9. Investigation of The Effect of Crack Prevention with Expansive Additive in Massive Concrete Structures -Analysis of the Expansion History, and Application to a Structure-

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When applying the expansive additive for preventing cracks in massive concrete structures, it is necessary to appropriately evaluate the effect. Expansion and stress in proportion to the restraint were measured accurately by constrained test equipment under temperature history. Using FEM analysis, the correction factor of Effective Young's modulus at an early age and the value of effective expansion were set by inverse analysis. Thus, it was possible to evaluate the stress history with expansive additive by the correction factor of Effective Young's modulus at an early age and the value of expansion in proportion to the restraint. Furthermore, it was shown that the value of effective expansion was estimated by reduction of the basic expansion in proportion to element stress intensity of the analytical model. By applying FEM analysis to a Box Culvert structure, the accuracy and effect of expansive concrete were examined by a comparison with measured stress.

Key words : massive concrete, expansive concrete, expansive additive, cracks, thermal stress analysis