Part 1 GENERAL

1.1 GENERAL INSTRUCTIONS

1. Read and conform to:

    1. CCDC 5B - 2010, Construction Management Contract for Services and Construction as amended in the Contract Documents.

    2. Division 1 requirements and documents referred to therein.

1.2 SUMMARY

1. Section Includes: Provide crystalline waterproofing including but not limited to following:

    1. Application of crystalline waterproofing to interior of elevator pits, sumps and other pits or depressions in slabs on grade and elsewhere where indicated.

    2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

        1. Provision of cast-in-place concrete: Structural.

1.3 REFERENCES

1. Reference Standards:

    1. ASTM C267-01(12) - Standard Test Method for Chemical Resistance of Mortars, Grouts and Monolithic Surfacing

1.4 ADMINISTRATIVE REQUIREMENTS

1. Coordination: Coordinate work of this Section with items to be cast-in or grouted into surfaces to receive crystalline waterproofing to ensure compatibility and continuity of waterproofing application.

1.5 SUBMITTALS

1. Product Data: Submit Product data, including manufacturer's specifications and general recommendations for waterproofing applications.

2. Test and Evaluation Reports: Submit test reports from approved independent testing laboratories certifying waterproofing system conforms to performance characteristics and testing requirements specified herein.

3. Certificates: Provide certificate signed by manufacturer's representative certifying materials installed comply with requirements of this specification and

applicator is qualified and approved to install Product in accordance with manufacturer's recommendations.

1.6 QUALITY ASSURANCE

1. Qualifications:

   1. Installers: Provide work of this Section executed by competent installers with minimum 5 years experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

1.7 SITE CONDITIONS

1. Ambient Conditions: Ensure surfaces and ambient air temperature is not less than 5 deg C (41 deg F) for a minimum period of 48 hours before, during and for 48 hours after applications.

1.8 WARRANTY

1. Manufacturer Warranty: Warrant work of this Section for a period of 2 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; water leakage, except as result of structural failure of concrete substrate. Cracks arising from normal shrinkage and/or expansion of concrete which are 0.3 mm (1/100") wide or less are not to be considered as structural failure. Hairline cracks which result from these causes are to be considered normal and consequently warranty will not be invalidated as a result of these minor defects.

PART 2 PRODUCTS

2.1 MANUFACTURERS

1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
   1. Aquafin, Inc.; www.aquafin.net
   2. Euclid Chemical Canada Ltd.; www.euclidchemical.com
   3. Tremco Canada; www.tremcosealants.com
   4. W.R. Meadows of Canada; www.wrmeadows.com
   5. Xypex; www.xypex.com

2. Substitution Limitations: This Specification is based on Tremco Canada's "Permaquik Products". Comparable Products from manufacturers listed herein will be accepted provided they meet requirements of this Specification.

2.2 MATERIALS

1. Performance/Design Criteria:

    1. Cementitious crystalline waterproofing is a blend of Portland cement, fine treated silica sand active proprietary chemicals. When mixed with water and applied as cementitious coating, active chemicals cause a catalytic reaction which generates a non-soluble crystalline formation of dendritic fibers within pores and capillary tracts of concrete causing concrete to become permanently sealed against penetration of liquids from any direction.

    2. Ensure chemical resistance in accordance with ASTM C267 exhibits no detrimental effects after exposure

    3. Ensure waterproofing treatment prevents passage of water under pressure and capable of spanning cracks up to 1.5 mm (1/16") without failure.

2. Crystalline Waterproofing: “Permaquik® Crystalline Waterproofing” by Tremco Canada, surface applied waterproofing compound, consisting of a patented formula of chemicals, cement and specially treated quartz which waterproofs by crystalline growth through cementitious voids in concrete substrate.

3. Slurry Coat: "Permaquik Super 200" by Tremco Canada, applied in slurry consistency or powder application on concrete surfaces to prevent passage of water under pressure.

4. Premixed Mortar: Ensure premixed waterproofing material is "Permaquik Mortar 300" by Tremco Canada used in connection with "Permaquik Super 200" by Tremco Canada; mixed to mortar consistency for filling of form tie holes, honeycombed areas, routed out cracks and seal strips and coves at construction joints, to assure water tightness of structure.

5. Water: Free from matter deleterious to waterproofing materials.

6. Sealant: Compatible with waterproofing material, of type which will not re-emulsify and acceptable to manufacturer of waterproofing material.

7. Mixes:

    1. Slurry Consistency: Use separate containers for measuring by volume powdery materials. Add water to materials (not vice versa) and mix thoroughly. Ensure ratio of water to powder is as recommended by waterproofing material manufacturer. Prepare only as much slurry mixture as can be applied within 20-30 minutes. Do not add more water when mixture starts to thicken. Stir mixture frequently.

    2. Mortar Consistency: Measure "Slurry Coat" and "Premixed Mortar" material and mix powder thoroughly. Add water to powdery mixture and work with trowel until a medium stiff consistency is reached. Prepare only as much mortar as can be applied within 10-15 minutes. Ensure ratio of water and powder is as recommended by waterproofing manufacturer.

Part 3 EXECUTION

3.1 EXAMINATION

1. Verification of Conditions: Examine concrete surfaces to be waterproofed for visible structural defects. Report unacceptable surface conditions. Report in writing, location of cracks exceeding 0.3 mm (1/100"). Commencement of work implies acceptance of previously completed work.

2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 PREPARATION

1. Surface Preparation:

    1. Remove form scale, laitance, oil, form release agents and other foreign materials likely to affect bond, penetration and performance of waterproofing. Employ steam cleaning, or sandblasting as required.

    2. Prepare smooth surfaces resulting from steel formwork and similarly smooth surfaces by light sandblasting or high pressure water blasting.

    3. Ensure prepared surfaces use an open crystalline system to assure permanent bonding of waterproofing application.

    4. Horizontal Concrete Surfaces:
        1. Do not treat concrete surfaces with floor hardener or curing agents prior to waterproofing application.
        2. Rout out to minimum 38 mm (1-1/2") wide by 19 mm (3/4") deep, construction joints and visible cracks exceeding 0.3 mm (1/100") in size. Thoroughly rinse with water all concrete slab surfaces. Remove free water a Day prior to waterproofing application. Ensure concrete surfaces are damp at time slurry coating is applied.

    5. Vertical Concrete Surfaces:
        1. Ensure form tie holes are left approximately 25 mm (1") back of surface.
        2. Ensure honeycombed pockets and faulty construction joints are routed out to sound concrete.
        3. Ensure vertical and horizontal construction joints and visible cracks in concrete surfaces exceeding 0.3 mm (1/100") are routed out 38 mm (1-1/2") wide by 19 mm (3/4") deep.
        4. Rinse surfaces to be waterproofed thoroughly with water a Day prior to waterproofing application. Ensure moisture is present in concrete substrate to achieve maximum initial penetration of activated waterproofing chemicals. Ensure surfaces are moist only (not wet) when waterproofing is applied.

3.3 APPLICATION

1. Waterproofing:

    1. Apply waterproofing material to concrete surfaces as soon as possible after stripping of formwork.

    2. Carry waterproofing up to pipes, standards and other items projecting through substrate, cut back to receive sealant.

    3. Waterproof concrete construction joints and pipes, standards and other items projecting through substrate.

    4. Apply slurry coatings by using a stiff masonry brush, or with suitable spray equipment.

    5. Allow each successive coat to reach initial set before recoating.

    6. Horizontal Concrete Surfaces:

        1. Dry sprinkle and power trowel or wood float application for slabs unless otherwise approved. When concrete of structure slab starts to reach initial set, dry sprinkle Slurry Coat 1.4 kg/m² (2.5 lbs/sq yd) on concrete surfaces and power trowel or wood float surfaces until uniformity in coverage and specified finish is reached.
        2. Where it is not possible or practical to float waterproofing into concrete structure, and where approved, apply slurry coating to concrete surfaces, "Slurry Coat" 1.4 kg/m² (2.5 lbs/sq yd) in slurry consistency. Apply slurry coatings uniformly in quantities specified (in 1 or 2 successive coatings). Second slurry coating of "Slurry Coat" may be applied while first coat is still green but after it has reached an initial set.
        3. Ensure vertical construction joints are treated with "Slurry Coat" 1.4 kg/m² (2.5 lbs/sq yd) in slurry consistency or powder form on pre-wetted surface immediately prior to pouring of concrete.
        4. Install seal strip 19 mm x 38 mm (3/4" x 1-1/2") at construction joints and at routed out cracks. Ensure seal strips consists of 2 laminating layers of "Slurry Coat" and "Premixed Mortar" material 1:6 in mortar consistency.

    7. Vertical Concrete Surfaces:

        1. Treat horizontal construction joints where accessible with "Slurry Coat" at rate of 0.8 kg/m² (1.5 lbs/sq yd) in slurry consistency or dry sprinkled on pre-wetted surfaces immediately prior to pouring of concrete.
        2. Rout out honeycombed areas, faulty construction joints and cracks, apply slurry coating of "Slurry Coat" 1.4 kg/m² (2.5 lbs/sq yd) and fill with mortar ("Slurry Coat" and "Premixed Mortar") 1:6 in laminating layers.
        3. Ensure form tie holes are filled with "Slurry Coat" and "Premixed Mortar" material 1:6 in mortar consistency after slurry coat of "Slurry Coat" has been applied.

4. Install seal strip 19 mm x 38 mm (3/4" x 1-1/2") at construction joints and junction of walls and slab with "Slurry Coat" and "Premixed Mortar" material 1:6 (mortar consistency) in 2 laminating layers.
5. Apply to concrete surfaces "Slurry Coat" 1.4 kg/m² (2.5 lbs/sq yd). Ensure slurry coating is uniformly applied in quantities specified (minimum 2 coatings). Fill small pockets in concrete surfaces with "Premixed Mortar" in mortar consistency. Second slurry coating of "Slurry Coat" can be applied while first coat is still green, but after it has reached an initial set. Ensure waterproofing is continuous through recesses to receive horizontal slabs and is installed prior to slab pour.

2. Curing:

1. When temperatures fall below freezing, cover waterproofed surfaces with tarpaulins, or other protection, and maintain surface temperature above 5 deg C (41 deg F) for a minimum period of 3 Days after completion of waterproofing application.

2. Protect freshly waterproofed surfaces from rain for a minimum of 24 hours.

3. Moist cure waterproofed surfaces for a minimum of 3 Days, starting with fine water fog spraying the day following completion of application.

4. During extreme hot weather, apply, as required, a light water fog spray to freshly applied slurry application in order to prevent dehydration of waterproofing.

3. Waterbars and Sealant:

1. Examine installed waterbars to ensure that proper waterbars are provided, correctly welded at joints and that placing of concrete does not destroy purpose of waterbars, as required to make foundation walls and slabs on grade watertight. Cooperate with and coordinate work of this Section with work of Section providing waterbars.

2. Seal around pipes and other protrusions with sealant.

3.4 SITE QUALITY CONTROL

1. Site Tests and Inspections: Owner may engage services of an independent inspection and testing company to carry out inspection and testing of work of this Section. Cost of such inspection and testing, if required, will be paid by Owner.

2. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Consultant at no cost to Owner.

3.5 CLEANING

1. Clean and repair to Consultant's approval surfaces soiled or otherwise damaged in connection with work of this Section. Replace materials or finishes that cannot be satisfactorily cleaned at no cost to Owner.

2. Waste Management: Upon completion of work remove debris, equipment and excess material from site.

3.6 PROTECTION

1. Protect surfaces which are not to be waterproofed from soiling or other damage resulting from work of this Section.

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