XYPEX® Method Statement

Sustainability In Concrete Structures

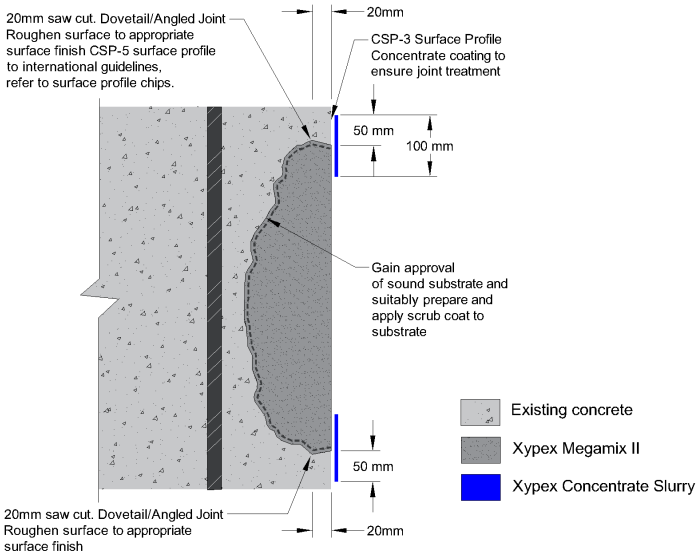
XYPEX CRYSTALLINE REPAIR SYSTEM

Repair of Concrete Spalling and Honeycombing

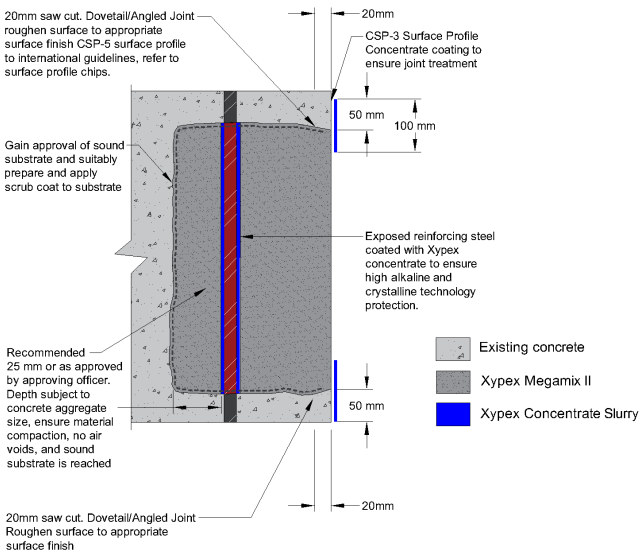
2018-06

The information presented is in addition to Xypex product data sheets and is not meant to replace these or any other installation guides but rather is meant to give a general description of the installation practices and procedures surrounding the use of Xypex products for waterproofing and protecting concrete and while normally provide an acceptable final appearance they are not meant as aesthetic finishes. Refer to Safety Data Sheets for safety information, applicators need to use all products and equipment in line with manufacturers and industry requirements.

TYPE A



TYPE B



***For special repair cases, please contact the Xypex Australia Technical Department**

SURFACE PREPARATION

TYPE A – SURFACE PREPARATION

1. Saw cut perimeter of concrete spalling or honeycombing area to a minimum 10mm, preferably 20mm with dove tail/angle joint. Roughen saw cut surface to a CSP-5 profile. Recommend diamond based masonry with soft matrix blade for rough finish.

2. Remove all loose and unsound concrete preferably using hydro demolition. Alternatively using jack-hammer (pneumatic, electro-mechanical or hydraulic) until a sound substrate is exposed. (Note: repair depth and area for reinstatement is to be approved prior to works by the supervising officer/client, should depth exceed the officer's direction or additional cracking and corrosion occur. Consult supervisor). Care is to be taken to avoid damage to the sound concrete adjacent/below the repair area. The substrate and materials should have a temperature between 3-30 degrees and >5 deg dew point at wind speeds <5 m/s at the time of application.

3. Clean the prepared surface by high pressure water blasting (3500-5000 psi or as required). Blast to remove dirt, debris, loose particles and to provide an open capillary surface. Conduct test wash prior to full application. Achieve surface profile CSP-5 to International Concrete Repair Institute Guidelines, refer to Surface Profile Chips.

4. Ensure concrete is saturated and water absorbed by concrete then remove excess surface water before application to achieve saturated surface dry (SSD) condition. No glistening water should be present on the surface. If concrete dries out before application, it must be re-wetted with fine mist spray.

TYPE B – SURFACE PREPARATION

1. Saw cut perimeter of concrete spalling or honeycombing area to a minimum 10mm, preferably 20mm with dovetail/angled joint. Roughen saw cut surface to a CSP-5 profile. Recommend diamond based masonry with soft matrix blade for rough finish.

2. Remove all loose and unsound concrete preferably using hydro demolition, particularly not to damage reinforcement. Alternatively jack-hammer (pneumatic, electro-mechanical or hydraulic) until a sound substrate is exposed.

XYPEX CRYSTALLINE REPAIR SYSTEM

Repair of Concrete Spalling and Honeycombing

2017-09

(Note: repair depth and area for reinstatement is to be approved prior to works by the approving officer/client, should depth exceed the officers direction or additional cracking, weak concrete and corrosion occur. Consult supervisor). Care is to be taken to avoid damage to the sound concrete and reinforcement adjacent/below the repair area. The substrate and materials should have a temperature between 3-30 degrees and >5 degrees dew point at wind speeds <5 m/s at the time of application.

3. When steel reinforcement is exposed and the corrosion of steel bars is observed, the whole length of corroded zone of steel shall be exposed until intact steel bar is visible under the approval of suitability qualified project officer. All steel should be cleaned of all rust especially laminations and pitting. The level of cleaning required for steel reinforcement prior to repair can vary depending on the type or nature of surface rust. Steel surfaces with flaky rust deposits must be cleaned to achieve a standard purity of at least Class 2.5 and 2.0 (AS1627.4). Steel cleaning and finishing method of works is to be advised by the supervising engineer/officer.

4. Measure the corroded/reduced diameter of the reinforcing steel with callipers. Engineering requirements dictate whether the residual capacity of a deteriorated bar necessitates replacement or whether supplementary strengthening is necessary. As a guide for bars less than 25mm in diameter a 10% reduction of bar diameter may be acceptable. Bars should also be checked for pitting and other defects. A competent engineer/officer representing the client is needed to assess the extent of reinforcement degradation and concrete damage and approve the extent and repair works. One method of steel replacement of corroded steel is to cut out the damaged area and splice in replacement bars with a specified lap length. Mechanical couplers may be used if approved. Contact site supervisor and/or Xypex Technical Department for possible works methods. All repair methods are to be approved by a competent engineer/officer representing the client. Xypex and Applicators do not take responsibility for the structural design, repair extents, structural integrity of the asset.

5. Remove all unsound concrete beyond the exposed corroded bars to encapsulate the steel reinforcement with the repair material; the clear space behind the reinforcing is recommended as 25mm but is to be approved by the supervising engineer/officer. Existing aggregate size, compaction and works methods to be considered. The depth is required to achieve a sound substrate.

6. Clean the prepared surface and 50mm of concrete surface beyond to saw cut line by high pressure water blasting (3500-5000 psi or as required). Blast to remove dirt, debris, loose particles and to provide an open capillary surface. Conduct test wash prior to full application, achieve surface profile CSP-5 to International Concrete Repair Institute Guidelines, refer to Surface Profile Chips. Ensure concrete is saturated and water absorbed by concrete then remove excess surface water before application to achieve saturated surface dry (SSD) condition. No glistening water should be present on the surface. If concrete dries out before application, it must be re-wetted with fine mist spray.

XYPEX MEGAMIX II MIXING PROCEDURE (TYPE A and B)

1. A mechanical mortar mixer and paddle with a capacity for low speed continuous blending can be used. Ensure mixing equipment is clean and does not remove fibers from the mix. *Xypex Megamix II* typically requires 2.4 to 2.8 litres of clean potable water (8°C to 25°C Water Temp Recommended) for every 20kg pail.

2. DO NOT exceed maximum water content of 2.8 litres.

3. 2.4 litres of water per 20kg should be suitable for vertical wall applications but for applications requiring higher workability or due to project conditions additional water up to a maximum 2.8 litres may be applied. Xypex recommends conducting a test mix and application to check the water content to produce a suitable material workability and bond strength under the project conditions.

4. Add approx. 90% of the required amount of water to a mixer/pail and then add the *Xypex Megamix II* powder. Mix briefly and add the remaining water to the mix to achieve the required consistency (2.4 to 2.8 litres total).

XYPEX CRYSTALLINE REPAIR SYSTEM

Repair of Concrete Spalling and Honeycombing

2018-06

NOTE: It is a requirement the mixing is carried out for 3-5 minutes to emulsify all polymers, blend fiber's and provide a uniform consistency. Over mixing or delivery delays may result in product stiffening. DO NOT over water.

XYPEX CONCENTRATE (TYPE B)

TREATMENT OF EXPOSED REINFORCEMENT

1. Mix five (5) parts dry powder of *Xypex Concentrate*, to two (2) parts clean water by volume into slurry consistency. Allow mixture to stand and start to harden, then reagitate. Apply *Xypex Concentrate* slurry coat to the prepared reinforcing steel. Use *Xypex Concentrate* Method Statement/ Data Sheet. Apply *Xypex Concentrate* with a CSP-5 surface Profile finish. Allow the *Xypex Concentrate* scrub (prime coat) to near initial set with some tackiness (approx. 12 hours). *Xypex Megamix II* can then be applied onto coated reinforcement. Do NOT allow *Xypex Concentrate* coating to fully set and dry.

APPLICATION PROCEDURE

1. Apply *Xypex Megamix II* scrub coat and place to the profile as per *Xypex Megamix II* data sheet instructions. Ensure the repair is well packed and fill the space behind the reinforcing bars taking care to eliminate air-pockets between layers. *Xypex Megamix II* thickness should be 10mm min thickness and applied in layers to a maximum 50mm layer. Roughen and score the surface before applying successive layers and apply immediately following initial set while layer is still "green". Apply scrub coat between layers. Finish to nominated surface profile and texture. For multiple lift layers contact the Xypex Technical Department.

2. While *Xypex Megamix II* is still "green", and stiff to accept the *Xypex Concentrate* coat, apply one coat of *Xypex Concentrate* slurry (0.8 kg/m2) on the repaired joint extending 50mm both sides of the repair joint, refer to *Xypex Concentrate* method statement/data sheet.

3. Cure under normal conditions by maintaining moisture by applying mist spray of clean water 3 times a day for 3 days. In hot or arid conditions spraying may be required more frequently. Refer to *Xypex Concentrate* and *Megamix II* data sheet. DO NOT use *Xypex Gamma Cure* to cure *Xypex Concentrate* above *Xypex Megamix II*.

NOTE:

- Prior to installation it is recommended that a test section be completed under anticipated ambient and project conditions to demonstrate appropriate bond strength.
- Refer to *Xypex Megamix II* data sheet for spray and overhead applications.
- Additional wire mesh, attached to the substrate, may be considered for multiple lift repairs.
- Repairs should not be mixed and placed at temperatures below 4ºC or above 30ºC. Protect from rapid evaporation (hot and/or cold and windy conditions).
- Repairs are to be protected from direct sunlight, rain, frost, wind and temperature below 3ºC for a period of not less than 48h. After application, if plastic sheet is used as a protection, it must be raised off the Xypex to allow the coating to breathe.
- Refer to safety data sheets for safe handling procedures.
- This method statement is a guide only. The project specific works method and extent of works/repairs is to be assessed and approved by a suitable and competent engineer for structural integrity, safety, and suitability before, during and after the proposed works. The works method is to be in accordance with HB84:2018 "Guide to Concrete Repair and Protection" and associated Australian Standards.
- Should the structure be subject to loading, deflection, thermal movement, pre-stressed and post tensioned materials. Detailed structural engineering investigations and alternative methods may be required. It may also be necessary, where appropriate, to check the susceptibility of the coating to damage by freezing and thawing due to trapped water in the concrete.