

SYSTEM FOR THE REPAIR AND PROTECTION OF STEEL REINFORCED CONCRETE



B01



concrete substrate

1

corrosion-inhibiting mortar
Mapofer 1K

2

structural repair mortar
MapegROUT T40

or

structural repair mortar
MapegROUT T60

3

smoothing mortar
Planitop Smooth & Repair R4

4

waterproofing and protective coating
Mapelastico Smart

or

waterproofing and protective coating
Mapelastico Guard

5

painting surface

6

Please refer to the corresponding Work Method Statement for complete list of suitable products and installation information

PART 1 SYSTEM

1.1 SCOPE

Prior to the removal of any concrete, it is essential to conduct a thorough assessment of the cause and extent of damaged, deteriorated or defective concrete. Professional advice may be required to determine the severity of the deterioration, the stability of the structure and suitability of repair works.

This work method statement covers the systems for repair and protection of steel reinforced concrete, in accordance with relevant standards, industry best practice and as per MAPEI technical data sheets (TDS).

1.2 REFERENCES

1. SA HB 84-2018 – Guide to concrete repair and protection
2. [Protection and Repair of Concrete in compliance with European Standard UNI EN 1504](#)
3. EN 1504 – Products and systems for the protection and repair of concrete structures

1.3 SUBSTRATE PREPARATION

1. Concrete Substrate

Remove any laitance, spalling, loose or deteriorated concrete via means of high-pressure hydro-scarifying or scabbling. Make sure a surface roughness of at least CSP 3 is achieved in accordance with the International Concrete Repair Institute (ICRI) standards. Clean the surface to remove any contaminants that may inhibit bond, such as, dust, grease, oil, paint or corrosion deposits. The substrate must then be prepared in accordance with relevant MAPEI technical data sheets (TDS).

2. Steel Reinforcing

Exposed reinforcing must be cleaned back to a bare metal surface, removing all corrosion. Removal via hydro-sandblasting for large areas or vigorous brushing for small areas is recommended. The rods must be fully exposed with adequate space behind the reinforcement for cleaning, anti-corrosion treatment and repacking with the selected repair mortar. The space should never be less than 2-3 times the size of the largest aggregate in the repair mortar.



1.4 EPOXY CRACK REPAIR

- **NOTE:** First assess if the crack is static or live. Static cracks are generally suitable for repair. Whereas cracks that are still moving, require evaluation prior to repair to determine the cause and extent of movement, otherwise the cracks may reform.

Epoxy crack repair product to be chosen from the following options:

A. EPOJET (367-2-2018)

Two component, super-fluid epoxy resin for injections and anchoring

B. EPOJET LV (365-2-2016-11)

Two component epoxy resin, with very low viscosity for injection in microcracks, also on wet surfaces.

C. EPORIP (366-7-2013)

Two component solvent-free epoxy adhesive for construction joints and for monolithic sealing of cracks in concrete and screeds.

- **APPLICATION:**

- ◇ Cracks between 0.2 - 0.5 mm must be opened with a grinder and cleaned of any dust resulting from grinding or job site contamination. Cracks greater than 0.5 mm should also be prepared with a grinder to remove any loose or crumbly parts.
- ◇ Pour component B into component A and mix with a trowel or drill mixer at a low speed.
- ◇ For horizontal applications pour directly into the crack. Then spread **Quartz 1.2** over the surface and allow to dry in order to favour bonding of the subsequent product. Ensure any loose sand is removed once the product has cured.
- ◇ For vertical applications use **EPOJET** or **EPOJET LV** via injection. Apply **ADESILEX PG1 RAPID** (374-4-2016 GB) or **ADESILEX PG2** to seal injection tubes and the entire working surface. Refer to the TDS for further details.

1.5 CORROSION-INHIBITING MORTAR

A. MAPEFER 1K (453-8-2013)

One component, corrosion inhibiting cement mortar for the protection of reinforcing rods.

- **APPLICATION:**

- ◇ Apply the mortar in two homogeneous coats with a brush, approximately 2 hours apart but no longer than 24 hours, to ensure a total dry thickness of 2 mm is achieved.
- ◇ Allow to cure before applying a repair mortar (approximately 6-24 hours at 20°C 50% R.H.).



1.6 STRUCTURAL REPAIR MORTAR

- **NOTE:** Prior to the application of any repair mortar, ensure the substrate is surface saturated dry (SSD), as per SA HB 84-2018 – Clause 6.7.2. Any excess/free-standing water must then be allowed to evaporate. As an alternative to water, use **EPORIP** (366-7-2013) as a wet on wet bonding bridge to achieve a monolithic bond, refer to the TDS for further detail.

Structural Repair Mortar to be chosen from the following options:

A. MAPEGROUT T40 (308-10-2017 AUS)

Medium strength (40 MPa), shrinkage compensated, fibre reinforced, thixotropic mortar for repairing concrete. Applied in layers from 10 to 35 mm.

B. MAPEGROUT T60 (317-12-2016 AUS)

Sulphate resistant, fibre reinforced, shrinkage compensated, thixotropic mortar for the repair of concrete. Applied in layers from 10 to 50 mm on vertical and horizontal surface, and 20 mm on ceilings.

- **APPLICATION:**

- ◇ Mix and apply the mortar in accordance with the TDS.
- ◇ Once repair work is complete and the material has hardened (8-12 hours), keep the mortar damp for the first 48 hours using a water spray, especially in hot and windy environments.

1.7 SMOOTHING MORTAR

- **NOTE:**

- ◇ Prior to the application of the smoothing mortar ensure the substrate is saturated (SSD), as per SA HB 84-2018. Any excess/free-standing water must then be allowed to evaporate.
- ◇ Once repair work is complete and the material has hardened, keep the mortar damp for at least 24 hours using a water spray, especially in hot and windy environments.

Smoothing mortar to be chosen from the following options:

A. PLANITOP 210 (110-7-2013)

Water-repellent, cementitious skimming mortar with a fine, natural finish for concrete and plastic coatings. Applied in layers up to 3 mm.

- **APPLICATION:**

- ◇ Mix and apply the mortar in accordance with the TDS.
- ◇ Finish the surface with a trowel or a damp sponge float a few minutes after application.

B. PLANITOP SMOOTH & REPAIR R4 (1136-9-2014) + MAPETARD ES

Structural R4 class, rapid setting, shrinkage compensated, thixotropic, fibre reinforced, cementitious mortar, applied in a single layer from 3 to 40 mm thick.

- **APPLICATION:**

- ◇ To extend the pot life, add a canister of **MAPETARD ES** to the mixing water in accordance with the **PLANITOP SMOOTH & REPAIR R4** TDS. Otherwise **PLANITOP SMOOTH & REPAIR R4** can also be mixed with water only, in accordance with the TDS.
- ◇ Add the powder slowly to the water or water mixed with **MAPETARD ES** while mixing in accordance with the TDS.
- ◇ Apply the mortar and finish the surface with a trowel or a damp sponge float a few minutes after application.

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1.8 PROTECTIVE COATING SYSTEM

- **NOTE:** Prior to application of either protective coating:
 - ◇ Ensure the substrate is not highly burnished. Achieve a surface profile of CSP 1 – 3.
 - ◇ Dampen the substrate with water and allow free standing water to evaporate prior to application.
 - ◇ Mix components A & B in strict accordance with the TDS.

Protective Coating System to be chosen from the following options:

A. MAPELASTIC SMART (2013-03-2018 AUS)

Two component, Class II high flexibility cementitious mortar (with crack-bridging capacity >2 mm) applied by trowel or roller for the protection of concrete structures.

- **APPLICATION:**

- ◇ Membrane must be applied in at least two coats by trowel or roller within 60 minutes of it being mixed. Waterproofing membrane applied at a thickness of at least 1 mm per wet coat.
- ◇ In areas with hairline cracks or which are highly stressed, insertion of **MAPENET 150** in the first layer of fresh **MAPELASTIC SMART** is recommended.

B. MAPELASTIC GUARD (2146-2-2018)

Two-component flexible cementitious mortar for protecting large concrete structures subject to high stress.

- **APPLICATION:**

- ◇ Skim the damp, prepared surface with **MAPELASTIC GUARD** to a feather edge with a smooth trowel, then while still fresh, apply **MAPELASTIC GUARD** to a thickness of at least 2 mm.
- ◇ For structures with hairline cracks or areas that are particularly stressed, we recommend applying 2 layers, embedding **MAPENET 150** in the first layer of fresh **MAPELASTIC GUARD** to reinforce the mortar. After embedding the mesh, finish off the surface with a flat trowel and apply the second layer of **MAPELASTIC GUARD** when the first layer has hardened (Approximately 4-5 hours).

1.9 MOISTURE CONTROL SYSTEM – IF A PROTECTIVE COATING SYSTEM WAS NOT USED

- **NOTE:** After applying **ANTIPLUVIOL W**, water-based products may not be used to paint over the surface.

A. ANTIPLUVIOL W (2036-8-2016)

Colourless, silane and siloxane-based water-repellent impregnator in water emulsion.

- **APPLICATION:**

- ◇ Apply on dry surfaces only by spray with a Nap-sack unit, roller or brush.
- ◇ Apply multiple coats until the surface is completely saturated, with each successive coat applied while the previous coat is still wet.

MAPEI provides technical data sheets (TDS) and safety data sheets (SDS) for all products which should be read in conjunction with this Work Method Statement (WMS). Where necessary, conduct a chemical risk assessment and SWMS to ensure each products' correct and safe use. These documents can be obtained from www.mapei.com.au, or by clicking directly on the products listed within the PDF.

This Work Method Statement (WMS) provides general recommendations only and is not intended to be interpreted as a generic specification for the application/installation of the listed products. As each project differs in exposure and site conditions, specific recommendations may vary from the information contained above. For recommendations for specific applications/installations please contact MAPEI Australia Pty Ltd.

