NZ 2016 BRIDGES
Innovation and information for building better bridges

PLUS 3 HANDS-ON WORKSHOPS:
1. Lifecycle management of bridge networks
2. Processes of managing risk and maintenance of bridge structures
3. Displacement-based seismic design methods

FEATURING:
• International speakers from Japan, Australia and Britain
• Smart Bridges Masterclass
• Bridge Manual updates
• Urban design case studies
• Asset management case studies

www.conferenz.co.nz/nzbridges
“The NZ Bridges Summit is back for 2016 with full support from NZ Transport Agency. This is an important event to attend for anyone involved in the NZ bridges industry. There are continuing developments of the NZ Transport Agency Bridge Manual and geotechnical engineering together with new subjects of structural health monitoring, new technology, heritage structures and urban design of bridge structures. In response to feedback from the last conference we have included three international speakers together with a mix of theory and case study presentations.”

FROM THE CHAIR
Barry Wright, National Structures Manager, NZTA

OPENING KEYNOTE
Dr Dikai Liu
Professor of Mechanical and Mechatronic Engineering / Co-Director, Centre for Autonomous Systems, University of Technology Sydney

Professor Dikai Liu is Co-Director of the Centre for Autonomous Systems at the University of Technology Sydney. He has developed many intelligent robotic systems for practical applications, including autonomous robots for steel bridge maintenance, bio-inspired climbing robots for inspection of complex steel structures, and human-interactive robots for human strength augmentation.

INTERNATIONAL KEYNOTE
Dr Akio Kasuga
Chief Technology Officer, Sumitomo Mitsui Construction

Akio Kasuga has been working for Sumitomo Mitsui Construction since 1980, and is responsible for the design and construction of more than 200 bridges. He is involved in R&D work which has led to more than 50 patents relating to bridges. He is a member of the Presidium, Technical Council, Commission 1, and Commission 9 of fib. His awards include the fib Award for Outstanding Structure in 2006, the Japan Society of Civil Engineers Tanaka Awards (paper category) for Bridge Engineering, 2012 and the Eugène Freyssinet Trophy 2013 1st Prize.

INTERNATIONAL SPEAKER
Dr Christian Christodoulou
Regional Director, Transportation, Bridges & Structures AECOM

Christian is a Chartered Engineer with international experience in the inspection, design, assessment and refurbishment of major highway and railway bridge structures, repair and maintenance of suspension bridges, and project management of multi-disciplinary projects. He is a leading expert in the field of corrosion asset management and durability design of reinforced concrete structures.

Supporting Organisations:

Exhibitors:

Networking Drinks:
DAY 1: TUESDAY 1 NOVEMBER 2016

8.30 REGISTRATION & COFFEE

9.00 Opening remarks from the Chair
Barry Wright, National Structures Manager, NZTA

9.10 International keynote: Autonomous robots for bridge inspection, condition assessment and maintenance
The latest innovations in maintenance technology are showcased in the lifecycle management of the Sydney Harbour Bridge: the future of bridge engineering. Learn about how the intelligent robotic technology was developed and applied to improve the safety, efficiency and effectiveness of inspections on bridges.
Dr Dikai Liu, Professor of Mechanical and Mechatronic Engineering / Co-Director, Centre for Autonomous Systems, University of Technology Sydney

9.50 Review of Bridge Manual and proposed changes
Addressing the current status of the Bridge Manual within the bridge community and the future vision for this integral guiding document. What’s changing this year and what do you need to know?
- Looking at sections 5 & 6 of the Manual and implications for the bridge community
- Understanding the new geotechnical standards
- Reflections on the Bridge Manual: future improvements and opportunities
Nigel Lloyd, Bridges & Structures Engineer, NZTA

10.20 Extended Q&A on NZTA Bridge Manual

10.30 MORNING BREAK & REFRESHMENTS

11.00 Smart Bridges Masterclass: Understanding and applying smart technologies
Are we data managers or bridge engineers? This masterclass gives a pragmatic working overview of the current and future applications of technology within bridge asset management, providing key insights into instrumental developments overseas and in New Zealand.
- Providing a context to advanced bridge technologies overseas and in New Zealand
- Understanding the applications of technology for structural health monitoring
- Adopting a pragmatic approach to bridge sensing technology
- Delving into current research and its applicability to New Zealand
- Utilising the data collected from bridges: data management for bridge engineers
- Exploring examples of smart technology implementation: Rakaia Bridge, Rangitata River Bridge
- New opportunities for improving asset maintenance techniques through smart technologies
Jeremy Waldin, Senior Bridge Engineer, Opus
Russell Kean, Instrumentation Engineer, Opus
Alessandro Palermo, Associate Professor, University of Canterbury
PLUS: Smart Bridges Panel: Applying smart technology to a New Zealand context
Following on from the Smart Bridges Masterclass, this panel looks at the current applications of smart technologies in New Zealand’s bridges - how far are we from intelligent bridges?

1.30 Quickfire case studies: Advancing aesthetics in bridge design
Sam Bourne gives an introduction to what urban design means to bridge engineers and the role of these guidelines in the Bridge Manual. Following this are effective applications of aesthetic bridge design, addressing the context and applications that deliver an attractive bridge from design to construction.
1. Hendon St Bridge
2. Canada St Bridge
3. Mackays to Peka Peka Bridge
Sam Bourne,
Principal Specialist - Urban Design and Landscape, NZTA
Will Pank, Technical Director - Structural Engineering, Beca
Dean Mackenzie, Partner, Monk Mackenzie
Geoff Brown, Technical Director - Bridges, Beca

2.30 Panel: Form following function-views from key stakeholders on bridge design and construction
We discuss the perspectives from designers, architects and contractors on how to design and build innovative aesthetic bridges; looking at the challenges and opportunities for building landmark bridges.
- Understanding the practicality of designing aesthetically effective bridges in the design and construction phases
- Ensuring quality in all stages of bridge design and construction
- Reviewing upcoming bridge projects: strategies for supporting collaborative design
Dean Mackenzie, Partner, Monk Mackenzie
Will Pank, Technical Director - Structural Engineering, Beca
Geoff Brown, Technical Director - Bridges, Beca

3.00 AFTERNOON BREAK & REFRESHMENTS

3.30 Case study: Strategies for collaboration with key bridge stakeholders
Hear about KiwiRail’s long-term view of relationships with key stakeholders and how they achieve effective outcomes of functional bridges through positive engagement and collaboration.
- Identifying local stakeholders as partners for collaboration and fostering this relationship
- Strategies for minimising the risk and cost of working appropriately in tapu areas
- Maintaining strong relationships - what’s next for KiwiRail?
Peter Dautermann, Construction Manager, KiwiRail

4.10 Panel: Achieving successful collaboration on NIMT BR 273 at Taupiri
This panel brings together key stakeholders of the Taupiri Bridge, reflecting upon how successful collaboration was achieved to deliver bridges that have both a social, cultural and environmental impact on the local community.
- Identifying a ‘successful bridge’ in the perspective of Tainui
- Achieving effective delivery of a bridge project with input from all stakeholders
- Examining the strategy of the successful collaboration between KiwiRail, Tainui and Downer
Peter Dautermann, Construction Manager, KiwiRail
Russell Herbert, Senior Project Manager, KiwiRail
Allister Sterling, Project Manager - Projects North, Downer
Major Herewini, Member Urupa Committee (Kaumatua), Tainui Iwi

4.50 Closing remarks from the Chair and Networking Drinks
DAY 2: WEDNESDAY 2 NOVEMBER 2016

9.00 Opening remarks from the Chair
Kevin Reid, National Manager Network Outcomes, NZTA

9.05 International keynote: Construction of Butterfly Web Bridges - Japanese Bridge Innovation
Sumitomo Mitsui Construction has a unique method of designing and constructing bridges. Dr Akio Kasuga shares the experience of constructing the butterfly web bridge and what this means for the future of bridge design.
· Applying the butterfly web construction method to the Takubogawa Bridge
· Understanding the benefits of the new bridge design and implications for construction, sustainability and life-cycle management
Dr Akio Kasuga, Chief Technology Officer, Sumitomo Mitsui Construction

9.40 Maintenance of critical structures: Key case studies & lessons
Liam Coleman gives an overview of effective processes for managing the lifecycle and maintenance of key bridge structures, reflecting on insights from three large bridge projects.
· Delving into best practice processes of managing risk and maintenance in bridges
· Effective strategies for assessing and evaluating critical structures
· Spotlight focus case studies: Old Mangere Bridge, Pahurehure Bridge & Victoria Park Viaduct
Liam Coleman, Principal Engineer - Bridge Structures, Opus & NZTA Structures Asset Manager Auckland Motorway Alliance

10.20 MORNING BREAK & REFRESHMENTS

10.50 Geotechnical structures asset management for structural engineers
Geotechnical structure management is becoming increasingly important in the context of horizontal infrastructure and roading in particular. The NZTA give their perspective on the future of geotechnical asset management and highlight the important changes that will take place in the coming year.
Stuart Finlan, Principal Geotechnical Engineer, NZTA

11.20 Introduction to heritage bridge maintenance
Difficult terrain led engineers to many inspiring and innovative design solutions for New Zealand’s bridges. Caring for the rarest and best of these enables our children’s children to visit and enjoy them. Ann Neill provides the NZTA's perspective on balancing the risks and opportunities these assets present.
Ann Neill, Principal Environmental Specialist, NZTA

12.00 International keynote: Corrosion asset management in bridge structures
This sessions looks at the development of holistic corrosion asset management strategies with a particular focus on the use of innovative electrochemical treatments such as Impressed Current Cathodic Protection.
· Understanding modern technologies for asset management
· Planning for durability with bridge structures - minimising corrosion with effective design
· Achieving effective corrosion control in UK’s Midland Links Motorway Viaducts and applications in New Zealand
Dr Christian Christodoulou, Regional Director, Transportation, Bridges & Structures, AECOM

1.30 Case study: Auckland Harbour Bridge long term asset management strategy
This session evaluates asset management strategies that have been employed on the Auckland Harbour Bridge and the challenges of maintaining an iconic structure.
· Building the timeline: historic, current and potential future strategies of asset management
· Understanding the challenges of maintaining and improving an iconic structure
· Long term outlook: future scenarios and their impact
Alex Ingram, Asset Manager, Auckland Harbour Bridge Alliance
Jon Patman, Alliance Manager, Auckland Harbour Bridge Alliance

2.10 Analysing bridge materials part A: Prefabricated steel structures
This two part session assesses the strengths and weaknesses of employing different bridge materials.
· Understanding the benefits and overcoming challenges with prefabricated steel
· Strategies to ensure quality when importing and implementing steel structures
· A new standard for bridge construction? HERA’s feedback on a new steel standard and its implementation in to New Zealand
Stephen Hicks, Manager of Structural Systems, HERA

2.30 Analysing bridge materials part B: Reinforced concrete structures
· Comparing the costs, durability and implementation of reinforced concrete to steel structures
· Traditional applications of concrete bridge structures and modern innovations
· Successful examples of bridge hybrids: concrete-steel structures in New Zealand contexts

2.50 AFTERNOON BREAK & REFRESHMENTS

3.10 Case study: Constructing the Karapiro Gully Bridge
Nick Myers-Kay reflects on some of the construction challenges for the Karapiro Gully Bridge and how they were overcome to deliver an effective bridge design.
· Identifying the unique challenges of the Karapiro Gully Bridge construction
· Reflecting on the importance of employing ingenuity and teamwork in major bridge projects
· Using temporary-works design to enable clever construction methods
Nick Myers-Kay, Project Engineer, HEB Construction

3.50 Case study: Waterview Connection surface structures
The surface structures design team reflects on the five-year journey through the design and construction challenges of the Great North Road Interchange viaducts, Northern Approach Trench and Hendon Park Footbridge, including:
· Overcoming challenges to ensure safety and structural stability from design to construction
· Utilising the alliance to streamline construction and design process
· Delivering with ‘Dennis’ - achieving success with high-tech construction methods
Andrew Dickson, Surface Structures Verifier / Senior Technical Director
Lawrence Blackmore, Discipline Team Lead - Bridges
Stuart Paterson, Senior Portal Structures Engineer, Melanie Regino, Park Footbridge Designer / Senior Structural Engineer - Civil Structures
Beca / Waterview Connection Alliance

4.30 Closing remarks from the Chair and end of conference
Facilitators

WORKSHOP 1: Thursday 3 November 9.00-12.30
Lifecycle management of bridge networks
- Appropriate asset management strategies for NZ bridge networks
- Lifecycle management strategies for optimising bridge performance
- Risk management, condition rating and forecasting of maintenance and renewals
- Focussing on ‘fundamental management’ of bridge structures
- Procurement of appropriate bridge management skills
- Getting the funds for bridge management

WORKSHOP 2: Thursday 3 November 1.30-5.00
Processes of managing risk and maintenance of bridge structures
- Key methods of inspection including condition and risk scoring of defects which can be used to prioritise works
- Assessment techniques to better understand structure capabilities and techniques that can be used to push analysis results
- Testing and monitoring of assets to get a better understanding of structures
- Looking at monitoring techniques that can be used to manage high risk substandard structures
- Working examples and lessons learned from bridge failures/near misses from Ireland, UK and New Zealand

Facilitators

John Reynolds, Principal Structures Engineer, NZTA

John Reynolds is a Principal Structures Engineer with the New Zealand Transport Agency. He has 42 years of experience as a consultant and client in State Highway and Local Authority bridge and civil structures design and asset management.

Liam Coleman, Principal Structures Engineer, Opus & NZTA Structures Asset Manager Auckland Motorway Alliance

Liam is chartered Civil and Structural Engineer with 14 years' experience. Currently, he is the Principal Bridge Engineer for OPUS International Consultancy, spending a majority of his time seconded to the NZTA Auckland Motorway Alliance as the Structures Asset Manager.

WORKSHOP 3: Thursday 3 November 9.00-5.00
Displacement-based seismic design methods
- Identifying the relevance of displacement-based design (DBD) in New Zealand and the limitations of forced-based design methods
- Addressing the fundamentals of DBD and how bridges handle seismic loading
- Seismic loading and displacement performance of traditional bridge types
- Comparing force-based and displacement-based methods on an existing bridge
- Working examples of where DBD has been effective
- DBD on bridge structures with load-damaged seismic devices
- Proposed revisions of displacement-based design to the Bridge Manual

Facilitators

John Wood, Principal, John Wood Consulting

John Wood is a consulting civil engineer specialising in bridge design, structural investigation, soil-structure interaction and earthquake engineering. John is a Life Member and past President of the New Zealand Society for Earthquake Engineering.

Alessandro Palermo, Senior Lecturer, University of Canterbury

Alessandro's research areas of interest are mainly focused on structural bridge engineering, where he is currently course coordinator of a post-graduate course. His expertise is particularly focused on implementation of seismic low-damage technologies for precast concrete bridges and buildings.

Phil Gaby, Project Director, Holmes Consulting Group

With 30 years’ experience in structural engineering, Phil is a wealth of technical engineering knowledge. Phil is a hands-on engineer with practice inspecting, assessing, retrofitting and modifying existing bridges as well as concept schemes and detailed design for new structures.
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