Course 1: Preliminary Design of High-Rise Buildings

Despite their challenging design, construction and great expense, high-rise buildings continue to be built in increasing numbers throughout the world. High-rise buildings quickly become impractically expensive if structural needs are not considered early. Similarly attempting to build an irrational design can waste a lot of money. It has been said that 50% of the cost of the structural frame costs are affected by preliminary design, whereas detailed design (e.g. refinement of reinforcement in a reinforced concrete structure) affects a small percentage only. This seminar discusses what should be considered at the preliminary design stage of a high-rise. The information can also be used in the checking of designs produced by computer.

The discussion includes the following: the origin of lateral loads; lateral load resisting systems; the nature of the wind; wind tunnel testing; effect of wind load on tall buildings; construction tolerances; notional load; shear wall layouts; wind codes; basic acceleration limits for tall buildings; vortex shedding; the importance of the P-delta phenomenon. Gravity systems are no different to those of low-rise buildings so little time is spent discussing these.

Although tall buildings are commonly constructed using steel or composite construction, this seminar focuses on concrete buildings as they are especially relevant to this region.

A case study is presented to illustrate how important preliminary design of high-rises is.
Course 2: Strengthening of Reinforced Concrete Structures

The strengthening of existing reinforced concrete (RC) structures is a common requirement. Strengthening may be required because of a change of use, resulting in an increased loading, or perhaps as the result of design or construction error.

This seminar discusses some of the most popular means of strengthening RC beams, slabs and columns, namely by the addition of either:

- new concrete and/or steel reinforcement (“jacketing” and “overlaying”),
- fibre reinforced plastic (FRP) plates or sheets,
- structural steel sections,
- external prestressing steel.

In the seminar it is assumed the assessment and any repair has been completed before the strengthening is recommended, so the seminar focus is on the strengthening of undamaged elements.

Lecture 1:
Strengthening of RC structures using conventional materials and methods (jacketing/overlaying, additional structural steel, external prestressing).

Lecture 2:
Strengthening of RC beams and slabs using FRP plate bonding and columns using wrapping with FRP sheets. In addition, some brief case studies of strengthening will be presented.

Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>9am – 10.30am</td>
<td>Preliminary Design of High-Rise Buildings</td>
</tr>
<tr>
<td>10.30am – 10.45am</td>
<td>Break with light snacks</td>
</tr>
<tr>
<td>10.45am – 12.15pm</td>
<td>Preliminary Design of High-Rise Buildings</td>
</tr>
<tr>
<td>1.15pm – 2.45pm</td>
<td>Strengthening of Reinforced Concrete Structures (Lecture 1)</td>
</tr>
<tr>
<td>2.45pm – 3pm</td>
<td>Break with light snacks</td>
</tr>
<tr>
<td>3pm – 4.30pm</td>
<td>Strengthening of Reinforced Concrete Structures (Lecture 2)</td>
</tr>
</tbody>
</table>

Speaker

**Er. Dr. Niall MacAlevey** is currently an independent consultant specializing in the analysis and design of reinforced and prestressed concrete structures, forensic engineering and the strengthening of concrete structures. He is the founder of the firm “Shamrock Consultants”, is a member of the Institution of Engineers of Ireland and is a registered Professional Engineer in Singapore.

He graduated from University College Dublin, Ireland in 1987, and completed his M.Sc. degree in “Concrete Structures” at Imperial College, London. He completed his Ph.D degree at the Nanyang Technological University in 1997 on “The Strengthening of Concrete Structures” and later joined the academic staff there.

He obtained a PGDipTHE (Post-Graduate Diploma in Teaching in Higher Education) from the National Institute of Education in 2001.

He has worked for a number of consulting engineering firms and specialist prestressing subcontractors in London, Cambridge, Hong Kong and Singapore.
REGISTRATION FORM

Course 1: Preliminary Design of High-Rise Buildings (3hrs Lecture)
Course 2: Strengthening of Reinforced Concrete Structures (3hrs Lecture)

Date: 19 Sept 2013 (Thursday)
Time: 9am – 12.15pm / 1.15pm – 4.30pm
Venue: NTU@one-north Executive Centre
Fees: $120.00 per course (IES Members) $150.00 per course (Non-Members)

Please tick (√) the course(s) you are interested in:  1 □  2 □

Please note that online registration is only available for signing up both courses. Otherwise, please mail/fax the completed form by 13 Sept 2013 before 3pm to:

Address:  IES Academy
70 Bukit Tinggi Road
Singapore 289758
Attn: Venus Loh
(Tel) 64611237 (Fax) 6463 9468

Participant Details

Name: __________________________ NRIC: __________________________
Company: __________________________ Designation: __________________________
Address 1: ________________________________________________________
(For mailing of invoice and receipt)
Address 2: ________________________________________________________
(For mailing of Certificate)
Postal Code: __________________________ Sex: Male / Female
Mobile No.: __________________________ Fax: __________________________
Email: ___________________________________________________________
(For sending of confirmation email)

Please indicate:

☐ IES members IES M’ship No.: __________________________ P.E. No.: __________________________ (if applicable)
☐ Non-members ☐ Sponsored by company ☐ Vegetarian

Contact Person Details (if different from participant)

Name: __________________________ Designation: __________________________
Tel: __________________________ Fax: __________________________
Email: __________________________

Payment Details

Bank / Cheque No.: __________________________ Amount ($): __________________________

* All Fees are inclusive of 7% GST.
Cheque should be made payable to: “IES”.

Acceptance of Terms and Conditions for Registrations of IES Academy’s Events
I agree to abide by the Terms and Conditions for Registration of IES Academy’s Events.

Name: __________________________ Signature: __________________________
TERMS & CONDITIONS COURSE REGISTRATION

Registration

Registration can be done either online or by faxing in the registration form.

Any registration, whether on-line or fax will be on a first-come-first-served basis and will only be confirmed upon receipt of full payment by The Institution of Engineers, Singapore (IES).

Email and phone registrations will not be accepted.

Closing Date & Payment

The closing date of the event will be 7 days prior to event commencement date. Cheques should be crossed ‘A/C payee only’ and made payable to ‘IES’, with the Date of event, Title of The Event and participants’ name indicated clearly on the back of the cheque, and post to:

IES Academy
70 Bukit Tinggi Road
Singapore 289758

Confirmation of Registration

Confirmation of registration will be given 7 days prior to the commencement date of event via email. If you do not receive the said confirmation email, you are required to contact IESA general admin immediately at 6463 9211 (office).

IESA reserves the right to allow only confirmed and paid registrants to attend the Event.

Withdrawals/Refunds of Fees

Notice of withdrawal must be given in writing to IESA. Policy on refund of course fee is as follows:

➢ FULL refund if we receive your written notice of withdrawal at least 7 days before the commencement of the Event.

➢ NO refund otherwise.

No show of participant would not be accepted as reason for withdrawal/refund.

Replacement is allowed but restricted to once only. Replacement will be allowed only if written notice is received by us at least 3 working days before the commencement of the event. However, when an IES member is replaced by a non-member, the participant has to pay the difference in the relevant fees.

Cancellation/Postponement

Changes in Venue, Dates, Time and Speakers for the Events can occur due to unforeseen circumstances. IESA reserves the full rights to cancel or postpone the Event under such circumstances without prior reasons. Every effort, however, will be made to inform the participants or contact person of any cancellation or postponement.

Fees will be refunded in FULL if any Event is cancelled by IESA.

Enquiries

For further enquiries, please contact IESA general office at Tel: 6463 9211.