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# Get Off to a Good Start with a Solid Mix Design

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In augercast piling, many of the problems encountered on the job can be traced back to a poor mix design. It can be tempting to reduce the amount of costly cementitious material (combination of cement and pozzolans like fly ash) and replace it with sand. There are a few reasons why this is not a good idea.

To compensate for strength loss, the first reaction is to reduce the water-cement ratio (w/c) and rely on a cocktail of water reducing admixtures. When admixtures are overdosed it can lead to set retardation and segregation of the grout. Another common reaction is to add water at the jobsite. Obviously, this raises the w/c, but it also causes the mix to over-yield. Consider the following example:

A contractor creates a cost-saving mix design for a 5000 psi grout. It contains 700 pounds of cement and 200 pounds of fly ash for a total of 900 pounds of cementitious material. At a .42 w/c it has only 375 pounds of water or about 45 gallons per yard and a potent blend of water reducing admixtures. The mix looks stiff when it arrives on site, so the decision is made to add 30 gallons of water to the 9 yard load. Not only does this bring the w/c to .45, but it also over-yields by half a cubic foot, effectively reducing the cement factor per cubic yard. The result is a grout that is difficult to pump and weaker than it was intended to be.

Avoid the frustration and costly delay of reevaluating a mix design mid-project by following these best practices:

- Include enough cementitious material to avoid pumping and strength issues.
- Account for all of the water and resist the urge to add more onsite.
- Avoid overdosing and combining water-reducing admixtures.

If you have a mix design question don't hesitate to call or email us. Specrete is always available to help.

