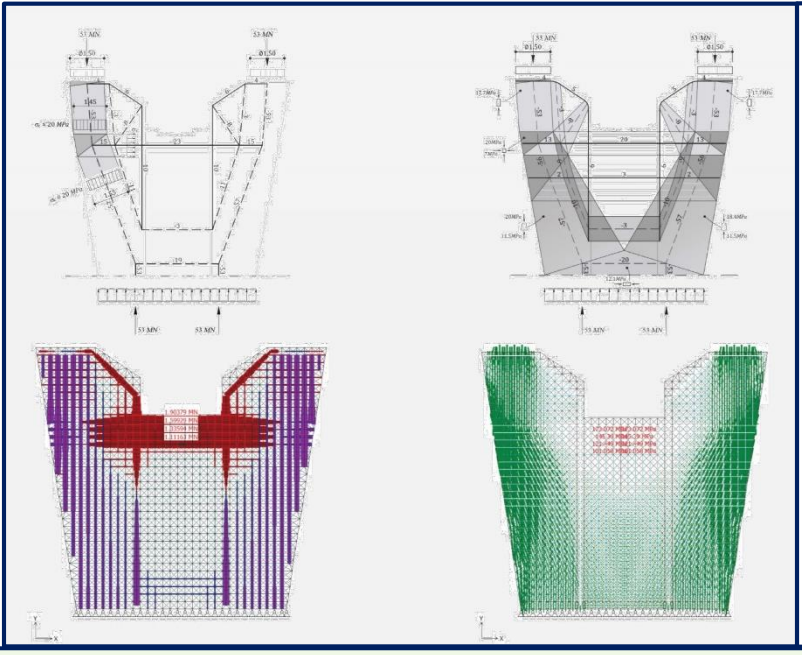

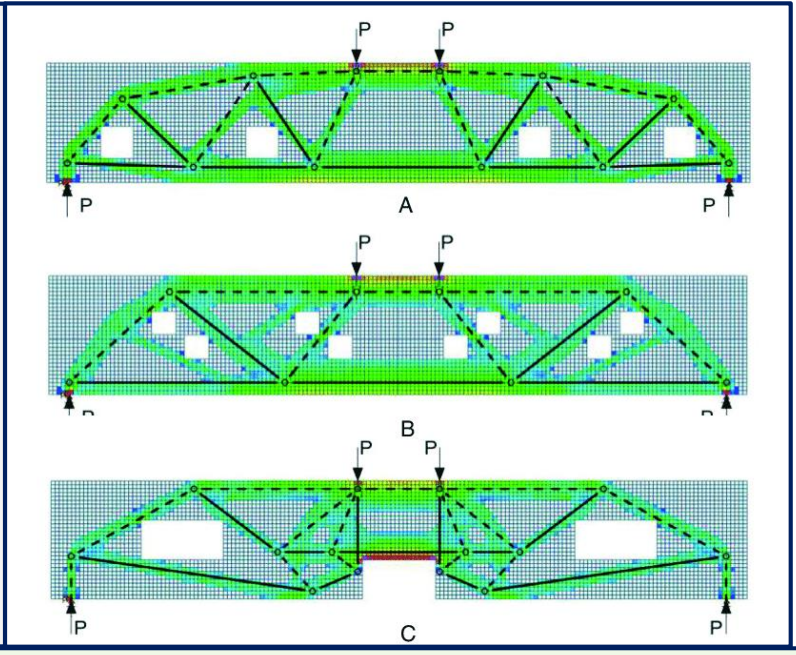

ONLINE COURSE ON

STRUT & TIE MODELS IN STRUCTURAL CONCRETE

During 15:00 Hours to 18:00 Hours (IST) on 21st Jan, 28th Jan, 04 Feb & 11th Feb 2023 (Saturday)

Series of 13 recorded Lectures

(All lectures will be followed by a Panel Discussion by Experts)

About the COURSE

Strut-and-tie models and stress fields have been widely used for decades in structural engineering for designing new structures and for assessing the structural capacity of existing ones. Stress fields and strut-and-tie models are currently seen as consistent and alternative means to calculate the same physical model, their original development and application were however historically different.

The power of these two methods resides in their wide range of applicability and the intuitive understanding of the structural response they provide. Regarding the former, strut-and-tie and stress field models have been considered as tools mostly addressed to regions where beam design theory does not apply, for instance, deep beams or discontinuities in geometry and loading; this scope was however widened when limit analysis design methods were introduced and generalised for beams with transverse reinforcement. Depending on the scale chosen, strut-and-tie and stress field modes can be used from detailed reinforcement design to global structural analysis and design. Regarding the latter, it is a prerequisite for the development of strut-and-tie and stress field models to understand the flow of forces, which ultimately leads to more consistent designs. This aspect is considered of special relevance in current engineering practice, where the use of computer software in a relatively automatic manner has generally reduced the time devoted to the conceptual design phase.

This Course is aimed to share knowledge on strut-and-tie and stress fields with practicing structural engineers, professionals, academics and students. The course will cover the subject comprehensibly, which will include a review of classical and advanced concepts of the methods, interactive sessions where real practical cases are solved by experts, using hand-based approaches and also using specific software for stress field design (the software will be free to download and use for all attendees). Speakers for this online course are members of the *fib* WP2.2.4 “Strut and tie modelling” and authors of the *fib* Bulletin 100 “Design and assessment with strut-and-tie models and stress fields: from simple calculations to detailed numerical analysis”.

In this *fib* Bulletin, the current state-of-the-art of the strut-and-tie models (STM) and the stress field models (SFM) is presented. Reference is not only made to classical rigid-plastic solutions, but also to solutions considering compatibility of deformations, such as elastic-plastic approaches or models allowing investigation of serviceability behavior and deformation capacity of concrete structures. It is shown in the *fib* Bulletin 100 that all models share the same ground and fundamental hypotheses. Their results are presented in a unitary and consistent manner by means of compression fields in the concrete and stresses in the reinforcement. The consistency amongst these approaches and their potential use in practice is also explored by means of the Levels-of-Approximation (LoA) approach as described in Model Code 2010. *fib* 100 Bulletin not only aims to give state-of-the-art rules and methods to design according to these techniques, but also to provide an outlook of how these methods could be implemented in future standards. This material also serves as the background document for the revision of the current provisions of Model Code 2010 in the new Model Code 2020.

Participants of this high-end course will be immensely benefited with the rich course content and with the opportunity to directly interact with the domain expert speakers, live at the end of each lecture session. The course will help structural engineers to re-orient their professional career to cope with the latest state of the art design methods.

Jointly organized by

IAStructE **Indian Association of Structural Engineers**

fib CEB-FIP

Official Media Partner

NBM&CW Infra Development & Const. Equipment Magazine

About IAStructE

Indian Association of Structural Engineers (IAStructE) is a national body of structural engineering professionals constituted in the year 2002 with the objective to cater to overall professional needs of construction industry in general and the structural engineers in particular. A prominent thrust area of IAStructE is to ensure that its members have requisite technical knowledge and experience, updated on continuing basis, to render professional services of high caliber to the society. Programs of continuing education, workshops, refresher courses are regularly organized. IAStructE also publishes high quality technical journal “Structural Engineering Digest” popularly known as SED. IAStructE has also published many code commentaries & guidelines. IAStructE national awards which were instituted with the aim of recognizing excellence in structural engineering are gaining eminence with time. It represents in various national code making bodies. It acts as a spokesperson for structural engineers in India in policy matters.

About the *fib*

The International Federation for Structural Concrete, *fib*, is the apex International body dealing with use of concrete in the structural industry. The primary goals of the body is to

- Spread awareness on the latest developments in concrete usage across the world
- Guide the propagation of safe practices in design and usage of concrete structures
- Transfer the findings from research into industry practice through publications, and spread the state of the art knowledge by organzing international congress, symposia and webinars.

The *fib* comprises more than forty one national delegations from across the globe and organises the international congress every four years, which provides an excellent opportunity to the users of concrete in structures to make a review of the progress achieved in the field.

Details of Lectures

S. No.	Date & Time	Title of the Lecture	Duration	Video Speaker
1	**21.01.2023** (Saturday) between 03:00 PM to 06:00 PM	Introduction to the Webinar	8 mins	David Fernández-Ordóñez
2		Introduction to STM, SF and Limit Analysis - Background	8 mins	Miguel Fernández Ruiz
3		Use of the LoA approach for design within STM and SF	25 mins	Miguel Serio Lourenço
4		Context & Historical Survey	21 mins	Linh Cao Hoang
5		Handmade STM and SF	33 mins	Miguel Fernández Ruiz
		Panel Discussion		
6	**28.01.2023** (Saturday) between 03:00 PM to 06:00 PM	Stringer Panel Models for D-region design special stress filed models	25 mins	Johan Blaauwendraad
7		Compatibility based stress fileds (FEM)	40 mins	Jaime Mata-Falcón
8		Applicability of Strut & Tie and Stress Field models to seismic design	28 mins	Boyan Mihaylov
		Panel Discussion		
9	**04.02.2023** (Saturday) between 03:00 PM to 06:00 PM	Example 1	58 mins	Miguel Pedrosa Ferreira
10		Example 2	42 mins	Miguel Pedrosa Ferreira
11		Case Studies – Part-1	31 mins	Duarte M. Viula Faria
		Panel Discussion		
12	**11.02.2023** (Saturday) between 03:00 PM to 06:00 PM	Some Comments on Crack Opening estimation – compatible stress fields LOA III	26 mins	Miguel Fernández Ruiz
13		Case Studies – Part-2	14 mins	Miguel Fernández Ruiz
14		Outlook on future possibilities for computer-aided structural design	58 mins	Jaime Mata-Falcón
		Panel Discussion		

REGISTRATION FEE

IAStructE Members	:	**Rs 6,000/-* + 18% GST**
IAStructE Student members	:	**Rs 1,200/- + 18% GST**
Non Members	:	**Rs 9,000/-* + 18% GST**
Students	:	**Rs 2,500/- + 18% GST**
Foreign Nationals	:	**USD 120 + 18 % GST or INR 9000/- + 18% GST**

(Foreign nationals - 20% discount for members of MoU Associations)

** 10% discount for Young engineer - Age upto 35 yrs*

Every five registration from one organization will entail one free registration from the same organization

(E-certificate of participation will be provided to those who will have 80% attendance)

Proficiency certificate will be provided to those who will qualify the assessment test, which shall be conducted after concluding session

fib-Bulletin 100, will be made available at discounted price to all registered participants.

SPONSORSHIP OPTION

ENTITLEMENTS	DIAMOND SPONSOR INR 3,00,000 + 18% GST*	SUPPORTER INR 1,00,000 + 18% GST*
Presentation Slot	**20 mins.**	**10 mins.**
Advertisement in SED (Quarterly journal of IAStructE published as soft copy)	**One Colour Page (for four issues)**	**One Colour Page (for one issue)**
Logo in Poster & all related correspondence		
Company Profile to all delegates		

* Indian Sponsor can either pay GST @ 18% or settle through Reverse Charge Mechanism

Registration Link: http://iastructe.co.in/online-refresher-course.php

HOW TO REGISTER

STEP 1 : Registration fee shall be paid through NEFT/RTGS/UPI as per bank details given below :

Beneficiary Name: Indian Association of Structural Engineers
Current Account Number: 10151200388,
MICR: 110002034 ; IFSC:SBIN0007196 ; Swift Code: SBININBB382
Bank Name: State Bank of India;
Branch Address: Flyover Market, Defence Colony, ND 110024
Branch Code: 07196

STEP 2: After registering, the proof of the payment is to be sent to iastructe@gmail.com to confirm the Registration. Students must send their valid ID card (scanned) along with proof of payment. *The registration link for each session shall be sent prior to the session to the registered participants only.*

For any clarification on the above steps, please contact the IAStructE Secretariat on
Email iastructe@gmail.com, Tel 011-45794829

Video Participants

(In alphabetical order)

Johan Blaauwendraad
Formerly of Delft University of Technology, The Netherlands

Stathis Bousias
University of Patras, Greece

Linh Cao Hoang
Technical University of Denmark, Denmark

Miguel Fernández Ruiz
Universidad Politécnica de Madrid, Spain

David Fernández-Ordóñez
fib, The International Federation for Structural Concrete

Miguel Filipe Passos Sério Lourenço
JSJ,Lda, Portugal

Jaime Mata-Falcón
ETH Zurich, Swizerland

Carlos Meléndez Gimeno
Esteyco SA, Spain

Boyan Mihaylov
University of Liege, Belgium

Miguel Pedrosa Ferreira
CSI/Univ. Coimbra, Portugal

Duarte M. Viula Faria
Muttoni et Fernández, ingénieurs conseils SA, Switzerland