

空気を連行したフレッシュ時の自己充填コンクリート中の固体粒子間摩擦に及ぼす 細骨材の物理的特性の影響

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要旨

空気連行による自己充填コンクリート中の固体粒子間摩擦の低減効果の違いを、物理的特性の異なる6種類の細骨材を用いた試験から調べた。ガラスビーズを用いた漏斗試験によるフレッシュモルタル中の固体粒子間摩擦試験における模擬粗骨材の容積比を、従来の模擬コンクリート中の20%から23%に増加させることにより、障害物 R_1 を用いたコンクリートの間隙通過性試験結果との相関が高くなった。フレッシュモルタル中の実質細骨材容積比を一定にした空気の有無による固体粒子間摩擦試験結果の比較から、空気を連行することで細骨材粒子の形状の影響を小さくすることが出来たと言える。その結果、粗粒率以外の要因の固体粒子間摩擦への影響を小さくすることにより、使用した細骨材とフレッシュモルタル中の固体粒子間摩擦との相関がわずかではあるが高くなった。一方、今回の試験の範囲内では、細骨材特性の違いによって生じた連行気泡径の分布の差異が、フレッシュモルタル中の固体粒子間摩擦の緩和効果に影響したとは言えなかった。細骨材の種類により実粗骨材を用いた連行空気の径に、モルタルへの連行の場合よりも大きな差が生じた。しかし、これがフレッシュコンクリートの自己充填性に影響しているかは明らかにはならなかった。

Effect of physical characteristics of fine aggregate on internal friction between solid particles
in air-enhanced self-compacting concrete at fresh stage

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ABSTRACT

Effect of entrained air on reduction in friction between solid particles of air entrained self-compacting concrete using six types with different characteristic of fine aggregate was investigated. The friction was evaluated by funnel test of mortar with glass beads. The volume of glass beads was increased from conventional amount of 20% to 23%, which resulted in more precise correlation between the friction value with mortar test and self-compactability of concrete with R_1 obstacle. According to the results of the friction, considering volume of fine aggregate and entrained air, it can be said that it was possible to reduce the influence of the shape of fine aggregate particles by employing entrained air. Therefore, the method to reduce the friction between solid particles other than that to reduce coarse aggregate volume has been found. The correlation between the fine aggregate used and the friction between solid particles in fresh mortar was slightly increased. On the other hand, in the scope of this test, air diameter size distributions were differed due to type of fine aggregate. It could not be said that the difference of those distributions was affected by the reduction in friction. Diameter of entrained air in self-compacting concrete with real coarse aggregate depended on type of fine aggregate. It was significantly different larger than that of mortar results. The effect of type of fine aggregate entrained air on self-compactability of SCC was not clear, it would be a future task.