



6-7 November Grand Millennium, Auckland

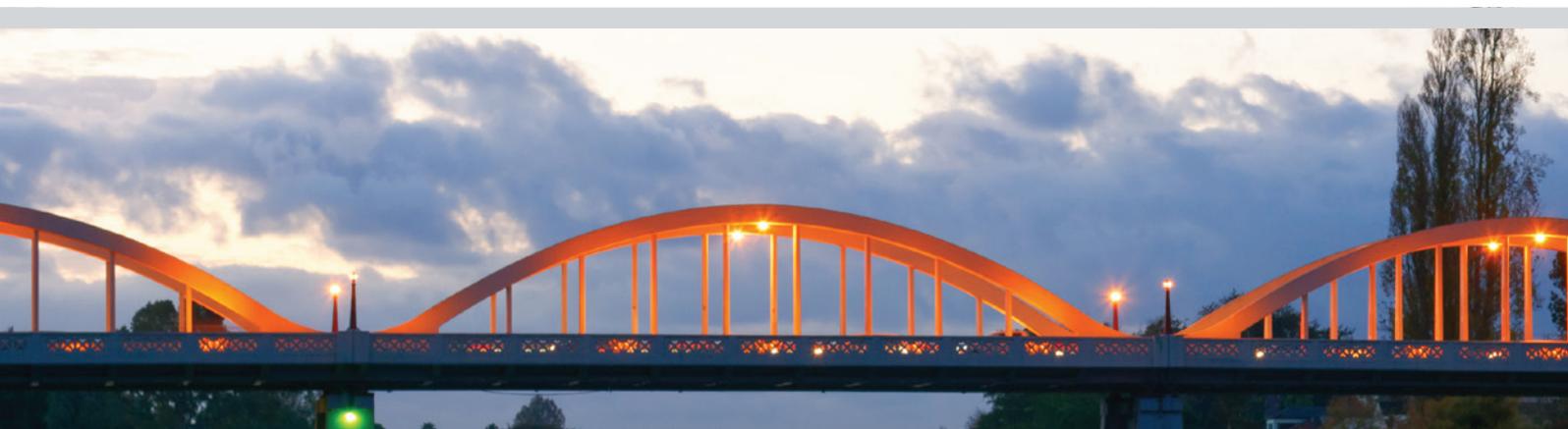
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NZ TRANSPORT AGENCY
WAKA KOTAHI

2018 NZ BRIDGES

Bringing together NZ's bridge community to deliver insights and updates for excellent bridge structures



NEW NZ Bridges Awards!

INTERNATIONAL SPEAKERS:



SEAN BRADY
Brady Heywood (AU)



PETER BALFE
Balfe & Assoc (AU)



PÁDRAIG MCCARRON
UN World Food Programme (AFRICA)

DELIVERING INSIGHT INTO:

- The latest GPS and future direction for NZTA
- Funding priorities and asset investment
- Bridge Manual updates
- Case studies on innovative bridge design

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CONFERENZ.CO.NZ/BRIDGES



NZ BRIDGES AWARDS

The NZ Bridges Awards acknowledge the innovation and outstanding work that is taking place in the New Zealand bridge community.

They aim to highlight the excellent work taking place in asset management, construction, innovation, sustainability. The awards showcase some of the NZ's most unique structures and bridge designers, engineers and developers who are creating long-lasting, and resilient structures that reflect their culture and community.

THERE ARE 5 CATEGORIES YOU CAN SUBMIT ENTRIES FOR:

- 1** Excellence in Bridge Design: Innovation, sustainability and structural award
- 2** Small - Medium Structure Award: Under \$5 million
- 3** Large - Structure Award: Above \$5 million
- 4** Excellence in Asset Management & Maintenance: Best practice and innovation in asset management and maintenance
- 5** Outstanding contribution and service to the NZ Bridge and Structures Industry

Note: structures will include vehicle bridges, rail bridges, pedestrian bridges & cycle bridges.

TIMELINE:

The NZ Bridges Awards will be open for entries **until Friday 21 September 2018**. To enter, you will need to submit a supporting application of no longer than 1800 words, highlighting why your nominee should win.

The submissions will be independently judged by a panel of experts. Finalists will be announced in October and award winners will be announced at an awards dinner at the NZ Bridges Summit.



The NZ Bridges Awards Dinner will be held on the 6th of November. A separately bookable event, this is your opportunity to network with the NZ bridge community, gain insights from your peers and celebrate success!

Make sure you're at the structures event of the year! Dinner tickets are \$180 each or book your table of 10 for \$1700. For more information and to enter, head to conferenz.co.nz/bridgesawards

DAY ONE

6 NOVEMBER 2018

8.30 Registration and coffee

9.00 Opening remarks from the Chair

Barry Wright, *Lead Advisor Structures*, NZTA

Transport & infrastructure investment outlook

9.10 The direction and future strategy for NZTA

There is a new government with a new policy statement for transport driving significant changes in direction and investment in the transport sector. The recent transformation of the NZ Transport Agency has identified that we are on the cusp of a transport revolution and a whole of system approach is required including public transport and alternative modes to best meet the countries transportation needs. Brett will outline his views on where the transport sector where the Agency is going and how it will get there.

Brett Gliddon, *General Manager - System Design & Delivery*, NZTA

9.50 GPS Funding priorities, allocations and the Investment Asset framework for infrastructure investment

The new government policy statement on transport defines their priorities for the transport sector. The NZTA Investment Assessment Framework (IAF) has been developed to give effect to the GPS and assess actual transport proposals for funding. The IAF combined with the funding allocations to activity classes in the national land transport programme (NLTP) define the forward work programme for the sector. Douglas will provide detailed insights into the new GPS, IAF and funding allocations together with the significant implications that this has for the NLTP and the sector.

Douglas Robertson, *Manager Treasury & Cash Flow*, NZTA

10.30 Morning break

11.00 Kaikoura rail performance and retrofit

Following the Kaikoura earthquakes, there was significant challenge to the Northline with the collapse and severe damage of several critical structures.

- Understanding the damage as a result of the earthquakes - addressing access, data and the action plan for reconstruction
- Developing solutions for damage scenarios and reinstating the structures to pre-earthquake standards
- Discussion point: Where to from here? Investigating the need for greater resilience for structures in earthquake-prone areas and compliance with current standards

Rudolph Kotze, *Professional Head Structures Engineering*, KIWIRAIL

11.50 Lessons learnt from Kaikoura: Moving towards post-earthquake repairable bridges

- Investigating the damage resulting from the Kaikōura earthquake and suggested improvements to design standards
- Examining the complexity and uncertainty associated with plastic hinges and alternative design strategies which will allow for their repair
- Presenting an alternate design philosophy for low damage connections with the aim to reducing construction costs

Dr John Wood, *Director*, JOHN WOOD CONSULTING

Brandon McHaffie, *PhD Candidate - Structural Engineering*, UNIVERSITY OF CANTERBURY

Royce Liu, *PhD Candidate - Low damage bridge design*, UNIVERSITY OF CANTERBURY

12.20 Lunch break

National structure strategies & Bridge Manual updates

1.20 Amendments and updates to the Bridge Manual

Nigel Lloyd will give an update on the latest amendments to the Bridge Manual and the future updates that will improve the design, construction and maintenance of New Zealand's bridge structures. Understanding the changes to the seismic design standards

- Incorporating AS/NZS 5100: 2017 into the Manual
- Reviewing natural event resilience levels
- Highlighting future updates for the Bridge Manual: Fatigue loading, waterway design, geotechnical design and evaluation procedures

Nigel Lloyd, *Bridges & Structures Engineer*, NZTA

1.50 Developing a new Live Load model for New Zealand road bridges

- Delving into historic live loads and vehicle load models in New Zealand
- Understanding the history and issues with the current HN-HO-72 design load model
- Looking into International live load models and application into New Zealand
- Process for developing a new live load model for New Zealand

Jeremy Waldin, *Principal Bridge & Civil Structures Engineer*, WSP OPUS

2.10 Bridge Manual load Combinations and load factors

The current Bridge Manual load combinations and load factors date back to 1972 and are out of sync with international practice. NZTA is working with Beca to update the Bridge Manual to bring it in line with international bridge codes and standards.

- Drivers of change for the Bridge Manual review of bridge combinations and factors
- Outcomes of the review for Bridge Manual load combinations
- Delving into the draft revised load combinations to be included in the Bridge Manual

Andrew Dickson, *Acting Manager & Senior Technical Director*, Auckland Civil Structures, BECA

2.30 Improving heavy vehicle compliance for safer roads

The NZTA is working on improving heavy vehicle compliance for safer roads. The Weight Right Programme and Heavy Vehicle Permits System will reduce heavy vehicle overloading and improve productivity and road safety.

- Highlighting how the projects will improve road safety, maintenance and productivity of New Zealand's roads and bridges
- Current progress on the Weigh Right Programme and future applications
- Bridge algorithms and the wider heavy vehicle permits project

Theo Deen, Permits Project Manager - Weigh Right Programme, NZTA

Matthew Hunt, Programme Manager - Weigh Right Programme, NZTA

3.15 Afternoon break

Spotlight focus: Asset management

3.40 Lifecycle management plans for bridge assets

The NZTA have developed lifecycle management plans for critical bridge networks to support robust asset management strategy. These plans document bridge conditions and critical management issues and can be used for funding requests to manage risk proactively.

- Providing a systematic and straight forward approach to bridge network asset information for asset managers
- Delving into examples of Management plans for critical bridges
- Using bridge management plans in annual bridge management cycle - particularly funding requests

John Reynolds, Principal Structures Engineer, NZTA

4.10 Hollow core bridges - Investigation, monitoring and remediation of failed shear keys

Beca has carried out an in-depth review of management and remediation options with bridge decks constructed of precast pre-stressed hollow core bridge beams, across both NZTA and Auckland Transport projects.

- Key factors influencing the decision to monitor or remediate
- Retrofit solutions currently being implemented
- Project learnings having influence on the design of new hollow core bridges

Andrew Dickson, Acting Manager & Senior Technical Director, Auckland Civil Structures, BECA

Andrew Ball, Senior Associate - Structural Engineering, BECA

4.30 Closing keynote - 'Drop your tools' - Does expertise have a dark side?

In this presentation, Sean Brady examines the role human factors play in engineering failures, superficially focusing on the concept of expertise bias. Expertise is required by every profession, and it's usually considered that possessing expertise provides protection against making mistakes and causing failures. But can mistakes be made despite possessing high levels of expertise? And most intriguingly, can mistakes be made precisely because we possess expertise?

Sean Brady, Managing Director, BRADY HEYWOOD

5.10 Closing remarks from the Chair and networking drinks

NZ BRIDGES AWARDS

6 November | 6.30PM | Grand Millennium

Come join us at the NZ Bridges Awards dinner. This is your opportunity to network with the NZ bridge community, gain insights from your peers and celebrate success!

DAY TWO

7 NOVEMBER 2018

9.00 Opening remarks from the Chair

Barry Wright, Lead Advisor Structures, NZTA

9.10 International keynote: Ireland, urban Britain and rural Ethiopia: Innovative bridge design in context

Pádraig brings insight on some of the landmark bridges he has worked on, sharing his unique innovations from Ireland's railway network, the Ordsall Chord in Manchester, England and his recent work in the humanitarian sector for the United Nations in Ethiopia.

- Creating innovation in bridge design through context - when to break free from standardised, prescriptive designs
- Managing the design and planning of unique and challenging bridge projects - bringing innovation to life and winning the support from key stakeholders.

Pádraig McCarron, Head of Engineering Ethiopia, UN WORLD FOOD PROGRAMME

New innovation in bridge design

9.50 Community, culture, heritage- Modern design and system integration for bridges

There is a greater emphasis in the New Zealand bridge community and client group on collaborating with local communities and building bridges that incorporate the culture and context of their environment. Hear from unique case

studies of urban design complementing heritage, culture and community from leading New Zealand bridge designers.

a) Pescara Point

Tom Locke, *Architect*, **WARREN AND MAHONEY**

b) Taumanu Bridge Onehunga

Sean Burke, *Landscape Architect*, **ISTHMUS GROUP**

c) Multimodal and system integration for bridges

Introduction from: Sam Bourne, Principal Specialist - Urban Design and Landscape, NZTA

10.50 Morning break

11.20 Design phase construction case study

Innovation in design may present challenges and opportunities when the design comes to life in the construction phase of the structure. This case study delves into the construction phase and effective models to ensure that unique designs are not lost from architect through to engineer.

11.45 Spotlight focus: Bridge design Steel and composite standard

- Delving into the new steel and composite standard: AS/NZS 5100.6
- Acceptance of steel materials
- Durability technical specification TS 3404

Stephen Hicks, *Manager of Structural Systems*, **HERA**

12.25 Young Engineers' session

This session will feature three young bridge engineers discussing the projects and case studies that reflect the future of the bridge community.

Young engineers will be announced closer to the summit at conferenz.co.nz/bridges

12.55 Lunch break

1.50 After lunch energiser: Deconstructing communication and dealing with difficult people

David Henton is an expert communicator with a background in geotechnical engineering. One of the trickiest challenges with project management can be effectively managing communication and dealing with difficult people.

- Creating an effective communications strategy: What is CCCRC and how does it apply to assertive communication?
- Profiling personality types and why engineers are different!
- Building your communications toolkit: useful phrases and negotiation reminders

David Henton, *Director*, **CONFIDENT COMMUNICATION**

Case studies and smart materials

2.20 Digital fabrication: Accelerated bridge construction and automation

Digital fabrication is the use of digital technologies and automation to create non-standard and cost-effective structures. This session highlights some

of the innovations taking place to digitally fabricate bridge structures and the opportunities to further use this technology in the future.

- 3D printing of bridges - examples so far and opportunities to enhance
- Smart materials: self-healing concrete, non-metallic reinforcement and ultra-high performance concrete

Alessandro Palermo, *Professor*, **UNIVERSITY OF CANTERBURY**

Sam White, *Bridge Engineer*, **WSP OPUS**

2.50 Long term strategy for structures - design, construction and asset management

The NZTA Structures discipline is responsible for the ownership of structures technical standards, processes and strategic asset management of structures over the full asset lifecycle.

- Reviewing the current status of NZTA bridge standards and asset management
- A summary review of developments in progress
- Future needs and priorities proposed for New Zealand bridges

Barry Wright, *Lead Advisor Structures*, **NZTA**

3.20 Afternoon break

3.45 Case study: Red Bridge investigation - Hastings

- Understanding the decision to improve the live load capacity of the bridge in the most cost-effective way to meet the growing capacity demand
- Highlighting the process of re-assessment and investigations to increase its live load capacity
- Creating public buy-in for the bridge improvement process and ensuring minimal disruption to local business and the network

Natalia Uran, *Work Group Manager Bridges/Structures*, **WSP OPUS**

Anu Ileperuma, *Bridge Engineer*, **HASTINGS DISTRICT COUNCIL**

4.20 Closing keynote: Quality assurance in construction - The new standard for engineers

The new Austroads Guide for Road Construction Quality Assurance was developed to address concerns that construction contracts have not been providing road agencies with confidence in the quality assurance process. Peter Balfe, the author of the Guide will explain:

- The concerns with current QA contracts
- Measures proposed with the Guide to ensure higher quality assurance
- Implementing the Guide: what's involved?

Peter Balfe, *Principal*, **BALFE & ASSOC**

5.00 Closing remarks from the Chair and end of conference

WORKSHOP

5 NOVEMBER 2018
9.00AM - 5.00PM

SEPARATELY BOOKABLE PRE-CONFERENCE WORKSHOP

Avoiding design errors: Lessons from forensics and their application to engineering design

The objective of this one-day workshop is to provide structural engineers with insight into how to avoid the design errors that ultimately lead to unsatisfactory performance or failure in engineering structures.

Featuring practical insight into:

- How structures fail in reality:
 - Seven categories of structural failure and common failures that occur throughout a structure's lifetime
 - Failure models specific to structures such as buildings and bridges
 - Typical failure mechanisms of individual structural elements such as beams and slabs
- The structural design process:
 - Design as a process of synthesis, limit state approach and the role of simplified analysis methods
- How errors can occur despite sophisticated design codes and software tools
- Non-technical factors of failure:
 - The role of human factors in structural errors
 - The dangers of: Expertise Bias, Implicit Assumption and Design Fixation
 - How Confirmation Bias and Normalisation of Deviance can obscure early warning signs of impending failure
- Failure prevention:
 - How Latent Errors can contribute to failure
 - The importance of Near Miss Theory as a warning system
 - The benefit of using Forensic Process to identify error
 - Practical techniques to apply in the design office to assist in error detection and failure prevention



DR SEAN BRADY

Managing Director, Brady Heywood

Dr Sean Brady is a forensic structural engineer specialising in identifying the cause of engineering failures and unsatisfactory performance in steel and concrete structures.

He is the managing director of Brady Heywood Pty Ltd and has investigated the cause of engineering failures on a wide range of structures both in Australia and internationally.

He has over 15 years of experience as a structural engineer, and he has published and presented internationally on the subject of engineering forensics. He is an Editorial Board Member of the ASCE Journal of Performance of Constructed Facilities and the ICE Forensic Engineering Journal.

FROM THE CHAIR

Barry Wright, *Lead Advisor Structures, NZTA*

“NZTA has worked closely with Conferenz to create an interesting and informative programme with a good mix of theoretical and pragmatic presentations directly applicable to the NZ bridge industry.



Three international keynote speakers cover bridge forensics, innovation and the latest in construction quality assurance, that will soon be implemented in NZ. NZTA will be outlining current and future developments for bridge design and asset management practices. Industry and academic experts will also be providing their latest insights and experiences including learnings from the Kaikoura earthquake and how they will be applied in practice going forward.”

THE NZ BRIDGES SUMMIT IS BACK IN 2018

to bring together New Zealand's bridge community to share the latest insights, updates, innovations and developments across the entire lifecycle of bridge structures with a focus on how we can create excellent bridges for the future generation.

As the only bridge conference written by and for New Zealand bridge designers and engineers, you won't want to miss this year's event, featuring:

- Bridge Manual updates and future direction
- GPS priorities and asset investment framework
- Innovative case studies of bridge design and construction
- THREE international keynotes
- Insight into the latest updates with materials and fabrication
- Asset management and lifecycle management

NEW to 2018 is the young engineer's session, which gives the opportunity to hear from the engineers that will be shaping the future of the bridge community. For more information on how to submit your abstract, head to conferenz.co.nz/bridges. Submissions close 17 August.

COME ALONG TO:

- Hear from world leaders in bridge design and construction
- Network with peers and industry experts
- Learn about the latest innovations and developments in bridge structures
- Be inspired by the NZ focused case studies
- Get the latest updates on Bridge Manual and the future direction for NZ's bridges

LEADING NEW ZEALAND BRIDGE ENGINEERS & DESIGNERS FROM:

- NZTA
- University of Canterbury
- WSP Opus
- Beca
- Warren and Mahoney
- Isthmus Group
- HERA
- KiwiRail

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SPONSORSHIP AND EXHIBITION OPPORTUNITIES

The NZ Bridges Summit is back for 2018 with a bigger and better event, incorporating an awards evening at the end of day one. This is a great opportunity to invest in two days to be informed, inspired and network with key people in this industry.

Showcase your firm for competitive advantage.

Contact Scott Clogg on (09) 912 3616 or email Scottc@conferenz.co.nz

REGISTRATION DETAILS

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BOOKING OPTIONS		SUPER SAVER Register & Pay before 5pm 14 SEP 2018	EARLY BIRD Register & Pay before 5pm 8 OCT 2018	LAST MINUTE Register & Pay after 5pm 8 OCT 2018
SEPARATELY BOOKABLE	CONFERENCE	\$1,199 + GST SAVE \$600	\$1,599 + GST SAVE \$200	\$1,799 + GST
	WORKSHOP	\$899 + GST SAVE \$500	\$1,199 + GST SAVE \$200	\$1,399 + GST
	AWARDS DINNER (PER PERSON)		\$180 + GST	
	AWARDS DINNER (TABLE OF 10)		\$1,700 + GST	

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YOU HAVE SEVERAL OPTIONS:

- Send a substitute delegate in your place
- Confirm your cancellation in writing (letter or email) at least ten working days prior to the event and receive a refund less a \$300+GST service charge per registrant. Regrettably, no refunds can be made for cancellations received after this date.

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