Installation Guide

Installation

Overview

It is recommended to engage concreters and premixed or precast concrete suppliers experienced in the supply, preparation and installation of coloured concrete and whenever possible to view examples of their work.

This information is intended for use as a guide to avoiding or limiting common problems such as colour variation, efflorescence, dusting and surface cracking that spoil the appearance of coloured concrete. It is not in any way intended as a complete procedure for preparing, placing, finishing and curing concrete.

This information relates primarily to the effect on colour: the effects on concrete strength and durability should also be taken into consideration.

For further & more comprehensive data, please refer to current industry codes of practice, your premixed or precast concrete supplier for their recommendations or the Cement, Concrete & Aggregate Association.

Remember that concrete is a product made with naturally occurring ingredients and is exposed to varying weather conditions. Some variations in colour should be expected.

Batching

Do:

- ✓ Place only the appropriate number of Aquasac bags in the front of the load of the concrete truck ie prior to loading other materials. For 25MPa and 32MPa concrete this will consist of 1 or 2, 10kg bags per m^3. Dispose of the outer paper bag; this SHOULD NOT go into the mix.
- ✓ Mixing should take place for 10 minutes at full speed to ensure that the pigment has fully dispersed throughout the concrete mix.

Note: Wet batch plants should contact their Colourmix representative for suggested batching recommendations.

Preparation

Proper preparation avoids delays, wastage, segregation and colour variations.

Do:

- ✓ Avoid excessive moisture loss from the concrete slab by dampening sub-grade prior to placing.
- ✓ Use a layer of plastic membrane under the slab to reduce restraint to early age concrete movement, as friction can lead to early cracking.
- ✓ Check weather conditions for the area and be prepared for likely adverse conditions. Weather conditions play a large role in the drying and curing processes of concrete. If possible put up wind barriers and provide as much protection as possible especially for dark colours and black concrete. *Remember:* the darker the concrete the more heat it is likely to absorb in direct sunlight.
- ✓ If warm conditions are forecasted then try to pour in the cooler part of the day whenever possible.
- ✓ Only pour if temperature is within the guidelines specified by your concrete supplier.
- ✓ Order the same mix design when pouring several batches. Changes to the slump, cement content and sand can alter the colour.
- ✓ Have sufficient materials like evaporation retarders available for the duration of the concreting work.

Do not:

- × Pour coloured concrete if rain, snow, frost or strong winds have been predicted.

Placing & Finishing

Coloured concrete is not a different 'beast' to regular grey concrete, however there are certain rules regarding placing and finishing that must be observed to avoid unsightly appearance issues.

Do:

- ✓ Keep the slump between 80-100mm unless admixtures are used to improve workability and reduce the water content to achieve higher slumps. In general, a slump in excess of 100mm is likely to result in a less vibrant colour.
- ✓ Wait for the bleed water to completely evaporate before commencing trowelling. Trowelling in the bleed water can lead to moisture entrapment, discolouration and surface dusting.
- ✓ Make sure all hand trowelling is commenced and completed in the same direction.
- ✓ Ensure that all residue is thoroughly washed away when saw cutting to create control joints in the concrete slab. Left over residue is likely to cause staining to the concrete surface.

Do not:

- × Place concrete more than 1½ hours after batching.
- × Add water to the surface of the concrete as this will alter the water:cement ratio, reducing the colour intensity and increasing the chances of surface dusting. It will also affect the strength and durability of the surface layer of the concrete. Similarly, avoid adding water from washed, wet tools like trowels, brooms etc.
- × Over-trowel the surface of the concrete unless a burnished finish is desired. Discolouration will be particularly evident on lighter colours where a machine trowel has been used.
- × Avoid re-visiting a finished area. Darker surface patches are likely to occur where the concrete has been re-worked.

Curing

Coloured concrete must be cured carefully to produce an even colour. Colour variation may result if different areas cure at different rates. For best the results, the slower the evaporation the more vibrant the colour.

Do:

- ✓ Use evaporation retardants like, for example, aliphatic alcohol to reduce moisture evaporation from the surface of the concrete, to improve concrete surface workability and reduce the risk of plastic shrinkage cracking and wind crusting.
- ✓ Consider using same day sealers to assist with curing. These will also protect the slab from the ingress of oil, grease and dirt, and help to reduce the effects of efflorescence. Seek advice and follow the application guidelines set out by the sealer manufacturer.

Do not:

- × Cover coloured concrete with polythene sheeting as condensation may cause colour variation.
- × Cover with hessian as tannins may leach from the hessian staining the concrete surface.
- × Intermittently wet the concrete surface as localized 'ponding' may occur. This will result in darker and lighter areas becoming present on the concrete surface as these areas have been allowed to cure at different rates.
- × Leave the concrete to 'air cure' unprotected, assuming that mild drying conditions will not cause cracking.

Note that as coloured concrete cures, the colour will lighten from that observed soon after installation. Full curing takes approximately 28 days, however a good indication of the final colour will be evident at 7 days.