

THIS METHOD STATEMENT COVERS THE PREPARATION AND INSTALLATION OF **MasterFlow 928 + MasterEmaco FL 100** AS A LARGE VOLUME CAST-IN-PLACE REPAIR.

METHOD STATEMENT: MasterFlow 928 + MasterEmaco FL 100 (Aggregate)

1. GENERAL:

- 1.1. If required, the area to be repaired should be marked on the structure and should be subject to revision based on conditions found as breaking out proceeds.
- 1.2. All areas of concrete identified as defective or contaminated should be removed.

2. PREPARATION:

- 2.1. After identification, the edges of all repairs should be cut by diamond blade to produce an edge depth of 20mm. There should be no feather edges. Minimum thickness of repair should be 40mm.
- 2.2. Loose concrete within the cut-out areas shall be removed.
- 2.3. Removal of loose concrete should be undertaken using suitable mechanical means or by high pressure water jetting. Removal of concrete should continue until sound; dense concrete is encountered.
- 2.4. The substrate should be prepared to a rough surface where the aggregate is showing (CSP 9-10).
- 2.5. The prepared surface should be sound, free of all oil, grease, loose aggregate or other contaminants that could impair adhesion.
- 2.6. Exposed steel should be cleaned by high pressure water jetting, mechanical abrasion or grit blasting, and should be washed down with potable water to remove any residual contaminated rust. Steel reinforcement should be fully exposed to allow the repair material to fully envelop it and create a mechanical anchor for the repair.
- 2.7. If reinforcement has deteriorated, this should be removed and replaced as directed by the Engineer.

3. COATING OF STEEL:

- 3.1. Generally, there should be no need to coat the reinforcement.

4. PRIMING / FORMWORK:

- 4.1. Formwork shall be erected, ensuring it is firmly in place, sealed to be "grout tight", and to provide at least 30mm cover to steel.
- 4.2. Provision must be made for drainage outlets at the lowest points of the sealed formwork.
- 4.3. A 45°birds' mouth shall be constructed at the top of the formwork to ensure ease of placement of the repair material (pourable).

- 4.4. The shuttered repair shall be saturated for 3-4 hours with potable water prior to placement of the **MasterFlow 928** mix.

5. TEMPERATURE CONDITIONS:

- 5.1. **MasterFlow 928** shall be used when the ambient temperature is between +5°C and 50°C. Chilled water shall be utilised to prevent mixed material temperatures exceeding 32°C.
- 5.2. Substrate temperatures should not be less than 5°C. In hot weather areas to be repaired shall be shaded from direct sunlight.

6. MIXING:

- 6.1. **MasterFlow 928** should be mixed using a heavy-duty drill and paddle, a forced action paddle mixer or a modified free fall mixer (normal concrete mixer with solid mixing blades and NOT ribbons).
- 6.2. Ensure the mixing container is clean and dampened down prior to mixing.
- 6.3. A proportion of the specified amount of water (approx. 90%) to achieve the required flow shall be poured into the mixer. Steadily pour the **MasterFlow 928** powder whilst the mixing drum is rotating and then immediately add the required quantity of aggregate (typically 10kg to every 25kg bag of **MasterFlow 928**). Aggregate addition rates are variable depending upon requirements and can go as high as 50% by mass – see note below regarding reductions in strength.
- 6.4. Mixing shall be for approximately 4 minutes during which time the remaining mix water shall be added, if required, until a uniform free flowing consistency is achieved.
- 6.5. Water addition shall be **4.0 to 5.0 litres** (MAX) of potable water per 25kg bag depending upon consistency / strength required. **DO NOT** add water beyond the recommended maximum without checking the strength development as this may seriously lower the ultimate compressive strength.
- 6.6. **NOTE:** The addition of a larger aggregate such as **MasterEmaco FL 100** does reduce the overall compressive strength by approximately 8% and site-based trials are recommended to ensure the required strengths can be achieved.

7. APPLICATION:

- 7.1. Ensure all free water is drained from the formwork and the drain holes are plugged before mixing commences.
- 7.2. The mixed **MasterFlow 928 + MasterEmaco FL 100** aggregate shall be poured steadily and continuously, through the bird's mouth opening at the top of the formwork. A slow steady pouring rate reduces the chances of air entrapment.
- 7.3. Alternatively, the **MasterFlow 928 + MasterEmaco FL 100** shall be placed by pouring into a funnel attached to a flexible pipe of at least 50mm diameter, the pipe is initially placed near the bottom of the formwork. The pipe is then raised as the pour continues.
- 7.4. The material should be placed continuously, minimizing the amount of time between successive batches.

- 7.5. For large scale repairs of extended volume, the **MasterFlow 928 + MasterEmaco FL 100** aggregates can be placed in thicknesses of up to approx. 500mm.
- 7.6. **MasterFlow 928 + MasterEmaco FL 100** is typically self-compacting and does not require external vibration. Tapping the formwork lightly with a hammer during placement or lightly rodding will contribute towards effective consolidation of the material. Internal mechanical vibration (pokers) should not be used.
- 7.7. Shutters should be left in place for as long as practically possible to act as curing blankets.

8. CURING:

- 8.1. Apply **MasterKure 181** curing compound, to all surfaces, by spray, immediately upon removal of formwork. Ensure this extend at least 10cm onto the adjacent concrete around the periphery of the repair.
- 8.2. Protect from wind, rain and direct sunlight for 24 hours.

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