

6. Investigation of the Effect of Crack Prevention with Expansive Additive in Massive Concrete Structures(Part2)

-The Analysis of the Expansion History-

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When we apply the expansive additive for preventing cracks in massive concrete structures, it is necessary to appropriately evaluate the effect. We proposed the analytical method using FEM analysis with the correction factor of Effective Young's modulus at an early age and the value of effective expansion strain of expansive additive. It is cleared experimentally that the expansion strain in a structure changes three-dimensional, and the strain shows the value from large to small by a restraint direction in an element .

In the analysis of wall structure model, analyzing by the expansion strain of JIS restraining expansion test, the expansion strain was reduced by the minimum principal stress. In the model with large wall-thickness, it was shown that examination was necessary on the size of the reduction of the expansion strain, because the minimum principal stress direction may be different from the direction noticed in respect of the crack. And in the analysis of the restrained specimen model, analyzing by the unrestrained expansion strain, it was shown that we could express the strain history from the unrestrained direction to the restrained direction in an element.

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