

TECHNICAL INFORMATION

PHOENIX[®] CONCRETE

Site Guide



Concrete containing Phoenix[®] Portland-fly ash cement is suitable for most construction applications. However, there are certain differences between Phoenix concrete and more conventional Portland cement concrete. This guide provides information on key aspects of successfully using Phoenix concrete on site and is intended primarily for Site Engineers and Site Supervisors (Foremen).

Phoenix

PPE

The appropriate personal protective equipment (PPE) should always be worn when using Phoenix concrete. Fresh concrete of any type is highly alkaline and contact with the skin can cause burns and dermatitis. Contact with skin or eyes should be avoided and affected areas should be thoroughly washed. It is also important that clothing is resistant to saturation with wet concrete, as this can also lead to burns and dermatitis. (see the Tarmac Cement Health & Safety Data sheet for Portland cements).

FRESH CONCRETE

Fresh Phoenix concrete delivered to site will often look darker than normal. It may also appear to be more cohesive and less workable than conventional concrete. Do not add extra water on site. When Phoenix concrete is vibrated it becomes fluid and will move more readily. The spherical fly ash particles in Phoenix act as a lubricant helping the concrete to move.

PLACING AND COMPACTION

Phoenix concrete generally pumps easily and can be placed in the same way as other concrete. Due to its lower water content and increased cohesiveness, poker vibrators should be inserted at closer centres than normal and left immersed for longer periods in order to ensure full compaction.

FINISHING

The setting time of Phoenix concrete is longer than that of Portland cement concrete and there is usually less bleed water rising to the surface. The slow setting may delay the start of power-floating operations (particularly in winter). However, the lack of bleed water generally ensures that a good power-floated finish is obtained. When aiming for a tamped or brushed finish, problems may sometimes be observed with mortar sticking to the tamping bar or brush. This can usually be reduced by wetting the tamping bar or in extreme cases, reducing the fines content of the concrete to make the concrete slightly less cohesive (see the Tarmac Cement guide to Phoenix concrete mix design). Effective curing measures should always be applied as soon as finishing is complete.

CURING

The combination of slow setting and reduced bleeding makes Phoenix concrete rather susceptible to surface drying, particularly in hot, dry or windy weather. In slab or floor construction, this can easily lead to plastic shrinkage cracking, if proper curing measures are not applied. Exposed concrete surfaces should be protected from excessive drying by the use of windbreaks, and application of effective curing measures. These would include covering the exposed surface with plastic sheeting and/or wet hessian or the application of a proprietary curing membrane. It is important that curing is applied as soon as possible after the completion of finishing operations.

FORMWORK REMOVAL

The early age strength development of Phoenix concrete is slower than that of Portland cement concrete. Consequently, formwork removal should be delayed until the concrete has developed sufficient strength to resist collapse, deformation or damage to the concrete. This will be particularly important in cold weather. Guidance on the minimum time before striking formwork may be available in the project specification or in standards such as BS 8110 (table 6.2). Once formwork has been removed it is advisable to protect the newly exposed surfaces from drying (see above).

TESTING

Test cubes made from Phoenix concrete should be representative of the concrete delivery. It is important that once made they are protected from drying and stored at a temperature of $20 \pm 5^\circ\text{C}$. Care should also be taken not to move the cubes, once setting has occurred, until stripping (at 24 hours). Once stripped, cubes should be immediately transferred to moist storage. The use of temperature matched curing techniques could be considered for critical elements in a structure.

MAKING GOOD

No special procedures are required for Phoenix concrete, but it should be noted that the colour of the concrete may change in the first few weeks after casting due to continued cement hydration.

SPECIALIST USES

This guide covers most conventional construction applications of Phoenix concrete. However for further advice on using Phoenix concrete in specialist applications, please contact the Tarmac Cement Technical Helpdesk on 0845 812 6232

ACKNOWLEDGEMENTS

This guide is based, in part, on the information contained in the United Kingdom Quality Ash Association (UKQAA) 'Best Practice Guide No:1 - The placing and compaction of concrete containing PFA/Fly Ash. 2004'. www.ukqaa.org.uk

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