SPECIAL FEATURE

PROFESSIONAL DEVELOPMENT

Equipping public works professionals for the future. p.34

FEATURE ARTICLE

LEADING THE WASTE REVOLUTION

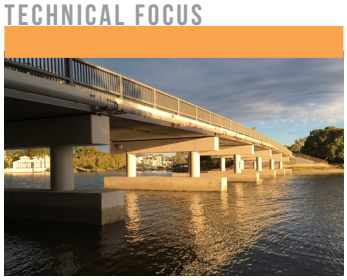
Sunshine Coast's innovative underground waste collection system. p.12

EXCELLENCE AWARD

CREATING THE THIRD PLACE

Toowoomba's City Library and Civic Square delivers for the community. p.8

TECHNICAL FOCUS



CURING A CANCER PATIENT

The remediation of Munna Point Bridge. p.26

ENGINEERING FOR PUBLIC WORKS

ISSUE No.6

www.ipweaq.com

PARTNERS

ENGINEERING FOR PUBLIC WORKS

SUPPORTERS

ENGINEERING FOR PUBLIC WORKS

Queensland Government

Department of Transport and Main Roads

BUNDABERG REGIONAL COUNCIL

Burdekin Shire Council

Cairns Regional COUNCIL

Lockyer Valley REGIONAL COUNCIL

CITY OF GOLDCOAST.

City of Ipswich

SHIRE OF FLINDERS

LOGAN CITY COUNCIL

Moreton Bay Regional Council

Livingstone SHIRE COUNCIL

Redland CITY COUNCIL

Rockhampton Regional Council

NOOSA COUNCIL

SOUTH BURNETT REGIONAL COUNCIL

Sunshine Coast COUNCIL

SCENIC RIM Regional Council

City of Townsville

TOOWOOMBA REGION

WESTERN DOWNS REGIONAL COUNCIL

CONTENTS

ENGINEERING FOR PUBLIC WORKS | JUNE 2017

» FEATURE ARTICLES

» TECHNICAL FOCUS

» IPWEAQ NEWS

» QLDWATER NEWS:

EDITOR'S NOTE:

Welcome to the June issue of Engineering for Public Works, exploring the theme 'Crossroads...to resources, to crucial decisions, an intersection of roads literally and of projects, people and communities metaphorically'. It features the Sunshine Coast Council's nation-leading underground waste system and Mayor Mark Jamieson details the infrastructure projects positioning the region at the forefront of economic prosperity, liveability and sustainability.

Building Queensland CEO, Damian Gould explains the robust decision making behind the state's infrastructure plans and the award-winning Munna Point Bridge remediation project shows how critical thinking delivers the best resource and sustainability outcomes. Our professional development feature summarises the learning requirements of public works professionals now and into the future.

Also included in this issue are the intangible community benefits from the Toowoomba City Library and Civic Square project and the current and future benefits flowing from the InterLinkSQ development. And you can read about Gleb Kolenbet's study tour to communities across the USA, Spain and Holland.

Thank you to all of our contributors, some of whom will feature in our state conference program in Townsville in October. Early-bird registrations close at the end of June, so register now.

Carlie Sargent
Editor

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

Become a Member

IPWEAQ is the peak body representing those working in the public works sector.

Benefits

Members enjoy a strong sense of community through our proactive branch network.

Our Knowledge Centre is an essential resource for anyone involved in public works in Queensland

Our quarterly e-journal is valued for its technical and industry-relevant content.

IPWEAQ technical products are widely-adopted and are leading-edge.

IPWEAQ's comprehensive professional development program is innovative and exceeds the needs of members and industry.

IPWEAQ conferences are must-attend events.

An IPWEAQ excellence award is highly sought after.

IPWEAQ upholds professional standards as an RPEQ assessor.

IPWEAQ influences government and industry.

Join IPWEAQ in June and receive a **$300 discount on your registration to the state conference in Townsville**, 24-26 October 2017.

Join Now

Membership of IPWEAQ is open to anyone actively engaged in the delivery of public works and services in Queensland including technical officers, draughtsmen and women, supervisors, fleet managers, project managers, councillors or consultants.

IPWEAQ members receive preferential rates for attendance at conferences, professional development, branch events, RPEQ assessments, publications, technical products.

Membership fees

(June 2017 to 30 June 2018)

$275 plus GST

under 35 members **$165** plus GST

Use your post nominals

MIPWEAQ (Member)
FIPWEAQ (Fellow)

Apply online at

www.ipweaq.com/membership

Enquiries

Carlie Sargent
Director | Member Services
+61 7 3632 6801
carlie.sargent@ipweaq.com

www.ipweaq.com

PRESIDENT'S REPORT

It has been a busy time since my last presidents report back in March for many of us as we approach end of financial year. For many of us this means the escalation of project delivery that we commenced earlier in the financial year and the preparation of projects and budget for the new financial year so that we can hit the ground running come July.

Amongst the busy challenges and tests of working as an engineer in an exciting local government, I have found myself trying to find time to look after a few chores at home. I know across the membership of the institute that our home chores vary greatly and recently I caught our Immediate Past President, Ged Brennan digging post holes to repair his property fences but for me my recent home chore was to trim the high hedge in my front yard.

After starting the hedge work with hand trimmers, I moved to the electric trimmer before the extension lead no longer reached. I then moved to the trimmer attachment for the whipper snipper. I know this progression sounds a little funny but what I realise is that I reached for the most convenient tool first instead of just realising that the job needed the petrol trimmer from the start.

Now I'm wondering if there are even better tools around that I should use instead or even experts at this that I should refer the task to. I actually enjoy the task of yard work so I don't want to give this away but you all get my point and that is how do you know it's the right tool if you are not aware of what the industry has available.

I think this is a bit like us at work, where we all work hard to deliver the projects that are our priorities but how do we know we are doing it the most efficient way. Our knowledge of the most efficient way is essential and to that point our networks of peers that help us know the most up-to-date methods and technology are critical to this.

Our networks are also the place to go when we need to lean on professional friends if times are tough and we need to bounce ideas off others. I find myself doing this a lot. I am aware that I don't have all the answers myself but I can do anything with the help of others. With the technology changes that are happening around us we have to understand things and do things that we never did before and we need to do them quickly.

A simple thing we can do to assist others to be aware of our successes and the challenges that we have overcome is to recognise standout work and peers to our network. I feel, and I'm sure many of you all will agree, that engineers are not normally good at promoting ourselves and the important role we do. Take a moment to think of and nominate those excellent projects and people around you for recognition through the upcoming excellence awards.

From a state wide perspective, the Queensland government concern around local governments approach to sustainable asset management practice has led a number of us to look at our gaps in practice. For myself I recall one of the turning points in my career and knowledge of asset management was back in 2010 when I took the opportunity to participate in the New Zealand asset management study tour with Peter Way. Spending a week with one of Australia's greatest practitioners and teachers in asset management is something that I will never forget. This study tour was full or networking and learning of stories, methods and challenges that peers go through in order to do what we all need to do. We learn so much from others.

Many of you would know of the NAMS Council but for those that need a reminder, the NAMS Council is a special committee of IPWEA with representatives from each division including Stephen Hegedus representing IPWEAQ. The NAMS Council aims to provide national leadership and advocacy in the sustainable management

of public works infrastructure, community assets and services. And given the recent reports from the Queensland Audit Office (QAO), the importance of asset management in the long-term sustainability of local councils is again gaining the attention it deserves.

Peter Way (IPWEAQ President 1993-1995) and IPWEA President (1995-1997) has been the Chair of the NAMS Council for the last 12 years but is now stepping down from the role. Peter's legacy has IPWEA renowned globally as a leader in asset management. As well as being a Past President of IPWEAQ, Peter has made an enormous contribution to IPWEAQ as Chair of the IPWEAQ Foundation, Chair of the Standard Drawings Working Group and various other IPWEAQ appointments over a considerable period of time. Peter also chaired the National Steering Committee for the development of the Australian Infrastructure Financial Management Guidelines.

A distinguished career spanning more than 40 years with service to several communities across Queensland saw Peter awarded a Public Service Medal in 1998 and our highest level of membership, Emeritus in 2004. Peter will continue to represent IPWEA on the ISO Standards AM TC. I would like to thank Peter for everything he has done for IPWEA, IPWEAQ, his local community and his national and international colleagues with strong leadership for the betterment of asset management across all public work areas. Peter will act in a mentoring capacity for the incoming Chair who we are pleased to say is another IPWEAQ Fellow, Murray Erbs. We wish Murray the very best in the role. He has big shoes to fill.

The IPWEAQ Board wishes to establish a NAMS Queensland Advisory Group (NAMS-Q) and I invite members to complete the Expressions of Interest form on our website if you would like to be involved. We would ideally like to have a NAMS-Q representative from each of the 77 councils or as many as possible. The inaugural meeting of the NAMS-Q Advisory Group is planned for the IPWEAQ state conference in Townsville, 24-26 October 2017 and I look forward to launching this Group before my term as president concludes.

I look forward to seeing you all in Townsville in October for the Queensland Conference.

Joe Bannan
President

CREATING THE THIRD PLACE: MEASURING THE SUCCESS OF COMMUNITY INFRASTRUCTURE

EXCELLENCE AWARD

Kelly Neill,
Principal Project Manager
Toowoomba

The Toowoomba City Library and Civic Square (winner of the 2016 IPWEAQ project over $10M) recently celebrated its 1st birthday. The distinctive 6,800m2 copper clad building, delivered over three levels, includes a new library, community meeting rooms, cycle centre, and basement car park. The Civic Square includes formalised plaza spaces, passive recreation areas, a large central lawn and strong pedestrian connections to the broader CBD.

As well as finalising all the project management requirements, the 1 year anniversary has also provided an opportunity to reflect on project outcomes. Nick Hauser,

Site prior to project commencement showing underutilised CBD land identified as a catalytic opportunity for urban renewal.

Toowoomba Regional Council's General Manager Environment and Community Services said "project delivery was successful using all the standard project measures, we were on time, under budget and stakeholders were fully engaged and thrilled with the outcome. And now that it's finished, the project's success as an urban renewal project is obvious: it has transformed an unsealed car-park into an iconic building and high-use community hub".

Certainly on the community acceptance measure, the numbers show that the Toowoomba Region community has embraced the project: literally voting with their feet! Over 5,000 community members visited the Library on the opening weekend alone, and the building has clocked up over 400,000 visitors in the first year. The community meeting room bookings have increased 20% month on month, and the Civic Square has hosted movie nights, markets, live music events and has even hosted super heroes.

Library forecourt with seamless connection to civic square. Plaza areas designed to accommodate civic/community events. Bespoke art piece in foreground "Confluence".

Victoria Street façade showcasing the building's striking copper façade, with brick elements reflective of Toowoomba's Heritage architecture. Large extents of glazing used to activate all frontages.

The project is also continuing to receive industry praise, winning excellence awards from IPWEAQ, Master Builders, and Architects Association of Australia.

But the benefits of this project and indeed all community infrastructure projects, extend beyond the measurable levels of attendance, community feedback and industry accolades, and include the role public places play in the development of communities.

Around the world, community infrastructure is increasingly being regarded as a "third place". Stemming from Ray Oldenburg's influential book The Great Good Place, with the "first place" seen as people's home, "second place" as the workplace, the "third place" are community spaces that are anchors of community life, that facilitate and foster broader, more creative interaction. Within this context, the benefits of well-planned and well-executed social infrastructure extend to the pivotal role communal meeting places play in the intrinsic development of networks and social interaction within our community.

"Walking through the building and civic square on any given day you will see not just people reading and borrowing books, but a community in action. Whether that's chess matches between individuals, meetings of community groups, children playing on the central lawn, English conversation groups, story-time under the tree, or colleagues from the adjacent office buildings having an informal meeting in the café. It's the project's role in creating places for these interactions that shows that the project's real success is in contributing to the social fabric of our community" Nick Hauser said.

The commitment to creating a "third place" was a strong theme for the project from the beginning and continues now in the ongoing management of the facility and the broader precinct. The project team set out to meet both the well-defined "functional" requirements of a Library, Civic Square and community meeting rooms, but also to deliver the less tangible aim of strengthening networks within our community.

Civic Square view across to Library forecourt – central lawn area maintain open space within developing CBD. Bespoke art piece in foreground "Playfulness of the Perrenials".

Community and library users were engaged at each stage of the project where they were invited to: pitch ideas for inclusion in the building or civic square; comment on preliminary design sketches; and review 3D fly-through and artist impressions. Community art projects were used very effectively as an engagement strategy, getting hands-on involvement from community members. The use of enquiry-by-design approaches, ensuring a multi-disciplinary approach to the design, peer and external reviews at key design points and utilising 3D and spatial design tools to ensure understanding, all contributed to a well-considered approach to a complex list of requirements.

The resultant design has created a bold built form within the Toowoomba landscape, easily recognisable and navigable. The building and the civic square with its mix of formal and informal spaces, the seamless transition from internal and external areas allows for both structured and spontaneous gatherings. Council's proactive management of the precinct as an event space maintains the energy and freshness of the area, bringing frequent visitors back and constantly reaching out to new audiences.

Certainly our results against the tangible measures look good on the score card and the "vibe" of the building and how it is being used each day suggests we have been successful in creating a much-loved space. But it will be the building's role in the day-to-day lives of our community members that will determine if we have created a worthy third place, an "anchor of community life that facilitates and fosters broader, more creative interaction".

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

CALL FOR NOMINATIONS

IPWEAQ EXCELLENCE AWARDS 2017

CELEBRATING EXCELLENCE IN PUBLIC WORKS

The Excellence Awards recognise best practice and innovation in public works projects and the people that deliver them.

Award nominations due
5.00pm Friday 28 July 2017

Submit your nomination at
www.ipweaq.com/awards

People Awards:
- Queensland Engineer of the Year
- Woman in Engineering
- Young Engineer
- Technical Officer
- Works Supervisor

Project Awards
- Design and/or construction of public works projects
- Innovation in public works
- Road Safety
- Asset Management
- Design and/or construction of water, waste water, sewerage and drought management projects
- Innovation in water, waste water, sewerage and drought management

EXCELLENCE AWARDS CEREMONY AND GALA DINNER

Wednesday
25 October 2017
The Ville Resort
Townsville

For more information contact
Carlie Sargent
3632 6801
carlie.sargent@ipweaq.com

SUNSHINE COAST COUNCIL'S UNDERGROUND AUTOMATIC WASTE COLLECTION SYSTEM

FEATURE ARTICLE

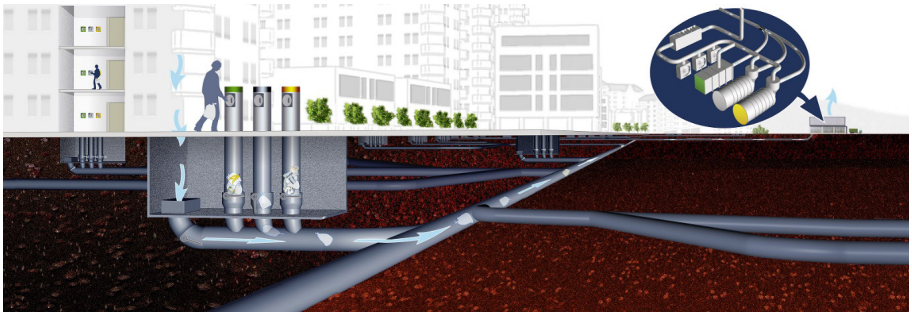
John Hogg
Manager Waste & Resources
Sunshine Coast Council

Sunshine Coast Council has taken a nation leading position in the field of waste management by unveiling Australia's first 'three fraction' underground Automatic Waste Collection System (AWCS).

A two-year research and development phase followed by a public tender process, culminated in Envac Australia Pty Ltd being awarded a contract to design, supply, construct, operate and maintain an AWCS in the new Maroochydore City Centre.

Envac Australia's parent company, Envac AB Sweden were the pioneers of underground waste vacuum systems and whilst new to Australia, the systems are founded on proven technology first used in the 1960's. Since then, systems have been installed in more than 700 municipal locations around the globe including Barcelona, Paris, London, Beijing, Dubai, Singapore and Seoul.

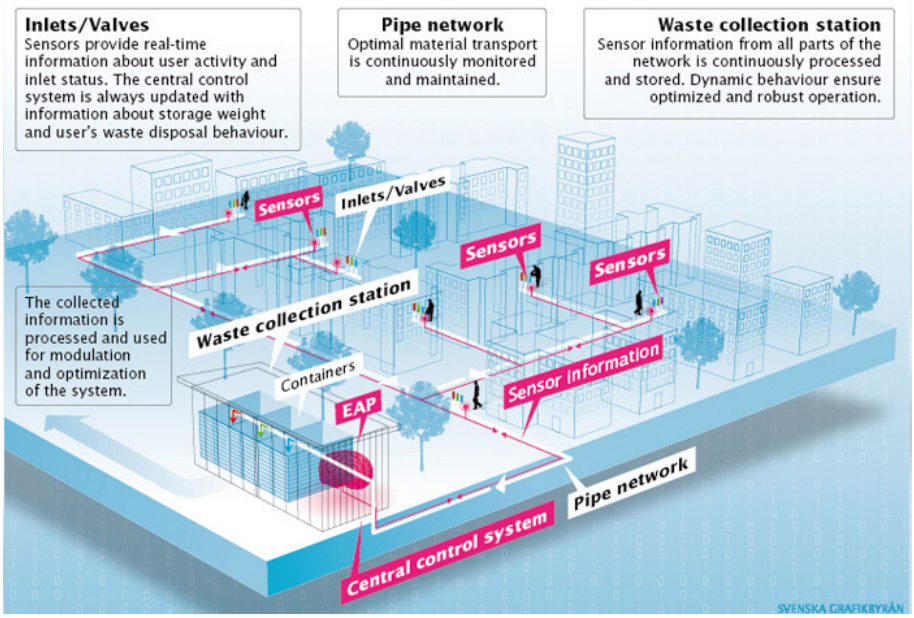
As an alternative to standard kerbside bin collection services, general waste, food waste and commingled recyclables produced within the new Maroochydore city centre will be transported from commercial buildings and apartments at up to 70kmh through a 6.5km system of underground vacuum pipes to a collection station located in the outskirts of the CBD.



The new CBD is being constructed on the site of a former golf course located in the heart of Maroochydore that presented a unique "greenfield" opportunity for Council to develop a central business district in one of Australia's fastest growing regions. The 53-hectare site is owned by Council, has been declared a Priority Development Area (PDA) and is destined to become the new cultural, business and government regional centre for the Sunshine Coast.

Like every other city and town across Australia, Council's 'business as usual' waste collection system requires a fleet of side-lift, rear-lift and front-lift trucks to provide a bin collection service that is a constant source of noise, traffic congestion and diesel fumes. Traditional waste management practices also require allocation of space within buildings to store waste bins and the daily or weekly presentation of bins on kerbsides awaiting collection which impacts on the visual amenity of the streetscape.

The city centre will deliver 2,000 residential dwellings and 240,000 m^2 of commercial & retail floor space. Modelling of predicted waste generation rates for the new CBD indicated that conventional waste collection would require daily servicing of approximately 300 bulk bins and 200 public place wheelie bins. Anyone who has lived or worked in a CBD will be acutely aware of the nuisance factor servicing these bins creates.



The innovation of underground waste collection means that city workers and residents will never have to walk past rows of 'fragrant' bins, overflowing public place bins or be woken early by noisy garbage trucks in the Maroochydore City Centre.

How the System Works

The system uses air as a transport medium, moving waste from source to a central collection point that can be up to 2.5 km away and consists of four basic components, Disposal Points, Pipe Network, Collection Station and Electronic Monitoring & Control.

Disposal Points

Disposal points are controlled inlets that sit above ground either in public streets, parks, courtyards or internally in buildings.

To encourage landfill diversion and maximise waste recycling, each building in the Maroochydore CBD will be required, as a minimum, to incorporate a single 'three fraction' inlet disposal point either in the building basement or ground floor. The three fractions being:

- Organic (food waste);
- Commingled recyclables; and
- General waste.

Developers have discretion to install multiple three fraction inlets throughout respective buildings, for example as a chute system to service each floor, and/or in various locations throughout the footprint of the site dependant on its proposed use.

To minimise the risk of organic fraction contamination, public place bins in the new CBD will comprise of two fraction inlets:

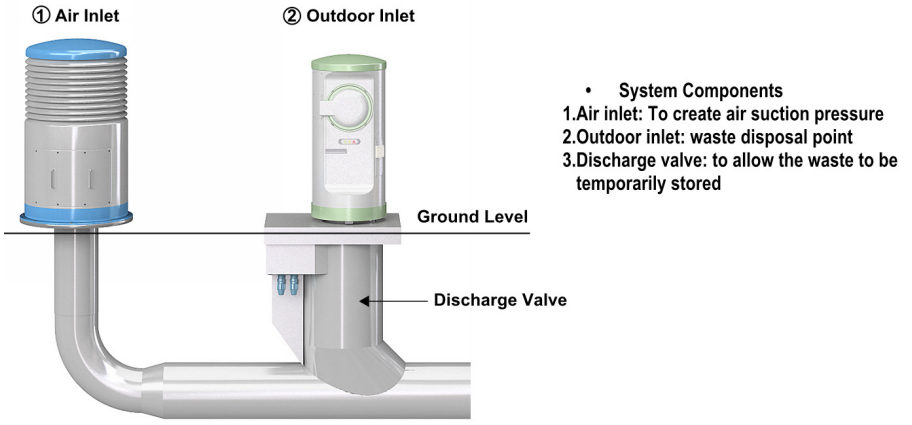
- Commingled recyclables; and
- General waste

Waste dropped into each disposal point inlet will be stored in a sealed compartment until the flow of air is activated by the central control system. The vacuum system will then consecutively collect each waste fraction according to the system's scheduled operation. Sensors within each inlet storage compartment will also alert the control system if the storage compartment reaches critical holding capacity earlier than scheduled and an additional collection event will be automatically activated.

For retail and commercial buildings, larger inlets can be incorporated to accommodate disposal of greater volumes of waste. Internal inlet doors can be key or swipe card controlled so that only registered users are able to access the system. This option if selected, will provide information to building managers regarding waste volumes deposited by different users.

Pipe Network

Infrastructure Agreements specifying land sale conditions applicable to the PDA, classify the AWCS pipe network as a utility



service, similar to water supply and sewerage. The AWCS pipe network when installed will form a tree like layout through the CBD where the collection station is the root and waste inlets located along the network of branches fork out from the main trunk line.

Council is responsible for provision and installation of the main trunk and branch line network, including delivery of an AWCS utility stub to the boundary of each Lot. As the system and most associated components are proprietary products, Developers of each Lot will acquire and connect the majority of their internal AWCS pipeline, disposal inlets and related infrastructure through Envac.

The steel pipe network incorporates an anti-corrosive external protective coating and the pipes range in diameter from 400mm to 450mm with pipe wall thickness varying between 6.35mm and 21.4mm depending on location. High wear and tear areas such as bends are thicker due to the abrasive nature of some waste components, particularly glass fines in the commingled recyclables fraction.

To minimize cost and augment civil works productivity, the pipe network, including a series of inspection pits for maintenance access, will be simultaneously installed in underground service corridors with other utility services (water, sewerage, fibre-optic network, electricity etc).

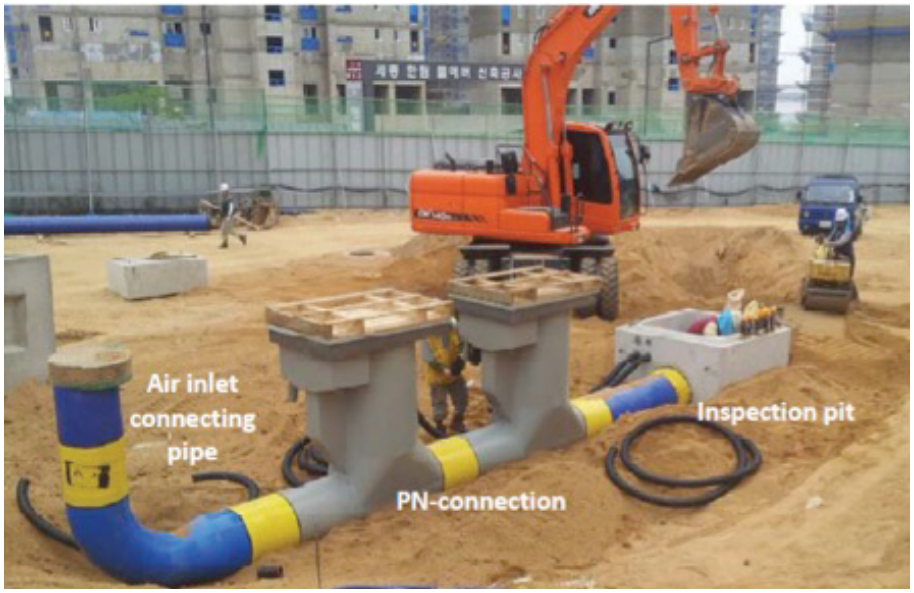
Collection Station

The 'engine room' of the system is the collection station which will be located on the outskirts of the CBD. The collection station has been designed to a style and architecture that complements the expected format and standard of surrounding commercial and residential developments. Due to its proximity to sensitive receivers, a major consideration of the collection station design process included mitigation measures to prevent odour & dust emissions and techniques to maximise noise attenuation.

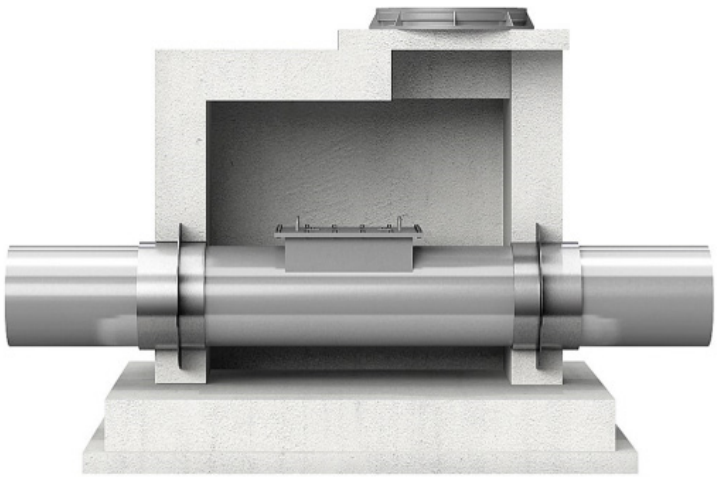
The collection station houses most of the system equipment including a series of centrifugal fans (exhausters) powered by 110kW 3 phase motors for creation of vacuum, waste cyclones for separation of waste and conveying air, dust cyclones with filter elements for cleaning the conveying air before it is released to the receiving environment, compactors to maximize bin load weights, a series of 30m^3 container bins for bulk waste transport, gantry cranes for lifting and moving the bins, air pipes, valves, silencers, and other auxiliary equipment.

A visitor viewing area has also been incorporated in the building to cater for technical tours and waste education purposes, and to ensure seamless continuity of service delivery, back-up generators will be located on-site for use in the event of power black-outs.

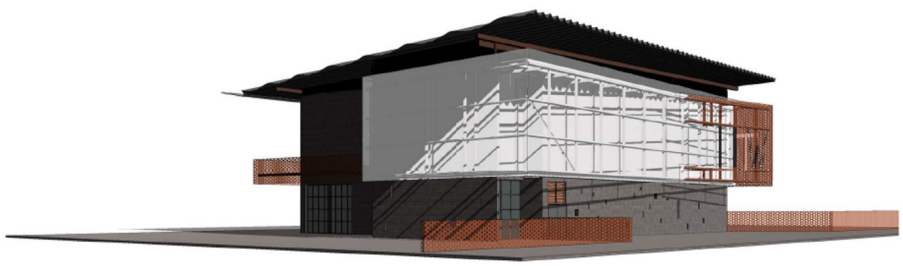
From disposal inlets located throughout the CBD to the collection station bin storage area, the entire system is airtight. Material from each waste fraction is sequentially extracted from disposal inlets, transported through the pipe network and



Outdoor waste inlet installation - underground parts.



Pipeline inspection pit



North Eastern Perspective

deposited into a series of sealed 30m^3 container bins located within the ground floor of the collection station. Six container bins are on site at any one time. Three 'active' bins are connected to respective waste fraction compactors and three spares are stored ready for swap over when active bins are disconnected for transit to and from disposal facilities.

When a container bin is at capacity, the automated gantry crane transfers the bin to an internal bay for loading onto a standard hook-lift haulage truck for transport to Council's respective recycling facilities or landfill. Haulage trucks will access and egress the site from a by-pass road adjacent to the city centre, thereby avoiding any travel through the CBD.

Electronic Monitoring and Control

The collection station is also home to the electronic monitoring and control system which identifies and draws stored waste from respective inlets on a priority demand process.

The AWCS uses a programmable logic controller (PLC) and a supervisory control and data acquisition (SCADA) system developed by Envac, known as the Envac Automation Platform (EAP).

The EAP will be continually updated with statistical data relating to waste disposal behaviour across the entire system through a series of sensors installed in individual waste disposal points which constantly monitor the system and provide real time intelligence regarding user activity and inlet status including available storage capacity.

Using this data, adaptive algorithms ensure that the self-learning system continually fine-tunes the frequency and sequencing of disposal point emptying and adjusts the scheduling of container bin retrieval from the collection station to ensure a balanced operation that optimizes automation, reduces energy consumption and minimizes operational costs.

Notably, management and oversight of the EAP can be undertaken on site or remotely.

System Commissioning
The underground pipe network is currently being installed and collection station construction is due to begin September 2017. System commissioning is planned to commence mid-2018 in readiness for tenancy of first buildings which is anticipated later that year.

In the meantime, Council is experiencing considerable interest in the AWCS from numerous municipalities across Australia and when operational we look forward to opening our doors to a broad range of visitors for technical tours, school education programs and other interested community groups.

In Summary
Automatic underground "Smart Waste" collection is an integral component of Council's 'Smart City Framework' and will provide significant contribution towards Council's aim of balancing improvements to quality of life with economic growth and environmental sustainability in the Maroochydore CBD.

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS.
REPRESENTS. LEADS.

QUEENSLAND URBAN DRAINAGE MANUAL

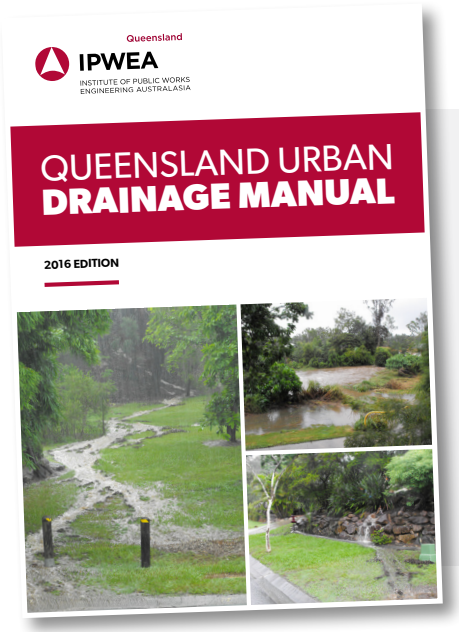
History

QUDM was first published in 1992 as a joint venture between IPWEAQ, the Brisbane City Council (BCC) and the Queensland Department of Energy and Water Supply (DEWS). In 2016, the ongoing management of QUDM was passed to IPWEAQ and we have pleasure in launching the 2017 version of QUDM for pre-order.

About QUDM

QUDM is intended to assist engineers and stormwater designers in the planning, design and management of urban stormwater drainage systems in Queensland. It addresses the technical and regulatory aspects, provides details of appropriate design methods and computational procedures and covers both hydrologic and hydraulic procedures as well as environmental and legal aspects.

The manual is an engineering guideline designed to be used in partnership with other design manuals on topics such as floodplain management, total water cycle management, water sensitive urban design, and natural channel design and needs to be applied appropriately to local conditions. QUDM is not intended to be a floodplain management manual.



Pre-Order QUDM 2017

IPWEAQ members:
$200 plus GST

Non-members:
$350 plus GST
($150 contributes to the ongoing review and management of the publication)

Thank you!

Thank you to the tireless efforts and the expertise of our QUDM Working Group:

- Ross Guppy (Chair), IPWEAQ
- Russell Cuerel, Department of Energy and Water Supply
- Tony Loveday, RMA Engineers Pty Ltd
- Neil McKee, Consulting Engineer (Civil)
- Phil McKone, Livingstone Shire Council
- Hamid Mirfenderesk, City of Gold Coast
- Ouswatta Perera, Brisbane City Council
- Richard Priman, Department of Energy and Water Supply
- Chris Russell, Department of Transport and Main Roads
- Frank Scheele, South Burnett Regional Council
- David Simpson, Brisbane City Council
- Grant Witheridge, Catchments & Creeks Pty. Ltd. (redraft and artwork)
- Sarah Hausler, McCullough Robertson Lawyers (review of Chapter 3)

CEO'S REPORT

The Queensland Audit Office's (QAO) reports 2 and 13 for 2016-2017 raised questions regarding the long-term financial sustainability of local governments across Queensland. An inquiry was initiated by the Infrastructure, Planning and Natural Resources Committee and IPWEAQ has made a submission.

The substance of our submission was to link the declining sustainability of local councils with the demise of the role of Chief Engineer within councils. With a focus on financial imperatives over the last decade, this position has disappeared from many councils or has been relegated to less than 'C level' in many other councils. This has led to some councils making poor investment decisions with regard to major infrastructure which then impacts on constituents across generations.

Asset management is a critical aspect of the role of councils yet in many councils, engineers are not involved in the decision-making process including procurement decisions. Such decisions cannot be relegated to administrators or financial personnel or elected officials who could not be expected to understand the long-term financial implications of engineering-related decisions.

Councils' commitment then to their engineers' ongoing professional development – including registration as an RPEQ – ensures best practices in asset management and maintenance continues to deliver sustainable financial outcomes.

We appreciate that there is no one-size-fits-all solution and councils, particularly smaller isolated councils continue to struggle with limited resources. However, we do believe that some investment now in skilled, professional technical people at a local level will deliver longer-term benefits and financial sustainability for councils. We also believe in the continuing decentralisation of engineering services which delivers the following benefits for councils and communities:

Local knowledge/wisdom is retained within the community that it serves – it is not possible to capture all knowledge in a centralised electronic database.

There is a higher level of commitment, ownership, responsibility and accountability when locally-based or home-grown engineers are responsible for engineering decisions for their communities.

Local government public works offers a career path for those wishing to work in regional areas. Career days at local schools offer an opportunity for public works engineers to inspire the next generation.

Communities benefit from the local presence of their engineers and their families with involvement at schools, sports and other community groups. Public works engineers tend to have a strong sense of community; it is fundamental to their roles.

Regional councils offer a fertile training ground for young, graduate engineers who are able to get involved with construction, maintenance, the use of local materials, engage with local contractors etc. They're also likely to gain a better understanding of non-engineering tasks, working closely with other council employees, and the impact of asset management decisions on their communities.

One of the pivotal roles of IPWEAQ is to support the network of local government engineers and technical officers within a collegiate environment. This occurs at our branch and state conferences where delegates not only learn from each other's experiences but also develop their technical and soft skills. Other than connecting with others at our forthcoming courses and workshops, there are opportunities for you to connect at Longreach, 6-7 September 2017 for the Western Roads Symposium then Townsville, 24-26 October for the state conference. Be sure to register early for a possible 16 CPD hours. If you were unable to attend the successful 2016 state conference, 12.5 CPD hours are available listening to the podcasts with the accompanying PowerPoint presentations.

I look forward to seeing you in Townsville!

Leigh Cunningham
CEO

Welcome to New Members

- Glen Allen
- Kazi Shahed Anwar Hossein Asadi
- David Baldwin
- Pedro Baraza
- Peter Boettcher
- Craig Bottcher
- Shane Botting
- Michelle Bradshaw
- Denis Brown
- Benjamin Bruce
- Matthew Burdett
- Mark Bustalinio
- Gregory Buxton
- Michael Buxton
- Rangi Campbell
- Michael Carter
- Ming-Hung Chen
- Bevan Clayton
- Ron Cleghorn
- Ari Craven
- Matthew Creedy
- Justin Crick
- Patrick Cullivan
- Allison Cuschieri
- Timothy Dack
- Danielle Danielsson
- Jeff Davey
- Noel Davidson
- David Di Tullio
- Matthew Dennis
- Timothy Dyball
- Wayne Eather
- Julie Edwards
- Sean Edwards
- Adam Evans
- Robert Evans
- Jason Favier
- Gavin Fields
- George Francis
- David Guinane
- Jayasiri Gunaratne
- Bijay Gyawali
- Mark Holopainen
- Briony Hooper
- Mark Judd
- Jessica Kahl
- Scott Kay
- Robert Kent
- Job King
- Eric Kraak
- Glen Langfeldt
- Casey Lee
- Richard Lewis
- Jason Litzow
- Weena Lokuge
- Chris Mandla
- Ricardo Marino
- Amelia Marshall
- Elizabeth Martin
- Allan McMaster
- Keith Metcalfe
- Marc Mill
- Wayne Mills
- David Munson
- Roger Naidoo
- Pieter Neethling
- Paul OConnor
- Leroy Palmer
- Torill Pape
- Jay Parton
- Dawn Pedersen
- Jessica Peters
- Cameron Playford
- Dominic Powell
- Taposh Purkaystha
- Aiyathurai Rameswaran
- Nam Ranatunga
- Ragulan Ratnarajah
- Nikeeta Roche
- Stephan Roy
- Mike Salmon
- Gihan Saparamadu
- Kaylene Scott
- Greg Shepherd
- Eric Swart
- Graham Sweetlove
- Robin Thekkekara
- Mitchell Wilson
- Barry Wolhuter
- Evan Woods

Membership is open to anyone actively engaged in the delivery of public works and services in Queensland.

Join now www.ipweaq.com/membership

MEET THE TEAM

CARLIE SARGENT
Director, Member Services
Carlie.Sargent@ipweaq.com
Carlie manages the IPWEAQ Excellence Awards, Member Services and the RPEQ Assessment Scheme. Carlie has held a number of roles in professional associations, most recently with CPA Australia as the Queensland Director and Corporate Social Responsibility Manager and was previously the Manager of the Institute of Management Consultants.

ROSS GUPPY
Director, Technical Products
Ross.Guppy@ipweaq.com
Ross has over 30 years' experience in the road and transport infrastructure sector, including 28 years with the Queensland Department of Transport and Main Roads (TMR). During Ross's time with TMR, he held various specialised engineering and senior executive roles, and was accountable for managing the Technical Documents Program.

CRAIG MOSS
Director, Professional and Career Development
Craig.Moss@ipweaq.com
Craig has worked in the civil infrastructure industry since 1985, including senior roles in the government and private sectors. He combines 19 years' practice as a technical professional with 12 years' experience as a learning and development specialist to assist in the enhancement of practical knowledge and skills that benefit the individual and the employer.

AMANDA MIKELEIT
Events Manager
Amanda.Mikeleit@ipweaq.com
Amanda has managed corporate events in the professional services and insurance sectors for more than eight years. Amanda is responsible for the delivery of all IPWEAQ branch and state conferences and events and exhibition and sponsorship opportunities.

JEANETTE SAEZ
Director, Finance and Administration
Jeanette.Saez@ipweaq.com
Jeannette has over 26 years bookkeeping/ finance experience in both the private & government sectors. In 2000 she launched her own finance and administration consultancy which services a range of clients including IPWEAQ, Marling Group and Muir Marine Qld to name a few.

MARK LAMONT
Information Resource Manager
Mark.Lamont@ipweaq.com
Mark Lamont has worked as a researcher/ tutor in academia for the past decade. While completing his own doctoral thesis, he worked as a tutor/lecturer in the school of humanities at Griffith University and the University of Southern Queensland and is currently undertaking a Masters qualification in Information Science at Queensland University of Technology.

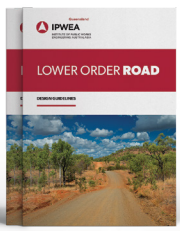
JOHANNA VANLING
ADMINISTRATION OFFICER
Johanna.Vanling@ipweaq.com
Johanna has a several years' experience in administration roles both within the real estate and education sectors. Johanna oversees the operations of the IPWEAQ office and provides administrative support in the delivery of professional development, events, conferences, accounts and membership engagement.

PUBLICATIONS

www.ipweaq.com/technical

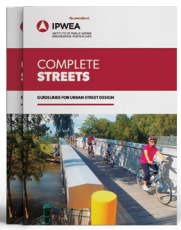
Asset Design As Constructed

ADAC is a strategic solution for quality data capture and management for government and utilities.



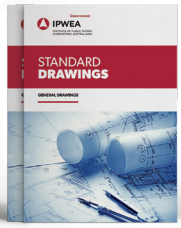
Lower Order Road Design Guide

This guide offers a risk-based approach to lower road capital improvement.



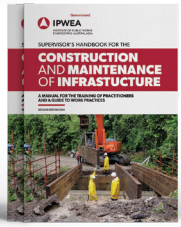
Complete Streets

A community focused how-to for contemporary urban street design.



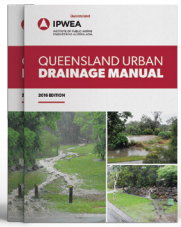
Standard Drawings

Standard Drawings for General, Drainage and Water Quality, Parks, Roads, Homeowner.



Supervisor's Handbook

For supervisors and staff working on local government projects in the field.



Queensland Urban Drainage Manual

For engineers and stormwater designers in the planning, design and management of urban stormwater drainage systems.

SHAPING A PROSPEROUS FUTURE FOR THE SUNSHINE COAST

FEATURE ARTICLE

Sunshine Coast Mayor Councillor Mark Jamieson

First elected in May 2012, mayor of the Sunshine Coast Mark Jamieson is delivering on his promise to shape a prosperous future for the Sunshine Coast. He was elected to create the right conditions for jobs while protecting the region's enviable lifestyle and environment - and that's what he and the Sunshine Coast Council are doing.

The Sunshine Coast is a region that is embracing being part of a changing world.

We have a clear and coherent plan, and a determined approach to seeing that plan implemented.

We are building confidence – that most essential ingredient in any success story and one that is very important for the growth of a community.

Our focus is on liveability with better access to jobs and services for our residents and making sure our outstanding environmental assets remain just that – outstanding - and a valuable community resource for generations to come.

We are positioning the Sunshine Coast at the forefront of economic prosperity, liveability and sustainability with elements and opportunities that will benefit our neighbours in south east Queensland and through the rest of the State.

In short we are creating a healthy, smart and creative city-region that has its own identity and is intimately connected to the world.

What we are achieving here on the Coast is being recognised nationally and globally.

Infrastructure Australia has listed the Sunshine Coast as one of five cities - in addition to the State capitals – that will drive the productivity of the Australian economy - and we have been included as one of only four Australian regions on the world's Smart 21 communities for 2017.

In the past 12 months, we have witnessed plenty of progress with our game-changing projects as we seek to take a leading position as a major Australian urban and economic centre.

Sunshine Coast Airport

After several years of intensive work, council has secured the required State and Federal

government approvals to proceed with the expansion of the Sunshine Coast Airport.

In October, we achieved our international designation for the airport, securing the provision of customs and border control services for scheduled international flights.

It was followed by finalising financing arrangements for the expansion project through a loan from the Commonwealth and support from the Queensland Treasury Corporation.

Then, in February, we signed contracts with Palisade Investment Partners who will be the Sunshine Coast Airport's commercial operating partner in a deal worth more than half a billion dollars.

Under the deal, the airport will continue to be owned by Sunshine Coast Council, with Palisade operating the asset under a 99-year lease.

Palisade will be responsible for operating, investing and developing the airport and will oversee future negotiations with airlines to expand both domestic and international routes available from the Sunshine Coast.

The airport expansion project, which includes new fully compliant 2450m long x 45m wide runway as well as upgrades to the existing terminal, will deliver an economic benefit to the region of some $4.1 billion through to 2040 and 2230 jobs over the same period.

The Sunshine Coast Airport continues to be the fastest growing major airport in Australia, hitting the million passengers mark within a single year for the first time at the end of 2016.

Maroochydore City Centre

It has also been rewarding to see work progress on our region's

new Central Business District on a 53ha greenfield site in the heart of Maroochydore.

In February 2016, I had the honour of assisting Premier Annastacia Palaszczuk turn the first sod to mark the start of bulk earthworks for the new city centre – a true heart for our region.

This year will see powerlines, water mains and stormwater drains installed, while on the surface the first roads and pavements will be laid, a new park will be created and a stunning new east-west waterway will be built.

The Maroochydore City Centre project will create more than 30,000 jobs by 2040 and provide a $4.4 billion boost to the Sunshine Coast economy.

The company established to oversee design and delivery of the new CBD, SunCentral Maroochydore Pty Ltd, has already commenced marketing the project to the private sector.

Expressions of Interest are now open for lots in the core commercial precincts of the new CBD and investors and developers have been quick to recognise the potential.

SunCentral is currently considering submissions proposing commercial and mixed use projects with a construction cost of more than $400 million.

This is great news given the very early stages of the development and our council looks forward to seeing these and other proposals for the Maroochydore City Centre progress to contracts in 2017.

We are also taking the opportunity associated with a greenfield site to build in the infrastructure and digital solutions that will make Maroochydore Australia's first truly smart city.

For example, our council is installing Australia's first underground automated waste collection system in a CBD.

The announcement of this inclusion attracted attention from around the country, increasing awareness of what we have underway here and the innovation and sustainability principles that are at the heart of what we do.

And there will be more to come as we incorporate smart lighting, smart parking and other smart solutions throughout our new CBD.

Sunshine Coast Solar Farm

We are about to commission our 15 megawatt Sunshine Coast Solar Farm at Valdora, west of Coolum.

This project is being keenly

watched by other councils wanting to replicate what we are achieving.

When operational in just a few weeks, our Solar Farm will offset 100% of council's electricity consumption across all its facilities and operations, with solar energy going into the grid.

Most other governments are still talking about offsetting 50% of their energy needs from renewables by 2025.

But importantly, this solar facility will reduce the cost of council's operations – at least $22 million after costs over the 30-year life of the project - and we will no longer be exposed to escalating energy costs.

This is a great win for the environment and a great win for our residents too.

The final of the almost 60,000 solar panels has been installed, while 36,000 trees will be planted to create a 10-metre green buffer area.

International Submarine Broadband Cable

Council has lodged a submission with the Australian Communications and Media Authority (ACMA) to start the process to declare an offshore cable protection zone.

If the zone is declared, this will encourage the private sector to deliver an international submarine broadband cable connection that would land at the Sunshine Coast.

The Sunshine Coast would be the only regional centre in Australia able to offer direct international broadband connectivity to global markets.

If this protection zone is achieved and the cable is delivered, the region's economy and our attractiveness to new businesses will change profoundly – and forever.

It will provide milli-seconds of advantage and significantly improved speed and bandwidth from Queensland – all from the Sunshine Coast.

Milli-seconds are integral to banking and finance operators, digital solutions developers and those businesses and industries that are heavily reliant on online transactions.

Businesses locating near the cable landing point will achieve a significant commercial advantage so many will want to locate here rather than other regional centres.

The greater speed and bandwidth will also transform the capacity of our Sunshine Coast University Hospital to undertake remote diagnostics and clinical treatments.

The hospital will also be able to gain direct access to some of the world's leading health and medical research institutes.

The opportunity to market the Sunshine Coast as a place in which to invest and operate a business will be exceptional.

A new economy

More broadly, there is considerable activity occurring that is helping us to achieve the strong economic position that we are now able to claim.

Our region has more than $10 billion committed (or in the pipeline) in major public and private investment in the region.

In March, the long awaited $1.8 billion Sunshine Coast University Hospital opened.

Work is now underway on the region's two large scale master planned communities - Caloundra South (now known as Aura) and the $3 billion Avid development "Harmony" at Palmview.

These master planned communities will eventually be home to 50,000 people and 17,000 people respectively.

The $400 million Sunshine Plaza expansion is underway and is planned to open by the end of 2017.

Each of these major regional projects are contributing to the reshaping of the regional economy and helping to deliver a wider mix of employment options, facilities and services for current and future residents of the Sunshine Coast.

While there is much still to be done, we are in a pretty good place right now and one that is markedly different to five years ago.

We have a wonderful mix of opportunity that is being delivered now and with a firm eye on the future.

There is none like it anywhere else in Australia.

The future is here on the Sunshine Coast and I invite you to be part of it.

IPWEAQ in conjunction with Sunshine Coast Council invites you to tour the Sunshine Coast Smart Centre and Living Lab and hear about the region's leading infrastructure projects on Wednesday, 23 August 2017. More information and registration coming soon at www.ipweaq.com/courses

SEEKING A CANCER CURE FOR MUNNA POINT BRIDGE

TECHNICAL FOCUS

IPWEAQ EXCELLENCE AWARD Winner

Chris Dowding
Director - Structures Group
TOD Consulting Pty Ltd

Munna Point Bridge was built in Noosa Heads, Queensland in the late 1970s. Over 1.8 million trips in each direction are made across the 106 metre bridge every year, by tourists and locals. The bridge is one of only two routes across saltwater canals, to reach the primary tourism attractions of Hastings Street, Main Beach, and Noosa National Park. Accordingly, it is a critical piece of infrastructure to facilitate Noosa's economy as a lifestyle and tourism destination.

In the 1990's, large cracks appeared in the precast concrete piles and cast-insitu pile caps. Engineers from Queensland's Department of Transport and Main Roads identified the cause as chloride attack and alkali silica reaction (ASR).

ASR is a worldwide issue, because many gravels (aggregates) contain silica. When used in concrete, these react with alkalis in the cement. The resulting expansive gel causes concrete to expand and crack. ASR occurs in the presence of water. The ASR cracks allowed salt (chlorides) to reach prestressed steel strands in the piles and reinforced steel in the pile caps (chloride attack). There is no "silver bullet" to solve ASR problems in existing concrete. The Federal Highway Administration (FHWA) in the United States says, 'the term "mitigation" is used in lieu of "repair".

Bridge owner, Noosa Shire Council (NSC) commissioned various consultants to monitor the bridge between 2001 and 2013.

- Their test labs included chemical and mechanical tests of the concrete, such as compression strength, chloride content, carbonation, sulphate, and ASR potential.

- The steel reinforcement condition was inferred from the crack width inspections and the lab tests.

The prognosis worsened with time. Later, consultants concluded the 106-metre-long bridge's economic life would end in 2013, and planned for replacement of the full substructure for $6 to 8 million (see Option 1 in later table).

In 2014, NSC and TOD Consulting (TOD) investigated the steel reinforcement, with surprising results. We determined that remediation (Option 2) was viable, and prepared a reference design. Specialist Repair Contractor, MCM enhanced the solution in 2016, extending the bridge's life by 50 years, for less than $3 million (50% less than Option 1 above).

How did we do that?

The previous consultants had relied on visual inspection of the exterior, and lab testing for ASR and chlorides. TOD's bridge engineers took a different approach: We knew the critical structural components were the unseen prestressing strands and reinforcement.

Investigation

TOD is a member of the Australasian Corrosion Association and our directors are members of the IPWEAQ. When NSC approached TOD in 2014, we had reports showing that all of the previous investigations had relied on visual inspection of the exterior, and materials testing for ASR and chlorides in a laboratory.

We conducted a joint invasive investigation, by breaking out small volumes of concrete in the piles and pile caps to visually identify the condition of the strands and reinforcement. The observed reinforcement in the pile caps of Piers 3, 4 & 5 and piles (No. 3 & 8, Pier 1) were in better condition than we expected. TOD's judgement was that macrocells had formed in the pile caps so that corroding bottom reinforcement was (temporarily) protecting the critical top reinforcement. In the piles, TOD determined that the reduced oxygen below tide level had resulted in much slower than expected corrosion rates. This meant the bridge was still safe for public use, giving NSC and TOD enough time to plan a solution properly, and with care, the bridge could remain open while the solution was implemented.

In summary, visual identification of the prestressing/reinforcing condition by a trained Bridge Engineer was a critical game-changer:

- The earlier materials testing (chloride levels, ASR potential, carbonation level and crack mapping) had given us valuable

information; but alone, could not give us a true idea of the bridge's structural safety level. Most testing service organisations do not have bridge/structural engineers on staff. Nor do many Local Authorities.

- Without the visual identification, we would not have known that the pile strands and pile cap top reinforcement were less corroded than expected,
- Without the Bridge engineer, we would not have known the significantly corroded pile cap bottom reinforcement bars were less important than the top bars.
- TOD summarised their report into a single drawing which visually identified the condition of each component by colour. This visual 'model' sped up everyone's comprehension of the extent of the issues.

Sustainability

Possibly the largest environmental impact of a bridge is its carbon footprint – the carbon dioxide emitted to produce and operate it.

Australia is a signatory to the Paris Accord and therefore has binding targets to reduce greenhouse gas emissions. NSC is committed to custodianship of the Noosa environment, and is planning for an emissions target of 0%. It follows the principle that 'resources are sustainably managed so that the lifestyle of the community is preserved without compromising the ability of future generations to meet their own needs'.

TOD is committed to reducing consumption and material waste in their operations. Accordingly, it was important to both parties that curing the cancer at Munna Point Bridge would be achieved with minimal waste or emissions. The carbon footprint of three options were compared as follows:

	Up-front embedded CO2 in demolished and new components	Running Operations over 50 yrs CO_2	Total CO_2
Option 1: Replace the Substructure	185 tonnes based on concrete and steel production emissions	3-6 tonnes (based on 6100 kw.hr electricity, gas or coal)	188-191 tonnes
Option 2: Remediate the existing structure	39 tonnes based on concrete and steel production emissions	3-6 tonnes (based on 6100 kw.hr electricity, gas or coal)	42-45 tonnes
Option 3: Replace the Bridge	619 tonnes based on concrete and steel production emissions	0	619 tonnes
Typical Australian Household emissions/yr	80-100 tonnes 18 tonnes/year x 50years =	900tonnes	980-1,000 tonnes

*CO2 emissions based on 270kg CO_2/m^3 - manufacture of Portland cement based concrete
178kgs CO_2/m^3 – manufacture of 80% portland : 20% flyash cement based concrete
825kg CO_2/tonne reinforcement steel production

Source: "Carbon Dioxide (CO2) emissions of concrete", presented by Stephen Leung, Arup Materials Technology, Feb 2009

From the table, we can see that Option 2 (Remediation) should

emit the lowest amount of CO^2 over its 50-year life.

The "Cure"

Research by Chris Dowding of TOD, and Adam Britton of NSC, indicated that ASR had been previously controlled with concrete encasements incorporating anti-bursting reinforcement.

- The fresh concrete needed to be carefully designed to avoid introducing more alkalis to the old ASR-prone concrete.
- This was achieved by replacing some portland cement with pozzolanic cements, including flyash and silica fume.
- Cathodic protection could protect the reinforcement from corrosion, even if some ASR cracking still occurred. This was important, given the worldwide indications about the difficulty of solving ASR problems.
- This approach was enhanced by Specialist design and construction Contractor, Marine and Civil Maintenance NSW (MCM), in 2016. MCM's director, Alan Bird, and his team greatly reduced the time and complexity of repairs. They also developed a viable method to use simpler anodes in the cathodic protection system.

By delivering a way (option 2) to maintain this vital connection through Noosa, at a cost 50% lower than the substructure replacement option (1), and 70% less than full bridge replacement option (3), the project has benefited Council and it's ratepaying Community significantly. Importantly, the bridge will continue to support the $600million/annum Noosa tourism industry.

Each of the main participants in the project, Noosa Shire Council, TOD Consulting and Marine Civil Maintenance were pleased and grateful to have contributed to the project's success and were very proud to be recognised with an IPWEAQ Excellence Award in 2016. Project award judges commended the project participants for delivering such an effective solution to extend the useful life of an asset which was a win for sustainability with materials saved, the embedded energy of the bridge was not lost and it saved $3-5 million which can be directed elsewhere to benefit the community.

For more information about the project and participants, visit:

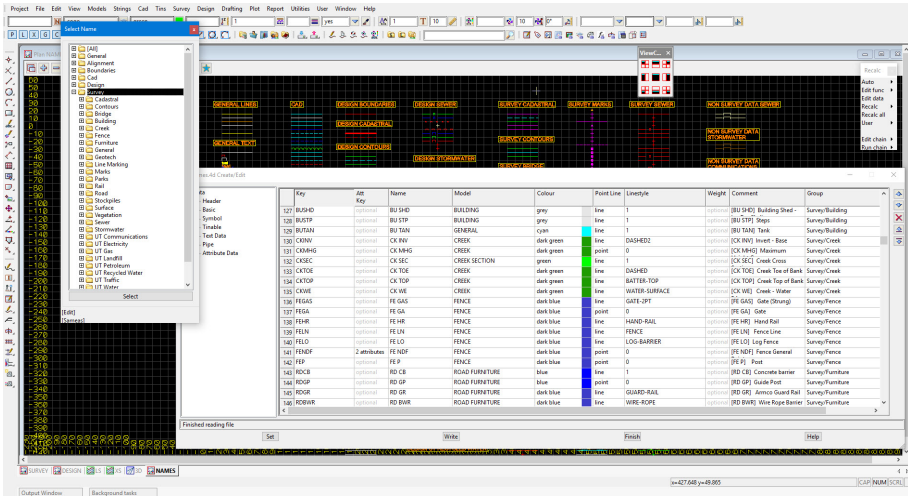
https://www.noosa.qld.gov.au/
http://www.todconsulting.com/
http://www.marineandcivil.com.au/

CREATING A COMMON CAD STANDARD

TECHNICAL FOCUS

Tim Brooks
12d Model and 12d Synergy Training Manager
12d Solutions

In 2016, 12d Solutions joined the IPWEAQ and the major councils of South East Queensland (Brisbane, Gold Coast, Logan, Moreton Bay, Ipswich and Toowoomba) to work on providing a common CAD standard. This is crucial to solve the issue of the many different standards for projects that span across multiple Council authorities. By giving Consultants one standard to adhere to, program customisation for all Councils and consultants can be minimised. This is especially important for small firms that don't have the man-power or budget to designate workers to this onerous task.



This process of creating a common standard began with meetings of the Survey and Design leads of these Councils to create standard naming codes, therefore creating a standard name, linestyle and symbols file that would be shipped with 12d Model software. 12d is currently also developing standard plotting files for long and cross sections and also for drainage outputs. Other standard files under consideration include design mapping, ACAD mapping, and drawing templates.

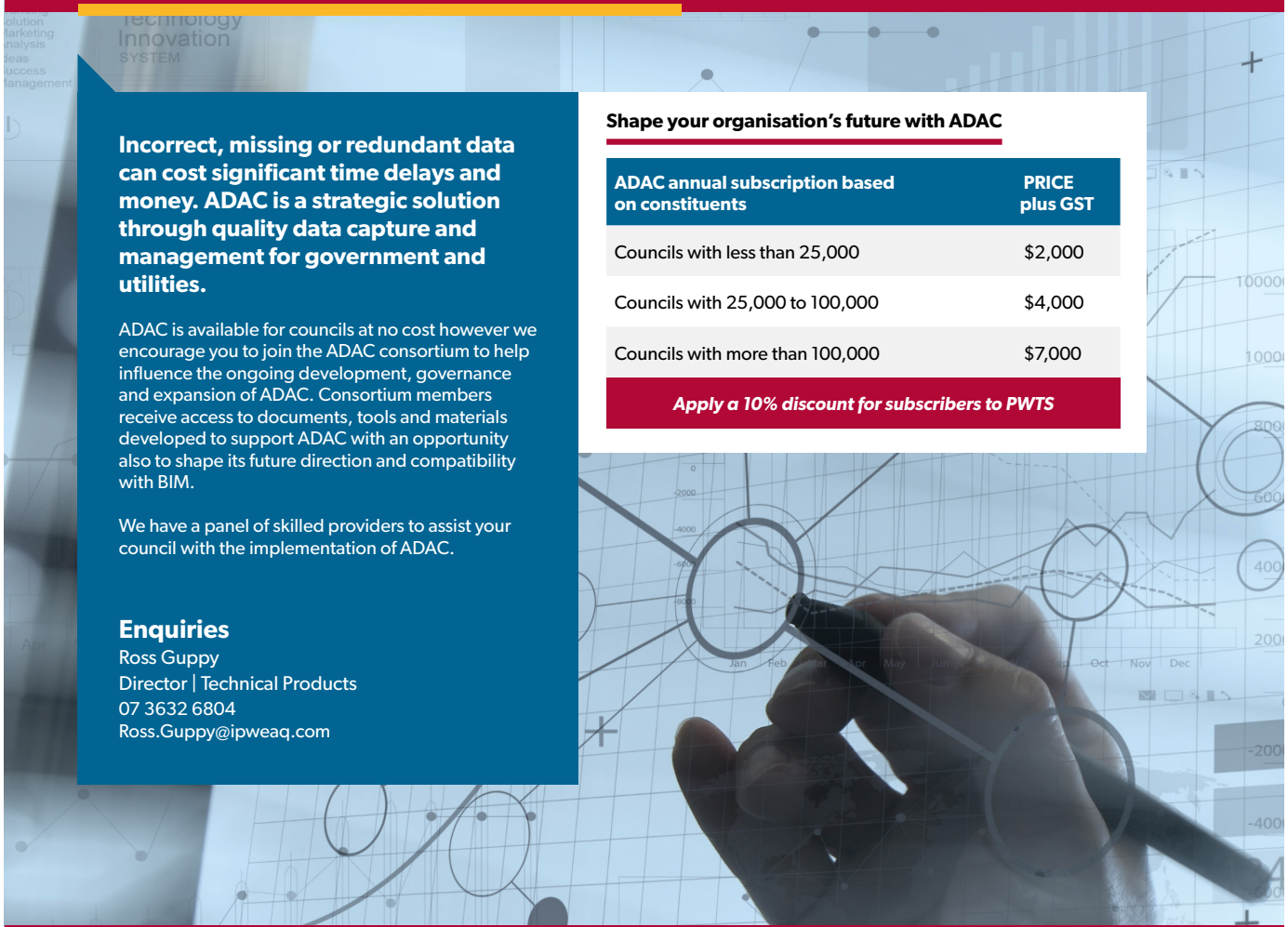
In the future, 12d Solutions (with IPWEAQ) will be looking at developing standard files for ADAC, field files and other items such as profiles for templates using Snippets. It is hoped that this standardisation will assist workflows across the board, and that other regions may follow suit.

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

TRANSFORM YOUR BUSINESS WITH

ASSET DESIGN AS CONSTRUCTED



Incorrect, missing or redundant data can cost significant time delays and money. ADAC is a strategic solution through quality data capture and management for government and utilities.

ADAC is available for councils at no cost however we encourage you to join the ADAC consortium to help influence the ongoing development, governance and expansion of ADAC. Consortium members receive access to documents, tools and materials developed to support ADAC with an opportunity also to shape its future direction and compatibility with BIM.

We have a panel of skilled providers to assist your council with the implementation of ADAC.

Enquiries
Ross Guppy
Director | Technical Products
07 3632 6804
Ross.Guppy@ipweaq.com

Shape your organisation's future with ADAC

ADAC annual subscription based on constituents	PRICE plus GST
Councils with less than 25,000	$2,000
Councils with 25,000 to 100,000	$4,000
Councils with more than 100,000	$7,000

Apply a 10% discount for subscribers to PWTS

www.ipweaq.com

IPWEAQ TECHNICAL WORKING GROUPS UPDATE

TECHNICAL PRODUCTS

Ross Guppy,
Director, Technical Products

Standard Drawings

The standards drawings group last met on the 6th April with our next meetings scheduled for 7th June & 9th August. At the last meeting, the group decided to review RS-049 in regards to the allowable number and width of residential driveways table to provide more clarity on the driveway widths.

We also undertook a short reflection on what needs to be achieved in the next two years and it was agreed to set aside a full day once a year for major reviews, with the first event to be hosted by the City of Gold Coast in August. The committee decided to first review the Parks standard drawings.

The group received input from industry on the requirement for small arises in RS-080 for concrete kerbs. It was agreed to amend to 20mm to accommodate the industry request.

ADAC

ADAC continues to gain interest from across industry, with a number of presentations with the surveying community through the Surveying & Spatial Sciences Institute (SSSI) and the Queensland Department of Natural Resources and Mines (DNRM). These events continue to generate a lot of interest from the survey industry and they are happy to work with IPWEAQ to further the broad acceptance of ADAC. The most recent event was the Queensland Surveying and Spatial Conference, Southport, 4-5 May 2017.

At the last technical reference group meeting a number of changes were finalised and they are now with the Strategic Reference Group for final approval. So, what will be in ADAC 5.0 when it is released later this year? Well the big changes are:-

- Introduction of a Bridge Asset Class
- Separate Class for Road Safety Barrier
- Removal of WSAA specific wording e.g. Pipe Embedment Types
- Removal of Main Roads specific references e.g. Geotextile Class.
- Pram Ramps to be collected as polygons
- Simplification of Kerb and Channel
- Changes to Stormwater End Structures
- Additional options in several areas e.g. frog flaps, fire trails, ductile iron, SN8
- Addition of Stormwater flow management devices

The discussion on BIM is still progressing slowly, myself and Darren Moore (Chair of the SRG) attended a meeting with Andrew Curthoys from DILGP to provide input into the State Government's BIM Strategy. Subsequently IPWEAQ made a submission on the "Building Information Modelling – draft policy and principles for Queensland".

As some of you would be aware, Austroads is undertaking a project to develop a Data Standard for Road Management Investment in Australia and New Zealand. I continue to work with the Austroads Program Manager and we have taken on board some suggestions from the draft documents for the simplification of Kerb and Channel.

IPWEAQ Director, Technical Products, Ross Guppy presenting at the Queensland Surveying and Spatial Conference, Southport, 4-5 May 2017.

MUTCD Part 4: Speed Controls Limit Review

The review of the speed limit setting process aims to improve road safety outcomes in Queensland. The improved process is expected to align closer to the "Safe System" approach that has been adopted in the Road Safety Action Plan to manage road safety in the State. The scope of the Project is essentially limited to the development of the technical process and tools to undertake speed limit reviews. TMR is keen to involve local governments through the involvement of a number of IPWEAQ representatives. In addition to myself we have James Jennings from Brisbane City Council, Etiene LaGrange from Toowoomba Regional Council, Helius Visser from Cairns Regional Council and Stuart Harvey from Rockhampton Regional Council on the working group.

Other related projects will contribute to the successful implementation of the revised speed limit setting guidance. These projects should address community consultation about the "hard conversation" on safe and appropriate speed, risk assessment automation and training for practitioners as required.

Computer Aid Design (CAD) Standards working Group

See separate article from 12D.

Survey Standards working Group

The Survey Standards working group will hold its second meeting on 6th July to develop and finalise a naming code convention. A standard set of codes for underground utility locations in accordance with the AS-5488 standard has also been included. The additional underground service codes will enable those unable to attribute field data into their CAD package and still follow the same naming convention with each utility quality label being in its own model / layer. Colours and line styles will be discussed within the CAD group but will be set through the Survey working Group with a possible convention of W-QA, W-QC etc. (water quality A and C respectively) same for other services.

CONTINUING PROFESSIONAL DEVELOPMENT – BURDEN OR BENEFIT?

PROFESSIONAL DEVELOPMENT

One of the most common discussions across our sector is the challenge of meeting CPD (Continuing Professional Development) obligations to gain or maintain professional registration. The prospect of undertaking a minimum 150 hours CPD over three years can be somewhat daunting and it is often regarded as a compliance issue which interrupts our everyday work activities rather than an opportunity to improve our skills and knowledge.

While we accept that CPD cannot be avoided, some of us look for convenient and easy CPD opportunities and use a 'tick-a-box' approach to achieving the minimum hours. But while we then meet the regulatory requirements, are we actually achieving the intended purpose of CPD or have we wasted an opportunity?

The underpinning principles of the CPD framework is to ensure practitioners extend or update their knowledge, skill or judgment in their area or areas of practice. And as a result, an individual will be able to:

- maintain their technical competence;
- retain and enhance their effectiveness in the workplace;
- be able to help, influence and lead others by example;
- successfully deal with changes in their career; and
- better serve the community.

It can be argued that a minimalistic approach to CPD will struggle to achieve these objectives, especially in a world of rapidly changing knowledge and technology. CPD must be addressed in a considered way if technical professionals are to keep up with changes.

Ultimately, there is no 'one-size-fits-all' approach to CPD. To achieve the best outcomes from CPD, the practitioner must clearly identify their own professional and career goals and work out a plan to achieve those goals. One of the critical roles of IPWEAQ is to assist our members as they progress through their careers, providing guidance with a professional development plan that takes into consideration the specific needs and requirements of the member and their council or organisation. We do this for our recent graduates, Young IPWEAQ members (under age 35) and experienced professionals.

Please be sure to contact us to help you with your professional development plan so that your 150 hours every three years takes you to where you would like to be in your career.

Contact
Craig Moss
Director, Professional & Career Development
Craig.Moss@ipweaq.com
3632 6805

Register now for IPWEAQ training courses in June

Roles and Responsibilities of Local Government Officers Seven-Part Webinar Series
Thursdays, 12:30pm to 1:30pm
Commencing 15 June 2017

Managing the Risk of Lower Order Roads
Toowoomba, Thursday
8 June 2017
Roma, Wednesday
21 June 2017

Erosion and Sediment Control Courses
Levels 1, 2 and 3 Training
Brisbane, 10- 14 June 2017

Register for all IPWEAQ courses via the PD opportunities page on the IPWEAQ Portal.

Roles & Responsibilities of Local Government Officers
(seven-part webinars)
15 June to 10 August
Thursdays 12:30 to 1:30

Managing Risks on Lower Order Roads
(includes a copy of the LORDG)
8 June - Toowoomba
21 June - Roma

Erosion & Sediment Control: Level 3
(Advanced)
7 - 8 June - Brisbane

Erosion & Sediment Control: Level 2
(Intermediate)
13 June - Brisbane

Erosion & Sediment Control: Level 1
(Awareness)
14 June - Brisbane

Supervisor's Workshop
Blocks 1-4 (2 days each)
Various Locations through
June to September

Bridge Inspections Level 1
10-11 October – Brisbane

Bridge Inspections Levels 1-2
10-12 October - Brisbane

IPWEAQ State Conference
'sustainability through inspired leadership and community engagement'
24-26 October – Townsville

www.ipweaq.com/courses

IPWEAQ 2016 State Conference Proceedings (Podcasts)

The 2016 state conference was IPWEAQ's most successful conference to date with 333 delegates from 36 councils and 52 organisations with 43 exhibitors.

Conference podcasts including all eight keynote presentations and all presentations delivered in all 12 streams are accessible for free to (paid) delegates. Other members and non-members may subscribe to all podcasts (12.5 hours of CPD) and receive $200 discount off the registration fee for the 2017 state conference in Townsville.

Paid delegates to the 2016 state conference can access the podcasts and view:

- State conference papers (16)
- PowerPoint presentations (21)
- Podcasts (43)
- The Great Debate podcast *('women make better engineers than men')*
- Podcast for the Fireside Chat *(Young IPWEAQ members interview Patrick Murphy)*
- Interviews of award winners, delegates, speakers and exhibitors on their conference experiences (31)
- Photographs of the event (332)

Conference Proceedings (podcasts)
Prices plus GST
Member **$600**
Non-member **$900**

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

Professional Development

Roles and Responsibilities of Local Government Officers

Lawyers | McCullough Robertson

Up to 7 CPD hours

Engineers and professionals working in local government perform a vital role in the delivery of services to their communities. These roles are quite different to private sector counterparts given the complex and ever changing regulatory environment of local government. Decisions are subjected to a high level of scrutiny with those responsible held to a very high standard by their communities.

Being aware of the additional roles and responsibilities is only the first step. Implementing good governance and effective management practices are all part of the day-to-day operations of government. It is not merely a 'tick box' exercise to achieve legislative compliance - it is what the community expects.

This seven-part webinar provides local government professionals with the tools for ensuring that statutory powers and responsibilities are exercised within a strong governance framework.

Attendees will obtain core knowledge to implement a practice of good governance, understand risk and avoid adverse consequences for both the professional and the organisation.

The seminar series is designed for all levels of local government professionals from graduates to technical officers, supervisors, managers to experienced local government professional leaders.

It will cover responsibilities for:

- ✔ planning, development, delivery and management of public works; and
- ✔ designing project briefs and procurement documents.

Course structure

Sessions will be presented via a series of seven live and interactive webinars. Questions will be encouraged so other attendees benefit from the sharing of information. Attendees will earn a total of seven CPD hours for the full program.

07 3632 6800 info@ipweaq.com www.ipweaq.com

Weekly Webinars
12:30 – 1:30 pm on Thursdays

Lawyers | McCullough Robertson

CPD points = 1 point per webinar (7 total)

Troy Webb
Partner

Webinar One: Good Governance 101

In this webinar we will provide an overview of the key legislation dealing with good governance and ethics. There will be a focus on the basics associated with the exercise of powers and responsibilities within a strong governance framework. Case studies will be considered to assist attendees avoid the adverse consequences of non-compliance and effectively deal with customers and government regulators.

Troy Webb
Partner

Sarah Hausler
Senior Associate

Webinar Two: Transparency in decision making and the provision of reasons

Further discussion will be undertaken relating to the decision accountability measures set out in the *Local Government Act* and the new *Planning Act 2016*, which confers new requirements to provide reasons for development assessment decisions. Many of the requirements will be new for local government engineers and other professionals. This session will cover the importance of sharing knowledge to those stakeholders to implement a system of compliance.

Cameron Dean
Partner

Liam Fraser
Senior Associate

Webinar Three: The Famous Five: things local government professionals need to know about employee relations and safety matters

This session focuses on current trends and developments in workplace relations and safety. Successful management of these issues requires a proper understanding of the risks, requirements and how to avoid legal pitfalls. We will focus on issues relevant to local government engineers, including recent developments in the response to work health and safety incidents as well as dealing with practical issues that can arise out of management of personnel.

Michael Rochester
Partner

Webinar Four: Procurement: Assets and Contracts

Much is stated about the requirement to achieve value for money in the procurement process. The way in which assets are procured and operated is a prime consideration for this requirement and for the long-term financial sustainability of local government. This session will cover Local Government Act procurement requirements for infrastructure and goods and services plus procedural recommendations to ensure probity and compliance. Different contractual models will be discussed including for ongoing operations and maintenance.

Troy Webb
Partner

Patrick Day
Lawyer

Webinar Five: Obtaining effective compliance outcomes – investigations and powers of entry

Local government engineers and other professionals play an important role in ensuring that compliance is achieved by developers and other community members with a range of laws and conditions imposed upon approvals. In this session, the key procedures for effective investigations, compliance with legislative powers of entry will be explained in conjunction with case workshop studies.

Sarah Hausler
Senior Associate

Webinar Six: Infrastructure agreements: tips and traps

A Council's power to levy charges and impose conditions for infrastructure is regulated by complex rules. Infrastructure agreements are often used to overcome planning constraints and funding limitations. This session will explain the legal requirements and provide tips and traps for successful infrastructure agreements.

Melanie Simmonds
Special Counsel

Webinar Seven: Environmental and waste management issues for local government

From sewage spills to landfills and beneficial use of resources, this webinar will cover environmental issues across the establishment, operational, maintenance stages of projects, as well as termination and remediation.

GRAND SLAM AWARD

MEMBER PROFILE

Greg Kennedy
Regional Sales Manager
Steel Mains Pty Ltd

Greg Kennedy is the winner of the 2016-17 Grand Slam Award for attending five IPWEAQ branch and state conferences during 2016-17. He spoke to IPWEAQ about his career and the value of IPWEAQ professional development courses and conferences:

Please tell us about your role and the organisation you represent?
I'm proud to be working with a company that manufactures steel pipeline systems in Australia using Australian made steel. In my role as Regional Sale Manager, I am responsible for identifying projects that can benefit from embracing Sintakote steel pipeline systems for their water supply or wastewater rising mains on local and regional pipelines. We technically support the whole project from conception, design, procurement, installation, operation and maintenance. I work with asset owners to help them understand the assets they are planning to install. We provide design consultants with technical support, design manuals and design tools. I tender or quote for the pipelines with either government authorities or direct to contractors. Our installation and training programs support the contractors installing the pipeline

systems to ensure that the asset is provided as designed. I greatly appreciate that Steel Mains Pty Ltd support my attendance at these conferences and hope that other organisations similarly recognise the benefits of allowing their employees the time to attend IPWEAQ conferences.

What do you find most valuable about attending IPWEAQ conferences?
Being a member of IPWEAQ and attending the conferences provides opportunity to connect with key people across the industry in a professional way. The conferences also provide an opportunity to gain continual professional development for my Civil Engineering qualifications. It is also a good way to keep up to date with current developments within the local government sector through conversations and attending the professional papers presented at the conferences.

How has attending IPWEAQ conferences benefited you and your organisation?
Steel Mains and its processor companies (Pentair, Tyco Water and "Tubies") have a long history of supporting IPWEAQ and many members would remember the annual engraved wine glasses that would feature at the Gala dinners. For myself, attending IPWEAQ conferences provides an opportunity to network and connect to key people in the industry in a professional but casual atmosphere. Conversations can flow naturally around developments in the industry from various perspectives, without the need for a formalised meeting. By attending the conferences, I gain a wider understanding of the industry and our position within it and better understand how to support projects that require water and wastewater pipes and pipeline services.

What was your response to being named the inaugural IPWEAQ Grand Slam Award winner?
Being announced as the Grand Slam winner was surprising at first, but I understand it is for recognition of attendance, support and participation. I've been a

member for around 20 years and attended many events and conferences with IPWEAQ and hope that I have contributed some value to the organisation and it members over this time.

What would you say to someone who hasn't attended an IPWEAQ conference before to encourage them to attend?
Just do it and help the company that you work for understand the value of attendance to industry wide functions. Gathering leaders and decision makers from local government organisations in one place where you can introduce yourself and have a casual conversation over morning tea about the industry is an opportunity that is too good to miss. The professional papers and presentations provide information about current events, technologies, new innovations, industry trends, OH&S, Environmental considerations and sometimes personal interest topics such as mental health awareness and support (Are you OK?).

Will we be seeing you at all of our branch and state conferences in 2017-18? We hope so.
I intend to attend to as many IPWEAQ branch and state conferences as I can. I find them very good value from a technical perspective and appreciate the opportunity to catch up with many people who I have developed friendships with over time.

IPWEAQ Western Roads Symposium

6 – 7 September 2017 Longreach

The use of non-standard materials and processes for the construction and maintenance of roads in regional and remote areas of Queensland has presented significant challenges to our sector over many years. Over the years, practitioners have built up a knowledge and skills base of what works best utilising locally sourced materials. However, in recent times the knowledge base has been slowly eroded through the natural attrition of our experienced workforce at a time when the demand on our network is growing.

Our roads networks are required to cater for higher traffic volumes, traffic loading, tyre pressures and demand caused by drive tourism. As network managers, we can either import standard materials from great distances at great expense or we can select and use locally sourced marginal materials, utilising an understanding of materials performance and risk management.

Run in partnership with IPWEAQ, the Department of Transport & Main Roads, and Longreach Regional Council, the Western Roads Symposium will explore the use of locally available materials in the construction, maintenance and operations of our road assets specifically related to western and northern climatic conditions. It will also promote the technical expertise and experience available to support stakeholders within the roads infrastructure industry.

For more information about the Western Roads Symposium or to register, contact Craig Moss, Director Professional and Career Development on 3632 6805 or Craig.Moss@ipweaq.com.

Queensland IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

2017-2018 IPWEAQ CONFERENCE GRAND SLAM

QLDWATER ANNUAL FORUM, *'no pain, no gain'* **BRISBANE**
6-7 September 2017

STATE CONFERENCE TOWNSVILLE
'sustainability through inspired leadership and community engagement'.
24-26 October 2017

NQ BRANCH CONFERENCE CAIRNS
In partnership with the Cairns Regional Council
18-20 April 2018

SEQ BRANCH TECHNICAL SERIES COMMENCING JULY 2017

6-7 September 2017
WESTERN ROADS SYMPOSIUM LONGREACH
In partnership with the Longreach Regional Council and TMR

15-16 March 2018
SWQ BRANCH CONFERENCE GOONDIWINDI
In partnership with the Goondiwindi Regional Council

14-16 June 2018
CQ BRANCH CONFERENCE BARCALDINE
In partnership with George Bourne & Associates

Attend any five events to be in the running for the **2017-2018 GRAND SLAM AWARD**

"Steel Mains has a long and distinguished history with IPWEAQ and its members delivering lasting critical water infrastructure to our communities. I'm grateful to the support of Steel Mains enabling me to attend IPWEAQ conferences."

Greg Kennedy
Regional Sales Manager
Steel Mains Pty Ltd
Winner 2016-2017 Grand Slam award

IPWEAQ STATE CONFERENCE

Townsville Convention and Exhibition Centre

24 – 26 October 2017

Sustainability through Inspired Leadership and Community Engagement

EARLY BIRD REGISTRATIONS

- **Member**
  $1,300 (+GST)
- **Non-member**
  $1,600 (+GST)
  *valid to 30 June 2017

Register 5 or more delegates and receive additional 5% off each registration

Fully refundable cancellations available up to one month prior to the event

Registrations are also transferable.

Sponsorship and exhibition opportunities available

please contact
Amanda Mikeleit on
3632 6802 or
amanda.mikeleit@ipweaq.com

www.ipweaq.com/townsville

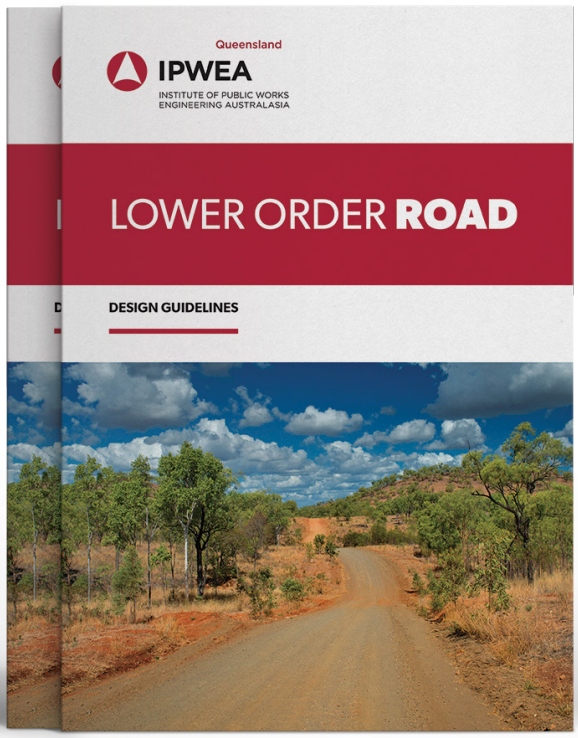
IPWEAQ 2017

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

LOWER ORDER **ROAD**

DESIGN GUIDELINES



The Lower Order Road Design Guidelines (LORDG) specify minimum standards for the design and construction of lower order road assets and provide practitioners with a risk-based approach to capital improvements. As the lower order road network accounts for over 70% local and state controlled networks throughout Queensland, this approach allows stakeholders to maximise the return on funds invested.

One-day training courses are available for key stakeholders to achieve a common understanding of the risk management strategies and how they apply at each stage of the design and construction process from concept through to completion.

Price for a PDF copy (plus GST)

$100 for members

$400 for non-members

Purchase at
www.ipweaq.com/lordg

www.ipweaq.com

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

Professional Development

Offering in-house and customised training in the following areas:

Technical Programs
- Construction & Maintenance
- Road Safety
- Environment Management
- Asset Management
- Planning & Design
- Fleet & Plant Management
- Traffic & Transport Management
- Stormwater & Flood Management

Non-Technical Program
- Construction Law
- Leadership & Management
- Project Management
- Business Services
- Contract Management
- Stakeholder Engagement
- Risk Management

Popular courses
- Road Safety Audit
- Bridge Inspections Levels 1 & 2
- Supervisor Workshop Series
- Erosion & Sediment Control
- Managing the Risks on Lower Order Roads
- Native Title & Cultural Heritage Compliance
- The Leadership Toolkit Series

07 3632 6800 **info@ipweaq.com** **www.ipweaq.com**

LINKING PRIORITIES TO GREAT INFRASTRUCTURE

FEATURE ARTICLE

Damian Gould
Chief Executive Officer
Building Queensland

Building Queensland will soon release its third Infrastructure Pipeline Report identifying priority proposals to inform the state government's decisions on unfunded infrastructure.

The Infrastructure Pipeline Report presents Building Queensland's independent assessment of priority infrastructure proposals under development by Queensland Government agencies, including departments, government owned corporations and statutory bodies. These are proposals that have an estimated capital cost greater than $50 million that are yet to receive a funding decision from the Queensland Government.

Importantly, the Pipeline Report is set out by stage of development to provide visibility of a proposal's status. Inclusion in the Pipeline Report is Building Queensland's recommendation to government to further develop that proposal.

Since the release of the first Pipeline Report 12 months ago, five projects recommended as priorities by Building Queensland have received either partial or full government funding. Projects like Cross River Rail, the European Train Control System (ETCS)—Inner City and Pacific Motorway—Mudgeeraba to Varsity Lakes all received state government funding based on a combination of Building Queensland's completion of detailed business cases or proposal analysis and recommendations as part of the Infrastructure Pipeline process. Similarly, several proposals have been further developed and are progressing through the project assessment process.

Established as a statutory authority on 3 December 2015 under the Building Queensland Act 2015, Building Queensland provides independent expert and respected advice on crucial infrastructure investment decisions that will shape the future of Queensland.

Helping the Queensland Government to understand the service needs and benefits of an infrastructure proposal before making decisions about future investments is the core of Building Queensland's activities. Ensuring consistency in the standard of infrastructure proposals being developed across the Queensland Government invariably involves early stage investigations to ensure the service need is substantiated and the benefits sought are identified and can be achieved. Building Queensland, through application of its Business Case Development Framework, is bringing rigour and consistency to proposal development, and ultimately supporting the progression of proposals that address a demonstrated need for the state.

With projects spanning most infrastructure sectors, more recently Building Queensland has been leading Business Case assessments for the Lower Fitzroy River Infrastructure Project, Nullinga Dam, Arthur Gorrie Correctional Centre, Townsville Eastern Access Rail Corridor (TEARC) and the Smithfield Transport Corridor Upgrade.

Building Queensland also provides visibility of major project development through the publication of proposal summaries that it is leading or where it has assisted. To further increase visibility of government investment decisions, Building Queensland publishes cost benefit analysis summaries for the Business Cases it has led.

All Levels of Government, Working Together

While the state government

is responsible for setting Queensland's infrastructure forward program, the advice Building Queensland provides is the culmination of collaborative, cross-agency relationships with a focus on providing the best advice for the infrastructure outcomes of Queensland. This collaboration often crosses all levels of government, including Commonwealth and local governments, and the private sector. Engaging with all project stakeholders, including local government, in the development of detailed Business Cases only adds to the informed advice Building Queensland delivers to state government to ensure best outcomes for the future of the state's infrastructure.

In November 2015, Townsville City Council signed a 15-year agreement with state and federal governments to work together on a collective program of planning, reform and investment in Townsville. The City Deal commits to actions, investments, reforms and governance needed to implement them. It encourages local leadership and good governance. For its part, Building Queensland is working in partnership with the Department of Transport and Main Roads leading the development of a Detailed Business Case for TEARC, a project identified by the City Deal Implementation Plan under its 'Industry Powerhouse of the North' initiative. Through collaboration with all levels of government and community and industry stakeholders, Building Queensland is working to deliver a robust Business Case which considers project options associated with the acceleration of the Townsville State Development Area and the potential future expansion of the Port of Townsville.

The delivery of the TEARC project will enhance regional development and economic growth through industrial investment attraction, allow for the development of additional jobs growth and skills, support trade and investment through the Port of Townsville and broaden industry development through enhanced supply chain opportunities.

Working closely with our partners across government and applying robust analysis to support proposal development and project selection is critical to ensure the government's investment in infrastructure meets the needs of the state, adds to productive capacity and delivers social and environmental benefits.

To find out more, visit www.buildingqueensland.qld.gov.au

INTERLINKSQ DELIVERS ECONOMIC BENEFITS FOR TOOWOOMBA

FEATURE ARTICLE

Michelle Reynolds
InterLinkSQ
Chief Executive Officer

InterLinkSQ is a 200-hectare intermodal transport terminal, logistics centre and industrial precinct located 13km west of Toowoomba, Queensland, strategically located to maximise freight and supply chain cost efficiencies. When completed it will offer access to domestic and international markets through modal choice with nearly 3km of frontage to the existing West Moreton Rail line connecting to the Port of Brisbane, direct connection to the Inland Rail alignment, location at the junction of three major highways (Gore, Warrego and New England), connectivity to the Toowoomba Second Range Crossing, and a new domestic and international airport.

Construction on the InterLinkSQ development commenced in May 2017, following the Federal Budget announcement of an $8.4bn commitment for Inland Rail.

InterLinkSQ is a major new component of the Toowoomba Enterprise Hub, one of the most significant transport, logistics and business hubs in Australia, covering more than 2,000 hectares of land and offering the synergy of a central location with extensive industrial land and a domestic and international airport.

InterlinkSQ is located within 3km of the junction of the Warrego Highway and the Toowoomba Second Range Crossing which is under construction. These will provide streamlined access to and from the development via the Warrego Highway, New England Highway and Gore Highway.

The InterLinkSQ intermodal precinct includes a 3-kilometre frontage along the existing Queensland Rail Western corridor and proposed Inland Rail route from Brisbane to Melbourne. The existing line is fit for purpose and currently facilitates access to the Port of Brisbane for 7.5 million tons of coal each year. Utilisation of this line is key to increasing transport efficiencies as well as reducing environmental and road safety issues.

Funded by 83 predominantly local families, the InterLinkSQ

Michelle Reynolds
InterLinkSQ Chief Executive Officer

development is set to become a major catalyst for job creation and economic growth in both the Toowoomba region and the State of Queensland, including the projected creation of 1,500 jobs at full development.

The completed InterLinkSQ project and associated industrial developments are worth $1 billion, with a civil works budget allocation of $40 million for stages one and two, including the construction of the intermodal freight terminal and 11 industrial lots.

InterLinkSQ Chief Executive Officer Michelle Reynolds explains how the InterLinkSQ project is a game changer for Toowoomba, providing opportunities for local businesses to benefit from both the construction and operation of the development.

"The InterLinkSQ project is expected to contribute $110m to the Queensland economy through the construction phase and a further $1.075bn in the operational phase, 80 per cent of which is expected to be generated in the Toowoomba Local Government Area," Mrs Reynolds said.

"The InterLinkSQ development incorporates the InterLink Industrial Park, a master-planned logistics, warehousing and industrial estate, with the InterLink Global Logistics Centre, an open access intermodal terminal linking rail with road, sea and air transport," she said.

"InterLinkSQ's strategic location, facilities and transport links provide massive productivity improvements in transport, enhancing the national and international competitiveness of the region's producers and help them access global markets.

"For some businesses, transport costs can equate to about 25 per cent of total sales revenue – we are offering an alternative rail service operating model, providing businesses with a way to increase profits through transport efficiencies.

"We are also working with the Queensland Government and Queensland Rail to get more freight back on rail in 2017, making for a positive news story about rail transport and improving the safety of our region's roads."

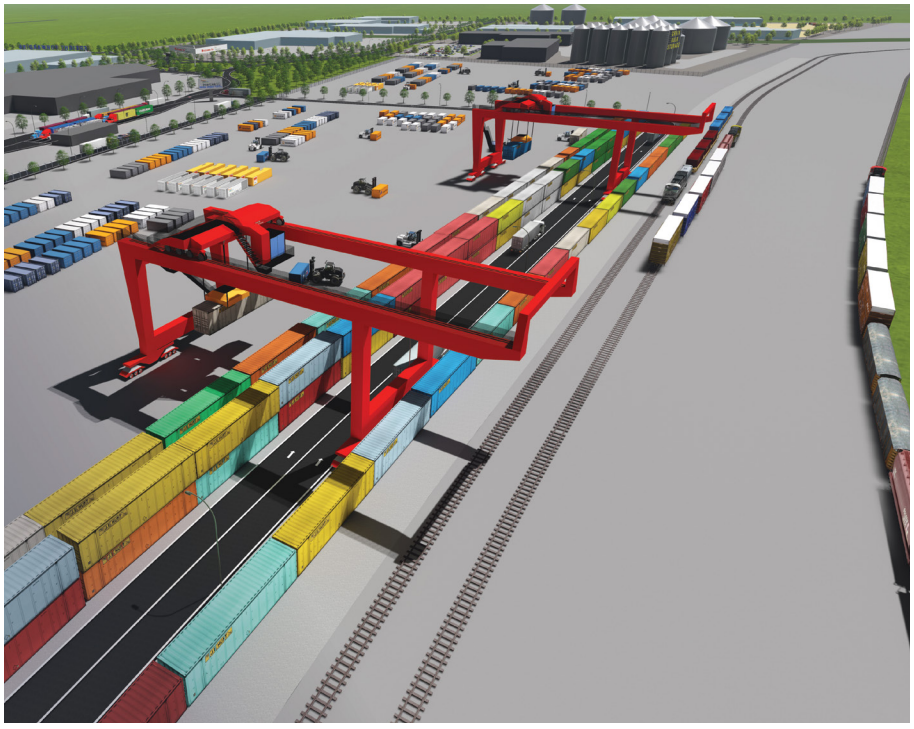
The recent release of the Draft Terms of Reference for the Gowrie to Helidon Section and Helidon to Calvert sections of the Inland Rail is a great step forward for the project and the Toowoomba Region. The Gowrie to Helidon alignment will connect InterLinkSQ to the Inland Rail, unlocking the benefits of Inland Rail for Toowoomba and in a large part, for Queensland.

Michael Kilgariff, Managing Director Australian Logistics Council (ALC) said the ALC has been a long-time supporter of the Inland Rail project.

"Providing a port-to-port rail link for freight between Melbourne and Brisbane is critical in allowing Australia to meet its future freight task. A project of this size needs government support, but just as importantly, backing from the private sector."

"To maximise its productive capacity, we also need to make sure there are efficient linkages to key freight hubs and intermodal terminals along the route. InterLinkSQ is leading the way by establishing a master planned logistics hub along a key section of the Inland Rail route near Toowoomba," Mr Kilgariff said.

InterLinkSQ's General Manager of Commercial & Development, Blair Batts said "The design of InterLinkSQ has considered flexibility in scalability for multiple scenarios over the next 30-year



horizon. This design has been balanced with the commercial reality and consideration of capital costs of commencing a Greenfield Operation as well as minimizing disruption to operations during future construction programs.

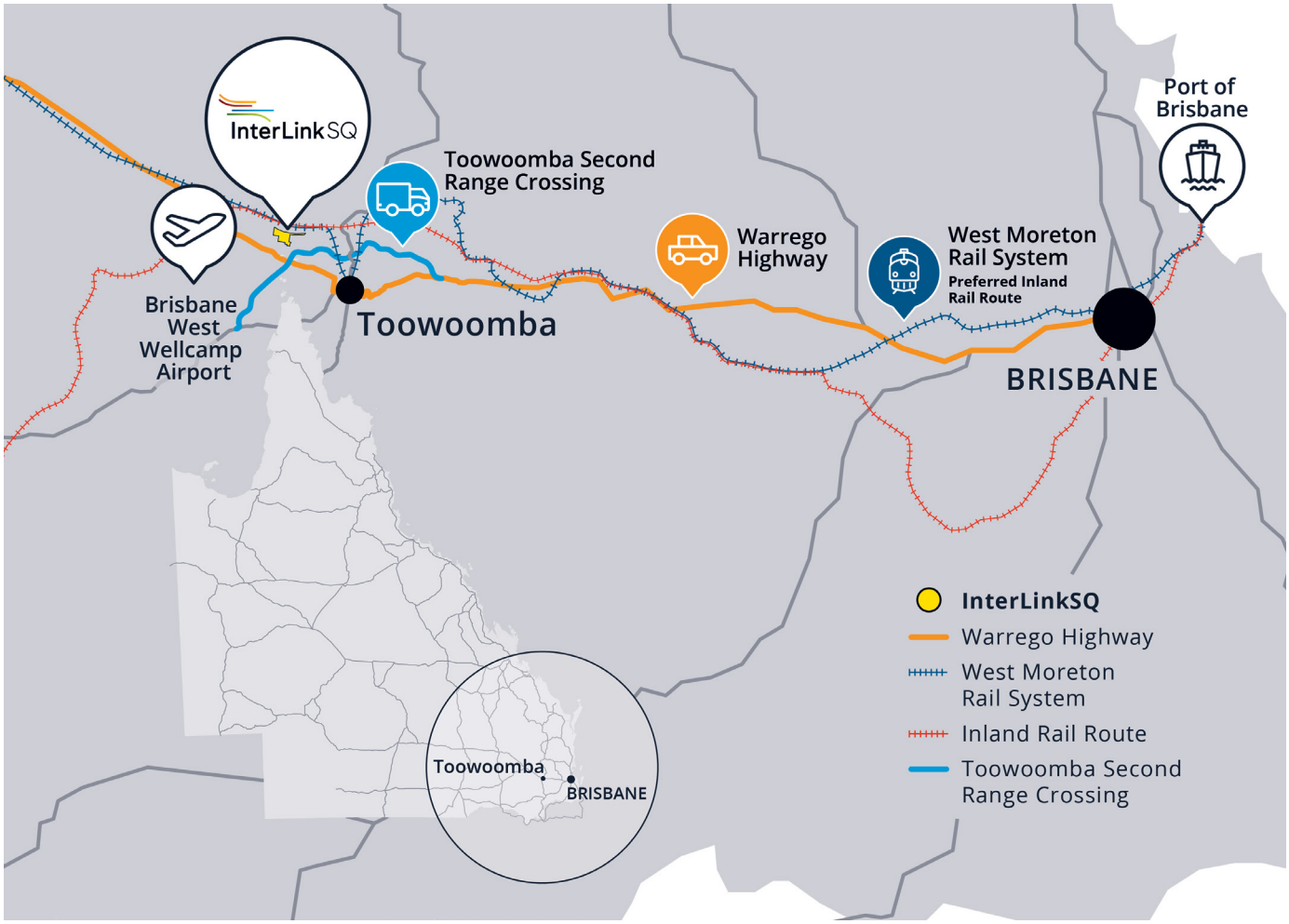
"Design of the new rail sidings had to consider the existing constraints on Western Rail System such as 63 gross tone wagon weights, 650m long trains and narrow-gauge line and the likely operational period of between 5 and 10 years under these constraints as well as the upgrade to infrastructure that will come with the construction of the inland rail.

"Post inland rail wagon weights will be 120 tonnes with double stacked, 1.8km trains on standard gauge. This marked difference in design specs has provided significant challenges, however the development will initially cater for rail 650m, narrow gauge trains with rail formation, ballast, sleepers and rail designed to cater for 128 tonne gross wagon loads as well as dual gauge track to cater for both narrow and standard gauge rolling stock. Loading sidings have been future proofed up to 900m and 1200m in length with provisioning sidings up to 2,200m.

"Importantly, the rail sidings have been designed such that new construction will happen between the initial sidings to be constructed and existing main line infrastructure. This will allow InterLinkSQ to maintain full operation during construction periods with no disruption to customers of the rail terminal or businesses located within the precinct.

"It is important that the design of terminals such as InterLink Global Logistics Centre consider future constraints around key infrastructure feeding the developments from their catchment areas.

"The InterLink Global Logistics Centre is strategically located and will access the Inland Rail route on the Gowrie to Helidon section east of Draper Road, which was designated a coordinated project by the Queensland Coordinator General in May 2017. The primary



feeder road network includes the Warrego Highway from the West and Gore highway from South. Both are currently undergoing upgrade works, duplicating lanes and insuring that the infrastructure has adequate capacity for anticipated future volumes.

"However significant time and effort has been undertaken in the design of last mile infrastructure and intersection design. The primary access to the Global logistics centre will be via a large round-a-bout which provides the key function of allowing a high traffic flow as our volumes through the terminal increase from start-up as well as providing access and turnaround capability for PBS Class 4 vehicles which will operate under permit within the InterLinkSQ precinct. The round-a-bout design provides maximum flexibility and scalability for the design of the intersection to change to cater for increased heavy vehicle volumes and throughput in the future without disrupting existing traffic flows or operations."

The Toowoomba Region is open and ready to do business with the rest of the world. InterLinkSQ is the region's solution for rail, providing a supply chain solution that has been future proofed for anticipated volumes ensuring the capacity of the last mile infrastructure is fit for the task both now and into the future."

First trains out of InterLinkSQ are expected March/April 2018. Further information can be found at www.interlinksq.com.au.

InterLinkSQ

MEMBER PROFILE GLENDA KIRK

MEMBER PROFILE

Glenda Kirk is the Contracts and Project Management Officer at Mareeba Shire Council in North Queensland. She's responsible for managing major infrastructure projects, including the two largest projects that Council has ever delivered: the $18 million Mareeba Airport Upgrade and the $16 million Mareeba Wastewater Treatment Plant Upgrade.

Glenda was born and bred in the Mareeba Shire, having grown up on a tobacco farm near Dimbulah. She says that she is fortunate to have the opportunity to return to her home town to work. "I completed a Bachelor of Civil Engineering at James Cook University in 2005. While I was at university, most of my holidays were spent doing work experience at Mareeba Shire Council. This was my introduction to engineering in the "real world". I mainly worked in asset management and GIS and was guided by some great mentors; however, I didn't really consider public works engineering as a career path at the time."

"At the beginning of my degree, I had big dreams of becoming a design engineer with working from a corner office in a big city, far from the rural setting I now call home. However, as I worked through the structural design subjects, I found that I wasn't really cut out to be a designer! When I finished my degree, I worked as Project Engineer for LDI Constructions, a small civil construction company in Cairns, before being lured to Western Australia by the mining boom in 2007. This was probably the steepest learning curve in my career, having been promoted from Project Engineer to Project Manager only weeks into my new job with Brierty, a mid-tier civil and mining contractor. I managed the civil works contract for the Boddington Gold Mine Expansion project near Perth before moving to Port Hedland to manage construction of a new heavy vehicle access road to the Utah Point Multi-User Materials Handling Facility for Port Hedland Port Authority."

Glenda's first local government experience was in 2010 after she returned to Queensland and took on a short-term role as Contracts Engineer for Cassowary Coast Regional Council. She was involved in delivery of several award-winning projects including the $34 million Innisfail Wastewater Treatment Plant and $26 million Jubilee Bridge replacement. As the major projects were wrapping up, Glenda was offered the opportunity to stay on as Council's Civil Works Engineer. Then in late 2014, she took on a new role altogether after becoming a mum. "No amount of planning or research can prepare you for becoming a parent! When I took maternity leave, I thought I'd spend my "time off" doing short courses and be back at work full-time within 4 months. I'd seriously underestimated how difficult it would be to juggle work with parenthood (and lack of sleep!). It took close to 18 months, and a lot of patience from my manager and colleagues at Cassowary Coast Regional Council before I was back in the office 5 full days a week. I'm grateful that I was given the support and encouragement to return to work at my own pace so I could balance work and family commitments."

In 2016, Glenda returned to her home town to work at Mareeba Shire Council as Contracts and Project Management Officer where she is responsible for delivering key infrastructure projects. "I never imagined that I'd travel to the other side of the country and later return to Mareeba to work alongside the people that helped me at the beginning of my journey as an engineer. This has definitely been one of the greatest highlights of my career. I love that I get the opportunity to work with some great people and contribute to the community as an engineer.

The projects I'm managing are essential for promoting growth and employment opportunities in Mareeba Shire. I hope to continue to work here long after these projects are completed."

Glenda believes that one of the greatest challenges a faced by regional councils with a small ratepayer base is managing the capital and ongoing costs associated with major infrastructure in a sustainable way. Mareeba Shire Council has been successful in securing funding from the Australian and Queensland governments for the Mareeba Airport Upgrade and Mareeba Wastewater Treatment Plant Upgrade projects. She believes that innovation and careful planning during the project delivery phase are vital to ensuring that infrastructure upgrades remain sustainable for Councils to own and maintain.

Glenda has been a member of IPWEAQ since 2013, when she joined as an Under-35 member and attended the State Conference in Cairns. "Being a member of IPWEAQ has provided me with invaluable networking and learning opportunities that have supported me as a professional engineer." Glenda obtained RPEQ status through IPWEAQ's assessment scheme in 2016 and remains actively involved in IPWEAQ as a member of the NQ Branch Committee. "I'm looking forward to many more years of involvement in IPWEAQ and in particular, this year's state conference in Townsville. This year's theme of *'sustainability through inspired leadership and community engagement'* is particularly relevant to the current issues faced by large and small Councils throughout Queensland."

Membership Renewals 2017-18

IPWEAQ membership renewals are due by 1 July 2017.

Members who renew before **30 June 2017** will receive access to the podcast of Stefan Hajkowicz's state conference 2016 keynote address, *'Global Megatrends'* (1 hour of CPD) and can purchase the full set of conference podcasts for $300 plus GST (50% discount).

Subscriptions can be paid online via the Membership Renewal tab in the IPWEAQ portal.

Queensland IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

MEMBERSHIP

A member is anyone actively engaged in the delivery of public works and services in Queensland

QLDWATER CEO'S REPORT

Mid-year means *qldwater* is immersed in events and travel with our Dial Before You Dig Water Connections Tour Week in early May and numerous other activities. This tour has been running for over a decade, and what started as the "STP tour" back in the day is now primarily an opportunity to visit members and give representatives of the Departments of Energy and Water Supply, Environment and Heritage Protection and Health direct exposure to the challenges of managing water and sewerage services in regional Queensland. This year's trip picks up Bundaberg Regional Council, North Burnett Regional Council, Banana Shire Council, Woorabinda Aboriginal Shire Council (with Central Highlands Regional Council), Rockhampton Regional Council, Livingstone Shire Council and Gladstone Regional Council.

The last quarter has involved some assistance with member recovery efforts, but in general, the member response to Cyclone Debbie and subsequent flooding in SEQ has proceeded without much call on the broader ***qldwater*** network. There are some impressive anecdotes emerging and we hope to be able to document and share some of the stories of resilience in future.

It's also been the season for submissions, typically with short timeframes to respond. With limited resources, we try to focus on the issues of greatest potential impacts on members and consult with reference groups where time permits. We welcome and are grateful for the input provided by members, particularly the ERA63 reference group. Submissions are available at http://www.qldwater.com.au/ReviewDocuments, but the following summarises the key issues addressed:

National Water Reform Issues Paper (Productivity Commission)

Urban water is only a component of the review (and sewerage is arguably absent) which requires the Commission to assess the outcomes of the National Water Initiative and related water reform efforts, consider the potential and realised benefits of NWI implementation, consider the scope for improving the NWI and make recommendations on future reform priorities.

qldwater's submission describes the missed opportunity with the NWI and the challenges still facing urban water and sewerage in Queensland, while highlighting the improvements in the sector since the Commission's last major "Inquiry Report into Australia's Urban Water Sector (2011)." It specifically cautions against the introduction of economic reform in isolation, stressing the need for regionally-specific studies around sector governance, levels of service and financial sustainability including asset investment and management strategies.

End of Waste Code for Biosolids (DEHP)

Recent regulatory changes have led to the creation of an End of Waste Framework, which in short, threatens the viability of beneficial use of biosolids across the state. The submission explains current industry practice and the general desire to increase the use of this beneficial by-product of sewage treatment, explaining the implications of a poorly conceived policy which would see enormous increases in landfill.

Offsets Mechanism (DEHP)

Offsets are a way of deferring or avoiding significant capital investment by undertaking works of equivalent environmental benefit. The submission attempts to offer constructive suggestions on improving uptake of the policy for nutrient offsets, by broadening the scope of the possible solutions able to be considered and promoting a shared risk model between members and the State.

Great Barrier Reef Water Quality (DEHP)

The submission reinforces the enormous investment made by local governments in reef

protection through sewerage management and reinforces that establishing minimum standards for pollution loads would create a significant cost for communities but have little impact on the reef. It argues that a better approach would see limited public funding focussed on high priority threats to the GBR while still ensuring local environmental values are not compromised.

Critical Infrastructure (Commonwealth Government)

The "Strengthening the National Security of Australia's Critical Infrastructure" discussion paper explains the federal government's establishment of a "Critical Infrastructure Centre" and register to deal with the perceived risk of cyber-terrorism. The ***qldwater*** submission (constructed with less than 2 weeks allowed for feedback) explains urban water and sewerage management in Queensland and attempts to ensure that this regulated approach works in concert with other statutory reporting requirements to reduce the burden on members.

We have additionally completed Water Skills Partnership submissions for the State's "Advancing Skills for the Future" and "Apprenticeships and Traineeships in Queensland" discussion papers.

qldwater membership requests for 2017/18 will be issued shortly along with our most recent capability statement – hopefully we will soon be able to report a 100% membership response.

Dave Cameron
***qldwater* - The Queensland Water Directorate**

T: (07) 3632 6854
M: 0407 761 991
W: www.qldwater.com.au

MEET THE TEAM

ROB FEARON | Director, Innovation Partnerships
rfearon@qldwater.com.au
Rob commenced with ***qldwater*** in 2006 as CEO and is currently the Director, Innovation Partnerships. Rob's current major project focus is the Queensland Water Regional Alliances Program and he has also recently undertaken significant work on the industry led Code of Practice for Pumping Stations and Networks. Rob has over eighteen years of experience in water industry roles across Local, State and Commonwealth Governments.

MICHELLE HILL | Manager, Skills and Strategy
mhill@qldwater.com.au
Michelle commenced with ***qldwater*** in 2010 and is responsible for managing the Queensland Water Skills Partnership program and industry capacity building projects as well as other strategic projects that emerge. Prior to her role at qldwater Michelle held a number of roles in Business Systems, Training and Industrial Relations in the non-profit sector.

DAVID SCHELTINGA | Manager, SWIM
dscheltinga@qldwater.com.au
David commenced with ***qldwater*** in 2011 and is responsible for managing the State-wide Water Information Management (SWIM) program. David has worked on indicators and assessment frameworks at local, State and national levels for over 15 years and has vast experience with running training sessions and workshops. He currently works remotely from Hervey Bay.

DESIRÉ GRALTON | Manager, Communications
dgralton@qldwater.com.au
Desiré has over fifteen years' experience in Public Relations and Communications with a particular focus on community engagement and corporate publications. Desiré commenced with ***qldwater*** in 2011 and works part-time managing qldwater's website, communications such as newsletters and promotional materials and assisting with event planning and other projects.

HEATHER GOLD | Project Assistant
hgold@qldwater.com.au
Heather manages ***qldwater*** Member Services and stakeholder engagement. She also coordinates conferences and manages events and industry communications including website management. Heather comes from a background in hotel management and project management in real estate and has been with the Queensland Water Directorate since 2006.

RYAN COSGROVE | Project Coordinator and Researcher
rcosgrove@qldwater.com.au
Ryan is ***qldwater's*** newest employee commencing in May 2017 as a project coordinator and researcher. Ryan's currently undertaking a major research project for the Queensland Water Regional Alliance Program and the administration of the South-East Queensland water design and construction code. Prior to joining ***qldwater*** Ryan worked within the fast-moving consumer goods industry.

ALGAE TRIALS PROVIDE MORE BANG FOR BUCK

WATER ARTICLE

Each year *qldwater* hosts the Dial Before You Dig Water Connections Tour, a one week roadshow where government and other utility representatives have the opportunity to gain first-hand experience with regional and remote water and sewerage service providers. This article provides a brief case study of one of the activities which has arisen as a direct result of the tour.

In 2016, Townsville City Council's Mark Vis and Steve Gray joined the North Queensland tour group and mentioned in passing a James Cook University (JCU) algal harvesting trial at Cleveland Bay Wastewater Treatment Plant (WWTP) to an interested Wayne Saldumbide from Burdekin Shire Council (BSC). Mark is the current chair of *qldwater's* ERA 63 Reference Group.

While the algal system is continuing to be evaluated in Townsville, BSC's Ayr/Brandon WWTP was facing a potential upgrade and the smaller scale had the potential to make the technology viable and cost-effective. With the arrival of Shaun Johnston as the new Manager Water and Wastewater at BSC, council agreed to a trial.

Algae harvesting trial from Cleveland Bay, courtesy MBD

According to Mr Johnston, ageing sewage collection and treatment infrastructure, increased environmental concerns around nutrient pollution sources in reef catchment areas, high energy, capital and operating costs of conventional treatment options, and limited funding availability meant there was a strong need to look at other fit-for-purpose solutions to maximise environmental benefit while minimising costs to the community.

"As no viable answers were available, BSC decided to look outside of the box for solutions and partnered with JCU and MBD Energy Ltd to trial the use of macro algal treatment to remove nitrogen and phosphorus from wastewater streams at the Ayr/Brandon WWTP," Mr Johnston said.

The technology

Low-energy High Rate Algal Ponds (HRAP) are constructed through which wastewater flows, allowing freshwater macro algae to grow and ultimately be harvested.

The Ayr/Brandon WWTP discharges 1.6 ML/day-1 with an average concentration of total

nitrogen (TN) of 11.7 mgL-1 and total phosphorous (TP) of 8.8 mgL-1. Should licence standards change, the treatment of this wastewater to contemporary standards would likely require discharge levels of <5 mgL-1 TN and <2 mgL-1 TP.

To determine the capacity to deliver these reductions using treatment with the algae technology, trials were conducted at JCU with wastewater from the Ayr/Brandon WWTP over a five week period using a seven day growth cycle. Algae was cultured directly in the wastewater from the WWTP with no added nutrients and was harvested after seven days with the changes in water quality measured. This was replicated five times with the significant reductions in nutrient concentrations presented in the Table below.

	Concentration change	% Reduction
Total Nitrogen (TN)	9.7 mgL-1 to 1.5 mgL-1	85%
Dissolved inorganic nitrogen (DIN)	8.2 mgL-1 to trace levels	99%
Total phosphorous (TP)	8.2 mgL-1 to 2.5 mgL-1	70%
Reactive phosphorous (RP)	7.5 mgL-1 to 1.7 mgL-1	77%

The daily growth rate of the macro algae was 18.8 g dry weight per m^2 over the period of the trial or the equivalent of 66 tonnes of macro algae per Ha per year.

Translating this to the full scale volume treated at the Ayr/Brandon WWTP (1.6 MLday-1 discharge) results in a required treatment footprint of 3 Ha of macro algal treatment facilities which would result in a retention time of approximately six days with the removal of >99% of DIN and 85% TN, and 77% RP and 70% TP. Discharge water quality would almost meet DEHP standards (5N/2P) and this water could be reused for irrigation or discharged with significantly reduced environmental impacts.

The treatment facilities would produce more than 150 tonnes of dried macro algae per year which would recover ~ 4.5 tonnes of nitrogen and 1.5 tonnes of phosphorous. The harvested algae has the potential be used as a protein and mineral animal feed supplement.

The pilot revealed that the addition of a sand pre-filter would increase the available nitrogen and phosphorus for the process, allowing better results to be achieved in practice than were measured in the trials.

BSC estimated a capital investment of $30 million would be required for the Ayr/Brandon WWTP to meet the current standard DEHP 5N/2P licences with conventional technologies. In contrast, the indicative capital cost of a 3 Ha facility using the algae-based technology is $1.5 million. The projected annual operating cost of the plant would be $300,000 which would exceed costs for a BNR plant, however the carbon emission reductions through reduced energy consumption show particular promise, and capital costs are a fraction of the alternative.

Overcoming barriers

The technology and trial formed the basis of BSC's submission to the Department of Environment and Heritage Protection's (DEHP) review of flexible nutrient offset arrangements.

Director of Innovation Partnerships at *qldwater*, Dr Rob Fearon prepared a report published in 2016 which outlined options for managing future loads to the Reef from smaller WWTPs in Reef catchments which clearly demonstrated that the cost of upgrading these smaller plants could not be justified and that smarter alternatives to achieve the same environmental benefit needed to be considered. According to the report, nitrogen released from WWTPs represents less than 4% of total catchment loads and focusing on priority sources of the 96% of non-urban load would have greater and more rapid benefits for the health of the Reef.

"Applying this 'smarter investment' principle where there are still going to be requirements for plant upgrades or renewals and linking to nutrient offset approaches is critical to achieve the best possible result for the Reef and for Queensland communities," Dr Fearon said.

Mr Johnston believes that the uptake of these sorts of innovative technologies should be incentivised – supported by both state capital investment and a link to the environmental regulator.

"This is a great example of something which is offering a low-cost, fit for purpose solution which clearly has limitations for some of the larger WWTPs but offers huge potential for the smaller ones.

BSC is sticking its hand up for the first full-scale implementation, but our council needs to be confident that our proactivity will be recognised and supported by government stakeholders willing and prepared to share the risk in order to realise the significant benefit," Mr Johnston said.

The DBYD Water Connections Tour
This is one of many examples of the benefits of water industry information sharing and innovation and encapsulates the goals of the Tour. We hope that in the coming years we are arranging industry visits to the full-scale plant and more showcases of other innovative technologies.

qldwater works to strengthen the Water Industry, through leadership, support and representation for its Queensland members. We provide technical input into policy development, guidelines, and coordination to respond to the needs of a changing industry. www.qldwater.com.au

qldwater Events

19 July
Mackay | Mini-Conference

6-7 September
Innovation Forum | Brisbane

www.qldwater.com.au/events

Partner Benefits

STATE CONFERENCE
One booth and priority allocation of location including two full registrations (value $4,000)
Chair a session in a stream (value $1,000)

BRANCH CONFERENCES/EVENTS
Opportunity to exhibit at up to four regional events (either IPWEAQ branch conferences, professional development courses or workshops) including two full registrations per event (value $4,000)

plus

- Your logo on the IPWEAQ website, linked to your website.
- Contribute a half-page advertorial for one of our quarterly issues of Engineering for Public Works.
- Your logo displayed in each quarterly issue of IPWEAQ's e-journal.
- 10% discount on all sponsorship opportunities at state and branch conferences.
- Use of our IPWEAQ Partner logo for your website, marketing collateral etc.
- Your logo on our conference registration online site and our conference App linked to your website.
- Discounted rates to purchase IPWEAQ technical products including Standard Drawings, Complete Streets, QUDM etc.
- Your employees will receive a 10% discount on their IPWEAQ membership. If they don't wish to become a member, they are still eligible to attend all our events and courses at member rates.
- We invite you to share your digital content on all IPWEAQ social media platforms including LinkedIn, Facebook and Twitter.

Partner | $7,500 (plus GST)

Upgrade to Principal Partner for greater exposure.

For more details contact
Carlie Sargent on 3632 6801 or Carlie.Sargent@ipweaq.com

IPWEAQ PARTNER BENEFITS

CQ BRANCH PRESIDENT'S REPORT

The 2017 CQ Branch conference held in Yeppoon, 23-25 March, hosted by the Livingstone Shire Council (LSC) was one of our most successful branch events to date despite the threat of Cyclone Debbie. 150 delegates and sponsors ensured it was an event to remember although Debbie was successful in cancelling the golf day.

The first day started with the Technical Tour which, despite the torrential rain, took delegates to The Keppel Kracken, Wreck Point Lookout and the Centenary of ANZAC. Those who braved the elements on tour were joined at the Emu Park RSL by IPWEAQ Partners, Supporters and staff for a Welcome BBQ.

The following day marked the official conference opening with Livingstone Shire Council Deputy Mayor, Councillor Graham Scott leading a strong program with key learnings. Councillor Graham's presentation emphasised the importance of cultural change, particularly culture that is embedded in systems and processes. The mayor, Councillor Bill Ludwig delivered the first keynote presentation, 'Teamwork and Quality of Subsidy Applications'. Ten technical papers were delivered throughout the day including, 'Limitation of Liability Clauses in Contracts" (Jason de Lacy, McCullough Robertson), 'Panorama Drive - a Royalties for the Region Project' (Phil McKone, LSC, Craig Jepson, Jespson Consulting and David Cugola, Siris & Associates). Greg Janes of Calibre Consulting delivered a paper on Yeppoon's multi storey car park. A presentation on precast concrete bridges by Stephen Farrington, Humes and Guy Johnson, VEC Civil Engineering concluded the program.

A popular paper and runner-up for Best Paper award was Queensland Water Directorate's Dr Rob Fearon who delivered a paper on 'The History of Urine'. Well done Dr Rob Fearon for an entertaining presentation.

The Best Paper was awarded to Celisa Faulkner for her account of Gladstone's economic growth and subsequent decline. Celisa reflected on the efforts of council's development and operational teams, highlighted a number of interesting statistics, opportunities and challenges, and explored the aftermath of the boom.

The conference was wrapped up with a highly enjoyable dinner with local actors from the Footlights Theatre Restaurant entertaining us. Mayor Bill Ludwig aka Billy the Mountain also stepped in as DJ for a memorable Karaoke session which some delegates continued at the local Strand Hotel after the event.

The conference brought together delegates from local and state government, consulting engineers and contractors and trade suppliers.

Thank you to all who attended and a special thank you to our gracious hosts, Livingstone Shire Council and chief organiser, Phil McKone who did an exceptional job. A special thank you once again to our valued sponsors and Partners for their continued support of IPWEAQ.

Planning for the 2017 Technical Forum is progressing, to be hosted once again by Hastings Deering in Rockhampton late November. We will be calling for papers in August.

The inaugural IPWEAQ Western Roads Symposium will be held in CQ, 6-7 September, hosted by the Longreach Regional Council and supported by TMR.

Our Partners, McCullough Robertson Lawyers will also be holding a construction workshop in Rockhampton, 19 June. McCullough Robertson are also delivering the revamped IPWEAQ Roles & Responsibilities seven-part webinar series commencing 15 June 2017. Please register early for this invaluable course on what is expected of engineers and professionals working in local government.

The CQ Branch conference for 2018 will be held in Barcaldine 14-16 June hosted by George Bourne and Associates.

Looking forward to seeing you at the state conference in Townsville in October and at the CQ Technical Forum in November!

Craig Murrell
CQ Branch President

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

IPWEAQ Knowledge Centre

The new IPWEAQ Knowledge Centre is an essential resource for anyone involved in public works in Queensland.

The Centre is fully searchable by title, speaker/author, subject, keyword, event or date. Resources available in the Knowledge Centre include:

1. Podcasts of state and branch conferences (accessible only to paid conference delegates or conference proceedings subscribers). The podcasts are accompanied by the presenters' PowerPoint presentation so you can follow the presentation while listening to the podcast.
2. Podcasts with accompanying video of all other IPWEAQ events
3. Papers submitted for state and branch conferences
4. Articles published in our quarterly e-journal, Engineering for Public Works
5. Articles of relevance to Queensland practitioners sourced by our Information Resources Manager from other states/territories and internationally.
6. IPWEAQ technical publications including Standard Drawings (accessible only to subscribers)
7. Podcasts of interviews of delegates taken at state and branch conferences
8. Photos of delegates taken at state and branch conferences

The Knowledge Centre is only accessible to IPWEAQ members. Conference podcasts/videos are only accessible to paid conference delegates. Technical publications are only accessible to subscribers of our technical products.

Join IPWEAQ today to access this vital resource for the public works sector in Queensland.

www.ipweaq.com

WHY DO WE NEED A KNOWLEDGE CENTRE?

KNOWLEDGE CENTRE

Mark Lamont,
Information Resources Manager

IPWEAQ has developed a digital Knowledge Centre, designed to serve the specific needs of members and those involved in the public works sector in Queensland. The intention has been to create a place where anyone involved in public works engineering can go to access and share a wide range of information including technical reports, collections of standard drawings, podcasts and papers arising from various conference proceedings, and articles of relevance from scholarly journals and daily media outlets.

The Knowledge Centre has been developed as an information repository in keeping with the rapidly changing information landscape of contemporary society. The early 21st century is commonly described as the knowledge era. The term was popularised, with considerable prescience, nearly fifty years ago, when Peter Drucker employed it as a major descriptor in his book, The Age of Discontinuity, from 1969. More recently, due to a fundamental shift in the global perception of information handling, the term has proliferated across every discipline and profession. It is now widely utilised in theory and practice within the sciences and humanities, in education, the media, and wider society in general. One of the central characteristics of this new era is that knowledge is perceived as an important, rapidly growing economic commodity, replacing the older definitions of resources encompassing tangible goods and services only. For this reason, knowledge management has become an integral part of overall asset management within any organisational context.

There has been an equally profound shift in the way we think about the spaces in which information is contained. The knowledge era spells the end for the centralised immobile building in which all information is stored, where users come in order to access the documents and books they require. Information now inhabits a space which that older physical model can no longer accommodate. The capacity of digital information storage has become so great that it is difficult to express in concrete terms. If we take the basic measure as being a stack of books that reach from the surface of the Earth to the sun, we'd need four and half thousand such stacks to represent our present capacity to store information. That equates to about six hundred and seventy five thousand million kilometres of books. That's a lot of books, and given the knowledge era is still very much in its infancy, information capacity is expected to rapidly multiply in the coming decades.

One of the principle needs of modern organisations therefore, is to take responsibility for their own information; for its collation, safe storage, and dissemination. The sheer volume of information made available since the inception of the internet has made it impossible for single-entity institutions such as libraries to curate it all.

Accordingly, libraries throughout the world, academic and public, as they transform to digital collections, have been instrumental in facilitating the shift to self-reliance. There has been a call, from the American Library of Congress down, for specialised

institutions to develop their own repositories, to complement the national public holdings. It has become incumbent upon professional and commercial organisations to assume responsibility and control of their own specific information needs via smaller self-contained knowledge centres. Knowledge is no longer kept under lock and key by specialised custodians, but instead must be available to all members of an organisation whenever, and wherever the need arises.

The information contained in the IPWEAQ Knowledge Centre is collected from external data bases, as well as from internal knowledge sources. It is structured in a way that allows users to access information in documented form but also to identify and connect with other people within the organisation who have the experience and expertise they are seeking. In practice it means individual members do not need to search and sift through the vast amount of information available in most subject areas of public works engineering. The Knowledge Centre represents the finished product of that searching, and provides a body of information designed to meet the specific needs of the public works engineering profession that IPWEAQ serves.

It is important to note that the Knowledge Centre provides, not only a means of collection and managing information but a vehicle through which that information can be shared. This last function needs emphasising because sharing knowledge is an essential element of collaboration, and there is no work in which collaboration plays more vital a role than in public works engineering. No knowledge centre can be truly effective and add to the work of the organization without continuing input and participation from the community it serves. Based on those principles, IPWEAQ hopes that the Knowledge Centre develops into a space of information engagement between users so that it becomes a source of knowledge generation, as well as a central storage facility. It is an open information space that is designed to encourage all users to make suggestions in regard to papers they may want to share, or any other material they think would be of benefit to the engineering community. We'd also welcome any comments and practical recommendations from users about their experience in utilising the space. For first time users, we have provided some general information on the IPWEAQ homepage, an instructional video, and a detailed 'help' menu within the space itself.

Please don't hesitate to contact me at Mark.Lamont@ipweaq.com with any queries or suggestions in regard to Knowledge Centre.

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

IPWEAQ PORTAL

Gateway to your profile, professional development and resources

The IPWEAQ portal is your gateway to update your contact details, register for training courses and view your course and CPD records.

Members can access member-only content including the Knowledge Centre and renew their membership and view membership history (coming soon).

Access the IPWEAQ Portal at:
https://ipweaq.eventsair.com/MemberPortal/ipweaq-master-contact-store/ipweaq-member-portal

SWQ BRANCH PRESIDENT'S REPORT

Our next SWQ Branch conference will be held in Goondiwindi, 15-16 March 2018.

A Call for Papers will be issued in November and I encourage members to submit an abstract for the program. There are a number of benefits to you personally and professionally in preparing and presenting papers at our conferences – see page 67 of the journal and '10 Reasons for Presenting Papers at IPWEAQ Conferences' for example, writing an abstract (up to 500 words) helps you develop the necessary skills to write concisely and being able to summarise your position, story or argument to those who may not have a lot of time eg your CEO. Presenting at an IPWEAQ conference not only earns you up to 45 CPD hours but it's an opportunity for you to advocate for our profession, increase your professional profile and build on your reputation.

As mentioned in the President's Report, I am the IPWEAQ representative on the NAMS Council which will be chaired by Murray Erbs following Peter Way's retirement from the role after 12 years. I encourage members with a keen interest in asset management to participate in the proposed NAMS Queensland Advisory Group (NAMS-Q) so that we can start to tackle some of the issues identified in recent reports from the Queensland Audit Office (QAO).

Please complete the Expressions of Interest form on our website if you would like to be involved. The NAMS-Q Advisory Group will be launched by our president, Joe Bannan at the state conference in Townsville, 24-26 October 2017. I look forward to seeing you then.

Stephen Hegedus
SWQ Branch President

Branch Scholarships

Each of our four branches (NQ, CQ, SEQ and SWQ) offer scholarships for disadvantaged members to attend the state conference.

Up to $1,000 is available to cover registration fees, travel and accommodation.

For more information or to apply for a scholarship, please visit **http://www.ipweaq.com/scholarships**

Queensland IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

Our members enjoy a **strong sense of community through our proactive branch network.**

TOWARDS MAKING QNTIME DATA PUBLICLY AVAILABLE

The Queensland Native Title Information Management Environment (QNTIME) was created in 2006 by the Department of Natural Resources and Mines (DNRM). QNTIME is a computerised system that assists in decision-making when dealing with the state's land, water and other natural resources. This is achieved by enabling the system to record textual data in relation to any native title interests and displaying that data spatially over the Digital Cadastral Data Base. The data that is included in this system are the native title claims, Indigenous Land Use Agreements, native title determinations, representative bodies, native title acquisitions, native title research and conclusions of extinguishment. This data is currently available to all Queensland State Government departments and several government owned corporations.

DNRM are currently conducting a feasibility study that includes determining whether certain data from QNTIME can be released for public use. The objectives of this project include:

- Identifying what datasets can be released for public use while remaining in accordance with DNRM's Open Data Strategy.
- Developing strategic options to guide the public release of QNTIME data.
- Determining what policy and relevant legislative changes are required to make QNTIME data publicly available.

Please complete the survey to assist DNRM determine whether QNTIME's data would benefit other agencies outside of the Queensland government and who make native title assessments. Your response to this survey will assist in shaping the public release of this information system for native title parties and prospective users. For more information on this project, please contact Georgia Power at georgia.power@dnrm.qld.gov.au.

COMING SOON!

IPWEAQ's Interactive native Title & Cultural Heritage Compliance System.

This project in conjunction with the Central Highlands Regional Council and Gilkerson Legal aims to create an e-solution that replicates the intent of the current paper based Native Title and Cultural Heritage compliance systems.

The system will offer an intuitive interface that maximises efficiencies and provides organisations with a high level of assurance that potential risks have been mitigated. The efficiency gains will be directly linked to the ability to interface easily with corporate systems and internal and external data sets in an end-to-end process. This extends from in-the-field inspections through to regulatory reporting requirements.

EMERGING LEADERS SERIES

MEMBER PROFILE

Craig Heck
Design Engineer, Scenic Rim Regional Council

Craig Heck is IPWEAQ's 2016 Young Engineer of the Year. Here he talks about the value of his career experiences so far, from starting out as a civil designer and working his way through formal study to achieve his current role of Design Engineer for Scenic Rim Regional Council.

Q. Please summarise your career to date.

A. My career path started in grade 10 when I decided I wanted to be a Surveyor. I undertook work experience with a local surveying firm and found this enjoyable and really liked the outdoor component. However, I realised I wanted to have more involvement in determining the outcome of the projects. This lead me to discover the field of Civil Engineering and the role of Designer and Engineer. These roles provide a good mix of determining the outcome of projects but also field work.

Once I was sure of this career path I undertook work experience at Boonah Shire Council in grade 11, which confirmed my desired to work in this field. I then finished grade 12 and proceeded to undertake the Advanced Diploma of Civil Engineering at Southbank TAFE (now the Associate Degree in Civil Engineering). I chose this course as it had a very strong focus on drafting in the first year and more focus on design and drafting combined in the second and this was the hands-on type of role I wanted. This course has also turned out to provide me with a very solid foundation as an Engineer, as AutoCAD, drafting and 3D modelling is not taught in enough detail in the Bachelor of Engineering. These skills have proved to have been very valuable for me over the years.

Following this I transferred into the Bachelor of Technology in Civil Engineering at QUT. I transferred to this course to further my skills and knowledge as a designer. During this degree, I secured my industrial experience at Boonah Shire Council. I then graduated from this degree and was offered a casual role as Design Officer at Boonah and at the same time transferred over to the Bachelor of Civil Engineering part time whilst working fulltime. After a short period, I secured a fulltime positon as Design Officer and worked in this role for a further two years' part time whilst gaining design and drafting experience on a lot of different projects. During this two year, period I realised that part time study was going to take me too long to complete. I chose to resign from my fulltime role, return to casual hours and complete my degree fulltime, whilst continuing to work as many hours as I could. I was very appreciative of the support my employer provided me during this stage of my career to enable me to complete my degree in the shortest possible time.

My completion of the Bachelor of Engineering coincided with the amalgamation of Boonah and Beaudesert Shire into Scenic Rim Regional Council and I was offered the role of coordinator of the Design Office supervising Design staff and the Design Program. I worked in that role for a few years until Council restructured and my role was expanded to my current role, still as Design Engineer coordinating the Design Office, however the Survey section, Operational Works and Traffic Safety functional areas were also added to my responsibilities.

Q. What's been your most significant career highlight?

A. Graduating from the Bachelor of Engineering. It was significant because it was the culmination of all the long hard testing hours of study across all the degrees I completed over 7 years. It was a

very rewarding feeling and a great relief to finally finish. The study itself is often more trying and testing than the work itself that follows. But it is worth it in the end.

Q. What do you find most satisfying about working as an engineer in public works?

A. The thrill of seeing a finished project and the improvement it has made for the community. Being able to drive over the new road for example and know that you were involved, made decisions about the outcome and solved a lot of little problems and issues along the way, that are not always known or appreciated by everyone, is very satisfying.

Q. What was your response to being named IPWEAQ Young Engineer 2016?

A. I was very surprised, as I had no idea I was nominated. I am very grateful to have been nominated and selected by my peers as Young Engineer of the Year. I'm also grateful for the acknowledgement I received within the community by recognition in the local papers. Credit is due to the IPWEAQ for offering the yearly excellence awards, both people and projects, that then go back out into the community to positively promote the public works engineering profession.

Q. Are there any specific challenges for young people working in public works engineering and what do you think could be done to address those?

A. I don't think there are any specific challenges. I believe young professionals are very well accepted and promoted by more experienced Engineers as they realise young Engineers are the future of the profession and are more than willing to pass on their skills and experience for the betterment of the profession. More experienced Engineers also realise that young Engineers have something to offer them as well in a new way of thinking instead of "we've always done it this way" and young Engineers are often more up to speed with the latest emerging trends. In my experience, as long as the young Engineers always act ethically, with respect and acknowledge what they don't know but commit to continuous improvement, then they will always be widely accepted, respected and helped along the way.

Q. What would be the one piece of advice you would give to other young people considering careers in engineering and public works?

A. Find something you love doing and you'll never have to work a day in your life.

Q. How has being a Young IPWEAQ member helped you in your career?

It has helped me realise that as Engineers in public works we are all in the same boat when it comes to problems and issues that we have to deal with on a daily basis and that you're not alone and there are generally others that are having or have had the same issues.

Q. What are the key benefits of your IPWEAQ membership?

A. Having the ability to catch up with other engineers and product and service suppliers at conferences and hear from them about the projects they've been working on both formally in presentations but also informally in a relaxed environment at social events.

Nominations for the 2017 IPWEAQ Excellence Awards close on 28 July. Find out more and submit your people and project nominations at http://www.ipweaq.com/awards.

SEQ BRANCH PRESIDENT'S REPORT

2017 has been an exciting year for me. I retired from my position at Redland City after a 40-year career including 30 years in local government across three states and five councils. As is often the case, I'm busier than ever but still positively managing my work/life balance.

The SEQ Branch continued to keep me busy leading up to the branch conference held at the Logan Metro Indoor Sports Centre, 9-10 May. The program began on Tuesday 9 May with a technical tour of the Logan Metro Sports Park, currently under construction and consistent with the conference theme, 'Building on Smart Solutions'.

The conference was officially opened following the Tech Tour with a welcome address from Logan City Council mayor, Councillor Luke Smith. This followed a keynote presentation, 'Technology and Transport - from horse and cart to smart places (learnings from the IPWEA International Study tour)' from Andrew Ryan, Director Infrastructure Services, Sunshine Coast Council and recipient of the 2016 International Study Tour scholarship.

The Wednesday morning program was opened by Silvio Trinca, Director Road & Water Infrastructure, Logan City Council. Silvio discussed the use of smart technology for flood management and how this was utilised in recent floods in Logan. It was great to see two of our most senior SEQ engineers taking the time to present. I would also like to express my appreciation to fellow IPWEAQ Board members and Foundation trustees for attending the branch conference.

The second day the program was split into four streams on adaptation, technology, assets and operations. Presentations delivered in the streams included papers from local councils, TMR, the AARB Group and IPWEAQ Partners: McCullough Robertson, Fulton Hogan and Lion Systems.

Professor Jean Palutikof, Director National Climate Change Adaptation Research Facility (NCCARF) closed the conference program with a presentation on 'Solutions for climate change in a rapidly changing world'.

Thank you to all those who attended the SEQ Branch conference in Logan including our dedicated Partners and exhibitors for their valued ongoing support of IPWEAQ. A special thanks also to our sponsors, Logan City Council, C-M Concrete and EJ Australia.

I will be stepping down from the position of SEQ Branch President and from 1 July, step into the shoes of Peter Way PSM as Chair of the NAMS Council. I consider it a great honour to have been offered Peter's role following his retirement and aim to continue the advocacy of asset management to the public works sector. Peter and John Howard (who is also standing down) are leaving IPWEA with an outstanding reputation and international recognition as leaders in the management of public works infrastructure.

I would like to thank all SEQ branch members for their trust and support over the last four years during my time as your branch president. As mentioned above, I am seeking a more reasonable balance between work and life and the part-time role of Chair of NAMS allows me to stay in touch with the sector, the institute and our members. The NAMS Council has a roadmap for reviewing and further developing the suite of tools that assist practitioners in their roles. Advocating for asset management is another comprehensive topic I will talk about at another time. In the meantime, I look forward to seeing you at the 2017 IPWEAQ state conference in Townsville, 24-26 October.

Murray Erbs
SEQ Branch President

CONGRATULATIONS TO THE BRANCH CONFERENCE BEST PAPER AWARD RECIPIENTS FOR 2016-17

NQ BRANCH CONFERENCE, LUCINDA

August 2016

NATASHA MURRAY

Cairns Regional Council

Transport Asset Revaluation

SWQ BRANCH CONFERENCE DALBY

March 2017

AARON MEEHAN

Western Downs Regional Council

WDRC Works 'Future Fit' Reorganisation

CQ BRANCH CONFERENCE YEPPOON

March 2017

CELISA FAULKNER

Gladstone Regional Council

Boom Went Development in Gladstone Region

SEQ BRANCH CONFERENCE LOGAN

May 2017

ARI CRAVEN

Engeny

Australian Rainfall & Runoff 2016 – Local Government & Development Perspectives

TEN REASONS FOR PRESENTING PAPERS AT IPWEAQ CONFERENCES

1. Earn up to 45 CPD hours for preparing and presenting a paper at an IPWEAQ conference.
2. Advocate for your profession – public works engineers tend to underplay the great work you do. Presenting to your peers will help you to convey the importance of your work to a wider audience.
3. Increase your professional profile, build on your reputation and stand out from the crowd in a tight employment market.
4. All papers delivered at IPWEAQ conferences are included in the IPWEAQ Knowledge Centre searchable by your name – amass a collection of papers to establish your expertise in a particular area. And enhance your resume with a section on papers delivered at conferences.
5. Develop your ability to write succinctly, summarising your presentation with an abstract of up to 500 words.
6. Develop your skills at formulating a coherent story on your project or case study.
7. Share your experiences with fellow practitioners to benefit their learnings.
8. Enhance your own learnings as you undertake research for your paper and answer questions from delegates.
9. Public speaking is daunting for everyone but the more you do it, the better (and calmer) you will become. This will help you when presenting and influencing internal and external stakeholders in your role.
10. Build connections – delegates will want to discuss your presentation with you during the conference breaks.

YOUNG IPWEAQ CHAIR REPORT

The past few months have seen many exciting initiatives being developed by the Young IPWEA committee which align with our strategic objectives. These objectives are all about supporting you with building a successful career through opportunities for developing your networks and relationships (local to a global scale), continued learning, getting involved in something greater than your immediate work and achieving excellence for your community.

This probably doesn't mean much to you other than some wordy words however let's flip it and break it down to what we want you to gain.

1. Opportunities for Career Progression
2. Learning new skills and knowledge
3. Connecting with people that can help achieve the above.

This is something that is always on my mind and remains the primary reason I contribute to the IPWEA family. It is also at the forefront of the initiatives put forward by the YIPWEA committee. As mentioned before, the YIPWEA team is developing a number of initiatives with the first of these to be launched in August at the IPWEA conference at Perth so watch this space.

On a local front, we are certainly in exciting times with change a prominent feature. The IPWEAQ board elections and Expressions of Interest for Branch Committees are in full swing and I believe that there is a great vibe to this process. There is so much encouragement for fresh new thinking and direction for IPWEAQ at a state and local level. I think this is a huge opportunity for young members to not only receive the benefits of what will fall out of these times but also to help steer it.

Often we look at leading, mentoring and teaching as being from 'more experienced' to 'less experienced' however I think we have it wrong. As young professionals we have so much to share too. Like what you say?

Technology, soft skills, innovation, marketing and certainly more than just 'engineering'.

The younger generation have skills that either weren't around in the 'good old days' like social media or have changed so much over time that in effect it is a whole new world today. Then there are the leaps and bounds in the technical world of engineering that we are all immersed in.

So going forward you will see a lot more coming your way trying to pull out the ideas and knowledge that you have so we can build on it and share to all members. All YIPWEAQ members (under age 35) will be invited to join me for a teleconference to workshop our ideas. Also there will be our annual Young Member survey undertaken in July/August that hopes to gauge how you want to be engaged with and areas you would like to see more development. Finally, I am making a big push to ensure there are more opportunities for our young members to be a part of the conferences, forums and workshops either as delegates or presenters. Can I just say that, as daunting as presenting sounds, it is the easiest way to connect with other professionals; to give a little knowledge and receive a truck-load back.

I can highly recommend being actively involved with our IPWEAQ family either on a branch committee or contributing through surveys, workshops, conferences etc. Come join me and please always feel free to contact me at any time for a chat.

Celisa Faulkner
YIPWEAQ Chair

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

INFORMS. CONNECTS. REPRESENTS. LEADS.

Young IPWEAQ program

1. University outreach program
Final year civil engineering students with a keen interest in public works will be chosen by their participating university to receive a complimentary registration to the IPWEAQ state conference (valued at $1,980). Following the conference, students will submit a report of up to 1,000 words on the conference, the program and streams, their learnings, interactions and their overall experience being a part of our community. These papers will be published in the December issue of Engineering for Public Works. Participating universities include JCU, CQU, UQ, USQ, QUT.

2. Young Engineer of the Year award
Announced each year at our excellence awards.

3. Career Development
Please contact Craig Moss, IPWEAQ Director Professional & Career Development to discuss your career in public works. Craig will devise a program for you including a professional development path, mentoring and steps to progress to RPEQ and maintenance of your registration.

4. Futures Challenge
It is important to ensure a transfer of knowledge and experience between our senior members and our members Under 35 and those entering the profession. Final year students studying engineering and related disciplines will be invited to present their thesis or research project on poster boards at the 2017 IPWEAQ state conference trade exhibition. Delegates will offer advice and feedback to students with the top three projects chosen by a panel of judges. The finalists will deliver a 10-minute presentation in the auditorium in a plenary session and delegates will vote on the best presentation using the conference APP.

5. Networking
IPWEAQ offers multiple opportunities each year for members to network with peers including branch conferences and Technical Forums and the state conference which features innovative networking forums.

6. Scholarships
Various scholarships are available each year including branch scholarships and international study tours for members to travel abroad to review innovative solutions to public works issues and their applicability to local conditions. Please refer to our Scholarships and Awards program.

young IPWEA
Queensland
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

Members under age 35 receive a 40% discount on their membership (valued at $110) and a 20% discount on their registration for the state conference (valued at $300).

www.ipweaq.com

NQ BRANCH PRESIDENT'S REPORT

It is less than five months to the IPWEAQ state conference to be held in the north of the state this year. It is challenging for us to get together given the distances we must travel so this is an excellent opportunity for NQ Branch members to connect. Last year, eight of our 25 branch councils were represented at the state conference in Brisbane and we are hoping to see more this year in Townsville, 24-26 October. If you need to submit a letter to your employer or council to support your conference registration, there is a template on the conference website.

The mayor of Townsville, Councillor Jenny Hill will open the conference and our MC this year is internationally-renowned business and leadership authority, Alan Patching. Alan was the Chief Executive Officer of the entity which owned Sydney's Olympic Stadium. He was also project director on the $280m redevelopment of Suncorp Stadium in Brisbane for the 2003 Rugby World Cup. Alan credits his business success to a lifelong interest and study of human behaviour and we are looking forward to Alan's insights throughout the conference and how this understanding might help us in our roles. Alan will also deliver keynote presentations on how to influence decision-makers and achieving and maintaining relevance and sustainability.

The topic for the Great Debate this year will be 'smart cities are not that smart'. I will be arguing for the affirmative team together with Andrew Ryan, Director Infrastructure Services, Sunshine Coast Council and Renn Niemann, a Partner at McCullough Robertson Lawyers. You can listen to last year's debate, *'women make better engineers than men'* (which was won by the affirmative team), in the new IPWEAQ Knowledge Centre – sign in via the new IPWEAQ member portal.

Early bird registrations for the 2017 state conference close 30 June 2017. The program (with 16 CPD hours) will be available mid-June. Any NQ Branch members who had intended submitting an abstract for the conference should contact Craig Moss as soon as possible.

With the state conference in our branch this year, the next NQ Branch conference will be held in Cairns, 18-20 April 2018. A Call for Papers will be issued in November.

If you would like to join the NQ Branch committee, Expressions of Interest (EOI) are open until 19 June 2017. We are looking for enthusiastic members with energy and commitment who want to actively contribute to the future vision of the institute. Branch committees are an important regional, strategic and technical extension of the IPWEAQ Board and ideally, should include representation from various councils, women and U35s.

I look forward to welcoming you to Townsville in October as we host our colleagues from across the state at the premier gathering of those involved in the public works sector in Queensland.

Bruce Gardiner
NQ Branch President

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALASIA

Our members enjoy a
strong sense of community through our proactive branch network.

Public Works Technical Subscription

(SUBSCRIBERS ARE RECOGNISED AS 'SUPPORTERS' OF IPWEAQ)

INFORMS. CONNECTS. REPRESENTS. LEADS.

- ✔ Full access to Standard Drawings which can be shared with constituents (value $800 per individual user)
- ✔ Your employees will receive a 10% discount on their annual IPWEAQ membership subscription (value $30 per employee)
- ✔ Complimentary subscription to Complete Streets: Guidelines for Urban Street Design (value $400)
- ✔ One Council delegate to attend the state conference (value $1500-$1800) plus one branch conference (value $200-$250) each year
- ✔ Discounted rates to purchase IPWEAQ technical products including ADAC, LORDG and QUDM (up to 15% discount)
- ✔ Free job advertisements in 'Connect' our fortnightly e-news service
- ✔ Your logo on the IPWEAQ website linked to your website
- ✔ Your logo in every issue of our quarterly e-journal 'Engineering for Public Works' and the opportunity to publish articles
- ✔ Opportunity to include notices in 'Connect' our fortnightly e-news service

$4,000 (plus GST)

Phone **07 3632 6801** carlie.sargent@ipweaq.com **www.ipweaq.com**

IPWEAQ Public Works Technical Subscription

BEST PRACTICE AND INNOVATION IN PUBLIC WORKS - 2016 IPWEA STUDY TOUR OF USA, SPAIN & HOLLAND

FEATURE ARTICLE

Gleb Kolenbet

Executive Summary

Each year the IPWEA Foundation offers its members an opportunity to participate in a sponsored study tour. It is a chance to visit local government authorities in different countries, meet fellow engineering professionals, see engineering projects and do some sightseeing. In order to be considered for the scholarship, members are required to submit an application addressing several criteria, outline their areas of interest and explain why they should be considered. After a formal selection process is completed, a small group of members are selected and the tour is organised, the itinerary of which is tailored to suit the interests of the group.

The 2016 tour was themed "Best Practice and Innovation in Public Works" and included visits to local authorities in Santa Monica, California, the City of Yonkers near New York, City of Madrid and Valladolid in Spain, and various places in Netherlands. As part of the tour, participants attended the annual American Public Works Exhibition (PWX) in Minneapolis - a four-day professional development conference and trade show - which attracts attendees from not only North America but also from other countries including Australia, Mexico and Europe. Conference attendees include engineers, public works directors, operations supervisors, infrastructure consultants and vendors of public works equipment.

The participants visited several local authorities and generally the format of the visits included formal greetings and presentations by the hosting party, followed by a Q&A session and site visits. The hosting parties were notified ahead about our group's specific interests and objectives of the tour by the organiser Mr Chris Champion, so the visits could be better arranged to benefit all parties.

While on tour the participants also had free time, which was used to travel and sightsee. This added a good social aspect to the tour and allowed participants to get to know each other, discuss engineering related issues and exchange knowledge and opinions in an informal atmosphere.

This report provides the insights of the 2016 study tour and discusses the highlights including a summary of events - the PWX, visits to local authorities and site visits. It also provides an overview of the projects inspected during the tour and outlines the key lessons and draws comparisons to Australian engineering, asset management and town planning practices.

The document is written in a way that follows the travel schedule of the study tour. Visits to each local authority are described as learnings and experiences accompanied by photographs taken on tour. A separate chapter of the report provides a summary and recommendations for application of technologies and engineering innovation witnessed during the tour. Sightseeing trips are also described where relevant with reference to innovation and good engineering practices.

1. Introduction and Study Tour Logistics

The 2016 International Study Tour ("IST" or "tour") was carried out between 25 August and 10 September with a group of four engineers visiting the USA, Spain and Netherlands. Our

group included participants from different engineering backgrounds and professional interests:

State	Name	Job Title	Organisation
NSW	Chris Champion	Director International	IPWEA Australasia
QLD	Andrew Ryan	Director Infrastructure Svs	Sunshine Coast Council
WA	Douglas Bartlett	Coordinator Asset Mgt	City of Mandurah
QLD	Gleb Kolenbet	Development Engineer	Redland City Council

The IST participants visited several municipalities and attended Public Works Exhibition (PWX) in Minneapolis:

Date	Place/Hosting Party
25/09/16	USA - Santa Monica Municipality, LA
27-31/08/16	PWX Conference, Minneapolis
01-02/09/16	New York – The City of Yonkers Municipality
03-07/09/16	Spain – Madrid and Valladolid Municipalities
08-10/09/16	Holland – Municipalities of North Holland, Noordwijkerhout and meeting with Stadswerk, Sustainable Amsterdam tour.

Some photographs in this report feature "Pocket Sally" – an initiative by Young IPWEA to promote awareness about gender diversity in engineering.

2. Participant Interests and Study Tour Objectives

The tour was designed around the participants' professional interests and areas of research, and coordinated accordingly with the hosting public authorities by tour organiser Mr Chris Champion. As the group comprised of engineers with different backgrounds and professional experiences, the areas of interest also varied.

2.1 Interests

My areas of interests for the tour included the following:

- Smart Cities and emerging use of technology;
- Management of sustainable growth & development;
- Challenges of growth for townships;
- Integration of different transport modes in growing commuities;
- Infrastructure, green space and master planning;
- Stormwater management including life cycle cost and maintenance of assets.

2.2 Objectives

My personal and professional objectives for the study tour were to:

- Further research into the information about the areas of town planning, land development, integration of public transport, stormwater management and sustainable engineering practices;
- Attend PWX and conference and get an understanding of American Public Works in terms of their core values, issues and practices;
- Extend professional network in the areas of interest;
- Obtain knowledge about modern technology use in public works engineering.

It is noted that although my personal interest did not include information on asset management, this topic was quite prevalent throughout the tour because of the keen interest and involvement of other participants in this area of engineering. I am glad that this was the case as it allowed me to learn more about this topic by attending asset management event and presentations and participating in discussions.

The study tour objectives were re-adjusted slightly during the tour, prompting further research in different areas. This was generally

Santa Monica's esplanade type foreshore street adjacent to beach.

due to discovering an interesting topic or seeing innovative projects during a local authority visit.

3. Visit to the USA

3.1 City of Santa Monica – Los Angeles, California.

On 25 August 2016, the group visited the municipality of Santa Monica and met with the representatives from the department of public works. Each of the Santa Monica municipality representatives presented to the group about their projects including difficulties and opportunities. The format of the visit was semi-formal and tour participants were able to exchange experiences and ask questions during presentations.

3.1.1 Background information

Santa Monica municipality is located west of Los Angeles along the Pacific Ocean coastline and is known for its iconic places like Santa Monica Pier, Venice Beach and extensive sandy beaches. Its population is around 85,000 people while during busy tourist seasons it swells to 250,000.

Santa Monica relies on external water supply for its drinking water and recent droughts in nearby areas have compromised the reliability of this source.

Recent drought management measures involved practices similar to Australia including control of outdoor irrigation, public awareness campaign and some policy changes towards conservation. Interestingly, the price of potable ("tap") water is significantly lower than that in South East Queensland (SEQ) as it was determined politically unpalatable to increase pricing for consumption management. By comparison, 1 kL of potable water costs around five to eight times less than in SEQ. Interestingly, the average consumption in Santa Monica is still quite high at around 300l/person/day, which is comparable to a pre-drought level previously experienced in SEQ. In contrast, current SEQ consumption is at around 160-180l/person/day.

All wastewater is sent away and treated at the central facility located in the city of Los Angeles. Currently, the aquifer recharge with treated wastewater is not practiced, however the authorities see this as an opportunity to reuse water as about 70% of Santa Monica's water supply is derived from underground sources.

3.1.2 Santa Monica's Water Self-Efficiency Plan

Santa Monica is trying to find a reliable and sustainable source of water supply and wants to become completely independent from external suppliers by 2020. Mr Borboa presented on Santa Monica's Water Self-Efficiency Plan and the following key points were noted:

- Authorities are aware about follow-on effects of reduced water consumption – reduced revenue. This calls for a balanced approach to sustainable use and multiple stream re-use instead of a single sided approach to reduce consumption.
- Significant increase of investment into water recycling, desalination and re-use for non-potable purposes (that is toilet flushing, clothes washing, sports fields/park irrigation).
- Capture, treatment and re-use of stormwater runoff from public places such as carparks for non-potable uses via installation of underground recycling facilities called Santa Monica Urban Runoff Recycling Facility (SMURRF).
- Installations of a modular solar-powered assisted "off-the-shelf" saltwater reverse osmosis container, as part of SMURRF, to advance- treat harvested water for eventual permitted indirect potable reuse.
- Establishing a Clean Beaches Initiative (CBI) project, designed

to provide an environmental benefit by removing pollutants from stormwater runoff before discharging to sea as well as capturing and storing water for re-use. Along with the obvious "clean beach" benefit the project also offered up to 6-7ML of recycled water capacity to be used for non-potable users. This is an interesting point as marketing and obtaining funds for such project would be much more palatable as a CBI rather than recycled water project.

- Installation of underground packaged type wastewater treatment plant around 4ML/day capacity in order to treat wastewater locally for further non-potable re-use and aquifer recharge in the future.

3.1.3 Santa Monica Sustainable City Council Building Project

Back in 1992, the City of Santa Monica was among the first in the country to publish a Sustainable City Plan that established goals and performance benchmarks for an environmentally responsible, economically viable, and socially just community. The Plan set ambitious goals for energy efficiency, renewable energy and greenhouse gas emissions citywide. In 2006, an updated Sustainable City Plan established a goal for reducing community greenhouse gas emissions to 15% below 1990 levels by the year 2015. By 2012, the City's emissions were 14% below 1990 levels, which was a great achievement.

In 2012, Santa Monica issued a new Climate Action Plan designed to create a framework to achieve the 15% goal by the end of 2015, taking into account projected population and economic growth. This Climate Action Plan recommended more aggressive energy efficiency standards than the state code for new buildings and a reduction in energy use from existing buildings by implementing a benchmarking and disclosure regulation. Today, Santa Monica is committed to reducing emissions 50% below 1990 levels by 2030 and 80% by 2050. To meet these goals, the government is reviewing the relationship between its built environment and the natural resources it takes to build and operate its buildings.

Mr Joel Cesare presented about a new "super-green" services building for Santa Monica city council. This initiative is a part of government's plan of meeting the city's environmental performance goals via re-shaping its relationship with natural resources and built environment.

The new "super-green" building will use less energy than it produces, it will not use external water for consumption (except for firefighting), while all wastewater will be disposed of using composting technology. In addition, there will be an opportunity to grow food on site and digital technology will be employed to reduce its reliance on paper. Council is also investing into cloud – based technology to enable its employees to work via remote access and be more mobile.

It was noted that Santa Monica government had a rather large environmental team of professional of about 15-20 people, working on city's sustainability initiatives. Such investment may partially be the reason why Santa Monica is doing quite well in achieving ambitious environmental performance targets and is able to research and invest into future projects. I believe that majority of SEQ local government authorities do not have the same level of investment and commitment into sustainable initiatives at the city of Santa Monica. This may also present an opportunity for learning and gaining experience for us.

3.1.4 Additional observations

Santa Monica has a similar feel to the Surfers Paradise area of the Gold Coast and it attracts many international and domestic tourists. One of the differences is that the beach line part of Santa Monica is very wide (around 200+ metres) and the coast side buildings are of a low-rise character with some exceptions of multi-storey buildings which are set back even further away from the beach. Hire bikes are very popular amongst the visitors and are relatively inexpensive. Wide bikeways/pedestrian paths are provided along the beach and are enjoyed by many. There is limited number of vehicles allowed at the foreshore esplanade, which makes the atmosphere more enjoyable, less polluted and safer for biking enthusiasts and walkers.

3.2 Minneapolis

Between the 26th and 31th of September 2016 the group visited the city of Minneapolis and attended the Public Works Expo (PWX) and conference. Australian delegates had distinct white IPWEA hats, which worked out well for spotting each other amongst the crowd.

3.2.1 Background information

Minneapolis is located on the banks of the Mississippi River and is the largest city in the state of Minnesota, Heinepin County. It

has a population of approximately 400,000 people and is the second largest economic centre in the US Midwest area after Chicago. There are several lakes and wetlands surrounding Minneapolis area.

3.2.2 Public Works Expo (PWX) and Conference

The PWX and conference attracted around 5,000 local and international guests and was held in Minneapolis Convention and Exhibition Centre. The programme offered a broad range of keynote speakers and multiple streams of technical presentations delivered simultaneously over the course of 4 days, along with a large trade display on show. The conference also offered an opportunity to socialise including a fishing trip, a microbrewery tour, a fun 5km run along Mississippi River, a tour of Minnesota Twins baseball stadium and several official receptions.

The organisers provided delegates with a conference app, which offered timetables of sessions, calendar booking options, important updates, live feedback including sharing of photographs and copies of presentations. This was a very convenient way to keep track of the extensive programme. Another interesting feature of the conference was that international guests were each assigned an ambassador to assist guests with logistics and answer any questions. My ambassador Mr Scott Brandmeier contacted me ahead and offered assistance. I ended up meeting with him over lunch and having a conversation about engineering practices in Australia and USA.

We attended technical sessions based on individual interests and later exchanged knowledge and key learnings. Mr Chris Champion and Mr Andrew Ryan presented on asset management topic based on Australian practices, which was very informative and provided a good insight into the asset management best practice using real examples. I have attended multiple technical sessions and presentations and found that the conference had a good amount of technical content and a broad range of topics. Surprisingly, the presentations were not moderated and were run by the presenters themselves. I believe that having moderators has its advantage as it helps to facilitate a more productive and orderly atmosphere and creates a discussion around the topic been presented.

My highlight of PWX was a presentation by Mr Charles Marohn from organisation called "Strong Towns". Mr Marohn talked about a new approach to township and neighbourhood development by prioritising financial solvency and resilience rather than a top down approach for creating available space in land development. He encouraged looking at the actual long-term land yield from accountants/ economic point of view and making comparisons between the styles of town planning and development based on a self-sustainable viability. Mr Marohn used an example of "needs based" development that used to occur hundreds of years ago. Such development happened only after there was a tangible need and a solid financial base to sustain expansion for years to come. Mr Marohn emphasised that an increasing total cost of investment into new infrastructure coupled with cost of maintenance of ageing infrastructure assets will continue to put tremendous pressure on our society. He argued that many modern development styles prioritise large-scale projects over incremental growth while employing top-down systems that can are "orderly but dumb". Interestingly, the presentation by Mr Marohn had a strong emphasis on improving communication between accountants, engineers and town planners. Mr Marohn also said that a more agile and superior way of asset management is needed, as role of asset management in the future of public works and our economies is becoming paramount.

3.3 The City of Yonkers near New York

On 1 September, we visited the city of Yonkers and met with the director of sustainability Ms Heliana Higbie and a representative from Omniflow USA. Ms Heliana's presentation about sustainability projects across the city was very informative and practical.

3.3.1 Background information

The city of Yonkers is an inner suburb of New York City, has a population of about 200,000 people and is located to the north of Manhattan. It is connected to New York by train services. The name Yonkers came from Adriaen van der Donck, a lawyer who originally acquired the land in the area in late 16th century. He was known locally as "Jonker" (approximately translated from Dutch as "young lord"), so the name Yonkers was later derived from that. The city is famous for recent iconic sustainability projects such as the "Science Barge" and "Saw Mill River Daylight Project", which we visited in addition to other sites .

The Science Barge. To the left are solar panels with tracking mechanisms and wind turbines and hydroponic enclosures are on the right.

3.3.2 Saw Mill River Daylight Project

This project involved uncovering a river that was put underground by engineers in 1920s using culverts in order to mitigate flooding issues and gain additional usable space. The space was later utilised as a parking lot. Much of the habitat that used to live in the river was lost after it was put underground. After considerable period of planning, design and community consultation in 2011 the Daylight project was complete. The parking lot was removed and part of the river uncovered or "day-lighted".

From talking to Ms Higbie and based on our site visit, it was evident that the project resulted in a positive outcome. The locals can now enjoy a revitalised natural running water stream, which supports biodiversity and encourages river life to come back and regenerate. One of the photographs taken by the fellow tourer Doug Bartlett has a Muskrat, which was spotted, in the Saw Mill River.

3.3.3 The Science Barge Project

The group visited the Science Barge – an environmental initiative project designed to promote sustainable living. The barge is permanently docked on the Hudson River at Yonkers. It generates its own electricity via solar panels with sunlight trackers while its wind turbines generate electricity in a more efficient way because of its access to prevailing winds. Water is produced by way of desalination and is used for irrigation of crops such as garden vegetables, grown using a hydroponic system in a multi-level tier set up. All of the runoff from vegetables irrigation is collected and reused. The Science Barge provides a real-life example of an enclosed system and how such a system can operate sustainably. The barge is open for visits and often hosts scientific tours and presentations for school children and parents.

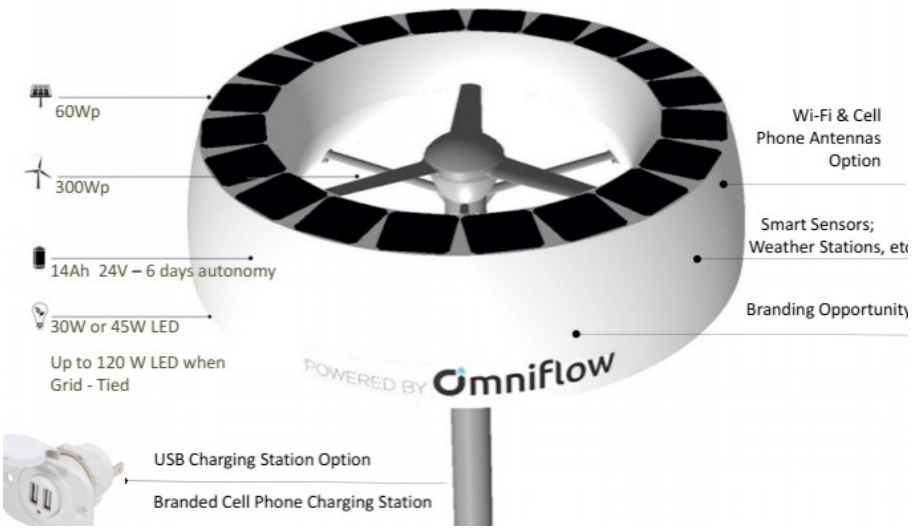
3.3.4 The "UNO Project" - Re-development of an industrial building into 100 micro-residential apartments

The group visited a multi-storey industrial building, which in the past housed an Otis elevator factory. Because of its location in Yonkers and close proximity to the train station, the developers took an interest in the building. After a close investigation it was discovered that the original building design allowed for up to 4 additional floors to be constructed on top with some structural modifications. The existing building offered extra large windows and 14-20 foot ceilings, which meant that even if the residential apartments were small in size, they could enjoy plenty of daylight and have extra ceiling space. The re-development project offered 100 micro-residential apartments, which were small in size but offered fairly affordable accommodation given its location. Yonkers administration welcomed the development and collaborated closely with the developer – The National Resources Company. The project is due to finish in 2017.

3.3.5 Rooftop Solar Project

Another great joint venture project we visited is the rooftop solar array of about 1.1MW capacity installed on top of a medium rise building. The energy generated by the

Solar panel array on top of a roof of a municipal building.



Schematic details of Omniled smart lighting tower.

solar panels is enough to power approximately 120 houses over a full year and had full municipality support as it promotes sustainable initiatives and is economically attractive.

3.3.6 Autonomous LED Smart Lighting

The group visited a JFK Marina Park where we saw an autonomous Smart Lighting – "The Omniled". It uses the "Omniflow" technology for wind and solar power generation. The tower houses battery storage, LED lights, electronics such as Wi-Fi routers and can have security cameras. The Omniled tower provides back to base real life monitoring of the Marina Park area and lights up the area at night for security and convenience. The tower is designed for remote area installations as it does not rely on external services and is fairly vandal proof. It was noted that during the recent power outage the Omniled provided a few locals with a power source for charging mobile phones as the tower is equipped with phone charger outlets.

Mr Luis Barros from Omniflow explains the operation of Omniled smart lighting tower.

3.3.7 The Smart waste bins

The group also witnessed a "smart" public waste bins fitted with solar-powered sensors that can detect how full the bins are and transmit this information to a service provider.

It is understood that the Sunshine Coast Council in Queensland installed some of these sensors in bins at Caloundra CBD. Beforehand, the Council was incurring the cost of emptying bins which were only 20% full every day. Since installation of the sensor bins, Council was able to change its schedule to twice weekly with a cost saving of $11,000, taking big trucks off the road and reducing its carbon footprint.

The smart waste bin equipped with solar powered sensor that senses how full the bin is and send a signal to service provider via Wi-Fi.

The High Line Park. Many people can be seen using the park. Note its location between the buildings creating an unusual urban effect.

3.3.8 Street Art

The City of Younkers has some interesting and unusual street art, offering a mix of impressions of everyday people as well as imaginative art (refer to pictures 25-26). Such street art is a sensible alternative to meaningless graffiti that is way too common in urbanised areas. In my opinion clever and professional street art contributes to a trendy neighbourhood feel and strengthens a sense of community. The council staff told us that there is even a street art painting by an Australian artist Damien Mitchell.

3.4 New York – the High Line Park

On 2 September, we visited an iconic New York project called the "High Line Park". This is a unique engineering, architectural, town planning and landscaping project that transformed an old unused elevated West Side rail line, located in lower Manhattan. This is another great example of innovative urban "infill" engineering that created environmental, social, economic and aesthetic benefits. The railway line was refurbished to include pedestrian walk ways, public "hangout" areas, bench seats, open areas for local small scale markets and coffee shops, coupled with clever landscaping using mostly local plant species as well as some street art. Interestingly, I questioned whether local businesses located under the high line may lose patronage due to de-activation of the street below as the people use the High Line. However, after observing nearby Chelsea markets I saw that the Highline project had the opposite effect. From talking to locals, I learned that the surrounding areas have benefitted from increased activity, the real estate prices adjacent to the High Line have increased since the project completion as well.

4. Visit to Spain

4.1 Background information

Between 3-7 September we visited Madrid and surrounding areas. Madrid is the capital of Spain and has a population of about 4 million people. During our trip, we visited Madrid underground road tunnel traffic control and made day trips to the cities of Toledo and Valladolid.

4.2 M30 Madrid Calle 30 - Madrid Underground Road Tunnel Project

On 5 September, we met with a representative from Madrid City Authority and Mr Samuel Romero Aporta – representative of Madrid Calle M30 company

M30 Calle control centre – a very modern facility.

(refer to Picture 31). The project is a joint venture between a private company and municipal authority and was designed to significantly improve traffic connectivity and efficiency by putting about 90 km of roads underground. The project offered a large amount of above ground space in place of existing roads, which was converted into open space parklands. The cost of the project was about 4 billion Euro while about 90km of road was constructed. Previously, the road network was cutting through densely populated areas and divided neighbourhoods without offering good connectivity. Some residents that lived on one side of the road felt "disconnected", which created social issues. Environmentally, the busy urban highway was an eye sore and a big polluter, affecting the quality of air and surrounding environment including a river located adjacent to the road.

The new underground road tunnel connected neighbourhoods and removed pollution away from densely populated areas. It also created a large amount of open space, which was landscaped and converted into park with playgrounds, cafes, walking and cycling facilities. In order to give the project a more local character and make the community feel more included, one of the connecting pedestrian bridges was complemented with images of local residents.

4.3 Visit to Valladolid - Background

On 6 September, we visited the city of Valladolid and met with representatives from local government. Valladolid is located in north-western area of Spain and has population of about 300,000. The city has a rich history and once was a capital of Spain and housed a Royal Court and a Royal Mint. Christopher Columbus died in Valladolid in 1506. Valladolid is a home to a successful rugby union team who are the holders of Spanish League title.

The local government system in Valladolid is similar to a local governement in SEQ, however the local council has an additional responsibility of managing traffic police and schools. Our tour group met with the colleagues from municipality including city Mayor – Mr Oscar Puente.

Our group was given an overview of Valladolid's town planning and development history and visited a water supply and wastewater plants. We also visited the traffic police centre and did a tour of the city centre and central park. Valladolid has a rich history having been originally settled in pre-Roman times and later became a city at around 1100. The central part of the city including "Plaza de Mayor" were devastated by fire around 1560. The city centre was re-planned and reconstructed under the direction of architect Francisco de Salamanca who was instructed by King Philip II. Salamanca's approach was to create a hub in a form of square – Plaza de Mayor - to house guilds, trades, and services, connected in a spider web-like roads and streets to the rest of the township. The city grew "outwards" from the central part as it developed and population rose. Plaza De Mayor set an example of town centre planning for the rest of Spain, parts of Italy and South America. During our travels through parts of Madrid, and the historic city of Toledo, we did note similarities in set out "Plazas" (or squares) which were usually the activated hubs of activity and attracted businesses, locals and tourists.

5. Visit to Netherlands

5.1 The city of Amsterdam

During 7-9 September, our group visited Amsterdam and its surroundings. Amsterdam was founded in the 12th century. It is now one of the European financial centres and also the cultural and political capital of Netherlands. It has a population of about 850,000 excluding its metropolitan area.

Landscaping features of the dyke and underground car park.

Our first impression of Amsterdam was the electric taxis – Tesla electric cars. As I found out, there are about 180 fully electric cars that operate as taxis in and out of Amsterdam Schiphol airport. Interestingly, in their effort to reduce air pollution in Amsterdam and promote use of electric cars, the government allows only electric cars to operate out of the airport. A frequent public transport service is also available to and from the airport at a reasonable cost.

5.2 City of Katwijk –Dyke Project

On 9 September, we visited a city of Katwijk where we met with Jeroen Rodenburg, an engineer at the local municipality, Noordwijkerhout. Jeroen presented about the Dyke in Dune project that was recently completed as part of a national coastal protection program. The project offered a unique solution – construction of an in-dune sand dyke or an artificial embankment complete with underground car park for 670 cars, several beach accesses, landscaping and a flood by-pass channel.

During our visit to Katwijk we also met with Mr Thomas Rau, an architect and the CEO of "Turntoo". Mr Rau's presentation about "circular economy" titled "The end of ownership" was specifically intended for asset management in local government. His presentation challenged a common practice of owning something to be able to use it or provide a service. He encouraged us to look carefully at the need, which often is a need for a service, rather than the ownership of an asset. He used an example of streetlights. As consumers, we just want light so the streets are lit up at night, we are not really interested in the technical side of things such as types of bulbs etc. So, if we are prepared to pay a certain amount for a service, it should be up to the service provider or supplier to come up with the economical and efficient way of providing such service. It creates healthy competition and puts the emphasis on the creators of that service to come up with innovative ways to provide a service. The responsibility of the actual ownership is with the designer and manufacturer for the life of the product including the end of life disposal. This is a very efficient way of looking at ownership versus service. In its core, Mr Rau's way of thinking is based on a fact that we live in a closed loop system where the resources are finite and we all have a role to play, we all share responsibility for what we do and how we behave as consumers and producers.

5.3 Institute of Public Works – Stadswerk

The group attended a general meeting of Stadwerk, a Dutch equivalent of IPWEA, organised by its director - Mr Loeffen.

During our visit we saw a number of presentations on asset management including a presentation by Mr Hjalmar Boon. He talked about development of ISO55001 which is a standard that covers the certification requirements or the "what to do" for asset management systems. He also acknowledged the Australian International Infrastructure Management Manual (IIMM) as a comprehensive document that provides the methods, models and tools or "how to do" for the asset management systems. Mr Boon provided an overview of implementation of ISO55001 in North Holland municipality including a diagrammatic representation of the process.

Covered bicycle-parking facility at a train station in Holland.

A ramp facility at the stairs for transporting bikes up and down at a train station in Holland.

A diagram of asset management system infrastructure for North Holland province, based on ISO55001 and IIMM.

We also participated in a bike tour organised by Stadswerk and designed to show some of the techniques used to manage street assets including integration of trees and footpaths and in Amsterdam. This was an informative tour and allowed for social interaction in an informal atmosphere while talking about engineering and town planning examples.

5.4 Solar Road Project – visit to Krommenie

On 9 September, our group met with local government engineers from province of North-Holland and a representative of research organisation TNO.

Dr de Wit and his colleagues presented about a joint venture project – "Solar Road". The project is a world first roadway and includes 70 metres of footpath with in-built solar panels designed to withstand foot and bicycle traffic. It is expected that solar road will produce 50kWh of electricity per square metre annually, based on Netherlands weather conditions. During the site visit we inspected the solar road and it looked and felt just like a normal asphaltic surface with imbedded granular material that appeared to be silica-based. It did not feel slippery or unsafe. We also observed several people on pushbikes using the pavement. According to Dr de Wit the pavement was installed nearly 4 years ago and is still undergoing testing. The project is an exciting venture and if successful it may provide opportunity for use in Australia.

5.5 "Sustainable Amsterdam" bike tour

The group also participated in a "Sustainable Amsterdam" bike tour hosted by Ms Cornelia Dinca.

The bike tour was an informal but a very informative event. It included exploring Amsterdam's bicycle culture by cycling through the city and visiting several tech labs and projects such as "MX3D", "De Ceuvel" and Amsterdam North – Shipping Container accommodation project.

5.5.1 Amsterdam bike tour – learning about development of a "bike culture"

Amsterdam is known as the "city of bikes" for its culture of integrating cycling into everyday life. Holland has a population of about 17 million people and nearly as many bikes, but it was not always like that. Amsterdam's active transport culture started from grass roots – residents' discontent with traffic, pollution and diminished lifestyle compromised by increase in reliance on petrol-powered cars. The 1973 world oil crisis triggered a political change in support of prioritising biking, walking, catching a bus or a light rail over car commuting. Amsterdam's efficient active transport system was created over time and took strong political will and collaboration between governments, town planners and environmental activists. Now, cycling is a part of everyday life for majority of people in Amsterdam. Clear benefits are seen in reduction in the number of vehicles entering city centres and therefore, reduction in fuel emissions, whilst the physical

PA busy 2-directional bike lane in peak hour in Haarlem. Bicycles share an on on-road lane painted in red colour on a lower order road.

De-Cuevel. Renovated ships for use as offices, surrounded by plants for phytoremediation.

health of people using active modes of transport including cycling, has improved.

Interestingly, it is not compulsory for bike users to wear helmets in Holland. While some may say that this is unsafe, the authorities have studied this issue carefully before allowing no helmets. Detailed town planning and engineering went into making sure that bicycles remain a safe method of transport, even without a helmet. For example, it was determined that a chance of severe injuries or even death at collision is increased significantly at a speed greater than approx. 50km/h. Consequently the Dutch have addressed the point so the roads with a speed limit over 50km/h to have separate bikeways protected from traffic, while on road bike lanes are provided in low speed environments only. Another important point is that there does not seem to be a "bad blood" between vehicle drivers and bike users, which is all too common in Australia. In fact, the law is structured in a way that bikes have a priority on majority of roads but must also obey road rules.

Urban researches say that because of cycling in Holland, "about 6,500 deaths are prevented each year, Dutch people have half-a-year longer life expectancy, and that these health benefits translate in economic benefits corresponding to some 3% of Dutch GDP". Studies also confirm "investments in bicycle-promoting policies (e.g. improved bicycle infrastructure and facilities) are likely to yield a high benefit-cost ratio in the long term".

Many facilities are provided for bicycle users including separate parking (incl. undercover), showers and change rooms at end of trip destinations, special ramps for easy manoeuvring and public transport facilities for transporting bikes.

5.5.2 De-Ceuvel

This was an unusual site established of a former shipyard on the IJ river. It was founded at 2012 by a group of architects who set their mind to re-generate a polluted site into a sustainable urban oasis. The project consists of several abandoned boats that are connected with a jetty type walkway and dense vegetation designed to phytoremediate the polluted water and soil. All waste is recycled on site and re-used where possible. The boats are renovated and let out for office space. There is also a café that attracts tourists and environmentalists visiting the site.

5.5.3 MX3D Studio and workshop

We visited an office-studio and workshop of MX3D - a venture started by software experts and engineers that researches and develops ground breaking robotic

A bike frame manufactured in 3D printing by robots by MX3D.

3D digital fabrication printing technology. MX3D develops robots and technology that can print sustainable materials such as metals and synthetics in virtually any size or shape. We witnessed robots making structures on site and were told that MX3D is trying to use robotics to build a short span pedestrian bridge with a view to employing this technology for re-building canal bridges in Amsterdam.

5.5.4 High-density modular living

Amsterdam North has an area occupied by high-density modular set-up using shipping containers. It is understood that this accommodation is designed for students because of its affordability and proximity to public transport and universities. Containers are air-conditioned and have all necessary basic amenities. This is an interesting concept as it does not involve permanent structures, is relatively inexpensive to set up and does not look aesthetically unwelcoming.

We also seen an example of medium density of low-rise residential living positioned on a small land footprint. It appeared to be a fairly structured, strata title-like living arrangement where dissimilar building façades are encouraged as they create a contemporary feel. On one hand it may seem disorderly from town planning perspective but the dwellings offer their own style and have a very different, special feel about them. Could this be a sign of contemporary Dutch architectural identity?

6. Additional observations and comments

During the tour I was able to find out about the American governance system, which is similar to Australian system but there are some noticeable differences and it appears a little more complex. It seems that there are more levels of governance perhaps due to a significantly larger population by comparison. There are 4 tiers of governance in US – Local, County, State and Federal, while Australia has 3. In addition to providing the same services that councils do here, American local Councils or municipalities are responsible for fire services and policing. Interestingly, this was similar in Spain. County government has greater powers than local councils and includes state law enforcement generally done by a Sheriff department. During my conversations with American engineers there was a common trend in talk about how they often need to work with three to four different tiers of government simultaneously in order to get approvals, funding and support.

While at Santa Monica, the group stayed at Venice Beach. Local culture seemed similar to coastal areas of Byron Bay – relaxed atmosphere coupled with a "surf culture".

It was noticed that path assets in some locations of Venice Beach were not maintained as well as in central areas of Santa Monica.

By comparison to Australian standards the state of these assets was poor in places. It was a surprise to see this as in Australia similar damage would have required an exclusion zone or a barricade for safety until repaired. From discussions with the American engineers I understood that public asset management such as paths is often approached on risk based basis and depends on funding availability.

High-density modular living made with shipping containers. Note the vibrant colours creating a contemporary feel. Amsterdam North, 2016.

7. Conclusion and Recommendations

The study tour was a valuable opportunity to visit other countries, meet new people and obtain first-hand experience about exciting and innovative projects. All hosting parties were very welcoming and excited to meet us and discuss engineering projects. I noticed that all the government officials that we met were very proud and excited about working in their local authorities and their achievements. This was evident throughout their presentations about projects and during our conversations. It was an honour to meet with the Mayor of Valladolid who recognised the importance of public works engineers in the community.

The trip gave me "food for thought" and prompted to further research the topics studied during the tour. I believe that most of the objectives of the tour were accomplished during the course of the trip. I also had a list of recommendations that may be useful for local government engineering, planning and asset management professionals.

7.1 Santa Monica municipality

- There is a good government investment into stormwater recycling infrastructure, which provides environmental as well as re-use benefits.
- Price increase for potable water use is not a key factor in management strategy. This is very different to Queensland where water prices at over $4/kL have played an important role in managing consumption.
- Authorities are using "packaged" small to medium scale infrastructure for water management projects instead of a one end of line "central" solution. This is seen as an opportunity as the initial capital investment, and project duration to completion is significantly reduced.
- Authorities are forced to utilise underground space for infrastructure, which is also seen as an opportunity for high-density areas in SEQ.
- Santa Monica appears to have a restriction on building height of about 10-12 metres near the beach. The buildings are set back at least a few hundred metres form the water. This seems like a good town planning outcome, as the beaches look extremely wide and unobstructed. By comparison it is more aesthetically more pleasing than some parts of Gold Coast.
- Hire bicycles are readily available along the beach. This could be an excellent business opportunity for SEQ Coastal areas, especially on the Gold Coast.

7.2 PWX Conference

- The conference was well organised and provided a good opportunity to get to know fellow engineers from USA as well as other countries. Social programme was organised extremely well. Activities like a 5k fun run could be adopted for Australian conference events as a health and wellness-promoting as well as a social gathering alternative.
- Having an "international ambassador" assigned to overseas guests for the time

of the conference was a good practice by the organisers and made guests feel welcome while providing a person to turn to in case of any questions. This is some thing that could be looked at in Australia also.

- The conference app offered an easy and convenient support for conference scheduling and keeping up with the calendar of events.
- Asset Management and development planning engineers must work closely with accountants and town planners as it will take a combine effort to create a financially agile and sustainable development outcomes. Engineers would benefit from understanding the principles of economics and accounting in relation to asset management.
- Long term land yield must be assessed when looking at different types of land development or redevelopment.

7.3 New York – City of Yonkers

- Engineers must consider future generations and environment in dealing with natural streams, rivers and constructed drainage lines in suburban environment. As the daylight project shows, taming the nature is an engineering practice of the past and engineers and town planners must adopt a new approach. The community values an opportunity to see water streams as it creates a different, aesthetically pleasing experience, particularly when it is tied in within city surrounds. Based on my personal opinion, I would much rather look at an attractively landscaped running stream instead of a concrete parking lot. Daylighting or uncovering drains also promotes biodiversity and as open water supports many types flora and fauna. Australian local government engineers could benefit from integrating the "daylighting" or similar practices based on Yonkers example.
- The science barge is an excellent initiative and a useful practical education tool that can be adopted by local governments in order to promote sustainable thinking. Although there is a cost involved in setting up and maintaining such facility, it may also provide a commercial opportunity for businesses to trial and advertise their technology such as reverse osmosis, solar panels and wind turbines.
- The "UNO" project is a real example of thinking outside the square and using existing buildings to create additional residential yield while not increasing actual footprint. This is an excellent illustration of development innovation and ties in well with previously mentioned "Strong Towns" approach by Mr Marohn.
- A rooftop solar project is another worthwhile initiative that local governments can research and adopt, particular in the Australian east coast and Queensland. Many councils occupy buildings with large roof space which is not utilised. With careful planning and clever procurement installation of solar array would produce financial and environmental benefits. Again, there is opportunity for investment by private companies as large projects are generally good advertising, education and marketing tools and make good business cases.
- Autonomous Omniled combined with wind turbine type infrastructure can be a real solution for local governments for providing lighting, security and occasional power service (e.g. phone charging) services particularly in remote areas. As Australia generally enjoys good accessibility to wind power it makes such technology even more attractive for our conditions.
- Smart bins are a real solution for local councils to ensure a more efficient way of managing collections and reducing long-term costs.
- Street art on buildings and otherwise unoccupied "canvases" such as brick and concrete walls should be promoted and supported by local authorities. Having an aesthetically pleasing street art to look at is much better option than looking at bare walls. It creates an exciting urban culture feel and promotes art.

7.4 Madrid M30 Calle

- Despite having a positive impact on traffic management and creating many social benefits, the project incurred a high capital and on-going maintenance costs. From our conversations with the engineers working on the M30 the finance management side of the project could have been improved in order to ensure financial sustainability for years to come. There is a lesson in this for all engineers that big projects attract big O&M costs and must be accounted for in early stages.

7.5 Valladolid

- Valladolid provided a good example on town planning based on city's practical needs and sustained economic growth, which again resonated with the "strong towns" theme that I learned about at PWX. Historically, architects and town planners promoted high-density living around transport, business and cultural hubs.

7.6 Amsterdam

- Cycling is seen as a mode of transport rather than an occasional way to exercise. There does not seem to be any "bad blood" between different road users. Everyone just seems to get along while there is an appreciation that the road is there for all to use. This is a fundamental difference between Australian culture and Dutch approach to bikes on the road. Our society can benefit from learning from Holland's example.
- Biking is supported by exceptionally well organised infrastructure and start and end trip facilities. It includes undercover bike parking at train stations and workplaces, complemented with shower and change room facilities. This is also an important point encouraging more people to use bikes.
- Despite not having a requirement to wear a helmet, biking is considered as a safe form of transport and in fact, many Dutch see a helmet as inconvenience and a deterrent for others to not cycle. This may seem unpalatable for Australians. However, we must realise that the perceived risk is well managed by a combination of infrastructure provided for cyclists, the culture surrounding cycling and people's physical ability to ride bikes from childhood. If Australia was to follow the examples of Holland, active modes of transport must be looked at holistically.
- Any cultural and behavioural change in Australia towards the use of bicycles must be a gradual and inclusive movement. It must involve all stakeholders including government, town planners, engineers, biking and motor vehicle activists and enthusiasts. Health and other benefits of cycling must be well communicated, as this is likely to encourage people to cycle.

8. Acknowledgements

I would like to acknowledge the following people and organisations:

- IPWEAQ and our Foundation for making this trip possible. I appreciate your support and what this trip has done for my professional career and personal development.
- All of the hosts who gave up their time to meet and greet us, always with a smile and a fantastic attitude. Thank you for organising interesting programmes and for your welcoming hospitality and us. Your passion for your work and community is truly contagious.
- Chris Champion for organising the tour and arranging visits to local authorities and been a patient leader and a tour guide. Chris's knowledge of places and travel tips coupled with his easy-going attitude made our trip stress free and very enjoyable.
- Andrew Ryan and Douglas Bartlett for being great travel buddies. I thoroughly enjoyed your company, humour and knowledge sharing through conversations after official visits.
- Redland City Council for providing support with organising time off work and providing souvenirs which were well received by our hosts.
- IPWEAQ SEQ Branch President – Murray Erbs for your support and guidance. Thank you Raad Jarjees for your travel tips.
- My wife, Helena, for your support and looking after our two very busy boys while I was away travelling around the world, and for proof reading this paper.

Australian representatives wearing iconic "white IPWEA hats".
(From L to R: Doug Bartlett, Andrew Ryan and Gleb Kolenbet).

Gleb will present the findings from his study tour at the IPWEAQ state conference in Townsville, 24-26 October 2017.

Early-bird registrations close 30 June. Register now at www.ipweaq.com/townsville.

Queensland
IPWEA
INSTITUTE OF PUBLIC WORKS
ENGINEERING AUSTRALASIA

Engineering for Public Works
MEDIA KIT 2017

INFORMS. CONNECTS. REPRESENTS. LEADS.

IPWEAQ is the peak body representing those working in the public works sector in Queensland. Our mission is to create a vibrant, vital, supportive community of professionals which serves to enhance the quality of life for all Queensland communities.

Our members take great pride in the projects they deliver because they know they're making a difference. And in delivering projects for their communities, our members rely on the expertise and resources of a number of valued suppliers and consultants. IPWEAQ continues to attract industry leaders as our partners and supporters who assist us in growing our networks and staying on the cutting edge of best practice.

In addition to our strong sense of community and proactive branch network, our leading-edge technical products are widely-adopted. IPWEAQ's comprehensive, innovative professional development program exceeds the needs of members and industry and our excellence awards are highly sought after. We continue to advocate on behalf of our members to government and industry.

Publication dates & themes

September 2017	***Shaping our future communities…smart cities, urban design, managing assets.***
Bookings due	1 August 2017
Content due	15 August 2017
December 2017	***Conference Special issue***
Bookings due	1 November 2017
Content due	15 November 2017

Engineering for Public Works is the primary professional publication for the public works and civil engineering community in Queensland.

Distribution: online journal sent to over 5,000 IPWEAQ members, partners, supporters, mayors and council CEOs.

Why advertise with IPWEAQ?

Each issue receives over **20,000** digital impressions.

Content: Each issue features a major project, technical articles, case studies, academic and legal articles, a member profile, article from LGAQ and a local council feature plus reports from our state and branch presidents, CEO and our subsidiary, the Queensland Water Directorate (QWD).

Readership: engineers and those actively involved in public works projects including technical officers and supervisors, procurement personnel, asset and fleet managers, mayors, council CEOs, consultants and those supplying equipment, products and services to the public works sector.

Value-Adds

As part of our Partner Program, Principal Partners are entitled to a one quarter page advertisement in every issue with all partners receiving one complimentary half page advertorial per year. Partners and Supporters also receive a 20% discount on any additional advertising. Partner and Supporter logos are featured at the front of the journal.

Multi-bookings
10% discount for bookings in two consecutive editions

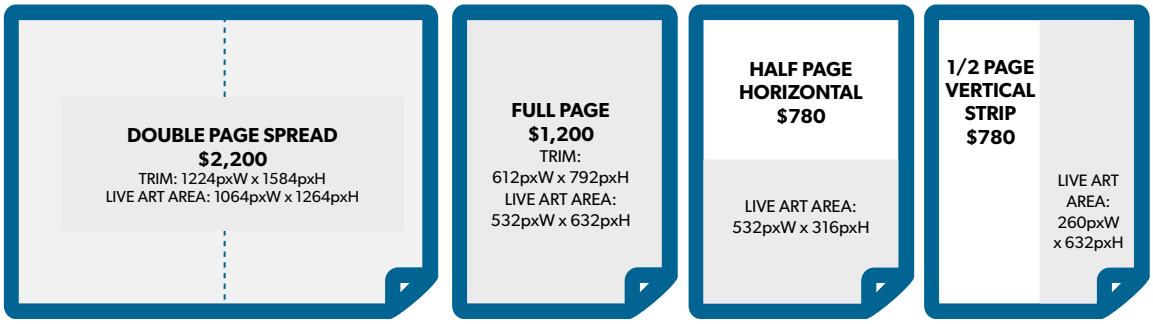
Advertorial - $1,200 per issue
- ✔ Half page 350 word editorial with one high resolution image/photo and logo

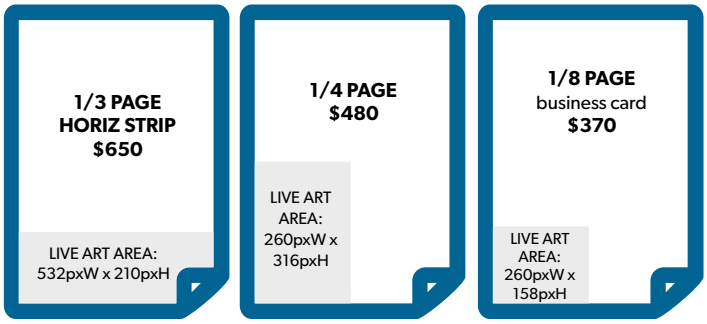
Front Cover - $3,490 per issue
- ✔ Front cover image
- ✔ Double page spread with 800 word feature article in first ten pages
- ✔ Full page display ad
- ✔ Circulated to up to 500 contacts provided by you

EPW reaches over 5,000 members, industry partners and local government decision-makers.

Advertising rates and specifications

- ✔ Prices do not include artwork design
- ✔ Prices are exclusive of GST
- ✔ Artwork must be supplied in high-resolution print ready format - PDF preferred, JPEG, GIF or PNG
- ✔ No crop or bleed marks
- ✔ Fonts must be embedded and graphics linked
- ✔ Files supplied as CMYK colour space
- ✔ Images must be at least 300dpi at the correct size
- ✔ Large files can be sent via Dropbox





DEADLINES

AD BOOKINGS
First Friday of month prior to publication

ARTWORK
Second Friday of month prior to each publication