

THIS METHOD STATEMENT COVERS THE PREPARATION AND APPLICATION BY HAND, WET OR DRY SPRAY TO RESTORE CONCRETE, WHICH IS SUBJECT TO CORROSION DAMAGE, KNOWN TO CONTAIN CAST-IN CHLORIDES.

REPAIR THICKNESS 10 – 50MM.

A SINGLE COMPONENT, HIGH STRENGTH FIBRE REINFORCED STRUCTURAL REPAIR MORTAR, ENGINEERED FOR REPAIRS TO NEW CONSTRUCTION.

METHOD STATEMENT: MasterEmaco S 422

1. GENERAL:

- 1.1. The area to be repaired should be marked on the drawings and on the structure, and subject to revision based on conditions found as breaking out proceeds.
- 1.2. All further repairs will be at the discretion of the Engineer and subject to remeasurement.
- 1.3. All deviations from the original Bill of Quantities or scope of works must be agreed in writing by the Engineer before reinstatement starts.

2. PREPARATION:

- 2.1. The edges of all repairs will be cut by angle grinder or similar to produce a regular profile with a minimum depth of 10mm. No feather edges will be accepted in any repair work.
- 2.2. The predetermined areas shall be broken out to remove all substandard concrete.
- 2.3. Breaking out should be undertaken using Ultra High Pressure Water Jetting or light weight mechanical breakers fitted with sharp pointed chisels only. The use of blunt scabbling / bush hammers which can fracture aggregate, but leave it in place, are not permitted.
- 2.4. Breaking out should continue until sound, dense concrete is encountered.
- 2.5. The substrate should be prepared to a rough surface having at least a 5 mm amplitude at 20 mm frequency – **Equivalent to ICRI CSP 9-10**
- 2.6. Exposed steel should be cleaned by high pressure water jetting, mechanical wire brush or grit blasting (if permitted) and should be washed down with potable water to remove any residual contaminated dust.
- 2.7. If any exposed reinforcement has deteriorated, it should be examined and if necessary, removed and replaced as directed by the appointed Engineer.
- 2.8. **The prepared concrete surface must be dry, sound, dense, free of all oil, grease, loose and fractured aggregate or other contaminants that could impair adhesion.**

3. COATING OF THE STEEL REINFORCEMENT:

- 3.1. Where directed by the Engineer, the cleaned steel shall be given a continuous coating of **MasterEmaco 8100 AP**, a single component, active, zinc rich, epoxy primer, and allowed to dry for at least 2 hours. If left exposed for extended periods (>24 hours) the **MasterEmaco 8100 AP** coated steel must be washed with potable water to remove any deposited contamination prior to encapsulation and the concrete surface allowed to become visibly dry.

4. PRIMING OF THE CONCRETE:

- 4.1. **MasterBrace ADH 1414**, a two component, solvent free, epoxy bonding agent, shall be applied to surfaces where the migration of chlorides present in the parent concrete is anticipated.
- 4.2. Pour the total contents of the **MasterBrace ADH 1414** (Part B) into the larger Base tin (Part A) and stir with a clean dry rod until a uniform and streak free consistency is achieved.
- 4.3. Pour contents into a flat paint tray.
- 4.4. Using a short haired brush **MasterBrace ADH 1414** shall be applied to the prepared surface, ensuring total coverage of the substrate and paying special attention to the sawn edges of the parent concrete.
- 4.5. The applied **MasterBrace ADH 1414** shall be allowed to stand for 45 – 90 minutes before application of subsequent repair mortars. This time delay is temperature dependent, cool = slower, warm = faster.
- 4.6. **MasterEmaco S 422** shall be applied to the primed substrate whilst the primer is still tacky. Re-apply if the primer dries before the mortar is installed.

5. TEMPERATURE CONDITIONS:

- 5.1. **MasterBrace ADH 1414 & MasterEmaco S 422** shall be used when the ambient temperature is between +5°C and 50°C chilled water shall be used to prevent mixed material (**MasterEmaco S 422**) temperature exceeding 32°C.
- 5.2. Substrate temperatures should not be less than 5°C. In hot weather areas to be repaired should be shaded from direct sunlight.

6. MIXING:

- 6.1. Hand mixing of **MasterEmaco S 422** with a trowel or similar tool is not permitted. For single bag mixes a variable speed heavy duty drill with suitable mortar mixing attachment can be used. For multiple bag mixes use a forced action paddle mixer – typically when using a wet spray system
- 6.2. Water addition shall be between **3.2-3.5 litres (MAX)** of potable water per 25kg bag.

- 6.3. Pour the required amount of mixing water into the mixing drum. Start the mixer and add the **MasterEmaco S 422** powder rapidly and continuously. Mix for 3 to 4 minutes after all the powder has been added until mortar is homogeneous and lump free.
- 6.4. Add water, if necessary, within the limits given, until the required consistency is achieved. Mix for a further 1 minute. The amount of water required will be affected by ambient temperature and relative humidity.
- 6.5. Application by wet process spray machine may require slightly higher water addition than the above. Site based trials **MUST** be conducted with the relevant equipment to determine the correct material consistency and water content along with confirmation of the physical properties of the **MasterEmaco S 422** at the required water content.
- 6.6. Dry process spraying the **MasterEmaco S 422** requires the material to be premixed by the addition of a small percentage of water to achieve a damp consistency (reduces dust) suitable for air conveyance. Additional water sufficient to achieve full compaction shall be added at the nozzle. Site trials are essential to determine the correct water addition rates when “dry” spraying is being considered.

7. APPLICATION: Repairs <40mm in thickness (Vertical & Horizontal)

- 7.1. After mixing, **MasterEmaco S 422** can either be sprayed or trowel applied. Suitable wet spraying units are Meyco Deguna 20, Turbosol T20 and Putzmeister P11. Dry spraying would require the use of standard “Shotcreting” equipment but with a smaller diameter spray nozzle.
- 7.2. Following the application of the **MasterBrace ADH 1414** epoxy bonder and after sufficient time for the bonder to become “tacky” the **MasterEmaco S 422** mortar can be applied by trowel, gloved hand or wet spray ensuring the mortar is worked well into the still “tacky” epoxy bonder and that the mortar is worked towards the sawn edges and around any exposed steel reinforcement.
- 7.3. Build-up the mortar evenly across the repair area and bring the mortar surface proud of the surrounding concrete surface by 1-2 mm. Check the surface by marking with the sharp corner of a straight edge to create a very shallow “score line” across the face of the repair in a grid pattern. This will indicate if there are any hollow spots that need filling.
- 7.4. Cover the placed mortar with a thin plastic sheet taped firmly in place and allow the mortar to stiffen for 30-60 minutes (temperature and humidity dependent)
- 7.5. Remove the plastic and check that the surface is firm to the touch **BUT** not hard. Use a sharp edged “straightedge” to cut back the excess material flush with the surrounding concrete using a light sawing motion. The mortar should “crumble” when cut back and should **NOT** be sticky or move unduly.

- 7.6. Use a dampened wood / plastic float to rub-up the cut surface and close any minor surface tears or holes. Use the cut off material to fill any minor defects and work well into the surface to create a dense flat but open pored finish. Replace the plastic sheeting and allow to stiffen further until the surface can only just be dented by hard finger pressure.
- 7.7. Once the surface has stiffened sufficiently use a steel trowel to create a very smooth and dense finish free of any pin holes or surface defects of any nature. DO NOT steel trowel if the surface is too soft as this will create blisters in the surface of the material.
- 7.8. Upon completion dampen the repair surface and replace the plastic sheeting, tape firmly in place and allow to cure overnight.
- 7.9.1 Remove the plastic sheeting and apply a coat of **MasterKure 181** curing compound or continue to wet cure under plastic sheeting for at least 7 days.

8. APPLICATION: Repairs > 40mm up to 50mm in thickness (Vertical and Horizontal)

- 8.1. Repairs in excess of 40mm on vertical surfaces should be initially roughly filled with the **MasterEmaco S 422** mortar to within 10 – 15mm of the required final finished level.

Horizontal repairs can be placed at a thickness up to 50mm in a single layer as the material has full support from below. Thicknesses in excess of 50mm on horizontal surfaces are preferable done using a micro-concrete or screed material – contact Master Builders Solutions Technical Department for further information.

- 8.2. Cover the placed mortar with a thin plastic sheet taped firmly in place and allow the mortar to stiffen for 30-45 minutes (temperature and humidity dependent)
- 8.3. Remove the plastic and apply the final layer of **MasterEmaco S 422** as per 7.4 above
- 8.4. Follow steps 7.5 to 7.9.1 above in terms of final finishing and curing.

9. OVERHEAD APPLICATION:

- 9.1. Where the application of **MasterEmaco S 422** is to exceed **20mm** in thickness overhead, this must be built up in layers, each not exceeding **20mm**. Each under lying layer shall be heavily cross hatched with a trowel or spatula and allowed to achieve its initial set prior to a subsequent layer being applied in the same manner.
- 9.3. **Maximum overhead thickness should not exceed 50mm without substantial mesh reinforcement anchored to the substrate to provide support.**
- 9.2. Finishing and curing is to be carried out as detailed in points 7.5. to 7.9.1 above.

10. CURING:

- 10.1. Good curing is essential. Particular care is required in hot and/or windy conditions. Curing can either be with a single coat of **MasterKure 181** curing membrane, and/or by covering the work with a properly secured wet hessian and plastic sheet.
- 10.2. Under no circumstances should the surface of the **MasterEmaco S 422** be left unprotected when it is not being worked upon. Ensure the surface is always covered with plastic sheeting in between the various application and finishing stages.

Large scale repairs in excess of 50mm in thickness should ideally be repaired using a castable / dry sprayable “micro-concrete” such as MasterEmaco S 443 or S 466.

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