

1.14.12. THE USABILITY OF TURKISH EARTHQUAKE RESISTANT STEEL BAR AS A SHEAR CONNECTOR IN COMPOSITE STRUCTURES

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The composite behavior of two or more structural members joined together by using different materials is called “a composite structure”. Shear connectors are used to avoid potential slippings between steel and concrete and slippings due to deformations on concrete plate. Many materials having different shapes and dimensions are tested as shear connectors. Headed stud shear connectors are commonly used to ensure composite action due to its fast manufacture.

In this study, availability of earthquake resistant steel bars manufactured in the same length as headed studs are investigated. For this purpose, 4 push-out tests accomplished to the composite beams with profiled steel sheeting in which earthquake resistant steels are used as shear connector. Earthquake resistant steel is a steel reinforcement bar used in concrete and produced by a heating process during hot rolling with the ribs on it to increase the adherence between concrete and steel. It is abundantly manufactured in recent years with an increasing use in reinforced concrete constructions due to its advantages in terms of ductility, weldability, adherence, corrosion resistance and strength. In the experimental section, 4 push-out tests performed on 8 specimens with different slab height, different number and arrangement of shear connectors. The dimensions of the test specimens were taken in appropriate to the dimensions of the push-out test procedure given in European Standards of Eurocode-4 according to which the steel profiles welded with shear connectors by using laminated steel plates were proposed to be HE260, and the slab dimensions were taken as 600×600×150 mm. As a result of the tests, earthquake resistant steel can be suggested to be used as an alternative material for the shear connectors. Consequently, performing more number of tests will give more accurate results for earthquake resistant steel use as a shear connector.