

Proceedings of the 2025 New Zealand Society for Earthquake Engineering Annual Technical Conference

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Keynote Presentations

Keynote 1 Seismic Design Strategies on Major Bridges Located in High Seismic Zones
Marwan Nadar

Keynote 2 Earthquake Resilient Infrastructure: How Do We Get It? Insights from Efforts in San Francisco and the U.S.
Laurie Johnson

Keynote 3 Expecting the Unexpected
Santiago Pujol

Keynote 4 Structural Health Monitoring for Informed Decision-Making: Practical Insights
Ruben Boroschek

Plenary Presentations

Plenary 1	Managing Seismic Risks in Existing Buildings Henry Tatham, Matthew McDermott, Jenni Tipler
Plenary 2	Seismic Risk Working Group Updates Rob Jury, John Hare, Ken Elwood
Plenary 3	Putting People at the Heart of Engineering Sonny Vercoe, Jeff Fahrensohn, Julia Becker, Charlotte Brown
Plenary 4.1	Enhanced Seismic Resilience: A Pathway to the Wider Implementation of Dissipative Controlled Rocking in Bridges Royce Liu
Plenary 4.2	The Place of Base Isolation and Other Mechanisms for Mitigating Significant Seismic Hazard Risks in Bridges Moustafa Al-Ani
Plenary 4.3	MBIE/NHC/SESOC Low Damage Seismic Design Guidance Hamish McKenzie
Plenary 5	Focus on Resilience and Sustainability of Existing and New Buildings Pathmanathan Brabhaharan
Plenary 6	Leveraging New Technologies for Earthquake Engineering and Resilience Julian Benito, Raj Prasanna, Maria Mingallon
Workshop	Joint Committee for Seismic Assessment and Retrofit Workshop Including: A Draft Performance Framework for Common NZ URM Buildings Seismically Strengthened using Standard Details Mr Hamish Tocher, Mr Alistair Cattanach

Oral Papers

Seismic Strengthening of Te Whare o Rehua Sarjeant Gallery in Whanganui

Mr Philip Yong, Mr Anthony Forlong, Mr Hayden Young, Dr Ian Brown, Mr Dean Latham

Seismic performance of suspended ceilings with Velcro-secured lay-in tiles via shake table tests

Mr Aasish Tiwari, Professor Rajesh Dhakal, Dr Jitendra Bhatta, Professor Timothy Sullivan, Dr Muhammad Rashid, Mr Jiajun YU, Associate Professor Ping Xiang, Mr Rajesh Shrestha, Dr Zhenduo Yan, Professor Gregory MacRae, Professor Liang-Jiu Jia, Associate Professor Shahab Ramhormozian, Professor George Charles Clifton, Professor Pierre Quenneville, Professor Geoff Rodgers, Professor Xianzhong Zhao

Seismic Retrofit of URM Parapets using Vertical Screw Reinforcing: Experimental Testing and Simplified Design Approach.

Dr Jerry Zhai, Dr Francisco Galvez, Mr Robert Hudson, Dr Dmytro Dizhur, Dr Eyitayo Opabola, Dr Marta Giaretton

A Methodology for the Seismic Assessment of Infilled Frames with Significant Vertical Discontinuities

Mr Rolf Veldboom, Mr Stuart Oliver, Mr Jonathan Chambers

Seismic retrofit of a two-storey reinforced concrete building using moment-resisting frames (MRFs) incorporating the optimised sliding hinge joint (OSHJ)

Mr Mahinda Ellegala, Dr Shahab Ramhormozian, Professor Charles Clifton

Understanding potential avoided upfront carbon emissions through strengthening of seismically-deficient buildings

Ms Annie Scott, Phoebe Moses, J Wang, E Blewden, A Thompson, K Symons

Seismic Risk and the Building Code – Integrating Geotechnical Requirements (For New Building Design Work)

Mr Kiran Saligame, Dr Kaley Crawford-Flett

Preliminary observations from the Chile-NZ research collaboration on the seismic design of hospitals

Assoc. Prof. Quincy Ma, Prof. Geoff Rodgers, Prof. Ruben Boroschek, Mr David Brunsdon, Jan Stanway, Dr Dion Marriott, Dr Alex Shegay, Dr Rodrigo Retamales, Mario Lafontaine, Renato Calcagno

A Comparison of the Seismic Demands Calculated for Residential Buildings using DZ TS 1170.5 and NZS 3604

Luketina, Nadia; Smith, Tobias

Shaping Future Practice for Non-Structural Seismic Performance

Baird, Andrew; Stanway, Jan; Hinz, Sara; Haymes, Kieran; Preston, Greg

Damage Observed in Chilean Hospitals during the 2010 Mw 8.8 Maule Earthquake

Calcagno, Renato; Retamales, Rodrigo

Repairable low damage seismic design buildings concept

Mr John Lucas,

The Past and Future of Ground-Motion Models: A Review on Uncertainty

Bora, Sanjay

Framework for Selection of Representative Earthquake Scenarios for Wellington

Kakoty, Preetish; Elwood, Ken

Assessing the Importance and Variability of kappa0, k0, in Ground-Motion Simulations: A Work in Progress

Sepulveda Garcia, Juan Jose; Lee, Robin; Bradley, Brendon

The New Zealand Ground-Motion Database: A 2024 Update

Rampersad, Aaron; Ridden, Joel; Lee, Robin; Bradley, Brendon; Zhu, Chuanbin; Pajaro Miranda, Cesar; Schill, Claudio

Progress on the NZ-Wide Vs30 Map Update

Kim, Jaehwi; Lee, Robin; Bradley, Brendon; Ridden-Harper, Andrew; Bae, Sung; Ridden, Joel

Validation of hybrid broadband ground-motion simulation for large magnitude earthquakes in New Zealand

Pajaro Miranda, Cesar; Bradley, Brendon; Lee, Robin

Influence of ground motion spatial variation in the seismic risk of a proposed inter-city railway

Bernales, Francis Jenner; Selda, Patrick Adrian; Luna, Roy Anthony

Modelling and Test-Analysis Correlation Study of a Five-Story Building Using in-Situ Measurements

Shirzadi, Hooman; Moaveni, Babak; Eftekhar Azam, Yashar; Andisheh, Kawa (Kaveh)

Pre-Assessment of Real-time Hybrid Shake Table Test for Evaluation of Seismic Response of MDOF System

Shiradhonkar, Saurabh; Gupta, Iwansh

Seismic Performance of Rib and Infill Floors

Moshref, Amir; Khanmohammadi, Mohammad

Design recommendations for concrete wall-to-steel beam bolted web plate connections

Pascua, Claire; Henry, Rick; Toma, Charlotte; Clifton, Charles

Flexural strengthening of RC T-beams using varied NSM-CFRP configurations

Haryanto, Yanuar; Hidayat, Banu Ardi; Hsiao, Fu-Pei; Hu, Hsuan-Teh; Lin, Chia-Chen; Nugroho, Laurencius; Weng, Pu-Wen

Comparative Analysis of Confined and Unconfined UHPC Column Under Axial Loading

Acharya, Manish; Wakjira, Tadesse Gemeda; Mashal, Mustafa

Full scale semi-cyclic experimental validation on the use of plywood panels for the in-plane strengthening of URM walls.

Cassol, Davide; Galvez, Francisco; Hudson, Robert; Dizhur, Dmytro; Giongo, Ivan

Seismic Restraint Approaches in Existing Buildings

Baird, Andrew; Long, Jasin; Kam, Weng Yuen

Seismic behaviour of ‘rocking’ precast cladding and partition wall assemblies in a full-scale three-storey steel building

Mr Rajesh Shrestha, Professor Rajesh Dhakal, Dr Jitendra Bhatta, Professor Timothy Sullivan, Mr Aasish Tiwari, Professor Gregory A. MacRae, Dr Ping Xiang, Mr Yiqing LIU, Professor Liang-Jiu Jia, Dr Zhenduo Yan, Professor G. Charles Clifton, Professor Pierre Quenneville, Dr Shahab Ramhormozian, Professor Geoffrey Rodgers, Professor Xianzhong Zhao

Numerical and Experimental Seismic Analysis of Cold-Formed Steel Pallet Rack Connections in the Down-Aisle Direction

Shokrollahi, Nima; Clifton, George Charles; Tang, Zhenghao

Seismic NSE Hiccups and Solutions from Buildings Services Perspective

Patel, Prashant

Conceptual development of demountable floor-frame connections to avoid earthquake damage on precast floors

Lozano, Gonzalo; Dhakal, Rajesh; Jiang, Ke; Pujol, Santiago

Damage to demolition – challenges and findings from inspection of damaged hollowcore floors

McKenzie, Hamish; Kakoty, Preetish; Beetham, Tessa

Seismic performance of non-ductile reinforced concrete frame detailing - a Taiwanese example

Hidayat, Banu Ardi; Hsiao, Fu-Pei; Weng, Pu-Wen; Shen, Wen-Cheng; Hu, Hsuan-Teh; Pita, Panapa; Nugroho, Laurencius; Han, Ay Lie; Haryanto, Yanuar

Seismic Performance Evaluation of Reinforced Concrete Structures with Infill Masonry Walls Containing Various Opening Locations

Sharafi, Qudratullah; Maulana, Taufiq Ilham; SAITO, Taiki; Ehsas, Mukhtar Ahmad

Performance Based Seismic Design Using NLTHA: Retrofit of a 1980s 12 Storey RC Structure in Wellington for New Seismic Hazard

M. Puthanpurayil, Arun; J. Carr, Athol

Performance-based seismic design of post-installed anchors in New Zealand

Borosnyoi-Crawley, Dorian

Diaphragm Design Considerations for Buildings Utilizing Viscous Dampers

Hazaveh, Nikoo

An Evaluation of Buckling Restrained Braced Frames with Eccentric Brace Configurations

Saxey, Brandt; Li, Chao-Hsien; Richards, Paul

Effect of coupling between the moment frame and the viscous damper on seismic Response of a steel building

Rad, Ali

The efficacy of linear and nonlinear viscous damper subsystem stiffness on response reduction in SDOF system subjected to earthquake.

Ahmed, Hayman; Rodgers, Geoffery; Vishnupriya, Vishnu; Beskhyroun, Sherif

New Friction-based Seismic Brace: Cost-efficient Alternative to BRB's and EBF's

Zarnani, Pouyan; Agarwal, Setu; Hashemi, Ashkan; Quenneville, Pierre

Seismic Strengthening of a Deep Basement Wall in a High Seismicity Area: A Case Study in Wellington

Yohannes, Mikias; Chin, EngLiang; Cattanach, Alistair

Addressing biases with mapping liquefiable soil

Millen, Maxim

Seismic lateral pile capacity analysis in marine soils: Philippine practices with open-source frameworks

Abcede, Enrico Luis; Selda, Patrick Adrian; Jotojot, Ella; Paulino, Arlene; Luna, Roy Anthony

Modelling earthquake induced cascading hazards alongside probabilistic risk assessment: A pilot study of Napier City

Jones, Katie; Moratalla, Jose; Ashok, Uma; Burbidge, David; Roger, Jean; Griffin, Angela; Mueller, Christof; Scheele, Finn; Bretherton, Edith; Mahmood, Yaseen

To which extent coastal ecosystems can play a mitigation role against tsunami waves and currents in Aotearoa New Zealand?

Roger, Jean; Uma, S R; Forkink, Annet; Hughes, Laura; Wang, Xiaoming; Gusman, Aditya; Sadashiva, Vinod

Findings of the subsurface compacted rubble rafts (SCRR) pilot project for severe liquefaction mitigation in Christchurch

Du, Zhaodong; Xu, Si; Brightwell, Robin

Introduction/The 2024 Hualien, Taiwan Earthquake: Mission Overview

Gregory Macrae, Bo-Yao Lee

The 2024 Hualien Earthquake NZSEE LFE Reconnaissance Mission Report – Seismology and Infrastructure

Doug Mason

Performance of reinforced concrete buildings surveyed following the 3 April 2024 Hualien Earthquake

Lucas Hogan

Effect of Low-Cost Retrofitting systems on performance of Reinforced Concrete buildings Surveyed after the 2024 Hualien earthquake in Taiwan

Lucas Hogan

Hualien Earthquake Functional Recovery / Organisational Response
Alice Chang-Richards, Ke Jiang, Bo-Yao Lee

Observed Damage from 17 Dec 2024 M7.3 Vanuatu Earthquake
Whitehurst, Laura; Seward, John

Towards incentivising resilience to natural hazards in Aotearoa: a case for action
Exton, Ben

New Zealand Emergency Management of Built Heritage: insights and recommendations from a gap analyses study
Caponi, Clara; Ohs, Amanda; Smith, Moira; Macauley, Amanda; Whybrew, Christine

Trends in Medium-Density Housing (MDH) Construction: A Case Study of Mid-Rise Apartments in New Zealand
Apriani, Indriana; Toma, Charlotte; Henry, Rick

Commemorating the 1974 Dunedin earthquake to encourage community resilience
Orchiston, Caroline; Johnston, David; Barrell, David; Cox, Simon; Goded, Tatiana; Stirling, Mark; Williams, Jack; Latton, Rhys; Mueller, Sonja; Stewart, Joshua; Vinnell, Lauren; Andrews, Erica; Cathie, Paula

War, Earthquake and Recovery Politics in Conflict-Affected Syria
Bothara, Jitendra; Ingham, Jason; Dizhur, Dmytro

Assessment of Seismic Capacity of Existing Steel Portal Frame Structures
Mr Jitendra Bothara, Mr Jagnesh Makwana, Mr Chamath Nanayakkara, Mr Gregory MacRae

Seismic interaction between a reticular structure and multi-supported secondary structures
Li, Fengze; Chouw, Nawawi; Zhi, Xudong; Wang, Duozhi; Zhang, Rong

Considerations for selection of friction moment frame connection configuration
Mr Roberto Carlevari, Assoc. Prof. Mario D'Aniello, Professor Raffaele Landolfo, Dr Roberto Tartaglia, Professor Gregory Anthony MacRae

Performance of Symmetric Friction Connection with Partially Deflected Belleville Springs (SFCBeSs) in a Brace-to-Gusset Plate Connection
Dr Zhenduo Yan, Assoc. Prof. Shahab Ramhormozian, Prof. Charles Clifton, Prof. Pierre Quenneville, Prof. Gregory MacRae, Prof. Geoff Rodgers, Prof. Rajesh Dhakal, Prof. Liangjiu Jia, Assoc. Prof. Ping Xiang, Prof. Xianzhong Zhao

Innovative Australasian cold-formed steel platform framing collector beams for multi-storey residential buildings

Karmakar, Ankeeta; Clifton, G. Charles

Design, Fabrication and Experimental Performance of Seismic Shear Panel Dampers

Wu, An-chien; Tsai, Keh-Chyuan; Lai, Jin-Ting; Chen, Daniel Weidar; Li, Wei-Yang; Xu, Shun-Wei

Design and evaluation of seismic resilient building structures in China

Peng, Pan; Haishen, Wang

The Asymmetric Friction Connection (AFC): Sliding Behaviour and Optimum Range of Installed Bolt Tension

Alizadeh, Fatemeh; Ramhormozian, Shahab; Clifton, Charles

Seismic Performance of Steel Braced Frames: Comparing Buckling Restrained Braces, Friction Braces, and Braces with Resilient Slip Friction Joint Dampers

Lal, Rajnil; Hashemi, Ashkan; Quenneville, Pierre

Optimised and adaptive supplementary damped isolation systems

Makan, Kiran; Pettinga, Didier; Huber, Peter

Effect of impact models on the response of base-isolated buildings subjected to moat wall pounding

Wei, Yuanyuan; Shegay, Alex; Henry, Rick

Building Storey Seismic Isolation Behaviour and Issues

Tristan Eiselen, Luke Jerkovic, Seifollah Dehghanian, Mereen Hussain, Gregory Macrae

Continuous column stiffness effects on buildings with lower storey isolation

Ethan Roach, Sam Evea, Seifollah Dehghanian, Mereen Hussain, Gregory Macrae

Challenges in achieving seismic resilience of light timber -framed houses

Liu, Angela

Traditional seismic fuses in timber structures - Pros and cons

Quenneville, Pierre; Zarnani, Pouyan; Hashemi, Ashkan

Experimental Investigation of a Two-Storey Full-Scale CLT Structure with Resilient Rocking Walls

Agarwal, Setu; Hashemi, Ashkan; Quenneville, Pierre

Experimental testing of a full-scale resilient, low-damage, two-story Cross Laminated Timber (CLT) wall structure

Assadi, Soheil; Hashemi, Ashkan; Quenneville, Pierre

Poster Papers

Enhancing Seismic Hazard Simulation in New Zealand: Advances in Cybershake NZ

Dr Morteza Abbasnejadfard, Professor Brendon Bradley, Dr. Karim Tarbali1, Mr. Sung Bae, Dr. Robin Lee

Resilient Shear Wall Steel Panels Equipped by Self-Restoring Friction Hold-downs for Earthquake Protection of Timber-Framed Residential Buildings

Mr Qurban Ali, Dr Pouyan Zarnani, Prof Pierre Quenneville

Cyclic Deformation Capacity of Yielding Zones at Brace Ends

Mr Ammad Ali, Gregory Macrae

An overview of the base isolated building inventory in New Zealand

Chen, Tina; Shegay, Alex

Some Design Considerations for Short CBF Collector Beams and columns

Mr Seifollah Dehghanian, Gregory Macrae, Professor Abdoreza S. Moghadam

Global approaches to ground improvement in liquefaction-prone areas: techniques guidelines, and recommendations

Du, Zhaodong; Xu, Si; Brightwell, Robin; Zhou, Hong; Aghazadegan, Liam

New Seismic Quick-Connects for Timber Portal Frames using Self-centring Slip Friction Joints: A Sustainable Design to be Green and Resilient

Mr Xi Duan, Dr Pouyan Zarnani1, Prof Pierre Quenneville

Dynamic Characterisation of a Steel Building with Friction Connections

Mr Gholamreza Hashemi, Dr. Shahab Ramhormozian, Dr. Sherif Beskhyroun, Dr. Zhenduo Yan, Professor G. Charles Clifton, Professor Gregory A. MacRae, Professor Liang-Jiu Jia, Professor Rajesh Dhakal, Professor Pierre Quenneville, Professor Geoffrey Rodgers, Dr. Ping Xiang, Professor Xianzhong Zhao

Dynamic Performance of Interlocking Plastic-Block Structure Using Shake Table

Fayaz Khan, Mr Ilyas Khan, Mr Niaz Khan, Mr Ismail Ahamd, Mr Asad Ullah

Exploring various methods for developing seismic fragility functions for the stopbanks (levees)

Mr Yaseen Mahmood, V. K. Sadashiva

An Introduction to Cross-Laminated Timber Diaphragm

Dr Reza Masoudnia, Saber Masoudnia

Testing alternatives and reimagining %NBS

Dr Catalina Miranda, Dr Charlotte Brown, Assoc Prof Julia Becker, Cameron Eade, Assoc Prof Emma Hudson-Doyle

A review of post-earthquake hospital functionality simulation methods

Qiu, Shuoguo; Ma, Quincy; Chang-Richards, Alice

Investigating potential implication of alternative approximations of buildings in tsunami inundation modelling

Dr Vinod Sadashiva, Dr Xiaoming Wang, Ms Biljana Lukovic

A review of Eccentric Braced Frame (EBF) systems and their applicability for mass timber structures

Zare, Alireza; Quenneville, Pierre; Hashemi, Ashkan

Design approach for Externally Bonded Fibre Reinforced Polymer with End anchorage

Mr Junrui Zhang, Dr Enrique del Rey Castillo, Dr Tom Allen, Dr Lucas Hogan, Mr Guoming Zhao, Mr Ravi Kanitkar, Dr Mike Lin, Mr Aniket Borwankar

Rocking steel frame system seismic behaviour

Miss Yudi Zhang, Mr Geoff Rodgers, Gregory Macrae, Mr Liangjiu Jia, Ms Kiran Rangwani, Mr Zhenduo Yan, Mr Yu'ao Lin, Mr Wenhao Sun, Mr Charles Clifton, Mr Pierre Quenneville, Mr Rajesh Dhakal, Ms Ping Xiang, Mr Shahab Ramhormozian, Mr Xianzhong Zhao