



# Base Isolation 101

**Presented by** The New Zealand Concrete Society and  
The Cement and Concrete Association of New Zealand

## Why You & Your Employees Should Attend This Seminar

This seminar will cover;

- Conventional seismic design of concrete structures: ensuring structural capacity exceeds seismic demand and accepting damage (plastic deformation)
- Base isolation of concrete structures: ensuring seismic demand is less than structural capacity and assuring essentially elastic (damage-free) behavior; an alternative to conventional design
- History of base isolation
- Basic requirements of an isolation system for buildings/bridges/industrial plant
- Typical base isolation hardware (elastomeric and friction devices)
- Applications of base isolation systems in New Zealand and worldwide
- Simplified design procedure of a base isolation system for given performance criteria
- Design of isolation hardware to meet system requirements
- Specifying isolation hardware
- Code requirements for quality assurance

Uncoupling a structure from the damaging components of earthquake ground motion has been a dream of structural engineers for more than a century. But it has not been possible until very recently, when response spectra became universally accepted, flexible devices for supporting structures became available, and validation was possible using shake table experiments and numerical modeling procedures.

The principal advantage of isolation is that it is often possible to keep structures elastic during strong

shaking with minimal repair costs and a higher level of post-earthquake functionality than is possible with conventional design.

New Zealand was one of the first countries to implement base isolation with the construction of the South Rangitikei Rail Bridge in the central North Island (1976), followed soon afterwards by the Clayton Building in Wellington (1981). But applications have not grown as rapidly as in other countries (especially Japan) for reasons that include lack of understanding of the principles and benefits, a lack of analytical modeling skills, and a lack of confidence in the hardware. This seminar is intended to address all three concerns.

At the end of this seminar attendees will be able to determine the properties of a base isolation system to meet a required level of seismic performance and make a first cut at the design of corresponding isolation hardware.

### Other Benefits

- Comprehensive resource through the seminar notes
- Knowledgeable experienced speakers with good platform 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, Building Owners and Property Developers.

### Investment details

NZCS Members \$260 (GST exclusive) per person

Non NZCS Members \$360 (GST exclusive) per person  
(includes one year complimentary membership)

### Seminar fees include:

- Tea and coffee on arrival
- Afternoon tea
- Comprehensive seminar notes

# Base Isolation 101

## Programme

**12.30pm – 1.00pm** Registration

**1.00pm – 1.10pm** Welcome & Introduction

**1.10pm – 2.15pm** Background – Ian Buckle and Ron Mayes

- Conventional seismic design vs base isolation design
- History of base isolation
- Basic requirements of an isolation system
- Typical base isolation hardware (elastomeric and friction devices)
- Applications of base isolation systems in New Zealand and worldwide

**2.15pm – 3.00pm** System Design – Ian Buckle

- Simplified design procedure for base isolation systems

**3.00pm – 3.30pm** Afternoon Tea

**3.30pm – 4.15pm** Hardware Design – Ian Buckle

- Design of isolation hardware to meet system requirements

**4:15 – 5:00 pm** Other Topics - Ian Buckle

- Specifying isolation hardware
- Code requirements for quality assurance

**5:00 – 6:00 pm** Discussion, Networking & Refreshments

## Speakers Profiles

### Ian Buckle

Ian Buckle is a Foundation Professor at the University of Nevada, Reno, and director of the University's Center for Civil Engineering Earthquake Research. He has previously served as the deputy vice-chancellor (research), University of Auckland, New Zealand, and as the deputy director of the National Center for Earthquake Engineering Research, University at Buffalo, New York (now the Multidisciplinary Center for Extreme Events Research).

In his current position at the University of Nevada Reno he teaches structural engineering and conducts research in the seismic performance of transportation structures. Ian is known in the United States for his work in the seismic isolation of bridges and is the lead author of the AASHTO Guide Specifications for Seismic Isolation Design, now in its 4th Edition. A graduate of the University of Auckland, Ian was an Erskine Fellow at University of Canterbury in autumn 2012, where he taught classes in seismic isolation of buildings.

Ian is President of the Earthquake Engineering Research Institute (EERI), a member of EERI Board of Directors and of EERI reconnaissance teams to Chile and Japan. In addition to his EERI activities he is currently vice chair of the Caltrans Seismic Advisory Board and a member of the Board of Directors of the Nevada Earthquake Safety Council.

### Ronald Mayes

Ronald Mayes has 40 years of management and technical expertise in earthquake and structural engineering. His technical experience includes working with many of the world's leading authorities in earthquake and structural engineering and he is highly respected by his peers in these areas. He recently served as Secretary/Treasurer of the Earthquake Engineering Research Institute and is a past Vice- President of The Masonry Society. He was selected as "Structural Engineer of the Year" by the Wiley Journal "Design of Tall and Other Buildings" in 2006 and is a Fellow of the Structural Engineers Association of California.

Ron joined SGH in 2001 and has been the base isolation project engineer on SGH's unique application of base isolation technology on the China Basin project. This involved the use of base isolators to add two additional stories on top of an existing three story building with the goal of minimizing the seismic force on the structure below. This project was awarded SEAOC's Excellence in Engineering award in 2008 and won the SEI/ATC Retrofit Project of the Decade award in 2009. Prior to joining SGH he co-founded Dynamic Isolation Systems, Inc., in 1982. DIS is a firm that specializes in the design, analysis and supply of base isolation systems. At DIS, he had a national leadership role in developing and implementing base isolation technology and code procedures for buildings, hospitals and bridges. DIS had completed 25 isolated building projects and in excess of 90 bridge projects through 1999 and Ron was the DIS Project Manager on most of the building projects and about 20% of the bridge projects.

## Venues

### Christchurch

**Tuesday 19 March 2013**

The Chateau On The Park  
Cnr Deans Avenue & Kilmarnock Street  
Christchurch

### Wellington

**Wednesday 20 March 2013**

Civic Suite 1 & 2  
Wellington Convention Centre  
111 Wakefield Street, Wellington

### Auckland

**Thursday 21 March 2013**

Ellerslie Events Centre  
Ellerslie Racecourse, 80-100 Ascot Avenue,  
Greenlane, Auckland

## Presenters

### Ian Buckle

Professor, University of Nevada Reno,  
formerly University of Auckland

### Ronald Mayes

Simpson Gumpertz & Heger

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

\_\_\_\_\_

Postal Address:

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

Email:

☐ **Auckland**, Thursday 21 March 2013

No. of non-member registrants [ ] at \$414.00 GST inclusive = \$

Signature: \_\_\_\_\_

NOTE: All payments must be received prior to each seminar.