



You are cordially invited to the seminar organised by Protective Technology Research Centre (PTRC).

Seminar on

Behaviour and Design of Cold-Formed Steel Wall Panels

Abstract:

The beauty of Cold-Formed Steel (CFS) is that it allows need based optimisation owing to its ease in manufacturing the required structural sections. The superstructure in a light-gage steel construction is fabricated from CFS structural components of which wall panels forms a major part. The wall panels in the light-gage steel construction is attached to external sheathing on both sides of the panel. The inherent sheathing can brace the wall studs from buckling to some extent. However, there is lack of design guidelines to account the structural contribution of sheathing that offers resistance against global buckling of the CFS studs. Therefore, this talk will focus on investigating the effect of various sheathing board materials on CFS structural members. The recommendations of the current design specifications for the sheathing braced design of CFS wall studs will be highlighted. The experimental investigation was carried out for various design parameters such as sheathing configuration [sheathing material type, fastener spacing (df), and thickness of the sheathing (tb)] and different shapes (singly, point and doubly symmetric) and slenderness (local, distortional and global) of the CFS studs. The experimental results show that the sheathing can be appropriately designed to bear the forces developed at the sheathing-fastener connections. A comparison of experimental results and design predictions indicates that the current AISI design specifications is unconservative. The further investigation revealed that the sheathing stiffnesses predicted by AISI for the axial compression loading case has been implicitly recommended for both axial compression and out-of-plane loading case. Therefore, a new test setup is developed to simulate the failure of the CFS stud subjected to out-of-plane loading case and appropriate sheathing stiffness is determined.

Speaker:

Dr M K MADHAVAN is currently an Associate Professor at the Indian Institute of Technology (IIT) Hyderabad and has published more than 30 journal papers in reputed international journals. His research interests are in high strength steel, parallel flange beams, composite structures, cold-formed steel. Prior to joining IIT Hyderabad, Associate Professor Madhavan worked at Alabama Power Company for close to seven years on various aspects of Structural Engineering and is also a registered professional engineer (PE) in the State of Alabama, USA.

Associate Professor Madhavan obtained his undergraduate degree from the College of Engineering (CEG), Anna University in 1998 and his master's degree from The National University of Singapore (NUS) in 2000. He immediately moved to USA to pursue his doctoral studies and obtained his PhD from The University of Alabama at Birmingham in 2005. Associate Professor Madhavan is the recipient of several awards such as Outstanding Achievement Award, International Students Scholarship and Who's Who among students in American Universities and Colleges. His graduate studies both in Singapore and USA were focused on stability of thin plates and the behaviour of such plates fabricated in the form of plate girders.

Date: 12 November 2019 (Tuesday)

Time: 3.30pm to 4.30pm

Venue: CEE Seminar Room A, Block N1, Level B1, N1-B1b-06

School of Civil and Environmental Engineering (CEE), Nanyang Technological University | Singapore