

Case 02 Repair of damage with exposed steel reinforcement

Surface preparation

Before undertaking any concrete repair, care should be taken to fix props and supports around the location to be repaired, especially in the surroundings of damaged columns and beams.

The following surface preparation is recommended:



STEP 1:

- By using a marker pen, delimit the area of damage.
- Break beyond the delimited area until reaching sound concrete and steel.
- With a jack hammer, saw-cut 2 cm deep in 90° angle the perimeter of breaking, in order to avoid feather edges.
- All weak, damaged and easily removable concrete should be chipped away. If the re-bars are only partially exposed after all unsound concrete is removed, it may not be necessary to remove additional concrete to expose the full circumference of the reinforcement. When the exposed reinforcement steel has loose wrap, corrosion or is not well bonded to the surrounding concrete, the concrete removal should continue until a clear space of 15 to 25 mm is created behind the reinforcing steel.

STEP 2:

- Clean steel reinforcement with mechanical wire-brushing or by sand blasting.
- In case the reinforcing bars are corroded and have lost more than 25% of their diameter, they have to be cut and removed.

STEP 3:

• In such event, removed steel bars should be replaced with new steel bars of the same diameter either by respecting the overlap length or by welding 100 mm length to the existing steel

STEP 4:

• Remove dust by air blowing and wash with clean water to achieve a Surface Saturated Dry (SSD) substrate.









Solution 02

Repair of damage with exposed steel reinforcement

Protection of steel reinforcement against corrosion

After all necessary preparation, steel reinforcement should be protected against corrosion with a highly alkaline product **Conrep.370 PF** or a zinc rich product that delays the aggressive elements attack on steel, like **Conrep.501 ZRP**.

SOLUTION A: Damaged surface with repair thickness up to 10 cm

Recommended products



Conrep.331 TX is a thixotropic, non-shrink repair mortar, fiber reinforced and polymer modified.

The powder is mixed with the proper amount of clean water using an appropriate electrical mixer until a homogeneous paste is obtained.

Conrep.331 TX and **weber.rep ST** can be applied for thickness up to 5 cm in one coat. A thickness of up to 10 cm can be achieved in two layers. For areas that are difficult to access, or if there is a need for a flowable repair mortar, use **Conrep.301 GA**, a highly fluid non-shrink mortar. When mixed with the proper amount of clean water using an appropriate electrical mixer, a lump free homogeneous and pourable mix is obtained. This product is applied into a 5cm layer. For higher compressive strength it is recommended to use **Conrep.301 HCS** to replace **Conrep.301 GA**. For higher compressive strength, it is recommended to use **Conrep.331 TX**. Proper curing should be performed.





Solution 02 Repair of damage with exposed steel reinforcement

SOLUTION B: Damaged surface with repair thickness above 10 cm

Recommended products



Conrep.311 MC is a non-shrink micro-concrete for structural repair and general void filling. When mixed with the proper amount of water using an appropriate electrical mixer, a lump-free homogeneous mix is obtained.

For higher compressive strength it is recommended to use Conrep.311MC- HCS.

Conrep.311 MC and Conrep.311 MC-HCS can be applied in thickness ranging from 50 mm to 300 mm per layer although greater thickness up to 500 mm can be practiced depending on the design of the repair job and level of steel reinforcement.









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Curing and Protection

Recommended products



After completion of repair, or between two layers, and when the repair mortar has reached its final setting (which depends on the ambient temperature), the repaired area should be cured either by using the traditional method or by applying a curing compound Cure WT or Cure Y40. The repaired area should be protected with Polyethylene sheet against drying due to wind or fast evaporation.

