

Performance test on simply supported composite beam with TWP steel section

Abstract

Steel beams with trapezoidal web profile (TWP) have been widely and increasingly used in recent years mainly due to corrugated webs have allowed the use of thin plates without the need for stiffeners. On the other hand, beams with steel-concrete composite action are one of the most commonly used structural elements because they considerably increase flexural strength and stiffness of steel beams. However, there are few or no experimental test data available which to check the performance of TWP steel section acting compositely with concrete. Consequently, the search for this experimental data has been the main concern in this project and the experiment is briefly described and discussed in this paper. The objectives of this project are: (a) to compare the ultimate performance of composite beam with TWP steel section to composite beam with I-plate girder; (b) to study the suitability of adopting composite design method by BS5950: Part 3: Section 3.1 [1] for designing composite beam with TWP steel section; (c) to obtain the stress and strain distribution and the position of neutral axis of the composite beam with TWP steel section. These will also allow better understanding of the true behaviour of composite beam with TWP steel section.