

12. Construction Aimed at Preventing Wall Cracks in a Massive Concrete Box Culvert and Thermal Stress Analysis Using Inverse Analysis

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The massive concrete box culvert on the Metropolitan seaside road has 2m thick slab and 1.8m thick walls. In the beginning, we investigated to use low heat Portland Cement and analytically compared the crack preventing effect with other cement. Then we successfully prevented cracks using low heat Portland Cement. In this paper we described the prevention effect by comparison the previous analysis with results of measurement.

For the purpose of the accuracy improvement of the thermal stress analysis, we applied inverse analysis using the Kalman filter and 3D FEM analysis. We examined fluctuation and accuracy of heat characteristic values of the inverse analysis model. We calculated the stress in sidewall from the heat characteristic values identified from the data in the base. As the result of comparing with the measured value, we obtained the applicable accuracy.

Key words : massive concrete, thermal stress, inverse analysis, low heat Portland cement