

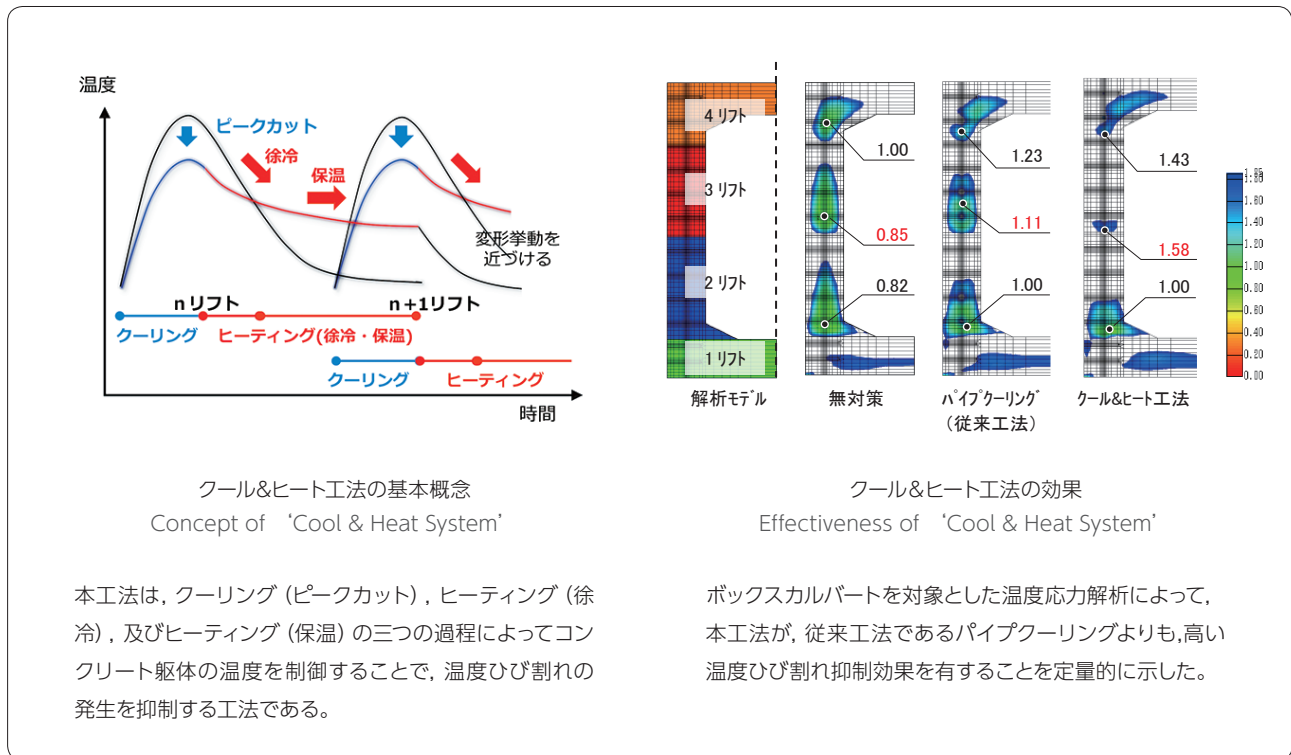
温度ひび割れを抑制するコンクリートの温度制御技術 －「クール&ヒート工法™」の開発と現場適用－

Method of Controlling Concrete Temperature to Prevent Thermal Cracks
Development and Application of 'Cool & Heat System'

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温度ひび割れ抑制工法の一つであるパイプクーリングを応用した「クール&ヒート工法™」は、躯体内部に設置した埋設管に冷水だけでなく温水を循環させることで躯体温度を制御して、温度ひび割れを抑制するものである。開発にあたり、まず、クール&ヒート工法による温度ひび割れの抑制効果について解析的に検討し、本工法が従来のパイプクーリングよりも温度ひび割れの抑制効果に優れることを明らかにした。次に、実構造物（中空断面橋脚）に適用し、概念どおりに躯体温度を制御できることを温度計測によって確認するとともに、躯体の温度ひび割れを抑制できることを確認した。



The pipe cooling method has been used since ancient times to prevent thermal cracks in concrete structures. An improved method, the 'Cool & Heat System,' has just been developed, in which the temperature of the concrete is controlled by circulating not only cold water but also hot water through a pipe placed in the structural member. The following were considered for the development of this method. First, analytical studies based on the concept were carried out to determine its effectiveness in preventing thermal cracks. Then the method was applied in actual construction work on a bridge pier and it was shown to have controlled the temperature of structural members as predicted, with no thermal cracks occurring in the members. Moreover, an accuracy analysis taking into consideration the field conditions and the actual properties of the concrete was conducted, and it showed the 'Cool & Heat System' to be more effective than the conventional pipe cooling method in preventing thermal cracks. This paper summarizes the results of these studies.