

Curing planning method based on cement hydration analysis - Consideration of compatibility with productivity and low carbonization -

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Curing of concrete is a very important work process for constructing a concrete structure with the required performance^{1),2),3)}. The authors have proposed “Curing planning method based on cement hydration analysis”^{4),5)}. The proposed method is based on the original purpose of curing and calculates the curing period from the viewpoint of sufficiently promoting cement hydration. That is, the curing period is calculated so that the hydration rate calculated by the cement hydration analysis reaches the target hydration rate for satisfying the required performance of concrete. Based on the investigations so far, it has been confirmed that it is possible to formulate a curing plan rationally according to the structural conditions, concrete conditions and construction environmental conditions⁵⁾.

On the other hand, in the construction industry, improving productivity has become an important issue. In particular, it has been pointed out that the productivity of concrete works is low, and efforts to improve the productivity of concrete works have been studied from various viewpoints. Securing the curing period to ensure performance may also be one of the reasons why the productivity of concrete works has not improved. In addition, there is an urgent need to expand the use of low-carbon cement for carbon neutrality. There are concerns that low-carbon cement may require a long curing period due to the high content of admixtures such as ground granulated blast furnace slag BFS and fly ash FA, which deteriorates initial strength development.

As mentioned above, it is not enough to find the curing conditions for securing the performance, and in the future, it is required to develop a curing planning method that aims at both productivity improvement and low carbonization. By applying the proposed “Curing planning method based on cement hydration analysis”, it is considered possible to find a method to achieve both productivity improvement by shortening the curing period and ensuring the performance of the structure.

From the above background, the purpose of this study is to develop a curing planning method that considers both productivity improvement, low-carbonization and performance securing. In this paper, we first introduce “Curing planning method based on cement hydration analysis”. Next, we will introduce the specific methods of curing planning methods that consider both productivity and low-carbonization and ensuring performance. In addition, we present examples of curing plans under various conditions, and show that it is possible to rationally formulate a curing plan that takes into account both productivity and low-carbonization and performance assurance.