

- 1 General
- 1.1 **SUMMARY**
 - .1 Section Includes
 - .1 Labour, Products, equipment and services necessary to complete the Work of this section.
- 1.2 **REFERENCES**
 - .1 Conform to the latest edition of the following:
 - .1 ASTM C920 - Standard Specification for Elastomeric Joint Sealants
 - .2 TTMAC - Terrazzo, Tile and Marble Association of Canada
 - .3 AODA - Accessibility for Ontarians with Disabilities Act
- 1.3 **QUALITY ASSURANCE**
 - .1 Retain a Subcontractor regularly engaged in installing ceramic tile for a minimum of five years, and whom has had a minimum of three successful installations of the type called for in this section, each at least three years old. Likewise Subcontractor shall be a member in good standing of the Terrazzo, Tile and Marble Association of Canada (TTMAC).
 - .2 Submit upon Consultant's request, documented evidence of compliance with the foregoing.
- 1.4 **SUBMITTALS**
 - .1 Submit in accordance with Section 01 33 00.
 - .2 Samples
 - .1 Submit full size sample of each type, colour, size and pattern of tile specified.
 - .2 Submit grout samples for approval by Consultant. Grout samples to match each tile colour, unless otherwise specified.
 - .3 Approved samples shall be used as minimum standard for all Work under this section and installed Work must match samples in every respect.
 - .3 Certification: Submit certification for each type of floor tile as follows:
 - .1 Provide tile products manufactured and tested in accordance with ANSI A137.1 as appropriate to the Basis-of-Design Materials listed in this Section and on the Drawings.
 - .2 Slip Resistance: Provide materials having a minimum Dynamic Coefficient of Friction (DCOF) of 0.42 dry and, wet in accordance with ANSI A137.1 when tested using BOT 3000 Digital Tribometer or minimum 0.45 dry and wet in accordance with DIN 51130 with minimum R9 Class Slip Resistance.
- 1.5 **DELIVERY, STORAGE AND HANDLING**
 - .1 Deliver materials in adequate crates or containers with manufacturer's name and Product description clearly marked thereon.

- .2 Handle and store tiles in a manner to avoid chipping, breakage or the intrusion of foreign matter. Take precautions to protect the mortar and grout admixtures from freezing or from excessive heat.

1.6 **EXTRA STOCK**

- .1 Upon completion of Work, deliver tiles in quantities equivalent to 5% (to nearest full carton) of each tiled area (wall and floor), including fittings, as required for Owner's future maintenance purposes.
- .2 Obtain maintenance tiles and fittings from the same production run as tiles and fittings installed. Put in heavy duty boxes and clearly label.

1.7 **WARRANTY**

- .1 Warrant Work of this section against defects and deficiencies for a period of two (2) years from date Work is certified as substantially performed in accordance with the general conditions of the Contract.
- .2 Promptly make good defects and deficiencies which become apparent within the Warranty Period by replacing defective Work satisfactory to the Consultant and at no expense to the Owner.
- .3 Defects shall include but not limited to loss of bond, loosening, cracking, splitting, warping and deformations.

2 **Products**

2.1 **GENERAL**

- .1 For Tile flooring, refer to Finishes Schedule.
- .2 It must be noted that the Finishes Schedule is for the purpose of establishing minimum standards for material types and/or colours for this Project.
- .3 Except where specified otherwise, other Products are acceptable provided that the quality and/or colour represented in the schedule are fully matched to the approval of the Consultant.

2.2 **MATERIALS**

- .1 Porcelain Tiles (~~TL-XX~~TL-01 to TL-04):
 - .1 Complete with trim fittings including bullnosed tiles for floors at doors where tile meets other finishes thinner than the porcelain tile.
 - .2 Refer to Finishes Schedule for type, manufacturer, colour, size, installation method and location.
- .2 Floor and Wall Transition Strips: Refer to Finishes Schedule for type.

2.3 **GROUT**

- .1 Polymer modified portland cement grout: Field mixed, high strength polymer modified portland cement/sand for floors; unsanded for wall applications. Colour to match tiles.
 - .1 Grout line width greater than 5 mm
 - .1 Mapei "Ultracolor Plus"
 - .2 Laticrete "Floor grout with 1776 additive"

- .3 Flextile "PM 600 Grout"
- .4 Kiesel equal
- .2 Grout line width between 1.5 mm to 3 mm
 - .1 Mapei "Ultracolor Plus"
 - .2 Laticrete "Wall grout with 1776 additive"
 - .3 Flextile "PM 500 Grout"
 - .4 Kiesel equal
- .3 Grout line - Walls over 3 mm grout line width:
 - .1 Mapei "KERACOLOR S" (sanded)
 - .2 Laticrete "Floor grout with 1776 additive"
 - .3 Flextile "PM 600 Grout"
 - .4 Kiesel equal
- .2 Epoxy grout: Meeting ANSI 118.3 requirements:
 - .1 Mapei "Kerapoxy"
 - .2 Daltile "Laticrete Latapoxy SP-100"
 - .3 Flextile "Flex-Epoxy 100"
 - .4 Kiesel equal
- 2.4 **SETTING BED AND THIN-SET**
 - .1 Thin set liquid latex-portland cement mortar: Field mixed, high strength thin bed mixture of latex-additive portland cement-filler powder.
 - .1 For tiles 200 mm x 200 mm or less in size:
 - .1 Mapei "Kerabond/Keralastic"
 - .2 Laticrete "4237/211"
 - .3 Flextile "41/silica sand and cement"
 - .4 Kiesel equal
 - .2 For tiles over 200 mm x 200 mm up to 300 mm x 300 mm in size:
 - .1 Mapei "Kerabond / Keralastic"
 - .2 Laticrete "4237 / 211"
 - .3 Flextile "53 / 44"
 - .4 Kiesel equal
 - .3 For 330 mm x 330 mm tiles, use a full contact thin set mortar:
 - .1 Mapei "Ultracontact"

.2 Kiesel equal

2.5 **WATERPROOFING AND CRACK ISOLATION**

- .1 Waterproof membrane: Meeting ANSI 118.10 Specification for load bearing, bonded, waterproof membranes for thin-set ceramic tile and dimension stone installation.
 - .1 Mapei "Mapelastic" with Mapei reinforcing mesh
 - .2 Laticrete "9235"
 - .3 Kiesel equal
- .2 Crack suppressant membrane: Fabric or mesh reinforced, meeting TTMAC requirements.
 - .1 Mapei "Mapelastic"
 - .2 Laticrete "9235"
 - .3 Kiesel equal
- .3 Uncoupling Membrane
 - .1 3 mm thick, orange, high-density polyethylene membrane incorporating a grid structure of 12 mm x 12 mm square cavities cut back in dovetail configuration. Polypropylene fleece laminated to its underside of HDPE layer. Provide waterproofing seaming membrane for seams and corners: 0.1 mm thick, orange polyethylene membrane, with polypropylene fleece laminated on both sides.
 - .1 Accepted manufacturer: Schluter "Ditra" or accepted equal.

2.6 **SEALER**

- .1 Sealant
 - .1 Tile control joints: Tremco "THC 900" or "Vulkem 245/255".
 - .2 For internal tile to tile corners: Mapei "Keracaulk", Laticrete "Flexible Sealant" or one-part polyurethane specified in Sub-paragraph .3 herein, colour to match wall grout.
 - .3 For other sealant associated with tile work: 1 part polyurethane conforming to ASTM C920, Type S, Grade NS, Class 25; Sika "RC-1", Tremco "Dymonic" or Sonneborn "NP-1", colour to match grout colour.
- .2 Floor sealer and protective coating: Compatible with tiles installed as recommended by tile manufacturer, to protect tile from yellowing, powdering, scuffing, acid, alkalis, calcium chloride and detergent dulling.

2.7 **CONTROL AND EXPANSION JOINTS**

- .1 Prefabricated control and expansion joints: Provide "Movement Joint Profiles" by Schluter or approved alternative in styles and sizes to suit application and as approved by Consultant.

3 Execution

3.1 **PREPARATION OF SURFACES**

- .1 Ensure surfaces are thoroughly clean, dry and sound. Remove oil, wax, grease, dirt, paint, form release agent, and other foreign material that may impair proper tile bond to

wall and floor surfaces. Use mechanical methods such as sanding for walls or bead blasting for floors.

- .2 On surfaces to be waterproofed, prepare concrete substrate in accordance with waterproofing manufacturer's preparation standards.
- .3 Ensure substrates are structurally sound, level and plumb, within a maximum tolerance of 3 mm in 2.4 m for vertical surfaces, and horizontal surfaces within a maximum tolerance of 6 mm in 3 m from finished levels of the surface, or better.
- .4 Trowel apply a levelling coat on uneven surfaces, or surfaces which do not guarantee a plumb or level finish to the tile, at a minimum of 6 mm thick.
- .5 Do not set tile on surfaces containing frost. Maintain temperature to a minimum of 10°C (50°F) during installation. Maintain temperature above freezing until mortar and grout have properly cured. The lower the temperature, the longer tile curing will take.

3.2 FLOOR CONTROL JOINTS

- .1 Clean control joints occurring in slab areas to receive tile and blow clean with compressed air. Use a vacuum to avoid spreading dust in areas to be tiled. Grout flush to slab with cement compound using same materials as specified for levelling coat.
- .2 If possible, use uncut tiles at structural floor control joints.

3.3 TILE LAYOUT

- .1 Lay out Work to produce a symmetrical pattern with minimum amount of cutting. Ensure cut tile at room perimeter is not less than one-half full size.

3.4 WATERPROOFING MEMBRANE

- .1 Prepare substrate for waterproofing in accordance with waterproofing manufacturer's directions.
- .2 Apply with a trowel on prepared substrate to a total dry film thickness of 635 microns (25 mils) in accordance with manufacturer's directions. Extend system over curbs and minimum 150 mm up walls.
- .3 Ensure full, complete, and permanent bond. Build up system where necessary to ensure positive slope to drain.
- .4 Reinforce intersections, projections, openings, and other locations as required, with fine glass fibre mesh reinforcing.
- .5 Terminate membrane in reglets wherever possible, except for control joints and grout joints.
- .6 In the case of reinforcing mesh or fabric, embed mesh or fabric while the first coat is fresh and apply a second coat on the mesh or fabric in accordance with manufacturer's written directions

3.5 INSTALLATION

- .1 Mix thin set mortar and grout components to proportions and methods specified by mortar and grout manufacturer, to achieve maximum bond strength within the capacity of the mortar or grout.
- .2 Use mortar and grout within their pot life as specified by manufacturer.

- .3 For Tiles Less Than 200 x 200 mm In Size
 - .1 Apply mortar with a notched trowel using a scraping motion to work the material into good contact with surface to be covered. A trowel having notches approximately 4 x 4 x 4 mm is recommended. Back of tiles must have 95% mortar coverage.
 - .2 Apply only as much thin set mortar that can be covered within twenty minutes or while surface of thin set mortar is still fresh. Discard thin set mortar that has skinned over and apply fresh thin set mortar. Set tiles in place and beat with a small beating block as necessary to ensure a proper contact of the thin set mortar to the back of the tile and also to level the tiled surface. Align tile to show uniform joints and then allow to set until firm, refer to thin set mortar manufacturer's written instructions. Clean excess thin set mortar from surface of tile with a damp cloth or sponge while the thin set mortar is fresh.
- .4 For Tiles 200 mm x 200 mm or Larger
 - .1 Apply thin set mortar with the flat side of a notched trowel using a scraping motion to key in the mortar into good contact with surface to be covered. A trowel notches approximately 8 mm x 8 mm x 8 mm is recommended, comb in one direction. Back of tiles must have 95% mortar coverage.
 - .2 Install with back-buttering to achieve good adhesion.
- .5 Lay out Work so that fields are centred on areas, with no tiles of less than half-size used at room perimeter.
- .6 Maintain heights of panels in full courses to nearest indicated dimension.
- .7 Align joints of wall tile with floor tile.
- .8 Make joints between tile uniform, plumb, straight, true, even and with adjacent tile flush.
- .9 Provide fittings (base, wall caps and wall corner units) to complement tile system. Install edge protection at external vertical corners.
- .10 Installation Methods
 - .1 Tile on concrete floor slab: Install tile floor, base fittings with thin set mortar in accordance with TTMAC Installation Manual, Detail 311F, latest edition.
 - .2 Tile on cementitious board ceilings in dry areas: Install tile with thin set mortar in accordance with TTMAC Installation Manual, Detail 315C, latest edition.
 - .3 Tile on cementitious board walls in wet areas: Install tile and fittings with thin set mortar in accordance with TTMAC Installation Manual, Detail 305W, latest edition.
 - .4 Tile on concrete or masonry walls: Install tile and fittings with thin set mortar in accordance with TTMAC Installation Manual, Detail 303W, latest edition. Install wall tile full height unless shown otherwise.
 - .5 Tile on gypsum board walls in dry areas: Install tile and fittings with thin set mortar in accordance with TTMAC Installation Manual, Detail 304W, latest edition.
 - .6 Tile on stairs: Install tile, fittings, and risers with thin set mortar in accordance with TTMAC Installation Manual, Detail 318S, latest edition.

- .7 Tile on wood subfloor in dry area: Install tile, fittings, and risers with thin set mortar in accordance with TTMAC Installation Manual, Detail 313F, latest edition.
- .11 Tile control joints: Provide 6 mm wide control joints in tiled floors where shown and directly over control joints in floor slab or masonry walls, in accordance with TTMAC Installation Manual, Detail 301MJ, latest edition. Apply sealant as specified.
- .12 Cut and fit tile neatly to piping, fittings, projections and around recesses for recessed washroom accessories. Where surface mounted equipment and accessories are to be installed on tiled surfaces, extend tile over surfaces. Make cut edges smooth, even and free from chipping. Chipped and broken edges are not acceptable.
- .13 Cut circular cutouts for pipe and drain penetrations by core drilling only.
- .14 If existing tiles, those to remain, are damaged during demolition and removal Work, provide new tiles to match existing tiles. Prepare substrate and install new tiles as specified for new Work of this Section.

3.6 **GROUTING**

- .1 Do not proceed with grouting until at least forty-eight hours after tile has set to prevent displacement of tiles.
- .2 Ensure grout is applied to the full thickness of the tile.
- .3 Force grout into joints in accordance with grout manufacturer's directions to produce watertight, filled joints without voids, cracks and excess grout. Finish flush to edge thickness of tile.
- .4 Do not grout internal corner intersections of wall tile.
- .5 Protect grouted work from traffic for minimum forty-eight hours. Epoxy grout will achieve chemical and stain resistance after ten days therefore protect Work against spills until curing period has lapsed.

3.7 **SEALANT**

- .1 Apply sealant around piping and fittings extending through tiled surfaces.
- .2 Apply sealant in tile control joints and in internal tile to tile joints.
- .3 Tool to a smooth, flush surface, free from air bubbles and contamination. Provide backer rod only where required to control depth of sealant.

3.8 **UNCOUPLING MEMBRANE**

- .1 Leveling of the subfloor must be done prior to installing uncoupling membrane.
- .2 Install uncoupling membrane to wood subfloor, concrete or vinyl floor in accordance with manufacturer's written instructions.
 - .1 For wood substrates, verify that subfloor panels are properly fastened to framing members
 - .2 For vinyl substrates, ensure that the structure is sound and adequate and well adhered. Remove wax and clean surface. For vinyl over wood structures, nail off floor with ring shank flooring nails every 4" (102 mm) o.c. Fasteners must pass through entire thickness of assembly with minimal penetration into joists.

- .3 For concrete substrates, mechanically remove any waxy or oily films and curing compounds if present.
 - .3 Install membrane in full bedding of thin set mortar. Roll membrane to ensure full and continuous adhesion to structure.
 - .4 Movement Joints: construct expansion joints and control joints in accordance with TTMAC Detail 301MJ.
- 3.9 **CLEANING**
- .1 Clean off excess grout with soft burlap or sponge moistened with clean water.
 - .2 After grouting has cured, clean floor and wall tile. Clean in accordance with TTMAC recommendations for treating new work as specified in its "Maintenance Guide". Do not use acid for cleaning.
 - .3 Apply two coats of sealer to unglazed floor in accordance with sealer manufacturer's printed directions.
 - .4 Re-point joints after cleaning as required to eliminate imperfections. Avoid scratching tile surfaces.
- 3.10 **PROTECTION ON COMPLETION**
- .1 After completion, close tiled areas to traffic for a minimum period of seventy-two hours.
 - .2 Cover Work temporarily with building paper properly lapped and taped at joints, or other protection, until the Work is accepted by Consultant.
- End of Section