

Finite Element Analysis of Steel-Concrete Composite Structures Considering Bond-Slip Effect

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Abstract : A numerical model considering slip behavior of steel-concrete composite structure is introduced. This model is based on a linear bond stress-slip relation along the interface. Single node was considered at the interface of steel and concrete member in finite element analysis, and it improves analytical problems of model that takes double nodes at the interface by adopting spring elements to simulate the partial interaction. The slip behavior is simulated by modifying material properties of steel element contacting concrete according to the derived formulation. Decreased elastic modulus simulates the slip occurrence at the interface and decreased yield strength simulates drop in load capacity of the structure. The model is verified by comparing numerical analysis applying this model with experimental studies. Acknowledgment—This research was supported by a grant(13SCIPA01) from Smart Civil Infrastructure Research Program funded by Ministry of Land, Infrastructure and Transport(MOLIT) of Korea government and Korea Agency for Infrastructure Technology Advancement(KAIA) and financially supported by Korea Ministry of Land, Infrastructure and Transport(MOLIT) as U-City Master and Doctor Course Grant Program.

Keywords : bond-slip, composite structure, partial interaction, steel-concrete structure

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