

消泡剤を用いた大径空気泡の除去による フレッシュコンクリートの自己充填性向上

亀島 健太

要旨

単位セメント量が大きいことによる自己充填コンクリートの高単価の問題を解決するために、セメントの一部を微細な空気泡に置き換えることで、自己充填性は維持したまま価格を抑えた気泡潤滑型自己充填コンクリートが開発された。気泡潤滑型自己充填コンクリートの自己充填性を向上による骨材量増加の鍵は微細な気泡の比率を高めることによるものである。

本研究では、フレッシュコンクリートの自己充填性に有効であると想定した小径空気泡の比率を向上させるために、練混ぜ手順の異なる二種類の方法の有効性を検証した。一つ目は、水分割練りで小径空気泡を多く連行させてから消泡剤で除去する方法で、一次水と同時に消泡剤添加、二次水と同時に消泡剤添加、最後に消泡剤添加の全てのケースで、大径空気泡の除去はできずにむしろ増加した。一方、二つ目は、一括練りで気泡を大量に連行させてから最後に消泡剤を添加し除去する方法では、空気連行剤の添加量を多くすれば、小径空気泡の比率を増加させ、大径空気泡の比率を減少させることができた。

Enhancement in self-compactability of fresh concrete by eliminating large air bubbles with defoaming agent

Kenta Kameshima

ABSTRACT

This study presents the advantage of entrained air on enhancement of self-compactability of self-compacting concrete (SCC). Cement content in SCC was partially replaced by fine air bubbles in order to reduce unit cost and increase self-compactability. Bubbles-lubricated self-compacting concrete has been developed. The usefulness of this concrete is that amount of aggregate can be increased by increasing fine air bubbles.

In this study, the ratio between fine air bubbles assumed to be effective for enhancement of self-compactability was increased by adding defoaming agent with two types of mixing procedure. The first method, water was divided into two parts and added separately to mixes. Defoaming agent was divided into three parts, and then it was added at the same of the first water and second water. The last part of defoaming agent was separately added at the last step. Large bubbles could not be significantly removed by this method. On the other hand, the second method that water was added at once and defoaming agent was separately added at the last exhibited high self-compactability due to the reduction of large bubbles. Proportion of fine bubbles could be increased with the increase of dosage of air entraining agent. Accordingly, the proportion of large bubbles was effectively reduced.