09 29 00 – Gypsum Board.
         4. Section 09 66 13 – Portland Cement Terrazzo Flooring.
         5. Section 12 48 16 – Entrance Floor Grilles.
   2. REFERENCE STANDARDS
      1. American National Standards Institute (ANSI):
         1. ANSI A108/ A118/A136.1 1999, Standard for Installation of Ceramic Tile.
      2. American Society for Testing of Materials (ASTM):
         1. ASTM C 241-90 (2005) Standard Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic.
         2. ASTM C 615 03, Standard Specification for Granite Dimension Stone.
      3. Canadian General Standards Board (CGSB):
         1. CGSB 71 GP 22M, Adhesive, Organic, for Installation of Ceramic Wall Tile.
         2. CAN/CGSB 51.34 M86, Vapour Barrier Polyethylene Sheet for Use in Building Construction.
         3. CAN/CGSB 1.132M90, Primer, Zinc Chromate, Low Moisture Sensitivity.
      4. Canadian Standards Association (CSA):
         1. CAN/CSA A3000 03, Portland Cements/Masonry Cement/Blended Hydraulic Cement.
      5. Terrazzo, Tile and Marble Association of Canada (TTMAC):
         1. TTMAC, Specification Guide 09 30 00 “Tile Installation Manual, latest edition”.
   3. SUBMITTALS
      1. Provide requested information in accordance with Section 01 33 00 – Submittal Procedures.
      2. Submit product data for each type of product indicated.
      3. Submit trim accessories, full size sample 305 mm (12") long for each trim accessory indicated.
      4. Submit a sample panel of stone with approved coloured grout, size 610mm (24") x 610mm (24") on 19mm (3/4") plywood.
      5. Submit drawings to indicate proposed construction details of cladding assemblies, including materials, methods of joining, welding, bonding, sealing, gasketing, methods of anchoring, type of materials, material thickness, joint sealants, expansion, and contraction provision including locations and details, and other pertinent data.
   4. QUALITY ASSURANCE
      1. All materials and workmanship to conform to the Terrazzo Tile and Marble Association of Canada (TTMAC).
      2. Work of this Section shall be executed by qualified mechanics skilled in stone installation and having a minimum of five (5) years proven experience.
      3. Contractor of this Section shall be a member in good standing of the TTMAC at time of Work.
   5. DELIVERY, STORAGE AND HANDLING
      1. Keep delivered material dry and free from stains. Store cementitious material off damp surfaces and under complete weatherproof conditions.
   6. PROJECT CONDITIONS
      1. Temperature of surfaces and surrounding air: Minimum 10 deg C.
      2. Apply stone only to surfaces sufficiently dry, clean, firm, level, plumb and free from oil or wax.
      3. Commence Work after the Work of other trades affecting this Work is completed.
2. PRODUCTS
   1. stone
      1. All stone shall be Grade 1, seconds material will not be acceptable. Colours used in floor patterns shall be in accordance with drawing details, and Finishes Legend as indicated on the Drawings.
      2. Granite: In accordance with ASTM C 615, selected for architectural finishing in sizes, colours, and finish as indicated on drawings, in accordance with ASTM C 241.
         1. ST-02: Exterior Granite Base:
            1. Ciot; Tecnica St. Vincent Black Granite, Flamed Finish.
         2. ST-14: Exterior Granite Stone - At secondary entrances to match existing sidewalk:
            1. Reference Colour: Ciot; Tecnica Candy Black Granite, Flamed Finish.
   2. MORTAR, GROUT AND ADHESIVE MATERIALS
      1. Acceptable manufacturer of premix grouts, mortars, and additives:
         1. Mapei Canada Inc.
         2. Laticrete International Inc.
         3. Flexitile Ltd.
      2. High performance polymer-modified rapid-setting, non-shrinking, efflorescence free grout which will not stain marble stone.
         1. ANSI A118.7 (ANSI A108/A118/A136.1-2017) and to ISO 13007: Classification CG2WAF or equivalent as acceptable to Consultant.
         2. Grout colours to later selection by Consultant from manufacturer's full range.
         3. Basis of Design Materials: Ultracolor Plus FA by Mapei.
         4. Grout sealer: as recommended by grout manufacturer.
      3. Uncoupling Membrane:
         1. Geometrically configured to create free space between the stone tile and the concrete substrate allowing independent movement between the substrate and stone tile, vapour management, supporting and load distribution.
         2. Membrane meets or exceeds ANSI A118.12 (ANSI A108/A118/A136.1-2017). Membrane shall be able to achieve 50 PSI or greater shear bond strength after a 7-day cure per test method per Section 5.1.3.
         3. Membrane shall be suitable for use with thin set mortar tile systems.
         4. Membrane shall be compatible with modified mortar specified.
         5. Review floor assembly design (live load deflection) with Consultant and uncoupling membrane manufacturer's representative to ensure product is acceptable for commercial application, type of installation application and conditions, and compatible with marble tile.
         6. Basis of Design Materials: Mapeguard UM by Mapei.
   3. MISCELLANEOUS MATERIALS
      1. Primers: Type as recommended by mortar material manufacturer compatible with materials and to suit substrate types and to comply with warranty requirements.
      2. Patching and Levelling: As indicated in Section 03 35 00.
      3. Control joint trim: Allow for at least 3 control joint trim product options in Contract Price to be selected by Consultant based on control joint shop drawings and tile design/layout.
      4. Control joint products shall be designed for use in commercial applications, medium to heavy duty loading. Residential control joint products or light duty products are not permitted.
      5. Control Joint Sealant:
         1. One-component, neutral cure, exterior grade silicone sealant.
         2. Tensile strength (ASTM C 794-18): Minimum 1.5 MPa (225 psi).
         3. Hardness (ASTM D751-06(2011); Shore A): Minimum 15.
         4. Weather resistance (QUV Weather-ometer): No change after 10,000 hours.
         5. Basis of Design Materials: Mapei 'Mapesi Tl'.
      6. Edge strips and/or expansion control joints: Extruded, aluminum, height of profile and type to suit installation.
         1. Acceptable Materials: Schluter Systems Trims, and as follows:
            1. Edge Strips: Schluter Jolly ACB.
            2. Juncture fixtures, doors/windows: Inside corner: Schluter Dilex AS.
            3. Control Joint: Schluter Dilex BWB.
            4. Edge, uniform 13 mm round: Schluter RONDEC AE.
      7. Dowels, clamps, and anchors for granite: Brass, bronze, or Type 304 stainless steel, and complying with the requirements of authorities having jurisdiction.
      8. Adhesive for stone liners, blocking, joints: Chemical Resistant Epoxy Grout: Performance standard to ANSI A118.3 and CGSB 71 GP 30M, Type 1. 100% solids epoxy grout. Two parts, pre sanded, thermosetting and cold water cleanable.
         1. Acceptable Materials:
            1. Kerapoxy as manufactured by Mapei Canada Inc.
            2. Latapoxy SP100 as manufactured by Laticrete International, Inc.
            3. 100 Flex Epoxy 100% Solids Epoxy Mortar and Grout as manufactured by Flextile Ltd.
      9. Non-Staining Cement: Freshly ground, waterproofed white Portland Cement.
      10. Primer Paint for Ferrous materials: CAN/CGSB 1.40.
      11. Zinc Chromate Primer: CAN/CGSB 1.132.
      12. Sealant for Internal Veneer: Non-bleeding and capable of supporting its own weight. Sealant, cleaning solvents, joint backing and primers shall be compatible with each other and acceptable to the sealant manufacturer. Refer to Section 07 92 00.
      13. Floor sealer for honed finish materials, as recommended by stone manufacturer.
      14. Polyethylene: To CGSB 51 GP 51M, 0.152 mm (6 mil) thickness.
      15. Sealer: Combination metalized acrylic polymer and urethane, scuff resistant, wax and resin free, non yellowing clear and transparent coating.
      16. Provide for expansion and contraction joints.
      17. Insofar as practical, execute fitting and assembly in the shop with the various parts or assemblies ready for erection at the building site.
      18. Check soundness of existing floor and make good any hollow areas with mortar.
      19. Notch back of joints to ensure 3 mm (1/8") maximum joint installation.
      20. Location of all joints shall be subject to Consultant's acceptance.
      21. Accurately fit together all joints, corners, and mitres. Match components carefully to produce perfect continuity of line and design.
      22. Fabricate steel used for connections and support framing in accordance with CAN/CSA S16.1.
      23. Weld steel, where required, in accordance with CSA W59. Welded joints shall be of adequate strength and durability with jointing tight and flush.
      24. Provide devices for anchoring the assemblies to the building structure with sufficient adjustment to permit correct and accurate alignment. The devices for anchoring shall also make provision for all short term and long-term strains and deflections.
      25. Fabricate all anchoring devices required to secure the Work of this Section. Supply anchors where required into Work of other Sections.
      26. Fabricate shelf angles, furring and support framing from rolled steel sections to suit the structure concrete and steel framing, and the general arrangement shown on the Drawings. Provide such other members and reinforce the support systems as required to support the stone and meet the specified design requirements, in compliance with requirements of authorities having jurisdiction.
   4. stone fabrication
      1. Stonework shall be executed by skilled craftsmen in accordance with the best practice of a company specializing in the type of stonework specified, indicated, and required.
      2. Cut stone accurately to conform with the shape and dimensions shown, with exposed plane surfaces true. Note that only non-standard full-size pavers to be cut at site, regular pavers shall arrive at site precut to required sizes.
      3. Joints shall be dressed straight and, unless shown otherwise, at right angles to the face. Exterior corners shall be mitred where indicated.
      4. Do cutting and drilling not provided by Supplier, required for Work of this Section and for Work of other Sections. Do not use impact or hammer drills on granite; use only diamond drill bits. In cutting and fitting the edges shall be carefully cut and ground to a perfect fit and all cutting shall be done in such a manner as not to impair the strength or appearance of the material. (Allow for up to 50 openings not specifically referenced on the Drawings.)
      5. All exposed edges to be machine polished only. Do not use waxes, sealers, or coatings.
      6. Patching or other forms of concealment to cover defects in material or workmanship will not be permitted.
      7. Identify the rift direction on a concealed surface of each unit. Panels shall be cut generally parallel to the rift and all panels shall be cut in the same direction.
      8. Mortise and sink stone units to receive anchors, dowels, cramps, and other necessary items.
      9. Lewis holes and holes for other back anchoring devices shall not be closer than 50 mm to the edges.
      10. No hand torches or any heat methods shall be used on stone in the field unless approved in writing by the Consultant.
3. EXECUTION
   1. application, general
      1. Install stone in accordance with current installation handbook of Terrazzo, Tile and Marble Association of Canada, and in accordance with material manufacturer's directions.
      2. Install stone complete with all special units and accessories that are necessary and required to complete the installation.
   2. INSTALLATION
      1. Apply stone to substrate with specified thin-set mortar and adhesive according to manufacturer's current recommendations.
      2. To ensure compatibility, use only one manufacturer's products, through all phases of installation.
      3. Cut, drill, and fit stone as required accommodating Work of other trades.
      4. Cut stone accurately and without damage. Smooth exposed cut edges with abrasive stone, where exposed. Chipped or split edges are not acceptable. Minimum stone width: 1/2 unit.
      5. Accurately locate accessories before stone is installed.
      6. Form an open joint for sealant in floor stone at all vertical corners, edges, around penetrating pipes, and fixtures, and where stone abuts other materials or fixtures.
      7. Fit stone accurately at intersections, against trim finish, built in fixtures and accessories. Fit stone closely around pipes, etc., so that plates, collars, etc. will overlap cuts.
      8. Distribute units of acceptable ranging colour or texture evenly over entire installation to avoid patches or streaks, to produce a homogeneous blending of all units. If an acceptable pattern or grain direction is apparent, due to natural appearance of stone, or finishing, install units so that pattern or grain is in one direction unless otherwise directed.
      9. Sponge or drench stone units with clean water just prior to setting.
      10. Set stonework level, plumb, square, and true with uniform joints. Chipped, broken, or blemished units shall be rejected.
      11. Avoid splashing mortar on exposed faces of stone. Remove droppings immediately by means of sponge and clean water.
      12. Provide cement mortar in accordance with the requirements of CAN/CSA A5 and CAN3 S304, as applicable, and these Specifications. Ensure no metal debris or other contaminants become embedded in mortar setting beds or substrates.
      13. Paving and flooring shall be true in plane, level to a tolerance of 3 mm in 3048 mm (1/8" in 10 feet) measured in any direction.
      14. Completed installations of paving and flooring shall ensure that no water puddles can occur.
      15. Butter back of stone units with mortar slurry and place stone units on a thin mortar setting bed.
      16. Joints between interior flooring slabs: 3 mm (1/8").
      17. Mask edges of joints prior to grouting and pointing.
      18. Grout joints solid with mortar except where indicated for caulking on drawings and point with coloured pointing compound. Remove masking.
      19. Provide expansion control joints at not over 3048 mm (10 feet) each way, or as recommended by the TTMAC.
      20. Fit tile accurately at intersections, against trim finish, built in fixtures and accessories. Fit tile closely around pipes, etc., so that plates, collars, etc. will overlap cuts.
      21. Prevent rapid drying of mortar bed. Do not set tile on dry bed. Sound tile after setting and replace any hollow sounding units to obtain full bond.
      22. Provide additional ventilation as required. Prohibit smoking near all flammable materials.
      23. Apply grout, using the proper approved coloured grout. Pack in solidly in all joints (except joints to receive sealant) so that no gaps or bubbles occur. Wipe off flush with surface of square edge tile. Use epoxy grout.
      24. Fasten the Work securely as erection progresses. Provide all units with suitable temporary braces, shores, and stays to hold them in position until permanently secured. Draw all nuts and bolts tight and check bolt threads to prevent the nuts from backing off or spot weld nut heads.
      25. Under no circumstances shall any granite unit butt directly against and/or bear directly upon another granite unit.
      26. Pre-load structure where deflection is anticipated and adjust all anchors so that the installed panels are level and joints plumb when pre-loading is removed.
   3. EDGE STRIPS
      1. Install edge strip at edges of floor tile, where abutting other flooring and at edges of thin set floor tile where required and shown on drawings.
      2. Install strips flush with finished surface of tile, in accordance with manufacturer's instructions.
   4. SEALING
      1. Seal and caulk joints between interior wall veneer units, and between these units and adjacent construction, except where specified or indicated to be done under other Sections.
         1. Mask areas adjacent to the joints to prevent contamination of adjacent surfaces. Remove masking promptly after the joint has been completed.
         2. Prime joints to prevent staining, or to assist the bond in accordance with manufacturer's written recommendations.
         3. Install joint filler strips as backup for sealant to provide optimum joint profile, but not less than 6 mm depth of sealant bead in compliance with manufacturer's recommendations.
         4. After joints have been completely filled, tool them neatly to a slightly concave surface.
   5. CLEANING
      1. Keep installed Work clean as Work progresses.
      2. Remove excess sealant and caulking by the moderate use of mineral spirits or other solvent acceptable by the sealant and caulking manufacturer and the stone fabricator.
      3. After grouting and pointing, clean stone with stiff fibre brushes and water. The use of wire brushes or acids will not be permitted. Flush down at Completion.
      4. Clean and make good to the approval of the Consultant, surfaces soiled or otherwise damaged in connection with the Work of this Section. Pay the cost of replacing finishes or materials that cannot be satisfactorily cleaned or which have been damaged by improper cleaning materials and techniques.
      5. Remove concrete and alkali wash offs on surfaces as Work progresses.
      6. Upon completion of the Work of this Section, remove all debris, equipment and excess material resulting from the Work of this Section from the site.
   6. FLOOR SEALER
      1. Apply three coats of sealer in accordance with manufacturer's written instructions.
      2. Do not apply finish until immediately prior to Owner's takeover of building.
   7. PROTECTION
      1. Protect pavers from traffic and abuse for a minimum of 48 hours after laying protection with polyethylene drop sheets. Tape joints to prevent shifting.

END OF SECTION