

# DISPLACEMENT-BASED SEISMIC DESIGN ASSESSMENT

Presented by Concrete NZ – Learned Society

## WHY YOU & YOUR EMPLOYEES SHOULD ATTEND THIS SEMINAR

**Due to recent events, including changes in legislation, it is now more important than ever that engineers are skilled in the seismic assessment of existing buildings. There are a range of analysis approaches that could be considered for seismic assessment but the displacement-based seismic assessment (DBA) method of Priestley et al. (2007) and others, promises to instil in engineers a better understanding of the likely response of a building.**

The approach offers the possibility of doing “hand calculations” to gain an idea of the likely plastic mechanism, strength and deformation capacity of a structure so that the intensity required to develop important damage states can be assessed. Owing to the benefits of displacement-based assessment, it has been included as a recommended analysis approach within the latest NZSEE guidelines for the seismic assessment of existing structures.

The aim of this seminar is to introduce participants to the use of the DBA for the seismic assessment of RC frame structures.

## THIS SEMINAR WILL COVER

- Review of the various features of older RC frame structures that can affect their force-displacement response and the types of failure mechanisms that may develop.
- An introduction to the displacement-based assessment approach of Priestley et al. (2007).
- Identification of potentially critical performance limits.
- Means of identifying the force-displacement pushover response of RC structures using hand calculations, explaining an approach that can be used to identify the likely plastic mechanism (via the so-called SLAMA method) and displacement profile for RC frame structures.
- Pointers for simply dealing with complex phenomena, like P-delta effects and torsion.
- An example problem to illustrate the approach.
- Brief discussion of the main uncertainties in the approach and additional research requirements.

## OTHER BENEFITS

- Valuable resource through the seminar notes
- Knowledgeable experienced speakers with good presentation skills
- The opportunity to network with industry peers

## WHO SHOULD ATTEND

Designers, Specifiers, Site Engineers, Contractors, Building Certifiers, Local Authorities, Consulting Engineers, Project Managers, Graduate Engineers.

## INVESTMENT DETAILS

- **CNZLS members \$434.78** (GST exclusive) per person
- **Non CNZLS members \$521.74** (GST exclusive) per person (includes complimentary Concrete NZ – Learned Society membership until 30 June 2018)

## SEMINAR FEES INCLUDE

- Tea and coffee on arrival
- Morning tea, lunch, afternoon tea
- Comprehensive seminar notes

## PROGRAMME

### 8.30 – 9.00 am

Registration, tea and coffee

### 9.00 – 9.45 am

Introduction to displacement-based seismic assessment (illustrating typical damage, objectives and limit states, assessment of SDOF systems)

### 9.45 – 10.30 am

Displacement-based seismic assessment of RC Wall Structures

### 10.30 – 10.45 am

Morning Tea

### 10.45 am – 12.00 pm

Displacement-based seismic assessment of RC Frame Structures

### 12.00 – 12.45 pm

Displacement-based seismic assessment of RC Frame-Wall Structures

### 12.45 – 1.15 pm

Lunch

### 1.15 – 3.30 pm

Lab/Tutorial: Assessing a 6 storey RC building

### 3.30 – 3.45 pm

Afternoon Tea

### 3.45 – 5.00 pm

Options for dealing with complex phenomena and use of non-linear analysis to confirm assessment results

## VENUES

Christchurch **Monday 5 March 2018**  
Chateau on the Park –  
a DoubleTree by Hilton  
189 Deans Ave, Riccarton

Wellington **Friday 9 March 2018**  
James Cook Hotel Grand Chancellor  
147 The Terrace

Auckland **Monday 12 March 2018**  
Ellerslie Event Centre  
80-100 Ascot Avenue  
(Ellerslie Racecourse), Greenlane

## SPEAKERS PROFILES

### Tim Sullivan

Tim is an Associate Professor at the University of Canterbury. He is also leader of QuakeCoRE Flagship 4, is a faculty member of the post-graduate ROSE School in Pavia and was previously head of the Design Methods section at the European Centre for Training and Research in Earthquake Engineering.

Tim is a chartered professional engineer with the institute of Civil Engineers (UK) and has seven years professional consulting experience, having worked in New Zealand, Germany, the UK and Italy. He is now actively addressing research needs in the field of earthquake engineering. A large part of Tim's research has focused on the development of displacement-based seismic design and assessment, in collaboration with the late Prof. Nigel Priestley as well as Professors Gian Michele Calvi and Mervyn Kowalsky.

### Didier Pettinga

Didier is a Senior Project Engineer at Holmes Consulting, Christchurch, and has been with Holmes since 2012. Since moving back to New Zealand, he has been involved with a number of reinforced concrete building assessments in Christchurch and Wellington. Prior to starting with Holmes, he worked for five years at Glotman Simpson Consulting Engineers, in Vancouver B.C., where a significant portion of his work applied Displacement-Based Design principles to high-rise reinforced concrete buildings and post-disaster facilities.

Didier's post-graduate research focussed on Direct Displacement-Based Design, working with Profs. Nigel Priestley, Stefano Pampanin and Constantin Christopoulos, with application and development in reinforced concrete frame dynamic behaviour and reducing residual deformations.

More recently his research has looked at developing guidelines for the application of simulated ground motions in-practice, and investigating the comparative behaviour of non-linear building models subjected to observed and simulated ground motion records.

## PRESENTERS

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

**Tim Sullivan**, Courtesy of University of Canterbury  
**Didier Pettinga**, Courtesy of Holmes Consulting

# REGISTRATION FORM - Tax Invoice: GST Registration Number 48-931-944

Name(s): \_\_\_\_\_  
\_\_\_\_\_

Company: \_\_\_\_\_

Postal Address: \_\_\_\_\_

Postcode: \_\_\_\_\_

Phone: \_\_\_\_\_ Mobile: \_\_\_\_\_

Email: \_\_\_\_\_

Christchurch, Monday 5 March 2018       Wellington, Friday 9 March 2018

Auckland, Monday 12 March 2018

## PAYMENT DETAILS:

No. of member registrants [ ] at \$500.00 GST inclusive = \$

No. of non-member registrants [ ] at \$600.00 GST inclusive = \$

Total= \$		I have enclosed our cheque of \$	
Or prefer to pay by credit card: <input type="checkbox"/> Visa <input type="checkbox"/> MasterCard <input type="checkbox"/> Amex			
Card No:	<input type="text"/>	<input type="text"/>	<input type="text"/>
Expiry Date:	Cardholders Name:		

### Please complete this form, take a copy for your records and forward it to:

Displacement-Based Seismic Assessment Seminars  
PO Box 12, Beachlands, Auckland 2147  
Email: learnedsociety@concretenz.org.nz

If paying by cheque or bank draft please make payable to Concrete NZ – Learned Society.  
For all enquiries phone (09) 536 5410

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