METHOD STATEMENT

Sika® Carbodur® Grid M

Masonry Strengthening

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BUILDING TRUST

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1 SCOPE

This Method Statement is written as a guide for the use and application of Sika® CarboDur® Grid M, a Masonry Strengthening Reinforcement System consisting of Sika® Carbodur® 300 Grid embedded in a Sika® MonoTop®-3260 Grid cement-based mortar matrix (Fibre Reinforced Cementitious Mortar or FRCM).

2 SYSTEM DESCRIPTION

The Sika® Carbodur® Grid M System is designed for the strengthening of masonry structures. This system is also used for concrete water retention structures such as drinking water reservoirs, for example, when they are to receive a reinforced epoxy coating and the substrate strength is less than 1.5 MPa (value measured in situ). In this case, an anchoring system for the Sika® CarboDur® Grid M System can be considered; this decision will have to be validated by a competent Structural Engineer.

2.1 LIMITATIONS

- The Products must only be used in accordance with their intended applications. The system configuration as described in the Product Data Sheets must be fully complied with and may not be changed.
- Strengthening Products and Systems should only be used by suitably trained and experienced professionals. All strengthening works must be carried out as directed by a suitably qualified Structural Engineer as the Supervising Officer.
- For any other specific construction / build information please refer to the relevant Engineer's specifications, details, drawings, and risk assessments.
- Local / regional differences in Product formulations may result in performance variations. The most recent and relevant local Product Data Sheets (PDS) and Material Safety Data Sheets (MSDS) must be referred to. and can be obtained from your local Sika® Technical Department.
- This Method Statement is intended as a guide and must be adapted to suit the local Products, Standards, Legislation, and any other specific local or specified requirements.

3 PRODUCTS

The FRCM (Fibre-reinforced Cementitious Matrix) System consists of the structural mortar Sika® MonoTop®-3260 Grid and the carbon fibre grid Sika® Carbodur®-300 Grid.

For further information on materials and application, please refer to the relevant Product Data Sheets.

Sika® Brand	Description
Sika® Carbodur®-300 Grid	Impregnated carbon grid packaged in plastic film
Sika® MonoTop®-3260 Grid	One component mortar for the embedding of the Sika® CarboDur®-300 Grid

3.1 MATERIALS STORAGE

All materials must be stored properly in undamaged, original sealed packaging, in dry and cool conditions at temperatures between +5°C and +35°C. Protect all the Products from direct sunlight. Please refer to the specific information contained in the respective Product Data Sheets regarding the minimum and maximum storage temperatures and times. Sika® MonoTop®-3260 Grid can be stored for up to 12 months from the date of production.

4 EQUIPMENT

Tools necessary for the preparation and application of the System:

Mixing Tools

Drill and Mixing Paddle: Small Quantities

Double Mixing Paddle: Small Quantities

Forced Action Pan Mixer: Medium Quantities

Forced Action Pan Mixer: Large Quantities

Hand Tools

Trowel

Mixing Bowl

Measuring Cylinder

Sponge

Scissors

PVC Float

Aluminium Ruler

Spraying Tools

Hopper Gun

Spraying Equipment

Air Compressor

4.1 CLEANING

Clean all tools and application equipment with water immediately after use. Hardened material can only be removed mechanically.

Spray equipment shall be thoroughly cleaned at appropriate intervals during the application process to prevent accumulation of residual deposits using adequate pressure water.

5 HEALTH AND SAFETY

5.1 RISK ASSESSMENT

The risks to health and safety from everything including any defects in the structure, working procedures and all the materials used during the installation must be properly assessed and safely accommodated.

Any working areas on platforms and temporary structures must also provide a stable and safe area to work. All work and working procedures must be carried out fully in accordance with the relevant local health and safety legislation.

5.2 PERSONAL PROTECTION

Work Safely!

Safety boots, gloves and other appropriate skin protection should be worn at all times. The use of disposable or new / clean protective clothing during the materials preparation and application is strongly advised.

Appropriate eye protection should be worn at all times whilst handling, mixing and installing the Products. Carrying an eye wash with you at all times is recommended.

Always wash hands with suitable soap and clean water after handling the Products and before food consumption, smoking, visiting the toilet and after finishing work.

The work area needs to be well ventilated, and operatives should take frequent breaks in fresh air to avoid any other health issues.

For more detailed health and safety information, please refer to the latest Material Safety Data Sheet (MSDS) for each Product.

5.3 FIRST AID

Seek immediate medical attention in the event of excessive inhalation, ingestion or eye contact causing irritation. Do not induce vomiting unless directed by medical personnel.

For eye contact, flush the eyes immediately with plenty of clean water, occasionally lifting the upper and lower eyelids. Remove contact lenses immediately. Continue to rinse the eye(s) for 10 minutes and seek medical attention.

Rinse contaminated areas of skin with plenty of water. Remove contaminated clothing and continue to rinse the skin for 10 minutes and seek medical attention.

For more detailed health and safety information, please refer to the latest Material Safety Data Sheet (MSDS) for the Product(s).

5.4 WASTE DISPOSAL

Do not empty any surplus material into drainage or water systems; dispose of all waste materials and packaging responsibly through licensed waste disposal facilities or Contractors, fully in accordance with local legislation and the relevant authorities' requirements.

6 PREPARATION

6.1 PRE-APPLICATION PREPARATION

Review the project specifications in detail, inspect the site conditions and report immediately in writing to the responsible Engineer if anything is, or appears to be, unsuitable for the proper execution of the works required.

The Contractor is responsible for the preparation of the work to ensure the proper functioning and quality of the application of the Sika® CarboDur® Grid M System.

Prior to commencement of work, the Contractor's representative must have visited the site and inspected all aspects of the application requirements. The Contractor shall provide a method statement detailing the application procedure of the system for approval by the responsible Engineer.

6.2 SUBSTRATE PREPARATION

The masonry substrate must be in good condition and free from dust, dirt, loose materials, surface contamination and all materials that reduce adhesion.

Masonry joints must be filled before starting the installation of the Sika® CarboDur® Grid M System.

Surface cohesion measured in situ shall be a minimum of 1 MPa for recent brick masonry.

Concerning old masonry made from elements of variable quality, the support must be repaired so that it has a surface pull-off strength in the order of 0.6 to 0.7 MPa.

The repair of the substrate can be achieved by spraying Sika® MonoTop®-3260 Grid mortar reinforced with wire mesh (ideally galvanised) anchored to the substrate.

The substrate should be thoroughly wetted down 24 hours before application of the Sika® CarboDur® Grid M System.

Immediately before applying the Sika® CarboDur® Grid M System, the condition of the substrate must be rechecked for cleanliness, loose materials, etc.

The masonry shall be saturated surface dry (SSD conditions) prior placing the mortar.

Remove excess water before application, e.g., by using a clean sponge. Ensure that there is no standing water on the surface. The surface should have a dark matt appearance without shine and the pores and hollows in the surface should be free of water.

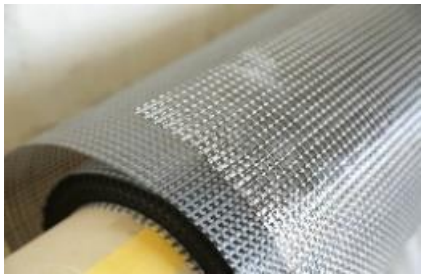
The Sika® MonoTop®-3260 Grid mortar layer can be up to a maximum of 60 mm, depending on the design produced by a competent engineer.

6.3 GRID PREPARATION

Prepare a material preparation area so that there is no risk of contamination to the Grid. It is recommended that the Grid be rolled out onto a clean plastic sheet on the floor / work surface.

According to the design drawings and / or instructions from the Overseeing Engineer, cut the reinforcement to the relevant dimensions, using a suitable pair of scissors.

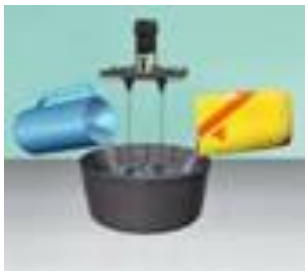
Store the remaining Sika® Carbodur® 300 Grid away from any risk of contamination or soiling, until it is ready to be used.



6.4 PREPARING SIKA® MONOTOP®-3260 GRID MORTAR

6.4.1 MIXING

Pour the **minimum** recommended clean water quantity into a suitable mixing container. While stirring slowly, add the powder to the water and mix thoroughly for at least for 3 minutes. Add additional water, if necessary, up to the maximum specified amount to achieve the required consistency and a smooth consistent mix.



7 APPLICATION

7.1 SPRAYED APPLICATION (WET SPRAY)

The pre-mixed quantity of mortar is fed into the hopper. The mortar is conveyed onto a substrate with help of compressed air.

Usually, a small valve on the air connector is used to regulate the air flow rate.

Too little air the material will “splutter” and not spray adequately. Too much air will produce turbulence in the sprayed material, causing separation of the grains and result in an increase in rebound.

As a rule, set the nozzle opening to two or three times larger than the maximum mortar grain size. Hold the nozzle at 90 degrees and approximately ~100 mm to 300 mm away from the substrate. It is advisable to test spray an area before starting the main application.

The spray distance from the substrate is dependent on-air pressure, nozzle opening size and type of hopper gun. Refer to the machine manufacturer’s instructions before use.

The wet mixed Sika® MonoTop®-3260 Grid must be placed into the spraying equipment and applied onto the pre-wetted substrate between the minimum and maximum layer thicknesses without the formation of voids.

The first layer of Sika® MonoTop®-3260 Grid sprayed on, will be tightened onto the masonry substrate using a suitable float or trowel.

The purpose of this operation is to ensure good adhesion of the Product to the substrate and to avoid any risk of delamination between the Sika® MonoTop®-3260 Grid mortar and the substrate.

This first layer of Sika® MonoTop®-3260 Grid mortar is applied with the help of an aluminium ruler to achieve an even surface.

7.2 INSTALLATION OF THE GRID

On top of the layer of freshly applied Sika® MonoTop®-3260 Grid, immediately place the Sika® CarboDur®-300 Grid. If the grid is freshly unrolled, it may have a concaved shape. Apply the grid to the substrate so that the central portion of its length is raised, and the ends meet the substrate first. Press the grid with a smooth stainless-steel trowel to embed it into the fresh mortar.

When the grid is properly embedded in this first layer of Sika® MonoTop®-3260 Grid mortar, spray the second layer of mortar to complete the strengthening installation.

Finishing must be carried out to the required surface texture using suitable finishing tools as soon as the mortar has started to harden.

7.3 OVERLAPPING

As each roll of Sika® Carbodur®-300 Grid is 50 m long, overlapping in the longitudinal direction is generally not required. However, where overlapping is required to facilitate easier installation, to ensure continuity of reinforcement, the overlap length of Sika® CarboDur®-300 Grid is 200 mm. There is generally no need to overlap with neighbouring, parallel strips of Sika® Carbodur®-300 Grid.

7.4 PROTECTION OF THE FRESH MORTAR DURING HARDENING

The surface of the fresh mortar must be protected from evaporation, so it doesn't take place too rapidly. This protection must be achieved by spraying water on the surface of the hardened mortar during its setting phase. In case of strong wind or exposure to the sun, physical protection may be necessary.

It is the responsibility of the Contractor to put in place a suitable solution for the climatic conditions in order to protect the mortar during its setting phase.

7.5 ASSOCIATED COATINGS

Once installed, no UV protection is required for the Sika® CarboDur® Grid M System; therefore, the finished surface can be left uncoated.

Where protective coatings are required for functional or aesthetic reasons, protective coatings such as Sikagard®-550 W Elastic, Sikagard®-675 W GB Elastocolor or Sikagard® 63 N can be applied onto the dried system.

8 LEGAL NOTE

The information, and in particular the recommendations relating to the application and end-use of Sika® products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the products suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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