

Load-Displacement Behaviors of Reinforced Concrete Beam Embedded with Galvanized Steel Cable: Comparison Between Experiment and Finite Element Analysis

Abstract

Lightning is a natural phenomenon which occurred when the upper atmosphere becomes unstable due to rising air currents. Lightning can be one of the natural causes of human injuries or damage to electrical equipment. In order to create a system to protect buildings from this natural phenomenon, the Lightning Protection System (LPS) was introduced. However, various problems have been associated with this conventional method. A common problem related to external lightning protection cables is corrosion. Therefore, the newly arrangement of lightning protection cable was proposed and investigated. Galvanized steel cable was used in this research due to suitability of the materials to be embedded inside reinforced concrete beam. Load-displacement behavior from the three (3) point flexural test was compared with the finding from the Finite Element Analysis (FEA). From the result, FEA showed slightly higher than experiment result at the maximum load.

Keywords

Finite element analysis; Galvanized steel cable; Lightning; Load-displacement; Reinforced concrete beam