

Estimation Model for Concrete Slump Recovery by Using Superplasticizer

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Abstract : This paper is aimed to introduce the solution of concrete slump recovery using chemical admixture type-F (superplasticizer, naphthalene base) to the practice, in order to solve unusable concrete problem due to concrete loss its slump, especially for those tropical countries that have faster slump loss rate. In the other hand, randomly adding superplasticizer into concrete can cause concrete to segregate. Therefore, this paper also develops the estimation model used to calculate amount of second dose of superplasticizer need for concrete slump recovery. Fresh properties of ordinary Portland cement concrete with volumetric ratio of paste to void between aggregate (paste content) of 1.1-1.3 with water-cement ratio zone of 0.30 to 0.67 and initial superplasticizer (naphthalene base) of 0.25%- 1.6% were tested for initial slump and slump loss for every 30 minutes for one and half hour by slump cone test. Those concretes with slump loss range from 10% to 90% were re-dosed and successfully recovered back to its initial slump. Slump after re-dosed was tested by slump cone test. From the result, it has been concluded that, slump loss was slower for those mix with high initial dose of superplasticizer due to addition of superplasticizer will disturb cement hydration. The required second dose of superplasticizer was affected by two major parameter, which were water-cement ratio and paste content, where lower water-cement ratio and paste content cause an increase in require second dose of superplasticizer. The amount of second dose of superplasticizer is higher as the solid content within the system is increase, solid can be either from cement particles or aggregate. The data was analyzed to form an equation use to estimate the amount of second dosage requirement of superplasticizer to recovery slump to its original.

Keywords : estimation model, second superplasticizer dosage, slump loss, slump recovery

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