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Evaluation of Applicability of High Strength Stirrup for Prestressed Concrete Members

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Abstract : Recently, the use of high-strength materials is increasing as the construction of large structures and high-rise structures increases. This paper presents an analysis of the shear behavior of prestressed concrete members with various types of materials by simulating a finite element (FE) analysis. The analytical results indicated that the shear strength and shear failure mode were strongly influenced by not only the shear reinforcement ratio but also the yield strength of shear reinforcement and the compressive strength of concrete. Though the yield strength of shear reinforcement increased the shear strength of prestressed concrete members, there was a limit to the increase in strength because of the change of shear failure modes. According to the results of FE analysis on various parameters, the maximum yield strength of the steel stirrup that can be applied to prestressed concrete members was about 860 MPa.

Keywords : prestressed concrete members, high strength reinforcing bars, high strength concrete, shear behavior
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