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Towards the design of super columns

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Tubular columns with welded U links to their walls and filled with concrete can sustain large loads. The axial capacity exceeds the sum of the yielding strength of the steel shell plus the crushing strength of concrete. The method of connecting the two structural materials brings the level of confinement of concrete to values never reached before. The concrete strength is increased by more than 100%. However the central result of this type of design is the huge compressive strains attained; such strains are well outside the plastic strains of steel and exceed 10 times the concrete crushing strain. The resulting integrity of the cross section goes beyond preventing local buckling of steel shell to sustaining loads up to the failure which is characterized by the plastic buckling of the steel tube and not by the crushing of the concrete. Concrete does not fail; in fact the concrete deforms inside the buckled steel shell depicting its exact shape with no sign of any form of cracking in its final shape.

Biography

Abdul Qader S Al-Najmi has completed his PhD from the Victoria University of Manchester. He is currently Professor of Civil Engineering at the University of Jordan. He has published more than 30 papers in reputed journals.

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