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A half-day Workshop on the new Eurocode 2 - Part 4: SS EN 1992-4 Design of Fastenings for Use in Concrete

Organiser : IES/IStructE Joint Committee & Building and Construction Authority

Date : Friday 31st March 2023

Time : 1.30 pm to 5.30 pm

Venue : NUS Lecture Theatre LT7A – see attached directional map



PDU (TBA)

Registration Fee:

IES/IStructE Member S\$ 50

Non-IES/IStructE Member S\$ 100

Full Time Students and Retirees: FOC

Register Link Please Click [Here](#)

Programme

31 Mar 2023 (Fri)		
1300	Registration	
1330 - 1340	Welcome Address and Opening Speech Er. Tan Chun Yong, Group Director, Building and Construction Authority	
1340 – 1440 (10' Q&A)	Keynote Speaker: Prof. Tan Kiang Hwee	Overview of SS EN 1992-4 and the Singapore National Annex
1440 – 15.20 (5' Q&A)	Speaker: Mr Liew Yong Seong	EU CPR Framework and important changes in design from EOTA ETAG to CEN EC2-4
1520 - 1550	Tea break	
1550 – 1630 (5' Q&A)	Speaker: Mr Michael Roessle	Design of fastenings using SS EN 1992-4
1630 – 1710 (5' Q&A)	Speaker: Mr Gary Connah	Overview of BS 8539 and Proof Load test
1710 – 1730	Concluding remarks and Token of Appreciation	

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Objectives

Singapore Standard SS EN 1992-4:2021 and its corresponding National Annex (NA) have been published and will be adopted as the prescribed standard on the design of fastenings for use in concrete. It has been included in the list of acceptable design standards in the Approved Document by BCA. The objectives of this workshop are to raise awareness and understanding among the engineers of this new standard, share the insights on how the code evolved from European Technical Approval Guideline and Technical Reports, and highlight the importance of carrying out proof load test for post-installed anchors to verify the quality of installation.

Keynote Speaker:

Prof Tan Kiang Hwee



Professor Tan Kiang Hwee is a faculty member at the National University of Singapore (NUS) since 1981. He obtained his doctoral degree from the University of Tokyo in 1985. He is a Fellow of Institution of Engineers, Singapore, Japan Concrete Institute, and Japan Society of Civil Engineers, and is a registered professional engineer in Singapore.

He specializes in the field of structural concrete, and he has taught courses in reinforced and prestressed concrete design at both undergraduate and graduate levels. He has carried out extensive research on structural concrete and composites, including fibre-reinforced concrete and fibre-reinforced polymer (FRP) systems, and has published more than 300 refereed technical papers. Currently, he is the Chairman of the Singapore Standard Council's Technical Committee on Building Structures and Sub-Structures.

Overview of SS EN 1992-4 and the Singapore National Annex

The presentation gives the background and an overview of the Singapore Standard SS EN 1992-4:2021 and the Singapore National Annex to the Standard. It will highlight the application and limitation of the Standard, as well as recommendations for local practice.

Mr Liew Yong Seong



Mr. Liew Yong Seong is currently the Senior Project Manager at Nanyang Technological University, where he oversees research topics related to structural fire safety. Prior to his current role, he served as the Codes and Approvals Manager at an established fastening solutions provider, where he was responsible for providing professional support to both the design office and job-site personnel on post-installed fastening selection, design, and quality assurance.

In his early career, he worked as a structural design engineer in renowned consulting and construction firms, where he was in charge of high-rise building analysis, post-tensioning, and seismic design for numerous landmark projects in the region. Later, he represented renowned structural engineering software brands such as ETABS, HDB SE CAD, and ADAPT to drive the modernization and digitalization of design and construction processes.

Mr. Liew obtained his Master of Engineering from NUS through a full research scholarship and served as a member of the SS EN 1992-4 and Singapore Fire Code Review (Capsule Hotel) workgroups. He is currently an active member and chairing one of the technical divisions of IES.

EU CPR Framework and important changes in design from EOTA ETAG to CEN EC2-4

EC2-4 (Eurocode 2 Part 4, one of CEN's hENs) refers to the European Technical Products Specification for system/product-specific design parameters. For fasteners, this is equivalent to the ETA (European Technical Assessment) issued based on EAD (European Assessment Documents) from EOTA (European Organisation of Technical Assessment). The mechanism of CEN hEN and EOTA EAD under the EU CPR (European Construction Product Regulation) will be presented first, followed by highlights of important changes in design based on the old EOTA ETA Guideline to the new CEN EC2-4, along with things to note when using these documents.

Mr Michael Roessle



Michael Roessle graduated in structural engineering at the Technical University of Munich (Germany) and worked as a structural designer for reinforced concrete structures in an engineering office in Berlin (Germany). In his research at University of Stuttgart, Michael focused on the reliability of fasteners in concrete structures. He is author and co-author of several publications on these topics. He has more than 17 years' experience in R&D departments of leading manufactures for cast-in and post-installed fastening systems in Germany to develop and qualify fasteners for design according to international standards. Currently he is working for Hilti Asia Pacific and is based in Singapore.

Design of fastenings using SS EN 1992-4

A wide variety of fasteners is used on construction to connect steel and concrete structures. To ensure a reliable design of the connections, the Singapore Standard SS EN 1992-4 'Design of fastenings for use in concrete' in conjunction with a National Annex has been launched in 2021 and can be used today. The presentation will share information on the working principles of fasteners covered by the design code, the product pre-qualification as well as first principles of the design method for fasteners in concrete.

Mr Gary Connah



Gary Connah is a Chartered Professional Engineer and currently holds the position of Coupler and Continuity Systems Product Manager for Leviat, based in Singapore. He graduated from Loughborough University in the UK in 1996 and has gained extensive experience in all manner of connection technologies including mechanical splices, precast and insitu connection systems as well as post installed and cast in anchor solutions in Europe, Asia and Australasia. As the ex-chair of the Construction Fixings Association technical committee in UK, he actively contributed to current anchor Approval guidelines in Europe and, whilst living in Australia, held the position of Chair of the AEFAC technical committee; an industry initiative seeking to enhance the specification, selection, design and installation of structural anchors and fasteners in the Australian construction industry. Since moving to Singapore, he has continued giving back to the Industry as the Honorary Secretary at the Singapore Concrete Institute and a façade committee member for the Institute of Engineers Singapore. His journey in regard to innovating connections still continues to this day with new and uniquely Singaporean building techniques providing a wealth of new opportunities.

Overview of BS 8539 and Proof Load test

In a 2014 circular, the BCA shared that a standard for the use of post-installed anchors (BS 8539 - Code of practice for the selection and installation of post-installed anchors in concrete and masonry) had been published and could be used in Singapore for the safe selection and installation of anchors for use in concrete and masonry.

This standard remains relevant and is considered complementary to SS EN 1992-4 as the scope of the documents are different with the new standard only covering design.

In the absence of a qualified installer certification scheme, proof load testing should be carried out for post installed anchors and reference can be made to BS 8539 for guidance on the test regime methodology. However, new frequency guidance has been included in the National Foreword of the NA to SS EN 1992-4 to increase productivity and only carry out tests that increase confidence levels. Such tests are usually carried out to check the quality of installation to ensure they have been installed correctly.

Location Map

