Part 1 GENERAL

1.1 GENERAL REQUIREMENTS

1. Conform to Sections of Division 1 as applicable.

1.2 DESCRIPTION

1. Work Includes:
    1. Concrete supply with specified aggregates and integral colour pigments.
    2. Surface preparations.
    3. Application of clear, colourless, liquid concrete hardener and densifier.
    4. Grind and polish of floor to desired finish.
    5. Application of water-based concrete enhancer.
    6. Joint sealant.

2. The concrete floor contractor shall include for the supply and installation of all concrete floor materials including: tinted concrete supply, reinforcing, placing, finishing, curing, jointing, joint caulking, polishing, and liquid hardening and densifying.

1.3 SUBMITTALS

1. Comply with Section 01300 - Submittals

2. Submit manufacturer's product data and application instructions.

3. Provide documentation showing finisher is certified by the polishing and densifier manufacturer.

1.4 QUALITY ASSURANCE

1. Standards:

    1. Comply with CAN/CSA A23.1 and the requirements of the Concrete Floor Contractors Association. All concrete floor and concrete polishing work is to be performed by a member in good standing of the Concrete Floor Contractors Association.
    2. ASTM C779 - Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
    3. ASTM F609 - Standard Test Method for Using a Horizontal Pull Slipmeter (HPS).
    4. In case of conflict between the reference standards, the more stringent requirements shall govern.

2. Mock-ups

    1. Up to 4 mockups of the concrete floor and final diamond polished finish shall be made prior to the preconstruction meeting for review and approval by the Consultant.

2. Apply mock-up of required finish to demonstrate exposure of aggregate, surface finish, color variations and to determine a level of workmanship.

3. Build mock-up in the location and dimensions as directed by the architect's representative.

4. Prior to proceeding, ensure that mock-up meets all requirements of the architect's representative.

5. Maintain mock-up during construction in an undisturbed condition as a standard for judging the work.

6. Provide name of technically qualified concrete polishing field representative.

7. Provide name of technically qualified densifier manufacturer's field representative.

8. Ensure that correct amount of densifier is onsite.

3. Pre-construction Meeting:

1. At least one month prior to the commencement of concrete flowing work, a preconstruction meeting shall be held on site to discuss the project specifications, site conditions, and other factors which may affect the outcome of the concrete floor finishing and polished concrete work. The meeting shall include attendance by the Consultant, General Contractor, Concrete Floor Contractor, Concrete Producer, Polished Concrete System Manufacturer and Inspection Company. The Concrete Floor Contractor shall submit a materials summary sheet and recommended joint layout at the preconstruction meeting.

1.5 QUALIFICATIONS

1. Use an experienced installer and adequate number of skilled personnel who are thoroughly trained and experienced in the floor treatment.

2. The applicator shall either:

1. An Induroshine approved applicator as certified by W. R. Meadows, having a minimum of 10 projects performed within three years of similar type, size and complexity as this contract.

2. Be a Level 2 Induroshine approved applicator by W. R. Meadows.

1.6 TOLERANCE

1. Allowance shall be from level given on Drawings, as determined by straight edge placed anywhere on the slab in any direction.

2. Finishes: Class A tolerance shall be true planes within 6mm using a 3m straight edge (1/4" in 10'0").

3. Concrete surfaces to receive a polished concrete finish shall be constructed using double pan float machines to a floor flatness tolerance of FF25 as per ASTM E1155. FF 25 will have no more than a single 1/4" defect across 10-feet.

1.7 DELIVERY STORAGE AND HANDLING

1. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

2. Store materials in a clean dry area in accordance with manufacturer's instructions.

3. Keep products from freezing.

4. Avoid direct contact with this product as it may cause mild to moderate irritation of the eyes and/or skin.

5. Protect materials during handling and application to prevent damage or contamination.

1.8 ENVIRONMENTAL REQUIREMENTS

1. Do not apply product when air, surface, or material temperatures are expected to fall below 4o C (40o F) within four hours of expected application.

2. Do not apply to frozen concrete.

3. Do not use on highly dense or non-porous surfaces.

4. Limit and control damage of all adjacent surfaces from excessive dust caused by grinding/polishing procedure.

5. Properly dispose of collected dry dust from polishing.

1.9 WARRANTY

1. Concrete floors shall be warranted against dusting and delamination for a period of 2 years.

1.10 ALTERNATE PRICE

1. See Supplementary Tender Form for the Alternate Price Item to use polished concrete finishing in lieu of porcelain tile at Lower Level (Basement).

Part 2 PRODUCTS

2.1 MANUFACTURER

1. W. R. Meadows, 70 Hannant Court, Milton, Ontario, Canada L9T 5C1.
   Phone 1.800.563.3618, Fax: 1.905.878.4125.

2.1 EQUIPMENT AND MATERIALS

1. Equipment to be used for grinding/polishing shall be:

   1. Three-head counter rotating variable speed floor grinding machine.

   2. Dust extraction system and pre-separator.

   3. 75kw MQ power generator or equivalent.

2. Equipment to be used for grinding/polishing shall possess at least 775 lb. of head pressure.

3. Equipment to be used for edge grinding/polishing shall be a hand grinder with dust extraction equipment.

4. Diamond grinding segments shall be:

   1. Metal bonds: 40, 60, 80 and 150 grit.

5. Diamond polishing pads shall be:

   1. Resin bonds: 100, 200, 400, 800, 1500, and 3000 grit.

6. Grinding pads for edges shall be:

   1. Resin bonds: 40, 60, 80, 100, 200, 400, 800, 1500, and 3000 grit.

7. Equipment to be used for densifying and cleaning the floor after grinding/polishing procedure has been performed:

   1. Tennant ride-on auto-scrubber or equivalent with a head pressure of 150 lb.

   2. Follow auto-scrubber's manual for cleaning instructions after densifying and conditioning the floor.

   3. Do not allow densifier to remain inside the auto-scrubber after densifying.

8. Concrete densifier:

   1. Liquid hardener/densifier shall be LIQUI-HARD as manufactured by W. R. Meadows.

9. Concrete enhancer:

   1. Water-based, synthetic polymer concrete floor enhancer shall be BELLATRIX as manufactured by W.R. Meadows.

10. Related Materials:

    1. Water: Potable water.

11. Polished concrete floors are to be heavy-ground to a full exposed aggregate finish. Aggregate in exposed concrete to be 3/8" crushed granite in two colors (red and black) or as selected by Consultant through the mock-up process.

12. Polished concrete floors are to be tinted with integral colour pigment or liquid admixture added by the concrete supplier at batch plant. Colour as selected by Consultant through the mock-up process.

13. Polished concrete surfaces are to polished to a semi-gloss honed finish (800 to 1200 grit as determined by Architect), and are to incorporate a liquid silicate densifier for polished concrete manufactured by one of the following companies: BASF, Curecrete, Euclid, W R Meadows, or Sika.

2. Colour matched rigid joint sealant at control joints: two component, semi rigid, polyurea control joint filler.

Part 3 EXECUTION

3.1 FLOATING

1. After all bleed water and water sheen has left the concrete surface and concrete is stiffened enough to walk on, mechanically float large open concrete surfaces using a machine fitted with float blades on a steel disc. Shake applied floor hardener is to be applied according to manufacturer's instructions to achieve a uniform surface.

3.2 STEEL TROWELLING

1. Machine or hand trowel concrete to produce a hard, smooth surface.

2. Repeat trowelling, with necessary time intervals in between to allow concrete to further harden until desired finish is achieved.

3. Keep trowel blades relatively flat for initial trowelling, raising blade on angle with subsequent passes.

3.3 GRINDING

1. Where steel trowel finish is not of specified quality, remove ridges, undulations or other imperfections by grinding.

3.4 CURING

1. Cure horizontal surfaces immediately after finishing operations, but not later than 12 hours, in normal weather, after concrete is placed. Slab on grade shall be kept

constantly damp for 14 days by fog spraying or covering with polyethylene, and by the application of Sternson FLOR-SEAL or equivalent curing and sealing compound.

2. Make good cracking and/or reduced strength and/or curling due to concrete drying out too rapidly. Assure that concrete is placed on thoroughly dampened subgrade, except where a poly vapor barrier is used.

3.5 CONTROL JOINTS

1. Sawcut control joints in slabs on grade. Locate control joints where shown on drawings but in any case of sufficient quantity and at locations to have maximum uncut dimensions of 5m in any direction and at all reentrant corners. Cut shall be 3mm wide and one fourth of slab thickness deep. Flush out sawcut immediately with water.

2. Make sawcuts no sooner than 12 hours nor later than 24 hours after finishing, depending upon curing conditions. Alternatively, use the "soft" cut technique where directed by the Engineer. Do not fill sawcuts for a least 28 days.

3. After 28 days, clean out sawcuts using brushes and compressed air, removing all dirt and foreign material. Fill sawcuts with specified filler. Finish to match surrounding surfaces.

3.6 PROTECTION

1. Protect concrete from harmful effects of heaters, mechanical shock, sunshine, drying winds, cold weather and running or surface water.

2. No materials shall be piled, stored, shovelled or handled on slabs, across slabs, until seven days after placing concrete.

3.7 SLABS

1. Top of all concrete floor slabs and toppings shall be steel trowel finished to Class A tolerance, except for floors receiving carpet, tile or quarry tile to be Class B.

End of Section 03 35 43