

Editor's note: See page 11 for information on a related event: *FHWA Concrete Admixture Workshop*.

Concrete materials have changed dramatically over the years.

Understanding the complexities of concrete mixes

Concrete Chemistry, Microstructure, and Performance Workshop
November 14, 2001
Ames, Iowa

If it's been a while since you reviewed the complexities of modern concrete mixes, this practical workshop will teach you about

- the basics of current cements
- the importance of various materials and admixtures
- supplementary cementitious materials
- changes during hydration and microstructure development
- effects of concrete chemistry on durability

Concrete materials have changed dramatically over the years. They now include finer ground cements; blended and special cements; supplementary materials such as slag, fly ash, and silica fume; and a wide range of admixtures. Climatic conditions such as freeze/thaw cycles take their toll and so do frequent applications of deicer salts.

Therefore, it is critical that selecting proper materials be given paramount consideration in constructing a durable concrete pavement that can

resist weathering action, chemical attack, abrasion, or any other process of deterioration.

Workshop registration information is in the mail and online at www.ctre.iastate.edu/calendar/.

For more information, contact Harold Smith, training and public works engineer, Center for Portland Cement Concrete Pavement Technology, Iowa State University, 515-294-4218, hsmith7@iastate.edu, or see www.ctre.iastate.edu/calendar/. •



Correction—and more—about flowable mortar

FLOWABLE MORTAR mix specifications were incorrect in the July/August issue of *Technology News* (page 6). Correct specifications for one cubic yard of **standard flowable mortar** are

- cement: 100 pounds
- fly ash: 300 pounds
- fine aggregate: 2,600 pounds
- water: approximately 70 gallons

A variation on standard flowable mortar

In very tight areas that are difficult to excavate and/or compact, **controlled low-strength flowable mortar** (also known as controlled low strength material, or CLSM) may be the preferred backfill for storm or sanitary sewer, water line, and utility conduit trenches.

Controlled low-strength flowable mortar has the fluidity and other advantages of standard flowable mortar, but it is much easier to excavate. In fact, it's commonly removed with a back hoe.

In addition, because controlled low-strength flowable mortar more closely simulates the compacted natural earth surrounding the trench, fewer cracks tend to develop in the pavement slab along trench boundaries. That is, controlled low-strength flowable mortar can minimize or eliminate the "beam effect." This is particularly true in shallow trenches where the mortar encasement (or arch or bedding) is close to the pavement and/or when the earth adjacent to the trench has a tendency to compact.

But, of course, controlled low-strength flowable mortar isn't as strong. Standard flowable mortar has approximately half the weight-bearing strength of portland cement concrete; controlled low-strength flowable mortar has less strength than standard flowable mortar but more than the surrounding earth.

Proportions for one cubic yard of **controlled low-strength flowable mortar** (from the *Central Iowa Standard Design and Specification Manuals*) are

- cement: 50 pounds
- fly ash: 250 pounds
- fine aggregate: 2,910 pounds
- water: approximately 60 gallons •