

Concrete Technology in Focus

4x4[™] Concrete System

Comparison to Rapid-Setting Cement Concrete

Application:

Rapid Pavement Replacement and Repair

When the need arises to rapidly replace or repair deteriorated concrete pavement, high-early strength concrete made with rapid-setting cement as have traditionally been used. However, these mixtures are plagued with placement difficulties and often exhibit post-placement problems such as cracking and the need for grinding. The 4x4 Concrete system uses patented technology to overcome the typical problems associated with rapid-setting cements.

The 4x4 Concrete System in Practice

To help agencies overcome these issues and meet the demands for fast-track pavement replacement and repairs, Master Builders Solutions has developed the 4x4 Concrete system, a patented, and economical method for achieving high-early strength. The 4x4 Concrete system is versatile, easy-to-place, achieves exceptional early strength, and is approved for use by a growing number DOT agencies.

The benefit of the 4x4 Concrete system is clearly seen in the minimal disruption to traffic. In addition to reducing or eliminating commuter impatience and reducing the economic impact of lane closures, the minimal disruption to traffic also increases safety on highways. From a contractor's perspective, the 4x4 Concrete system is easy to work with as noted by the following comments taken from customers who have used the 4x4 Concrete system:

- "The 4x4 Concrete was very easy to place and finish."
- "These were the smoothest slabs done to date."
- "The mix was very workable and there was no cracking."
- "We finally have our arms around a portland mix, out of a ready-mix truck, for fast-track applications."

Because the 4x4 Concrete system is made with locally available cements and aggregates, it can be developed by local concrete producers to meet the specific needs of transportation agencies and contractors. The secret to the development of very high early strength lies in the unique combination of Master Builders Solutions' brand MasterGlenium,[®] MasterSet[®] DELVO and MasterSet specialty admixtures.

In applications where corrosion control is needed, the 4x4 Concrete system can also be produced using MasterLife[®] CI 30 corrosion-inhibiting admixture to extend the service life of the structure or pavement.

4x4 Concrete System

Advantages
Controlled hydration/setting
Rapid strength gain
High ultimate strength
Slump control
User friendly/workable
Minimal vibration necessary to consolidate
Standard ready mix truck delivery
Less expensive/economical
Predict strength using maturity methods
No post-placement grinding required
Uses local cements
No penalties by avoiding disruption of peak-hour traffic
Disadvantages
Cannot be used in a mobile mixer

Rapid Setting Concrete

Advantages
Fast setting
Rapid strength gain
High ultimate strength
Can be used in a mobile mixer
Disadvantages
Non-user friendly
Erratic workability/setting time
Expensive
Difficult to finish
Risk set up in delivery truck
Truck add-on expenses for chipping and cleaning
Cracking experienced
Post-placement grinding may be required

The table above shows the similarities and differences between the 4x4 Concrete system and conventional high-early strength concrete made with rapid-setting cement.



About Master Builders Solutions

Master Builders Solutions is a leading global manufacturer of concrete admixtures, as well as other sustainable solutions for the construction industry, focussed on delivering its vision: **Inspiring people to build better**. Master Builders Solutions provides value-added technology and market-leading R&D capabilities to improve the performance

of construction materials and to enable the reduction of CO2 emissions in the production of concrete. Founded in 1909, Master Builders Solutions has ca. 1600 employees operating 35 production sites globally, supporting their customers in mastering their building challenges of today – for a decarbonised future.

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