

# Helix TSMR Reinforced Concrete Mixing, Placing and Finishing Instructions

## Important Notes

1. A copy of these instructions is to be provided by the purchaser of Helix TSMR to the relevant concrete supplier/s, concreter/s and construction company/s of each element of this project in which Helix TSMR is to be used.
2. Compliance with these instructions is essential for the best outcome.
3. Failure to comply with these instructions may void the manufacturer's warranty.

## 1 Helix Mix Design and Slump Recommendations

- Refer to the Helix Alternative Design solution for each element of this project to confirm the MPa and the Engineers Notes for the Slump requirements for each element.
- Water reducing admixture is to be used to achieve the specified slump levels (**no additional water to be added**).

## 2 Loading and Mixing Instructions

### 2.1 The Helix Direct Loading Method for Use at Batch Plants (This is the preferred loading method for Helix)

**Step 1:** Load the total amount of Helix required directly into the agitator of the truck. In most circumstances the loading will be by hand but may also be automated as part of the batching process.

**Note:** Helix boxes are not soluble and therefore must not be loaded into the truck.



**Step 2:** Add 80% to 90% of the mix water and allow the Helix to mix in the water for **not less than** 45 seconds.

**Note 1:** This mixing time must be followed otherwise balling of the Helix may occur.

**Note 2:** ALL mixing of Helix reinforced concrete must be carried out with the agitator set at 'mixing speed' (i.e. maximum speed).

### Step 3:

- **For dosages of Helix under 10Kg**, add the aggregate, sand, cement, other ingredients and the remaining water (giving preference to the loading of the aggregate first, if possible).
- **For dosages of Helix between 10Kg and more**, the aggregate must be loaded separately.
  - **For dosages between 10Kg and 20Kg**, allow the Helix to mix in the water for 90 seconds, then 30 seconds with the aggregate, then add the sand, cement other ingredients and the remaining water.

- **For high dosages over 20Kg**, allow the Helix to mix in the water for 120 seconds, then 30 seconds with the aggregate, then add the sand, cement other ingredients and the remaining water.



**Note: Under no circumstances add the cement separately as this may cause problems with balling of the cement.**

**Step 4.** Record details of the Helix dosage on the batch ticket for each load.

**Note: If the Batch Plant is not set up to be able to operate in accordance with these procedures then please contact the Helix Agent in order to confirm an acceptable alternative procedure.**

## 2.2 Other Methods of Loading Helix

In instances where it is not possible to use the Helix Direct Loading Method as set out in 2.1 above, e.g. where the Helix is to be loaded at a Project Site and the concrete has already been mixed at an off-site batch plant, then HSA has equipment which can be used to load the Helix into the concrete mix/truck.

Contact HSA Customer Support for more information.

## 3 Placing Instructions

Helix reinforced concrete can be placed using conventional methods – either directly from the concrete truck or through a concrete pump.

Prior to pouring the concrete:

- Check sub-base is well prepared and compacted
- Check sub-base is flat and level
- Check plastic membrane is installed

## 4 Finishing Instructions

### Finishing

- The key to finishing a Helix slab is promoting sufficient fines (sand and cement slurry) to move the surface so that the Helix has a creamy slurry paste to settle under.
- The general finishing processes used to finish Helix reinforced concrete are the same as those used to finish conventionally reinforced concrete.
- Use of a vibrating roller or a laser screed to force coarse materials below the surface is recommended.

- As with conventionally reinforced concrete, do not overwork the surface. Overworking will bring water and Helix to the surface.
- Use only metal hand tools for finishing.
- Always pull finishing tools in a constant direction.
- For 'Broom Finish' wait 15-60 minutes after the concrete is placed to apply the brush finish. Brush in one direction only and use a light-bristled broom. Keep the broom clean at all times during the course of the brushing.
- In order to draw creamy slurry to the surface and allow the Helix and course aggregates to settle below the surface, it is recommended to pan float for the first 2-5 passes before trowelling. Allow the concrete to bleed its excess water before pan floating so not to dilute the surface slurry.

### Vibrating

- Care should be taken when vibrating concrete in which most, or all of the traditional steel reinforcement has been removed and replaced by Helix. In these instances, the vibrating should be consistent with that applied to plain concrete. Over-vibrating may result in adversely affecting the distribution of the aggregate and the Helix throughout the concrete element.
- For precast concrete elements, care must be taken not to excessively vibrate the concrete as this may result in adversely affecting the distribution of the aggregate and the Helix throughout the mould.
- For smaller precast elements, it is recommended that vibration occur externally with care taken not to use excessive force which can adversely affect the distribution of the aggregate and the Helix throughout the mould.

### Saw Cutting

- Ensure saw cuts are installed as detailed in the engineering drawings for the project.
- Saw cuts are recommended to be at least 1/3 of the depth of the slab or otherwise specified in writing by the Helix Steel Engineer.
- **The final decision on the precise timing of the saw cuts rests with the concreter who is accountable for the laying and quality of the slab, however, Helix Steel Australasia recommends the following:**
  - Saw cuts are to be made on the same day as the pour using a soft cut saw. (This timing is necessary because it reduces the likelihood of early age cracking occurring).
  - Zippering is less likely with Helix MR as there are no hooked ends and they rarely get caught on the end of the blade. Ensure that the blades of the soft cut saw are not dull or past due for replacement.
  - A quality diamond encrusted continuous rim blade will further enhance the ability of the saw cut / soft cut equipment to grind through the concrete rather than rip it.

### Curing

- Concreters must ensure that the concrete is cured in accordance with the relevant sections of AS 3600 Concrete Structures Standard.
- It is recommended by Helix Steel that curing should continue for at least 7 days.
- Concreters should use aliphatic alcohol to manufacturer's recommendations in order to slow the evaporation rate and reduce the risk of plastic shrinkage cracking occurring.
- There are many reasons for cracks appearing in concrete during its 'plastic phase'. This 'plastic phase' cracking is in no way connected with the use of Helix product or for that matter with the use of reinforcing mesh where it is used. The Helix reinforcement will take full effect when the concrete reaches 20MPa. Care should be taken by the concreter and the customer to ensure that generally accepted preventative measures are taken in the laying of the concrete to ensure that 'plastic phase' cracking does not occur.