

## Renovation and strengthening of reinforced concrete structures with collaborative castings – reconstruction of missing parts of the casting

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### APPLICATION DATA SHEET

Renovation and strengthening of reinforced concrete structures with collaborative castings through:

1. Removal of the damaged concrete;
2. treatment of the existing metal reinforcement;
3. protective treatment of the reinforcement bars;
4. placement of new reinforcement bars and creation of the formwork;
5. pouring of the castings;
6. skimming;
7. final protective coat.

#### 1) REMOVAL OF THE DAMAGED CONCRETE

The surfaces to be restored must be prepared by completely removing the damaged concrete by hand or mechanical chipping or by other suitable means such as hydro-scarifying, in order to obtain a solid support, free of loose parts and sufficiently rough.

The concrete in contact with the visible metal reinforcements must be removed from each side of bars using a needle gun; the areas to be skimmed will be preliminarily sanded and / or hydro-sandblasted to eliminate any residue of old paint, dirt, disarming, mosses and / or lichens, dust, friable materials in general that would prevent the perfect adherence of the mortar to the substrate.

#### 2) TREATMENT OF THE EXISTING METAL REINFORCEMENT

Perform the brushing of exposed reinforcing bars or proceed with hydro-sandblasting in order to remove the rust and bring the surface to "white-metal" condition (hydro-sandblasting is not necessary if the preparation of the surface has been carried out by hydro-scarification, but it is necessary when a long period of time elapses from this operation due to particular organizational requirements of the site, before the treatment of the reinforcing bars).

#### 3) PROTECTIVE TREATMENT OF THE REINFORCEMENT BARS

Carry out the protective treatment of exposed reinforcement bars by applying single-component anti-corrosive hydraulic mortar **Betonfix KIMIFER** with a CE mark in conformity with UNI EN 1504-7, applied with a brush, according to the consumption rates in the Technical Data Sheet, on the metal reinforcement to be protected.

#### 4) PLACEMENT OF NEW REINFORCEMENT BARS AND CREATION OF THE FORMWORK

Possible placement of new metal reinforcement bars or collaborative electro-welded mesh, in the case of significant oxidation of the existing bars with a strong reduction of the section, and grouting with special epoxy resins or cement-based grout (consult our Technical Office). If necessary, prepare the formwork; it is advisable to treat it with a release agent.

#### 5) POURING OF THE CASTINGS

Wet both the formwork and the area to be treated to saturation and eliminate, at the time of casting, any stagnation of water (s.s.d condition) by hydro-washing.

Mix **Betonfix CR**, CE marked according to UNI EN 1504-3 Class R4, with a cement mixer for about 5 minutes, adding the 3/4 of necessary water and then the product with the remaining water until the desired consistency is obtained. Respect the consumption rates indicated in the Technical Data Sheet.

The inserts must have a suitable contrast reinforcement anchored to the existing structure with a minimum cover of 2 cm.

For thicknesses greater than 10 cm, mix **Betonfix CR** with about 30% of washed siliceous aggregates, free of impurities, with minimum particle size greater than 10 mm and maximum diameter depending on the thickness of the jet.

After the formwork is removed, it is advisable to wet the surfaces and, in the case of high temperatures and excessive ventilation, cover the elements with plastic sheets, to avoid excessive evaporation of the mixing water.

#### POSSIBLE ALTERNATIVES

*As an alternative to **Betonfix CR** pre-mixed mortar, it is possible to use binder **Betonfix 200** to be mixed on site with aggregates in a granulometric curve, to make high-strength concrete.*

#### 6) SKIMMING

Possible protective skimming by applying a double coat of single-component mortar, with excellent characteristics of impermeability to water and to carbon dioxide and resistance to atmospheric agents, freezing and thawing cycles, with high adherence, with maximum granulometry of the aggregates 0, 5 mm, **Betonfix RS** with CE mark in conformity with UNI EN 1504-3 Class R2, for an average total thickness of 3 mm finished with trowel or sponge.

In order to increase the durability of the skimming,

fiberglass mesh **Kimitech 350** can be placed between the two layers of skim coat.

#### **POSSIBLE ALTERNATIVES**

*As an alternative to **Betonfix RS**, it is possible to perform skimming by applying one-component, ready-to-use hydrophobic protective skimming mortar with aggregates with a maximum grain size of 0.5 mm, white or gray, **Betonfix R30** or with one-component water-repellent protective ready-to-use skimming mortar with aggregates of a maximum grain size of 0.7 mm **Betonfix R52**, white.*

#### **7) FINAL PROTECTIVE COAT**

Once the substrate is cured, carry out the anti-carbonation protective coating of the reinforced concrete structure through the use of single-component resin with CE mark according to UNI EN 1504-2 **Kimicover BLINDO**. The resin will be diluted with 10-15% of drinking water and will be applied in a double layer by brush, roller or spray respecting the consumption rates indicated in the Technical Data Sheet.

#### **POSSIBLE ALTERNATIVES**

*As an alternative to **Kimicover BLINDO** it is possible to use **Kimicover DUO**, a two-component elastic cement-based waterproofing system, mixed with 33% of the weight of component B, respecting the consumption rate indicated in the Technical Data Sheet.*