

building on a foundation of excellence in roads bridges precast marine water land







ABOUT ACENZ

The Association of Consulting Engineers New Zealand represents business services and advocacy in the consulting industry for engineering and related professionals. We represent the Business of Consulting.

ACENZ is...

- Over 190 Members directly employing more than 12,270 professional and technical staff.
- Nearly two-billion dollars turnover p.a. (total member firms) translates to between 15 and 20 billion dollars of completed capital plant and infrastructure.
- Over 90% of consulting engineering firms in this country are ACENZ members.

ACENZ is "The Trusted Advisor" to government, public sector, member firms and their clients and we are committed to achieving 'public good' outcomes in association with its representation of member firms & industry interests and in promoting safety in design.

We provide an informed and representative role in the development of relevant public policy regulation and legislation. Demonstrably a leading and important contributor to goals of the national construction industry. ACENZ is fully committed to advocating and advising on health and safety in the workplace.

ACENZ believes in quality management and Quality Based Selection (QBS) for design services and provides guidance to Members to assist them in implementing appropriate standards, and to enable them in offering their clients a superior service.

We are an active proponent of consistent and robust processes, documentation, and terms of engagement in the engineering related consulting industry. We promote that

leadership values be demonstrated by professionals working in the built and natural environment and we advocate as the communal voice of the consulting and engineering voice for the industry.

ACENZ membership requires that Members subscribe to a code of ethics that requires them to be responsible professionals who consider the effect of their work on society, and who ensure that their advice is technically competent to ensure safe and sustainable outcomes. Our Members employ a range of professional staff, including engineers, surveyors, architects, planners and scientists and employ a versatility and broad experience allowing consulting engineering firms to offer a complete consulting service to their clients.

The collective knowledge and skills of ACENZ members are an important source of sound advice to both the public and private sectors, and their undertakings and works contribute to the interests and wellbeing of society. ACENZ also have worldwide insight and exposure to engineering related matters through being a member, and active participant in FIDIC (The International Federation of Consulting Engineers).



ACENZ KEY WINS

- Completed a collaborative review of ACENZ CCCS and Short Form Contract Forms with key clients
- Progressed development of a consistent approach to ACENZ Producer Statement content
- Developed a new edition of our in-house prepared and acclaimed state of the industry publication "Our Business' launched at an event hosted in Parliament by Hon. Dr. Nick Smith
- Caused unacceptable wording in some Government Design Certificates to be amended and re-issued
- Negotiated amendments to Ministry and Agency contract conditions for professional services
- Provided input and made submissions on draft bills including Incorporated Societies Act, Standards and Limitations Act, and Earthquake Prone Buildings Act.
- Signed a Memorandum of Understanding with the Ministry of Education, CEAS, Wellington Water and IDMACA
- Renewed a Memorandum of Understanding with NZTA and liaised with the Minister of Transport
- Persuaded a number of BCA's to adopt unrevised ACENZ Producer Statement documentation (e.g. Hamilton, New

- Plymouth, Tauranga and Waikato Cluster of councils)
 Updated Producer Statement Guidelines that are
- endorsed by councils, insurers and MBIE
- Negotiated changes to bespoke contract forms in use by some clients
- Worked with Ministry of Education to produce revised Conditions of Engagement and procurement processes
- Continued a close relationship with Auckland Council to advocate robust and fair Conditions of Contract
- Resolved numerous issues between member firms and local authorities
- Circulated real-time member advisories and cautions regarding contracts/certificates
- Originated or contributed to many submissions into government and statutory bodies
- Promoted Proportionate Liability with Government ministers and departments
- Issued media releases and editorials
- Launched Facebook, YouTube and Flickr Stream
- Another successful Conference & Innovate Awards
- Developed workshops focused for YP's & SME's
- Significant increase of Young Professionals attending

- conference and other events
- Annual Roadshow to 14 regional centres and networking meetings in main centres
- Developing Leader awards and promoted a young professionals networking programme
- Conducted three meetings of the ACENZ Large Firm Forum and revised agenda content
- Promoted more and new activities within Regions coordinated by ACENZ Regional Chairs
- Represented NZ in Jakarta (Indonesia) at international federation conference and committee meetings (2017)
- Notable meetings with relevant ministers and regular senior level interface with government bodies
- Many private/public sector clients now frequently come to ACENZ for consultation prior to changes
- Monthly liaison meetings and joint undertakings with leaders in the wider industry groups
- Much better subscribed Personnel, Remuneration and Business surveys
- New sponsorship opportunities identified
- A significant growth in membership 10,000 to 12,270 individuals in over 190 member firms.



THE ACENZ AWARDS

The ACENZ Awards are informally known as our People Awards, recognising incredible personal achievement within and for the consulting and engineering industry. The people awards are designed to recognise significant contributors to the industry or rising young leaders who may influence the future of our profession. The awards include:

- AECOM / ACENZ Best Practical Work Report Award (for students)
- Tonkin & Taylor / ACENZ Future Leader Award (for young professionals)
- President's Award





PRESIDENT'S MESSAGE

Mike Kerr, Beca

Another year and another impressive showcase of remarkable projects. Each year the projects become more technically sophisticated and world leading and as a small nation and as an industry we should be very proud.

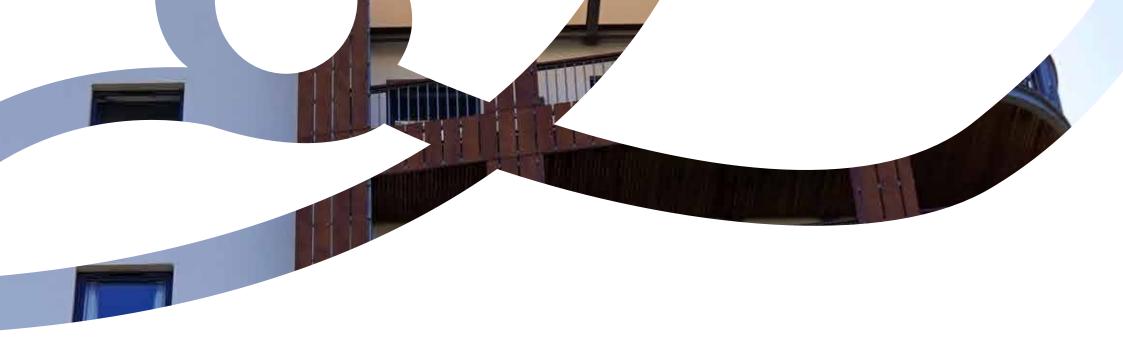
This is an opportunity to reflect on our role in the community whether it is our impact on resilient buildings, public health, receiving water quality, transport solutions to free up and grow communities or industrial project supporting export. We should also be very proud of how we support our community whilst at the same time remaining aware of the responsibility that comes with it.

We should all take heart in the talented leadership that is already taking our organisation and our industry forward. We have a fantastic group of future leaders coming through and this year is no exception.

I have the pleasure of awarding the President's Award again this year. Tristan Meo is this year's recipient. On behalf of you all I extend my appreciation for Tristan's ongoing contribution.

Well done to all our award winners. Again you have shown us the depth of talent we have in our industry.

Finally, a huge thank you to the ACENZ team that worked tirelessly behind the scenes. This year's awards event is a credit to all their hard work.





PRESIDENT'S AWARD

Tristan Meo, Aurecon

Tristan Meo holds a double degree in law (Hons) and building science from Victoria University in Wellington and was admitted to the bar in 2002. He worked in private practice as a litigation solicitor in construction and infrastructure at Kensington Swan before taking senior advisory roles in government (Ministry of Fisheries) and industry (Gas Industry Company Limited).

Tristan is currently the New Zealand Legal Manager for Aurecon, working as part of a global legal team in a company with assignments in over 80 countries. Tristan applies his unique combination of skills to the resolution of complex technical and legal issues and over the past 9 years has contributed greatly to ACENZ.

Tristan has provided, and continues to provide ACENZ with legal input, including the review of the Conditions of Contract for Consultancy Services (CCCS). More recently he has

chaired the newly formed Commercial Advisory Forum, a collection of a number of in house solicitors. This team has already provided much needed insight in a number of areas.



THE ACENZ / TONKIN & TAYLOR FUTURE LEADER AWARD

About the award

Introduced by the association in 1998, the award was established to recognise and acknowledge the future leaders of our industry. ACENZ aims to empower young engineers and equip them with the management tools and training through the experiences of this award. The winner and finalists for this award have been identified as possessing a high standard of leadership abilities and great potential to be game changers within our industry. This award has been jointly sponsored by ACENZ and Tonkin & Taylor since 2015. We also want to thank our judging panel including Samir Govind, Rachel Wright, Lyall Green, Kat McDonald, and Doug Johnson.

Prize.

The winner receives an opportunity of a lifetime, including registration costs for the FIDIC Young Professionals Management Training Programme. This is run through webinars with young professionals from all over the world during the year with the final module to be completed at the FIDIC Annual Conference. The winner receives the prestige title "Future Leader Winner," a framed certificate, \$1,500 cash prize, conference registration and travel, and one year on the ACENZ Board.

Runner-up finalists will receive a framed certificate and \$1,000 towards an approved business management course.

About Tonkin & Taylor

Tonkin & Taylor is an employee owned, New Zealand environmental and engineering consultancy that provides innovative, cost effective and sustainable solutions for a diverse range of clients. T&T has a strong reputation for technical excellence in the following discipline areas, civil, environmental, geotechnical and water resources. T&T are the proud sponsors of the Tonkin & Taylor ACENZ Future Leader Award for Young Professionals in the built and natural environment.



FUTURE LEADER AWARD WINNER

Weng Yuen Kam, Beca

Beca is an award winning professional engineering and management consultancy, with over 3,000 employees spread accross 20 offices throughout Asia Pacific. As a multidisciplinary consultancy, Beca employs licensed surveyors, professional planners, specialist urban designers, landscape architects and engineers.

Weng Yuen Kam (Kam) is a Senior Associate and a Team Leader with Beca Auckland Structure. His recent projects including seismic advisor to ANZ Bank, structural lead for SKYCITY's Hobson Street Hotel and the University of Auckland's Recreation and Wellness Centre, and lead verifier for the Groningen Seismic Strengthening Project in the Netherlands.

Kam is a recognised leader in seismic engineering in Beca and New Zealand. He has made significant contribution to technical standards and practice in the seismic assessment of earthquake prone buildings. In recognition of his contributions, he was made a Fellow of the New Zealand Society for Earthquake Engineering (NZSEE) in 2018 and received their President's award in 2017.

He was a finalist in the coveted New Zealand Young Engineer of the Year in 2014. He obtained his B.Eng (Hons) and B.Com in 2006 and PhD in 2011, all from the University of Canterbury.



FINALIST

Robert Lane, Lewis Bradford Consulting Engineers

Robert is a design and construction professional specialising in structural engineering and is a Chartered Engineer with the Institution of Structural Engineers (UK). Starting his engineering career in Dublin, Robert moved to London to complete a Masters in Advanced Structural Engineering at Imperial College and worked locally there for five years.

Moving to Christchurch in 2012 Robert joined Lewis Bradford Consulting Engineers and is currently an Associate and Senior Structural Engineer at the firm. Robert leads teams of engineers and technicians in delivering high quality building projects with a strong focus on integrated design to improve client and wider community outcomes.

Robert is a strong believer in instigating change from the bottom up, exploring new ways of forming teams and creating projects with the goal of improving the construction industry and generating value through mutually beneficial results.

FINALIST

Thomas Small, Jacobs

Thomas Small was appointed Director of Operations – New Zealand Transport at Jacobs in 2016. His role is to grow and diversify the Transportation discipline across the New Zealand business; executing a head count of approximately 160 professionals and a revenue of approximately \$40 million per annum. The group has diversified significantly under Thomas' leadership to respond to the changing needs of the clients and the way projects need to be delivered in a highly political setting. Clients repeatedly commend Thomas for his 'client orientated focus' and excellent communication and management skills. The Transport group has successfully delivered over 100 projects, although not directly involved in them all on a day to day basis, Thomas often participates with a governance role on the more challenging or complex projects.

As a Civil Engineer with over 11 years' civil infrastructure experience, Thomas has worked across New Zealand and is based nationally between the Wellington, Auckland, Christchurch and Waikato office, leading 160 staff. Thomas sits on the NZ Leadership Team, conveying an excellent skills set, comprising of operations management, project management, design and contract management.



STUDENT AWARD

THE ACENZ / AECOM BEST PRACTICAL WORK REPORT AWARD

About the award

The student award was introduced by ACENZ in 1996. This award highlights the importance of written communication skills that are essential for report writing in the business of consulting and engineering, and promotes career opportunities within the consulting engineering industry. AECOM is pleased to sponsor this award jointly with ACENZ since 2015. Fourth year engineering students are invited to submit their practical work report as part of the Bachelor of Engineering Degree prescriptions. The entries are judged on report writing and the student's ability to describe the work they carried out and their experience gained, rather than on the duties undertaken. We also want to thank our judging panel Mike O'Halloran , Jenson Varghese, Craig Davidson, and Dr Jan Kupec.

About AFCOM

AECOM is built to deliver a better world. They design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries. As a fully integrated firm, AECOM connect knowledge and experience across our global network of experts to help clients solve their most complex challenges. From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, their work is transformative, differentiated and vital. It is the fusion of AECOM's global reach with local knowledge that enables our New Zealand team to deliver innovative solutions, technical excellence and support the nation's growth.

Winners

- Miguel Montalla, University of Auckland
- Matthew Waghorn, University of Canterbury
- Sheryl Wong, University of Canterbury



SENTIMENT

INFRASTRUCTURE AND BUILDINGS CONSTRUCTION SURVEY NEW ZEALAND 2018

As a nation, New Zealand is looking towards a new era of growth. The way we plan and build our cities and regions is a key part of this. For the past nine years, AECOM has surveyed the market to provide the industry with in-depth insights to meet the challenges ahead. Our 2018 Sentiment Report is out now.

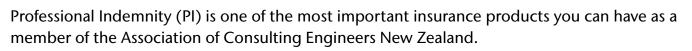


Want to be kept up to date with the latest industry research and insights? Scan this code and let us know.

aecom.com/nz/sentiment



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The INNOVATE NZ Awards of Excellence showcase and celebrate outstanding consulting service or innovative practice which raises the profile of the industry in the built and natural environment. All the winning projects have demonstrated excellence in either innovation or superior consulting service.

The INNOVATE Awards differ from others as the projects are evaluated individually on the merit of each project alone, so there may be more than one award in any of the given categories or none at all.

A project is not awarded a prize (being Gold, Silver, or Merit) for simply being a good project. The work, technology, service, and innovation must go above and beyond what is considered standard operating procedure for the industry. Often winning projects help to instate a new industry norm, which constantly challenges professionals to become better at consulting for clients and the public good.

This in turn helps the profession to grow, continually pushing the boundaries of what is accepted as standard practice or what is determined to be outstanding work in the consulting or engineering field.

The Awards are about more than just "business as usual" or doing a good job. Consultants should be delivering a good job as a part of the standard. Winning is about producing an "above and beyond" result and setting a new standard of practice for the industry.





CONVENOR'S MESSAGE

David Bridges, Good Earth Matters Consulting

The depth and breadth of the entries in this years awards highlights the immense contribution ACENZ members make within the natural and built environment. This includes enhancing the resilience of critical infrastructure, delivering innovative structural systems for the strengthening of buildings, developing rapid response disaster relief tools, undertaking contaminated site remediation, delivering roads of national significance and providing leading edge geothermal power solutions.

The standout projects are characterised by good old fashioned consulting excellence, outstanding delivery, great client relationship and a focus on adding value to our clients businesses. A key feature of these projects is the collaborative manner that the projects are delivered within and clients who embrace the contribution the consultants can make. This

requires trust and mutual respect.

It's a privilege to share these outstanding projects with you and acknowledge the outstanding contribution consultants are making to both the built and national environment.

The Innovate Awards are an opportunity for the profession to showcase its work to a wider audience. I ask that you stand tall, speak with pride and share this celebration of excellence with your colleagues, friends and neighbours.

I wish to acknowledge the contribution and dedication of my fellow judges and their willingness to take time out of busy schedules. Lastly, I wish to thank all the entrants for sharing their projects with us and congratulate the winners.

David Brye

David Bridges, 2018 INNOVATE Awards Convenor



THE PROCESS

What many don't fully realise is just what an intensive judging process the INNOVATE Award entries go through. It is by far one of the most thorough and rigorous awards processes in the country.

Written submissions are entered each year around March, each addressing a standard set of criteria and highlighting what the entrants feel is the most special or meritorious aspect of their projects.

From there, the Convenor reads each submission to assess which skill set will be most needed to evaluate the project to the highest of standards in a particular

discipline. The entire judging panel is composed of 25-35 judges in an array of specialist and general engineering experience. Our panel combined holds close to 1,000 years of experience and expertise to contribute to the evaluation of projects.

Each project is then assigned a specific judges team of 4-7 judges and includes one Lead Judge, one Judge, and up to four Readers for each project.

The teams then investigate the written material of each project, often conducting Client interviews, and where appropriate interviews with the Lead Contractor and sometimes Principal. The Lead Judge and Judge often conduct a physical site visit of the project to further investigate the meritorious aspects

of the submission. This preliminary evaluation period can last several months and culminates at a Final Judges Meeting where the full panel of 25-35 judges come together in one room over two days to debate and test the meritorious aspects of each project. The judges consider what the current industry standard or "norm" of delivery is and considers if these projects elevate the industry standard or have provided exceptional and superior consulting work. It's not good enough to just be good, but winners provide exceptional consulting work for their clients.

This robust process is what keeps the INNOVATE Awards as the pinnacle awards programme in the consulting and engineering industry.

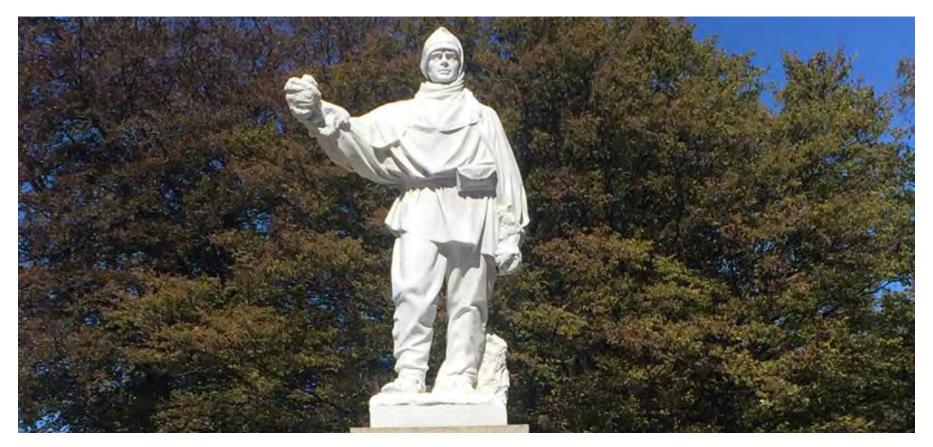


THE PANEL

2018 INNOVATE Judges

Adam Thornton, Alistair Cattanach, Allan Leahy, Andrew Read, Angus Macdonald, Ann-Marie Head, Ashley Wilson, Ben Holland, Bob Nelligan, Brent Meekan, Brett Harries, Cam Wylie, David Bridges (Convenor), David Voss, Geoff Banks, Hamish Nevile, Iain Rabbitts, Matt Spooner, Michael Simpson, Murray Spicer, Nathanael Sterling, Ray Patton, Rebecca Jackson, Richard Neate, Scott Vaughan, Simon Drew, Steve Abley, Steve Jenkins, Tania Williams, Trevor Matuschka, Win Clark, Catherine Chong (ACENZ Awards Coordinator), and Holly Morchat Stanko (ACENZ Awards Coordinator).





SCOTT STATUE REMEDIATION

Ruamoko Solutions Ltd for Christchurch City Council

CHRISTCHURCH

The reinstatement of the damaged Captain Robert Falcon Scott Statue in central Christchurch is an excellent example of superb consulting used for a complex and unique project. The Captain Robert Falcon Scott Statue is 100 plus years old, originally carved from one solid piece of flawed marble. During the February 2011 earthquake, it fell off its plinth and was badly damaged at the thinnest point in the statue, the ankles.

Ruamoko Solutions was selected as the consultant for the repair, strengthening, and reinstatement of this priceless and internationally important heritage statue.

Ruamoko Solutions was a key member of a project team assembled to optioneer multiple solutions for this project. The agreed solution addressed the complex challenge to repair and strengthen the severely damaged statue, while absolutely minimising the visual effects of the repair work both now and into the future. Another key goal for the solution was not to have any adverse impact on the heritage material. The statue broke both ankles when it fell and the broken surfaces were steep and multi-faceted making the repair and strengthening particularly complex and challenging. The elegant solution adopted relatively new technologies in a novel manner to achieve a stunning outcome that met and exceeded all

stakeholder expectations. The success of this project has been widely praised by many of the stakeholders and specifically by the Mayor, Lianne Dalziel.

The solution required extensive research, full scale prototype testing and utilised carbon fibre rods, carbon tow, specialised epoxy adhesives and a spring loaded rocking base fixing to its supporting stone plinth. The project gained a large public interest leading to a documentary being produced which includes footage of the full scale prototype testing. The project was completed on time and to budget, and serves as an excellent example of what outstanding consulting work looks like to find a superb solution to a complex problem with a stringent set of parameters to work within.







WAIRAKEI B STATION GAS REMOVAL SYSTEM (GRS) UPGRADE

Jacobs for Contact Energy TAUPO

The Wairakei Power Station, located north of Lake Taupo, is over 60 years old (typical economic life of this type of power station is 25 years). This station comprises three 30MW mixed pressure generating units with direct contact condensers and all-ejector gas removal systems (GRS) which remove non-condensable gases (NCGs). The purpose of the GRS is to

remove the NCGs which affect the performance of the plant and discharge them into the atmosphere in accordance with environmental permits that allow the harnessing the natural geothermal power of New Zealand.

As the steam demand of Contacts new Te Mihi power station would limit the amount of steam available for the Wairakei station, Contact Energy sought to improve the overall efficiency of steam usage at the B Station. Jacobs was tasked to prepare the concept design and undertake the Front End Engineering Design (FEED) for upgrading the GRS of this historic power station. Jacobs further undertook the detailed design and supported the project through implementation and commissioning over two years.

An improved gas solubility and heat balance model was

developed and then validated by plant testing, taking into consideration seasonal changes to maximise output throughout the year. Working within the technical limitations of a 60 plus year old plant and maintaining continuous operation, Jacobs excelled for the client to provide innovation and elegant solutions to address the project needs. A number of innovations were included in the upgrade. While some of these are relatively simple, each provided the right solution for the issue being addressed, adding up to excellent and smart consulting which extended the efficient life of an ageing asset and goes above and beyond current industry standards.







CANTERBURY EARTHQUAKES COMPLEX LAND DAMAGE ASSESSMENT OF INCREASED LIQUEFACTION & FLOODING VULNERABILITY

Tonkin + Taylor for Earthquake Commission **CHRISTCHURCH**

The Canterbury earthquakes of 2010-2011 caused widespread liquefaction related land damage throughout

the Christchurch area affecting 85% of the residential flat land properties, the most ever witnessed worldwide in an urban setting. The land damage included liquefaction ejecta, liquefaction-induced subsidence and lateral spreading, resulting in extensive ground surface deformations and hence substantial damage to buildings and infrastructure. To quantify the extents & severity of liquefaction related land damage to urban residential properties for the Earthquake Commission (EQC), Tonkin + Taylor mapped the observed land damage after each main earthquake event.

Tonkin + Taylor undertook an extensive programme of works to assist the EQC with the identification and qualification of these complex forms of land damage. This programme of works included: detailed technical studies to identify the mechanisms causing these forms of land damage; advice to the High Court that resulted in the confirmation that these forms of land damage are covered under the EQC Act; the compilation & management of unprecedented quantities of data related to this process; the development of tools

and innovative assessment methods to be able to quantify the increase in vulnerability; processes to determine which residential properties qualified for these forms of land damage; & the application of Tonkin + Taylor's technical expertise to implement these assessment methods in a robust, consistent & timely manner for 140,000 residential properties in a way that considered all of the relevant data for each individual property.

Working through immense complexity, applying innovation and an incredible level of technical expertise, Tonkin + Taylor took their client on a voyage of discovery which elevated the way the industry operates. They demonstrated excellent consulting work in a highly emotional environment, with the outcome affecting the community of the Christchurch area. T+T have developed an elegant solution to this problem that has also resulted in a significant contribution to the international body of knowledge around liquefaction and flooding hazards that has been recognised through international accolades and awards.

















PERRY BRIDGE

Holmes for Emmetts Civil Construction **HAMILTON**

Te Awa walk and cycleway stretches along the Waikato River, running from Ngaruawahia in the north to Karapiro in the south. The Perry Bridge was the final link in the chain, completing the path and opening up a fantastic activity for locals and visitors to the region.

Holmes Consulting and Emmetts Civil Construction submitted an alternative solution to the originally proposed timber suspension bridge, with a visually stunning, network arch. The efficiency of this form of structure kept its costs within a practical budget. Waikato District Council and Te Awa also

recognised the opportunity to create a visually compelling focal point to help attract people to use the cycleway.

The bridge is very long and slender, spanning 130m at just 3m in width—presenting a number of complex technical engineering challenges, including footfall vibration and arch buckling phenomena. It's the country's first network arch bridge designed specifically for pedestrians and cyclists, and the longest of the four network arch bridges in New Zealand.

Moving into the construction phase, it became evident that the proposed launch sequence, involving barges on the river, had a high level of risk and uncertainty. Holmes Consulting devised an alternative launch sequence, pulling the bridge across the river on cables. The alternative tender design helped to capture the publics imagination, and involved local schools,

artists and other stakeholders to ensure relevance to the local community.

Holmes Consulting elevated a simple project into a great piece of adaptive and smart consulting work, delivering a better outcome not only for the client but for the community and visitors to the region.







WESTERN RING ROAD OPERATIONAL INTEGRATION

Aurecon for NZ Transport Agency **AUCKLAND**

The Western Ring Route (WRR) extensively contributes to New Zealand's regional and national economy and as such is one of the government's Roads of National Significance. The WRR is a 48 kilometre motorway alternative to State Highway 1 and the Auckland Harbour Bridge via SH20, SH16 and SH18, bypassing the city to the west. It links Manukau, the City, West

Auckland and the North Shore. It is the biggest and most complex infrastructure project the NZ Transport Agency has ever embarked upon with a budget of \$2.4 Billion for six connected projects. The WRR projects along the SH16 North-western Motorway were opened in 2016, with the remaining SH20 Waterview Connection and tunnel opened in 2017. The final Lincoln to Westgate project will be completed by 2020.

NZTA required a partner with the technical competence and endurance to tenure the six separate projects which compose the Western Ring Route. Working together since 2006, Aurecon as Principal Advisor and Programme Manager, have navigated the WRR programme throughout all phases of programme definition, investment decision making, implementation and operational components. Aurecon worked from the planning phase through to post opening optimisation of

relevant completed WRR projects.

With such a large umbrella oversight role on six separate projects as principal advisor and programme manager, Aurecon demonstrated excellent adaptability, technical expertise, and consulting solutions to be the glue helping the client bring together many stakeholders through many projects for a better outcome on the overall WRR project.







SH5/SH30 HEMO GORGE INTERSECTION IMPROVEMENTS

WSP Opus for NZ Transport Agency ROTORUA

The intersection of Old Taupo Road (SH5) and Hemo Road (SH5/SH30) in the Hemo Gorge at Rotorua's southern entrance, was identified as the fourth riskiest intersection in New Zealand. The intersection carries around 12,500 vehicles, 140 cyclists and 80 pedestrians per day, as well as providing access to Tihi-o-Tonga suburb and the Toi-Ohomai

Institute of Technology. WSP Opus were engaged by the NZ Transport Agency (NZTA) to undertake the integrated planning and design for the SH5/SH30 Hemo Gorge improvements. WSP Opus created a solution to replace the difficultly aligned T-intersection with a roundabout to improve safety for drivers, cyclists and pedestrians, therefore reducing the risk of death and serious injury crashes.

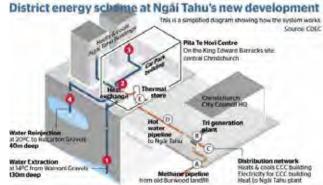
The reconfiguring of the intersection to ensure maximum safety was challenging enough, but when paired with changing geothermal site conditions and the necessary detailed consultation with multiple stakeholders to ensure sensitive elements were protected, this project demanded a lot of the consultants. While all these elements had their own significant challenges, many of which were exclusive to the geothermal location, WSP Opus delivered great consulting by

navigating complex ownership of land, designing smart cycling and pedestrian solutions, addressing the complex geothermal site conditions, and incorporating intelligent planning for the evolution of this site for future development.

As a gateway road to Rotorua, this project was well managed by WSP Opus and delivered an above and beyond smart set of solutions for the client.







PITA TE HORI DISTRICT ENERGY SCHEME

Aurecon for Ngai Tahu Property **CHRISTCHURCH**

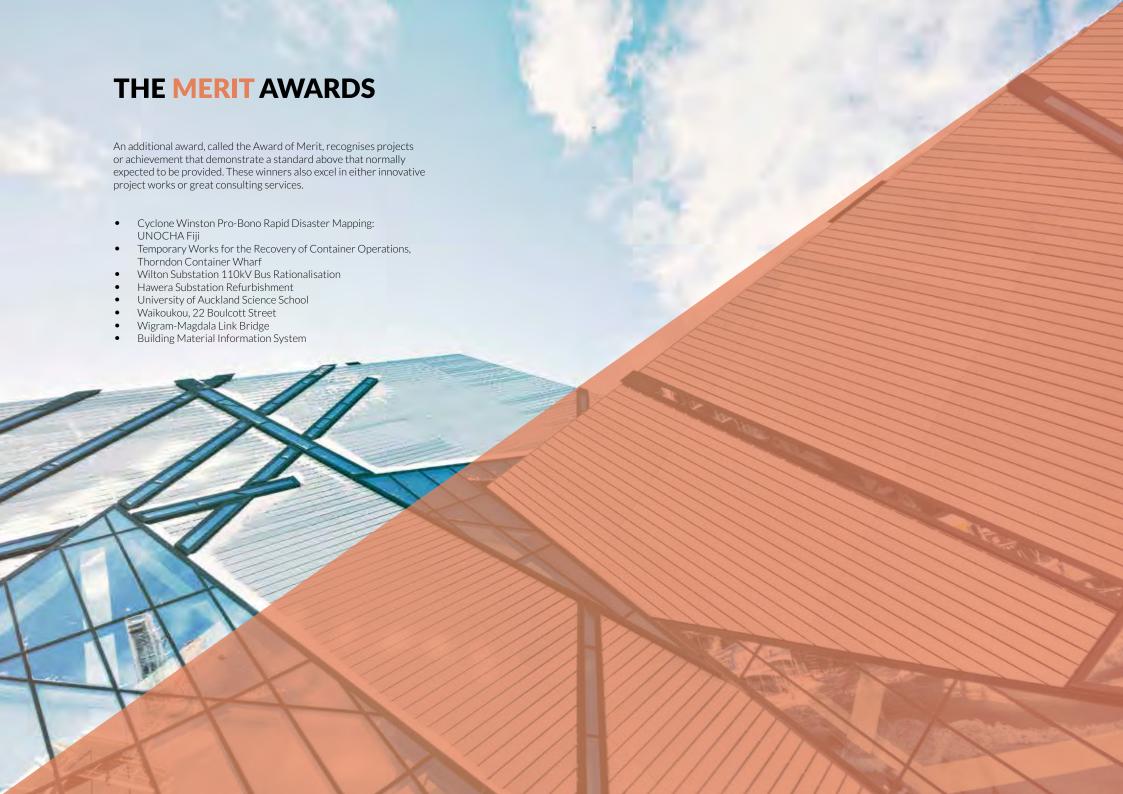
After Christchurch experienced devastating earthquakes in 2010 and 2011 public consultation indicated a district energy scheme was desirable as part of the city's rebuild. The central energy management system is capable of sharing energy resources across nine independent private and civic buildings. Providing diversified and resilient district energy schemes was an important factor in the rebuild of Christchurch.

Ng i Tahu Property was demolishing two existing buildings on

the Christchurch city block and building four new commercial and two residential buildings and a car park. Having been contracted to design a traditional distributed building services system, Aurecon began looking at the available natural resources and discovered an abundance of fresh water up to 120m below ground – perfect for the extraction of energy. This is when the idea of a ground sourced heat pump solution first came to Aurecon. Not a new idea in the city, but this was for an entire city block. With seven buildings planned for the site it was a bold plan, helping the client to imagine the future of their development and how they could provide for the needs of future generations.

This project did not exist until Aurecon brought the idea to their client, Ng i Tahu Property. Initially contracted to design independent buildings, Aurecon saw an opportunity to do

something different, aligning to some of the iwi's core values of stewardship and sustainability, and proposed the idea of a district energy scheme to them. Aurecon delivered great consulting service with long term maintenance and energy cost savings, as well as contributing to a sustainable future for the wider community.









CYCLONE WINSTON PROBONO RAPID DISASTER MAPPING: UNOCHA FIJI

Tonkin + Taylor for United Nations Office **AUCKLAND**

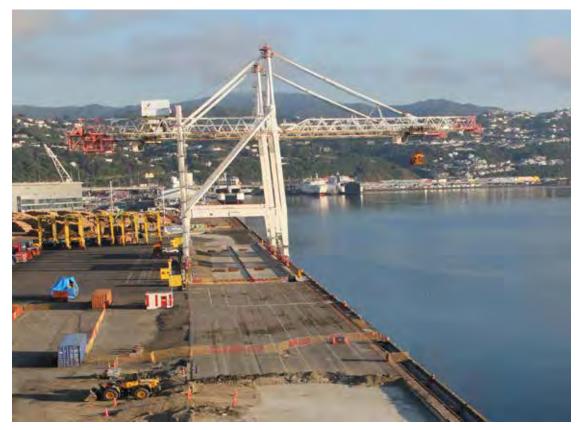
Tropical Cyclone Winston was the most intense tropical cyclone ever recorded in the Southern Hemisphere, With 310 km/h peak winds and massive storm surges, destroying homes, crops and infrastructure, and killing 44 people. The Fiji Government estimated almost 350,000 people living in the cyclone's path had been affected. Losses were estimated at \$USD 250 million. Cyclone Winston's

devastation of Fiji resulted in one of the New Zealand Defence Force's largest peacetime deployments in the Pacific, involving hundreds of Navy and Air Force personnel and a New Zealand Government commitment of more than \$15 million for relief and recovery work.

It was critical that first responders were able to efficiently prioritise their efforts and deliver prompt support to those people worst affected. Tonkin + Taylor's world-leading rapid disaster mapping, utilised images captured by NZDF personnel undertaking aerial surveys, as well as those provided by their own on-ground personnel,. Since 2004, rapid damage assessment has been a routine part of Tonkin + Taylor's initial major natural disaster event response in New Zealand, so that damage recovery efforts can be appropriately triaged, and the worst damage identified and attended to first. It also provides a

factual basis upon which rapid response organisations can base their decisions.

Tonkin + Taylor applied their technologies and knowledge to help triage the international humanitarian aid response in Cyclone Winston-ravaged Fiji. Disaster relief organisations such as UNOCHA, UNICEF and Save the Children, as well as NGOs and Government agencies, were provided with the bespoke online portal, contributing to the fast and efficient aid and serving as a shining example of smart and socially responsible New Zealand consulting.







TEMPORARY WORKS FOR THE RECOVERY OF CONTAINER OPERATIONS, THORNDON CONTAINER WHARF

Holmes, WSP Opus, and Tonkin + Taylor for CentrePort

WELLINGTON

CentrePort's Thorndon Container Wharf in Wellington

Harbour is a busy and vital part of the city's goods distribution network. The wharf is approximately 600 metres long and 25 metres wide, with two 750 tonne gantry ship-to-shore (STS) container cranes. A large number of regional and local businesses and suppliers rely on the Port's container operations for import and export of goods to international markets. Following the Kaikoura Earthquake, the wharf was severely damaged and had little ability to resist further gravity or earthquake loads. With the ongoing potential for aftershocks, CentrePort had a significant challenge to re-establish their container business in and around this challenging environment.

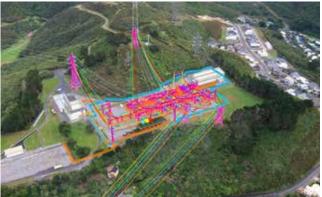
Working as one team, based on the best capability and experience, to deliver extremely complex solutions in nine months, Holmes Consulting, WSP Opus and Tonkin + Taylor

contributed to the wharf temporary works design, with HEB Construction carrying out the construction works. All temporary securing works had to happen from above or behind the wharf deck and in a systematic manner—demonstrating the extreme nature of the Health and Safety, environmental, and technical engineering challenges.

The wharf reopened for container handling operations in mid-September 2017 and stands as an example of how close collaboration, and flexible thinking can deliver superb consulting work.







WILTON SUBSTATION 110kV BUS RATIONALISATION

AECOM for Transpower

LOWER HUTT

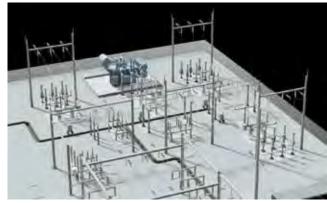
The Wilton 110kV Bus Rationalisation project was a major rebuild project for Transpower's Wilton Substation. The site is an important node in the National Grid supplying all of Wellington City either directly or via downstream substations. AECOM's involvement covered the initial conceptual design, options analysis, cost estimation and construction program

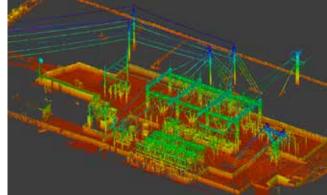
through to detailed design and construction support. The aim of the project was to improve the safety and maintainability of the site and security of supply to Wellington through the rebuild and rearrangement of the 110kV bus. The need to carry out these works was emphasised by an event in 2010 which resulted in an unplanned power outage for the Wellington CBD.

AECOM worked collaboratively with the client and the contractor to develop adaptable solutions to address the issues at a complex site including construction at a live substation, minimising disruption to users and an ageing asset station to name a few. AECOM developed detailed staging, testing and commissioning methods that enabled both construction and decommissioning to occur without any unplanned outages. An effective working relationship between the client,

consultant and contractor resulted in the successful delivery of the project on time and below budget. AECOM managed a demanding project at a complex and difficult site, elevating the service expectation of consulting within the industry.







HAWERA SUBSTATION REFURBISHMENT

Beca for Transpower **HAWERA**

Hawera is the second largest town in the Taranaki region, with the Hawera township, Fonterra's Whareroa dairy factory, Trustpower's Patea Generation and the Origin Energy operated Kupe onshore gas production station all dependant on the substation's output. The Hawera Substation Refurbishment involved a complex 17 stage construction sequence, replacing much of the 60 year old asset. This enabled the refurbishment to be completed without disruption

of supply to the region. The key objective for this project was to increase site capacity while providing security of supply to all stakeholders.

The project was challenging and technically complex due to the multidisciplinary nature, spatial constraints of the site and requiring work to be carried out within a live site. Using new technologies, including laser scanning and three dimensional (3D) modelling, Beca developed a complex staged construction sequence.

The technical expertise Beca brought to the project cumulated in a transparent and well-structured set of design documentation. The final stage was completed in July 2017, three months ahead of schedule and under budget. This was a very complex project with many challenges including a

constrained site space to carry out works while maintaining operation and power supply. Beca has demonstrated great consulting for their client and ultimately for the stakeholders of the region.







UNIVERSITY OF AUCKLAND SCIENCE SCHOOL

Beca for University of Auckland **AUCKLAND**

The high tech 23,000m2 Science Centre building offers world-class facilities, dedicated design spaces and laboratories to carry out a wide range of research based on the premise of collaborative working and social engagement. The new \$200 million facility occupies a key gateway to the University's city campus and creates an entry point from the city into the network of University buildings beyond. This new configuration offers a connection between the University's Science Sector and the neighbouring urban context: organised to offer a

generous "window into the life at the University".

A high level of integration of building systems, services and structural design with the architecture ensures the building delivers adaptable and efficient spaces. The design exceeds strict laboratory code requirements, incorporates future expansion potential and is arranged to facilitate exploration and collaboration among students and visitors. The building includes innovative seismic and floor vibration control, as well as significant provision for flexibility in the services for future changes. Beca rose to the challenge to provide an elegant solution to a complex set of requirements and outcome measures, resulting in a very happy client and smart consulting which exceeded expectations.







WAIKOUKOU, 22 BOULCOTT STREET

Beca for McKee Fehl Constructors **WELLINGTON**

The Transpower Head Office involved redevelopment of three existing buildings at 22 Boulcott Street, Wellington. The buildings were transformed into one integrated, open and modern workspace for Transpower. The project consisted of significant structural modifications including; seismic strengthening up to 130%NBS, addition of floors on top of one of the buildings, insertion of new floors in the basement of another, and the creation of a full-height internal atrium that

incorporates 'floating' pedestrian bridges and a staircase which hangs below the glass roof.

Whereas most seismic strengthening projects add to or enhance existing structural elements, this project involved the demolition of critical structural shear walls, which were in turn replaced by new buckling-restrained braces (BRBs) inserted in to the floorplate. A large area of floor in the centre of the building was also demolished to create the central atrium. This all required Beca to take a considered approach to both the permanent and the temporary stability of the building during construction, which was put to the test during the Kaikoura earthquakes.

Beca's structural team collaborated extremely well with all stakeholders including client, contractor and architect to

produce a beautiful and dynamic consulting solution. The team were praised for their collaborative, proactive approach to resolve the many challenges that the project threw up including dealing with limited existing drawings, and many surprises uncovered during demolition. This made an already complex engineering problem even more different, but one which has resulted in an absolute triumph through great consulting.

The project is a shining example of the sustainable re-use of existing buildings.







WIGRAM-MAGDALA LINK BRIDGE

WSP Opus for Christchurch City Council **SOCKBURN, CANTERBURY**

The Wigram-Magdala Link Bridge in Christchurch connects Wigram Road and Magdala Place crossing over State Highway 73 Curletts Road. At project start-up, the pier foundations for this bridge had already been constructed as part of the adjacent Christchurch Southern Motorway Project, aiming to minimise traffic disruption on Curletts Road during the eventual construction of the bridge. This resulted in an unusual situation whereby WSP Opus was commissioned to design the bridge utilising existing foundations designed by another

consultant. Another challenging aspect was the need to adapt design for a heightened Importance Level from IL2 to IL3 due to NZTA's Bridge Manual upgrades. This required the bridge to be designed for a larger earthquake than had been assumed in the design of the existing foundations.

The existing design constraints on this bridge compelled WSP Opus to develop an innovative solution for the seismic resisting system, incorporating low-damage ductile-jointed connection details into the pier columns. The solution used concrete-filled steel columns connected at rocking interfaces by internal un-bonded post-tensioning and special replaceable dissipater bolts.

The project overcame significant aesthetic challenges and other challenges arising from scaling-up the prototype

(developed and tested by UC) for application to a full-size bridge, and construction was completed early and within budget. The project also developed the basis for a step-change in seismic design philosophy for use with low-damage details, which will lead to more resilient structures with economic benefits into the future. WSP Opus excelled with an elegant and adaptive solution, providing great consulting service that raised the game for future work of this type.



BUILDING MATERIAL INFORMATION SYSTEM

ENGEO

CHRISTCHURCH

In 2016 the Health and Safety at Work (Asbestos) Regulations were enacted, dramatically changing the way workplaces are required to manage asbestos. The development of a management plan lies with the Person Conducting a Business or Undertaking (PCBU). Due to the changing regulations and more arduous processes currently in practice around Asbestos management, ENGEO saw an opportunity to apply simple technology to elevate the way the industry could potentially

manage these risks easily into the future.

Through their own initiative ENGEO took on the challenge of creating a system to support client's regulatory requirements. The software was developed entirely in house, via collaboration between ENGEO's contamination consultants and software development company (Entuitive Ltd). The system not only develops simple asbestos management plans that comply with the regulations but assists PCBUs in managing additional regulatory requirements and multiple buildings.

BMIS is a comprehensive solution for holding all the asbestos related information of a workplace, as well as providing assurances that their workplace is safe, protecting all workers on site as well as offering considerable cost and time savings. It's more than just a risk registry, as the system integrates





reminders, checklists, and suggested management plans which all contribute to better safety and management of asbestos risks. ENGEO has given the industry an automated way of managing asbestos risk, elevating the standard of consulting in this area.





HPS2 SEPARATION STATION UPGRADE

Jacobs for Polaris Energy Nicaragua S.A.

LEON, NICARAGUA, US

The San Jacinto Geothermal Power Plant, located near Leon City in Nicaragua, Central America, has a capacity of 72MWe, consisting of two 36MWe condensing steam turbine-generator units. The geothermal two-phase fluid is supplied by a number of production wells located in the surrounding steamfield. The steam & brine mix is then collected and separated via vertical 'webre' type centrifugal separators located in two centralized separation stations.

Wanting to increase the steam production and achieve the maximum power plant capacity, a new well was connected to promote early revenue and a prompt investment recovery. PENSA was facing steam quality problems due to poor separation efficiency of the existing separators HPS2 and HPS3 located at SJ5 and SJ12 wellpads respectively. The geothermal turbines need clean dry steam for reliable operation and poor quality steam increases the risk of large operational and maintenance, loss of generation and reduced power plant availability. In addition, the expected increment of two-phase production pursued through the drilling campaign was going to exacerbate the separation efficiency problems. Jacobs was appointed by PENSA to deliver an execution strategy and engineering design of the new above ground steam field facilities to connect the new production wells to the power plant and to mitigate the separation efficiency problems, which they did well, adding to Jacobs already high reputation for geothermal consulting work worldwide.



OTAHUHU STATION - LIGHTING DESIGN

Aurecon for Auckland Transport

OTAHUHU

Otahuhu Transport Interchange is Auckland's first integrated bus and rail interchange and carves out a new era of building infrastructure. Seeing the NZD\$28 million station after sun down is a spectacular and memorable sight. It's a proud moment for Aurecon as its lighting design pays tribute to the design of the building and the transformation that now provides improved and more frequent public services.

Aurecon's lighting design is not just beautiful but also important for wayfinding, safety, train and vehicle movements, maintenance costs, and environmental efficiency. The design incorporates future City Rail Link connections to the interchange, with differing requirements between Kiwi Rail and Auckland transport. Lighting plays a key role in detailing the cultural design principles and the architectural vision - enhancing the integration of local graphic art designs, inlays and signage, surface textures, colours, treatments and landscape elements.

There were multiple challenges and innovations in the new facility incorporating the existing train station, linking the rail platform with two new bus platforms and a terminal building via an elevated concourse. It's a key piece of public transport infrastructure that's part of the vision of Auckland Transport and Auckland Council to be one of the world's most liveable cities



SH1 RUSSLEY ROAD UPGRADE

AECOM for NZ Transport Agency

CHRISTCHURCH

The SH1 Russley Road Upgrade was a complex project, which provided an exciting design challenge to AECOM, around one of the busiest intersections on the state highway. The resultant 4 lane highway, bridges & structures have provided a great outcome to the client, NZ Transport Agency, to the people of Christchurch, & to the passing traveller. The stunning Memorial Avenue Gateway arches & bridge, & Harewood Road pedestrian & cycle underpass, are excellent examples of the application of good urban design & considered aesthetic detailing on a state highway project. The complexity of design & construction of these structures in a live traffic environment was a key focus for the team. The resultant temporary & permanent design solutions kept traffic, pedestrians & cyclists moving safely & efficiently during construction. Smart traffic management solutions, value engineering design solutions & risk management, coupled with effective communications & stakeholder buy in, meant that the project was completed eight months ahead of schedule.

The project has achieved its purpose of reducing congestion, improving travel times, improving safety & improving the visual impact of the road corridor through the western corridor. The success of this project was down to a team effort & the excellent collaboration between the client (NZ Transport Agency), Principal's Advisor (AECOM), & the JV Contractor (McConnell Dowell/Downer) & their designer (URS, now AECOM) under an ECI contract model.



COUNTDOWN WAIHEKE - WORKING WITHIN THE ISLAND ENVIRONMENT

Riley Consultants for Progressive Enterprises

WAIHEKE ISLAND, AUCKLAND

Progressive Enterprises Ltd aimed to establish a standard mainland-size large format Countdown supermarket without compromise of configuration and facilities where there were no available municipal reticulated services for water and wastewater. The new supermarket is 3,325m2 and the first of this scale constructed on Waiheke Island.

The RILEY unified approach of comprehensive investigation and modelling of all three waters (water supply, wastewater, stormwater) has resulted in a solution for the development. The non-reticulated site required investigation and design of on-site systems. The space required for water supply (from rain harvesting and on-site bore) and wastewater treatment imposed significant constraints on available space when compared to conventional municipally reticulated sites. RILEY created water usage models to confirm suitable supply and optimise inground storage requirements for tanks located beneath the car park and main building structure. Several mitigating measures ensure the protection of the downstream Raupo wetland area and marine wetland area in Okahuiti Bay, both of which are of high ecological value. The supermarket is designed to fit within the unique Waiheke Island environment. Progressive and the community are pleased with the final supermarket layout and consulting work delivered by Riley Consultants.



KOPEOPEO CANAL REMEDIATION PROJECT

Harrison Grierson for Bay of Plenty Regional Council

WHAKATANE

The Kopeopeo Canal Remediation Project aims to clean-up one of NZ's most contaminated sites, achieving important environmental, cultural & social outcomes. This project has been led by the Bay of Plenty Regional Council with the support of the Ministry for the Environment.In large measure, this project was initiated due to the concerns, then vision & persistence, of the group Sawmill Workers Against Poison & Ngati Awa. The remediation project is ongoing. & the extraction & containment phase is due for completion in late 2018. However carefully managed field trials have been successfully completed to demonstrate the effectiveness of the methodology adopted for the planning process. Harrison Grierson led the planning inputs through complex & highly technical consenting & variation processes to enable the use of a cost effective & sustainable method of extracting, containing & remediating the site. The solution developed by the project team ensures minimal risk of exposure to contaminants, achieves both environmental & cultural outcomes through the use of bioremediation methodologies & provides community assurance through independent monitoring, communication & a community liaison group. The consenting of the project, including the substantial variation, involved navigating a multi-layered regulatory framework to achieve an outcome which achieved a balance between flexibility & certainty to ensure necessary environmental safeguards were met, is a testament to good planning by

Harrison Grierson.



ST ANDREW'S COLLEGE CHAPEL

Holmes Consulting for St Andrew's College

CHRISTCHURCH

St Andrew's College Chapel in Christchurch is an important focal point for the school, and a striking structure that has become a vibrant centre for the local community. The previous chapel, which had to be demolished following extensive damage caused by the 2011 earthquakes required a new structure. With a large number of interested stakeholders, this was a sensitive, high profile project that needed connect with the local community. The architectural design has received exceptionally positive feedback, and the structural engineering that brought it to life is equally impressive. Holmes Consulting was brought on to structurally bring to life the architect's design vision, coping with challenging factors such as mixed material integration of masonry, wood, steel, and a risky site next to the Avon River. The masonry portion of the building is structurally independent from the main roof. Within the main building there is also a small mezzanine floor. The structural system allows a functional, flexible space for school and community activities, as well as supporting the complex and sensuous roof structure that makes the Chapel so memorable and distinctive. This was a project that unfolded very much in the public eye, replacing a cherished historic structure that many felt was irreplaceable. The outcome is an architecturally compelling chapel enabled by intelligent engineering from Holmes Consulting, having received strong approval from the school and local community.



NEW ZEALAND WATER CONSUMER SURVEY AND DIGITAL TOOL 2017

Arup for WaterNZ

AUCKLAND

perspective.

The New Zealand Water Consumer Survey Report and Digital Tool 2017, undertaken by Arup, on behalf of Water New Zealand (Water NZ), provides an accurate gauge of New Zealanders' attitudes towards water and will assist water utilities, councils and government to develop a deeper understanding of consumers' views. This insight will enable them to develop relevant and sustainable policies around water and continue the transition to a customer-centric focus. The Survey was conducted online in 2017 and received more than 4,500 responses. It was the first ever nationwide survey about consumer's perspectives on water. Undertaken in collaboration with a number of Water NZ's member organisations, it asked respondents to think about a range of important subjects, including drinking water quality, water security, pricing, customer service, waterways, and the future of water in New Zealand. Arup developed a complementary data visualisation tool to enable interested parties to view and interrogate the Survey data. This tool makes the captured data both readily accessible and easily understandable. It allows users to review the data by geography and other demographics, enabling in-depth analysis of what consumers think about water. The report and tool have gained significant media attention locally, particularly during the recent Central Government elections and is a useful way to understand the consumer

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North Canterbury Transport Infrastructure Recovery (NCTIR)

