

Part 1 General

1.1 SECTION INCLUDES

- .1 Ceramic tile, backing and installation at locations shown on Drawings.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)/Ceramic Tile Institute (CTI).
 - .1 ANSI A108/A118/A136.1:2019, Specification for the Installation of Ceramic Tile.
- .2 American Society for Testing and Materials International (ASTM):
 - .1 ASTM C473 – 17, Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - .2 ASTM C518 – 17, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - .3 ASTM C666 / C666M – 15, Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.
 - .4 ASTM C947 - 03(2016), Standard Test Method for Flexural Properties of Thin-Section Glass-Fiber-Reinforced Concrete (Using Simple Beam With Third-Point Loading).
 - .5 ASTM C1325 - 18, Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units.
 - .6 ASTM D1037 – 12, Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
 - .7 ASTM D3273 – 16, Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - .8 ASTM E84 - 19a, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .9 ASTM E330 / E330M – 14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .10 ASTM G21 – 15, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- .3 Canadian Standards Association (CSA)
 - .1 CSA- A23.1-14/A23.2-14, Concrete materials and methods of concrete construction / Test methods and standard practices for concrete.
- .4 Terrazzo Tile and Marble Association of Canada (TTMAC)
 - .1 Tile Specification Guide 09 30 00 2016/2017, Tile Installation Manual.

1.3 MEASUREMENT PROCEDURES

- .1 No measurement will be made under this for preparation and installation tiles and associated items.
- .2 Repair of cracks in concrete substrate exposed by removal of existing ceramic tiles and mortar bed will be a Unit Price component.
- .3 Repair areas will be identified by the Contract Administrator on-site by a chain drag sounding survey which will be completed in the presence of, and with the assistance of the Contractor. The areas will then be measured and agreed upon by the Contractor and the Contract Administrator prior to commencement of work. These measurements will form the basis of payment for the area.

- .4 If the area of the repair is increased over that originally measured without consultation with the Contract Administrator, then the Contractor will not be paid for the increased area.
- .5 Unit prices are to include all supervision, labour and materials, and equipment.
- .6 Unit prices:
 - .1 Crack repair:
 - .1 Gravity feed epoxy repair of cracks.
 - .1 Unit of measure: per lineal foot (L.F.).
 - .2 Minimum payment for repair areas will be 1 L.F.
 - .2 Direct pull-out tensile tests to determine bond strength of tank wall mortar bed.
 - .1 Unit of measure: per test location.
 - .2 Minimum payment for testing will be 1 test location.

1.4 PRE-INSTALLATION MEETING

- .1 In accordance with Section 01 31 19 – Project Meetings.
- .2 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installation of mock-up. Agenda for meeting to include:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Review installation details.
 - .4 Co-ordinate with other subtrades.
 - .5 Review manufacturer's installation instructions and warranty requirements.
 - .6 Review compatibility of materials.
 - .7 Review testing requirements.

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Product data:
 - .1 Each tile type, size, and shape required, including slip resistance and frost resistance where applicable.
 - .2 Tile chemical resistance to mortar and grout.
 - .3 Bonding agent characteristics
 - .4 Repair mortar and mortar bed
 - .5 Accessories specified including waterproofing membrane and reinforcing fabric.
 - .6 High performance, marine-grade sealants
 - .7 Tile setting mortar characteristics
 - .8 Each grout type, colour, and characteristics
 - .9 Grout sealer
 - .10 Cleaning compounds
 - .2 Submit manufacturer's technical information and colour charts for each product specified.
 - .3 Samples:
 - .1 Assembled samples mounted on a rigid panel, with grouted joints, for each type and composition of tile and for each tile colour, texture, size and pattern, including related trims and profiles at edges, corners, transition. Make samples at least 300mm square (12" x 12"). Use grout of type and in colour or colours approved for completed Work. Adhere tile samples to 11mm thick plywood.

- .2 Full-size units of each type of trim and accessory for each colour and finish required.
- .4 Tiling Plans: Submit tiling plans giving all details of special fittings, expansion joints, joint layouts, etc. These plans and details must be submitted in sufficient time to allow for review & ordering of tiles so as not to cause a delay in the work.
- .5 Qualification Statements
 - .1 Installation Contractor Qualifications:
 - .1 Submit five project references of successful completion of work of similar scope and complexity demonstrating experience with ceramic tiling and membrane application of pools completed within past ten years.
 - .1 Minimum of one project reference to be from ten years ago.

1.6 CLOSEOUT SUBMITTALS

- .1 Provide in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Maintenance data: submit maintenance data for incorporation into Operations and Maintenance Manual. Include:
 - .1 Cleaning and maintenance recommendations for The City's use.
 - .2 TTMAC Maintenance Guide. Provide specific warning of any maintenance practice or materials that may damage or disfigure finished work.
- .3 Warranty: Submit final executed warranty.
- .4 Extra materials:
 - .1 Provide minimum 5% of each type and colour of tile required for project for maintenance use. Store where directed.
 - .2 Maintenance material same production run as installed material.

1.7 QUALITY ASSURANCE

- .1 Conform to TTMAC Manual, latest edition.
- .2 Maintain one (1) copy of each document on site.
- .3 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten (10) years documented experience.
- .4 Installation Contractor Qualifications: Company specializing in performing the work of this section with minimum ten (10) years documented experience and approved by the manufacturer.

1.8 MOCK-UP

- .1 Provide 10 feet long by 20 feet wide mock-up, with finish grout, and specified accessories.
- .2 Mock-up to include control joints.
- .3 Locate where directed by the Contract Administrator and The City.
- .4 Approved mock-up may remain as part of the Work.
- .5 Schedule bond tests of mock-up as unit price component.

1.9 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.10 AMBIENT CONDITIONS

- .1 Maintain air temperature and structural base temperature at ceramic tile installation area above 12 degrees C for 48 hours before, during, and after, installation.
- .2 Do not install tiles at temperatures less than 12 degrees C or above 38 degrees C.
- .3 Do not apply epoxy mortar and grouts at temperatures below 15 degrees C or above 25 degrees C.

1.11 WARRANTY

- .1 Provide Setting material Manufacturer's superior 25-year materials and labour warranty against breakdown or deterioration of the waterproof membrane and setting materials.

Part 2 Products

2.1 TILES

- .1 Ceramic Tile (CT-1):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 23mm x 23mm (1" x 1") Square
 - .3 Colour: Pepper White D037.
 - .4 Code: D037 (Group 1)
 - .5 Location: Pool Deck – Field Tiles. Refer to layout.
 - .6 Trims and Profiles: Include all required trims & profiles such as cove base, nosing, inside corner, outside corner, cove base corner, universal trims, etc.
- .2 Ceramic Tile (CT-2):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 23mm x 23mm (1" x 1") Square
 - .3 Colour: Artisan Brown D144.
 - .4 Code: D144 (Group 2)
 - .5 Location: Pool Deck Border 1 (Adjacent to Pool Markers on decks & walls), Pool Tank A & B Borders (Floor & Walls), Nosings, Skimmer Drains, Step Holes, Jacuzzi Deck Border 1, Administration/ Office 4" Baseboard (all North Side Wall). Refer to layout.
 - .6 Trims and Profiles: Include all required trims & profiles such as cove base, nosing, inside corner, outside corner, cove base corner, universal trims, etc.
- .3 Ceramic Tile (CT-3):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 23mm x 23mm (1" x 1") Square
 - .3 Colour: Arctic White D617.
 - .4 Code: D617 (Group 2)
 - .5 Location: Pool Deck Border 2 (Adjacent to Pool Markers on decks, walls & scupper drains), Jacuzzi Deck Border 2. Refer to layout.
 - .6 Trims and Profiles: Include all required trims & profiles such as cove base, nosing, inside corner, outside corner, cove base corner, universal trims, etc.

- .4 Ceramic Tile (CT-4):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 48mm x 48mm (2" x 2") Square
 - .3 Colour: Black D311.
 - .4 Code: D311 (Group 3)
 - .5 Location: Pool Tank A & B Lane Markers (Floor & Walls), Depth Marker Lines (Floor & Walls), Secchi Disk. Refer to layout.
 - .6 Trims and Profiles: Include all required trims & profiles such as cove base, nosing, inside corner, outside corner, cove base corner, universal trims, etc.
- .5 Ceramic Tile (CT-5):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 48mm x 48mm (2" x 2") Square
 - .3 Colour: Biscuit D317.
 - .4 Code: D317 (Group 1)
 - .5 Location: Pool Tank Walls & Floors. Refer to layout.
 - .6 Trims and Profiles: Include all required trims & profiles such as cove base, nosing, inside corner, outside corner, cove base corner, universal trims, etc.
- .6 Ceramic Tile (CT-6):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 23mm x 23mm (1" x 1") Square
 - .3 Colour: Urban Putty Speckle D201.
 - .4 Code: D201 (Group 1)
 - .5 Location: Pool Deck Benches/ Mechanical boxed up (all walls, seats & 8" return), Shower Area Kerb. Refer to layout.
 - .6 Trims and Profiles: Include all required trims & profiles such as cove base, nosing, inside corner, outside corner, cove base corner, universal trims, etc.
- .7 Ceramic Tile (CT-7):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
 - .2 Size: 150mm x 610mm (6" x 24"). To be Water Jetted for wordings & numberings.
 - .3 Colour: Background Tile - "Beige or White". As per approved colour.
 - .4 Code: Submit for approval.
 - .5 Location: Depth Markers Background Tile to be Water Jet to received words & numbers indicating Depths & Warnings. Refer to layout.
 - .6 Submit Sample for approval before proceeding.
- .8 Ceramic Tile (CT-8):
 - .1 Acceptable product: "Keystones Series", by Daltile.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

- .2 Size: 150mm x 610mm (6" x 24"). To be Water Jetted for wordings & numberings.
- .3 Colour: Wording/ Number Tile - "Black". In accordance with approved colour.
- .4 Code: Submit for approval.
- .5 Location: Depth Markers Wording/ Number Tile to be Water Jetted to be attached to the Background Tile indicating Depths & Warnings. Refer to layout.
- .6 Submit Sample for approval before proceeding.

2.2 CRACK SEALER

- .1 Epoxy crack sealer: Sikadur 52 SLV by Sika.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.3 MORTAR BED – POOL DECK FLOOR AND TANK FLOOR

- .1 Accelerated-cure mortar bed.
- .2 Application thickness:
 - .1 As required to achieve finished tile thickness to match existing tile finished thickness.
 - .2 ¼" to 4": Standard mix.
 - .3 Extended mix up to 4": Add up to 20 per cent by weight of washed, clean, non-reactive saturated surface dry 0.375" pea gravel.
- .3 Acceptable Product:
 - .1 Topcem Premix by Mapei mixed with Planicrete AC by Mapei.
 - .2 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.4 MORTAR BED – TANK WALLS:

- .1 Two component, fast setting, thixotropic, fibre reinforced repair mortar with corrosion-inhibitor.
- .2 Application thickness:
 - .1 As required to achieve finished tile thickness to match existing tile finished thickness.
 - .2 ¼" to 2" per lift.
 - .3 Maximum two lifts to total thickness of 4".
- .3 Acceptable Product:
 - .1 Planitop 12 SR by Mapei.
 - .2 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.5 BONDING AGENT

- .1 Single component, polymer-modified premium thin-set mortar, complying with ANSI A118.4.
- .2 Acceptable Product:
 - .1 Ultraflex 3 by Mapei.
 - .2 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.6 WATERPROOFING MEMBRANE

- .1 Membrane: Fast setting, flexible, thin, load bearing, premium latex-based waterproofing and crack isolation membrane complying with ANSI A118.10 and ANSI A118.12.
- .2 Reinforcing fabric: Flexible, alkali-resistant, nonwoven polyester fabric.
- .3 Acceptable Products:
 - .1 Membrane: Aquadefense by Mapei.
 - .2 Reinforcing fabric: Reinforcing fabric by Mapei.
 - .3 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.7 TILE SETTING MORTAR

- .1 Single component, polymer-modified premium thin-set mortar, complying with ANSI A118.4.
- .2 Acceptable Product:
 - .1 Ultraflex 3 by Mapei.
 - .2 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.8 GROUT MATERIALS

- .1 Fine-aggregate, fast-setting, polymer-modified, colour-resistant, non-shrinking, efflorescence-free grout.
- .2 Acceptable Products:
 - .1 Ultracolor Plus FA by Mapei.
 - .2 Colour: By The City based on manufacturer standard colour range.
 - .3 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

2.9 JOINT SEALANT/JOINT BACKING

- .1 Joint Sealant: Mapesil T by Mapei.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
- .2 Joint Backing (ASTM D1056): round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width.
- .3 Teflon tape bond breaker tape for control joints.

2.10 ACCESSORIES

- .1 Anchors:
 - .1 For installation of deck fixtures removed and salvaged for re-installation.
 - .1 Anchor: Hilti-HS-RN 316 SS.
 - .1 Diameter: to match existing.
 - .2 Adhesive: Hilti HIT RE 500 V3.
 - .3 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.
- .2 Cement Board: DensShield Tile Backer by Georgia Pacific.
 - .1 Substitutions will be considered in accordance with Bidding Procedures B7 - Substitutes.

- .3 Tile Closure: Extruded, anodized clear aluminum.
 - .1 Profile as shown on Drawings.

2.11 TRIM SHAPES

- .1 Conform to applicable requirements of adjoining floor and wall tile.
- .2 Use trim shapes sizes conforming to size of adjoining field wall tile, including existing spaces, unless specified otherwise.
- .3 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.

2.12 SCHEDULES

- .1 Deck floors:
 - .1 Ceramic tile.
 - .1 Grout joints with grout materials.
 - .2 Tile setting mortar.
 - .3 Waterproofing membrane.
 - .4 Mortar bed – Pool deck floor and tank floor.
 - .5 Bonding agent.
 - .6 Existing concrete substrate.
- .2 Deck walls:
 - .1 Ceramic tile.
 - .1 Grout joints with grout materials.
 - .2 Tile setting mortar.
 - .3 Waterproofing membrane.
 - .4 Existing concrete substrate.
- .3 Tank floors:
 - .1 Ceramic tile.
 - .1 Grout joints with grout materials.
 - .2 Tile setting mortar.
 - .3 Waterproofing membrane.
 - .4 Mortar bed – Pool deck floor and tank floor.
 - .5 Bonding agent.
 - .6 Existing concrete substrate.
- .4 Tank walls:
 - .1 Ceramic tile.
 - .1 Grout joints with grout materials.
 - .2 Tile setting mortar.
 - .3 Waterproofing membrane.
 - .4 Mortar bed – Tank walls.
 - .5 Existing concrete substrate.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance:
 - .1 Comply with manufacturer's written recommendations, instructions and specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.
 - .2 Proportion and mix materials in accordance with manufacturer's most current written instructions and applicable ANSI standards.

3.2 DEMOLITION

- .1 Demolish existing materials as shown on Drawings to allow preparation of surfaces for ceramic tiling installation.

3.3 EXAMINATION

- .1 Verify that surfaces are ready to receive work.
- .2 Tile installation contractor to inspect substrate.
 - .1 Commencement of installation shall be considered acceptance of substrate.
- .3 General Contractor shall be responsible for ensuring that the substrate, the overlay and underlayment meet the specification requirements or surface flatness tolerances.
- .4 Contractor to verify surface conditions in structural slab comply with TTMAC.
- .5 Conduct Calcium Chloride moisture emission testing of concrete substrate:
 - .1 In accordance with ASTM F1869.
 - .2 Frequency: minimum three independent floor test locations at each tank.
 - .3 Acceptable conditions: moisture emission not to exceed 2,26 kg/92m² per 24 hours (5 lbs per 1000 S.F. per 24 hours).

3.4 PREPARATION

- .1 Protect surrounding work from damage or disfiguration.
- .2 Ensure that any contaminants, including but not limited to oils and solvents which may impact the bond of the thin-set are removed. The removal of such stains shall be included in the fixed price of the tile installation.
- .3 Vacuum clean surfaces and damp clean.

3.5 CRACK SEALING WITH EPOXYCRACK SEALER

- .1 At locations of cracks requiring repair identified by the Contract Administrator:
 - .1 Sawcut with 1/8" blade along length of crack identified.
 - .2 Clean crack with vacuum.
 - .3 Infill crack with epoxy crack sealer.
 - .4 Top crack repair with silica sand to saturation.
 - .5 Remove loose sand.

3.6 INSTALLATION: MORTAR BED – POOL DECK FLOOR AND TANK FLOOR

- .1 Examination:
 - .1 Once existing tiles and mortar bed have been removed to expose existing concrete substrate, surfaces will be reviewed by the Contract Administrator in the presence of and with the assistance of the Contractor to identify concrete repairs.

- .2 Concrete repairs to be completed in accordance with applicable concrete repair specifications.
- .3 Once concrete repairs are complete, ensure concrete repairs have acceptable cured.
- .2 Preparation:
 - .1 Treat existing cracks in concrete with crack sealer as shown on Drawings.
 - .2 Shotblast and sandblast surface of concrete and repair areas prior to installation of mortar bed.
 - .1 Surface preparation to ICRI CSP-3 to 5.
 - .3 Vacuum clean surfaces and damp clean.
 - .4 Thoroughly wet surfaces for a period of not less than two (2) hours.
 - .5 Remove standing water prior to installation of mortar bed.
 - .6 Maintain the substrate in a saturated, surface-dry (SSD) condition with no surface water, and concrete that is turning from dark to light.
- .3 Installation:
 - .1 Bonding Agent:
 - .1 After the concrete surface has been prepared and cleaned, mix and apply bonding agent in accordance with manufacturer's directions and application rates.
 - .2 Apply one coat of bonding agent:
 - .1 Brush scrub into surface.
 - .2 If scrub coat dries prior to application of mortar bed, re-coat bonding agent.
 - .2 Mortar Bed:
 - .3 Mix and apply mortar bed materials in accordance with manufacturer's directions and application rates.
 - .4 While bonding agent is still wet, spread thin layer of mortar bed materials onto the floor surface with a flat trowel.
 - .1 Work mortar bed materials into bonding agent with wood or magnesium float.
 - .5 Immediately follow with more mortar bed material to desired height.
 - .1 Compact and close surface.
 - .6 Provide slopes and contours as shown on Drawings.
 - .7 Allow mortar bed to cure for at least 48 hours per ½" thickness based at 21° C and 50% relative humidity, plus or minus 10% prior to application of waterproofing.

3.7 INSTALLATION: MORTAR BED – TANK WALLS

- .1 Examination:
 - .1 Once existing tiles and mortar bed have been removed to expose the existing concrete substrate, surfaces will be reviewed by the Contract Administrator in the presence of and with the assistance of the Contractor for concrete repairs.
- .2 Preparation:
 - .1 Shotblast and sandblast surface of concrete prior to installation of mortar bed.
 - .1 Surface preparation to ICRI CSP-7.
 - .2 Vacuum clean surfaces and damp clean.
 - .3 Thoroughly wet surfaces for a period of not less than two (2) hours.
 - .4 Remove standing water prior to installation of mortar bed.

- .5 Maintain the substrate in a saturated, surface-dry (SSD) condition with no surface water, and concrete that is turning from dark to light.
- .3 Application
 - .1 Mix and apply repair mortar material in accordance with manufacturer's directions and application rates.
 - .2 Apply scrub coat of repair mortar with pressure into prepared surface.
 - .3 Prior to scrub coat drying, quickly apply repair mortar by trowel or spray.
 - .4 Allow repair mortar to cure for at least 24 hours based at 23° C and 50% relative humidity prior to application of waterproofing.

3.8 WATERPROOFING INSTALLATION

- .1 Preparation:
 - .1 Shotblast surface of concrete and repair areas prior to installation of mortar bed.
 - .1 Surface preparation to ICRI CSP-2.
 - .2 Vacuum clean surfaces and damp clean.
 - .3 Pre-treat cracks, floor-to-wall interfaces, inside corners and drains as shown on Drawings and in accordance with manufacturer directions.
 - .4 Maintain surface temperature of concrete slab at least 3°C above the dew point.
- .2 Installation:
 - .1 Mix and apply waterproofing membrane material accordance with manufacturer's directions and application rates.
 - .2 Apply membrane into corners, coves, drains and penetrations.
 - .1 Immediately embed reinforcing fabric into membrane to 100% and remove excess membrane material.
 - .2 Immediately re-cover fabric with another coat of membrane.
 - .3 Ensure reinforcing fabric is installed at 90° angle in corners.
 - .4 Overlap reinforcing fabric minimum 2".
 - .3 Apply membrane material on areas to be waterproofed using 3/8" nap roller.
 - .4 Allow membrane to cure for minimum 24 hours.
 - .5 Apply second coat of membrane over entire application area.

3.9 CERAMIC TILE INSTALLATION

- .1 Install in accordance with TTMAC and manufacturer's written instructions.
- .2 Tile setting Mortar
 - .1 Mix and apply tile setting mortar in accordance with manufacturer's directions and application rates.
 - .2 Apply mortar with a notched trowel of sufficient depth to achieve more than 95% mortar contact to both the tile and substrate.
 - .3 Backbutter tiles.
 - .4 With pressure, apply a coat using the trowel's flat side to key mortar into substrate.
 - .5 Apply additional mortar, combing in single direction with trowel's notched side.
 - .6 Spread only as much mortar as can be tiled before mortar skins over.
 - .7 Place tiles firmly into wet mortar.
 - .8 Remove excess mortar from joint so that at least 2/3 of the tile depth is available for grouting.
- .3 Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

- .4 Place thresholds, edge strips at exposed tile edges at locations indicated.
- .5 Cut and fit tile tight to penetrations through tile. Form corners, bases neatly. Align floor, base and wall joints.
- .6 Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- .7 Lippage: To TTMAC tolerances; 2 mm maximum.
- .8 Sound tile after setting. Replace hollow sounding units.
- .9 Grouting:
 - .1 Remove tile spacers, pegs, ropes and strings.
 - .2 Grout joints to be clean and free of standing water, dust, dirt, and foreign matter.
 - .3 Remove excess mortar from joints to maintain 2/3 of the depth of tile is available for grouting.
 - .4 Mix and apply grout in accordance with manufacturer's directions.
 - .5 Use hard-rubber floats with sharp edge to force grout into joints in continuous manner. Leave flush with tile edge.
 - .6 Compact grout in joints and maintain free of voids and gaps.
 - .1 Fill joints with maximum amount of grout.
 - .7 Remove excess grout from the face of tile.
 - .8 Clean tiles immediately following application of grout.
 - .9 Grout and clean in small areas.
- .10 Grout joint width:
 - .1 In accordance with manufacturer's direction to suit tile size.
 - .2 All grout widths to be uniform throughout installation.
- .11 Control joints:
 - .1 Spacing:
 - .1 Minimum: 4 875 mm (16'-0").
 - .2 Maximum: 6 100 mm (20'-0").
 - .2 Width: Minimum 6 mm.
 - .3 Show locations on tiling plans to be submitted.
 - .4 Keep control joints free of adhesive or grout.
 - .5 Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.
 - .6 Apply sealant to joints.
- .12 Allow tile to set for a minimum of 48 hours prior to grouting.
- .13 Grout tile joints.
- .14 Tile installation not to impede operation of swing of doors. Check all thresholds prior to installation.
- .15 Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.10 POOL TANK FILLING

- .1 Fill pool tank in accordance with manufacturer's directions.
 - .1 Co-ordinate with City of Winnipeg staff to have pool tanks filled. Pool tank filling and water testing of pool water will be completed by City of Winnipeg.
- .2 Rate of tank filling and draining: not to exceed 75 cm per 24 hours.
- .3 Water temperature: Difference in water temperature and tiled surface temperature not to exceed 10°C.

3.11 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services
 - .1 Co-ordinate with mortar bed, waterproofing and tile setting material Manufacturer's representative to inspect prepared conditions and installations as required to satisfy warranty requirements.
 - .2 Do not take instructions directly from the manufacturer's representative unless approved by the Contract Administrator.
- .2 Mortar Bed Bond Testing
 - .1 Conduct direct pull-out tensile tests in accordance with CSA A23.2, Procedure A to determine bond strength of mortar bed to:
 - .1 Pool deck floors: Minimum three locations.
 - .2 Tank floors: Minimum three locations per tank.
 - .3 Tank walls: Minimum three locations per tank.
 - .2 Schedule testing following minimum 72 hour cure of mortar bed, but prior to installation of waterproofing membrane.
 - .3 Infill core hole. Prepare surfaces and install mortar bed as specified.
 - .4 Submit test results in accordance with Section 01 33 00 – Submittal Procedures.
- .3 Post waterproofing application flood test
 - .1 Following application of waterproofing membrane, conduct flood testing of membrane as follows:
 - .1 Erect scaffolding and platform in middle of tank.
 - .1 Provide protection of membrane at locations of scaffolding supports in contact with membrane.
 - .2 Elevation of scaffold platform to be 6" below pool water elevation.
 - .2 Place plastic 5 gallon pail on top of scaffold platform.
 - .3 Sequentially fill pool in accordance with waterproofing membrane manufacturer directions.
 - .4 Fill 5 gallon pail with water. Elevation of water in pail to match elevation of pool tank water level.
 - .5 Over next 72 hours:
 - .1 Observe pool and pail water levels.
 - .2 Observe leaks in tank walls and floor from underside of tank.
 - .6 Record difference in pool and pail water levels.
 - .2 Where no difference in pool to pail water levels observed and no leaks observed at underside of tank, membrane is acceptable.
 - .1 Empty pool water at rate in accordance with manufacturer's directions and proceed with ceramic tiling.
 - .3 Where a difference in pool to pail water levels are observed or where leaks are observed at underside of tank:
 - .1 Empty pool water at rate in accordance with manufacturer's directions.
 - .2 Visually review waterproofing application with Contract Administrator and manufacturer representative.
 - .3 Repair defects observed in waterproofing membrane in accordance with manufacturer's directions.
 - .4 Apply another coat of waterproofing membrane.
 - .5 Re-test.

3.12

CLEANING

- .1 Clean tile and grout surfaces.

END OF SECTION