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Experimental investigation of axial compression behavior of shock wave compacted concrete filled steel tube (CFST) to increase strength and sustainability

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Abstract

Concrete filled steel tubes (CFST) are the composite structures adopted in construction. It is a combination of steel casing and high strength concrete core at the inner portion. It combines the advantages of hollow structural steel and concrete in this material. Concrete filled steel tubes (CFST) are extensively depended in other modern civil engineering applications. When used as structural columns, especially in high-rise buildings and bridges, the composite members may be subjected to high lateral forces under wind or seismic actions which cause shearing and bending moment effects on the member. The use of high strength concrete in thin steel casings helps minimize the structural steel cost and the majority of the load in compression is resisted by the high strength concrete along with the steel casing .However, bare steel or reinforced concrete columns are still depended more widely than CFSTs due to the lack of knowledge and experience that Engineers have with CFST structural elements. This paper compares the axial compression behavior of shock wave compacted Concrete Filled Steel Tube (CFST) Column and Concrete Filled Steel tube without shock wave compaction. The specimens used for this experiment are 110mm diameter steel tubes with 2mm thickness and height 300mm.

Key Words: Concrete Filled Steel Tubes (CFST), Composite structure, Shock wave, Axial Compression, Column, Compressive strength.

Biography

V Selvan has 34 years of experience in teaching profession for B.E. students and M.E students at reputed Engineering colleges. Expertise in Structural Engineering specialization for Civil and Aeronautical Engineering disciplines. 15 years of experience in R&D.

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