a.b.e.® Construction Chemicals

METHODOLOGY

dura.®rep FMC

Fluid Micro Concrete

All the relevant product data sheets are to be read for additional information like pot life, mixing instructions, surface preparation etc.

REPAIR AREAS

The areas to be repaired are to be as shown on the drawings or as indicated by the Responsible Engineer.

The areas are to be clearly marked out on site and agreed with the Responsible Engineer before proceeding.

A clear indication of maximum permitted depth and area of existing concrete which may be removed at any time, shall be provided by the Responsible Engineer.

The areas may be adjusted by the Responsible Engineer as work proceeds according to the conditions found.

Propping shall be provided as noted on the drawings or as agreed by the Responsible Engineer.

The surfaces adjacent to and of areas for repair shall be cleaned to remove any dust, unsound material, plaster, oil, paint, grease, corrosion deposits, or organic growth.

REINFORCEMENT PRIMING

Immediately following preparation and cleaning, the reinforcing steel shall be primed with **dura.®rep ZR primer** single component epoxy primer complying with the relevant parts of BS4652, 1971 (1979) Specification For Metallic Zinc Rich Priming Paint Type 2.

The **dura.®rep ZR prime**r shall be brush applied to the cleaned reinforcement ensuring that all exposed steel is fully coated. Special attention shall be paid to the backs of the steel bars and where steel bars are tied together. It is essential that this coat is continuous with that of any adjacent repaired area where zinc-rich primer has been used. Avoid excessive over-painting onto the concrete and allow to dry.

CONCRETE PREPARATION

The equipment and methods used to break out the concrete shall be such that no reinforcing steel or other embedded items such as conduits or lifting sockets, etc., are loosened, damaged or removed, unless so directed by the Responsible Engineer.

If reinforcement is found to be congested, making difficult the removal of concrete by mechanical means, then high pressure water jetting shall be considered and a necessary provision for protecting the rest of the structure shall be allowed for.

The prepared void shall be profiled so that entrapment of air during the process of placing the fluid micro-concrete is avoided.

Using a saw, disc cutter, or other suitable tool, the perimeter of the area to receive fluid micro-concrete shall be incised to a depth of at least 10 mm causing good arises to be formed at outer edges all to preclude feather edging. The minimum section thickness of installed fluid micro-concrete shall be 40 mm.

All concrete surfaces against which fluid micro-concrete is to placed shall be of a rough scabbled nature.

Saw/disc cut edges shall be grit blasted to lightly roughen.

All physically damaged, poorly compacted, loose, cracked or friable concrete shall be removed until sound concrete is reached. This preparation shall be such as to leave a sound exposed concrete substrate free from dust, loose particles and any deleterious matter.

Due account shall be taken of any propping or other instructions given by the Responsible Engineer regarding sequences of removal and repair.

FLUID MICRO-CONCRETE

dura.®rep FMC high performance, shrinkage compensated micro-concrete suitable for large volume concrete repairs at nominal thicknesses in excess of 50 mm. Supplied as a premix requiring only mixing with water to produce a free flowing material, for placing by hand or pump. The low eater requirement ensures fast strength gain and long-term durability.

FORMWORK

Adequate formwork shall be provided in accordance with the relevant codes of practice. It shall be constructed from appropriate materials as agreed with the Responsible

Engineer and shall be watertight at all joints between panels, and between formwork and the existing concrete.

The formwork shall be securely fixed to withstand the hydraulic pressures of the fluid micro-concrete without distortion or movement during and subsequent to placement. It may be necessary to divide into suitably sized sections.

Formwork surfaces that are to be in contact with the fluid micro-concrete shall receive two coats of epoxy coal tar shutter paint (**abe.®cote 320**) and be treated with a suitable release agent such as **dura.®strip** in accordance with current instructions for use.

The formwork shall include bottom drainage outlets for pre-soaking water, provision for introduction of the micro-concrete and air venting as required. The introduction and venting points shall be located so as to avoid any possibility of entrapment of air, etc. Where necessary provision shall be made for controllable venting points to prevent air entrapment and enable the extent of flow of the fluid micro-concrete to be assessed.

In hot, humid, coastal situations and in heavy industrial areas ensure that the interval between priming the reinforcement and erecting the shutter is kept to a minimum. This is to prevent possible contamination of the bond line with air-borne contaminants, resulting in possible bond failure with the substrate. In the event that delays are unavoidable, wash down the surface thoroughly with clean water before erecting the formwork.

PRE-SOAKING (unless priming with epidermix 345)

The formwork shall be inspected by the Responsible Engineer and if approved, the void filled with clean water and kept full. This shall remain for a minimum of 2 hours, then the formwork shall be completely drained and resealed immediately prior to introducing the fluid micro-concrete.

PRIMING CONCRETE HAVING INHERENT CHLORIDE

To form a barrier between the chloride contaminated concrete and the new concrete, the prepared concrete surface shall be primed with **epidermix 345** and allowed to cure for 8-24 hours. This coating is to be imperforate and should any unfilled voids (blowholes) be apparent, they shall be filled with **epidermix 505**.

A second coat of **epidermix 345** shall be applied, which, depending upon requirements may be (A) immediately followed by the shuttering and pouring of the micro-concrete, or (B) blinded with dry, dust free, sharp sand and allowed to harden before pouring the micro-concrete.

Pre-soaking with water is unnecessary in this case and shall not be permitted.

PRIMING CONCRETE NOT AFFECTED BY CHLORIDES WHERE DELAY FOLLOWING PRIMING IS UNAVOIDABLE

If erection of shuttering, or fixing of steel reinforcement, etc., necessitates priming the prepared concrete before hand, then the primer shall be **epidermix 345** slow set.

The **epidermix 345** slow set shall be used in accordance with current instructions for use. It will enable the micro-concrete to be placed not before 1 hour and up to 24 hours after the application of the primer.

Pre-soaking with water shall not be permitted in this case.

MIXING MICRO-CONCRETE

Only mixes using complete bags of **dura.®rep FMC** shall be allowed and part bag mixes shall not be permitted.

The mixing shall be carried out strictly in accordance with current product instructions for use and only appropriate mixing equipment will satisfy.

The mixing water shall be potable quality and the carefully measured quantity of water shall be placed into the mixing container before the **dura.®rep FMC**.

The **dura.®rep FMC** shall be added to the mixing water and in no circumstances shall more water be added than the maximum volume specified for each bag.

MIXING WARNING

As with other 'one pack' repair mortars **dura.®rep FMC** may exhibit satisfactory handling characteristics even though inadequately mixed. This will result in a significantly lower level of performance or possible failure. It is therefore essential that mixing instructions are strictly adhered to with particular emphasis on the quantity of water used and the time of the mixing operation.

CONCRETING

When assessed in accordance with the flow measurement requirements of DTP BD27/86 the **dura.®rep FMC** shall flow 750 mm along the test trough within 30 seconds, without segregation or bleeding.

Test cubes may be made at intervals if required by the Responsible Engineer. They shall be made in 100 mm metal mould to BS1881:Part 108. The mould shall be carefully filled to avoid air entrapment.

There shall be no compaction and the top of each cube shall be covered by a metal plate with a weight not less than 0.5kg. The cubes shall then be cured and tested in accordance with the relevant parts of BS 1881.

Poured material shall be introduced slowly into the formwork. It may be introduced via a funnel, or hopper, at the top of the formwork, unless the configuration of the repair necessitates the use of external pipe-work to reach remote parts of the void. The entry point(s) shall be designed to provide sufficient head of material to ensure total displacement of air.

The placing of the **dura.®rep FMC** shall be, as far as possible, continuous. The requirements of DTP BD 27/86 permit a maximum 20 minutes between completion of mixing and placing.

Mixing shall be timed so that there is minimal interruption to material placing. If, however, placing is interrupted, this shall be brought immediately to the attention of the Responsible Engineer. The operation may continue while the **dura.®rep FMC** retains its flow characteristics.

Where fluid **dura.®rep FMC** is poured in sections, the previously cast edge at the stop end face shall be suitably roughened and cleaned.

dura.®rep FMC shall not be placed when the ambient or substrate temperature is below 5°C or above 35°C nor at ambient temperatures of 5°C on a falling thermometer. In cold conditions down to 5°C the use of warm water, up to 30°C shall be permitted for pre-soaking and mixing.

FORMWORK REMOVAL

The formwork shall not be removed until the **dura.®rep FMC** has achieved a compressive strength of at least 10 N/mm² or as directed by the Responsible Engineer.

CURING

Details of the methods of curing shall be submitted to the Responsible Engineer for approval.

Curing techniques shall be instigated immediately following application of repair mortar to any given area. Large areas (0.5 m² at a time) shall be cured as trowelling progresses without waiting for completion of the whole area.

dura.®bond GP may be low pressure spray applied as a curing membrane. In fast drying conditions it will be necessary to supplement this with polyethylene sheet taped around its edges. Note: **dura.®bond GP** is compatible with the **dura.®cote WB** range of surface coatings and does not require removal prior to application of **dura.®cote WB** material. Other curing membranes will require removal prior to further surface treatment.

Curing shall be instigated immediately after removal of the formwork and continued for at least 3 days.

During application and curing all work shall be protected against direct strong sunlight.

CLEANING

epidermix products should be removed from tools, equipment and mixers with **abe® super brush cleaner** immediately after use. Hardened material can only be removed mechanically.

PRODUCTS REQUIRED

- **abe.®cote 352**
- **dura.®bond GP**
- **dura.®cote WB**
- **dura.®rep FMC**
- **dura.®rep ZR primer**
- **dura.®strip**
- **epidermix 345**
- **epidermix 505**

EQUIPMENT NEEDED

- 100 mm paint brush
- Pan mixer
- Suitable 10 litre plastic mixing buckets

IMPORTANT NOTE

This data sheet is issued as a guide to the use of the product(s) concerned. Whilst **a.b.e.® Construction Chemicals Limited** endeavours to ensure that any advice, recommendation, specification or information is accurate and correct, the company cannot - because **a.b.e.®** has no direct or continuous control over where and how **a.b.e.®** products are applied - accept any liability either directly or indirectly arising from the use of **a.b.e.®** products, whether or not in accordance with any advice, specification, recommendation, or information given by the company.

FURTHER INFORMATION

Where other products are to be used in conjunction with this material, the relevant technical data sheets should be consulted to determine total requirements. **a.b.e.® Construction Chemicals Limited** has a wealth of technical and practical experience built up over years in the company's pursuit of excellence in building and construction technology.