WHY YOU & YOUR EMPLOYEES SHOULD ATTEND THIS SEMINAR

The use of Fibre Reinforced Polymer materials (FRP) is often preferred for the strengthening of existing structures over more traditional methods due to the versatility of the solution, the light-weight of the material and the unobtrusiveness of the final result. However, no New Zealand guidance currently exists on how to design these strengthening systems, and engineers typically refer to international guidelines. The seminar will present an overview of the most commonly used design guidelines for FRP materials as externally bonded reinforcement, the American Concrete Institute ACI 440.2R-2017, with input from other international documents. The provisions from ACI440.2R are often insufficient for real applications, especially for seismic strengthening. The seminar will provide insight on several research studies conducted in New Zealand and overseas and, where possible, design guidance.

A key element of seismic strengthening of existing structures with FRP is anchorage, given the different tensile strength between the concrete and the FRP and the risk of a larger-than-expected earthquake. Anchorage however is so far not included in any design guidelines, despite extensive research completed in the last few years. Special emphasis will be placed on determining when anchorage is required and how to design suitable FRP anchors.

This seminar will cover

• Understanding the basics of Fibre Reinforced Polymer (FRP) materials, how the technical information is presented and what data to use

• In depth understanding of the main design guidelines (mainly ACI440) and how to use them for design. Awareness of the limitations of the guidelines.

• Evidence and research-based guidance for FRP strengthening solutions that are outside the scope of the main guidelines

• The application of externally bonded FRP systems in seismic conditions

• Understanding the advantages of anchorage for externally bonded FRP system, when anchorage is required, and how to design FRP anchors

OTHER BENEFITS

• Comprehensive seminar notes

• Experienced speakers with extensive knowledge of FRP materials and their application for strengthening existing buildings

• The opportunity to network with industry peers

WHO SHOULD ATTEND

• Designers, FRP Specifiers, Consulting Engineers, Building Officials, and Contractors.

INVESTMENT DETAILS

• CNZ-LS members
  $600 (GST exclusive) per person

• Non CNZ-LS members
  $700 (GST exclusive) per person
  (includes complimentary CNZ-LS membership until 30 June 2020)

SEMINAR FEES INCLUDE

• Tea and coffee on arrival

• Morning, lunch & afternoon tea

• Comprehensive seminar notes
Strengthening of Existing Concrete Structures with Externally Bonded Fibre Reinforced Polymer (FRP) Materials

PROGRAMME

8.00 - 8.30 am  Registration

8.30 – 9.15 am  Introduction, Guidelines, Principles of Design (Rhys Rogers)
  • What is FRP, fibre and resin types.
  • Design codes/guidelines, design philosophy and design limits
  • Quality Assurance for FRP projects

9.15 – 10.00 am  Design with ACI440.2R (Rhys Rogers)
  • Flexural strengthening
  • Confinement of concrete

10.00 - 10.30 am  Morning Tea

10.30 – 11.15 am  Design with ACI440.2R (Enrique del Rey Castillo)
  • Shear strengthening
  • Beyond ACI440 - advantages of anchorage for shear strengthening

11.15am – 12.30 pm  Anchorage of FRP and FRP Anchors (Enrique del Rey Castillo)
  • Research and design of FRP anchors
  • FRP anchor design with worked examples

12.30 - 1.15 pm  Lunch

1.15 – 2.00 pm  Shear wall strengthening and column ductility enhancement (Rhys Rogers)
  • Concrete shear wall flexural and shear strengthening
  • Column ductility enhancement

2.00 – 2.45 pm  Column strengthening research (Enrique del Rey Castillo)
  • Research on columns strengthening & how to apply it
  • Post-elastic behaviour

2.45 – 3.30 pm  Column flexural strengthening with ACI440.2R (Rhys Rogers)
  • ACI 440.2R design approach.
  • Limitations and constraints

3.30 – 4.00 pm  Afternoon Tea

4.00 – 5.30 pm  Floor diaphragm (Enrique del Rey Castillo)
  • Floor diaphragms - underlying assumptions and behaviour requirements
  • Worked example of FRP tension tie design

VENUES

Wellington  Thursday 21 November 2019
Engineering New Zealand
Level 6, NEC House, 40 Taranaki St.

Christchurch  Monday 25 November 2019
Sudima Christchurch Airport
550 Memorial Ave, Christchurch Airport.

Auckland  Wednesday 27 November 2019
Ellerslie Event Centre, 80-100 Ascot Avenue (Ellerslie Racecourse), Greenlane.

SPEAKERS PROFILES

Enrique Del Rey Castillo
Concrete NZ Fellow and lecturer at the University of Auckland. Enrique completed his PhD studies on the seismic strengthening of concrete structures with FRP materials and has been working exclusively on this topic for the last five years. Enrique has various active research projects on the strengthening of concrete structures with FRP, working closely with consulting engineers, suppliers and contractors from New Zealand and overseas. He is an active participating member on the ACI 440 committee, regularly contributing to the development of the ACI 440.2 guidelines.

Rhys Rogers
Rhys Rogers is a Structural Engineer and Director at RAC Specialist Structural Consultants. He is a member of Engineering New Zealand and holds a B.E. (Civil), and a Ph.D. from the University of Auckland on the topic of durability of pre-tensioned bridge beams in NZ. He spent 6 years on the CNZ - Learned Society Council and has presented numerous guest lectures, seminars, and conference papers for which he has received several awards. His previous role at a leading NZ specialist contractor included providing advice to consulting engineers on the design and practical application of specialist civil engineering technologies including FRP.

PRESENTERS

Concrete NZ - Learned Society acknowledges the following supporting organisations for making this seminar series possible:

Enrique Del Rey Castillo, Courtesy of Concrete NZ
Rhys Rogers, Courtesy of RAC Specialist Structural Consultants
Sika (NZ) Ltd
REGISTRATION FORM - Tax Invoice: GST Registration Number 48-931-944

Name(s):

Company:

Postal Address:  

Postcode:

Phone:  

Mobile:

Email:

Dietary Requirements:

PLEASE INDICATE WHICH SEMINAR AND VENUE:

☐ Wellington  21 November 2019
☐ Christchurch  25 November 2019
☐ Auckland  27 November 2019

PAYMENT DETAILS:

No. of member registrants  [ ] at $690.00 GST inclusive  =  $

No. of non-member registrants  [ ] at $805.00 GST inclusive  =  $

Total= $  

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admin@bluepacificevents.com. For all enquiries phone (09) 536 5410

If paying by cheque or bank draft please email your registration form and send payment to
Concrete NZ Learned Society, PO Box 4234, Marewa, Napier 4143.

NOTE: Full payment must be received prior to each seminar.