Cracking safety evaluation of massive concrete structures.

ABSTRACT

High temperatures generated in the concrete due to the hydration of cement induce thermal tensile stresses. If these stresses are not controlled, they cause cracks in mass concrete structures such as dams. Hence, the thermal and structural stresses needs to be checked against the possibility of cracking to evaluate the safety of the dam. This study deals with formulation and simplified procedure to predict the possibility of crack development in RCC dam. An existing 2-D code has been modified by implementing the crack prediction procedures. The applicability of the modified 2-D code has been shown by analyzing a real RCC dam called Zirdan dam situated in southeast of Iran. The predicted stresses which were obtained through the finite element analysis are examined against the crack development at Gaussian points and it was found that the dam is structurally safe.

Keyword: Crack safety; FEM; Mass concrete; Thermal stress