Composite Structural Systems in Bridges and Buildings

W H Wan Badaruzzaman

Smart and Sustainable Research Centre
Faculty of Engineering and Built Environment
Universiti Kebangsaan Malaysia, Bangi, Malaysia
wanhamidon@ukm.edu.my

Abstract

The paper highlights various structural composite construction techniques that finds increasingly wide applications in bridges and buildings throughout the world focussing on the composite systems dealt with by the author. Composite structures are created by combining/binding two or more structural elements to act as a single combined structural unit, where each element behaves in a very structurally efficient manner. Various advantages are achieved by composite structures: higher stiffness and strength, reduced depth and weight of structures, faster construction speed, and structurally more efficient, thus providing an economical solution for a wide range of industrial, residential and commercial buildings and bridges. The paper firstly overviewed the principle of composite construction, followed by an account of the research developments undertaken in the past by the author. Research findings on composite construction that include stiffened in-filled columns, tapered plate girders, CFRP strengthened steel tube beams, and an innovative lightweight composite panel system known as the Profiled Steel Sheeting Dry Board (PSSDB) System applied as flooring, walling and roofing units in buildings are covered. The paper also highlights applications of the PSSDB system in real projects.